



---

# HP OmniBook 7100



---

## Service Manual

## Notice

In a continuing effort to improve the quality of our products, technical and environmental information in this document is subject to change without notice.

This manual and any examples contained herein are provided “as is” and are subject to change without notice. Hewlett-Packard Company makes no warranty of any kind with regard to this manual, including, but not limited to, the implied warranties of merchantability and fitness for a particular purpose. Hewlett-Packard Co. shall not be liable for any errors or for incidental or consequential damages in connection with the furnishing, performance, or use of this manual or the examples herein.

Consumer transactions in Australia and the United Kingdom: The above disclaimers and limitations shall not apply to Consumer transactions in Australia and the United Kingdom and shall not affect the statutory rights of Consumers.

© Copyright Hewlett-Packard Company 1998. All rights reserved. Reproduction, adaptation, or translation of this manual is prohibited without prior written permission of Hewlett-Packard Company, except as allowed under the copyright laws.

The programs that control this product are copyrighted and all rights are reserved. Reproduction, adaptation, or translation of those programs without prior written permission of Hewlett-Packard Co. is also prohibited.

Portions of the programs that control this product may also be copyrighted by Microsoft Corporation, SystemSoft Corp., Crystal Semiconductor Corporation, Phoenix Technologies, Ltd., and ATI Technologies Inc. See the individual programs for additional copyright notices.

Microsoft, MS, MS-DOS, and Windows are registered trademarks of Microsoft Corporation. Pentium and the Intel Inside logo are U.S. registered trademarks and MMX is a U.S. trademark of Intel Corporation. TrackPoint is a U.S. registered trademark of International Business Machines.

All certifications may not be completed at product introduction. Check with your HP reseller for certification status.

This equipment is subject to FCC rules. It will comply with the appropriate FCC rules before final delivery to the buyer.

Hewlett-Packard Company  
Mobile Computing Division  
19310 Pruneridge Ave.  
Cupertino, CA 95014, U.S.A.

## Edition History

Edition 1.....April 1998

---

# Contents

<b>1. Product Information</b> .....	<b>1-1</b>
Features and Operation.....	1-2
Turning the OmniBook On and Off .....	1-4
Checking the Status of the OmniBook .....	1-5
Using Fn Hot Keys .....	1-6
Resetting the OmniBook .....	1-7
System Resources .....	1-7
Specifications .....	1-9
Internal Design .....	1-12
<b>2. Removal and Replacement</b> .....	<b>2-1</b>
Removing the Battery or Plug-In Module (User-Replaceable) .....	2-3
Removing a RAM Board (User-Replaceable).....	2-4
Removing the Hard Disk Drive (User-Replaceable).....	2-5
Replacing Small Parts (User-Replaceable) .....	2-7
Removing the Keyboard (HP Authorized Service Providers Only) .....	2-8
Removing the Heatsink (HP Authorized Service Providers Only) .....	2-9
Removing the Display Assembly (HP Authorized Service Providers Only) .....	2-11
Removing LCD Module (HP Authorized Service Providers Only) .....	2-12
Removing the Top Case (HP Authorized Service Providers Only) .....	2-14
Removing the Motherboard or Bottom Case (HP Authorized Service Providers Only).....	2-15
Removing the BIOS IC (HP Authorized Service Providers Only) .....	2-19
Removing Other Components (HP Authorized Service Providers Only) .....	2-20
<b>3. Troubleshooting and Diagnostics</b> .....	<b>3-1</b>
Troubleshooting .....	3-2
Troubleshooting the Problem .....	3-2
Verifying the Repair .....	3-3
Suggestions for Troubleshooting.....	3-4
Diagnostic Tools .....	3-11
OmniBook Diagnostic Program .....	3-11
Power-On Self-Test .....	3-16
Sycard PCCTest 450 CardBus Card (Optional) .....	3-16
Desktop Management Interface (DMI) .....	3-20
BIOS Setup Utility.....	3-22
<b>4. Replaceable Parts</b> .....	<b>4-1</b>
<b>5. Reference Information</b> .....	<b>5-1</b>
Password Removal Policy .....	5-1
Hewlett-Packard Display Quality Statement.....	5-2

## Figures

Figure 1-1. OmniBook - Front View.....	1-2
Figure 1-2. OmniBook - Side View .....	1-2
Figure 1-3. OmniBook - Rear View.....	1-3
Figure 1-4. Replaceable Module Diagram.....	1-12
Figure 2-1. Removing the Battery or Module .....	2-3
Figure 2-2. Removing a RAM Board.....	2-4
Figure 2-3. Removing the Hard Disk Drive.....	2-5
Figure 2-4. Installing a Hard Drive in the Case .....	2-6
Figure 2-5. Removing the Keyboard.....	2-8
Figure 2-6. Removing the Heatsink .....	2-10
Figure 2-7. Removing the Display Assembly .....	2-11
Figure 2-8. Removing the LCD Module .....	2-13
Figure 2-9. Removing the Top Case .....	2-15
Figure 2-10. Removing the Motherboard (Part 1).....	2-16
Figure 2-11. Removing the Motherboard (Part 2).....	2-17
Figure 2-12. Removing the BIOS IC .....	2-20
Figure 3-1. Basic Troubleshooting Steps.....	3-2
Figure 3-2. OmniBook Diagnostic Screens — Basic and Advanced.....	3-11
Figure 3-3. Serial and Parallel Loopback Connectors.....	3-13
Figure 3-4. DMI Components.....	3-21
Figure 4-1. Exploded View .....	4-2
Figure 4-2. Display Components .....	4-5
Figure 4-3. Top Case Components .....	4-6
Figure 4-4. Motherboard-Related Components .....	4-6

## Tables

Table 1-1. OmniBook 7100 Models .....	1-1
Table 1-2. Product Comparisons.....	1-3
Table 1-3. Activating Power Modes .....	1-4
Table 1-4. Status Panel Indicators (Icon PCA) .....	1-5
Table 1-5. Status Lights (Front-IR PCA) .....	1-6
Table 1-6. Fn Hot Keys.....	1-6
Table 1-7. System Interrupts .....	1-7
Table 1-8. System Memory .....	1-8
Table 1-9. System Input/Output Addresses (100-3FF) .....	1-8
Table 1-10. DMA Channels.....	1-8
Table 1-11. OmniBook 7100 Specifications.....	1-9
Table 1-12. OmniBook 7100 Accessories .....	1-11
Table 1-13. Functional Structure.....	1-13
Table 2-1. Removal Cross-Reference .....	2-1
Table 2-2. Required Equipment .....	2-2
Table 2-3. Recommended Screw Torques .....	2-2
Table 2-4. RAM Board Replacement Part Numbers .....	2-4
Table 2-5. Hard Disk Drive Replacement Part Numbers.....	2-5
Table 2-6. Replacing Small Parts (User-Replaceable).....	2-7
Table 2-7. Removing Display Components .....	2-21
Table 2-8. Removing Top Case Components .....	2-22
Table 2-9. Removing Bottom Case Components.....	2-23
Table 3-1. Scope of Diagnostic Tools.....	3-4

Table 3-2. Troubleshooting Suggestions.....	3-5
Table 3-3. OmniBook Diagnostic Error Codes.....	3-13
Table 3-4. POST Terminal-Error Beep Codes.....	3-16
Table 3-5. POST Messages.....	3-17
Table 3-6. BIOS Setup Menus and Parameters.....	3-22
Table 4-1. OmniBook Replaceable Parts.....	4-3
Table 4-2. Assembly-Component Breakdown.....	4-7
Table 4-3. Accessory Replaceable Parts.....	4-7
Table 4-4. Part Number Reference.....	4-8
Table 5-1. OmniBook 7100 LCD Guidelines (TFT).....	5-3

## Introduction

This service manual provides reference information for the HP OmniBook 7100. 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	<a href="http://www.hp.com/omnibook">http://www.hp.com/omnibook</a> ( <a href="http://www2.hp.com/omnibook">http://www2.hp.com/omnibook</a> , European mirror)	No usage restriction.
HP US Reseller Web	<a href="http://partner.americas.hp.com">http://partner.americas.hp.com</a>	Restricted to Authorized Resellers only.
HP Asia Pacific Channel Support Centre for DPSP Partners	<a href="http://www.hp.com.au">http://www.hp.com.au</a>	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 First (automated fax)	(800) 333-1917	US and Canada.
	(801) 344-4809	Outside US and Canada.
	(800) 544-9976	Reseller support number (enter outlet id number).
HP Support Assist CD-ROM	(800) 457-1762	US and Canada.
	(801) 431-1587	Outside US and Canada.
* Baud rates = 300-28,800; Parity = E; Data bits = 7; Stop bits = 1.		

## Product Information

The HP OmniBook 7100 provides desktop performance and expandability as well as the latest in multimedia capabilities. It uses high-performance component technologies that make it capable of replacing a desktop computer or serving as a multimedia presentation tool.

**Table 1-1. OmniBook 7100 Models**

OmniBook Product *	CPU **	Display	Hard Drive	Floppy Drive	CD-ROM Drive	Standard RAM
F1441N F1441W	Pentium II 266 MHz	14.1-inch XGA TFT	6.4 GB (F1475A)	1.44 MB floppy and CD-ROM combination (F1446A)		32 MB
F1442N F1442W			8.1 GB (F1449A)			
<p>* For the products listed: "N" suffix means Windows NT 4.0 Workstation installed. "W" suffix means Windows 95 installed.</p> <p>** Intel Mobile Pentium or Pentium II processor.</p>						

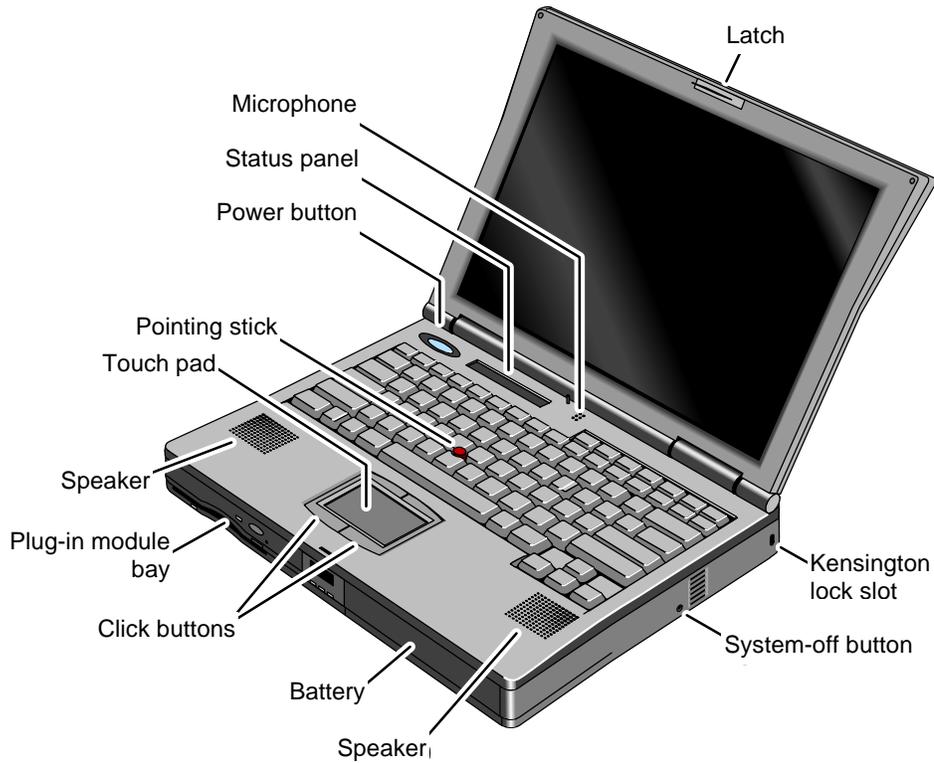
This chapter describes

- Features and operation (below).
- Specifications (page 1-9).
- Internal design (page 1-12).

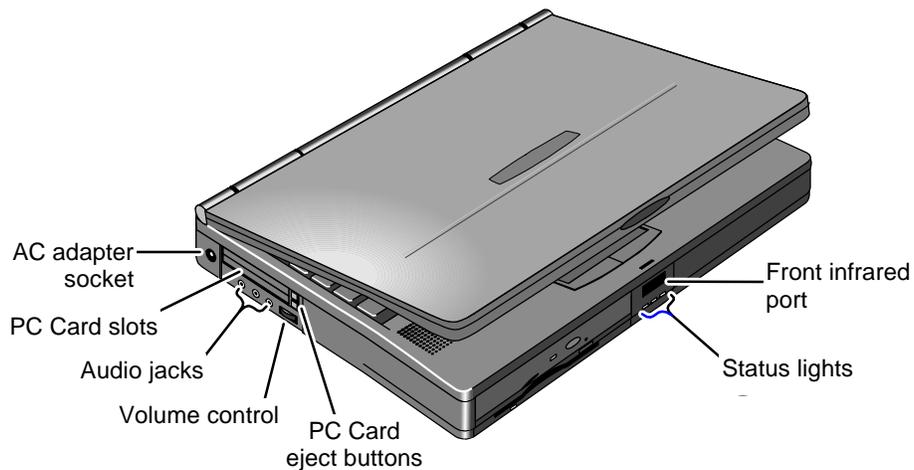
---

# Features and Operation

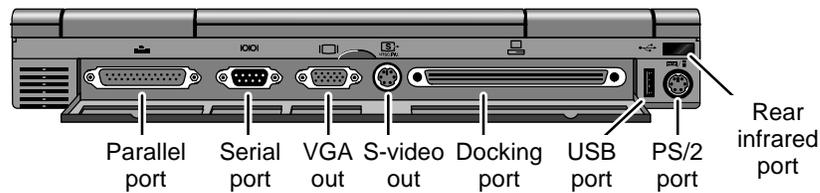
The following three illustrations point out the main external features of the computer. They are followed by highlights of the computer's operation. For an internal, exploded view, see page 4-2.



**Figure 1-1. OmniBook - Front View**



**Figure 1-2. OmniBook - Side View**



**Figure 1-3. OmniBook - Rear View**

**Table 1-2. Product Comparisons**

	<b>OmniBook 7100</b>	<b>OmniBook 4100</b>	<b>OmniBook 2100/3100</b>	<b>OmniBook 3000</b>
<b>Processor *</b>	Intel Pentium II (266 MHz), with MMX technology. 512-KB burst-synchronous L2 cache (high-speed bus).	Intel Pentium II (266 or 233 MHz), or Pentium (266 MHz), with MMX technology. 512-KB burst-synchronous L2 cache (high-speed bus for Pentium II).	Intel Pentium (266, 233, or 200 MHz), with MMX technology. 512-KB burst-synchronous L2 cache.	Intel Pentium (266, 233, or 200 MHz), with MMX technology. 512-KB burst-synchronous L2 cache.
<b>Memory</b>	32 MB RAM on motherboard. Expandable to 160 MB.	32 MB RAM on motherboard. Expandable to 96 MB.	32 MB RAM on motherboard. Expandable to 96 MB.	16 MB RAM on motherboard. Expandable to 144 MB.
<b>Display</b>	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.	13.3-inch TFT XGA display.
<b>Video</b>	PCI local bus video. 64-bit graphics controller with 4 MB external video RAM. Up to 16M colors (XGA). Zoomed Video enabled.	PCI local bus video. 128-bit graphics controller with 2 MB internal video RAM. Up to 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.	PCI local bus video. 128-bit graphics controller with 2 MB internal video RAM. Up to 64K colors (XGA). Zoomed Video enabled.
<b>Operating System</b>	Windows 95 or Windows NT 4.0 preinstalled.	Windows 95 or Windows NT 4.0 preinstalled.	Windows 95 or Windows NT 4.0 preinstalled.	Windows 95 preinstalled. (Windows NT 4.0 certified.)
<b>Desktop Management Interface</b>	DMI 2.0. HP TopTools 2.6.	DMI 2.0. HP TopTools 2.6.	DMI 2.0. HP TopTools 2.6.	DMI 1.1. HP TopTools 2.0.
<b>Power Management</b>	APM 1.2. ACPI compliant.	APM 1.2. ACPI compliant.	APM 1.2. ACPI compliant.	APM 1.2.
<b>Power States</b>	On, Standby, Suspend, Hibernate, Off.	On, Standby, Suspend, Hibernate, Off.	On, Standby, Suspend, Hibernate, Off.	On, Standby, Suspend, Hibernate, Off.
Features at the time of product introduction. Not updated for later versions.				
* Intel Mobile Pentium or Mobile Pentium II processor.				

## 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.

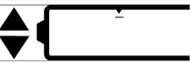
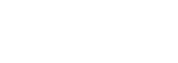
**Table 1-3. Activating Power Modes**

Power Mode	To Enter Mode	To Turn Back On
<b>Standby</b> 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 –or– allow time-out.	Press any key or move a pointing device to display the current session ("Instant-On").
<b>Suspend</b> 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– close the lid* –or– click Start, Suspend (Windows 95) –or– allow time-out.	Press blue power button to display the current session ("Instant-On").
<b>Hibernate</b> 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.
<b>Off</b> 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.
* Does not suspend if Video Display Device set to Both in BIOS Setup.		

## Checking the Status of the OmniBook

The OmniBook status panel, located above the keyboard, contains indicators that show the current keyboard status, drive activity, and power status of the OmniBook. (These indicators are on the icon PCA.)

**Table 1-4. Status Panel Indicators (Icon PCA)**

Indicator	Meaning
	<b>AC power.</b> The ac adapter is plugged in.
	<b>Battery status.</b> Shows the approximate charge level of the battery relative to a full charge. Each bar represents 10% charge. The upper and lower triangles indicate the presence of the main battery (upper) and a second battery (lower). A triangle blinks when that battery is charging. The main battery charges first, discharges last. If two batteries are installed, the indicator shows the combined charge of both batteries. Press Fn+F6 to show separate battery levels.
	<b>Battery low.</b> (Triangle, but no bars.) The OmniBook also beeps.
	<b>Defective battery.</b> (No triangle, no bars.) No charging, even though ac adapter is present.
	<b>Overheated battery.</b> (No triangle, top bar.) The battery is too hot to charge. Not necessarily a defective battery.
	<b>Internal drive.</b> The OmniBook is accessing one of the internal drives: the hard disk drive, CD-ROM drive, or other plug-in module drive.
	<b>Floppy disk drive.</b> The OmniBook is accessing the floppy disk drive.
	<b>PC Card.</b> There is activity between the PC Card and the computer.
	<b>Caps Lock.</b> Caps Lock is active.
	<b>Num Lock.</b> Num Lock is active.
	<b>Keypad Lock.</b> The embedded keypad is active (Fn+F8). Num Lock must also be on for the numeric keys—otherwise, cursor control is active.
	<b>Scroll Lock.</b> Scroll Lock is active (Fn+ScrLk).

The OmniBook status lights, located at the front-center of the bottom case, indicate power status and drive activity. (These lights are on the front-IR PCA.)

**Table 1-5. Status Lights (Front-IR PCA)**

	Meaning
	<b>Power mode</b> 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). Alternating green and orange light: OmniBook failed when resuming.
	<b>Hard disk drive</b> Green light: OmniBook is accessing the hard disk drive.
	<b>Charging</b> Steady green light: AC adapter is connected, battery is full. Blinking green light: AC adapter is connected, battery is charging. No light: AC adapter is not connected.

## 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 + F6 (hold)	For use with two batteries: The battery indicator in the status panel briefly displays the individual battery status for each battery you have installed in the OmniBook.
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 + F	Toggles between front and rear infrared ports.
Fn + R	Enters Suspend mode.
Fn + S	Enters Standby mode.
Fn + ScrLk	Toggles Scroll Lock on and off.
Fn + UP ARROW Fn + DOWN ARROW	Increases and decreases the sound volume. The volume range is limited by the setting of the volume control knob.

## Resetting the OmniBook

1. Use a pen or a straightened paper clip to push the system-off button on the right 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 icon PCA.)

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/floppy drive installed,
- You have a bootable CD in the drive, such as the OmniBook Recovery CD, and
- You select the CD-ROM 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 3-22), 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	Crystal sound
6	Floppy drive
7	LPT1 (ECP parallel port)
8	Real-time clock
9	Free
10	USB and CardBus - assigned by Windows driver
11	Free (or MIDI, if enabled)
12	Pointing device
13	Numeric data processor
14	Internal hard disk (primary IDE controller)
15	Internal CD-ROM drive (secondary IDE controller)

**Table 1-8. System Memory**

00000 - 9FFFF	System memory
A0000 - BFFFF	Video
C0000 - CFFFF	Video BIOS
D0000 - DBFFF*	Free**
DC000*- FFFFF	System BIOS
* Approximate boundary.	
** Valid uses for memory addresses D0000-DBFFF: Upper memory blocks (UMBs). PC card memory windows.	

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

170-177	Internal CD-ROM drive (secondary IDE controller)
1F0-1F7	Internal hard disk (primary IDE controller)
220-22F	Crystal sound
376	Internal CD-ROM drive (secondary IDE controller)
378-37F	LPT1 (printer port)
388-38B	Sound
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)

**Table 1-10. DMA Channels**

0	Sound record
1	Sound playback
2	Floppy drive
3	LPT1 (ECP parallel port)
4	Cascade
5	Free
6	Free
7	Free

# Specifications

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

**Table 1-11. OmniBook 7100 Specifications**

<b>Physical Attributes</b>	Size: 324mm×252mm×56mm (12.76"×9.92"×2.22") closed. Weight: 3.95 kg (8.7 lb).
<b>Processor and Bus Architecture</b>	266-MHz Intel Pentium II processor with MMX technology. 1.6-V core, 2.5-V external, low-power processor. 32-KB (16-KB instruction, 16-KB data) L1 cache. 512-KB pipeline-burst-synchronous L2 cache. 32-bit PCI bus.
<b>Graphics</b>	14.1-inch XGA active-matrix (TFT) display (1024×768×16M colors). 64-bit ATI Rage LT Pro graphics controller with 4-MB 100-MHz SGRAM. 2D and 3D acceleration, SXGA-out and TV-out support. Zoomed Video support for both PC Card slots.
<b>Power</b>	Rechargeable 12-cell lithium ion battery with LED charge-level gauge (14.4 Vdc, 4.2 AH, 60 watt-hours). Battery life (one battery): 3.25 to 4.25 hours run time. Fast battery recharge: 80% in 1.5 hours, 100% in 2.0 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.
<b>Mass Storage</b>	24X CD-ROM/floppy drive combination module. 8.1-GB or 6.4-GB removable hard drive. Optional LS-120 storage module. Optional 2X DVD module.
<b>RAM</b>	32-MB SDRAM on board. Two slots for RAM expansion up to 160 MB (288 MB maximum with future memory technologies).
<b>Audio System</b>	16-bit, Sound Blaster Pro-compatible. SRS 3D enhanced audio. Dolby Digital for DVD playback (with DVD module). Stereo sound via two built-in speakers. Built-in microphone. Line-in, headphone-out, and microphone-in.
<b>Keyboard and Pointing Device</b>	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.
<b>Input/Output</b>	Universal serial bus (USB). 9-pin, 115,200-bps serial (16550 UART). 25-pin bi-directional ECP/EPP parallel. Video-out (up to 1024×768×16M colors at 75-Hz refresh rate or 1280×1024×64K colors at 60-Hz refresh rate). S-video TV-out, composite video with optional adapter. PS/2 keyboard/mouse. Two 4-Mbps IrDA-compliant infrared ports.
<b>Expandability</b>	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.

<b>Preinstalled Software</b>	<p>Microsoft Windows 95 or Windows NT 4.0.  Windows 95-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.  McAfee Virus Scan 3.1.5.  Online documentation.  OmniBook Recovery CD-ROM included.  Centralized worldwide BIOS and driver update service.</p>
<b>Security Features</b>	<p>User and administrator passwords.  System, hard drive, and docking passwords.  PC identification displayed at boot.  DMI-accessible electronic serial number.  Kensington Microsaver lock slot.</p>
<b>Environmental Limits</b>	<p>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).</p>
<b>Major ICs</b>	<p>CPU: Intel Mobile Pentium II.  South Bridge: PIIX4E.  Video: ATI Rage LT Pro.  Audio: Crystal CS4237B (with Crystal CS9236 hardware wavetable).  CardBus: TI PCI1250A.  Keyboard controller: National PC87570.  Super I/O: SMC FDC37N769.</p>

**Table 1-12. OmniBook 7100 Accessories**

<b>OmniBook 7100-Only Accessories</b>	
F1446A	24X CD-ROM drive / floppy drive combo module.
F1447A	2X DVD module.
F1448A	LS-120 SuperDisk drive module.
F1449A	8.1-GB internal hard disk drive.
F1475A	6.4-GB internal hard disk drive.
F1450A	Lithium-ion battery (primary and secondary).
F1459A	Composite video adapter.
<b>OmniBook 7100, 4100, 3100, 2100 Accessories</b>	
F1477A	Docking system and monitor stand (tall).
F1452A	Mini dock.
F1451A	Port replicator.
F1453A	Monitor stand (short).
F1456A	32-MB RAM expansion card (7100/4100 only).
F1457A	64-MB RAM expansion card (7100/4100 only).
F1454A	60-watt ac adapter.
F1455A	75-watt auto/airline power adapter.
F1469A	PS/2 Y adapter.
TMC3X575	10/100-Mbps Ethernet PC Card.
TMC3C589	10-Mbps Ethernet PC Card.
XIRCM56T	56-Kbps modem PC Card.
8120-6313	Replacement power cord (U.S., Canada, Taiwan).
8120-6314	Replacement power cord (Europe).
8120-6315	Replacement power cord (Hong Kong, Singapore, U.K.).
8120-6312	Replacement power cord (Australia).
8120-6316	Replacement power cord (Japan).
8120-6317	Replacement power cord (India, South Africa).
8120-8373	Replacement power cord (People's Republic of China).

# 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 1-13—it lists the roles the replaceable modules play in each of the functional subsystems.

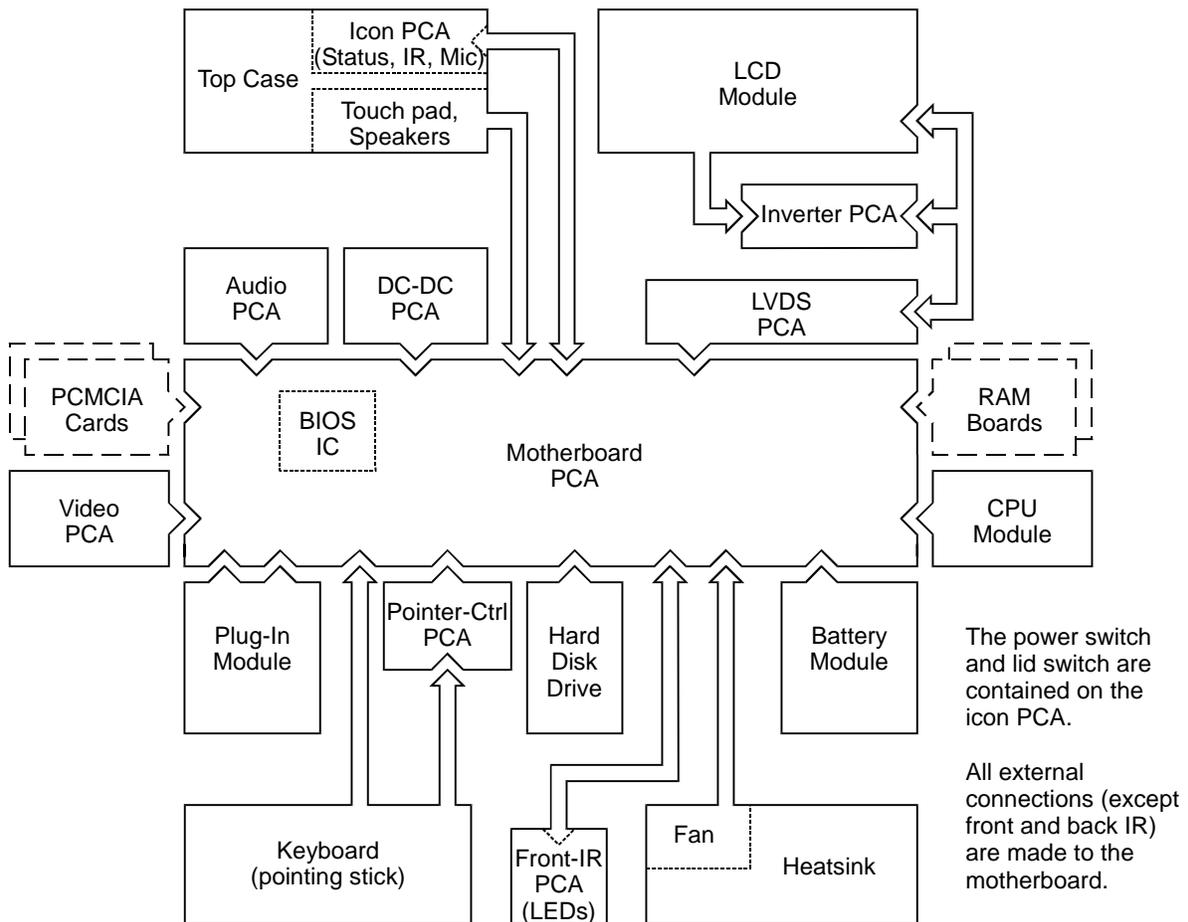


Figure 1-4. Replaceable Module Diagram

**Table 1-13. Functional Structure**

<b>Function</b>	<b>Modules</b>	<b>Roles</b>
<b>Bootup</b>	CPU module Motherboard BIOS IC Floppy disk module Hard disk drive	Main processor (MMO). Primary system circuitry. Code for basic system functions. First source of disk-based startup code. Second source of disk-based startup code.
<b>Processor</b>	CPU module Motherboard	Main processor, numeric data processor, L1 and L2 cache. Primary system circuitry.
<b>Memory</b>	Motherboard RAM boards Video PCA	First 32 MB of RAM. Optional, additional RAM. Video RAM.
<b>Power</b>	Battery DC-DC PCA Motherboard Icon PCA AC adapter	Power storage. Power supply. AC adapter socket, system-off switch. Power switch, lid switch. AC-to-dc converter.
<b>Display</b>	Motherboard LCD module Inverter PCA LVDS PCA Video PCA	PCMCIA/zoomed video controller. Display output, backlight. Power converter for backlight. Display switch, LVDS signal pass-through. Display/graphics controller, video RAM, LVDS processor/driver.
<b>Hard disk</b>	Motherboard Hard disk drive	Hard disk controller. Hard disk mechanism.
<b>Floppy drive</b>	Motherboard Floppy disk module	Floppy disk controller. Floppy disk mechanism.
<b>Keyboard</b>	Motherboard BIOS IC Keyboard	Keyboard controller. Keyboard BIOS. Key switches.
<b>Pointer</b>	Motherboard Pointer-control PCA Keyboard Top case	Keyboard controller. Pointing stick controller (PS/2 output). Pointing stick sensor. Touch pad sensor, controller (PS/2 output).
<b>Audio</b>	Motherboard  Audio PCA Icon PCA Top case	Speaker amplifier, external audio jacks, headphone amplifier, zoomed video controller, volume knob. Audio controller, wavetable. Microphone. Speakers.
<b>Status</b>	Motherboard Icon PCA Front-IR PCA	Keyboard controller. Status panel. Front LEDs.
<b>Serial</b>	Motherboard	I/O controller, serial connector.
<b>Parallel</b>	Motherboard	I/O controller, parallel connector.
<b>Infrared</b>	Motherboard Icon PCA Front-IR PCA	I/O controller. Back infrared transmitter/receiver. Front infrared transmitter/receiver.
<b>PS/2 port</b>	Motherboard Pointer-control PCA	Keyboard controller, PS/2 connector. PS/2 processor.
<b>USB</b>	Motherboard	Bus controller (South Bridge), USB connector.
<b>Docking port</b>	Motherboard	Docking logic, docking connector.
<b>PCMCIA</b>	Motherboard PCMCIA socket	PCMCIA controller. PCMCIA connectors.



## Removal and Replacement

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

**Table 2-1. Removal Cross-Reference**

Audio heatsink (table on page 2-23).	Hinge cover (table on page 2-22).
Audio jack cover (table on page 2-23).	Hinge mount (table on page 2-23).
Audio PCA (table on page 2-23).	Icon PCA (table on page 2-22).
• Battery (page 2-3).	Inverter PCA (table on page 2-21).
• Battery faceplate (table on page 2-7).	• I/O door (table on page 2-7).
• BIOS cover (table on page 2-7).	Keyboard (page 2-8).
BIOS IC (page 2-19).	LCD module (page 2-11).
Bottom case (page 2-15).	LCD shield (table on page 2-21).
CPU fence (table on page 2-23).	LVDS PCA (table on page 2-23).
CPU module (MMO) (table on page 2-23).	Motherboard PCA (page 2-15).
Display bezel (table on page 2-21).	Motherboard frame (table on page 2-23).
Display bracket (table on page 2-21).	PCMCIA shield (table on page 2-23).
Display cable (table on page 2-21).	PCMCIA socket (table on page 2-23).
Display case (table on page 2-21).	• Plug-in module (page 2-3).
Display latch (table on page 2-21).	Pointer-control PCA (table on page 2-23).
DC-DC PCA (table on page 2-23).	• RAM board (page 2-4).
End cap (table on page 2-21).	• RAM cover (table on page 2-7).
Fan (table on page 2-23).	• Screw cover (table on page 2-7).
• Feet (table on page 2-7).	Speaker (table on page 2-22).
Front-IR PCA (table on page 2-23).	Top case (page 2-14).
• Hard disk drive (page 2-5).	Touch-pad cable (table on page 2-22).
Heatsink, CPU (page 2-9).	Touch-pad PCA (table on page 2-22).
Hinge (table on page 2-21).	Video PCA (table on page 2-23).

### 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 M2.5x5mm screw.)

**Table 2-2. Required Equipment**

- Small Phillips screwdriver, preferably magnetized.
- 5 mm hex driver.
- Probe or tweezers.
- Small flat-blade screwdriver.
- Needle-nose pliers.
- IC insertion/removal tool.

**Table 2-3. Recommended Screw Torques**

Screw Thread Size	Torque (kgf•cm)	Torque (in•lbf)
M2	1.5 – 2.0	1.3 – 1.7
M2.5 except those below	1.5 – 2.5	1.3 – 2.2
M2.5 for display brackets and hinge mounts	4.5	3.9
M3	2.0 – 2.5	1.7 – 2.2

---

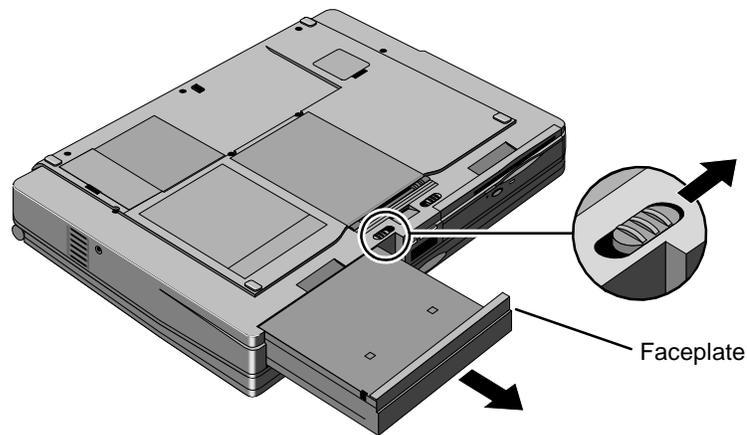
## Removing the Battery or Plug-In Module (User-Replaceable)

### Required Equipment

- None.

### Removal Procedure

1. Unplug the ac adapter, if present.
2. Turn the unit bottom side up.
3. Slide the latch open and pull out the module.



**Figure 2-1. Removing the Battery or Module**

### Reassembly Notes

- You can install a battery in either bay. But any other type of module must be installed in only the left bay (on the right side when the unit is upside-down).
- For a battery, slide its faceplate to the left or right so it fits into the bay correctly.

---

# Removing a RAM Board

(User-Replaceable)

Table 2-4. RAM Board Replacement Part Numbers

Description	Part Number	Exchange Part Number
RAM board, 32-MB	1818-7413	F1456-69001
RAM board, 64-MB	1818-7414	F1457-69001

### 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

- None.

### Removal Procedure

1. Unplug the ac adapter, if present, and remove the battery.
2. Turn the unit bottom side up and unsnap the RAM cover.
3. Release the two metal 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.

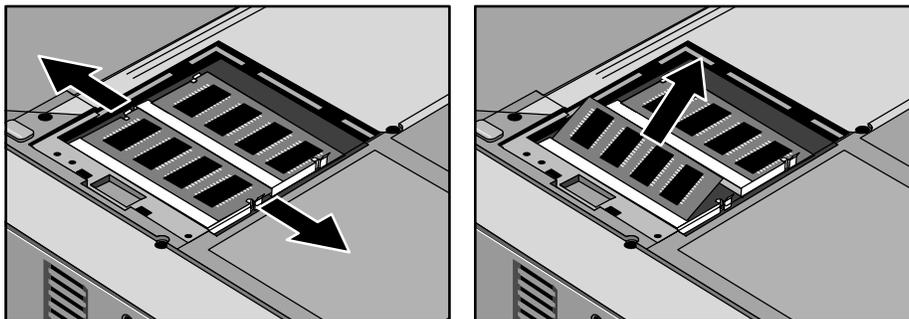


Figure 2-2. Removing a RAM Board

### 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.
- If only one RAM board is present, you can install it in either connector.

---

# Removing the Hard Disk Drive

(User-Replaceable)

Table 2-5. Hard Disk Drive Replacement Part Numbers

Description	Part Number	Exchange Part Number
Drive, hard disk (6.4GB, IBM)	0950-2829	F1440-69100
Drive, hard disk (8.1GB, IBM)	0950-2830	F1449-69100

## 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.
3. Use a key or flat-blade screwdriver to pop up the hard drive handle.
4. Slide the hard drive toward the front, then lift it out.

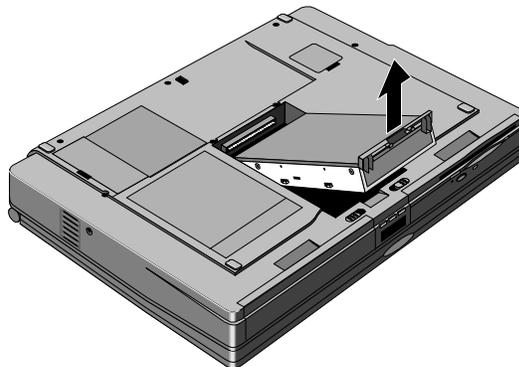
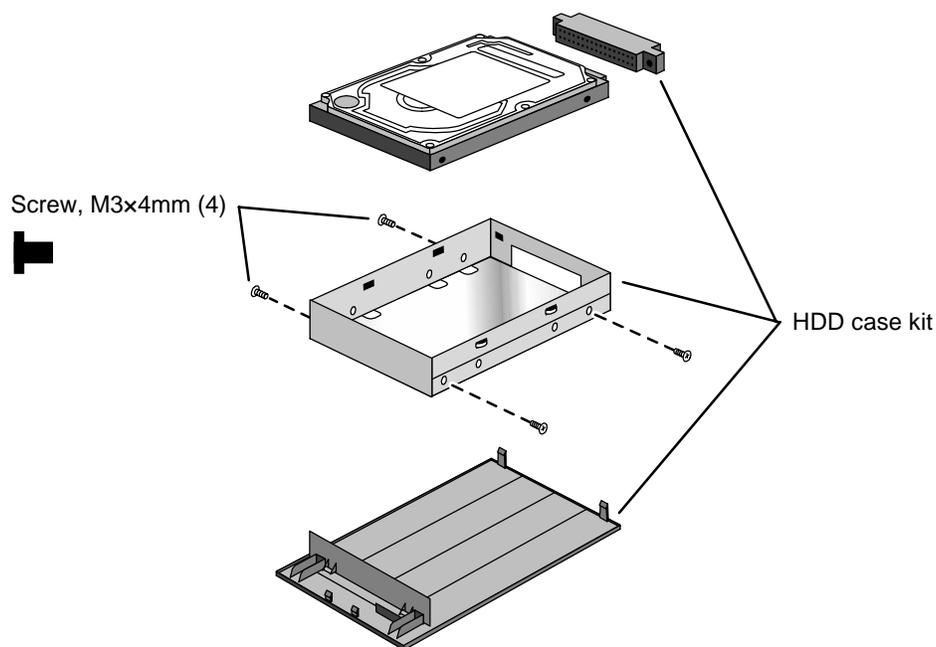


Figure 2-3. Removing the Hard Disk Drive

5. If you are installing a new hard drive that does not have a plastic case, you can remove the case parts from the old hard drive:
  - Unsnap the two plastic snaps next to the connector and remove the plastic tray.
  - Remove the four screws from the sides of the shield.
  - Remove the hard drive from the shield.
  - Unplug the connector from the hard drive.



**Figure 2-4. Installing a Hard Drive in the Case**

### Reassembly Notes

#### Caution

- Do not cover the vent hole in the top surface of the hard drive. If you cover the hole, the hard drive could fail prematurely.
- When installing the drive into the bottom case, first insert the complete assembly into the front of the opening, then slide it backward to make the connection. Otherwise, you could damage the hard drive case.

#### Important

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

### Creating a Hibernate Partition

1. If you do not have an OmniBook Recovery CD and internal CD-ROM 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 a 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 7100 Recovery CD.
- On any computer with World Wide Web access, download the Support Utility software package from the OmniBook website (see page vi). Follow the instructions provided.

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, and choose the diagnostics boot option.
4. When prompted, select “Create Hibernate Partition.”

We recommend that you create a 160-MB partition, the same as the factory setup.

---

## Replacing Small Parts (User-Replaceable)

The following small parts are user-replaceable.

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

Part	Replacement Procedure
<b>Battery Faceplate</b>	Slide the panel to one side. Pry off the top edge next to the overhanging end, then slide the panel to the opposite end and remove the panel. <b>Reassembly Notes:</b> Attach the bottom edge of the panel first, then snap on the top edge.
<b>BIOS Cover</b>	On the bottom of the unit, insert a flat-blade screwdriver into the slot at the edge of the BIOS cover and pry it off.
<b>Feet</b>	Insert a small flat-blade screwdriver under the end of the foot and pry it loose. To replace, firmly press the adhesive side of the foot into the recess.
<b>I/O Door</b>	Open the door and flex the center of the door until one of the side tabs releases. To replace an I/O door hinge, insert a small flat-blade screwdriver behind the middle of the flat plate and pop the hinge out of the case. When installing a hinge, make sure the hinge support curves downward.
<b>Pointing Stick Cap</b>	Pull the cap off the pointing stick.
<b>RAM Cover</b>	On the bottom of the unit, insert a flat-blade screwdriver into the slot at the edge of the RAM cover and pop it off.
<b>Screw Cover</b>	Use a small screwdriver or probe to pry out the screw cover on the display bezel. To replace, firmly press the adhesive side of the cover into the hole.

---

# Removing the Keyboard

(HP Authorized Service Providers Only)

## Required Equipment

- Small Phillips screwdriver.
- Small flat-blade screwdriver.
- Probe or tweezers.

## Removal Procedure

1. Unplug the ac adapter, if present, and remove the battery.
2. Remove the four screws from the bottom case.
3. Use a flat-blade screwdriver to free the three tabs along the top edge of the keyboard. Be careful not to damage the case.
4. Lift the top edge of the keyboard, then slide the keyboard toward the back until the front-left corner is free.
5. Flip over the keyboard toward the back and lay it flat against the display.
6. Using a probe or tweezers, release the two flex cables from the connectors in the case.

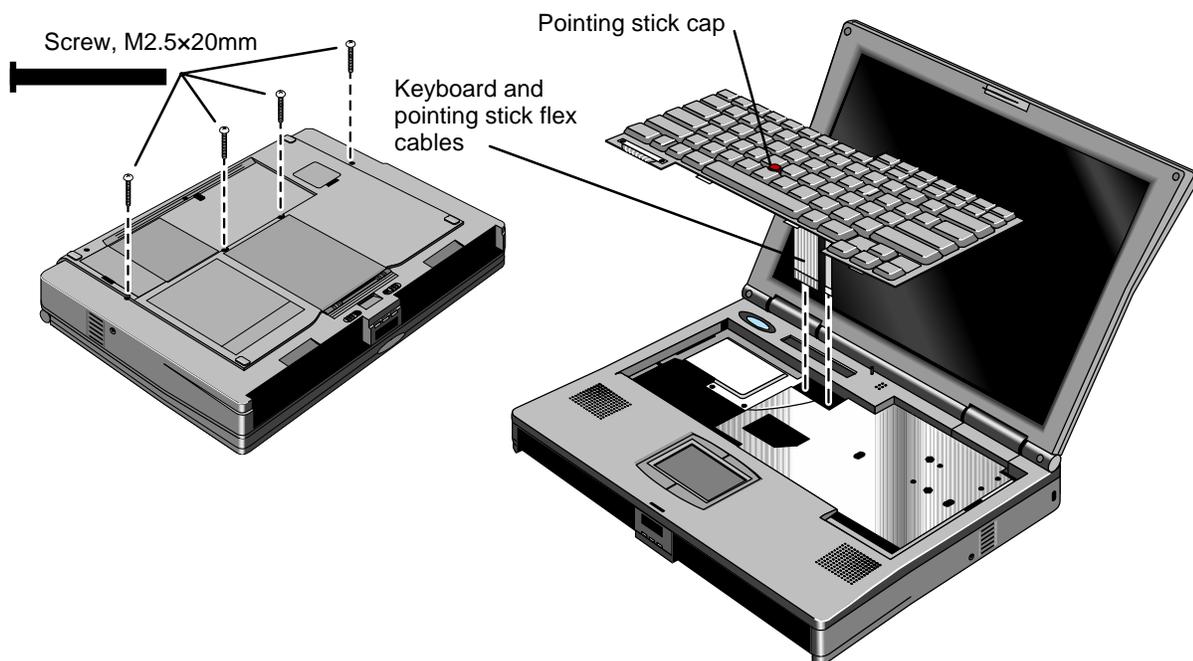


Figure 2-5. Removing the Keyboard

## Reassembly Notes

- To connect the keyboard cables, do the following:

1. Lay the keyboard on the case slightly forward of its normal position, then connect the pointing stick cable (smaller cable).
2. Lean the keyboard against the display, then connect the keyboard cable (larger cable).

**Caution**

Before inserting the keyboard into the case, tuck the excess length of the keyboard flex cable under the top case behind the keyboard. Then pull the free end of the stiffener tab on the cable toward the front of the case—so the tab is not under the top case. *Check the cable again after lowering the keyboard into its final position.*

- When you lower the keyboard into the case, pull it toward the front so the three tabs at the back fit down into the case. Adjust the keyboard until the tabs lock under the top case.

---

## Removing the Heatsink

(HP Authorized Service Providers Only)

**Required Equipment**

- Small Phillips screwdriver.
- Needle-nose pliers.

**Removal Procedure**

1. Unplug the ac adapter, if present, and remove the battery.
2. Remove the keyboard (see the previous topic).
3. Remove the screw from the CPU heatsink into the PCMCIA shield.
4. Remove the two screws from the middle area of the CPU heatsink.
5. Lift the front edge of the heatsink slightly and slide it to the front about 5 mm—until the front edge of the fan clears the top case.
6. Lift the left side of the heatsink until it reaches about 45°, then slide the fan out of the case.
7. Remove the right hinge cover. Pull the right-front corner forward until it unsnaps, then lift it off.
8. Use a needle-nose pliers to unplug the fan cable from the motherboard.

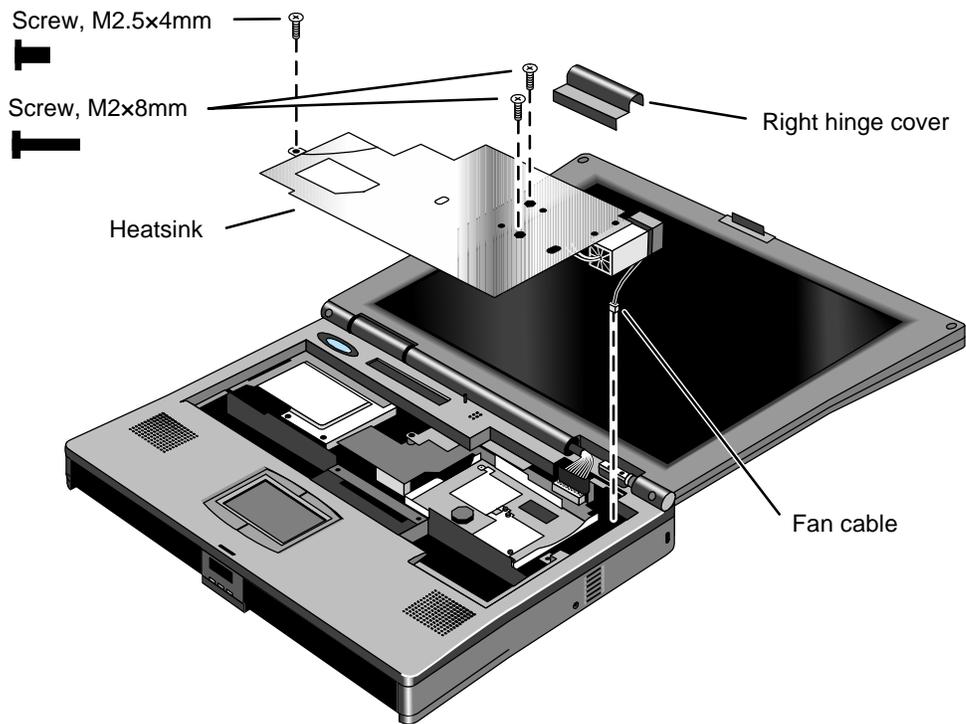


Figure 2-6. Removing the Heatsink

#### Reassembly Notes

##### Caution

Replace any thermal pads on the heatsink that are damaged.

- Plug in the fan cable before inserting the heatsink into the case.
- Tuck the fan cable under the heatsink.