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HP OmniBook 4100/4150

Service Manual

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Contents

Figures

Tables

Introduction

This service manual provides reference information for the HP OmniBook 4100/4150. It is intended to be used by HP-authorized service personnel in the installation, servicing, and repair of these products.

The manual is designed as a self-paced guide. It is intended to train you to install, configure, and repair OmniBook computers. You can follow this manual without having equipment available.

The following table lists additional places where you can get supplementary information about OmniBook products.

Sources of OmniBook Information

Source	Address or Number	Comments
HP External Web	http://www.hp.com/omnibook (http://www.europe.hp.com/omnibook, European mirror)	No usage restriction.
HP US Reseller Web	http://partner.americas.hp.com	Restricted to Authorized Resellers only.
HP Asia Pacific Channel Support Centre for DPSP Partners	http://www.hp.com.au	Restricted to DPSP Partners only.
America Online	Keyword: HP	Call (800) 827-6364 for membership within the US.
CompuServe	GO HP	Call (800) 524-3388 for membership within the US.
HP Bulletin Board Service		Refer to the latest Product Support Plan for non-US BBS numbers.
HP Support Assist CD-ROM	(800) 457-1762	US and Canada.
	(801) 431-1587	Outside US and Canada.
Microsoft Web	http://www.microsoft.com	Information and updates for Windows operating systems.

1

Product Information

The HP OmniBook 4100/4150 provides desktop performance and expandability as well as convenient portability. It uses high-performance component technologies that make it capable of replacing a desktop computer or serving as a portable multimedia presentation tool.

Table 1-1. Product Comparisons

	OmniBook 7100/7150	OmniBook 4100/4150	OmniBook 2100/3100	OmniBook 900
Processor *	Intel Pentium II (300 or 266 MHz).	Pentium II (233 to 400 MHz), or Pentium (266 MHz).	Pentium II (300, 266, or 233 MHz), or Pentium (266, 233, or 200 MHz).	Intel Pentium II (366 or 300(PE) MHz).
Memory	64 MB RAM in system slot or 32 MB RAM on motherboard. Expandable to 320 or 288 MB.	128 or 64 MB RAM in slot or 32 MB RAM on motherboard. Expandable to 256 or 160 MB.	32 MB RAM on motherboard. Expandable to 160, 192, or 288 MB.	32 MB RAM on motherboard. Expandable to 160 MB.
Display	14.1-inch TFT XGA display.	14.1- or 13.3-inch TFT XGA display.	13.3-inch TFT XGA display, or 12.1-inch TFT or DSTN SVGA display.	12.1-inch TFT SVGA display.
Video	AGP or PCI local bus video. 64-bit graphics controller with 4 MB external video RAM, 3Dgraphics acceleration. Up to 16M colors (XGA). Zoomed Video enabled.	AGP or PCI local bus video. 256- or 128-bit graphics controller with 8, 4, 2.5 or 2 MB internal video RAM. Up to 16M or 64K colors (XGA). Zoomed Video enabled.	PCI local bus video. 128-bit graphics controller with 2 MB internal video RAM. Up to 64K colors (XGA), 16M colors (SVGA). Zoomed Video enabled.	AGP video. 256-bit graphics controller with 2.5 MB internal video RAM. Up to 16M colors (XGA). Zoomed Video enabled.
Operating System	Windows 95, Windows 98, or Windows NT 4.0 preinstalled.	Windows 95, Windows 98, or Windows NT 4.0 preinstalled.	Windows 95, Windows 98, or Windows NT 4.0 preinstalled.	Windows 95, Windows 98, or Windows NT 4.0 preinstalled.
Desktop Management Interface	DMI 2.0. HP TopTools 2.6 or 3.0.	DMI 2.0. HP TopTools 2.6 to 4.5.	DMI 2.0. HP TopTools 2.6 or 3.0.	DMI 2.0. HP TopTools 3.0.
Power Management	APM 1.2. ACPI compliant.	APM 1.2. ACPI compliant.	APM 1.2. ACPI compliant.	APM 1.2. ACPI compliant.
Power States	On, Standby, Suspend, Hibernate, Off.	On, Standby, Suspend, Hibernate, Off.	On, Standby, Suspend, Hibernate, Off.	On, Standby, Suspend, Hibernate, Off.
* Intel Mobile Pentium processor.				

Table 1-2. OmniBook 4100/4150 Series Models

OmniBook Product *	CPU **	Display	Hard Drive	Floppy Drive	CD-ROM Drive	Standard RAM
OmniBook 4100						
F1462*x*	Pentium II 233 MHz	13.3-inch XGA TFT	4 GB (F1467A)	1.44 MB (F1472A)	CD-ROM (F1474A)	32 MB
F1463*x***	Pentium 266 MHz	14.1-inch XGA TFT				
F1464*x*	Pentium II 266 MHz		6 GB (F1475A)			
F1479*x*			4 GB (F1467A)			
F1703*x*		13.3-inch XGA TFT				
OmniBook 4150 Series						
F1629*x*	Pentium II 300 MHz	14.1-inch XGA TFT	6 GB (F1475A)	1.44 MB (F1472A)	CD-ROM (F1474A)	64 MB (F1457A)
F1640*x*	Pentium II 333 MHz					
F1641*x*	Pentium II 366 MHz					
F1642*x*			10 GB (F1744A)		DVD Drive (F1653A)	128 MB (F1622A)
F1647*x*	Pentium II 300 MHz		4.8 GB (none)		CD-ROM (F1474A)	64 MB (F1457A)
F1648*x*	Pentium II 400 MHz		10 GB (F1744A)		DVD Drive (F1653A)	
F1658*x*[B]	Pentium II 366 MHz	13.3-inch XGA TFT	4.8 GB (none)		CD-ROM (F1474A)	64 MB (F1457B)
F1660*x*[B]	Pentium II 400 MHz	14.1-inch XGA TFT	6 GB (F1475A)			
F1663*x*	Pentium II 366 MHz		4.8 GB (none)			64 MB (F1457A)

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

*   For the products listed:
     "*x*" suffix means
        "N", "NT", "NV", "NG" for Windows NT 4.0 installed (marketing distinction only), or
        "W", "WT", "WV", "WG", "WR" for Windows 95 or Windows 95/98 installed (marketing distinction only).

**   Intel Mobile Pentium or Pentium II processor.

***   Available only with Spring '98 software—other OmniBook 4100 products rolled to Fall '98 software. All OmniBook 4150 products were released with Fall '98 software or later.

[B]   The OmniBook 4150 Series has two classes of products with different internal designs, different software drivers, and different BIOSes. Models marked with [B] have "4150 B" after the serial number and are called 4150B in this manual—other OmniBook 4150 models listed in this table are called 4150† in this manual, and they have no marking after the serial number.

Features and Operation

The following three illustrations point out the main external features of the computer. They are followed by highlights of the computer's operation. For an internal, exploded view, see page 4-2.
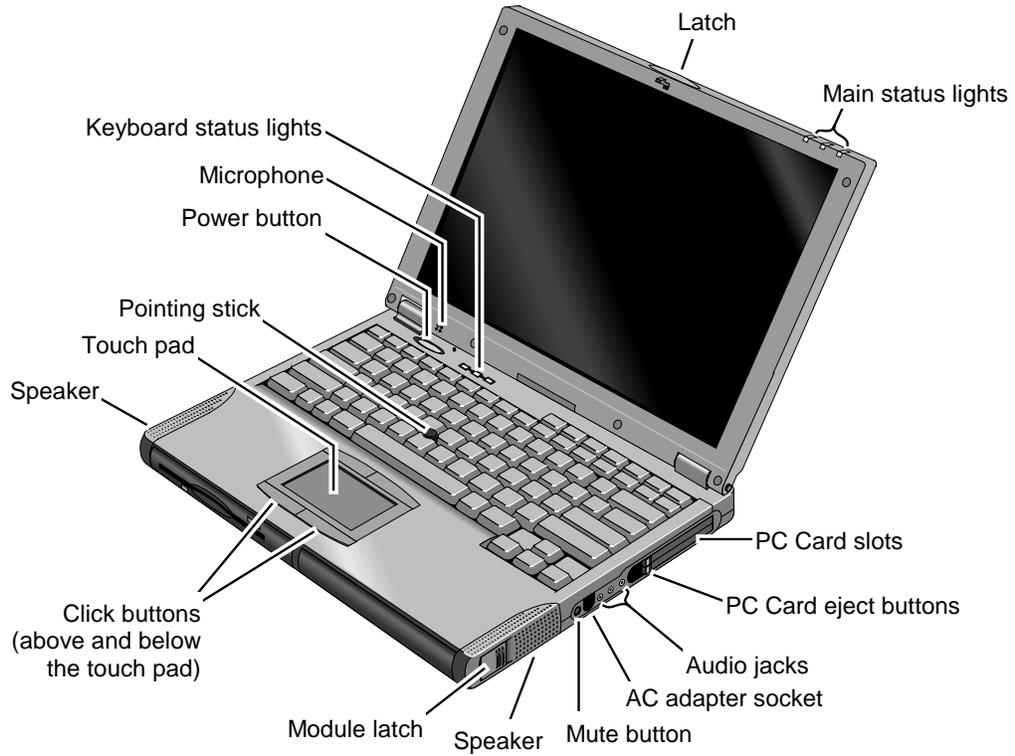
Figure 1-1. OmniBook - Front View
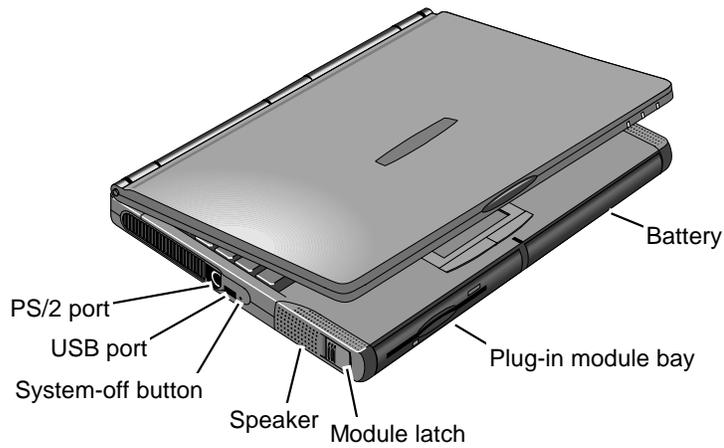
Figure 1-2. OmniBook - Side View

Infrared
port

Kensington   Parallel   Serial   VGA   Docking
lock slot   port   port   out   port
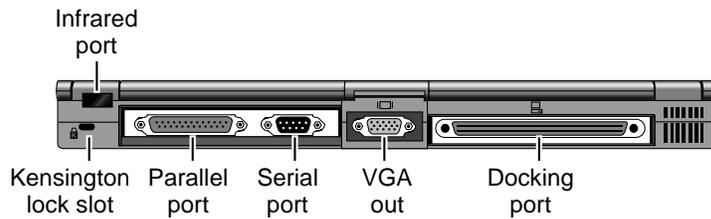
Figure 1-3. OmniBook - Rear View

Turning the OmniBook On and Off

- **On.** Press the blue power button to turn on the OmniBook.

- **Standby.** The display turns off automatically if the computer is inactive for about 2 minutes.

- **Suspend.** Click Start, Suspend (Windows 95) or press the blue power button briefly (about 1 second) to suspend activity when the OmniBook is on. When you turn on the computer, it resumes your previous work session.

  Closing the lid (for more than 2 seconds) also suspends the computer.

- **Hibernate.** Press Fn+F12. This is like Off, except that your current work session is first saved to disk. When you turn on the computer, it reboots and restores your previous session.

- **Off**. Click Start, Shut Down. If the OmniBook does not respond, press and hold the blue power button until the display shuts down. When you turn on the computer, it reboots. Unsaved data is lost.

Table 1-3. Activating Power Modes

Power Mode	To Enter Mode	To Turn Back On
Standby Reduced-power/stopped state. Display is off. Everything is in a reduced-power state. Network devices are maintained. Your current work session continues at turn-on (any key or pointer action).	Press Fn+S (not Windows 98) –or– allow time-out.	Press any key or move a pointing device to display the current session ("Instant-On").
Suspend Low-power/stopped state. Lower power state than Standby. Everything is off or in a low-power state. Network devices are off. Your previous work session resumes at turn-on. For plug-and-play operating systems, network connections resume at turn-on.	Press blue power button for about 1 second –or– click Start, Shut Down, Standby (Windows 98) –or– click Start, Suspend (Windows 95) –or– allow time-out.	Press blue power button to display the current session ("Instant-On").
Hibernate No-power/stopped state. Session is saved on the hard disk. Everything is shut down. Computer reboots at turn-on and restores previous session and network connections (if plug-and-play).	Press Fn+F12 –or– allow time-out.	Press blue power button to restart and restore the previous session.
Off No-power/stopped state. Everything is shut down (battery continues charging if ac adapter is connected). Computer reboots at turn-on and restores network connections.	Click Start, Shut Down –or– Press and hold the blue power button until the display shuts down.	Press blue power button to restart with a new session.

Checking the Status of the OmniBook

The main OmniBook status lights, located at the front-right edge of the display bezel at the top of the display, indicate power status and drive activity. (These lights are on the LED strip cable.)

Table 1-4. Main Status Lights (LED Strip Cable)

⏻ 🗄 ⚡	Meaning
▉ ▢ ▢	**Power mode** Steady green light: OmniBook is running (On mode). Steady orange light: OmniBook is suspended (Suspend or Standby mode). No light: OmniBook is off (Off or Hibernate mode). Green and orange lights: OmniBook failed when resuming.
▢ ▉ ▢	**Drive access** Green light: OmniBook is accessing the hard disk drive, floppy disk drive, or a drive in the plug-in module bay. For the OmniBook 4100, it also indicates PC Card activity.
▢ ▢ ▉	**Charging** Steady green light: AC adapter is connected, battery is full or stopped charging. Blinking green light: AC adapter is connected, battery is charging. No light: AC adapter is not connected or battery is not present.

The keyboard status lights, located above the keyboard, indicate the states of the keyboard locks. (These lights are on the VGA PCA for the OmniBook 4100, and on the motherboard for the OmniBook 4150 Series.)

Table 1-5. Keyboard Status Lights (VGA PCA or Motherboard)

A🔒 ⠿🔒 1🔒	Meaning
▉ ▢ ▢	**Caps Lock** Caps Lock is active.
▢ ▉ ▢	**Keypad Lock** The embedded keypad is active (Fn+F8 or Fn held down). Num Lock must also be on for the numeric keys—otherwise, cursor control is active.
▢ ▢ ▉	**Num Lock** Num Lock is active.

In addition, the battery module has five lights that indicate its charge level. To view the lights, you have to remove the battery and press the pad on the back next to the connector. The number of lights that turn on indicates the charge.

Using Fn Hot Keys

The Fn key combined with another key is a hot key—a shortcut key sequence for various system controls. For an external keyboard, CTRL+ALT is normally equivalent to the Fn key.

Table 1-6. Fn Hot Keys

Hot Key	Effect
Fn + F1	Decreases the display's brightness.
Fn + F2	Increases the display's brightness.
Fn + F3	Decreases the display's contrast (non-TFT displays only).
Fn + F4	Increases the display's contrast (non-TFT displays only).
Fn + F5	Switches among the built-in display, an external display, and simultaneous displays.
Fn + F8	Toggles the embedded 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 Hibernate mode.
Fn + R	Enters Suspend mode.
Fn + S	Enters Standby mode (Windows 95, Windows NT) or Suspend mode (Windows 98).
Fn + ScrLk	Toggles Scroll Lock on and off.
Fn + UP ARROW Fn + DOWN ARROW	Increases and decreases the sound volume.

Resetting the OmniBook

1. Use a pen or a straightened paper clip to push the system-off button on the left side of the OmniBook. (The switch is on the motherboard.)

   –or–

   Press and hold the blue power button until the display shuts down. (The switch is on the motherboard.)

2. After the computer shuts down, press the blue power button to turn it back on.

Note

The OmniBook can boot from a CD if all these conditions are true:

- You have an internal CD-ROM or DVD drive installed,

- You have a bootable CD in the drive, such as the OmniBook Recovery CD, and

- You select the CD-ROM or DVD drive as the boot device. You can do this during reboot by pressing ESC to cancel the OmniBook screen, then ESC to display the boot-device menu for a one-time selection.

System Resources

Below are default values for system resources. To see other, non-default possibilities, use the BIOS Setup utility (see page 3-26), which lists port and audio device configurations in the System Devices menu.

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

Table 1-7. System Interrupts

0	System timer
1	Keyboard
2	Cascade IRQ 9
3	Free (or COM2 infrared port, if enabled)
4	COM1 (serial port)
5	Audio
6	Floppy drive
7	LPT1 (ECP parallel port)
8	Real-time clock
9	Free (OmniBook 4100/4150B) Video (OmniBook 4150†)
10	USB and CardBus - assigned by Windows driver Video Controller (OmniBook 4150B)
11	Free
12	Pointing device
13	Numeric data processor
14	Internal hard disk (primary IDE controller)
15	Internal CD-ROM drive (secondary IDE controller)
†	Models called 4150† in this manual have no marking in the serial number, whereas models called 4150B have 4150 B after the serial number.

Table 1-8. System Memory

00000 - 9FFFF	System memory
A0000 - BFFFF	Video
C0000 - CBFFF	Video BIOS (OmniBook 4100/4150†)
C0000 - CFFFF	Video BIOS (OmniBook 4150B)
CC000 - DBFFF*	Free** (OmniBook 4100/4150†)
D0000 - DBFFF*	Free** (OmniBook 4150B)
DC000*- FFFFF	System BIOS
*	Approximate boundary.
**	Valid uses for memory addresses CC000-DBFFF or D0000-DBFFF: Upper memory blocks (UMBs). PC card memory windows.
†	Models called 4150† in this manual have no marking in the serial number, whereas models called 4150B have 4150 B after the serial number.

Table 1-9. System Input/Output Addresses (100-3FF)

120-127	Audio (OmniBook 4150† only)
170-177	Internal CD-ROM drive (secondary IDE controller)
1F0-1F7	Internal hard disk (primary IDE controller)
220-22F	Audio
376	Internal CD-ROM drive (secondary IDE controller)
378-37F	LPT1 (printer port)
388-38B	Audio
3B0-3BB	VGA adapter
3C0-3DF	VGA adapter
3E0-3E1	PCMCIA controller
3F0-3F5	Floppy controller
3F6	Internal hard disk (primary IDE controller)
3F7	Floppy controller
3F8-3FF	COM1 (serial port)
†	Models called 4150† in this manual have no marking in the serial number, whereas models called 4150B have 4150 B after the serial number.

Table 1-10. DMA Channels

0	Sound record (OmniBook 4100/4150†) Free (OmniBook 4150B)
1	Sound playback
2	Floppy drive
3	LPT1 (ECP parallel port)
4	Cascade
5	Free
6	Free
7	Free
†	Models called 4150† in this manual have no marking in the serial number, whereas models called 4150B have 4150 B after the serial number.

Specifications

The following tables list descriptions for the OmniBook and its accessories.

Table 1-11. OmniBook 4100/4150 Series Specifications

Physical Attributes	Size: 330.5mm×256.9mm×35-36.5mm (13.0"×10.1"×1.3-1.4"). Weight: 2.92-2.99 kg (6.45-6.60 lb.).
Processor and Bus Architecture	300/333/366/400 MHz Pentium II processor with internal 256 KB 4-way, set-associative L2 cache. –or– 233/266/300-MHz Intel Pentium II, or 266-MHz Intel Pentium processor with 512-KB pipeline-burst-synchronous L2 cache. 1.6- to 1.8-V core, 2.5-V external, low-power processor. 32-KB (16-KB instruction, 16-KB data) L1 cache. 32-bit PCI bus.
Graphics	14.1- or 13.3-inch XGA active-matrix (TFT) display. Zoomed Video support for lower PC Card slot. **OmniBook 4150B:** ATI Mobility-M or -M1 graphics accelerator with 4- or 8-MB video RAM (1024 × 768 × 16M colors). 2X AGP graphics capability. **OmniBook 4150†:** 256-bit NeoMagic MagicGraph graphics accelerator with 2.5-MB video RAM (1024 × 768 × 16M colors). 1X AGP graphics capability. **OmniBook 4100:** 128-bit NeoMagic MagicGraph graphics accelerator with 2-MB video RAM (1024 × 768 × 64K colors). Zoomed Video support for both PC Card slots.
Power	Rechargeable 9-cell lithium ion battery with LED charge-level gauge (10.8 Vdc, 4.2 AH or more, 45 watt-hours or more). Battery life (one battery): up to 3-4 hours typical (varies with type of usage and model). Fast battery recharge: 80% in 1.5-2 hours, 100% in 2-2.5 hours. Low-battery warning. Suspend/resume capability. 60-watt ac adapter: 100 to 240 Vac (50 to 60 Hz) input, 19 Vdc, 3.16 A output.
Mass Storage	4, 6, or 10 GB removable hard drive. Standard 1.44-MB floppy drive module. Standard 24X CD-ROM drive module or DVD drive module. Optional LS-120 SuperDisk module. Optional DVD drive. Optional 10 GB second hard drive module.
RAM	**OmniBook 4150† or 4150B:** 128 MB or 64 MB SDRAM in first RAM slot. Two total slots for RAM expansion up to 256 MB (using 128 MB modules). 66 MHz RAM bus, or 100 MHz RAM bus for OmniBook 4150B. **OmniBook 4100:** 32-MB SDRAM on motherboard. One slot for RAM expansion up to 160 MB. 66 MHz RAM bus.

Audio System	16-bit, Sound Blaster Pro-compatible. SRS 3D enhanced audio. Stereo sound via two built-in speakers. Built-in microphone. Line-in, headphone-out, and microphone-in.
Keyboard and Pointing Device	87/88-key touch-type QWERTY keyboard with 101/102 key emulation. Embedded numeric keypad. 12 function (Fn) keys. Two pointing devices: pointing stick (technology licensed from IBM) and touch pad.
Input/Output	FDD/IDE interface for external module bay. Universal serial bus (USB). 9-pin, 115,200-bps serial (16550 UART). 25-pin bi-directional ECP/EPP parallel. Video-out (up to 1024×768×64K colors, or up to 1600×1200×64K or 16M colors for OmniBook 4150B. Refresh rate 60 to 85-Hz). Dual display. PS/2 keyboard/mouse. 4-Mbps IrDA-compatible infrared port.
Expandability	One Type III or two Type II 16-/32-bit PC Card slots (3.3- and 5-V support). CardBus enabled. Plug-in module bay for accessory modules. Optional port replicator, mini dock, and docking system.
Preinstalled Software	Microsoft Windows 95, Windows 98, or Windows NT 4.0. Windows 95/98-compatible Plug-and-Play. Windows NT 4.0 APM and PC Card Plug-and-Play. Advanced Power Management (APM 1.2). DMI 2.0 with HP TopTools 2.6 to 4.5 DiagTools. Agate Tioman for HP (Hot Swap). Adobe Acrobat Reader. Virus Scan software. Online documentation. OmniBook Recovery CD-ROM included. Centralized worldwide BIOS and driver update service.
Security Features	User and administrator passwords. System, hard drive, and docking passwords. PC identification displayed at boot. DMI-accessible electronic serial number. Kensington Microsaver lock slot.
Environmental Limits	Operating temperature: 5 to 35 °C (41 to 95 °F). Operating humidity: 20 to 90 percent RH (5 to 35 °C). Storage temperature: –20 to 50 °C (–4 to 122 °F).

Major ICs	**OmniBook 4150B:**
	CPU: Intel Mobile Pentium II.
	South Bridge: PIIX4M.
	Video: ATI Mobility-M or -M1.
	Audio: ESS ES1978 Maestro-2E and ESS ES1921.
	CardBus: TI PCI 1225.
	Keyboard controller: National PC87570.
	Super I/O: SMC 869.
	OmniBook 4150†:
	CPU: Intel Mobile Pentium II.
	South Bridge: PIIX4E.
	Video: NeoMagic MagicGraph NM2200 (NMG5).
	Audio: NeoMagic MagicGraph NM2200 (NMG5) and NeoMagic Audio MNA2.
	CardBus: TI PCI1220A.
	Keyboard controller: National PC87570.
	Super I/O: SMC 769.
	OmniBook 4100:
	CPU: Intel Mobile Pentium or Pentium II.
	South Bridge: PIIX4E.
	Video: NeoMagic MagicGraph NM2160 (NMG4).
	Audio: Crystal CS4237B.
	CardBus: TI PCI1250A.
	Keyboard controller: National PC87570.
	Super I/O: SMC 769.

† Models called 4150† in this manual have no marking in the serial number, whereas models called 4150B have 4150 B after the serial number.

Table 1-12. OmniBook 4100/4150 Series Accessories

Accessory	Description	OmniBook 4150B	OmniBook 4150†	OmniBook 4100	Compat. 2100/7100
Memory					
F1456A	32-MB SDRAM (66 MHz) expansion module		●	●	●
F1457A	64-MB SDRAM (66 MHz) expansion module		●	●	●
F1622A	128-MB SDRAM (66 MHz) expansion module		●	●	●
F1456B	32-MB SDRAM (100 MHz) expansion module	●	●	●	●
F1457B	64-MB SDRAM (100 MHz) expansion module	●	●	●	●
F1622B	128-MB SDRAM (100 MHz) expansion module	●	●	●	●
Hard Drives					
F1467A	4-GB internal hard disk drive		●	●	
F1475A	6-GB internal hard disk drive	●	●	●	
F1744A	10-GB internal hard disk drive	●	●		
Modules					
F1465A/B	DVD drive module (with DVD player card)	●	●	●	
F1470A	LS-120 SuperDisk drive module	●	●	●	
F1472A	Floppy drive module	●	●	●	
F1473A	Floppy drive cable for external use	●	●	●	
F1474A	24X CD-ROM drive module	●	●	●	
F1653A/B	4X DVD drive module	●	●		
F1746A	10-GB second hard drive module	●	●		
Power Options					
F1454A	60-watt ac adapter	●	●	●	●
F1455A	75-watt auto/airline power adapter	●	●	●	●
F1466A	Lithium-ion battery (primary and secondary)	●	●	●	
F1620A	Battery charger (external)	●	●	●	
8120-6312 8120-6313 8120-6314 8120-6316 8120-6317 8120-8367 8120-8373 8120-8452 8120-8699	Replacement power cord (Australia) Replacement power cord (U.S., Canada, Taiwan) Replacement power cord (Europe) Replacement power cord (Japan) Replacement power cord (India, South Africa) Replacement power cord (Argentina) Replacement power cord (People's Republic of China) Replacement power cord (Chile) Replacement power cord (Hong Kong,Singapore,U.K.)	●	●	●	●
Adapters					
F1469A	PS/2 Y adapter	●	●	●	●
PC Cards					
F1623A	10/100-Mbps Ethernet + 56-Kbps modem PC Card by Xircom	●	●	●	●
F1625A	56-Kbps global modem PC Card by Xircom	●	●	●	●
F1626A	10/100-Mbps Ethernet PC Card by 3Com	●	●	●	●
F1627A	56-Kbps US modem PC Card by Xircom	●	●	●	●
F1643A	Realport 10/100-Mbps Ethernet + 56-Kbps modem PC Card by Xircom	●	●	●	●

Docks					
F1451A	Port replicator	•	•	•	•
F1452A	Mini dock	•	•	•	•
F1453A	Monitor stand (short) for F1451A and F1452A	•	•	•	•
F1468A	Docking module bay adapter	•	•	•	
F1477A	Docking system and monitor stand (tall)	•	•	•	•
† Models called 4150† in this manual have no marking in the serial number, whereas models called 4150B have 4150 B after the serial number.					

Internal Design

The motherboard PCA is the central component of the OmniBook design. It plays a role in virtually all system functions. The CPU module (MMO) and most other subsystems connect to the motherboard.

The following figure shows the connections among the replaceable electrical modules. As a substitute for a functional block diagram, see the table on page 1-15—it lists the roles that the replaceable modules play in each of the functional subsystems.

Keyboard cable connects to VGA PCA (OmniBook 4100) or motherboard (OmniBook 4150 Series).

LVDS PCA is not present in the OmniBook 4150B.

The BIOS IC is not removable on the OmniBook 4150 Series.

Two RAM slots are available on the OmniBook 4150 Series.

The power switch and lid switch are contained on the motherboard.

All external connections (except IR and audio) are made to the motherboard.

Figure 1-4. Replaceable Module Diagram

Table 1-13. Functional Structure

|		
Bootup	CPU module Motherboard BIOS IC Floppy disk module Hard disk drive	Main processor (MMO). Primary system circuitry. Code for basic system functions (part of motherboard on OB 4150). 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 RAM board VGA PCA	No onboard RAM (OB 4150), or first 32 MB of RAM (OB 4100). Changeable RAM (1 slot on OB 4100, 2 slots on OB 4150). Video RAM.
Power	Battery Motherboard DC-DC PCA AC adapter	Power storage. AC adapter socket, power switch, lid switch, system-off switch, power supply. Power control circuitry. AC-to-dc converter.
Display	Motherboard LCD module Inverter PCA LVDS PCA VGA PCA	PCMCIA/zoomed video controller. Display output, backlight. Power converter for backlight. Display drivers, LVDS processing (OB 4100/4150†). Display/graphics controller, video RAM (OB 4150B: LVDS processing).
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 BIOS IC Keyboard	Keyboard controller. Keyboard BIOS (part of motherboard on OB 4150). Key switches.
Pointer	Motherboard BIOS IC Keyboard Top case	Keyboard controller, pointing stick controller (PS/2 output). Keyboard BIOS (part of motherboard on OB 4150). Pointing stick sensor. Touch pad sensor, controller (PS/2 output).
Audio	Motherboard VGA PCA Audio jack PCA Inverter PCA Speakers	Audio controller (OB 4100/4150B), audio decoder, speaker amplifier, headphone amplifier, zoomed video controller, mute switch. Audio controller (OB 4150†). External audio jacks. Microphone. Speakers.
Status	Motherboard LED strip cable VGA PCA	Keyboard controller, plus keyboard LEDs (OB 4150). Main LEDs. Keyboard LEDs (OB 4100).
Serial	Motherboard	I/O controller, serial connector.
Parallel	Motherboard	I/O controller, parallel connector.
Infrared	Motherboard IR PCA	I/O controller. Infrared transmitter/receiver.
PS/2 port	Motherboard	Keyboard controller, PS/2 connector.
USB	Motherboard	Bus controller (South Bridge), USB connector.
Docking port	Motherboard	Docking logic, docking connector.
PCMCIA	Motherboard PCMCIA socket	PCMCIA controller. PCMCIA connectors.
† Models called 4150† in this manual have no marking in the serial number, whereas models called 4150B have 4150 B after the serial number.		

2

Removal and Replacement

This chapter tells you how to remove and replace the following components and assemblies. The ones marked by • are user-replaceable.

Table 2-1. Removal Cross-Reference

Air vent cover (table on page 2-33).
Audio jack cover (table on page 2-33).
Audio jack PCA (table on page 2-33).
• Battery (page 2-3).
BIOS IC (page 2-28).
Bottom case (page 2-19).
Cable holder (table on page 2-31).
CPU bottom plate (table on page 2-33).
CPU module (page 2-13).
CPU top plate (table on page 2-33).
DC-DC PCA (table on page 2-33).
Display bezel (table on page 2-31).
Display case (table on page 2-31).
Display latch (table on page 2-31).
• Docking door (table on page 2-8).
End cap (table on page 2-31).
Fan (table on page 2-33).
• Foot (table on page 2-8).
Frame (table on page 2-33).
• Hard disk drive (page 2-5).
Heatsink parts (table on page 2-33).
Hinge (table on page 2-31).
• Hinge cover (table on page 2-8).

Inverter PCA (table on page 2-31).
• I/O door (table on page 2-8).
IR PCA (table on page 2-33).
Keyboard (page 2-9).
LCD brackets (table on page 2-31).
LCD flex cable (table on page 2-31).
LCD module (page 2-13).
LCD shield (table on page 2-31).
LED strip cable (table on page 2-31).
LVDS PCA (table on page 2-33).
Module latch (table on page 2-33).
Motherboard (page 2-19).
PCMCIA socket (table on page 2-33).
• Plug-in module (page 2-3).
• RAM board (page 2-4).
• RAM/BIOS cover (table on page 2-8).
Speaker cover (table on page 2-33).
Speaker (table on page 2-33).
Spring, grounding (table on page 2-33).
Strip cover (table on page 2-32).
Top case (page 2-16).
• VGA connector cover (table on page 2-8).
VGA PCA (table on page 2-33).

Caution

Always provide proper grounding when performing repairs. Without proper grounding, an electrostatic discharge may damage the OmniBook and its components.
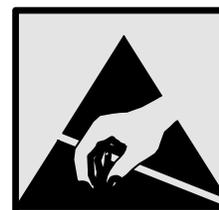
Notes

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 them 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.
- 5 mm hex driver.
- Pointed knife or probe.
- Small flat-blade screwdriver.
- IC (PLCC) removal tool (similar to OK Industries EX-5).
- OmniBook 4150† CPU removal tool (HP part number T-335665).

Table 2-3. Recommended Screw Torques

Screw Thread Size	Torque (kgf•cm)	Torque (lbf•in)
M2	1.3 – 1.8	1.1 – 1.5
M2.5 (4–5 mm long)	3.0 – 3.5	2.6 – 3.0
M2.5 (16–19 mm long)	2.5 – 3.0	2.2 – 2.6
M3	3.0 – 3.5	2.6 – 3.0

Removing the Battery or Plug-In Module

(User-Replaceable)

Required Equipment

- None.

Removal Procedure

1. Unplug the ac adapter, if present.

2. Slide forward the module latch slider on the corner next to the module, then swing back the latch to loosen the module.

3. Pull out the module.
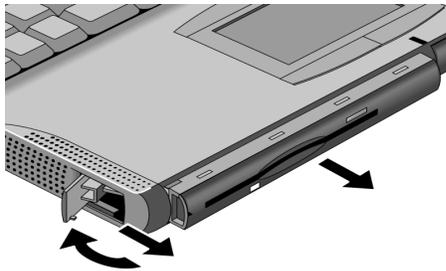
4. Slide the latch back into the case.

Figure 2-1. Removing the Battery or Plug-In Module

Reassembly Notes

- **Important:** You must slide the latch forward before you can insert a module.

- You can install a battery in either bay. Any other type of module must be installed in the left bay.

Removing a RAM Board
(User-Replaceable)

The OmniBook 4100 has 32 MB of RAM on the motherboard and has one RAM slot for installing additional RAM. The OmniBook 4150 Series has no RAM on the motherboard and has two RAM slots for installing RAM.

Table 2-4. RAM Board Replacement Part Numbers

| Description	Part Number	Exchange Part Number	OmniBook 4150B	4150†	4100
RAM board, 32-MB SDRAM (66 MHz)	1818-7413	F1456-69001		•	•
RAM board, 64-MB SDRAM (66 MHz)	1818-7414	F1457-69001		•	•
RAM board, 128-MB SDRAM (66 MHz)	1818-7549	F1622-69001		•	•
RAM board, 32-MB SDRAM (100 MHz)	1818-7950		•	•	•
RAM board, 64-MB SDRAM (100 MHz)	1818-7951		•	•	•
RAM board, 128-MB SDRAM (100 MHz)	1818-7952		•	•	•
† Models called 4150† in this manual have no marking in the serial number, whereas models called 4150B have 4150 B after the serial number.					

Caution

Handle the RAM board only by its edges and provide proper grounding. Otherwise, you may damage the board due to electrostatic discharge.

Required Equipment

- Small Phillips screwdriver.

Removal Procedure

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

2. Turn the unit bottom side up, then remove the two screws from the RAM/BIOS cover and remove the cover.

3. Release the two latches at the sides of the RAM board, so the free edge of the board pops up.

4. Pull the board out of the connector.
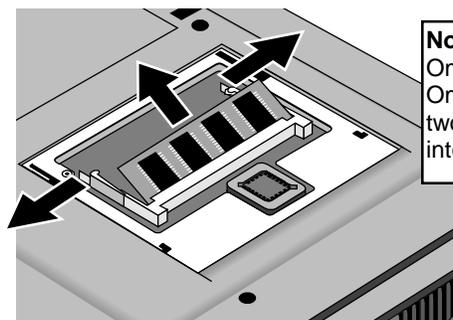
Note:
OmniBook 4100 shown. For the OmniBook 4150 Series, there are two RAM slots (with no RAM built into the motherboard).

Figure 2-2. Removing a RAM Board

Reassembly Notes

- Insert the RAM board into the connector at about a 30° angle until it is fully inserted. Then press down at both sides until both latches snap closed.

Removing the Hard Disk Drive
(User-Replaceable)

Table 2-5. Hard Disk Drive Replacement Part Numbers

Description	Part Number	Exchange Part Number	OmniBook		
			4150B	4150†	4100
Drive, hard disk (4.0GB, 12.7mm, IBM)	0950-2671	F1386-69100			●
Drive, hard disk (4.0GB, 12.7mm, Toshiba)	0950-2865	F1386-69101			●
Drive, hard disk (4.3GB, 9.5mm, IBM)	0950-3409	F1711-69100		●	●
Drive, hard disk (4.8GB, 9.5mm, IBM) *	0950-3611	F1711-69102	●	●	●
Drive, hard disk (6.4GB, 9.5mm, IBM) *	0950-3442	F1711-69101	●	●	●
Drive, hard disk (6.4GB, 12.7mm, IBM)	0950-2785	F1475-69100		●	●
Drive, hard disk (6.4GB, 8.4mm, Toshiba)	0950-3675	F1475-69102	●	●	●
Drive, hard disk (6.4GB, 12.7mm, Toshiba)	0950-3397	F1475-69101		●	●
Drive, hard disk (10.1 GB, 12.5mm, IBM) *	0950-3443	F1744-69101	●	●	
* These hard drives are the preferred drives at the time of publication. Drives shipped in units are subject to change without notice. For current information about preferred and approved drives for these products, see the latest version of service note HDD-01.					
† Models called 4150† in this manual have no marking in the serial number, whereas models called 4150B have 4150 B after the serial number.					

Required Equipment

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

Removal Procedure

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

2. Turn the unit bottom side up.

3. Remove the hard drive screw from the bottom case.

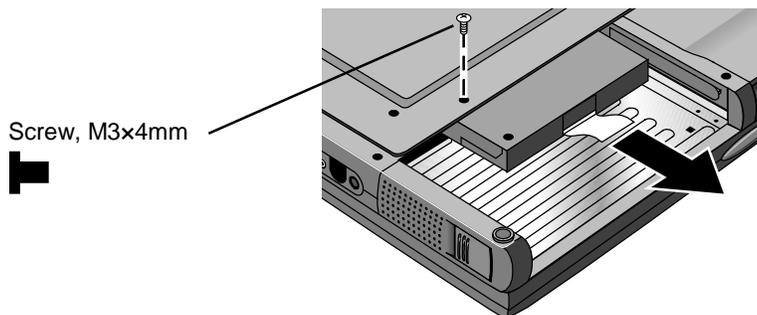4. Pull out the hard drive by its plastic tab.

Screw, M3×4mm

Figure 2-3. Removing the Hard Disk Drive

5. If you are installing a new hard drive that does not have a cover, you can remove the cover parts from the old hard drive:

   • Remove the screw from the case, then pry open the flap. If necessary, use a flat-blade screwdriver

   • Use a flat-blade screwdriver to pry open the snaps at the ends of the case, then open the connector-side of the case.

   • Pry out the corner next to the connector, then lift out the connector and hard drive together.

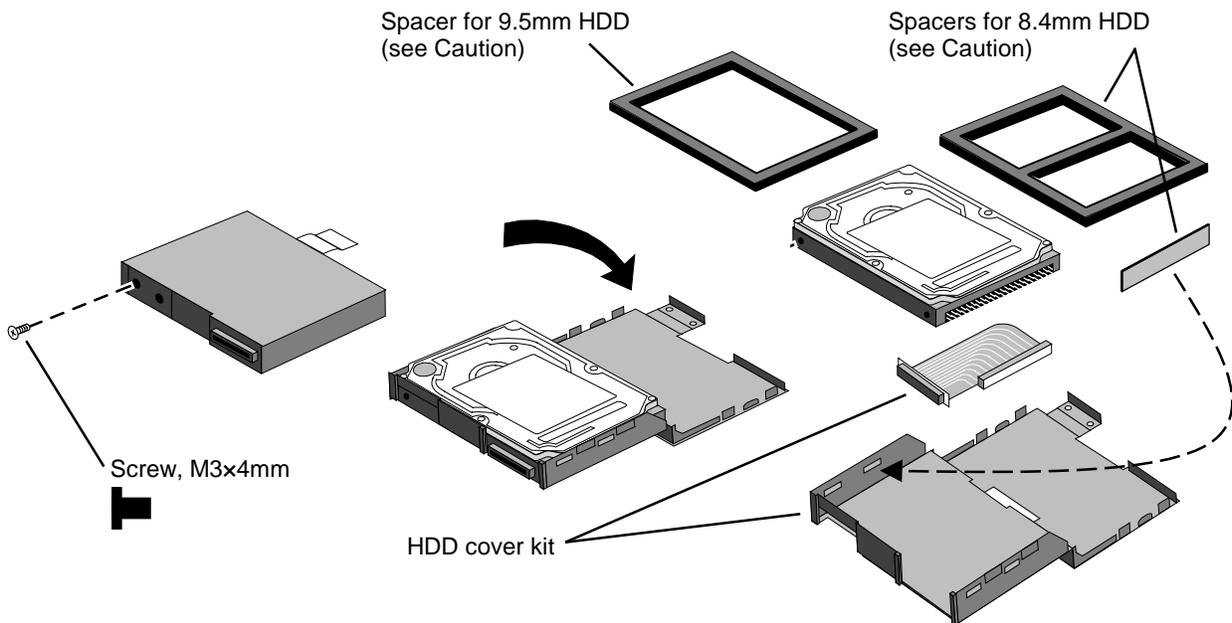   • Unplug the internal connector and cable from the hard drive.

Figure 2-4. Installing a Hard Drive in the Cover

Reassembly Notes

> **Caution**
> • Do not cover the vent hole in the top surface of the hard drive or in the case. If you cover the hole, the hard drive could fail prematurely.
> • If you install a 9.5-mm hard drive in the case, make sure you install the spacer on top of the drive. If you install an 8.4-mm hard drive, make sure you stick the end spacer on the case and install the top spacer on top of the drive.

   • Pry out the connector corner of the case and insert the external connector and hard drive at the same time. The connector seats in the lower part of the opening in the case.

   • Secure the two tabs on the screw flap by inserting the corner tab last, while prying out the nearby corner of the case.

   • When you install the battery module, be sure the plastic tab on the hard drive case lays folds up against the front of the case.

> **Important**
>
> - If you are installing a new hard drive, create a Hibernate partition on the drive before loading any software—see the steps below.

Creating a Hibernate Partition – OmniBook 4100

1. If you do not have an OmniBook Recovery CD and internal CD-ROM (or DVD) module for the computer you are repairing, create a Support Utility floppy disk now.

   After inserting a formatted floppy disk in the floppy drive, do one of the following:

   - On an OmniBook 4100 with a Spring-98 factory software installation, click Start, Programs, OmniBook, Create Support Utility Disk.

   - On any computer that has a CD-ROM drive, run **makesupp** from the \Omnibook\Drivers\Hputils directory on the OmniBook 4100 Recovery CD.

2. Insert the Recovery CD in the CD-ROM drive—or insert the Support Utility disk in the floppy drive.

3. Reboot the computer. If you are using the Recovery CD, press ESC during reboot to cancel the OmniBook screen, ESC to display the boot-device menu, then select the CD-ROM drive as the boot device.

4. When prompted, select "Create Hibernate Partition."

   We recommend that you create a partition the same as the default option.

Creating a Hibernate Partition—OmniBook 4150 Series

1. Plug in the ac adapter.

2. Insert the *Recovery CD* in the CD-ROM drive.

3. Shut down and restart the computer—when you see the HP logo, press ESC two times.

4. Select the CD-ROM drive as the boot device.

5. When the Recovery CD dialog box appears, follow the displayed instructions. Accept the recommended partition size. If you install the factory software, the recovery process can take up to 10 minutes.

   If you want to create the Hibernate partition without installing the factory software, click Advanced and select the option to not install the operating system. If you intend to install Windows NT, you should choose the FAT16 option or the Hibernate-only option.

   Note: If, instead, you see an MS-DOS menu of options, select "Recover..." to create the Hibernate partition and install the factory software, which can take up to 60 minutes. Or select "Create Hibernate Partition" to not install the software. Accept the recommended partition size.

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

Replacing Small Parts
(User-Replaceable)

The following small parts are user-replaceable.

Table 2-6. Replacing Small Parts (User-Replaceable)

Part	Replacement Procedure
Docking Doors	Open each door and flex the door until one side tab releases. To replace, see the picture on page 2-28.
Feet	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.
Hinge Cover, Left	With the display lid fully open, push back on the bottom edge of the hinge cover until it unsnaps, then work it loose and lift it off. To install, make sure the front and back tabs snap into the case.
Hinge Cover, Right	With the display lid closed, push in the bottom of the hinge cover until it unsnaps, then work it loose and lift it off. To install, make sure the front and back tabs snap into the case.
I/O Door	With the door closed, insert a small flat-blade screwdriver behind the door from below. Flex the door until one side tab releases. It helps to press in lightly on the ends of the door. To install, keep the icons on the door toward the top.
Pointing Stick Cap	Pull the cap off the pointing stick.
RAM/BIOS Cover	On the bottom of the unit, remove the two screws from the RAM/BIOS cover and remove the cover.
VGA Connector Cover	With the display closed, push up on the connector cover and down on the bottom case until the lower tabs release. To install, insert the top tabs into the strip cover, then push up on the cover and down on the bottom case until you can insert the lower tabs.