



HP Omnibook XT6050

HP Omnibook XT/VT6200

Technology Codes EF, EG



Service Manual

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Introduction

This manual provides reference information for servicing the HP Omnibook XT6050 (technology code EF) and XT/VT6200 (technology code EG) series notebook computers. It is for use by HP-authorized service personnel while installing, servicing, and repairing these products.

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

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

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

Product Information

The HP Omnibook XT6050 and XT/VT6200 series notebooks provide outstanding performance and expandability in a conveniently portable form. Their high-performance components use the latest technologies to enable them to serve as desktop computers or portable multimedia presentation tools.

Table 1-1. Omnibook XT6050 and XT/VT6200 Notebooks

Omnibook Product *	CPU **	Display	Hard Drive	CD/DVD Drives	Standard SDRAM	Communication
Omnibook XT6050 Series						
F4506 J/K/H	Celeron 1.06 GHz	14-in XGA	10 GB	CD	128 MB	Modem/LAN
F4507 J/K/H	Celeron 1.06 GHz	14-in XGA	20 GB	DVD	128 MB	Modem/LAN
F4508 J/K/H	Celeron 1.13 GHz	14-in XGA	10 GB	DVD	128 MB	Modem/LAN
F4509 J/K/H	Pentium III 933 MHz	14-in XGA	20 GB	DVD	256 MB	Modem/LAN/802.11b
F4510 J/K/H	Pentium III 1.06 GHz	14-in XGA	20 GB	DVD	256 MB	Modem/LAN
F4511 J/K/H	Pentium III 1.06 GHz	14-in XGA	30 GB	DVD	256 MB	Modem/LAN
F4512 J/K/H	Pentium III 1.06 GHz	14-in XGA	30 GB	DVD	256 MB	Modem/LAN/802.11b
F4513 J/K/H	Pentium III 1.06 GHz	14-in XGA	20 GB	DVD	256 MB	Modem/LAN/802.11b
F4514 J/K/H	Pentium III 1.06 GHz	14-in XGA	20 GB	DVD/CDRW	256 MB	Modem/LAN
F4515 J/K/H	Pentium III 1.13 GHz	14-in XGA	30 GB	DVD/CDRW	256 MB	Modem/LAN
F4516 J/K/H	Pentium III 1.06 GHz	14-in XGA	20 GB	DVD/CDRW	256 MB	Modem/LAN/802.11b
F4517 J/K/H	Celeron 1.06 GHz	14-in XGA	10 GB	DVD	128 MB	Modem/LAN
F4518 J/K/H	Pentium III 933 MHz	14-in XGA	10 GB	CD	128 MB	Modem/LAN
F4519 J/K/H	Pentium III 933 MHz	14-in XGA	20 GB	DVD	256 MB	Modem/LAN
Omnibook XT6200 Series						
F4525 H	Pentium 4-M 1.4 GHz	14-in XGA	20 GB	CD	128 MB	Modem/LAN
F4526 J	Pentium 4-M 1.4 GHz	14-in XGA	20 GB	DVD	256 MB	Modem/LAN
F4527 J	Pentium 4-M 1.4 GHz	14-in XGA	20 GB	DVD/CDRW	256 MB	Modem/LAN
F4528 J	Pentium 4-M 1.4 GHz	14-in XGA	30 GB	DVD	256 MB	Modem/LAN
F4529 J	Pentium 4-M 1.4 GHz	14-in XGA	20 GB	DVD	256 MB	Modem/LAN/802.11b
F4530 J	Pentium 4-M 1.4 GHz	15-in SXGA+	20 GB	DVD	256 MB	Modem/LAN
F4531 J	Pentium 4-M 1.4 GHz	15-in SXGA+	20 GB	DVD/CDRW	256 MB	Modem/LAN
F4532 J	Pentium 4-M 1.5 GHz	14-in XGA	30 GB	DVD/CDRW	256 MB	Modem/LAN
F4533 J	Pentium 4-M 1.4 GHz	15-in SXGA+	30 GB	DVD/CDRW	256 MB	Modem/LAN/802.11b
F4534 J	Pentium 4-M 1.5 GHz	15-in SXGA+	30 GB	DVD/CDRW	256 MB	Modem/LAN/802.11b
F4535 J	Pentium 4-M 1.6 GHz	15-in SXGA+	30 GB	DVD/CDRW	512 MB	Modem/LAN/802.11b

Omnibook Product *	CPU **	Display	Hard Drive	CD/DVD Drives	Standard SDRAM	Communication
Omnibook VT6200 Series						
F5037 J	Pentium 4-M 1.4 GHz	14-in XGA	20 GB	DVD	128 MB	Modem/LAN
F5038 J	Pentium 4-M 1.4 GHz	14-in XGA	30 GB	DVD	256 MB	Modem/LAN
F5039 J	Pentium 4-M 1.5 GHz	14-in XGA	30 GB	DVD	256 MB	Modem/LAN
F5040 J	Pentium 4-M 1.5 GHz	14-in XGA	30 GB	DVD	256 MB	Modem/LAN
F5041 J	Pentium 4-M 1.5 GHz	14-in XGA	20 GB	DVD	256 MB	Modem/LAN/802.11b
F5042 J	Pentium 4-M 1.5 GHz	14-in XGA	30 GB	DVD	256 MB	Modem/LAN/802.11b
F5043 J	Pentium 4-M 1.5 GHz	14-in XGA	40 GB	DVD/CDRW	256 MB	Modem/LAN
F5044 J	Pentium 4-M 1.5 GHz	15-in SXGA+	40 GB	DVD/CDRW	256 MB	Modem/LAN/802.11b
F5045 J	Pentium 4-M 1.6 GHz	15-in SXGA+	30 GB	DVD	256 MB	Modem/LAN
F5046 J	Pentium 4-M 1.6 GHz	15-in SXGA+	30 GB	DVD/CDRW	512 MB	Modem/LAN/802.11b
F5047 J	Pentium 4-M 1.6 GHz	15-in SXGA+	30 GB	DVD/CDRW	256 MB	Modem/LAN
F5048 J	Pentium 4-M 1.6 GHz	15-in SXGA+	40 GB	DVD/CDRW	512 MB	Modem/LAN/802.11b
F5049 J	Pentium 4-M 1.7 GHz	14-in SXGA+	40 GB	DVD/CDRW	512 MB	Modem/LAN/802.11b
This table lists only base product configurations—custom configurations are not included. * The J/K/H suffix indicates the notebook's OS: J = Windows XP Professional, K = Windows 2000, H = Windows XP Home. ** Intel Mobile Pentium III or III-M with SpeedStep Technology or Intel Mobile Celeron processor.						

Table 1-2. Product Comparisons

	Omnibook XT/VT6200	Omnibook XT6050	Omnibook 6000/6100
Processor*	Pentium 4-M (1.4 to 1.8 GHz).	Celeron (1.06 to 1.13 GHz) or Pentium III-M (933 to 1133 MHz).	Celeron (550 to 750 MHz) or Pentium III-M (600 to 1133 MHz).
Memory	At least 128 MB RAM preinstalled. Can support up to 2 GB RAM.	At least 128 MB SDRAM in system slot. Expandable to 1024 MB.	64, 128, or 256 MB SDRAM in system slot. Expandable to 512 (OB 6000) or 1024 (OB 6100) MB.
Display	15-in TFT UXGA or SXGA+, or 14-in TFT SXGA+ or XGA.	14-in TFT XGA.	15-in TFT SXGA+ or 15- or 14-in TFT XGA.
Video	AGP 4X graphics interface. 16 or 32 MB DDR video RAM with 32- or 64-bit graphics interface. 3D and OpenGL graphics support. Up to 16M colors.	AGP 4X graphics interface. Up to 48 MB dynamically allocated video RAM (shared with system RAM) with 32- or 64-bit graphics interface. 3D and OpenGL graphics support. Up to 16M colors.	AGP 2X or 4X graphics interface. 4, 8, or 16 MB video RAM with 32- or 64-bit graphics interface. 3D and OpenGL graphics support. Up to 16M colors (UXGA). Zoomed Video enabled.
Operating System	Windows 2000 or XP preinstalled.	Windows 2000 or XP preinstalled.	Windows 98, 2000, or XP preinstalled.
Power States	On, Standby, Hibernate, Off.	On, Standby, Hibernate, Off.	On, Standby, Hibernate, Off.
* Intel Mobile Pentium, Mobile Pentium-M, Mobile Pentium 4-M, or Mobile Celeron Processor. Dual-speed processors use Intel SpeedStep Technology. All models feature HP Toptools, and are ACPI compliant.			

Features

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

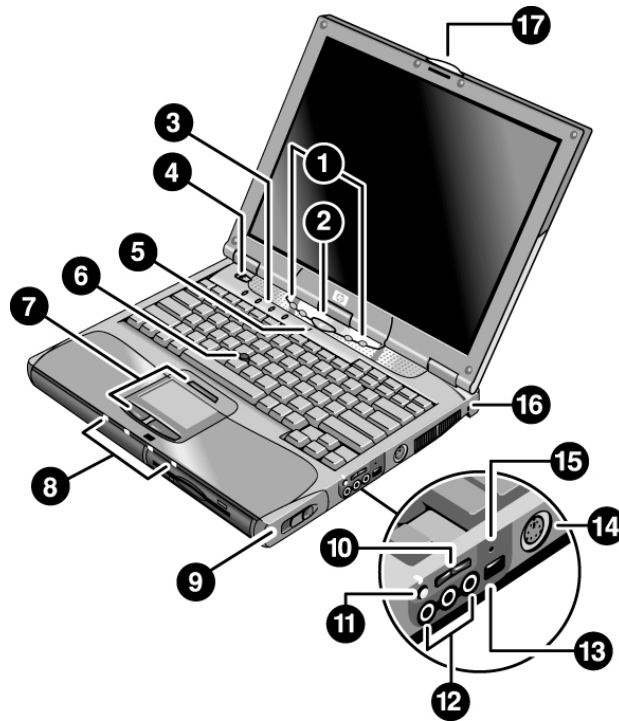


Figure 1-1. Omnibook — Front View

- | | |
|--|---|
| 1. One-Touch buttons. | 9. Module release latch. |
| 2. Sleep button. Suspends and resumes operation. | 10. Volume control. |
| 3. Keyboard status lights (left to right: Caps Lock, Num Lock, Keypad Lock, Scroll Lock). | 11. Audio-off button and audio-off light. |
| 4. Power slide button. Turns the computer on and off. | 12. Audio jacks (left to right): audio out, external microphone, audio in (certain models). |
| 5. Built-in microphone. | 13. Infrared port. |
| 6. Pointing stick (certain models). | 14. S-video port (TV-out) (certain models). |
| 7. Touch pad, click and scroll buttons, plus touch pad on-off button and indicator (certain models). | 15. System-off switch. |
| 8. Main status lights (left to right): power mode, hard disk activity, charging status for main battery, and charging status for secondary battery (certain models). | 16. Kensington lock slot (security connector). |
| | 17. Notebook latch. |

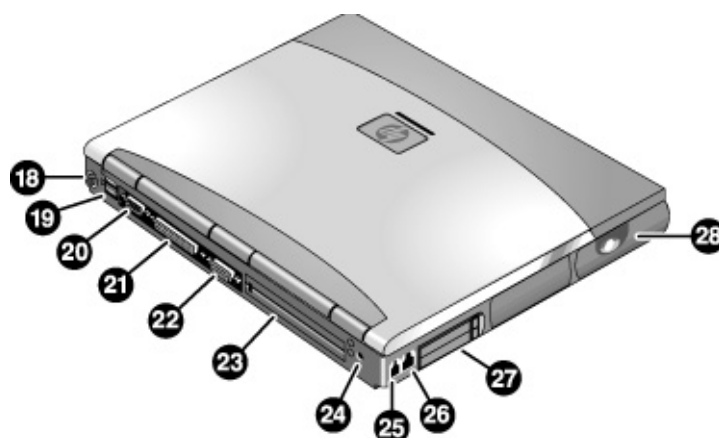


Figure 1-2. Omnibook — Back View

- | | |
|--|--|
| 18. PS/2 keyboard mouse port (supports Y adapter). | 24. AC adapter jack. |
| 19. Universal serial bus (USB) ports. | 25. Modem port (certain models). |
| 20. Serial port (COM1). | 26. LAN port and indicator LEDs. |
| 21. Parallel port (LPT1). | 27. PC card and CardBus slot. |
| 22. External VGA monitor port. | 28. Wireless on-off button and indicator light (certain models). |
| 23. Docking port. | |

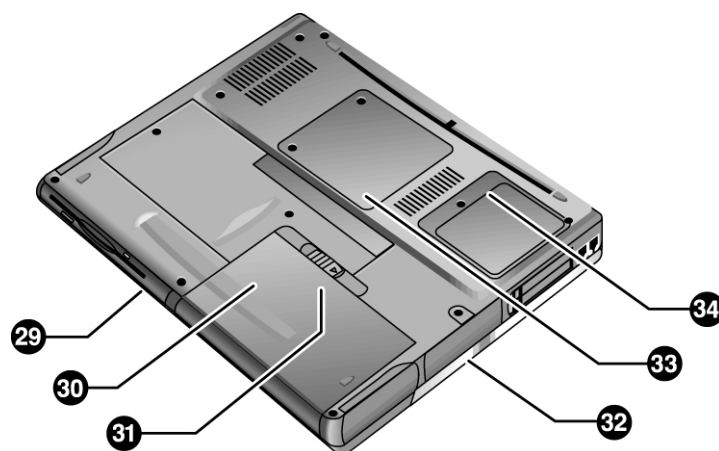


Figure 1-3. Omnibook — Bottom View

- | | |
|--|--|
| 29. Plug-in module bay. Can contain a CD-ROM or DVD drive, floppy disk drive, secondary battery (certain models), or other plug-in module. | 32. Hard disk drive cover. |
| 30. Main battery. | 33. RAM cover. |
| 31. Main battery latch. | 34. Mini-PCI cover (no user parts inside). |

Operation

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

Turning the Computer On and Off

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

Note

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

Table 1-3. Activating Power Modes

Power mode	To enter this mode	To turn on again
On Power mode status light is on.	Press the blue sleep button.	
Standby mode Saves significant power. Turns off the display and other components. Maintains current session in RAM. Restarts quickly. Restores network connections. Power mode status light blinks.	Press the blue sleep button –or– Click Start, Shutdown, Standby (Windows 2000). –or– Click Start, Turn Off Computer, Stand By (Windows XP). –or– Allow timeout.	Press the blue sleep button to quickly resume your 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, Shut Down, Hibernate (Windows 2000). –or– Click Start, Turn Off Computer, then press and hold Shift and click Hibernate (Windows XP). –or– Allow timeout.	Press the blue sleep button to resume 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 (Windows 2000). –or– Click Start, Turn Off Computer, Turn Off (Windows XP). –or– Slide the power button and hold for five seconds (only if the Start menu procedure doesn't work).	Press the blue sleep button to restart with a new session.

Checking the Status of the Notebook

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

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

   	Meaning
   	Power status On: notebook is on (even if the display is off). Blinking: notebook is in Standby mode. Off: notebook is off or in Hibernate mode. Red light: notebook failed when resuming, and must be reset.
   	Hard disk drive activity On: notebook is accessing the hard disk drive.
   	Main battery status Green: The AC adapter is connected and the battery is fully charged. Amber: The AC adapter is connected and the battery is charging. Red or blinking: The AC adapter is connected and the battery is missing or has a fault. Off: The AC adapter is not connected.
   	Secondary battery status (XT/VT6200 models only) Green: The AC adapter is connected and the battery is fully charged. Amber: The AC adapter is connected and the battery is charging. Red or blinking: The battery has a fault. Off: The AC adapter is not connected, a secondary battery is not installed, or the battery is not charging.

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

Table 1-5. Keyboard Status Lights

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

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

Using Fn Hot Keys

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

On Omnibook XT6050 models with Windows 2000, external keyboards support only Fn+F5, Fn+F7, and Fn+F12. To use these, press and hold left Ctrl+left Alt, press the appropriate second key, then release both keys.

Windows XP does not support Fn keys on external keyboards.

Table 1-6. Fn Hot Keys

Hot Key	Effect
Fn+F1	Decreases the display brightness.
Fn+F2	Increases the display brightness.
Fn+F5	Toggles among the built-in display, an external display, and simultaneous display on both.
Fn+F7	Mutes the computer's speakers.
Fn+F8	Toggles the built-in keypad on and off. Does not affect an external keyboard. If Num Lock is on, then the numeric functions are active; otherwise, cursor control is active.
Fn+F12	Enters Hibernation mode.
Fn+NumLock	Toggles Scroll Lock on and off.

Resetting the Computer

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. Press the blue sleep button to restart.

- If possible, shut down Windows: click Start, Turn Off Computer, Turn Off (Windows XP) or Start, Shut Down, Shut down (Windows 2000).
- Press Ctrl+Alt+Del, then click Shut Down.
- Slide and hold the power button for about four seconds, until the display turns off.
- Use a straightened paper clip to press the system-off switch on the right side of the notebook.

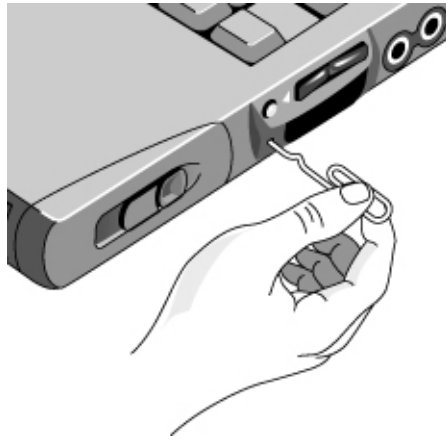


Figure 1-4. Resetting the Computer

Note

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

Specifications

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

Table 1-7. Omnibook XT6050 and XT/VT6200 Specifications

Physical Attributes	Size (14-inch display): 315 × 261 × 32 mm (12.4 × 10.3 × 1.3 in). Size (15-inch display): 325 × 264 × 35 mm (12.8 × 10.4 × 1.4 in). Weight: 2.2–2.8 kg (4.9–6.2 lb), depending on configuration. Magnesium display cover on certain models.
Processor and Bus Architecture	Omnibook XT/VT6200: 1.4- to 1.7-GHz Intel Pentium 4-M processor with Intel SpeedStep technology. 512-KB L2 cache. 1.4-V core low-power processor with 400-MHz processor system bus. Omnibook XT6050: 933- to 1133-MHz Intel Mobile Pentium III-M processor with Intel Speed Step technology or 933- to 1133-MHz Intel Mobile Celeron processor. 512-KB (Pentium models), 256-KB (Celeron models 1000 MHz and above), or 128-KB (Celeron models below 1000 MHz) L2 cache. 1.4-V core low-power processor with 133-MHz processor system bus.
Video	Omnibook XT/VT6200: 14-inch XGA (1024 × 768) or SXGA+ (1400 × 1050), or 15-inch SXGA+ (1400 × 1050) or UXGA (1600 × 1200) active-matrix (TFT) LCD display. Hardware 3D and DVD acceleration. Dual display capability (depends on operating system support). External monitors up to 1600 × 1200 resolution, 16M colors, and at least 75-Hz refresh rate (only 60 Hz at 1400 × 1050). Refresh rate and clarity may vary depending on monitor, resolution, and color depth. ATI Mobility Radeon graphics accelerator with 16- or 32-MB DDR graphics memory, 4x AGP graphics capability. Omnibook XT6050: 14-inch XGA (1024 × 768) active-matrix (TFT) LCD display. Hardware 3D and DVD acceleration. Dual display capability (depends on operating system support). External monitors up to 1600 × 1200 resolution with 16M colors at 60 Hz refresh rate or 64K colors at 85 Hz refresh rate. Up to 48-MB dynamically allocated video RAM shared with system RAM.
Power	Rechargeable lithium-ion battery with LED charge-level gauge: 11.1 Vdc (certain Omnibook XT6050 models) or 14.8 Vdc. Battery life (one battery): 3 to 4 hours typical (varies with model, usage, and power settings). Fast battery recharge: Omnibook XT/VT6200: 80% in 2 hours, 100% in 3 hours typical. Omnibook XT6050: 80% in 1.5 hours, 100% in 2 hours typical. Low-battery warning. Suspend/resume capability. Universal AC adapter: Omnibook XT/VT6200: 100–240 Vac (50/60 Hz) input, 19 Vdc output minimum, 75 W/3.95 A minimum. Omnibook XT6050: 100–240 Vac (50/60 Hz) input, 19 Vdc output minimum, 60 W/3.16 A minimum. Optional secondary battery available for module bay for Omnibook XT/VT6200.

Mass Storage	Removable hard drive with Ultra-DMA 100 interface: Omnibook XT/VT6200: 20 to 40 GB Omnibook XT6050: 10 to 30 GB 1.44-MB floppy drive module (certain models). 24x CD-ROM, 6x or 8x DVD, or other drive module (or higher). Optional drive modules available.
RAM	Omnibook XT/VT6200 Two slots for PC2100 DDR266 RAM modules: Up to 1024 MB RAM using 512-MB modules, can support 2 GB RAM maximum. Omnibook XT6050 Two slots for PC133 RAM modules: Up to 1024 MB RAM. All models: At least 128 MB RAM preinstalled.
Audio System	Stereo sound via two built-in speakers (500 Hz to 10 kHz range). 16-bit Sound Blaster Pro-compatible stereo sound (certain models). 3D-enhanced audio. Built-in microphone. Separate audio-off button with indicator light. Headphone-out and microphone-in jacks; audio line-in jacks for certain models.
Keyboard and Pointing Device	87/88-key touch-type QWERTY keyboard with 101/102 key emulation. Embedded numeric keypad. Left and right click buttons, center scroll button. 12 function (Fn) keys. 4 user-programmable One-Touch buttons. Touch pad with on-off button with indicator light (certain models). Pointing stick (certain Omnibook VT6200 models).
LAN	Ethernet 10Base-T (10 Mbps) and 100Base-TX (100 Mbps) support. Supports wake-on-LAN (Windows 2000 and XP), fast IP, DMI, dRMON. MBA (Managed Boot Agent) support for PXE/BINL, NCP/IPX, DHCP.
Modem (certain models)	Ambit/Lucent hardware-based controllerless modem or software-based modem (Ambit/ESS), mini-PCI interface. Data speed: 56 Kbps (V.90, V.92) maximum. Fax speed: 14.4 Kbps, Class 1 and 2. Modulation: V.21, V.22, V.22bis, V.23, V.32, V.32bis, V.34, V.90, V.92, X2, Bell 103, Bell 212A.
Wireless LAN (certain models)	Radio: IEEE 802.11b, WECA Wi-Fi compliant, direct-sequence spread-spectrum. Operating frequency: 2.5-GHz ISM band, exact frequencies and channels depend on country. Raw data rate: 1, 2, 5.5, or 11 Mbps. Transmitter output: 15 dBm typical (approx. 30 mW), 16 dBm max (approx. 40 mW). Receiver sensitivity: -84 dBm typical. Range: up to 100 m (300 ft) or more, depending on environment and conditions. On-off button and indicator. Mini-PCI interface.
Input/Output	Universal serial bus (USB 1.1), two ports. 9-pin, 115,200-bps serial port. 25-pin bi-directional ECP/EPP parallel port. 15-pin VGA video-out with DDC support. S-video (TV out) (Omnibook XT/VT6200). PS/2 keyboard/mouse. 4-Mbps IrDA-compliant infrared port.
Expandability	PC card slots: one Type I, II, or III 16-/32-bit. CardBus enabled. Plug-in module bay for accessory modules. Optional port replicator, and mini dock.

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 [40 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	Omnibook XT/VT6200: CPU: Intel Pentium 4-M processor. Core logic: ALI 1671/1535+ chipset. Display controller: ATI Mobility Radeon M6-P. Super I/O: integrated in core logic. Omnibook XT6050: CPU: Intel Mobile Pentium III-M or Celeron processor. Core logic: Intel 830MG/ICH3M chipset. Display controller: integrated in Intel 830MG. Super I/O: National PC87393F. All models: 802.11b wireless LAN: Actiontec with Intersil Prism 2.5 chipset. Keyboard/embedded controller: National PC87570. Audio controller: Realtek AC-97 ALC201 soft audio. Modem: Ambit/Lucent controllerless or Ambit softmodem. LAN: Realtek RTL8100B. CardBus controller: TI PCI1410.

Table 1-8. Omnibook XT/VT6200 and XT6050 Accessories

Accessory	Description	Omnibook XT/VT6200	Omnibook XT6050
Memory			
F2298A	512-MB SDRAM module (PC133)		•
F3495A	128-MB SDRAM module (PC133)		•
F3496A	256-MB SDRAM module (PC133)		•
F4694A	128-MB SDRAM module (DDR266 PC2100)	•	
F4695A	256-MB SDRAM module (DDR266 PC2100)	•	
F4696A	512-MB SDRAM module (DDR266 PC2100)	•	
Hard Drives			
F2295A	30-GB hard disk drive (replacement)		•
F4690A	30-GB hard disk drive replacement/module kit	•	•
Plug-in Modules			
F2009B	250-MB Zip drive module	•	•
F2013A	Floppy disk drive module	•	•
F2014A	6-cell secondary lithium-ion battery module	•	
F2015B	DVD module	•	•
F2017B	CD-ROM module	•	•
F2018B	20-GB second hard disk drive module		•
F2018C	30-GB second hard disk drive module		•
F2022B	LS-240 SuperDisk drive module	•	•
F2026B	CD-RW module	•	•
F2107B	DVD/CDRW module	•	•
F4690A	30-GB hard disk drive replacement/module kit	•	•
Power Options			
F1455A	Auto/airline power adapter		•
F1781A	Ultra SlimLine AC Adapter		•
F2011A	Lithium-ion battery charger (external)	•	•
F2019A	Lithium-ion primary battery (14.8 V)		•
F2019B	Lithium-ion primary battery (14.8 V)	•	•
F4600A	75-watt AC adapter (19 Vdc output, 3.95 A)	•	•
8120-6312	Replacement power cord (Australia)	•	•
8120-6313	Replacement power cord (U.S., Canada, Taiwan)		
8120-6314	Replacement power cord (Europe)		
8120-6316	Replacement power cord (Japan)		
8121-0702	Replacement power cord (India)		
8120-6317	Replacement power cord (South Africa)		
8120-8367	Replacement power cord (Argentina)		
8120-8373	Replacement power cord (People's Rep. of China)		
8120-8441	Replacement power cord (S. Korea)		
8120-8452	Replacement power cord (Chile)		
8120-8699	Replacement power cord (Hong Kong, Singapore)		
Communications			
F2135B	802.11b wireless LAN access point		•
F2135C	802.11b wireless LAN access point	•	•
F2136B	802.11b wireless LAN PC card (128-bit)	•	•
F2196A	Bluetooth PC card	•	•
F4697A	802.11b range extender antenna	•	•

Accessory	Description	Omnibook XT/VT6200	Omnibook XT6050
Docking			
F1451B	Port replicator		•
F1451C	Port replicator	•	•
F1452B	Mini-dock		•
F1452C	Mini-dock	•	•
F1453A	Monitor stand for port replicator and mini-dock	•	•
F1477B	Full docking system and monitor stand		•
F2010A	Docking module bay adapter for docking system		•
F2012A	Docking tray		•
F2012B	Docking tray	•	•
Adapters/cables			
F1469A	PS/2 Y adapter	•	•
F2008B	External floppy disk drive cable	•	•
Security			
F1645A	Kensington notebook lock	•	•
F1747A	Defcon 1 notebook alarm	•	•
Miscellaneous			
F2100A	USB optical mouse	•	•

Internal Design

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

The following figure shows the connections among the Omnibook's replaceable electronic modules. Table 1-9 on page 1-15 lists the roles that these modules play in the Omnibook's functional subsystems.

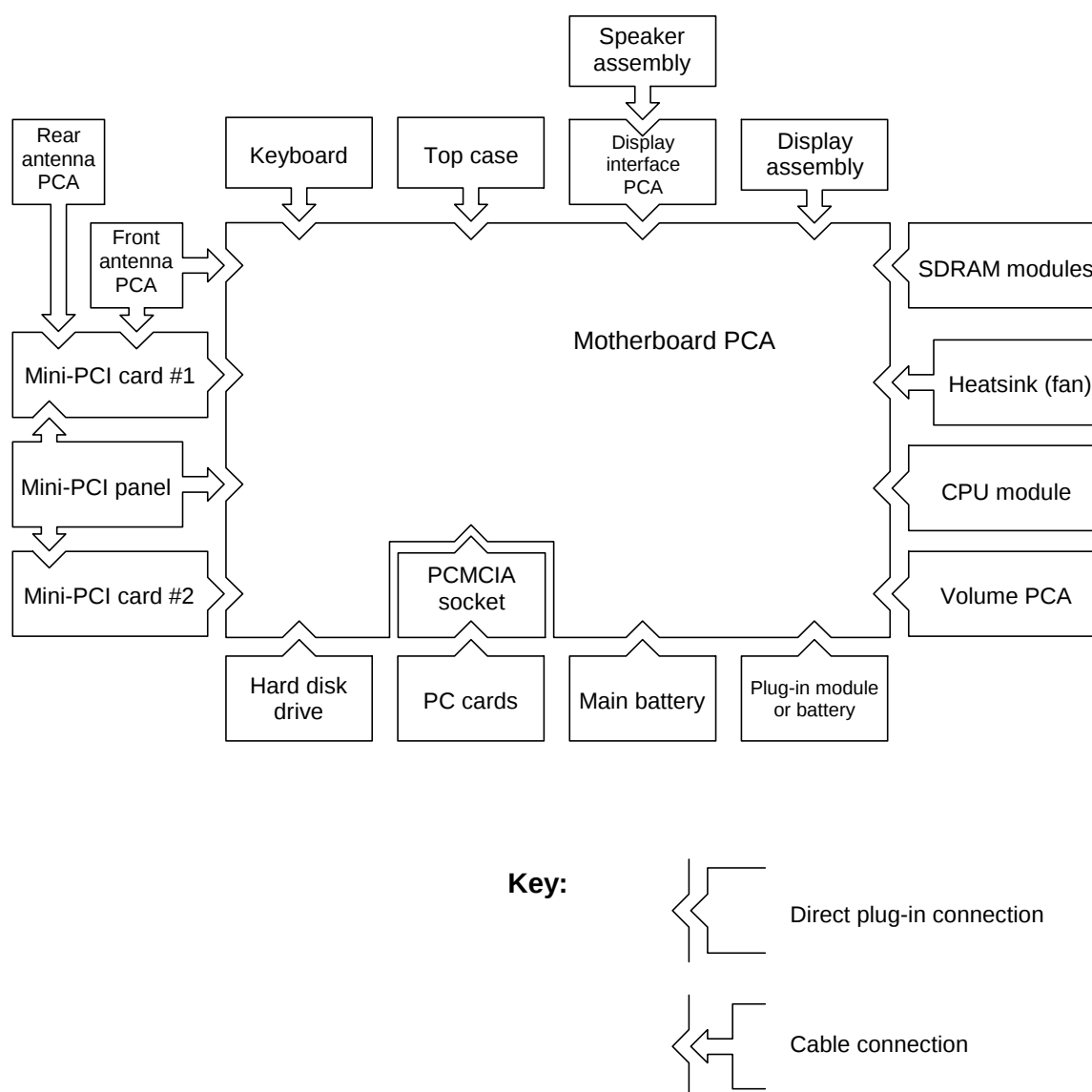


Figure 1-5. Replaceable Module Diagram

Table 1-9. Functional Structure Description

Bootup	CPU module Motherboard Hard disk drive Floppy disk module	Main processor (MMO). Primary system circuitry, system BIOS. First source of disk-based startup code. Second source of disk-based startup code.
Processor	CPU module Motherboard	Main processor, numeric data processor, L1 and L2 cache. Primary system circuitry.
Memory	Motherboard SDRAM module	Video RAM, no onboard RAM. Changeable RAM (2 slots).
Power	Battery Motherboard Display interface PCA. AC adapter	Power storage. AC adapter socket, power switch, lid switch, system-off switch, power supply, power control circuitry. Blue sleep button. AC-to-DC converter.
Display	Motherboard Display assembly	Graphics controller, video RAM. Display output, backlight, power converter for backlight.
Hard disk	Motherboard Hard disk drive	Hard disk controller. Hard disk mechanism.
Floppy drive	Motherboard Floppy disk module	I/O controller, floppy connector. Floppy disk mechanism.
Keyboard	Motherboard Keyboard	Keyboard BIOS, keyboard controller. Key switches.
Pointer	Motherboard Keyboard Top case	Keyboard circuitry, keyboard controller, keyboard BIOS. Pointing stick sensor (certain models). Touch pad sensor, click buttons, controller (PS/2 output).
Audio	Motherboard Display interface PCA Volume PCA Speaker assembly	Audio controller, audio decoder, speaker amplifier. Microphone. External audio jacks, headphone amplifier, audio-off switch. Speakers.
Status	Motherboard Display interface PCA Top case	LED circuitry, keyboard controller. Keyboard LEDs. Main status LEDs.
Serial	Motherboard	I/O controller, serial connector.
Parallel	Motherboard	I/O controller, parallel connector.
Infrared	Motherboard	I/O controller, infrared transmitter/receiver.
PS/2 port	Motherboard	PS/2 connector, keyboard controller.
USB	Motherboard	Bus controller (South Bridge), USB connector.
Docking port	Motherboard	Docking logic, docking connector.
PCMCIA	Motherboard PCMCIA socket	PCMCIA controller. PCMCIA connector.
Wireless LAN	Motherboard Front antenna PCA Rear antenna PCA Mini-PCI card #1	I/O controller. Receive antenna, on-off button, indicator light. Transmit/receive antenna. Radio, radio frequency circuitry.
LAN	Motherboard Mini-PCI panel	LAN circuitry, bus controller. LAN connector.
Modem	Mini-PCI card #1 Mini-PCI card #2 Mini-PCI panel	Modem circuitry (certain models). Modem circuitry (certain models). Modem connector.

Removal and Replacement

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

Table 2-1. Removal Cross-Reference

• Battery, main (page 2-4). Battery, CMOS (page 2-31). • Bumpers, display (page 2-12). • Cap, pointing stick (page 2-12). • Card, mini-PCI #1 (page 2-10). Card, mini-PCI #2 (page 2-31). • Case, bottom (page 2-23). Case, top (page 2-21). • Cover, center hinge (page 2-31). • Cover, left corner (page 2-12). • Cover, mini-PCI (page 2-12). • Cover, SDRAM (page 2-12). • Cover, right corner (page 2-12). • Covers, screw (page 2-12). CPU module (page 2-17). Display assembly (page 2-19). Doors, docking (page 2-25). Doors, PCMCIA (page 2-25).	• Drive, hard disk (page 2-7). • Feet, rubber (page 2-12). Heatsink (with fan) (page 2-15). Keyboard (page 2-13). Panel, sound/IR (page 2-32). Panel, mini-PCI (page 2-32). • Panel, power button (page 2-11). PCA, display interface (page 2-32). PCA, motherboard (page 2-23). PCA, volume (page 2-33). PCA, front antenna (page 2-32). PCA, rear antenna (page 2-33). • Plug-in module (page 2-5). • SDRAM module (page 2-6). Socket, PCMCIA (page 2-33). Speaker assembly (page 2-33). • Tray, hard disk drive (page 2-7).
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Caution

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



Notes

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

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

Table 2-2. Required Equipment

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

Table 2-3. Recommended Screw Torques

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

Disassembly Flowchart

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

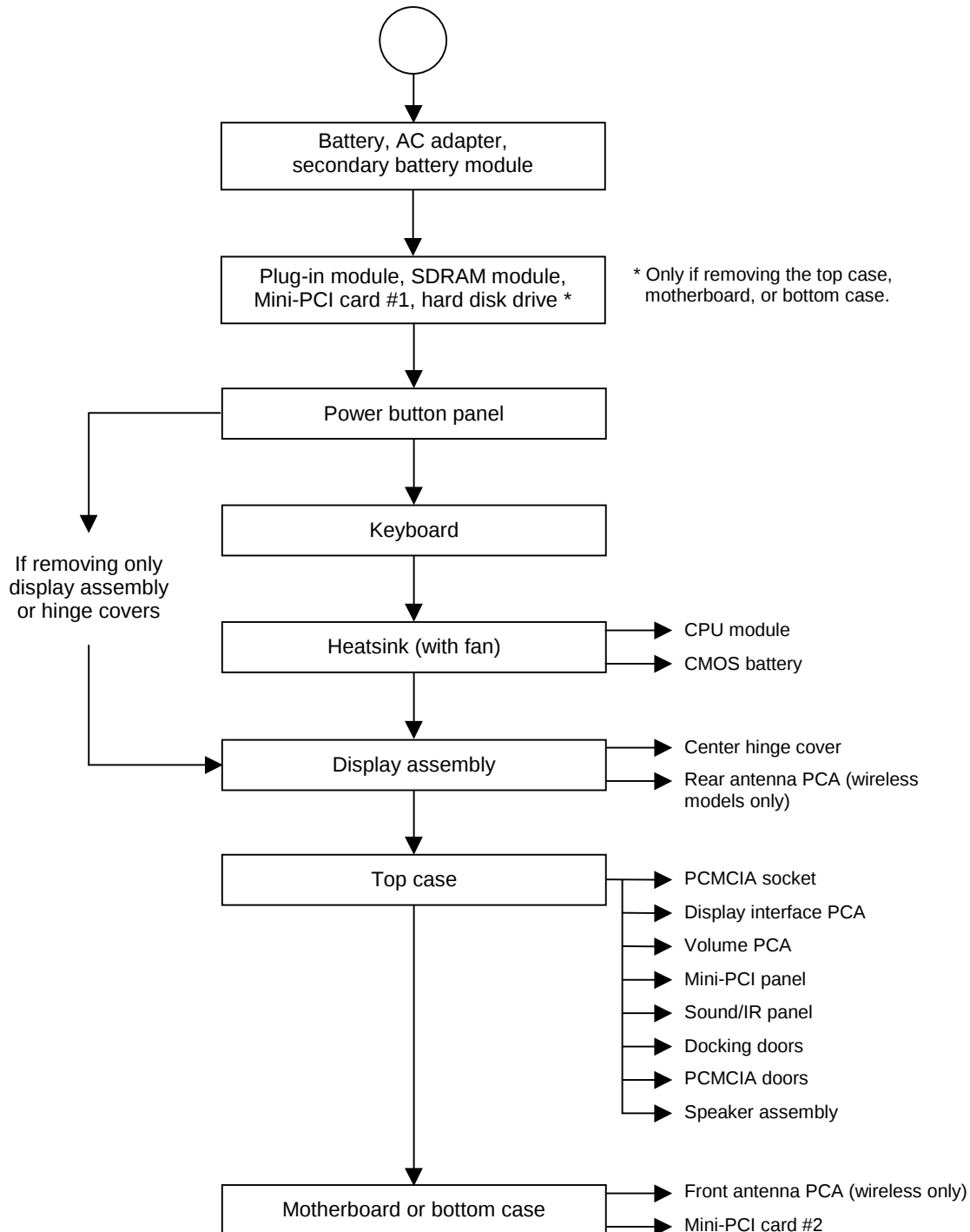


Figure 2-1. Disassembly Flow

Removing the Battery

(User-Replaceable)

Required Equipment

- None.

Removal Procedure

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

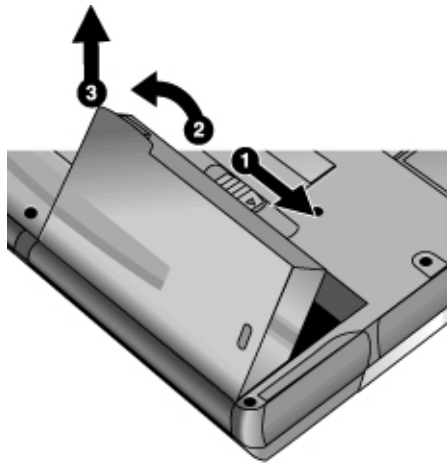


Figure 2-2. Removing the Battery

Reassembly Notes

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

Removing a Plug-In Module (User-Replaceable)

Required Equipment

- None.

Removal Procedure

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



Figure 2-3. Releasing a Module

2. Grasp the module and pull it out.

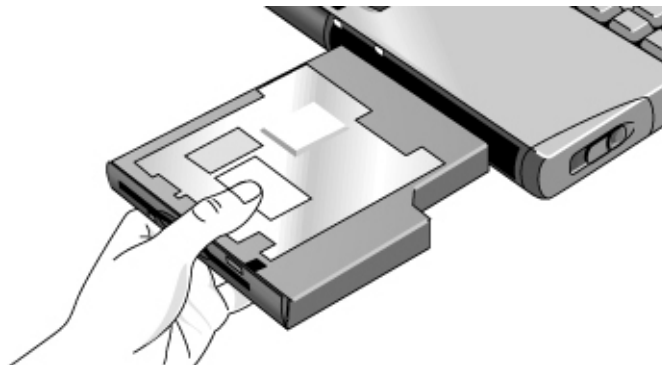


Figure 2-4. Removing a Module

Removing an SDRAM Module

(User-Replaceable)

The notebook has no SDRAM built into its motherboard, but has two slots for SDRAM modules. One slot contains an SDRAM module installed at the factory.

Note

Omnibook XT6050 models use only PC133 SDRAM modules, and Omnibook XT/VT6200 models use only DDR266 SDRAM modules. Using the wrong type of module prevents the notebook from booting.

Caution

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

Required Equipment

- Small Phillips screwdriver.

Removal Procedure

1. Unplug the AC adapter, if present, and remove the battery and any secondary battery module.
2. On the bottom of the notebook, loosen the screws holding the SDRAM cover (the cover retains the screws), and remove the cover.
3. Press outward to release the latches at the sides of the SDRAM module, so that the free edge of the module pops up.
4. Carefully pull the module out of the connector.

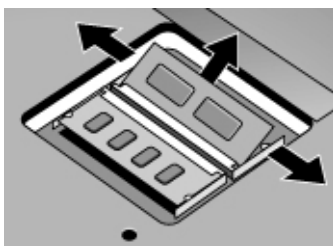


Figure 2-5. Removing an SDRAM Module

Reassembly Notes

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

Removing the Hard Disk Drive

(User-Replaceable)

Required Equipment

- Small Phillips screwdriver.

Removal Procedure

1. Unplug the AC adapter, if present, and remove the battery and any secondary battery module.
2. On the bottom of the unit, remove the hard drive retaining screws.
3. Raise the cover on the end of the drive so that its retainer tab is free of the notebook case, then carefully pull the hard drive out of the computer.

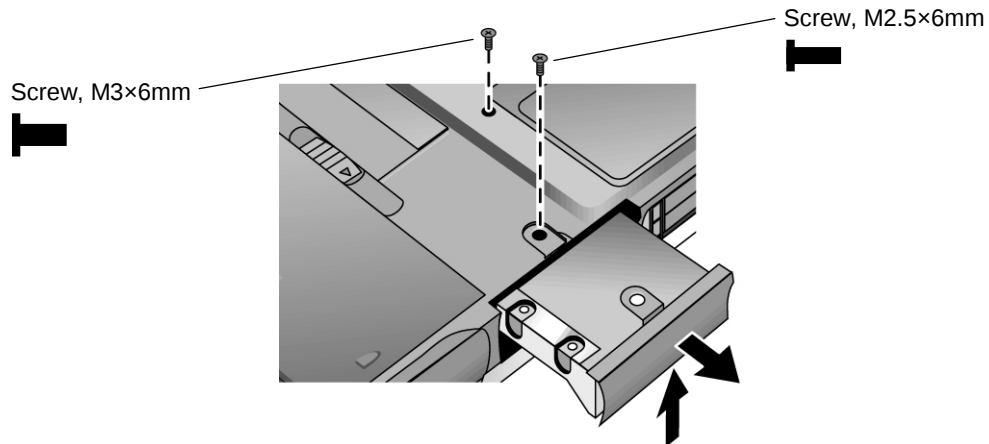


Figure 2-6. Removing the Hard Disk Drive

4. Remove the screws from the drive and drive tray, 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 by working alternately at each end of the connector so that it slides off evenly without bending the connector pins.

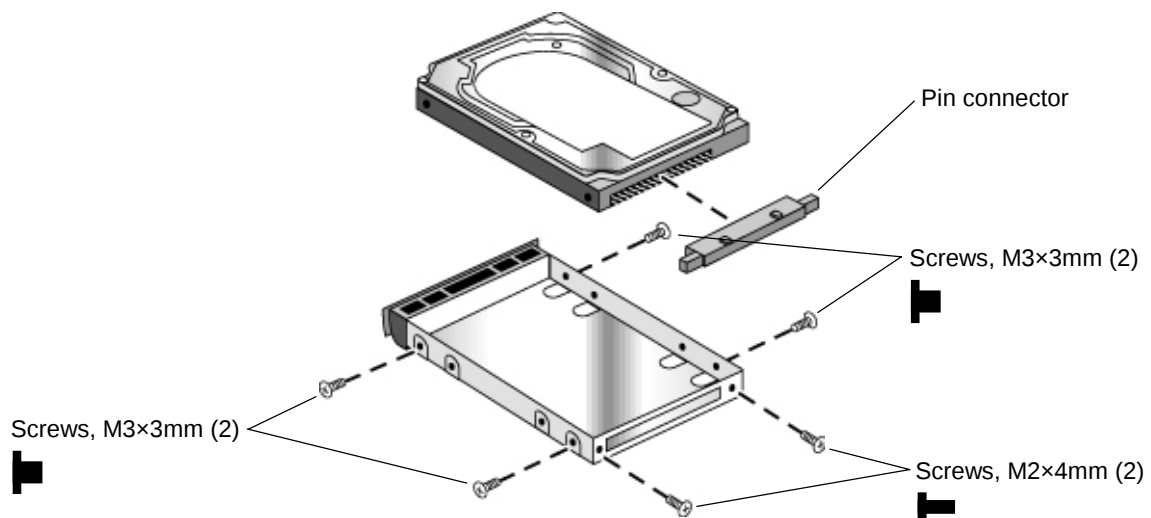


Figure 2-7. Removing the Hard Disk Tray

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 pins.
- Slide the cover down into place so the retainer tab engages the notebook case.

Important

If you are installing a new hard disk drive, load the factory software and operating system on the drive as described in "Recovering the Factory Software," below.

Recovering the Factory Software

The following procedure describes how to recover the notebook's original software and operating system. This process can take up to 15 minutes to complete. (For more information about recovering the factory software installation, see the file *readme.txt* in the root directory of the *Recovery CDs*.)

Caution

Do not interrupt the following process or unplug the AC adapter until the process is complete.

1. Connect the AC adapter to the notebook. **This is necessary to provide an uninterrupted power source.**
2. Insert *Recovery CD* disk 1 into the notebook's CD/DVD drive. If the notebook is turned off, use a pin or straightened paper clip to press the release switch on the drive door to open it.
3. Turn on or restart the notebook.
4. When the HP logo appears, press Esc to display the Boot menu.
5. Use the arrow keys to select the CD/DVD drive as the first boot device, then press Enter.
6. When the *Recovery CD* dialog box appears, follow the displayed instructions. If prompted, accept the recommended partition size.

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

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

7. When prompted to reboot the notebook, press Ctrl+Alt+Del and follow any instructions that appear.

Removing Mini-PCI Card #1

(User-Replaceable)

Certain notebooks include a mini-PCI card under the mini-PCI cover on the bottom of the unit. (In addition, certain models may have a second mini-PCI card located under the motherboard—see the table on page 2-31.)

Caution

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

Required Equipment

- Small Phillips screwdriver.

Removal Procedure

1. Unplug the AC adapter, if present, and remove the battery and any secondary battery module.
2. Loosen the screw in the mini-PCI cover (the cover retains the screw), and remove the cover.

Caution

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

3. Detach all cables from the card.
4. 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.

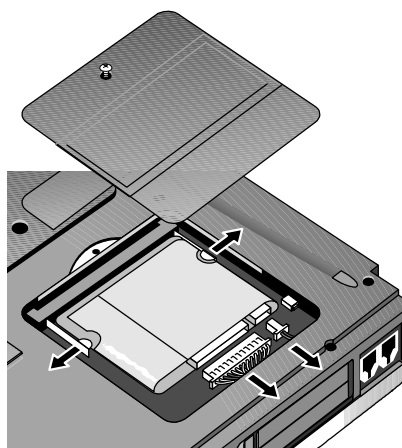


Figure 2-8. Removing the Mini-PCI Card

Reassembly Notes

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

Removing the Power Button Panel (User-Replaceable)

Required Equipment

- Small flat-blade screwdriver.

Removal Procedure

1. Unplug the AC adapter, if present, and remove the battery and any secondary battery module.
2. Carefully insert the screwdriver blade under the power button panel along the edge shown below, and gently pry up the center of the cover.
3. Insert a finger under the center of the panel, and lift the panel out.



Figure 2-9. Removing the Power Button Panel

Reassembly Notes

- Insert the tabs on the left end of the panel into their slots in the top case, and press the panel into place.

Replacing Small Parts

(User-Replaceable)

The user can replace the following small parts.

Table 2-4. Replacing Small Parts (User-Replaceable)

Part	Replacement Procedure
Cap, pointing stick	Pull the cap off the pointing stick.
Bumpers, display (on display bezel)	Insert a small flat-blade screwdriver under the bumper and pry it loose. To replace, firmly press the adhesive side of the bumper into the recess.
Cover, mini-PCI	On the bottom of the computer, loosen the screw in the mini-PCI cover (the cover retains the screw) and remove the cover.
Cover, SDRAM	On the bottom of the computer, loosen the one or two screws in the SDRAM module cover (the cover may retain the screws) and remove the cover.
Covers, screw (on display bezel)	Insert a pointed edge under the cover and pry it loose. To replace, press the adhesive side of the cover firmly into the recess.
Covers, left/right corner	From the bottom of the computer, remove the screws (M2.5x6mm) holding the corner covers, then remove the covers. The right cover may be easier to remove if you move the module release latch forward.
Feet, rubber (on bottom of unit)	Insert a small flat-blade screwdriver under the foot and pry it loose. To replace, firmly press the adhesive side of the foot into the recess.

Removing the Keyboard

(HP Authorized Service Providers Only)

Required Equipment

- Small Phillips screwdriver.

Removal Procedure

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

Warning

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

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

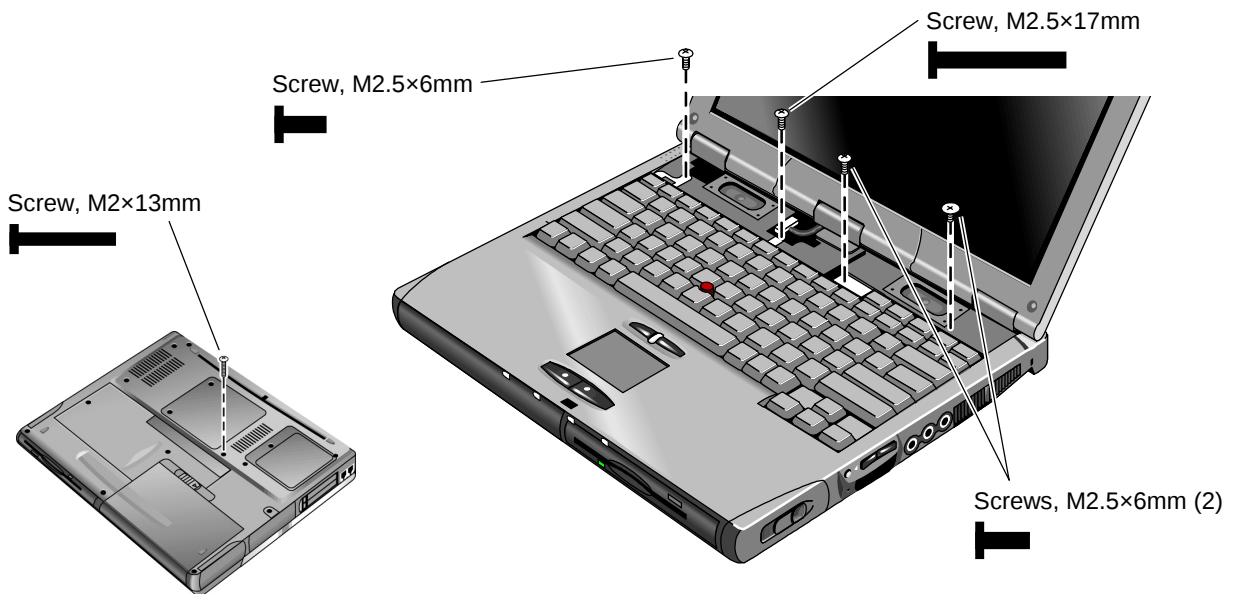


Figure 2-10. Removing the Keyboard

Caution

Be careful not to pull on the cables connecting the keyboard to the computer.

5. Raise the back of the keyboard, then lift the keyboard out of the computer.

6. Lay the keyboard face down on the top case, forward of its normal position. Be careful not to pull on the cables.
7. Disconnect the keyboard cable (wide) from the motherboard, and release the pointing stick cable (narrow) if present.

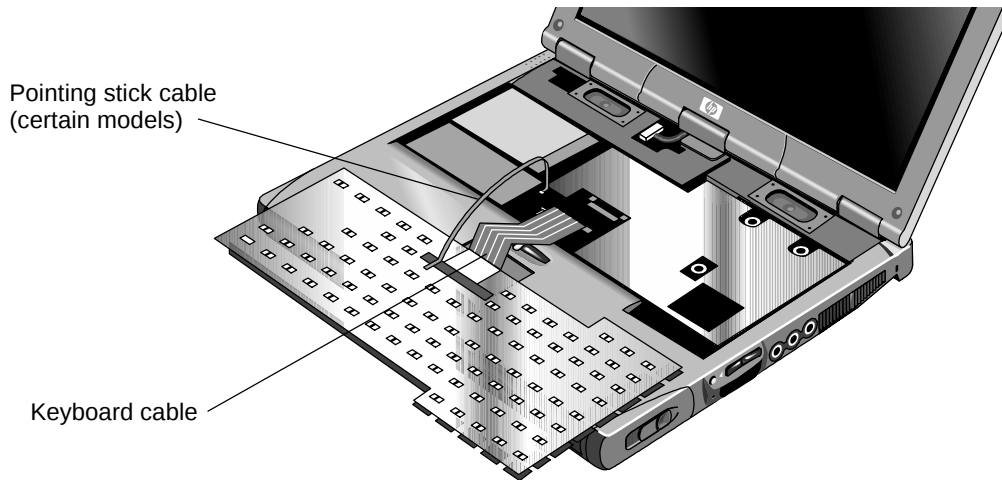


Figure 2-11. Unplugging the Keyboard Cables

Reassembly Notes

Caution

Do not excessively bend or fold the keyboard cables.

- Lay the keyboard face down on the top case, forward of its normal position, then reconnect the keyboard cable and (if present) pointing stick flex cable.
- Slip the metal tabs on the bottom of the keyboard into their slots in the top case, then lower the keyboard into place.

Removing the Heatsink (with Fan)

(HP Authorized Service Providers Only)

Required Equipment

- Small Phillips screwdriver.
- Knife or scraper.

Removal Procedure

1. Unplug the AC adapter, if present, and remove the battery and any secondary battery module.
2. Remove these additional assemblies:
 - Power button panel (page 2-11).
 - Keyboard (page 2-13).
3. Disconnect the fan cable. Access the cable through the opening in the heatsink (near the fan).
4. Remove all five retaining screws.

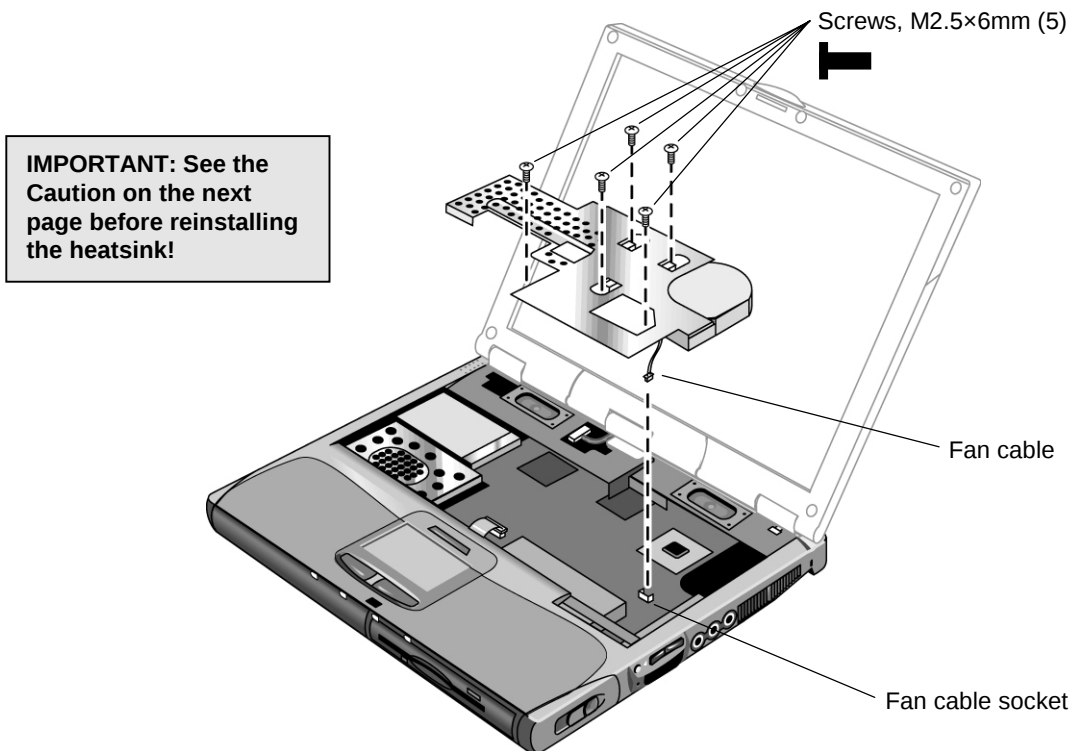


Figure 2-12. Removing the Heatsink

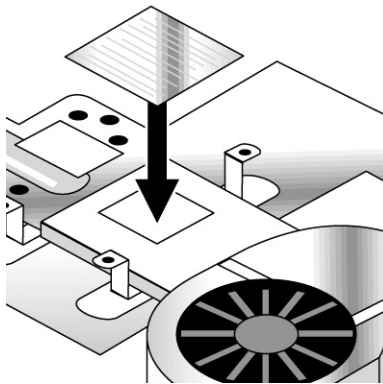
5. Raise the left end of the heatsink and lift it out of the unit.

Caution

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

Reassembly Notes**Caution**

Whenever you remove and reinstall the heatsink, you must also replace the heatsink's thermal pad to maintain optimum heat transfer. Use a sharp knife or scraper to carefully remove the old thermal pad from the heatsink, then attach the new thermal pad.



- Install the heatsink screws in this order:
 1. Install all five screws lightly.
 2. Tighten the three screws around the CPU.
 3. Tighten the two remaining screws.

Removing the CPU Module

(HP Authorized Service Providers Only)

Required Equipment

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

Removal Procedure

1. Unplug the AC adapter, if present, and remove the battery and any secondary battery module.
2. Remove these additional assemblies:
 - Power button panel (page 2-11).
 - Keyboard (page 2-13).
 - Heatsink (page 2-15).
3. Turn the lock screw one-half turn counterclockwise to release the CPU module, and carefully lift the CPU module off of its socket on the motherboard.

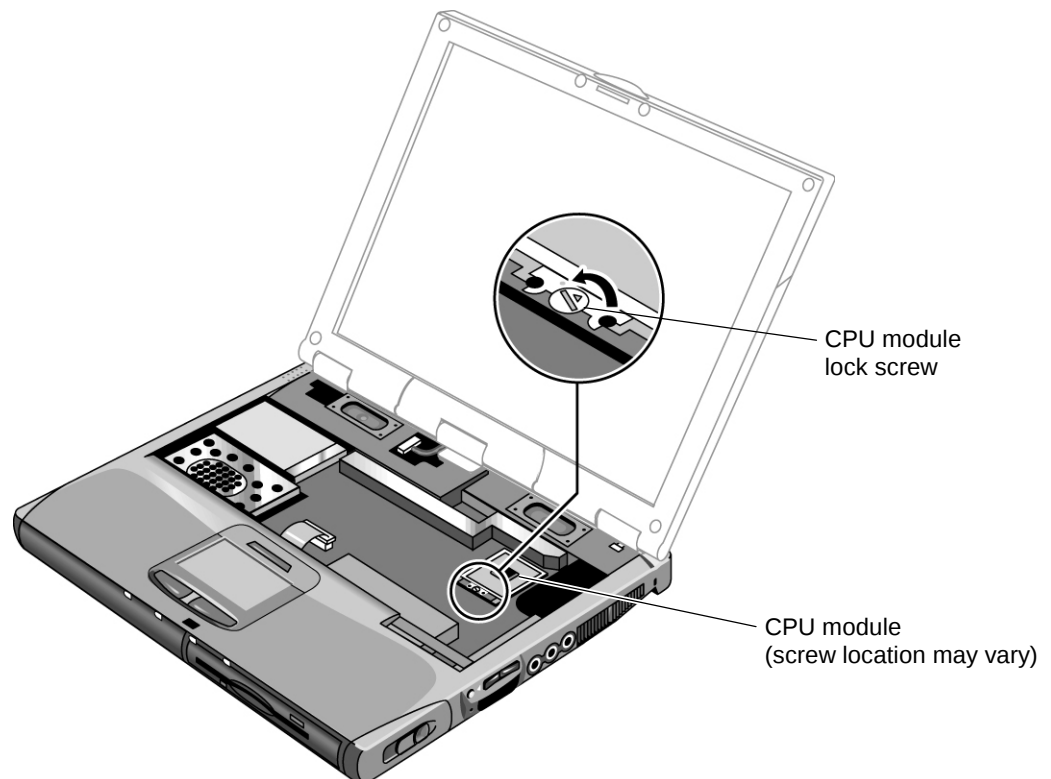


Figure 2-13. Removing the CPU Module

Reassembly Notes

- Carefully insert the CPU module into the motherboard, and turn the lock screw one-half turn clockwise to secure the CPU module.
- The CPU module is keyed for installation, and can only be inserted one way.
- Be sure to replace the thermal pad on the heatsink, as described in the reassembly notes on page 2-16.

Removing the Display Assembly

(HP Authorized Service Providers Only)

Required Equipment

- Small Phillips screwdriver.

Removal Procedure

1. Unplug the AC adapter, if present, and remove the battery and any secondary battery module.
2. Remove the power button panel (page 2-11).
3. Remove all four retaining screws from the back of the computer (two near the PS/2 port, and two near the AC adapter jack).
4. On the bottom of the notebook, remove the two screws from the rear corners (nearest the back edge).
5. Open the display. Remove the screws from the display ground wires, and disconnect the main cable.
6. Remove the screw from the center hinge cover, and from the left and right hinges.
7. Lift the display off of the notebook.

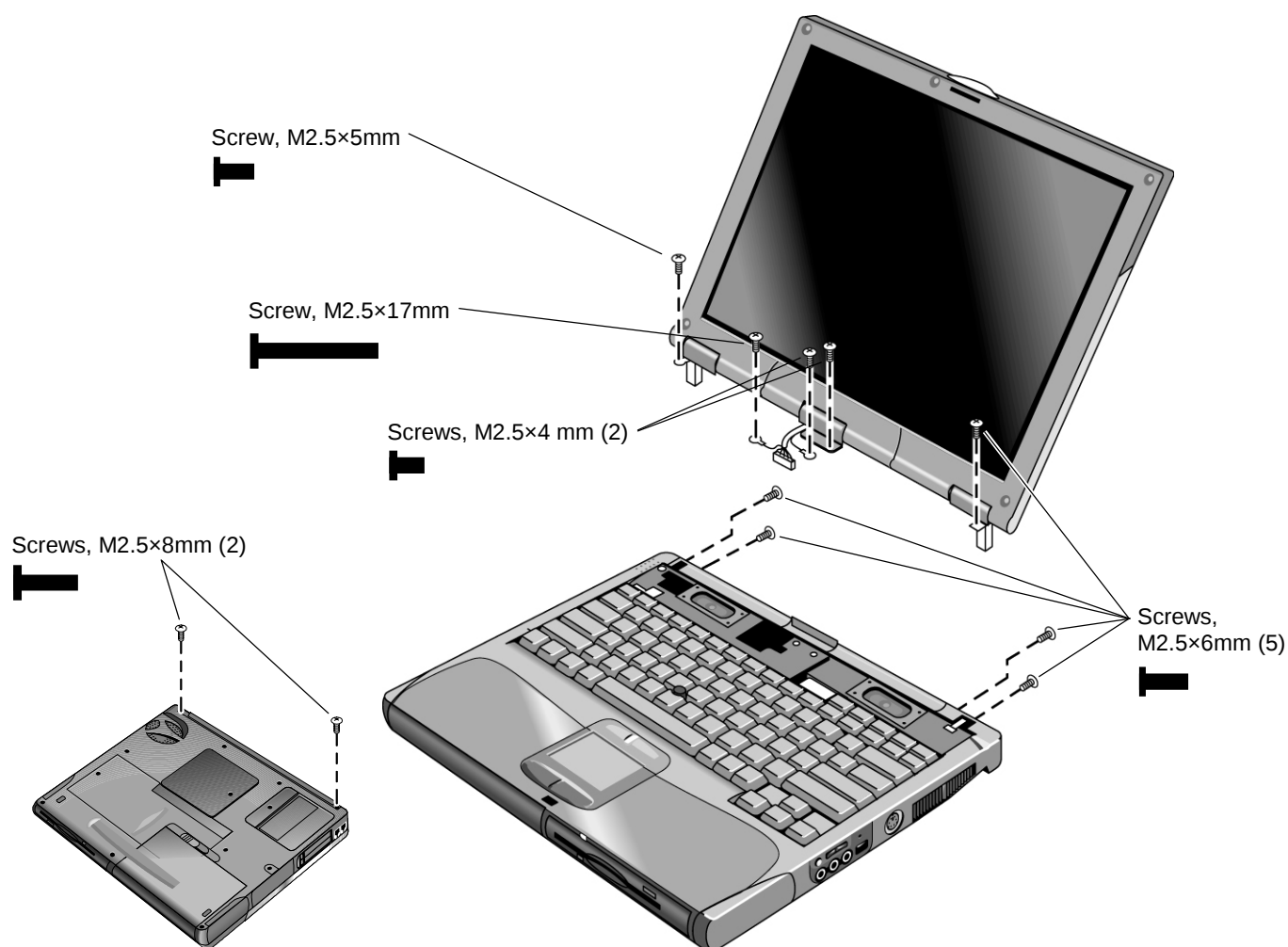


Figure 2-14. Removing the Display

Reassembly Notes

Important

The label on the display cable indicates the display type.

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

Removing the Top Case

(HP Authorized Service Providers Only)

Required Equipment

- Small Phillips screwdriver.

Removal Procedure

1. Unplug the AC adapter, if present, and remove the battery and any secondary battery module.
2. Remove these additional assemblies:
 - Plug-in module (page 2-5).
 - Hard disk drive (page 2-7).
 - Power button panel (page 2-9).
 - Keyboard (page 2-13).
 - Heatsink (page 2-15).
 - Display assembly (page 2-19).
3. From the bottom of the computer, remove the screws holding the left and right corner covers, then remove the covers. (The right corner cover may come off more easily if you slide the plug-in module latch forward.)
4. Remove all six retaining screws from the bottom case.
5. Remove both retaining screws from just inside the hard disk drive compartment.
6. Remove the single screw inside the battery compartment.
7. From the top of the computer, release the touch pad flex cable from its motherboard connector. (Certain models have a forked cable and two connectors.)

Caution: Wireless Models

Be careful not to pull on the cable from the rear antenna PCA.

8. **Wireless models only:** Remove the retaining screw from the rear antenna PCA, and detach the PCA by sliding it slightly to the left. (The PCA's cable is still attached to mini-PCI card #1. Unplug the cable only if you are replacing the PCA or removing the bottom case.)
9. Remove the three top case retaining screws: one to the right of the left speaker, and two to the left of the right speaker.
10. Raise the back of the top case, then lift it off the computer.

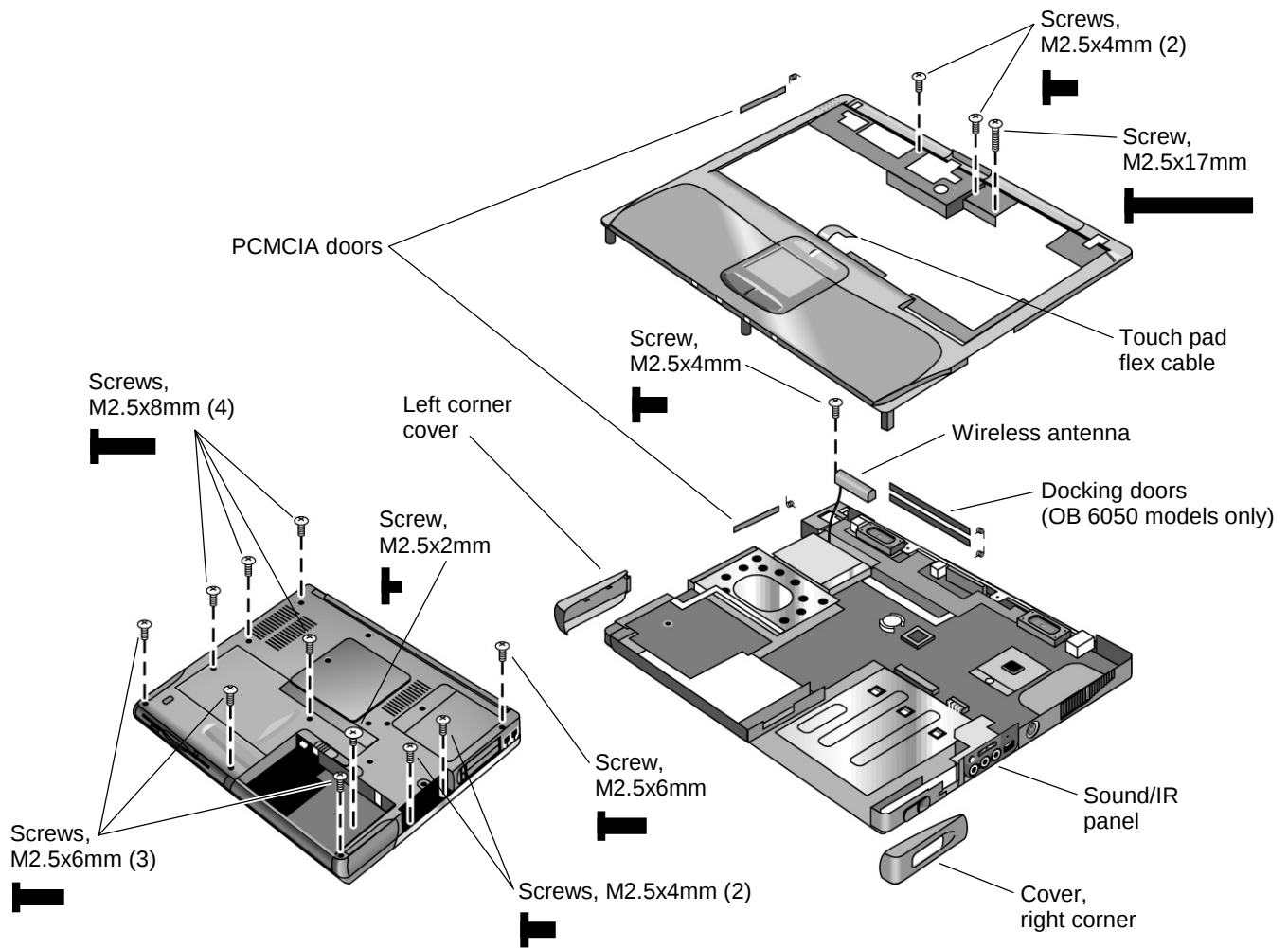


Figure 2-15. Removing the Top Case

Reassembly Notes

- To reinstall the sound/IR panel, insert the tabs on the ends of the panel into the slots in the bottom case.
- When reinstalling the right corner cover, first insert the tab at the back end of the cover into the case, then slide the plug-in module latch forward and snap the cover over the latch and into place.
- **Wireless models only:** If you are replacing the rear antenna PCA, place the PCA in its position near the left hinge, replace the screw, then thread the cable through to the bottom of the computer and reconnect the cable to the mini-PCI card.

Removing the Motherboard or Bottom Case

(HP Authorized Service Providers Only)

Required Equipment

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

Removal Procedure

Note: Before Replacing the Motherboard

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

1. Download the service package for the Omnibook XT6050 (technology code EF) or Omnibook XT/VT6200 (technology code EG) 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 module: insert the module into the notebook, or connect it to the notebook's parallel port using an F2008 external floppy drive cable.
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 into the floppy drive.
6. Turn on the notebook. When the HP logo appears (on either the built-in display or the external monitor), press Esc to display the boot menu, then choose Removable Device and 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 and any secondary battery module.
2. Remove these additional assemblies:
 - Plug-in module (page 2-5).
 - Hard disk drive (page 2-7).
 - Power button panel (page 2-11).
 - Keyboard (page 2-13).
 - Heatsink (page 2-15).
 - Display assembly (page 2-19).
 - Top case (page 2-21).
3. Remove the five screws that attach the motherboard to the bottom case.
4. From the back of the unit, remove the screw from the LAN/modem PCI panel, and lift the panel out of the bottom case.

Caution: Wireless Models

Be careful when removing and attaching antenna cables. Damage to cables or connectors can degrade performance.

5. **Wireless models only:** Disconnect the front antenna PCA flex cable from the motherboard.
6. **Wireless models only:** Remove the mini-PCI cover and unplug the two antenna cables from mini-PCI card #1.
7. Lift the motherboard out of the bottom case.

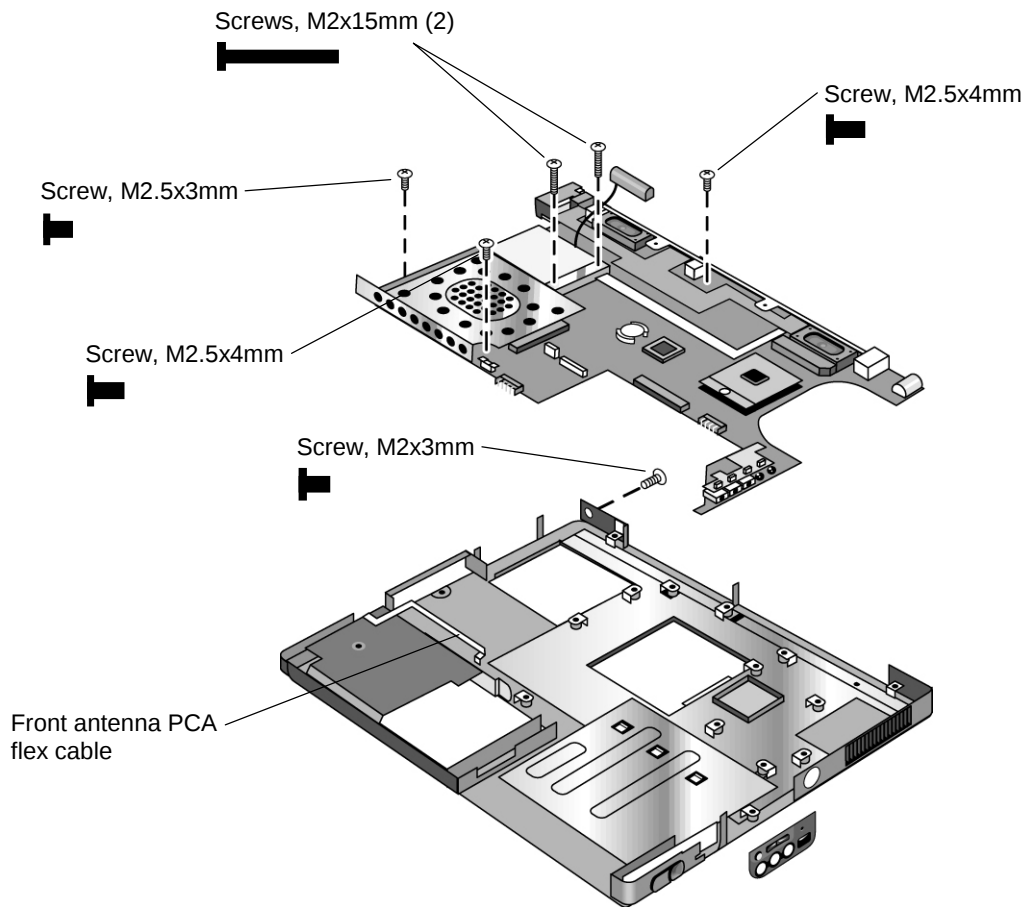


Figure 2-16. Removing the Motherboard

8. Depending on what you are replacing, go to “Replacing the Motherboard” on page 2-26, or “Replacing the Bottom Case” on page 2-28.

Reassembly Notes

- Reinstall the sound/IR panel before reinstalling the motherboard.
- If you need to install or replace the docking doors or PCMCIA doors, see the figures below.

Wireless Models Only

- Before installing the motherboard, make sure the round coaxial cable from the front antenna PCA is held in place by the clips in the bottom case.
- Reconnect the front antenna PCA flex cable before reinstalling the top case. Make sure it lies in its groove in the bottom case (battery compartment).
- To reinstall the rear antenna PCA, place the PCA in its position near the left hinge, then replace the screw that attaches the PCA to the top case. Thread the PCA cable through the hole in the motherboard (at the lower left corner of the left speaker) to the bottom of the computer, and reconnect the cable to mini-PCI card #1.

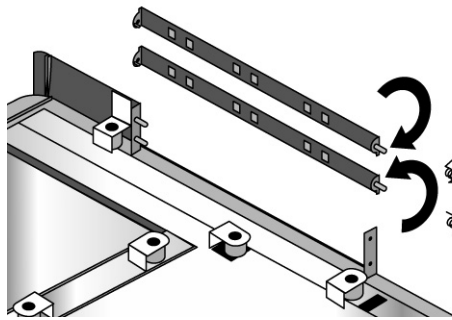


Figure 2-17. Installing the Docking Doors

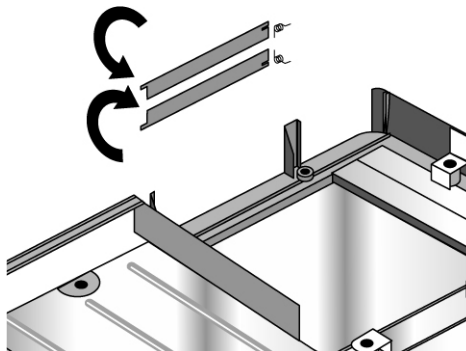


Figure 2-18. Installing the Lower PCMCIA Door

Replacing the Motherboard

Disassembly Procedure

1. If a mini-PCI panel is attached, disconnect the LAN/modem cables from the mini-PCI card or motherboard and remove the mini-PCI panel.
2. If mini-PCI card #1 is present, remove it: release the latches at the sides of the card, so that its free edge pops up, then carefully pull the card out of its connector.
3. If mini-PCI card #2 is present, remove it: release the latches at the sides of the card, so that its free edge pops up, then carefully pull the card out of its connector.
4. Disconnect the cable connecting the display interface PCA to the speaker assembly.
5. Carefully lift the display interface PCA off of its connector.
6. Remove the speaker assembly from the unit.
7. Carefully lift the volume PCA off of its connector.
8. Turn the lock screw one-half turn counterclockwise to release the CPU module, and remove the CPU module from the motherboard.
9. From underneath the motherboard, remove the two retaining screws from the PC card socket and lift the socket off the connector.

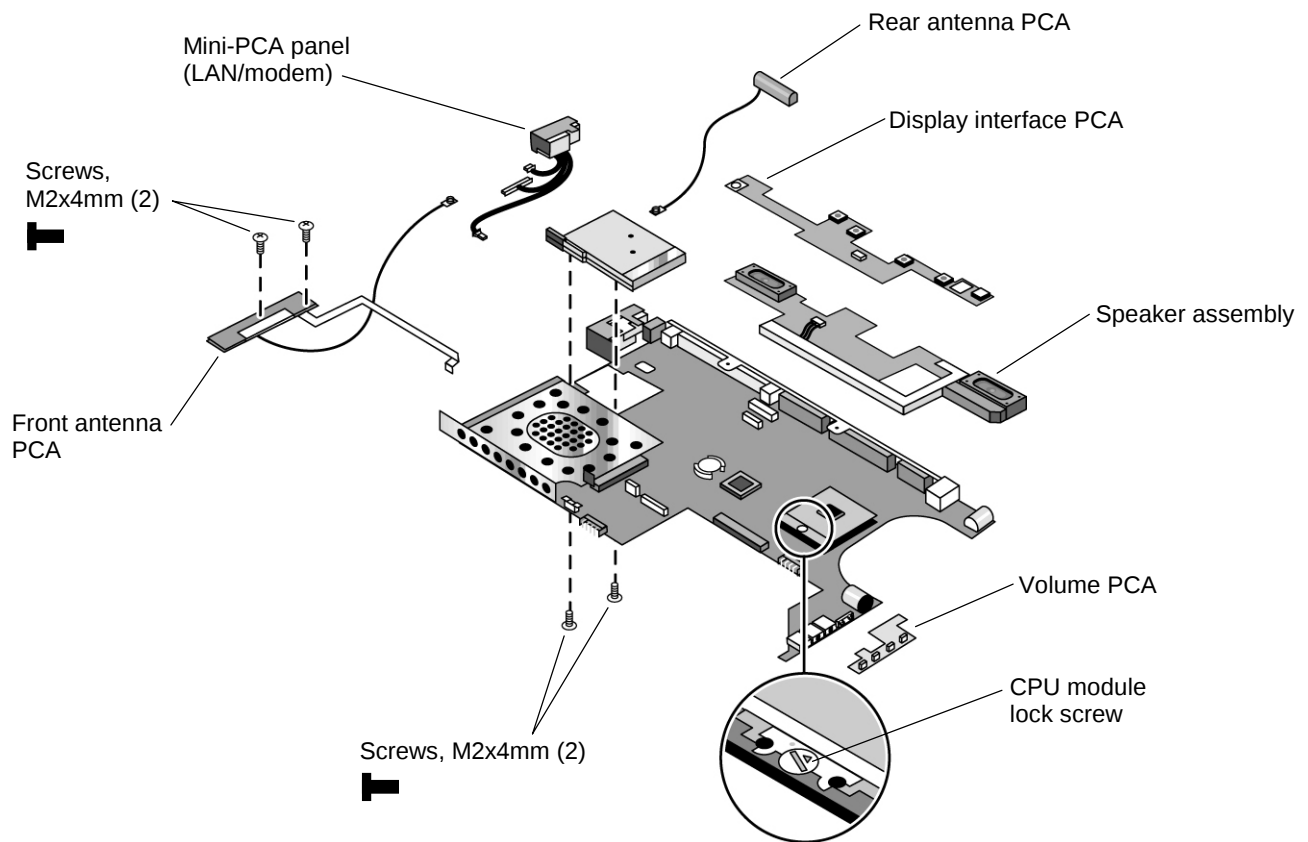


Figure 2-19. Replacing Motherboard Components

Reassembly Procedure

Note: Reprogramming the BIOS IC

A new BIOS IC contains only enough basic programming to enable the notebook to boot. After installing a new motherboard, you must reprogram the BIOS IC, preferably with the latest BIOS—see page 2-29.

1. Transfer the following components from the old motherboard onto the new motherboard:

- SDRAM module
- speaker assembly
- display interface PCA
- volume PCA
- CPU module
- PCMCIA socket
- mini-PCI card #1 (if present)
- mini-PCI card #2 (if present)

2. Follow the reassembly notes in the section entitled “Removing the Motherboard or Bottom Case” on page 2-25.

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 module: insert the module into the notebook, or connect it to the computer using an F2008 external floppy drive cable.
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

Installation Procedure

1. Transfer the SDRAM cover and sound/IR panel from the old bottom case to the new bottom case.
2. Install a new Microsoft Product ID label.
3. Transfer the old serial number label and install a new overlay, or create a new serial number label using the steps below.
4. Follow the “Reassembly Notes” on page 2-24.

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. The overlay covers and protects the serial label.
5. Make sure all regulatory labels that were on the old bottom case are also on the new bottom case. You can do this by keeping the old covers, if necessary.

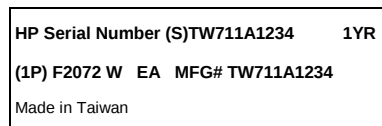


Figure 2-20. Example of Serial Number Label

Repairing the BIOS IC

(HP Authorized Service Providers Only)

The notebook's BIOS IC cannot be replaced separately. If it is defective, you must replace the motherboard. In some cases, however, you may be able to reprogram a malfunctioning BIOS IC using either e-DiagTools for Windows, a BIOS floppy disk, or a Crisis Recovery floppy disk.

If the notebook will boot sufficiently, use e-DiagTools for Windows or a BIOS floppy disk to reprogram the BIOS IC. If you cannot boot the notebook adequately, use a Crisis Recovery floppy disk. See below for instructions for all three methods.

Caution

The BIOS update completely replaces the previous BIOS, so follow the directions in this section **exactly** or you might damage the notebook. The BIOS update also resets the configurations in the BIOS Setup utility—except for BIOS passwords—so record these before performing the update.

Using a BIOS Floppy Disk

Use a BIOS floppy disk to update the notebook's BIOS as follows:

1. Undock the notebook if it is docked, and remove any PC cards from it.
2. Connect a floppy disk drive module: insert the module into the notebook, or connect it to the notebook's parallel port using an F2008 external floppy drive cable.
3. Connect the AC adapter to the notebook.
4. Insert the BIOS floppy disk into the floppy drive.
5. Turn on the notebook. When the notebook boots, follow the instructions that appear on screen.
6. When the process is completed, press the system-off switch to reset the system.

BIOS updates are also available from the HP Business Support web site (www.hp.com/go/bizsupport). Installation utilities and instructions for creating a BIOS floppy disk are provided with the updates.

Using e-DiagTools for Windows

If the notebook allows you to boot into Windows, you may be able to use e-DiagTools for Windows to update the notebook's BIOS as follows:

1. In Windows, exit any programs that are running.
2. Undock the notebook if it is docked, and remove any PC cards from it.
3. Connect the AC adapter to the notebook.
4. Connect any cables or equipment needed to connect to the Internet.
5. Click Start, Programs (or All Programs), HP e-DiagTools, e-DiagTools for Windows.
6. Click Update, select Download New and click OK. Follow the instructions that appear. **Once the update process begins, do not interrupt it.**

The first time you make an Internet connection from this program on a particular unit, click Change Settings in the Connect window to define your connection settings.

7. When the process is completed, press the system-off switch to reset the system.

Using a Crisis Recovery Floppy Disk

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

Caution

Make sure to use the correct BIOS Crisis Recovery floppy for the Omnibook model you are repairing. The program does not verify the Omnibook model, so you could accidentally install the wrong BIOS.

1. Insert the BIOS Crisis Recovery disk in the floppy disk drive.
2. Turn on the computer and allow it to boot from the floppy disk.

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

- a. Unplug the AC adapter.
- b. Press and hold Fn+B.
- c. Plug in the AC adapter.
- d. Release Fn+B.

Note: If the notebook will not boot from the floppy, try plugging the boot-block jumper into the notebook's parallel port. See the wiring diagram below.

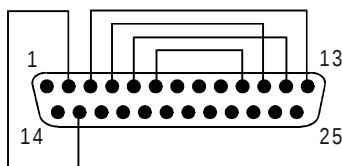


Figure 2-21. Boot-Block Jumper

3. The display goes blank for a minute or more while the BIOS is reprogrammed.

Note: If you plugged in a boot block jumper, unplug it before the notebook automatically reboots.

4. After the BIOS is reprogrammed, check the BIOS version to make sure it is the latest version. If necessary, download the latest BIOS version and reprogram the BIOS IC.

Removing Other Components

(HP Authorized Service Providers Only)

Required Equipment

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

Removal Procedure

1. Unplug the AC adapter, if present, and remove the battery and any secondary battery module.
2. Remove the assemblies and follow the additional steps given in the table below.

Table 2-5. Removing Omnibook Components

Component	Removal Procedure	Additional Steps
Battery, CMOS	Power button panel (page 2-11). Keyboard (page 2-13). Heatsink (page 2-15).	Reassembly Notes: After replacing the CMOS battery, set the correct time and date using the BIOS Setup utility or Date/Time in the Control Panel.
Card, mini-PCI #2	Plug-in module (page 2-5). Hard disk drive (page 2-7). Power button panel (page 2-11). Keyboard (page 2-13). Heatsink (page 2-15). Display assembly (page 2-19). Top case (page 2-21). Motherboard (page 2-23).	The card is attached to the underside of the motherboard. Release the two latches at the sides of the card so the free edge of the card pops up.
Case, bottom	See page 2-23.	
Case, top	See page 2-21.	
Cover, center hinge	Power button panel (page 2-11). Display assembly (page 2-19).	Reassembly Note: Make sure the center hinge cover fits over the tab in the bottom case.
CPU module	See page 2-17.	
Display assembly	See page 2-19.	
Doors, docking	Plug-in module (page 2-5). Hard disk drive (page 2-7). Power button panel (page 2-11). Keyboard (page 2-13). Heatsink (page 2-15). Display assembly (page 2-19). Top case (page 2-21).	See the figure on page 2-25.

Component	Removal Procedure	Additional Steps
Doors, PCMCIA	Plug-in module (page 2-5). Hard disk drive (page 2-7). Power button panel (page 2-11). Keyboard (page 2-13). Heatsink (page 2-15). Display assembly (page 2-19). Top case (page 2-21).	See the figure on page 2-25.
Heatsink (with fan)	See page 2-15.	
Keyboard	See page 2-13.	
Panel, sound/IR	Plug-in module (page 2-5). Hard disk drive (page 2-7). Power button panel (page 2-11). Keyboard (page 2-13). Heatsink (page 2-15). Display assembly (page 2-19). Top case (page 2-21).	Reassembly Notes: Insert the tabs on the ends of the panel into the slots in the bottom case.
Panel, mini-PCI	Plug-in module (page 2-5). Hard disk drive (page 2-7). Power button panel (page 2-11). Keyboard (page 2-13). Heatsink (page 2-15). Display assembly (page 2-19). Top case (page 2-21).	On the rear of the computer, remove the screw at the far left end (nearest the mini-PCI panel). Detach the cables from mini-PCI card and motherboard.
PCA, display interface	Plug-in module (page 2-5). Hard disk drive (page 2-7). Power button panel (page 2-11). Keyboard (page 2-13). Heatsink (page 2-15). Display assembly (page 2-19). Top case (page 2-21).	Unplug the speaker cable, and carefully lift the PCA off of its connector.
PCA, front antenna (wireless models only)	Plug-in module (page 2-5). Hard disk drive (page 2-7). Power button panel (page 2-11). Keyboard (page 2-13). Heatsink (page 2-15). Display assembly (page 2-19). Top case (page 2-21).	Disconnect the front antenna PCA flex cable from the motherboard, and the coaxial cable from the mini-PCI card (see Figure 2-19 on page 2-26).

Component	Removal Procedure	Additional Steps
PCA, motherboard	See page 2-23.	
PCA, rear antenna (wireless models only)	Plug-in module (page 2-5). Hard disk drive (page 2-7). Power button panel (page 2-11). Keyboard (page 2-13). Heatsink (page 2-15). Display assembly (page 2-19). Top case (page 2-21).	1. Remove the retaining screw from the rear antenna PCA, and detach the PCA by sliding it slightly to the left. 2. On the bottom of the computer, loosen the screw holding the mini-PCI cover (the cover retains the screw), and remove the cover. 3. Disconnect the cable from the mini-PCI card, and remove the PCA from the computer. Reassembly Notes: Place the PCA in its position near the left hinge, replace the screw, then thread the cable through to the bottom of the computer and reconnect the cable to the mini-PCI card.
PCA, volume	Plug-in module (page 2-5). Hard disk drive (page 2-7). Power button panel (page 2-11). Keyboard (page 2-13). Heatsink (page 2-15). Display assembly (page 2-19). Top case (page 2-21).	Remove the screw from the PCA, and carefully lift it off of its connector.
Socket, PCMCIA	Plug-in module (page 2-5). Hard disk drive (page 2-7). Power button panel (page 2-11). Keyboard (page 2-13). Heatsink (page 2-15). Display assembly (page 2-19). Top case (page 2-21).	1. On the bottom of the computer, loosen the screw holding the mini-PCI cover (the cover retains the screw), and remove the cover. 2. Remove both screws (M2x4mm) from inside the mini-PCI compartment. 3. Remove the two screws attaching the socket to the motherboard (see Figure 2-16 on page 2-24). 4. Unplug the PCMCIA socket from the motherboard.
Speaker assembly	Plug-in module (page 2-5). Hard disk drive (page 2-7). Power button panel (page 2-11). Keyboard (page 2-13). Heatsink (page 2-15). Display assembly (page 2-19). Top case (page 2-21).	1. Disconnect the cable from the display interface PCA. 2. Lift the display interface PCA out of the notebook. 3. Lift the speaker assembly out of the notebook.

Troubleshooting and Diagnostics

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

- Troubleshooting information
 - Checking for customer abuse (page 3-3).
 - Troubleshooting the problem (page 3-3).
 - Verifying the repair (page 3-4).
 - Suggestions for troubleshooting (page 3-5).
- Diagnostic tools
 - e-Diagtools diagnostic program (page 3-19).
 - Power-on self-test (page 3-23).
 - Sycard PCCtest 450/460 PC card (page 3-27).
 - Windows Management Instrumentation/Desktop Management Interface (page 3-28).
 - BIOS Setup utility (page 3-29).

Troubleshooting

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

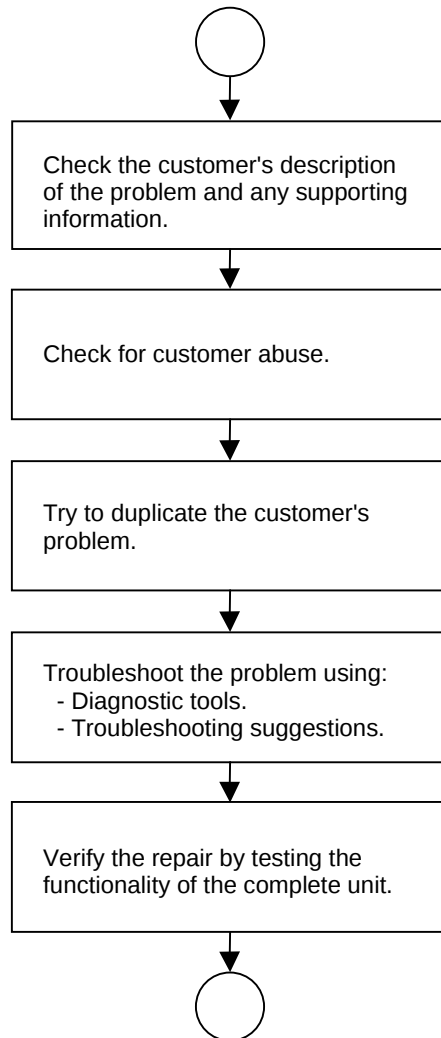


Figure 3-1. Basic Troubleshooting Steps

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 (stored in hidden file c:\version.inf).
- BIOS version.
- Accessories and peripherals used.

Analyze the problem:

- **Observe Symptoms.** Using the customer's information, try to duplicate the problem. Determine how the problem differs from proper behavior. Also, note the functions that *do* work properly.
- **Separate Problems.** If there are multiple symptoms, 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 notebook's components using automatic and interactive tests, and will be your primary troubleshooting tool. Other tools include the power-on self-test, WMI/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 that show specific failure symptoms.

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

After you replace a module, the notebook will normally be in a confused state and lock up when you apply power. If this happens, press the system-off switch: this resets the notebook, so that you can restart it in a known state.

Verifying the Repair

Before returning the repaired 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 those in e-Diagtools (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/WMI/Toptools (if installed)	BIOS Setup
Bootup		Tests		Describes	Configures
Processor	Tests (System menu)	Tests		Describes	
Memory	Tests (Memory menu)	Tests		Describes	Describes
Fan	Tests (Misc menu)				
Batteries		Tests (CMOS battery only)			
Display	Tests (Video menu)			Describes	Configures
Hard disk	Tests (IDE menu)	Tests		Describes	Configures
Floppy drive	Tests (FDD menu)	Tests		Describes	Configures
Keyboard	Tests (KBD menu)	Tests		Describes	
Pointer	Tests (Misc menu)			Describes	
Audio	Tests (System, Misc menus)				
Serial	Tests* (Misc menu)			Describes	Configures
Parallel	Tests* (Misc menu)			Describes	Configures
LAN	Tests* (Misc menu)			Describes	Configures
Modem	Tests** (User menu)				Configures
Wireless					Configures
Infrared				Describes	Configures
PS/2 port	Tests† (KBD, Misc menus)				Configures
USB	Tests† (USB menu)			Describes	Configures
Docking port	Tests (System menu, using docks)				
PCMCIA	Tests*† (Misc menu)		Tests	Describes	
AC adapter				Status	
Docking products	Tests ports 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 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 of a problem, determine which replaceable modules are involved in the system function and what roles they play: see the figure on page 1-14 and the table on page 1-15.			
Startup			
Does not boot on AC or battery.	Check power source. Press system-off switch to reset notebook, then press blue sleep button to turn notebook on. Unplug AC adapter, remove all batteries and any PC cards, press system-off switch to reset notebook, then reconnect power and try again. Do not use touch pad while booting or resuming. Remove all but one SDRAM module and try again. Reinsert any other SDRAM module and try again.	AC adapter. SDRAM module. CPU module. Display interface PCA. Motherboard. Display assembly. Hard drive.	Check AC adapter. Remove all but one SDRAM module and try again. If power status light does not turn on, reprogram BIOS, replace top case, replace motherboard. If power status light turns on but display remains off, try external monitor. If monitor shows successful boot, replace display assembly. If monitor shows activity but BIOS does not complete, replace display assembly. If monitor is blank, replace display interface PCA, replace display assembly, replace motherboard. If power status light and display turn on, BIOS completes, but OS does not start from hard disk or floppy drive, replace CPU module, replace motherboard. If OS starts from floppy drive, reload hard drive, replace hard drive.
Beeps once, spins hard disk, repeats, but does not boot.	Make sure at least one SDRAM module is installed.	SDRAM module.	
Does not boot on battery, but boots on AC.	Make sure battery is properly installed and fully charged. Check battery level on battery LEDs. Check battery contacts. If available, try another battery.	Battery or contacts. Motherboard.	
Does not boot from floppy drive.	Make sure floppy disk is bootable. Make sure floppy drive is installed or connected correctly. Use BIOS Setup to check default boot order and make sure floppy boot is enabled. Try using alternate connection (with or without floppy cable).	Floppy drive or contacts. Floppy cable. Motherboard.	

Symptom	Call Center: Suggestions	Repair Center: Likely Causes	Repair Center: Comments
Does not boot from CD in CD/DVD drive module	Make sure CD is bootable. Use BIOS Setup to check default boot order. Restart notebook.	CD/DVD drive module. Motherboard.	
Sluggish startup or shutdown.	Use Tools tab in disk's Properties sheet to check hard disk. Use Disk Defragmenter to optimize hard disk. Delete temporary and unneeded files.	Hard drive.	
Does not boot into POST.	Try removing wireless mini-PCI card.	Mini-PCI card.	Replace mini-PCI card.
Error message such as "Invalid system disk" or "Auto IDE error".	Check for disk in floppy drive. Check boot order in BIOS Setup. Remove and reinstall hard drive.	Hard drive contacts. Hard drive.	If unit boots from floppy drive, check for corrupt files on hard drive, use <i>Recovery CDs</i> to reinstall factory software onto hard drive, replace hard drive.
Password forgotten.	Verify proper ownership, then follow removal procedure with owner and record appropriate data—see page 5-1.		User must call Technical Support and provide proof of ownership. Password removal is restricted to certain sites. See page 5-1.
Power			
No power.	Make sure charged battery is installed or AC adapter connected. Try another battery or AC adapter if available.	AC adapter. Battery. Motherboard.	
Turns off immediately after turning on.	Battery may be extremely low. Plug in AC adapter, insert charged battery, or plug in secondary battery module (OB XT/VT6200).	Battery.	
Does not run on battery; empty battery indication.	Check battery and contacts. Try another battery if available.	Battery or contacts. Motherboard.	
Beeeps repeatedly.	Notebook beeps repeatedly when battery is low. Connect AC adapter or replace battery.	Battery.	
Battery does not charge.	Make sure AC adapter is connected properly and battery installed properly. Check battery contacts. If available, try another battery and AC adapter. Move notebook away from any nearby heat source. Unplug AC adapter and allow battery to cool. Check for blocked air vents.	Battery or contacts. AC adapter. Motherboard. Heatsink.	Check battery and AC adapter. Check heatsink.

Symptom	Call Center: Suggestions	Repair Center: Likely Causes	Repair Center: Comments
Notebook has short operating time when on battery.	Turn down display brightness. Check timeout settings in Power in Control Panel. Check power management settings in BIOS Setup. Try default settings. Run HP Battery Optimizer (Omnibook XT/VT6200 models). Battery gauge may need calibration. Restart notebook, press F6 when HP logo appears, and follow onscreen instructions. This calibrates battery gauge, and requires four to five hours. You cannot use notebook during this process. During process, you may have to disconnect and reconnect AC adapter to begin recharging. Certain applications can cause excess CPU and power usage. (Users can get Intel Power Monitor from www.intel.com and monitor CPU load.) When playing DVD movies on battery power, use Power Options in Control Panel to select Portable/Laptop power scheme. When using applications with automatic save feature (such as MS Word), extend save time or disable to reduce hard disk access and power usage. PCMCIA card use can affect battery life. Some PCMCIA cards draw power even while not in use. Heavy modem use can affect battery operating time.	Battery. Motherboard.	Battery capacity often decreases after a year or more.
Secondary battery does not charge (Omnibook XT/VT6200 models).	Check power source. Make sure main battery is fully charged. If not, secondary battery will not charge. Check contacts on second battery.	Second battery or contacts. Motherboard.	
AC adapter does not power notebook.	Try another AC adapter, if available.	AC adapter. Motherboard.	AC adapter cannot be repaired, and must be replaced.

Symptom	Call Center: Suggestions	Repair Center: Likely Causes	Repair Center: Comments
Battery indicator is inaccurate.	Time Remaining is an estimate based on notebook's power use at that moment. It therefore depends on current task, and assumes power will be used at that rate until battery runs out. So if notebook is currently using good deal of power (such as when reading CD or DVD), Time Remaining likely shows less time than actually remains.		
Standby/resume			
General problems.	Close all applications before entering (or allowing notebook to enter) Standby or Hibernate mode. If problem appears after installing new software (including drivers), uninstall that software. Contact software vendor for additional support.		
Notebook resumes slowly from Standby mode.	Notebook can take a minute or longer to resume if network card is installed. Blinking cursor appears while system is loading and checking hardware and network connections. When hardware is reinitialized, Windows desktop appears.		
Does not suspend to Standby mode as expected.	Notebook won't suspend if connection to another computer is active. If notebook is busy, it normally finishes current operation before suspending.		
Does not automatically enter Hibernate mode as expected.	Make sure hibernate support is enabled in Power in Control Panel. Also, make sure Hibernate timeouts (Power Schemes tab) for AC and battery power are not set to Never.		

Symptom	Call Center: Suggestions	Repair Center: Likely Causes	Repair Center: Comments
Display			
Dark display, no light.	Make sure notebook is turned on and warmed up. Check power supply. Make sure SDRAM modules are installed properly. Adjust display brightness. Press Fn+F5 several times. Try external monitor.	Display cable connection. SDRAM modules. CPU module. Display assembly. Motherboard.	Check cable connections. Replace SDRAM modules. Make sure CPU module is installed properly, replace CPU module. Check display cable connections, replace display assembly. If external monitor displays no image, replace motherboard.
White display.	Adjust display brightness.	Display assembly. Display interface PCA.	
Erratic display.		Display cable connection. Display interface PCA. Display assembly. Motherboard.	Check display cable connection.
Bright or missing pixels or lines.	See quality statement on page 5-2.	Display cable connection. Display assembly.	Check display cable connection. See quality statement on page 5-2.
Punctured display.			Declared to be caused by customer abuse.
Vertical crack near center of display.		Usually caused by closing display with pencil-sized object on keyboard.	Declared to be caused by customer abuse.
Scratched display glass.			Declared to be caused by customer abuse.
Local area of dark or light discoloration visible when display is on.		Caused by excessive pressure applied to area on screen.	Declared to be caused by customer abuse.
External display does not work.	Check connections. Press Fn+F5 several times. Try display on another computer.	External display. Motherboard.	
Hard disk			
Hard disk never spins.	Check power source. Remove and reinstall hard drive. Check connector.	Hard drive or connector. Motherboard.	If drive case is damaged, drive may not operate properly.
Hard disk makes clunking or scratching noise.	Back up disk immediately. Was notebook or drive dropped?	Hard drive.	Check notebook and drive for evidence of customer abuse.
Hard disk makes buzzing or whining noise.	Back up disk immediately. Check hard disk installation. Check for alternate noise sources, such as PCMCIA drive or fan.	Depends on noise source.	

Symptom	Call Center: Suggestions	Repair Center: Likely Causes	Repair Center: Comments
Files corrupted.	Run virus scan program. Check hard disk using Tools tab in disk's Properties sheet. Test hard disk drive with e-Diagtools diagnostics. Back up files if possible, then use <i>Recovery CDs</i> to reformat hard disk and reinstall factory software.		
Disk capacity less than normal.	Check hard disk using Tools tab in disk's Properties sheet. Check partitions using Control Panel, Administrative Tools, Computer Management under Storage. Use <i>Recovery CDs</i> to reformat hard disk and reinstall factory software.	Hard drive.	
Disk's reported capacity is less than actual size.	Hard disk allocates space to diagnostic software. This space is unavailable for other uses, and not included in hard disk capacity reported by Windows.		
Floppy drive			
General problems.	Make sure floppy drive module is installed and connected correctly. Try alternate connection (with or without floppy cable). Use BIOS Setup to make sure FDD controller is enabled.	Floppy drive module or contacts. External floppy drive cable. Motherboard.	
Floppy drive does not work as 3-mode drive.	3-mode drive not supported when drive is connected to dock.	External floppy drive cable. Floppy drive module.	
CD/DVD drive module			
Particular CD or DVD not playing properly.	Check disk for proper insertion, dirt, or damage. Clean with soft cloth or replace as needed. If CD was created on CD-RW drive, try using HP certified media. Read and write quality may vary for other media.		
Cannot read any CD or DVD.	Restart notebook. Make sure CD/DVD drive module is inserted properly.	CD/DVD drive module.	
DVD movie stops playing.	DVD may be double-sided. Movie may be paused. Press Play button.		

Symptom	Call Center: Suggestions	Repair Center: Likely Causes	Repair Center: Comments
Region Code error.	DVDs contain embedded regional codes that prevent them from playing outside region in which they are sold. This error occurs when trying to play DVD intended for different region. Important: Most DVD drives allow region code to be changed only a limited number of times (usually no more than four). When this limit is reached, last change is hard-coded on DVD drive, and is permanent. Refer to DVD player software help for details.		HP warranty does not cover expense of correcting this situation.
"System Error: Unable to read drive" message.	Make sure disk is clean, undamaged, and inserted correctly. Clean with soft cloth or replace as needed. Wait 5 to 10 seconds after closing tray before pressing Play. Restart notebook. Make sure CD/DVD drive module is installed properly.	CD/DVD drive module. Motherboard.	
All DVD play is erratic.	Some DVDs include software called "PC Friendly". This software can cause errors or erratic play. If needed, uninstall PC Friendly and restart notebook.		
Keyboard			
Some or all keys do not work properly.	Check settings in Control Panel.	Keyboard. Motherboard.	Try reinserting ribbon cable in connector on motherboard.
Embedded numeric keypad does not work.	Press Fn+F8 to activate numeric keypad, and Lock key to turn on number lock. Avoid touching touch pad while booting or resuming.	Keyboard. Motherboard.	
PS/2 keyboard and mouse with Y-adapter do not work.	Check devices separately.	Y-adapter. PS/2 device. Motherboard.	

Symptom	Call Center: Suggestions	Repair Center: Likely Causes	Repair Center: Comments
Pointing stick			
General problems.	Reset notebook (see page 1-8). Check settings in Control Panel. Make sure pointing stick is enabled in Mouse Properties. By default, pointing stick is disabled if external PS/2 mouse is connected, Use BIOS Setup to check settings.	Keyboard. Motherboard.	Try reinserting flex cable in connector on motherboard.
Special pointing stick features not working.	Check Mouse Properties in Control Panel.	Keyboard assembly. Motherboard.	
Touch pad			
General problems.	Reset notebook (see page 1-8). Check settings in Control Panel. Make sure touch pad is enabled in Mouse Properties. By default, touch pad is disabled if external PS/2 mouse is connected, Use BIOS Setup to check settings. Avoid touching touch pad while booting or resuming.	Top case. Motherboard.	
Special touch pad features not working.	Check Mouse Properties in Control Panel.	Top case. Motherboard.	
Click button does not work.		Top case. Motherboard.	
Memory			
Out of memory error.	Make sure C drive has adequate free space. Delete temporary and unneeded files. Use memory troubleshooter in Windows Help. Third-party memory cards have not been tested for use with notebook.	SDRAM module.	
Computer doesn't boot after adding SDRAM.	Use only PC133 (OB XT6050) or PC2100 DDR266 (OB XT/VT6200) SDRAM modules.	SDRAM module.	

Symptom	Call Center: Suggestions	Repair Center: Likely Causes	Repair Center: Comments
Audio			
No sound audible.	Increase sound volume. Check whether sound is enabled (audio-off button and software controls). Check for sound resource conflicts in Device Manager. Test audio with e-Diagtools diagnostics.	Top case. Speaker assembly. Volume PCA. Motherboard.	Check operation using headphones or external speakers (volume PCA). Make sure speaker assembly cable is connected.
Sound does not record.	Check software controls. Test audio with e-Diagtools diagnostics.	Display interface PCA. Volume PCA. Motherboard.	Check operation using external microphone (volume PCA).
Serial/Parallel/USB			
General problems.	Check connections. Restart notebook. Use troubleshooters in Windows Help. Check settings in Control Panel. Check settings in BIOS Setup. Check port settings in Device Manager. Test ports with e-Diagtools diagnostics. For USB: contact device vendor and HP Notebook web site (see page vi) for latest USB drivers. For USB: if the device is powered by the USB port, try the other port.	Motherboard.	Use loop-back connector when testing serial or parallel port—see page 3-21.
Modem			
General problems.	Check settings in Control Panel. Open hardware Device Manager. If modem is disabled, try to enable. If modem has a conflict, try disabling another device. Use analog telephone line (2, 3, or 4 wires), not PBX or digital line. In a hotel, ask for data line. Try disabling error correction and data compression. Test modem with e-Diagtools diagnostics.	Mini-PCI modem card Mini-PCI panel. Motherboard.	

Symptom	Call Center: Suggestions	Repair Center: Likely Causes	Repair Center: Comments
LAN/network			
General problems.	Check cables and connections. Try connecting notebook to another network station (if applicable). If green light next to LAN port does not light, LAN cable may not be connected to network or network may be down. Use networking troubleshooter in Windows Help. Check settings in BIOS Setup. Check settings in Control Panel. Make sure LAN cable is Category 3, 4, or 5 for 10Base-T operation, or Category 5 for 100Base-TX operation. Maximum cable length is 100 meters (330 feet). Test LAN with e-Diagtools diagnostics.	Mini-PCI panel. Motherboard.	
Infrared			
General problems.	Infrared is disabled and no drivers installed as shipped. (Drivers are included.) Make sure line between infrared ports is not blocked, ports face each other squarely and are no more than 1 meter apart. Sunlight, heat from nearby equipment, or other sources of infrared radiation can cause transmission errors. Check settings in BIOS Setup. Remove any PC cards from notebook (possible IRQ conflict). For fast-IrDA, check for DMA conflict with ECP parallel port.	Motherboard.	

Symptom	Call Center: Suggestions	Repair Center: Likely Causes	Repair Center: Comments
Wireless			
General problems.	Check TCP/IP setup in Control Panel. Check SSID, channel, and encryption settings: click wireless link icon in taskbar and select Advanced Configuration.	Mini-PCI card #1. Rear antenna PCA. Front antenna PCA. Motherboard.	Make sure all cables are properly connected to mini-PCI card #1 and motherboard. Check for damaged coaxial cables or connectors.
One-Touch buttons			
Buttons not working properly.	Make sure correct applications are associated with buttons in One-Touch tab of Keyboard in Control Panels.	Keyboard cover. Display interface PCA. Motherboard.	
On-screen display does not appear when button is pressed.	Make sure Onscreen Display is enabled in One-Touch tab of Keyboard in Control Panels.		
PCMCIA			
General problems.	Restart notebook. Try card in another computer or other device. If card requires an IRQ, make sure one is available. In Device Manager, refresh device list and check for conflicts. Check HP Notebook web site for installation instructions (page vi). When using PC card in docking system, insert or remove card while system is turned on. Download current drivers from card manufacturer's web site.	PCMCIA socket. Motherboard.	Using a flashlight, look for bent pins inside the PCMCIA socket. Replace PCMCIA socket; replace motherboard.
AC adapter			
Does not power notebook.	Try another AC adapter, if available.	AC adapter. Motherboard.	AC adapter cannot be repaired and must be replaced.
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.

Symptom	Call Center: Suggestions	Repair Center: Likely Causes	Repair Center: Comments
Miscellaneous			
Clock loses time.	Plug in AC adapter for 24 hours to charge CMOS battery.	CMOS battery. Motherboard.	Charge CMOS battery.
Notebook gets abnormally hot.	Always set notebook on a flat surface, so air can flow freely around and underneath it Make sure air vents are not blocked. Games and other programs that drive CPU usage toward 100% can contribute.	Heatsink.	Check heatsink for damage or proper fan operation. Check thermal contact between CPU and heatsink. Replace thermal pad if needed.
Notebook pauses or runs sluggishly.	May be normal Windows behavior (background processing can affect response time). Certain operations (such as virus scanning or file browsers) can affect performance. Press Ctrl+Alt+Del to see if an application is not responding. Restart notebook. If hard disk has spun down to conserve power, it can take several seconds to spin up (you can hear this). Use Control Panel to modify hard disk power settings. Check for overheating—see previous symptom. If notebook's hard drive frequently runs (as indicated by hard drive light on front of notebook) while notebook appears to be paused or running slowly, consider installing additional SDRAM. Make sure hard drive has adequate free space. Delete temporary and unneeded files.	CPU module. Motherboard.	If notebook slows after period of continuous activity, check heatsink—see previous symptom.
Notebook still on but stops responding.	Press Ctrl+Alt+Del and end any application not responding. Reset notebook (see page 1-8).		
Plug-in Modules			
General problems.	Make sure module is installed properly. Check module contacts. Reset notebook (see page 1-8).	Plug-in module or contacts. Motherboard.	Plug-in modules cannot be repaired, and must be exchanged.

Symptom	Call Center: Suggestions	Repair Center: Likely Causes	Repair Center: Comments
Accessories			
Docking product I/O problems.	Make sure AC power is connected to dock, and notebook is fully inserted in dock. Check notebook's power supply. Check settings in BIOS Setup. Try using corresponding port on notebooks while undocked.	Docking product. Motherboard.	Test corresponding notebook ports while undocked. Port replicator and mini dock are not repairable, and must be exchanged.

Diagnostic Tools

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

- Omnibook e-Diagtools diagnostic program (below).
- Power-on self-test (page 3-22).
- Sycard PCCTest 450 PC card (page 3-27).
- Windows/Desktop Management Interface (page 3-28).
- BIOS Setup utility (page 3-29).

e-Diagtools Diagnostic Program

The hardware diagnostic programs provide two levels of testing:

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

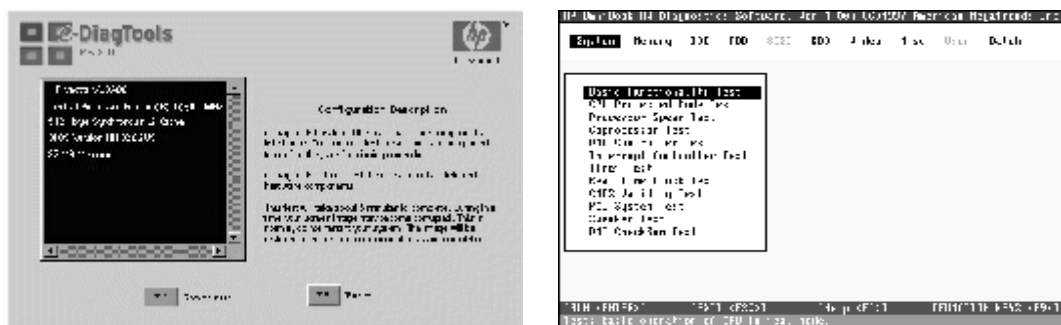


Figure 3-2. Diagnostic Screens — Basic and Advanced

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

Running e-Diagtools

The following steps describe how to run e-Diagtools. The procedure may differ slightly for different versions of 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 hardware detection finishes, check the list of detected hardware.

Note

If a device is not detected or fails its test, it might be configured incorrectly in the notebook's BIOS. You can confirm this by running BIOS Setup and checking the settings—see “BIOS Setup Utility” on page 3-29.

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.

(Press F9 for a list of all function keys.)

If a test fails, the error code and description are logged, and the error code is displayed temporarily. If several errors occur, look for patterns that might indicate a common cause.
11. **Save the Support Ticket.** Press T to update and display a Support Ticket containing system and test information.
12. When you are finished running tests, press Esc to exit the advanced tests.
13. **Optional:** To save the Support Ticket to a floppy disk, press F7 then Alt+C.
14. **Exit.** Press F3 and then any key to exit and restart the notebook.
15. **Optional: Open the Support Ticket.** In Windows, click Start, Programs (or All Programs), Hewlett-Packard, Notebook, 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 and enable the external loopback option before running the test for that port. See the wiring diagrams below.

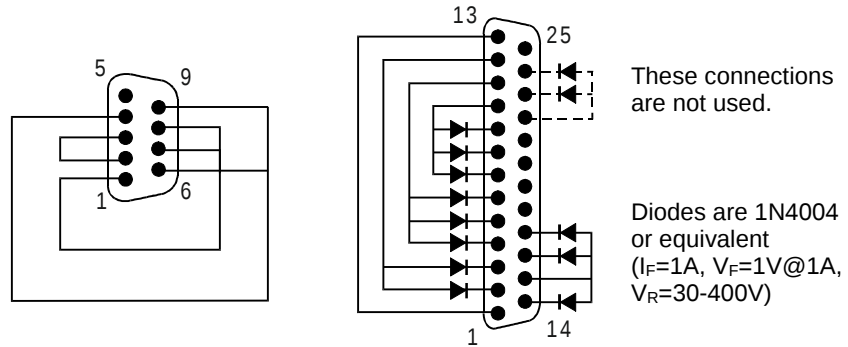


Figure 3-3. Serial and Parallel Loopback Connectors

Interpreting the Results

The e-Diagtools diagnostic program returns test groups, error codes, and suggestions for repair and/or follow-up actions. The basic hardware test will show a recommended replacement part, while the advanced tests also provide more detailed error descriptions.

To help interpret the results of the e-Diagtools tests, refer to the following:

- e-Diagtools online help
- Replaceable Module Diagram on page 1-14
- Functional Structure Description on page 1-15

This combined information should enable you to determine which of the notebook's components require service.

Power-On Self-Test

Note

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

When the notebook boots, its system BIOS runs a series of initialization routines and diagnostic tests called POST (Power-On Self-Test). The BIOS will not boot the notebook's operating system if certain components fail the POST diagnostic tests. POST indicates progress by a sequence of codes; if an error occurs, the BIOS displays a message and/or issues a beep code.

Note that not all POST messages indicate a failure in the notebook—some messages are for information only. You should not necessarily interpret the failure of one or more POST tests as a hardware, software, or firmware failure. If POST displays an error message or issues a beep code indicating an error, *confirm the problem using other diagnostic tools*.

First, confirm the failure by performing a “clean” boot, as described below: If the notebook fails to restart with a clean boot, it requires repair.

1. Remove all accessories, including SDRAM modules, floppy drive, port replicator, PC cards, printer, external monitor, pointing device, and keyboard.
2. Provide “clean” AC power—no auto adapter or unusual AC adapter configuration.
3. Press the system-off switch to return the notebook to a known state.
4. Press the blue sleep button to start the notebook.

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

Table 3-3. POST Terminal-Error Beep Codes

Beep Codes*	Error Code	POST Description	Beep Codes*	Error Code	POST Description
1	B4h	One short beep before boot.	1-3-1-1	20h	Test DRAM refresh.
1-2	—	Search for option ROMs.	1-3-1-3	22h	Test 8742 Keyboard Controller (on motherboard).
1-1-1-3	02h	Verify Real Mode.	1-3-2-1	24h	Set ES segment register to 4 GB.
1-1-1-4	03h	Disable Non-Maskable Interrupt (NMI).	1-3-3-1	28h	Auto size DRAM; or wrong type or no RAM installed.
1-1-2-1	04h	Get CPU type.	1-3-3-2	29h	Initialize POST Memory Manager.
1-1-2-3	06h	Initialize system hardware.	1-3-3-3	2Ah	Clear 512 kB base RAM.
1-1-2-4	07h	Disable shadow and execute code from ROM.	1-3-4-1	2Ch	RAM failure on address line xxxx.
1-1-3-1	08h	Initialize chipset with initial POST values.	1-3-4-3	2Eh	RAM failure on data bits xxxx of low byte of memory bus.
1-1-3-2	09h	Set IN POST flag.	1-3-4-4	2Fh	Enable cache before system BIOS shadow.
1-1-3-3	0Ah	Initialize CPU registers.	1-4-1-1	—	RAM failure on data bits xxxx of high byte of memory bus.
1-1-3-4	0Bh	Enable CPU cache.	1-4-1-3	32h	Test CPU bus-clock frequency.
1-1-4-1	0Ch	Initialize caches to initial POST values.	1-4-1-4	33h	Initialize Phoenix Dispatch Manager.
1-1-4-3	0Eh	Initialize I/O component.	1-4-2-3	36h	Warm start shut down.
1-1-4-4	0Fh	Initialize local bus IDE.	1-4-3-1	38h	Shadow system BIOS ROM.
1-2-1-1	10h	Initialize Power Management.	1-4-3-3	3Ah	Auto size cache.
1-2-1-2	11h	Load alternate registers with initial POST values.	1-4-4-1	3Ch	Advanced configuration of chipset registers.
1-2-1-3	12h	Restore CPU control word during warm boot.	1-4-4-2	3Dh	Load alternate registers with CMOS values.
1-2-1-4	13h	Initialize PCI Bus Mastering devices.	2-1-1-2	41h	Initialize extended memory for RomPilot.
1-2-2-1	14h	Initialize keyboard controller.	2-1-1-3	42h	Initialize interrupt vectors.
1-2-2-3	16h	BIOS ROM checksum.	2-1-2-2	45h	POST device initialization.
1-2-2-4	17h	Initialize cache before memory Auto size.	2-1-2-3	46h	Check ROM copyright notice.
1-2-3-1	18h	8254 timer initialization.	2-1-2-4	47h	Initialize I20 support.
1-2-3-3	1Ah	8237 DMA controller initialization.			
1-2-4-1	1Ch	Reset Programmable Interrupt Controller.			

Beep Codes*	Error Code	POST Description
2-1-3-1	48h	Check video configuration against CMOS.
2-1-3-2	49h	Initialize PCI bus and devices.
2-1-3-3	4Ah	Initialize all video adapters in system.
2-1-3-4	4Bh	QuietBoot start (optional).
2-1-4-1	4Ch	Shadow video BIOS ROM.
2-1-4-3	4Eh	Display BIOS copyright notice.
2-1-4-4	4Fh	Initialize MultiBoot.
2-2-1-1	50h	Display CPU type and speed.
2-2-1-2	51h	Initialize EISA board.
2-2-1-3	52h	Test keyboard.
2-2-2-1	54h	Set key click if enabled.
2-2-2-2	55h	Enable USB devices.
2-2-3-1	58h	Test for unexpected interrupts.
2-2-3-2	59h	Initialize POST display service.
2-2-3-3	5Ah	Display prompt "Press F2 to enter SETUP".
2-2-3-4	5Bh	Disable CPU cache.
2-2-4-1	5Ch	Test RAM between 512 and 640 kB.
2-3-1-1	60h	Test extended memory.
2-3-1-3	62h	Test extended memory address lines.
2-3-2-1	64h	Jump to UserPatch1.
2-3-2-3	66h	Configure advanced cache registers.
2-3-2-4	67h	Initialize Multi Processor APIC.
2-3-3-1	68h	Enable external and CPU caches.
2-3-3-2	69h	Set up System Management Mode (SMM) area.
2-3-3-3	6Ah	Display external L2 cache size.
2-3-3-4	6Bh	Load custom defaults (optional).
2-3-4-1	6Ch	Display shadow-area message.
2-3-4-3	6Eh	Display possible high address for UMB recovery.
2-4-1-1	70h	Display error messages.
2-4-1-3	72h	Check for configuration errors.
2-4-2-3	76h	Check for keyboard errors.
2-4-4-1	7Ch	Set up hardware interrupt vectors.
2-4-4-2	7Dh	Initialize Intelligent System Monitoring.
2-4-4-3	7Eh	Initialize coprocessor if present.
3-1-1-1	80h	Disable onboard Super I/O ports and IRQs.
3-1-1-2	81h	Late POST device initialization.
3-1-1-3	82h	Detect and install external RS232 ports.
3-1-1-4	83h	Configure non-MCD IDE controllers.
3-1-2-1	84h	Detect and install external parallel ports.
3-1-2-2	85h	Initialize PC-compatible PnP ISA devices.
3-1-2-3	86h	Re-initialize onboard I/O ports.
3-1-2-4	87h	Configure Motherboard Configurable Devices (optional).
3-1-3-1	88h	Initialize BIOS Data Area.
3-1-3-2	89h	Enable Non-Maskable Interrupts (NMIs).
3-1-3-3	8Ah	Initialize Extended BIOS Data Area.
3-1-3-4	8Bh	Test and initialize PS/2 mouse.
3-1-4-1	8Ch	Initialize floppy controller.
3-1-4-4	8Fh	Determine number of ATA drives (optional).
3-2-1-1	90h	Initialize hard-disk controllers.
3-2-1-2	91h	Initialize local-bus hard-disk controllers.
3-2-1-3	92h	Jump to UserPatch2.
3-2-1-4	93h	Build MPTABLE for multi-processor boards.
3-2-2-2	95h	Install CD-ROM for boot.
3-2-2-3	96h	Clear huge ES segment register.
3-2-2-4	97h	Fix up Multi Processor table.
3-2-3-2	99h	Check for SMART Drive (optional).
3-2-3-3	9Ah	Shadow option ROMs.
3-2-4-1	9Ch	Set up Power Management.
3-2-4-2	9Dh	Initialize security engine (optional).
3-2-4-3	9Eh	Enable hardware interrupts.
3-2-4-4	9Fh	Determine number of ATA and SCSI drives.
3-3-1-1	A0h	Set time of day.
3-3-1-3	A2h	Check key lock.

Beep Codes*	Error Code	POST Description
3-3-2-1	A4h	Initialize typematic rate.
3-3-3-1	A8h	Erase F2 prompt.
3-3-3-3	AAh	Scan for F2 keystroke.
3-3-4-1	ACH	Enter SETUP.
3-3-4-3	ACh	Clear Boot flag.
3-4-1-1	B0h	Check for errors.
3-4-1-2	B1h	Inform RomPilot about the end of POST.
3-4-1-3	B2h	POST done - prepare to boot OS.
3-4-2-2	B5h	Terminate QuietBoot (optional).
3-4-2-3	B6h	Check password (optional).
3-4-2-4	B7h	Initialize ACPI BIOS.
3-4-3-2	B9h	Prepare Boot.
3-4-3-3	BAh	Initialize SMBIOS.
3-4-3-4	BBh	Initialize PnP Option ROMs.
3-4-4-1	BCh	Clear parity checkers.
3-4-4-2	BDh	Display MultiBoot menu.
3-4-4-3	BEh	Clear screen (optional).
3-4-4-4	BFh	Check virus and backup reminders.
4-1-1-1	C0h	Try to boot with INT 19.
4-1-1-2	C1h	Initialize POST Error Manager (PEM).
4-1-1-3	C2h	Initialize error logging.
4-1-1-4	C3h	Initialize error display function.
4-1-2-1	C4h	Initialize system error handler.
4-1-2-2	C5h	PnPnd dual CMOS (optional).
4-1-2-3	C6h	Initialize note dock (optional).
4-1-2-4	C7h	Initialize note dock late.
4-1-3-1	C8h	Force check (optional).
4-1-3-2	C9h	Extended checksum (optional).
4-1-3-3	CAh	Redirect Int 15h to enable remote keyboard.
4-1-3-4	CBh	Redirect Int 13h to Memory Technologies Devices such as ROM, RAM, PCMCIA, and serial disk.
4-1-4-1	CCh	Redirect Int 10h to enable remote serial video.
4-1-4-2	CDh	Re-map I/O and memory for PCMCIA.
4-1-4-3	CEh	Initialize digitizer and display message.
4-2-1-3	D2h	Unknown interrupt.
4-3-1-1	E0h	Initialize the chipset.
4-3-1-2	E1h	Initialize the bridge.
4-3-1-3	E2h	Initialize the CPU.
4-3-1-4	E3h	Initialize system timer.
4-3-2-1	E4h	Initialize system I/O.
4-3-2-2	E5h	Check force recovery boot.
4-3-2-3	E6h	Checksum BIOS ROM.
4-3-2-4	E7h	Go to BIOS.
4-3-3-1	E8h	Set Huge Segment.
4-3-3-2	E9h	Initialize Multi Processor.
4-3-3-3	EAh	Initialize OEM special code.
4-3-3-4	EBh	Initialize PIC and DMA.
4-3-4-1	ECh	Initialize Memory type.
4-3-4-2	EDh	Initialize Memory size.
4-3-4-3	EEh	Shadow Boot Block.
4-3-4-4	EFh	System memory test.
4-4-1-1	F0h	Initialize interrupt vectors.
4-4-1-2	F1h	Initialize Run Time Clock.
4-4-1-3	F2h	Initialize video.
4-4-1-4	F3h	Initialize System Management Manager.
4-4-2-1	F4h	Output one beep.
4-4-2-2	F5h	Clear Huge Segment.
4-4-2-3	F6h	Boot to Mini DOS.
4-4-2-4	F7h	Boot to Full DOS.
1 long, 2 short	98h	Improper video configuration (replace motherboard) or external ROM checksum failure.

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 3-4. POST Messages

Message	Description
0200 Failure Fixed Disk	Fixed (hard) disk is not working or not configured properly. Make sure the hard disk is installed properly. Run BIOS Setup and make sure the hard disk type is correctly identified.
0210 Stuck key	Stuck key on keyboard.
0211 Keyboard error	Keyboard is not working.
0212 Keyboard Controller Failed	Keyboard controller failed the test. May require replacing 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	Monitor type is not correctly identified in BIOS Setup.
0230 Shadow RAM Failed at offset: <i>nnnn</i>	Shadow RAM failed at offset <i>nnnn</i> of the 64k block at which the error was detected.
0231 System RAM Failed at offset: <i>nnnn</i>	System RAM failed at offset <i>nnnn</i> of the 64k block at which the error was detected.
0232 Extended RAM Failed at offset: <i>nnnn</i>	Extended memory is not working or not configured properly at offset <i>nnnn</i> . Update to the latest BIOS version.
0250 System battery is dead – Replace and run SETUP	CMOS clock battery indicator shows that the CMOS battery is dead. Connect the AC adapter for at least 24 hours, then run BIOS Setup to reconfigure the system.
0251 System CMOS checksum bad – Default configuration used	System CMOS has been corrupted or modified incorrectly, perhaps by an application that changes CMOS data. In response, the BIOS has installed the default Setup values. Use BIOS Setup to modify these values if needed. If the error persists, check the CMOS battery. Connect the AC adapter for at least 24 hours; replace the motherboard.
0260 System timer error	Timer test failed. Replace the motherboard.
0270 Real time clock error	Real-time clock failed the BIOS test. May require replacing the motherboard.
0271 Check date and time settings	BIOS found the date or time to be out of range, and reset the real-time clock. You may need to use BIOS Setup to reset the legal date.
0280 Previous boot incomplete – Default configuration used	Previous POST did not complete successfully. POST loads default values and offers to run BIOS Setup. If the failure was caused by incorrect values that are not corrected, the next boot will likely fail. This error is cleared the next time the system is booted.
0281 Memory Size found by POST differed from CMOS	Memory size found by POST differed from that specified in CMOS.
02B0 Diskette drive A error 02B1 Diskette drive B error	Drive A: or B: is present but fails the BIOS POST diskette tests. Make sure the drive is defined with the proper diskette type in BIOS Setup and that the drive is connected correctly.
02B2 Incorrect Drive A type – run SETUP	Type of floppy drive A: not correctly identified in BIOS Setup.
02B3 Incorrect Drive B type – run SETUP	Type of floppy drive B: not correctly identified in BIOS Setup.
02D0 System cache error – Cache disabled	RAM cache failed and BIOS disabled the cache. May require replacing the motherboard. A disabled cache slows system performance considerably.

Message	Description
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 Direct Memory Access (DMA) registers.
02F6: Software NMI Failed	ServerBIOS2 test error: Cannot generate software Non-Maskable Interrupt (NMI).
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 ISA or EISA Configuration Utility to resolve a resource conflict for the specified device.
CD ROM Drive	CD-ROM drive identified.
Entering SETUP ...	Starting BIOS Setup.
Failing Bits: <i>nnnn</i>	Hex number <i>nnnn</i> is a map of the bits at the RAM address that failed the memory test. Each 1 (one) in the map indicates a failed bit. See errors 230, 231, or 232 above for offset address of the failure in System, Extended, or Shadow memory.
Fixed Disk <i>n</i>	Fixed disk <i>n</i> (0–3) identified.
Invalid System Configuration Data	Problem with NVRAM (CMOS) data.
I/O device IRQ conflict	I/O device IRQ conflict error.
PS/2 Mouse Boot Summary Screen:	PS/2 mouse installed.
<i>nnnn</i> kB Extended RAM Passed	Where <i>nnnn</i> is the amount of RAM in kB successfully tested.
<i>nnnn</i> Cache SRAM Passed	Where <i>nnnn</i> is the amount of system cache in kB successfully tested.
<i>nnnn</i> kB Shadow RAM Passed	Where <i>nnnn</i> is the amount of shadow RAM in kB successfully tested.
<i>nnnn</i> kB System RAM Passed	Where <i>nnnn</i> is the amount of system RAM in kB successfully tested.
Operating system not found	Operating system cannot be located on drive A: or drive C:. Enter BIOS Setup and see if the hard disk and drive A: are properly identified.
Parity Check 1 <i>nnnn</i>	Parity error found in the system bus. BIOS attempts to locate the address and display it on the screen. If it cannot locate the address, it displays ?????. Parity is a method for checking errors in binary data. A parity error indicates that data has been corrupted.
Parity Check 2 <i>nnnn</i>	Parity error found in the I/O bus. BIOS attempts to locate the address and display it on the screen. If it cannot locate the address, it displays ????.
Press <F1> to resume, <F2> to Setup, <F3> for previous	Displayed after any recoverable error message. Press <F1> to start the boot process or <F2> to enter 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 copied to shadow RAM.

Message	Description
UMB upper limit segment address: <i>nnnn</i>	Displays the address <i>nnnn</i> of the upper limit of Upper Memory Blocks (UMB), indicating released segments of the BIOS that can be reclaimed by a virtual memory manager.
Video BIOS shadowed	Video BIOS copied to shadow RAM.

Sycard PCCtest 450/460 PC Card (Optional)

The PCCtest 450 and 460 cards (version 1.05) 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 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 software disk. (Software updates are available at the Sycard Technology web site.)
- Configuration headers (PC card/16-bit and CardBus/32-bit) that attach to the card.

You will also need a CardBus extender card (such as the Sycard PCCextend 70) to avoid wear on the Sycard PCMCIA connector.

Use the following tests to check the function of the notebook's PCMCIA slots. See the Sycard documentation for details about running the tests.

Table 3-5. Sycard PCCtest Commands

	PCMCIA PC card (16-bit) test (PC card configuration header)	CardBus (32-bit) test (CardBus configuration header)
Omnibook XT/VT6200 and XT6050 (PCI1410)	PCT450 -0 -v -b75	TESTCB -0 -v -b76(b)

Windows Management Instrumentation (WMI)

The Windows Management Instrumentation (WMI) is basically a set of rules for accessing information about a computer. 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 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 WMI Package

The WMI 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 WMI preloaded on the hard disk:

1. Start Windows, if it is not already running.
2. Click Start, Programs (or All Programs), HP Tootools, Setup.

Using WMI

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

- A README.TXT file: click Start, Programs, HP Tootools, Read me.
- A Windows online help file describing Hewlett-Packard's implementation of WMI (group and attribute definitions): click Start, Programs, HP Tootools, HP Tootools Help.

Uninstalling the WMI Package

1. Click Start, Programs (or All Programs), HP Tootools, Uninstall WMI.
2. Restart the notebook.

BIOS Setup Utility

The BIOS Setup utility provides access to the notebook's basic configuration settings. It is independent of the operating system.

Running the BIOS Setup Utility

1. Close all applications, then restart the notebook: click Start, Shut Down (Windows 2000) or Turn Off Computer (Windows XP), Restart. (If necessary, you can press Ctrl+Alt+Del to restart.)
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.

Note

The listings in the following table are for the initial XT/VT6200 BIOS release, and may differ somewhat for other models.

Table 3-6. BIOS Setup Menus and Parameters

Omnibook XT6050: Introduced with BIOS version EF.M1.00 (Spring 2002). Omnibook XT/VT6200: Introduced with BIOS version EG.M1.00 (Spring 2002).		
Main Menu	Description	Default
BIOS Revision	Shows the current HP BIOS version.	Detected automatically.
System Time	Sets the date using dd/mm/yy format (except English, which uses mm/dd/yy format). The value set in this field takes effect immediately.	
System Date	Sets the date using mm/dd/yy (English) or dd/mm/yy format. The value set in this field takes effect immediately.	
Internal Hard Disk	Sets the hard disk drive type, capacity, and other parameters.	Detected automatically.
Video Configuration		
Quiet Boot	When enabled, hides summary of power-on self test and messages during boot.	Enabled
Video Display Device	Sets whether the built-in display automatically switches to an external display, if one is detected.	Auto
Video Expansion	When enabled, the video image covers the entire display in lower-resolution modes. When disabled, the video image is centered in the display.	Disabled

Primary Video Adapter	Sets whether the computer automatically switches to an external video adapter connected to the docking system, if one is detected.	Auto
Television Type	Controls the signal format (NTSC or PAL) output by the S-video port.	NTSC
System Memory	Shows the system memory size.	640 KB
Extended Memory	Shows the extended memory size (equals total memory size minus 1 MB).	Detected automatically.
Unique Dock ID	Sets whether the computer creates a unique hardware profile for each dock (Enabled) or uses a common profile for all docks (Disabled).	Enabled
UUID	Displays the value of the 16-byte UUID (Universally Unique ID) as 32 hex characters.	Detected automatically.
MAC Address	Displays the internal LAN MAC address.	Detected automatically.
Serial Number	Displays the serial number as it appears on the back of the notebook.	Detected automatically.
Service ID	Displays the "Born On Date" stored in EEPROM in format YYYYDDD.	Detected automatically.
System Devices Menu	Description	Default
PS/2 Pointing Devices	Disables the internal pointing devices when an external PS/2 mouse is connected.	Auto
FDD Controller	Enables the floppy drive.	Enabled
Legacy USB Support	Enables BIOS support for USB mouse, keyboard, and floppy disk drive.	Enabled
Internal LAN	Enables the internal (wired) LAN.	Enabled
Mini PCI Slot 1	Enables the PCI slot normally used for a wireless LAN.	Enabled
Mini PCI Slot 2	Enables the PCI slot normally used for a modem, which is located under the cover on the bottom of unit. (Does not affect Ambit modem.)	Enabled
Serial port	Enables the serial port.	Enabled
Base I/O address	Sets the I/O address.	3F8h
Interrupt	Sets the interrupt.	IRQ4
Infrared port	Enables the infrared port.	Disabled
Mode	Sets the hardware to support FIR (Fast IR) or SIR (Standard IR) infrared communications.	FIR
Base I/O address	Sets the I/O address.	2F8h
Interrupt	Sets the interrupt.	IRQ3
DMA channel	Sets the DMA channel for Fast IR (FIR) mode.	DMA0
Parallel Port	Enables the parallel port.	Enabled
Mode	Sets the port to output only, bi-directional, EPP, or ECP.	ECP
Base I/O address	Sets the I/O address.	378h
Interrupt	Sets the interrupt.	IRQ7
DMA channel	Sets the DMA channel for ECP mode.	DMA3

Security Menu	Description	Default
User Password is	Shows if a user password is set.	Clear
Administrator Password is	Shows if an administrator password is set.	Clear
Set User Password	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
Smart Card Security	Enables Smart Card user validation instead of the password scheme. This field appears only if Smart Card Security has been enabled by HP Smart Card software in Windows.	Enabled
Password Required to		
Boot	Sets whether a user password is required when the computer boots. Requires the administrator password for changes.	Enabled
Internal hard disk drive lock	Encodes the current user password (or administrator password if that is the only password set) on the hard disk drive.	Disabled
Removable Device Boot	Sets whether the computer will attempt to boot from a floppy drive or other removable device.	Enabled
Power Menu	Description	Default
Backlight Control	When switching to battery power, sets whether the display brightness reverts to the previous battery-power brightness (Auto Restore) or to a very low brightness to save power (Auto Dim).	Auto Restore
Auto Suspend on Undock*	Sets whether the computer suspends to Standby power mode after undocking.	When Lid Closed
Auto Turn-On on Dock*	Sets whether the computer turns on after docking.	Enabled
Boot Menu	Description	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 provides diskless boot from a network server.	1. Hard Disk 2. Removable Device 3. CD-ROM/ DVD drive 4. Internal NIC
Exit Menu	Description	
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.	

Updating the Notebook's BIOS

Hewlett-Packard may from time to time provide updates to the notebook's BIOS. Use e-DiagTools for Windows to download and install these BIOS updates as needed—see “Using e-DiagTools for Windows” on page 2-29.

Caution

The BIOS update completely replaces the previous BIOS, so follow these directions exactly or you might damage the notebook. The BIOS update also resets the configurations in the BIOS Setup utility—except for BIOS passwords—so record these before performing the update.

Update the notebook's BIOS as follows:

1. In Windows, exit any programs that are running.
2. Undock the notebook if it is docked, and remove any PC cards from it.
3. Connect the AC adapter to the notebook.
4. Connect any cables or equipment needed to connect to the Internet.
5. Click Start, Programs (or All Programs), HP e-DiagTools, e-DiagTools for Windows.
6. Click Update, select Download New and click OK. Follow the instructions that appear. **Once the update process begins, do not interrupt it.**

The first time you make an Internet connection from this program on a particular unit, click Change Settings in the Connect window to define your connection settings.

7. When the process is completed, press the system-off switch to reset the system.

BIOS updates are also available from the HP Business Support web site (www.hp.com/go/bizsupport). Installation utilities and instructions for creating a BIOS floppy disk are provided with the updates.

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).

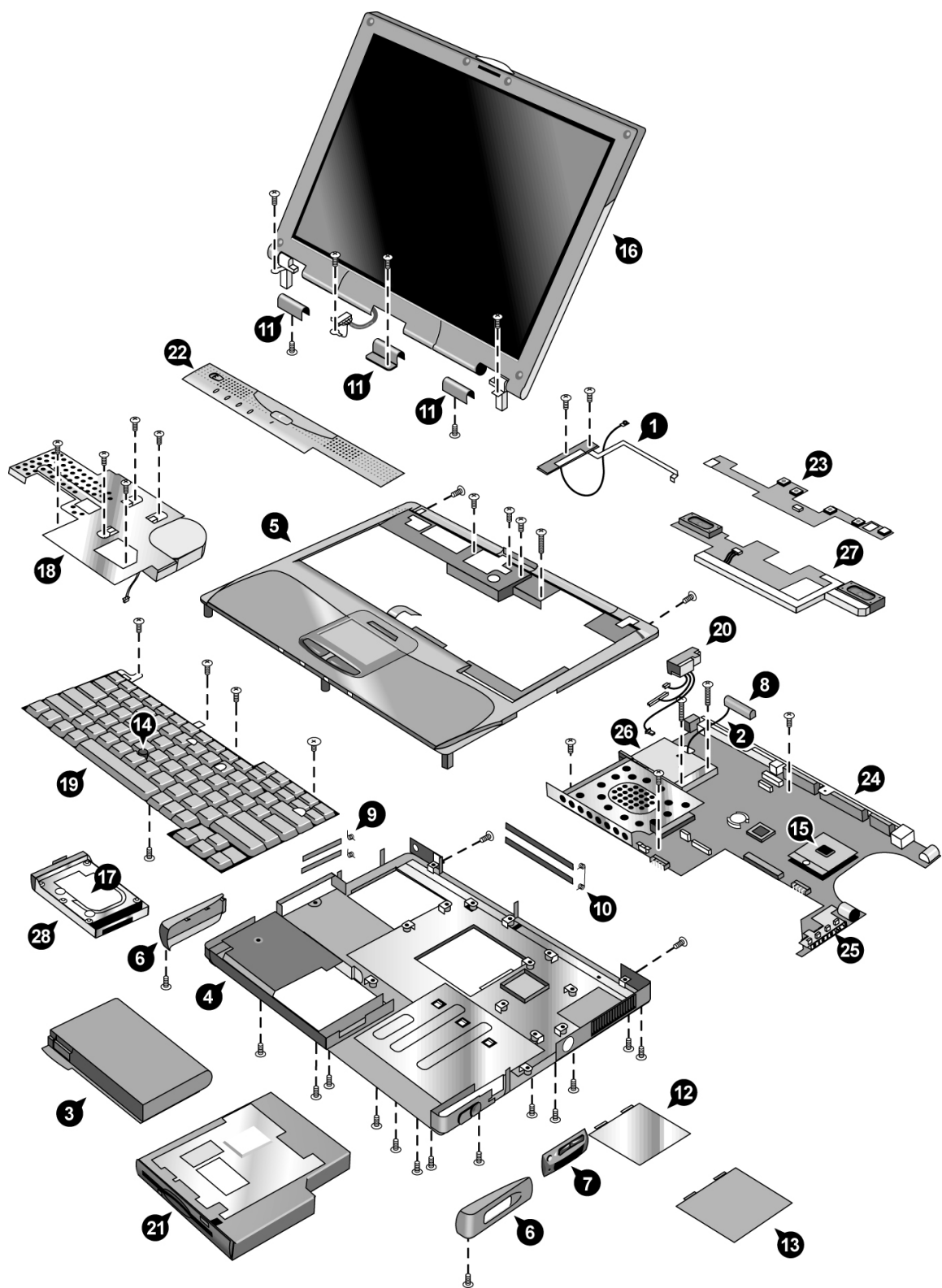


Figure 4-1. Exploded View

Table 4-1. Omnibook Replaceable Parts

	Description	Part Number	Exchange Part Number	Omnibook		User Repl.
				XT6200 VT6200	XT6050	
	Antennas, OB6100, kit	F3257-60952		•	•	
1	Front antenna PCA	(see above kit)		•	•	
2	Rear antenna PCA	(see above kit)		•	•	
3	Battery, main	F2019-60902		•	•	Yes
	Card, mini-PCI (hardware modem)	F4624-60906			•	Yes
	Card, mini-PCI (software modem)	F4506-60932		•	•	Yes
	Card, mini-PCI, 802.11b (worldwide)	F3257-60962		•	•	Yes
	Card, mini-PCI, 802.11b (France only)	F3257-60963		•	•	Yes
	Card, mini-PCI, 802.11b (Israel only)	F3257-60964		•	•	Yes
4	Case, bottom	F4506-60935			•	
4	Case, bottom	F4525-60908		•		
5	Case, top	F4506-60933			•	
5	Case, top	F4525-60906		•		
6	Covers, corner, OB6100, kit	F3257-60951		•	•	Yes
	Covers, service, kit	F4506-60901		•	•	
7	Panel, sound/IR	(see above kit)		•	•	
8	Cover, rear antenna	(see above kit)		•	•	
9	Doors, PCMCIA (with springs)	(see above kit)		•	•	
10	Doors, docking (with springs)	(see above kit)			•	
11	Cover, center display hinge	(see above kit)		•	•	
12	Cover, mini-PCI (no label)	F3257-60942		•	•	Yes
13	Cover, SDRAM (for Actiontech card)	F3257-60943			•	Yes
13	Cover, SDRAM (no label)	F3257-60944		•	•	Yes
14	Cover, Trackpoint (bag of 3, Raspberry Red)	5182-5138		•	•	Yes
15	CPU module, Celeron-T, 1.06 GHz, Tualatin uFCPGA	1822-0691	F3377-69201		•	
15	CPU module, Celeron-T, 1.13 GHz, Tualatin uFCPGA	1822-0692	F3377-69202		•	
15	CPU module, Pentium III, 933 MHz, Tualatin uPGA2	1822-0400	F3257-69004		•	
15	CPU module, Pentium III, 1.00 GHz, Tualatin uFCPGA	1822-0395	F3257-69005		•	
15	CPU module, Pentium III, 1.13 GHz, Tualatin uFCPGA	1822-0392	F3257-69006		•	
15	CPU module, Pentium 4, 1.4 GHz, Northwood uFCPGA	1822-0778	F3398-69204	•		
15	CPU module, Pentium 4, 1.5 GHz, Northwood uFCPGA	1822-0779	F3398-69203	•		
15	CPU module, Pentium 4, 1.6 GHz, Northwood uFCPGA	1822-0780	F3398-69202	•		
15	CPU module, Pentium 4, 1.7 GHz, Northwood uFCPGA	1822-0781	F3398-69201	•		
15	CPU module, Pentium 4, 1.8 GHz, Northwood uFCPGA	1822-0819	F3398-69205	•		
16	Display assembly, 14-in XGA, plastic	F4506-60934	F4506-69034		•	
16	Display assembly, 14-in XGA, plastic	F4525-60911	F4525-69011	•		
16	Display assembly, 14-in SXGA+, magnesium	F4525-60902	F4525-69002	•		
16	Display assembly, 14-in XGA, magnesium	F4525-60901	F4525-69001	•		
16	Display assembly, 15-in SXGA+	F4525-60903	F4525-69003	•		
16	Display assembly, 15-in UXGA	F4525-60904	F4525-69004	•		
17	Drive, hard disk (10 GB, 9.5mm, IBM [diablo], ATA100)	0950-4166	F3257-69100		•	Yes
17	Drive, hard disk (10 GB, 9.5mm, Toshiba, ATA100)	0950-4178	F3257-69101		•	Yes
17	Drive, hard disk (20 GB, 9.5mm, Toshiba, ATA100, FDB)	0950-4287	F3476-69002	•	•	Yes
17	Drive, hard disk (30 GB, 9.5mm, IBM [diablo], ATA100)	0950-4162	F2072-69115	•	•	Yes

	Description	Part Number	Exchange Part Number	Omnibook		User Repl.
				XT6200 VT6200	XT6050	
17	Drive, hard disk (30 GB, 9.5mm, TITAN Toshiba ATA100)	0950-4360	F3414-69501	•		Yes
17	Drive, hard disk (30 GB, 9.5mm, Toshiba, ATA100)	0950-4176	F3257-69103	•	•	Yes
17	Drive, hard disk (40 GB, 9.5mm, IBM ATA100, FDB)	0950-4320	F3428-69500	•		Yes
17	Drive, hard disk (40 GB, 9.5mm, Toshiba, ATA100)	0950-4288	F3378-69102	•		Yes
	Feet/bumpers, OB6100, kit	F3257-60950		•	•	Yes
18	Heatsink (with fan)	F3257-60930			•	
18	Heatsink (with fan)	F4525-60907		•		
19	Keyboard, Arab/English (with pointing stick)	F3257-60924		•		
19	Keyboard, Arab/English (without pointing stick)	F4506-60923		•	•	
19	Keyboard, Belgian (with pointing stick)	F3257-60902		•		
19	Keyboard, Belgian (without pointing stick)	F4506-60905		•	•	
19	Keyboard, Czech (with pointing stick)	F3257-60903		•		
19	Keyboard, Czech (without pointing stick)	F4506-60906		•	•	
19	Keyboard, Danish (with pointing stick)	F3257-60904		•		
19	Keyboard, Danish (without pointing stick)	F4506-60907		•	•	
19	Keyboard, French (with pointing stick)	F3257-60905		•		
19	Keyboard, French (without pointing stick)	F4506-60908		•	•	
19	Keyboard, French Canadian (with pointing stick)	F3257-60906		•		
19	Keyboard, French Canadian (without pointing stick)	F4506-60909		•	•	
19	Keyboard, German (with pointing stick)	F3257-60907		•		
19	Keyboard, German (without pointing stick)	F4506-60910		•	•	
19	Keyboard, Greek (with pointing stick)	F3257-60908		•		
19	Keyboard, Greek (without pointing stick)	F4506-60911		•	•	
19	Keyboard, Hebrew (with pointing stick)	F3257-60920		•		
19	Keyboard, Hebrew (without pointing stick)	F4506-60921		•	•	
19	Keyboard, Hungarian (with pointing stick)	F3257-60922		•		
19	Keyboard, Hungarian (without pointing stick)	F4506-60922		•	•	
19	Keyboard, Iceland (with pointing stick)	F3257-60921		•		
19	Keyboard, Iceland (without pointing stick)	F4506-60928		•	•	
19	Keyboard, International English (with pointing stick)	F3257-60909		•		
19	Keyboard, International English (without pointing stick)	F4506-60912		•	•	
19	Keyboard, Italian (with pointing stick)	F3257-60910		•		
19	Keyboard, Italian (without pointing stick)	F4506-60913		•	•	
19	Keyboard, Japanese (with pointing stick)	F3257-60911		•		
19	Keyboard, Japanese (without pointing stick)	F4506-60925		•	•	
19	Keyboard, Norwegian (with pointing stick)	F3257-60912		•		
19	Keyboard, Norwegian (without pointing stick)	F4506-60914		•	•	
19	Keyboard, Portuguese (with pointing stick)	F3257-60913		•		
19	Keyboard, Portuguese (without pointing stick)	F4506-60915		•	•	
19	Keyboard, Russian (with pointing stick)	F3257-60923		•		
19	Keyboard, Russian (without pointing stick)	F4506-60924		•	•	
19	Keyboard, Spanish (with pointing stick)	F3257-60914		•		
19	Keyboard, Spanish (without pointing stick)	F4506-60916		•	•	
19	Keyboard, Swedish/Finnish (with pointing stick)	F3257-60915		•		
19	Keyboard, Swedish/Finnish (without pointing stick)	F4506-60917		•	•	
19	Keyboard, Swiss (with pointing stick)	F3257-60916		•		

	Description	Part Number	Exchange Part Number	Omnibook		User Repl.
				XT6200 VT6200	XT6050	
19	Keyboard, Swiss (without pointing stick)	F4506-60918		•	•	
19	Keyboard, Traditional Chinese (with pointing stick)	F3257-60919		•		
19	Keyboard, Traditional Chinese (without pointing stick)	F4506-60926		•	•	
19	Keyboard, Turkish (with pointing stick)	F3257-60917		•		
19	Keyboard, Turkish (without pointing stick)	F4506-60919		•	•	
19	Keyboard, UK English (with pointing stick)	F3257-60918		•		
19	Keyboard, UK English (without pointing stick)	F4506-60920		•	•	
19	Keyboard, US English (with pointing stick)	F3257-60901		•		
19	Keyboard, US English (without pointing stick)	F4506-60904		•	•	
	Label, MS Windows W2K/NT POD COA	B23-02269			•	
20	Mini-PCI panels, OB6100, kit	F3257-60949		•	•	
	Panel, mini-PCI, LAN/modem	(see above kit)		•	•	
21	Module, floppy disk drive	F2013-60901		•	•	Yes
22	Panel, power button	F3257-60929			•	Yes
22	Panel, power button	F4525-60912		•		Yes
23	PCA, display interface	F4506-60929		•	•	
24	PCA, motherboard	F4506-60931	F4506-69031		•	
24	PCA, motherboard, 32 MB	F4525-60905	F4525-69005	•		
25	PCA, volume	F4506-60930		•	•	
	Screws, OB6000/6100/6050, kit	F4506-60902		•	•	Yes
	SDRAM module, 128 MB, DDR266B	F4694-60901		•		Yes
	SDRAM module, 128 MB, PC133, SODIMM (X16)	1818-8504			•	Yes
	SDRAM module, 256 MB, DDR266B	F4695-60901		•		Yes
	SDRAM module, 256 MB, PC133, SODIMM (X16)	1818-8635			•	Yes
	SDRAM module, 512 MB, DDR266B	F4696-60901		•		Yes
	SDRAM module, 512 MB, PC133, SODIMM (X8)	1818-8604	F2298-69001		•	Yes
26	Socket, PCMCIA (one slot)	F4506-60903		•	•	
27	Speaker assembly	F3257-60936		•	•	
	Tray, business card	F2072-60921		•	•	Yes
28	Tray, hard disk drive	F3257-60931		•	•	Yes

Table 4-2. Accessory Replaceable Parts

Description	Part Number	Exchange Part Number	Omnibook		User Repl.
			XT6200 VT6200	XT6050	
AC Adapter, Ultrastim Delta, 75W s/PFC	F4600-60901		•		Yes
Battery, main	F2019-60902		•	•	Yes
Battery, secondary module	F2014-60902		•		Yes
Cable, floppy disk drive (external)	F2008-60901		•	•	Yes
Charger, battery (external)	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, China #AB2 (2w)	8120-8373		•	•	Yes
Cord, power, Europe #ABB (2w)	8120-6314		•	•	Yes
Cord, power, India (2w)	8121-0702		•	•	Yes
Cord, power, Japan #ABJ (2w)	8120-6316		•	•	Yes
Cord, power, S. Africa #ACQ (2w)	8120-6317		•	•	Yes
Cord, power, S. Korea (2w)	8120-8441		•	•	Yes
Cord, power, U.S #ABA (2w)	8120-6313		•	•	Yes
Cord, power, UK (EPSR) for Hong Kong (2w)	8120-8699		•	•	Yes
Cover, Trackpoint (bag of 3, Raspberry Red)	5182-5138		•	•	Yes
Mini Dock (C) Version	F1452-60903		•	•	Yes
Module, floppy disk drive	F2013-60901		•	•	Yes
Module, DVD drive	F2015-60903		•	•	Yes
Module, CD-ROM drive	F2017-60901		•	•	Yes
Module, LS-240 Super Disk drive	F2022-60902		•	•	Yes
Module, CDRW drive	F2026-60902	F2026-69002	•	•	Yes
Module, DVD/CDRW Combo drive	F2107-60901		•	•	Yes
Module, 2nd hard disk drive holder	F2072-60910		•	•	Yes
Module, weight saving	F2072-60922		•	•	Yes
Module, Zip drive	F2009-60902		•	•	Yes
Monitor stand (short)	F1453-60901		•	•	Yes
Port Replicator (C) Version	F1451-60903		•	•	Yes
SDRAM module, 128 MB, DDR266B	F4694-60901		•		Yes
SDRAM module, 128 MB, PC133, SODIMM (X16)	1818-8504			•	Yes
SDRAM module, 256 MB, DDR266B	F4695-60901		•		Yes
SDRAM module, 256 MB, PC133, SODIMM (X16)	1818-8635			•	Yes
SDRAM module, 512 MB, DDR266B	F4696-60901		•		Yes
SDRAM module, 512 MB, PC133, SODIMM (X8)	1818-8604	F2298-69001		•	Yes
Tray, docking F	F2012-60903		•	•	Yes

Table 4-3. Part Number Reference

Part Number	Exchange Part Number	Description	Omnibook		User-Repl.
			XT6200 VT6200	XT6050	
0950-4162	F2072-69115	Drive, hard disk (30 GB, 9.5mm, IBM [diablo], ATA100)	•	•	Yes
0950-4166	F3257-69100	Drive, hard disk (10 GB, 9.5mm, IBM [diablo], ATA100)		•	Yes
0950-4176	F3257-69103	Drive, hard disk (30 GB, 9.5mm, Toshiba, ATA100)	•	•	Yes
0950-4178	F3257-69101	Drive, hard disk (10 GB, 9.5mm, Toshiba, ATA100)		•	Yes
0950-4287	F3476-69002	Drive, hard disk (20 GB, 9.5mm, Toshiba, ATA100, FDB)	•	•	Yes
0950-4288	F3378-69102	Drive, hard disk (40 GB, 9.5mm, Toshiba, ATA100)	•		Yes
0950-4320	F3428-69500	Drive, hard disk (40 GB, 9.5mm, IBM ATA100, FDB)	•		Yes
0950-4360	F3414-69501	Drive, hard disk (30 GB, 9.5mm, TITAN Toshiba ATA100)	•		Yes
1818-8504		SDRAM module, 128 MB, PC133, SODIMM (X16)		•	Yes
1818-8604	F2298-69001	SDRAM module, 512 MB, PC133, SODIMM (X8)		•	Yes
1818-8635		SDRAM module, 256 MB, PC133, SODIMM (X16)		•	Yes
1822-0392	F3257-69006	CPU module, Pentium III, 1.13 GHz, Tualatin uFCPGA		•	
1822-0395	F3257-69005	CPU module, Pentium III, 1.00 GHz, Tualatin uFCPGA		•	
1822-0400	F3257-69004	CPU module, Pentium III, 933 MHz, Tualatin uPGA2		•	
1822-0691	F3377-69201	CPU module, Celeron-T, 1.06 GHz, Tualatin uFCPGA		•	
1822-0692	F3377-69202	CPU module, Celeron-T, 1.13 GHz, Tualatin uFCPGA		•	
1822-0778	F3398-69204	CPU module, Pentium 4, 1.4 GHz, Northwood uFCPGA	•		
1822-0779	F3398-69203	CPU module, Pentium 4, 1.5 GHz, Northwood uFCPGA	•		
1822-0780	F3398-69202	CPU module, Pentium 4, 1.6 GHz, Northwood uFCPGA	•		
1822-0781	F3398-69201	CPU module, Pentium 4, 1.7 GHz, Northwood uFCPGA	•		
1822-0819	F3398-69205	CPU module, Pentium 4, 1.8 GHz, Northwood uFCPGA	•		
5182-5138		Cover, Trackpoint, (bag of 3, Raspberry Red)	•	•	Yes
7121-7525		Overlay, serial label	•		
8120-6312		Cord, power, Australia #ABG (2w)	•	•	Yes
8120-6313		Cord, power, U.S #ABA (2w)	•	•	Yes
8120-6314		Cord, power, Europe #ABB (2w)	•	•	Yes
8120-6316		Cord, power, Japan #ABJ (2w)	•	•	Yes
8120-6317		Cord, power, S. Africa #ACQ (2w)	•	•	Yes
8120-8367		Cord, power, Argentina (2w)	•	•	Yes
8120-8373		Cord, power, China #AB2 (2w)	•	•	Yes
8120-8441		Cord, power, S. Korea (2w)	•	•	Yes
8120-8452		Cord, power, Chile (2w)	•	•	Yes
8120-8699		Cord, power, UK (EPSR) for Hong Kong (2w)	•	•	Yes
8121-0702		Cord, power, India (2w)	•	•	Yes
B23-02269		Label, MS Windows W2K/NT POD COA		•	
F1451-60903		Port Replicator (C) Version	•	•	Yes
F1452-60903		Mini Dock (C) Version	•	•	Yes
F1453-60901		Monitor stand (short)	•	•	Yes
F2008-60901		Cable, floppy disk drive (external)	•	•	Yes
F2009-60902		Module, Zip drive	•	•	Yes
F2011-60901		Charger, battery (external)	•	•	Yes
F2012-60903		Tray, docking F	•	•	Yes
F2013-60901		Module, floppy disk drive	•	•	Yes
F2014-60902		Battery, secondary module	•	•	Yes

Part Number	Exchange Part Number	Description	Omnibook		User-Repl.
			XT6200 VT6200	XT6050	
F2015-12003		CD/DVD software (InterVideo ver. v31b53.8)	•	•	Yes
F2015-60903		Module, DVD drive	•	•	Yes
F2017-60901		Module, CD-ROM drive	•	•	Yes
F2019-60902		Battery, main	•	•	Yes
F2022-60902		Module, LS-240 drive Super Disk	•	•	Yes
F2026-12004		CDRW software (Veritas v31b100B47b)	•	•	Yes
F2026-60902	F2026-69002	Module, CDRW drive	•	•	Yes
F2072-60910		Module, 2nd hard disk drive holder	•	•	Yes
F2072-60921		Tray, business card	•	•	Yes
F2072-60922		Module, weight saving	•	•	Yes
F2107-60901		Module, DVD/CDRW Combo drive	•	•	Yes
F3257-60901		Keyboard, US English (with pointing stick)	•		
F3257-60902		Keyboard, Belgian (with pointing stick)	•		
F3257-60903		Keyboard, Czech (with pointing stick)	•		
F3257-60904		Keyboard, Danish (with pointing stick)	•		
F3257-60905		Keyboard, French (with pointing stick)	•		
F3257-60906		Keyboard, French Canadian (with pointing stick)	•		
F3257-60907		Keyboard, German (with pointing stick)	•		
F3257-60908		Keyboard, Greek (with pointing stick)	•		
F3257-60909		Keyboard, International English (with pointing stick)	•		
F3257-60910		Keyboard, Italian (with pointing stick)	•		
F3257-60911		Keyboard, Japanese (with pointing stick)	•		
F3257-60912		Keyboard, Norwegian (with pointing stick)	•		
F3257-60913		Keyboard, Portuguese (with pointing stick)	•		
F3257-60914		Keyboard, Spanish (with pointing stick)	•		
F3257-60915		Keyboard, Swedish/Finnish (with pointing stick)	•		
F3257-60916		Keyboard, Swiss (with pointing stick)	•		
F3257-60917		Keyboard, Turkish (with pointing stick)	•		
F3257-60918		Keyboard, UK English (with pointing stick)	•		
F3257-60919		Keyboard, Traditional Chinese (with pointing stick)	•		
F3257-60920		Keyboard, Hebrew (with pointing stick)	•		
F3257-60921		Keyboard, Iceland (with pointing stick)	•		
F3257-60922		Keyboard, Hungarian (with pointing stick)	•		
F3257-60923		Keyboard, Russian (with pointing stick)	•		
F3257-60924		Keyboard, Arab/English (with pointing stick)	•		
F3257-60929		Panel, power button		•	Yes
F3257-60930		Heatsink (with fan)		•	
F3257-60931		Tray, hard disk drive	•	•	Yes
F3257-60936		Speaker assembly	•	•	
F3257-60942		Cover, mini-PCI (no label)	•	•	Yes
F3257-60943		Cover, SDRAM (for Actiontech card)		•	Yes
F3257-60944		Cover, SDRAM (no label)	•	•	Yes
F3257-60949		Mini-PCI panels, OB6100, kit	•	•	
F3257-60950		Feet/bumpers, OB6100, kit	•	•	Yes
F3257-60951		Covers, corner, OB6100, kit	•	•	Yes
F3257-60952		Antennas, OB6100, kit	•	•	
F3257-60962		Card, mini-PCI, 802.11b (worldwide)	•	•	Yes

Part Number	Exchange Part Number	Description	Omnibook		User-Repl.
			XT6200 VT6200	XT6050	
F3257-60963		Card, mini-PCI, 802.11b (France only)	•	•	Yes
F3257-60964		Card, mini-PCI, 802.11b (Israel only)	•	•	Yes
F4506-12001		Recovery CD, W2K, North American English		•	
F4506-12002		Recovery CD, W2K, International English		•	
F4506-12003		Recovery CD, W2K, French		•	
F4506-12004		Recovery CD, W2K, Italian		•	
F4506-12005		Recovery CD, W2K, German		•	
F4506-12006		Recovery CD, W2K, Spanish		•	
F4506-12007		Recovery CD, W2K, Swedish		•	
F4506-12008		Recovery CD, W2K, Traditional Chinese (Hong Kong)		•	
F4506-12009		Recovery CD, W2K, Simplified Chinese		•	
F4506-12010		Recovery CD, W2K, Traditional Chinese (Taiwan)		•	
F4506-12011		Recovery CD, W2K, NA ENG		•	
F4506-12012		Recovery CD, W2K, INTL ENG		•	
F4506-12013		Recovery CD, W2K, French		•	
F4506-12014		Recovery CD, W2K, Italian		•	
F4506-12015		Recovery CD, W2K, German		•	
F4506-12016		Recovery CD, W2K, Spanish		•	
F4506-12017		Recovery CD, W2K, Swedish		•	
F4506-12018		Recovery CD, W2K, Traditional Chinese (Hong Kong)		•	
F4506-12019		Recovery CD, W2K, Simplified Chinese		•	
F4506-12020		Recovery CD, W2K, Traditional Chinese (Taiwan)		•	
F4506-12021		Recovery CD, W2K, Japanese		•	
F4506-12022		Recovery CD, XP Pro, Japanese		•	
F4506-12023		Recovery CD, W2K, Czech		•	
F4506-12024		Recovery CD, W2K, Danish		•	
F4506-12025		Recovery CD, W2K, Dutch		•	
F4506-12026		Recovery CD, W2K, Finnish		•	
F4506-12027		Recovery CD, W2K, Norwegian		•	
F4506-12028		Recovery CD, XP Pro, Czech		•	
F4506-12029		Recovery CD, XP Pro, Danish		•	
F4506-12030		Recovery CD, XP Pro, Dutch		•	
F4506-12031		Recovery CD, XP Pro, Finnish		•	
F4506-12032		Recovery CD, XP Pro, Norwegian		•	
F4506-12033		Recovery CD, XP Home, International English		•	
F4506-12034		Recovery CD, XP Home, North American English		•	
F4506-12035		Recovery CD, XP Home, German		•	
F4506-12036		Recovery CD, XP Home, Dutch/English		•	
F4506-12037		Recovery CD, XP Home, Swedish/English		•	
F4506-12039		Recovery CD, XP Home, Danish/English		•	
F4506-12040		Recovery CD, XP Home, Finnish/English		•	
F4506-12041		Recovery CD, XP Home, Norwegian/English		•	
F4506-12042		Recovery CD, XP Home, Traditional Chinese (Taiwan)		•	
F4506-12046		Recovery CD, XP Home, French		•	
F4506-12047		Recovery CD, XP Home, Japanese		•	
F4506-12048		Recovery CD, XP Home, Spanish		•	
F4506-12049		Recovery CD, XP Home, Italian		•	

Part Number	Exchange Part Number	Description	Omnibook		User-Repl.
			XT6200 VT6200	XT6050	
F4506-12050		Recovery CD, XP Home, Czech		•	
F4506-12055		Recovery CD, XP Home, German/French		•	
F4506-12057		Recovery CD, W2K, North American English		•	
F4506-12058		Recovery CD, W2K, International English		•	
F4506-12061		Recovery CD, XP Pro, Hebrew/English		•	
F4506-12062		Recovery CD, XP Pro, Arabic		•	
F4506-12063		Recovery CD, XP Pro, Hungarian		•	
F4506-12064		Recovery CD, XP Pro, Russian		•	
F4506-12065		Recovery CD, XP Pro, Polish		•	
F4506-12066		Recovery CD, XP Pro, Turkish		•	
F4506-12067		Recovery CD, XP Pro, Greek/English		•	
F4506-60901		Covers, service, kit	•	•	
F4506-60902		Screws, OB6000/6100/6050, kit	•	•	Yes
F4506-60903		Socket, PCMCIA (one slot)	•	•	
F4506-60904		Keyboard, US English (without pointing stick)	•	•	
F4506-60905		Keyboard, Belgian (without pointing stick)	•	•	
F4506-60906		Keyboard, Czech (without pointing stick)	•	•	
F4506-60907		Keyboard, Danish (without pointing stick)	•	•	
F4506-60908		Keyboard, French (without pointing stick)	•	•	
F4506-60909		Keyboard, French Canadian (without pointing stick)	•	•	
F4506-60910		Keyboard, German (without pointing stick)	•	•	
F4506-60911		Keyboard, Greek (without pointing stick)	•	•	
F4506-60912		Keyboard, International English (without pointing stick)	•	•	
F4506-60913		Keyboard, Italian (without pointing stick)	•	•	
F4506-60914		Keyboard, Norwegian (without pointing stick)	•	•	
F4506-60915		Keyboard, Portuguese (without pointing stick)	•	•	
F4506-60916		Keyboard, Spanish (without pointing stick)	•	•	
F4506-60917		Keyboard, Swedish/Finnish (without pointing stick)	•	•	
F4506-60918		Keyboard, Swiss (without pointing stick)	•	•	
F4506-60919		Keyboard, Turkish (without pointing stick)	•	•	
F4506-60920		Keyboard, UK English (without pointing stick)	•	•	
F4506-60921		Keyboard, Hebrew (without pointing stick)	•	•	
F4506-60922		Keyboard, Hungarian (without pointing stick)	•	•	
F4506-60923		Keyboard, Arab/English (without pointing stick)	•	•	
F4506-60924		Keyboard, Russian (without pointing stick)	•	•	
F4506-60925		Keyboard, Japanese (without pointing stick)	•	•	
F4506-60926		Keyboard, Traditional Chinese (without pointing stick)	•	•	
F4506-60928		Keyboard, Iceland (without pointing stick)	•	•	
F4506-60929		PCA, display interface	•	•	
F4506-60930		PCA, volume	•	•	
F4506-60931	F4506-69031	PCA, motherboard		•	
F4506-60932		Card, mini-PCI (software modem)	•	•	Yes
F4506-60933		Case, top		•	
F4506-60934	F4506-69034	Display assembly, 14-in XGA, plastic		•	
F4506-60935		Case, bottom		•	
F4525-60901	F4525-69001	Display assembly, 14-in XGA, magnesium	•		
F4525-60902	F4525-69002	Display assembly, 14-in SXGA+, magnesium	•		

Part Number	Exchange Part Number	Description	Omnibook		User-Repl.
			XT6200 VT6200	XT6050	
F4525-60903	F4525-69003	Display assembly, 15-in SXGA+	•		
F4525-60904	F4525-69004	Display assembly, 15-in UXGA	•		
F4525-60905	F4525-69005	PCA, motherboard, 32 MB	•		
F4525-60906		Case, top	•		
F4525-60907		Heatsink (with fan)	•		
F4525-60908		Case, bottom	•		
F4525-60911	F4525-69011	Display assembly, 14-in XGA, plastic	•		
F4525-60912		Panel, power button	•		Yes
F4525-60999		CD, OB6200 Training OB6050	•	•	
F4600-60901		AC Adapter, Ultralim Delta, 75W s/PFC	•		Yes
F4624-60906		Card, mini-PCI (hardware modem)		•	Yes
F4694-60901		SDRAM module, 128 MB, DDR266B	•		Yes
F4695-60901		SDRAM module, 256 MB, DDR266B	•		Yes
F4696-60901		SDRAM module, 512 MB, DDR266B	•		Yes

Reference Information

This chapter includes the following reference information:

- Password removal policy.
- Display quality statement.

Password Removal Policy

If the user forgets the system password, the user calls Technical Support to determine the proper removal procedure. The user must provide proof of ownership, and the Omnibook must be operated during the procedure.

The password removal procedure is protected as HP Company Private information. There are a restricted number of locations that can perform password removal. It may not be disclosed or distributed outside those locations.

Password removal is strictly controlled. Hewlett-Packard and authorized support providers must ensure with written evidence that the Omnibook being “cleansed” is actually in the possession of the unit’s actual and current owner. This requires a sales receipt showing the unit serial number and owner’s name, or a written statement from the owner attesting that he or she is the owner of the unit. The statement can be a fax copy of the document. The fact that the unit is in the hands of an HP representative on behalf of the customer is not evidence of ownership. In addition, HP will not remove the password of a unit for any non-owner, even if it is requested by law enforcement agencies. If you receive such a request, you should notify management and HP Corporate Legal immediately. (These requests may require a court order prior to our participation.)

Further, the entity removing the password must log the name, serial number and date of the removal, and file the written backup with the log. The log and backup are subject to standard record retention process and review.

The final issue relating to removal of passwords is that HP cannot provide information to users that would assist them in improperly removing a password and opening a unit.

Hewlett-Packard Display Quality Statement

TFT display manufacturing is a highly precise but imperfect technology, and manufacturers cannot produce large displays that are cosmetically perfect. Most, if not all, TFT displays exhibit some level of cosmetic imperfection. These cosmetic imperfections may be visible to the customer under varying display conditions, and can appear as bright, dim, or dark spots. *This issue is common across all vendors supplying TFT displays in their products and is not specific to the HP Omnibook display.*

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

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

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

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

2. Use the table below to determine whether the display should be considered for replacement. These are the only conditions in this guideline that may call for a replacement due to a defect in material or workmanship based on the HP Limited Warranty Statement.
3. If a display is considered for replacement, make sure the customer understands that cosmetic variations may also exist on the replacement display, and may require the customer to use a work-around to obscure the cosmetic imperfection.
4. Customers with cosmetic-based complaints that do not conform to the above conditions and tests will not normally be considered for display replacement. The HP-responsible person working with the customer should identify work-arounds that are reasonable and appropriate for the individual customer. Customers who must have a more perfect display solution should consider switching to an Omnibook with a DSTN display.

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

Table 5-1. Omnibook XT6050 and XT/VT6200 LCD Guidelines

Type of Imperfection	Imperfections Not Allowed
Electrical Imperfections: Bright dots (a) Dark dots (a)	• 7 or more single bright dots. • 7 or more single dark dots. • 9 or more total (bright and dark combined) defective dots. • Any occurrence of multiple defective dots within 15 mm.
Mechanical Imperfections: Discoloration Polarizer bubbles, dents (b)	• Any polarizer bubble, discoloration, or dent that is visible from at least 36 cm (14 in).
Definitions of imperfections: a Bright or dark dot: a subpixel (red, green, or blue dot) that is stuck on or off. b Polarizer dent or bubble: a light spot with a darker border that appears on a lighted display and does not change size. (In contrast, a polarizer scratch is a light line that is visible on a darker background and does not change size.)	

Service Notes

Service notes containing important repair information for Technology Codes EF, EG will be issued as needed. These notes are available online at the Partnership web site—see page vi.

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