

HP OmniBook 5000C/CT

Familiarization Guide

This guide is for experienced HP Response Center personnel, CEs, and reseller technicians, such as personnel who have already completed the HP Vectra PC family training course, or equivalent, and have at least six months of experience servicing the HP Vectra PCs.

It is a self-paced guide designed to train you to install, configure, and repair the OmniBook Notebook PC. You can follow it without having any equipment available.



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OmniBook Product Comparisons

	HP OmniBook 5000	HP OmniBook 4000	HP OmniBook 600
Size Closed	29.5 x 22.6 x 4.9 cm (11.6 x 8.9 x 1.93 in)	29.5 x 22.6 x 4.9 cm (11.6 x 8.9 x 1.93 in)	18.49 x 28.24 x 3.99 cm (11.12 x 7.28 x 1.57 in)
Weight	3.08-3.18 kg (6.8-7.2 lb)	DSTN (C): 3.13 kg (6.9 lb) TFT (CT): 3.27 kg (7.2 lb)	1.72 kg (3.8 lb)
Processor	75-, 90-, or 120-MHz Intel Pentium® processor	50-, 75- Intel 486DX2, or Intel 486DX4 100- MHz	50- or 75-MHz Intel 486DX2
Bus Architecture	32-bit PCI bus	ISA bus	ISA bus
Cache	Some models include: 256-KB external L2 cache	No L2 cache	No L2 cache
Display	10.4-inch diagonal: VGA (C/CT): 640 x 480 x 65,536 colors (DSTN or TFT) SVGA (CTS): 800 x 600 x 256 colors (TFT) PCI local bus video; 1.5-MB video RAM SVGA-out supports VGA & SVGA monitors (up to 1024 x 768 x 256 colors)	10.3-diagonal DSTN (up to 256 colors) or 10.4-inch diagonal TFT (up to 65,536 colors) VGA: 640 x 480 Local bus video; 1-MB display RAM SVGA-out supports VGA & SVGA monitors (up to 1024 x 768 x 256 colors)	8.6-diagonal DSTN or 640x480 backlit color VGA displays 9.5-inch diagonal TFT 64K colors from a 262K color palette VGA-out supports VGA and SVGA monitors (up to 1024x768x256 colors) Accelerated local bus video with 1-MB VRAM

	HP OmniBook 5000	HP OmniBook 4000	HP OmniBook 600
Power	<p>14.4Vdc Rechargeable Lithium-Ion or NiMH battery</p> <p>Battery life (approximate with one battery): 2 to 3 hrs</p> <p>Battery recharges to high level in 4 hrs using AC adapter while PC is on or off</p> <p>2-minute low-battery warning</p> <p>AC adapter 100 to 240 Vac (50 to 60 Hz) input; 12 Vdc, 3.3 A output</p> <p>Instant-on maintains computer in ready-to-work state for weeks on a full charge; returns you to your application or file instantly</p>	<p>14.4 Vdc rechargeable NiMH battery pack</p> <p>Battery life (approximate):</p> <p>3-4 hrs on DSTN DX2/50</p> <p>2-3 hrs on TFT DX4/100 AC adapter 100 to 240 Vac (50 to 60 Hz) input; 21 Vdc, 1.35 A output</p> <p>Suspend-resume power management.</p>	<p>9.6 Vdc rechargeable NiMH or Lithium Ion battery</p> <p>Battery life up to 3.0-3.5 hours.</p> <p>Battery pack recharges to high level in less than 2 hours using AC adapter</p> <p>2-minute (or less) low-battery warning</p> <p>AC adapter 100 to 240 Vac (50 to 60 Hz) input; 12 Vdc, 2.5 A output</p> <p>Instant-on maintains computer in ready-to-work state for months on a charge. Turn it on again, and you're instantly back where you were.</p>
Removable Modules	<p>Floppy disk drive (can be replaced with a second battery for double battery life)</p> <p>Hard disk drive</p> <p>RAM</p> <p>Battery</p>	<p>Floppy disk drive (can be replaced with a second battery for double battery life)</p> <p>Hard disk drive</p> <p>RAM</p> <p>Battery</p>	<p>Hard disk drive</p> <p>RAM</p> <p>Battery</p>
Mass Storage	<p>540-MB, 810-MB, or 1.2-GB hard disks</p>	<p>260-, 340-, 520-, or 810-MB hard disk options</p>	<p>170, 260, or 340 MB hard disk drive.</p> <p>Note: 170MB hard drives are no longer available.</p>
RAM	<p>8- or 16-MB Models upgradable to 64 MB</p> <p>8-, 16-, or 32-MB RAM cards</p>	<p>4-, 8-MB, or 16-MB RAM models upgradable to 32 MB</p>	<p>4-, 8-, 16- or 24-MB RAM models upgradable to 32MB (CT) 20MB or 24MB (C).</p>

	HP OmniBook 5000	HP OmniBook 4000	HP OmniBook 600
Audio	16-bit with Sound Blaster™ and MIDI support Stereo sound via two built-in speakers	16-bit, Sound Blaster-compatible Stereo sound via two built-in stereo speakers	Microsoft® Windows® sound in CT. Two built-in speakers in CT (not stereo sound)
I/O Ports	9-pin, 115,200 - b/s, RS-232 port 25-pin EPP and ECP parallel port SVGA-out (up to 1024 x 768 x 256); VGA-out (640 x 480 x 65,536 colors) 115,200-baud, bidirectional infrared Expansion bus connector SCSI-2 port NTSC/PAL video-out port Keyboard/mouse port Headphone/stereo-out port Stereo-in and microphone ports MIDI/joystick port	9-pin, 115,200 - b/s, RS-232 port 25-pin EPP and ECP parallel port SVGA-out (up to 1024 x 768 x 256) 115,200 - baud, bi-directional infrared Expansion bus connector Keyboard/mouse port Headphone/stereo-out port Microphone port Stereo-in port	9-pin, 115,200 - b/s, RS-232 port 25-pin bidirectional parallel port SVGA-out (up to 1024 x 768 x 256) 115,200 - baud, bidirectional infrared Enhanced port replicator connector Floppy drive port

	HP OmniBook 5000	HP OmniBook 4000	HP OmniBook 600
Expandability	<p>One Type III PCMCIA slot (or use as two Type II slots) with 3.3-V or 5-V support</p> <p>ISA-based slots, and parallel, serial, SVGA-out (up to 1024 x 768 x 256),</p> <p>keyboard, PS/2 mouse, MIDI/joystick, audio, and SCSI-2 ports</p>	<p>One Type III PCMCIA slot (or use as two Type II slots)</p> <p>Enhanced port replicator with parallel, two serial, SVGA-out (up to 1024 x768), keyboard, PS/2 mouse, and SCSI ports; and PCMCIA slot (concurrent Type II and Type III)</p>	<p>One Type III PCMCIA slot (or use as two Type II slots)</p> <p>External ultra-thin floppy disk drive (included with product)</p> <p>Enhanced port replicator with EPP parallel, serial, VGA-out (up to 1024 x 768), keyboard, PS/2 or Microsoft mouse, and SCSI ports; external floppy connector; and optional HP EtherTwist LAN card slot</p>
Pre-installed Software	<p>Microsoft Windows 95 or</p> <p>Microsoft Windows for Workgroups 3.11 *</p> <p>MS-DOS® 6.22</p> <p>Plug and Play BIOS</p> <p>HP PIM</p> <p>*dual-loaded</p>	<p>Microsoft Windows for Workgroups 3.11</p> <p>MS-DOS 6.22</p> <p>Laplink Remote Access™</p> <p>Easy connection to your desktop PC, network and desktop printers; works via cable or infrared.</p>	<p>Microsoft Windows for Workgroups 3.11</p> <p>MS-DOS 6.22</p> <p>Upgrade easily to Windows 95</p> <p>Plug and Play BIOS</p> <p>LapLink Remote Access</p> <p>Appointment Book</p> <p>HP Financial Calculator</p> <p>Phone Book</p> <p>IrDA infrared printing driver</p>
Security	<p>2-level password protection</p> <p>PC ID (tattooing)</p> <p>Kensington lock slots</p>	<p>User password</p> <p>Kensington lock slots</p>	<p>User password</p> <p>Kensington lock slots</p>

OmniBook 5000 Series: Product Features

Description Premium performance with Pentium processing and PCI bus, optimized for notebook PCs.

Models This is a complete list of all the standard OmniBook 5000 models now available. Factory special options are not included in this listing. New models will continue to be introduced.

Please refer to the Hewlett-Packard Corporate Price List for currently available models and options.

Product	Description	Part Number
HP OmniBook 5000C	P-75, PCI BUS, 540MB HDD, 8MB RAM, NiMH Battery, VGA DSTN Display, One year warranty.	F1126A
HP OmniBook 5000C	P-90, PCI BUS, 810MB HD Drive, 8MB RAM, NiMH Battery, VGA DSTN Display, One year warranty.	F1127A
HP OmniBook 5000CT	P-75, PCI BUS, 1.2GB HD Drive, 8MB RAM, NiMH Battery, TFT VGA Display, One year warranty.	F1128A
HP OmniBook 5000CT	P-90, PCI BUS, 1.2GB HD Drive, 8MB RAM, NiMH Battery, VGA TFT Display, One year warranty.	F1129A
HP OmniBook 5000CT	P-90, PCI BUS, 1.2GB HDD, 8MB RAM, L2 cache, SCSI, Lilon Battery, VGA TFT Display, Three year warranty.	F1130A
HP OmniBook 5000CTS	P-90, PCI BUS, 1.2GB HDD, 16MB RAM, L2 cache, SCSI, Lilon Battery, SVGA TFT Display, Three year warranty.	F1131A
HP OmniBook 5000C	P-75, PCI BUS, 540MB HDD, 16MB RAM, NiMH Battery, VGA DSTN Display, One year warranty.	F1141A
HP OmniBook 5000C	P-75, PCI BUS, 810MB HDD, 16MB RAM, NiMH Battery, VGA DSTN Display, One year warranty.	F1142A
HP OmniBook 5000C	P-75, PCI BUS, 1.2GB HDD, 16MB RAM, NiMH Battery, VGA DSTN Display, One year warranty.	F1143A
HP OmniBook 5000C	P-90, PCI BUS, 1.2GB HDD, 16MB RAM, NiMH Battery, VGA DSTN Display, One year warranty.	F1144A
HP OmniBook 5000CT	P-75, PCI BUS, 540MB HDD, 16MB RAM, NiMH Battery, VGA TFT Display, One year warranty.	F1145A

Product	Description	Part Number
HP OmniBook 5000CT	P-75, PCI BUS, 810MB HDD, 16MB RAM, NiMH Battery, VGA TFT Display, One year warranty.	F1146A
HP OmniBook 5000CT	P-90, PCI BUS, 540MB HDD, 8MB RAM, NiMH Battery, VGA TFT Display, One year warranty.	F1148A
HP OmniBook 5000CT	P-90, PCI BUS, 540MB HDD, 8MB RAM, Lilon Battery, VGA TFT Display, One year warranty.	F1149A
HP OmniBook 5000CT	P-90, PCI BUS, 1.2GB HDD, 16MB RAM, NiMH Battery, VGA TFT Display, One year warranty.	F1150A
HP OmniBook 5000CT	P-90, PCI BUS, 1.2GB HDD, 16MB RAM, Lilon Battery, TFT Display, One year warranty.	F1151A
HP OmniBook 5000CT	P-90, PCI BUS, 1.2GB HDD, 16MB RAM, L2 cache, SCSI, Lilon Battery, VGA TFT Display, Three year warranty.	F1152A
HP OmniBook 5000CT	P-90, PCI BUS, 1.2GB HDD, 32MB RAM, L2 cache, SCSI, Lilon Battery, VGA TFT Display, Three year warranty.	F1153A
HP OmniBook 5000CTS	P-90, PCI BUS, 1.2GB HDD, 8MB RAM, L2 cache, SCSI, Lilon Battery, SVGA TFT Display, Three year warranty.	F1154A
HP OmniBook 5000CTS	P-90, PCI BUS, 1.2GB HDD, 32MB RAM, L2 cache, SCSI, Lilon Battery, SVGA TFT Display, Three year warranty.	F1155A
HP OmniBook 5000CTS	P-120, PCI BUS, 1.2GB HDD, 16MB RAM, L2 cache, SCSI, Lilon Battery, SVGA TFT Display, Three year warranty.	F1198A
HP OmniBook 5000CT	P-120, PCI BUS, 1.2GB HD Drive, 16MB RAM, NiMH Battery, VGA TFT Display, One year warranty.	F1316A
HP OmniBook 5000C	P-75, PCI BUS, 810MB HD Drive, 8MB RAM, NiMH Battery, VGA DSTN Display, One year warranty.	F1340A
HP OmniBook 5000CT	P-90, PCI BUS, 810MB HD Drive, 8MB RAM, L2 cache, SCSI, Lilon Battery, VGA TFT Display, One year warranty.	F1341A

Product	Description	Part Number
HP OmniBook 5000CT	P-75, PCI BUS, 810MB HD Drive, 8MB RAM NiMH Battery, TFT Display, One year warranty.	F1342A
HP OmniBook 5000C	P-120, PCI BUS, 1.2GB HD Drive, 16MB RAM NiMH Battery, VGA DSTN Display, Three year warranty.	F1343A
HP OmniBook 5000CTS	P-120, PCI BUS, 1.2GB HD Drive, 32MB RAM NiMH Battery, SVGA TFT Display, Three year warranty.	F1343A

Accessories

Description	Part Number
8-MB RAM expansion card	F1134A
16-MB RAM expansion card	F1135A
32-MB RAM expansion card	F1136A
540-MB Hard Disk Drive	F1156A
810-MB Hard Disk Drive	F1138A
1.2 GB Hard Disk Drive	F1139A
3.5 inch Floppy Drive Module	F1079A/B
AC Adapter	F1044B
NiMH Battery Pack Module	F1073A
Lilon Battery Pack Module	F1137A
External Battery Charger (Charges up to two batteries concurrently)	F1074A
Automobile Adapter	F1064A
Docking system. Includes 2 full-length ISA slots, parallel, serial, SVGA-out, keyboard, PS/2 mouse, audio, MIDI/Joystick, SCSI-2 ports, supports PnP and hot docking. Motorized docking to ensure solid dock. Docking system only for the OmniBook 5000	F1189A

**OmniBook 5000
enhancements over
the OmniBook 4000.**

Pentium P54LM CPU, 90 MHz, Opti Viper chip set

Add L2 cache option, 256KB

Chips and Technologies Inc. (65545) PCI bus VGA Controller with 1.5 MB of display

SVGA Display option (800 x 600 x 256 colors)

New RAM modules: 8-MB, 16-MB, 32-MB

Instant-On feature added

5V Self-Refresh DRAM, Power supply changes for "Instant On"

Lithium Ion Battery

Fast SCSI-2 port on the notebook (on some models)

NTSC/PAL port for hook up to TV monitors

Midi/game port
Quick charge while on
Local Bus Enhanced IDE
Battery charging LCD status
Software wake up feature and includes HP PIM
Docking connector supports multimedia signals
Internal speakers can be turned off with docking station docked

What comes in the box

OmniBook 5000 mainframe
Battery pack
Recovery CD ROM and floppy disk
Microsoft Windows CD ROM
AC adapter (P/N: F1044B), localized power cord
User documentation: Quick Start Guide, support documentation, registration form
Y adapter for mouse/keyboard
Midi/Joy Stick adapter
Brochures for OmniBook accessories and Deskjet 320

Microprocessor

Intel Pentium, 120MHz w/L2 Cache, 256K, (synchronous burst cache)
Intel Pentium, 90-MHz w/L2 Cache, 256K, (synchronous burst cache) The 90-MHz from Intel is a P54LM chip which has a core voltage of 2.9 volts. Internal CPU bus speed: 90MHz, External bus speed: 60MHz, PCI bus speed: 33MHz.
Intel Pentium, 75 MHz (currently does not have L2 cache).

Bus Architecture

PCI (Peripheral Component Interconnect)

Memory and Memory Slots

Note: The OB5000 RAM is different then the OB4000. The differences are:

- 1) The OB5000 RAM is 64 bit vs the OB4000 32 bit.
- 2) The OB5000 incorporates SRDRAM (self refreshed dynamic RAM) to enable instant-on like the OmniBook 600.

Max Possible RAM: 64MB

Type of memory boards: HP Proprietary Daughter boards, 2 user accessible slots on the bottom case.

Expansion Memory Board Options:

8-MB RAM, p/n: F1134A
16-MB RAM, p/n: F1135A
32-MB RAM, p/n: F1136A

RAM Manufacturer: Multiple Vendors: NEC, Samsung, etc.

Cycle time: 70 ns

Possible Memory Configurations:

Memory Slot 1	Memory Slot 2	Total RAM
8MB	--	8MB
8MB	8MB	16MB
8MB	16MB	24MB
8MB	32MB	40MB
16MB	--	16MB
16MB	8MB	24MB
16MB	16MB	32MB
16MB	32MB	48MB
32MB	32MB	64MB

Mass storage

The hard disk drive can be removed by the user for easy upgrades. The hard drive is located on the bottom case and with the removal of one screw the hard drive can be replaced.

Hard drive manufacturer: IBM® and Toshiba (subject to change without notice).

2.5" Hard Drive	540MB	810 MB	810 MB	1,215MB
	AT Interface RLL	ATA2 Interface	ATA2 Interface	ATA2 Interface
	HDD (Toshiba) Note: VL models shipping 11/95 will have the 540MB option	HDD (Toshiba)	HDD (IBM) Note: Current plan is to dual source the 810MB hard drive, currently the Toshiba 810 is the major supplier	HDD (IBM) Note: Currently the 1.2GB drive is sole sourced from IBM.
Average seek (read)	12 ms	12 ms	12 ms	12 ms
Track to track seek	3 ms	3 ms	4 ms	4 ms
Full Track	NA	25 ms	23 ms	23 ms
Average latency	7.5 ms	7.1 ms	6.1 ms	6.1 ms
Rotational speed	4000 rev/m	4200 rev/m	4900 rev/m	4900 rev/m
Data transfer rate:				
Media Transfer rate	18.9-31.6 Mbits/sec	43.75 Mbits/sec (max.)	36.3 (inner), 57.0 (Outer) Mbits/sec	36.3 (inner), 57.0 (Outer) Mbits/sec
Buffer to host	6 Mbytes/sec	11.1Mbytes/sec	11.1Mbytes/sec	11.1Mbytes/sec
Buffer size	128 Kbytes static RAM	128Kbytes static RAM	64KB (read and write segmented buffer)	64KB (read and write segmented buffer)
Spindle start time	5 sec (typical)	5 sec (typical)	NA	NA
Reliability:				
MTBF: Power-on Hours	300,000 hours	300,000 hours	300,000 hours	300,000 hours
Unrecoverable errors	1 in 10 ¹³ (bits)	1 in 10 ¹³ (bits)	1/1.0E 13 bits transfer	1/1.0E 13 bits transfer
Configuration:				
2.5" Hard Drive	540MB	810 MB	810 MB	1,215MB

Sector Size	512 Bytes	512 Bytes	512 Bytes	512 Bytes
Recording Zones	4.00	8.00	8.00	8.00
User Cylinders	NA	NA	3478.00	3478.00
Cylinders	1053.00	1591.00	NA	NA
User sectors/Track at zone 0	63.00	63.00	NA	NA
Data Heads	4.00	8.00	4.00	6.00
Disks	NA	NA	2.00	3.00

Note: The hard disk drive can be removed by the user for easy upgrades. The hard drive is located on the bottom case and with the removal of one screw the hard drive can be removed. The hard drive plastic case on the OB5000 is changed from the OB4000 due to a design change requirement; therefore, they are not interchangeable between platforms.

Flexible disk drive

Internal 3.5 inch, 1.44-MB flexible disk drive is standard on all models. The flexible disk drive can be easily removed by the user and replaced with an additional battery pack to double battery life. This is part of the modularity features of the OmniBook 5000.

Manufacturer: F1079A = Canon; F1079B = NEC (subject to change)

Built-in I/O

9-pin, 115,000-b/s RS-232 port, UART 16550

25 pin bi-directional ECP and EPP parallel port

SVGA out (up to 1024 x 768 x 256 colors) with simultaneous viewing VGA out (640 x 480 x 65,536 colors)

115,000-b/s bi-directional infrared port. Note: Infrared hardware can support the IRDA (Infrared Data association) higher speed standards when available.

Expansion Bus Connector for connecting to the docking station.

SCSI-2 port, mini 50 pin. Controller: AMD, 32-bit PCI bus, 10 MBps, asynchronous max. transfer

NTSC/PAL port

Keyboard/mouse port

Headphone/stereo-out port

Microphone port

Stereo-in port

MIDI/joystick port

Display/Video

	TFT SVGA Display (CTS Models) Active Matrix	TFT VGA Display (CT Models) Active Matrix	DSTN Display (C Models)
Size	10.4 inches diagonal	10.4 inches diagonal	10.4 inches diagonal
Resolution	800 x 600 x 256 colors Refresh: 90ms (18 bit)	640 x 480 x 65,536 colors. Refresh: 90ms (18 bit)	640 x 480, 16 or 256 colors. Refresh: 160ms (8 bit)
Video bus, display RAM	32-bit PCI bus, 1.5 MB display RAM	32-bit PCI bus, 1.5 MB display RAM	32-bit PCI bus, 1.5 MB display RAM
Memory	1.5-MB display RAM	1.5-MB display RAM	1.5-MB display RAM

Display Manufacturer: Hitachi

Video graphics controller chip: Chips and Technologies CT 65545

External video resolution (both types): Supports VGA/SVGA external monitors with up to 1024 x 768 x 256 colors in noninterlaced mode. Resolution options:

Resolution	Maximum colors
640 x 480	64K
800 x 600	64K
1024 x 768	256.00

Auto detection of external monitor without rebooting

Note: Includes option to simultaneously display external video and notebook display.

TFT Display Quality

TFT display manufacturing is a high precision but imperfect technology and manufacturers cannot currently produce large displays that are cosmetically perfect. Most if not all TFT displays will 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.

The HP OmniBook TFT displays meet or exceed all TFT manufacturer's standards for cosmetic quality of TFT displays. HP does not warrant that the displays will be free of cosmetic imperfections.

TFT displays may have a small number of cosmetic imperfections and still conform to the display manufacturers cosmetic quality specifications.

Here are some guidelines to use in determining what action to take on a customer complaint of cosmetic imperfection in their TFT display:

1. The unit should be viewed in the customer's normal operating condition.

This means if the customer uses the unit predominately in DOS, or Windows, or in some other application or combination of applications, that is where the determination shall be made. Self test is not a normal operating condition and is not a sufficient tool to interpret display quality.

2. In the customer's normal operating mode:

- a. If 4 or more variant pixels appear clustered in the area approximated by a thumbprint on the display surface, then the display should be considered for replacement.

- b. On OmniBook 4000CT models, if more than 30 total pixels anywhere on the display are bad, then the display should be considered for replacement. On OmniBook 600CT and OmniBook 5000CT models, if more than 15 total pixels anywhere on the display are bad, then 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, it should be clear to the customer that cosmetic variations on the replacement display may also exist, and may require the customer to use a work-around to obscure the cosmetic imperfection.

4. Customers with cosmetic-based complaints only, that do not conform to the above conditions and tests will not normally be considered for display replacement. It will be left to the judgment of the HP-responsible person who, in working with the customer, to 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 over time that the industry will continue to improve in their ability to produce displays with fewer inherent cosmetic imperfections and will adjust our HP guidelines as the improvements are implemented.

User interface

Keyboard: 85-key touch-type keyboard with embedded numeric keypad and 12 Fn keys. Wrist pad provides comfort for extended keyboard use. External 6-pin mini-DIN interface for external keyboard and/or mouse connection. OmniBook 5000 supports the Y connector to use both the keyboard and mouse. (HP external keyboard (101-key) Part number C3756A)

Pointing device: Built in large 25MM trackball positioned in the center of the palm rest for easy access and comfort. Industry compliant to maintain software compatibility.

Optional pointing devices: Includes 6-pin mini-DIN interface for external PS/2 mouse connection. Also supports serial mouse connection.

Power

Battery types: Removable 14.4-Vdc rechargeable NiMH (same as OmniBook 4000) and new Lithium Ion battery [Lilon (OmniBook 5000 only)]. Both battery types do not require complete discharge before recharging. There is no "memory" effect that reduces battery life.

Battery Life; rundown data (approx.):

Processor/Display Type	No Power management (worst case scenario) Note: if 2 batteries of the <u>same type</u> are used, multiply by 2	With Power management (standard industry run down tests) Note: if 2 batteries of the <u>same type</u> are used, multiply by 2
90Mhz, L2 cache, 16MB DRAM, TFT SVGA Display	NiMh = 1.10 hr Lilon = 1:40 hr	NiMh = 2:00 hr Lilon = 2:50 hr
75Mhz, no L2 cache, 16MB, VGA, DSTN Display	NiMh = 1.40 hr Lilon = 2:20 hr	NiMh = 2:30 hr Lilon = 3:30 hr

Note: The Lilon battery will not work on the OmniBook 4000 -- the recharging circuitry will not accept it. The Lilon battery is double-keyed and will not plug in to the OB4000.

Recharge time:

NiMh: 2 hr 45 min
Lilon: 4 hrs

Note: If unit has 1 Lilon and 1 NiMh: 4 hrs + 2 Hr 45 min = 6 hrs 45 min. If unit has 2 Lilon: 4 hrs + 4 hrs = 8 hrs. User can utilize any combo of Lilon and NiMh batteries in the OB5000.

Low battery signals: 2-minute low battery warning. Unit will shut down if battery warning ignored to ensure data retention.

Instant on: Maintains OmniBook in ready-to-work state for weeks on a full charge; when turned on it returns *instantly* to previous state. No waiting for restoring from disk. Accomplished by the use of self refreshed DRAM technology. Note: The OmniBook 5000 utilizes the same technology as the OmniBook 600 to achieve the instant on feature.

Smart Battery: The OmniBook 5000 uses "Smart" battery technology. The battery itself contains an ASIC (Application Specific Integrated Circuit) that is able to continuously test and track the status of the battery. The OmniBook BIOS can then receive high-quality information about the battery condition directly from the hardware and not interrupt the CPU. The OmniBook 5000 no longer has to rely on software to determine the condition of the battery. The condition can be checked using two methods that receive information from the BIOS (CONFIGURATION [fn][f2], Windows Control Panel Power).

Energy S.T.A.R. compliant

AC Adapter: 100 to 240 Vac adapter (50 to 60 Hz) input; 12 Vdc, 2.5 A output. Same adapter as the OB600 (F1044B). OmniBooks will be standardized on the 12 volt adapter.

Use only an HP F1044B AC adapter (the type shipped with the OmniBook). Using any other adapter could damage the OmniBook and void the warranty. Always plug it into a grounded outlet.

Power management options: Advanced; Standard; Off; Custom.

The OmniBook 5000 includes a "fake" off mode while docked. This enables the user to turn off the OB5000 while docked and not loose any connectivity (such as to a network). Basically, this mode shuts down the display only and maintains all power to ports and the CPU.

A fully charged NiMH battery in storage will loose 20% of its charge per month in storage.

External battery charger

Designed for desktop use. Powered by the F1044B adapter

Charges two additional batteries

Size: 15.5 x 13.3 x 5.2 cm (estimated), no weight estimate at this date

Charges both the NiMh and Lilon batteries

HP part number: F1074A

Automobile adapter

HP part number F1064A - same as OmniBook 600

NiMH battery pack

HP part number F1073A

Lilon battery pack

HP part number F1137A

AC adapter

HP part number F1044B- same as OmniBook 600

Accessory Slots

User available PCMCIA Slots: 2 Type II or 1 Type III

Bus: Intel QuickSwap (ExCa)

The PCMCIA slots are fully industry compatible and supports the latest SystemSoft Card Services and Socket Services. The system will support a wide variety of PCMCIA cards.

PCMCIA controller chip manufacturer: Cirrus Logic (CL-PD6729). Note: This is fully compatible with the Intel 365 chip). Cirrus Logic is the original company that developed the PCMCIA controller and is considered the best in the industry.

The PCMCIA slots have been redesigned for easier insertion and removal on the OmniBook 5000

Audio Systems

High performance audio: 16-bit stereo sound, Sound Blaster hardware compatible. Supports Native Signal Processing (NSP) and is Plug and Play compatible.

Two stereo speakers with acoustic chambers

I/O: Headphone/stereo-out port; microphone port; Stereo-in port

IRQ default setting for soundblaster is 5.

Audio controller and Manufacturer: CS4232, Crystal

Audio controller characteristics:

Sampling: 8-48khz

Playback rate: 8-48khz

Distortion: maximum is 0.02% (Consideration should be taken regarding the type of external speakers used, as these can be a factor in the distortion created.)

Operating environment

Temperature: 0 to 35^o C (32 to 95^o)

DSTN display models: 41 to 104 degrees F (5 to 40 degrees C)

TFT display models: 50 to 104 degrees F (10 to 40 degrees C)

90% relative humidity at 104 degrees F (40 degrees C) maximum

Storage environment

Temperature: -40 to 149 degrees F (-40 to 65 degrees C)

90% relative humidity at 149 degrees F (65 degrees C) maximum

Environmental Testing

ESD as per IEC-801-2, EN 55024-2

Drop testing: 1 drop flat onto all six faces from .75 meter

Also tests for altitude, magnetic & radiated susceptibility & interference, shock & vibration.

Note: These are the tests that HP designs notebook computers to meet. Due to normal variations in the components of individual machines, some machines will perform better and some won't perform as well. HP does not guarantee that every notebook computer will meet these specifications.

BIOS

Plug and Play BIOS stored in EEPROM

User Upgradable via floppy drive

A corrupt BIOS that prevents the machine from booting requires a system board replacement. The BIOS can be corrupted by interrupting the a BIOS upgrade in the middle of the process.

Software and Operating System

Microsoft Windows for Workgroups 3.11 or Windows 95

The HP OmniBook 5000 family comes co-loaded with Windows for Work Groups and Windows 95. The user selects the operating system of choice and the other is auto deleted.

MS-DOS 6.22

Supported Operating Systems

MS DOS version 6.22*

Microsoft Windows for Workgroups 3.11*

Microsoft Windows 95*

Microsoft NT workstation 3.51/4.00.**

OS/2[®] version 3.0**

* Supported to the application level.

** Only setup and configuration supported.

Security

Physical security from Kensington Lock

2 - level password protection (admin and user levels), PC ID (tattooing)

Password Decode

If the user forgets the system password, there is a master password that will unlock the OmniBook. The user calls Technical Support to determine this master password as follows:

1. Support will tell the user the keys to type at the password entry screen.
2. The OmniBook generates and displays an encoded master password. This is displayed under the normal password entry area. At this point, this is the only password that will unlock the OmniBook unless the user presses [ESC] to remove the encoded master from the password entry screen. Then the user's stored password can be entered.
3. The user reads the encoded master password to Support.
4. Support runs a program that decodes the encoded password, and reads the decoded password (alphanumeric) to the user.
5. The user types in the decoded password.
6. OmniBook decodes the encoded master password it generated and compares it to the decoded password typed in by the user.
7. If the two passwords match, the OmniBook is unlocked. The forgotten password is automatically erased. Support can then guide the user through the process of entering a new password.
8. If the two passwords do not match, the previous sequence must be repeated until the user correctly enters a master password.

The encoded master password is an eight-character alphanumeric sequence that the OmniBook generates at random every time the appropriate keys are pressed in the password entry screen. Because it is generated randomly, a master password can only be used to unlock the OmniBook once. If the user forgets the password at another time, it will require another call to Support. (If the user presses the appropriate keys by mistake, pressing [ESC] will allow entering the stored password.)

Password Decode Policy

The password descramble programs for the HP OmniBook PCs are protected as HP Company Private information. They may not be copied, backed-up, printed or distributed. There are only six official copies of each program.

In addition to protecting the program itself, its use is also controlled. Hewlett-Packard and authorized support providers must ensure with written evidence that the OmniBook that is being "descrambled" is actually in the hands 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 they are 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 the behalf of the customer is not evidence of ownership. In addition, HP will not descramble a unit for any non-owner, even if it involves 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, you must log the name, serial number and date of the running of the descramble program, and file the written backup with the log. The log and backup is subject to standard record's retention process and review.

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

Notebook Hardware Structure

Field Replaceable Assemblies

Torque Specification: For M2.6 screws; 5.0 +/- 1 in-lb

Installing memory (End User Replaceable)

Caution: To avoid damage from electrostatic discharge, be sure to ground yourself prior to installation or removal of memory.

The OmniBook 5000 family has two memory locations for expanding system RAM. The memory locations are under the cover on the back of the computer. Remove the cover by lifting at the finger indent.. The factory installed RAM module is located in the back pair of sockets. To add an additional 8MB, 16MB, or 32MB of RAM, use the front location. To expand beyond 40MB or 48MB of memory, you must discard the factory installed card and replace it with either a 16MB or 32MB memory module.

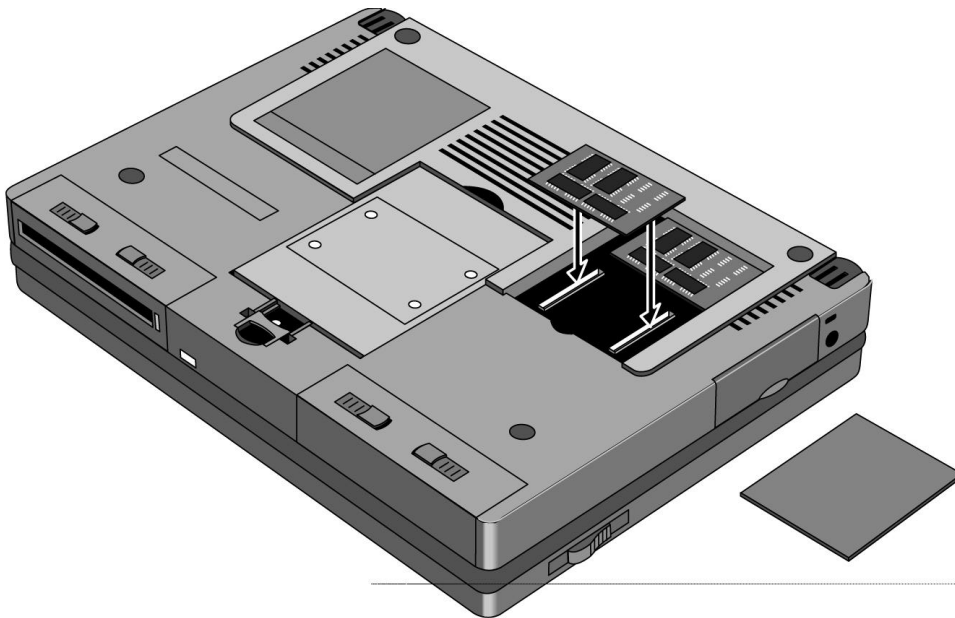


Figure 1 - Memory Door and Slot

Battery Module and Floppy Disk Drive Module (End User Replaceable)

Caution: Do not mutilate, puncture, or dispose of the battery in fire. The battery can burst or explode, releasing hazardous chemicals. A rechargeable battery pack must be recycled or disposed of properly.

The Battery and Floppy Disk Drive Modules are user replaceable. A second Battery Module may be installed in the Floppy Disk Drive Bay. This doubles the battery life of the OmniBook 5000.

To remove either module, turn the OmniBook over. Squeeze the two levers together and slide the module forward.

Warning: Be careful not to short the terminals on the battery. This can generate a lot of heat, causing burns and fire as well as damage to the battery.

Reverse the procedure to install a new Battery or Floppy Disk Drive Module.

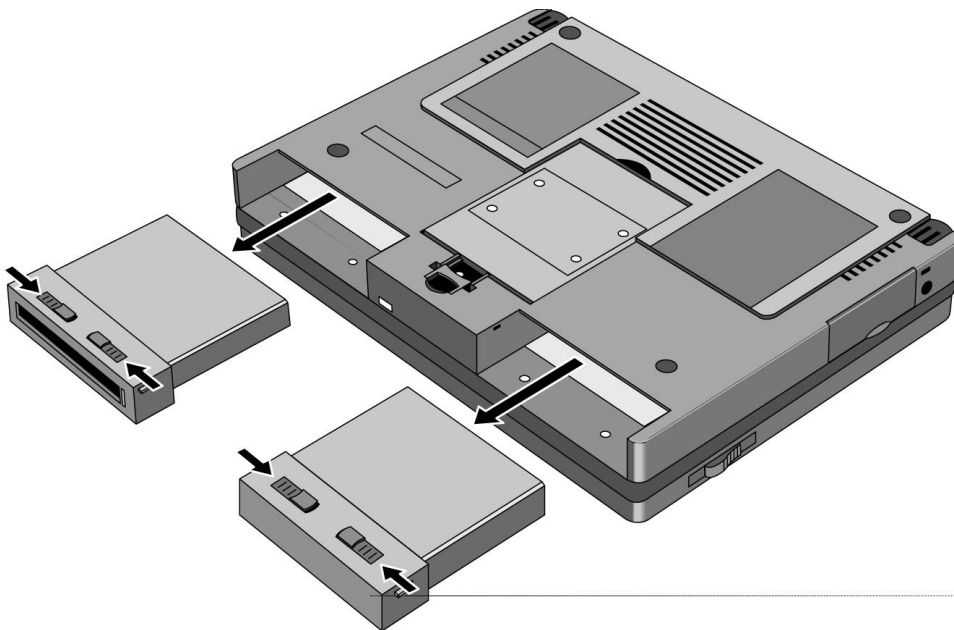


Figure 2 - Floppy Drive and Battery

Hard Disk Drive (End User Replaceable)

The Hard Disk Drive Module is user replaceable.

Caution: Handle the hard disk drive only by its edges to avoid damage from electrostatic discharge.

To remove the Hard Disk Drive Module, remove the screw under the latch on the hard drive. Push the Hard Drive Module Forward - do not pull on the latch - it is not strong enough, use the back edge of the module in front of the depression in the bottom case instead.

Reverse the procedure for installation. To ensure proper pin placement, hold the Hard Disk Drive by the sides, being careful not to touch the pins. Turn the OmniBook on its backplane (where all the ports are) and place the hard drive into the slot and allow gravity to drop the drive down the remaining distance into the slot. The pins will line up and a small push thereafter will ensure it is seated correctly.

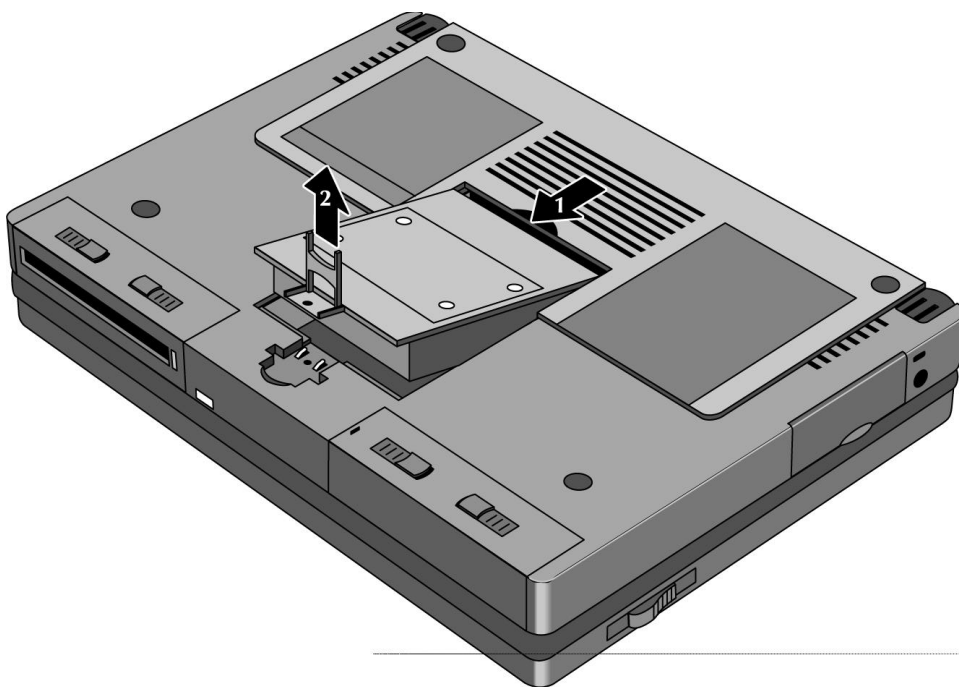


Figure 3 - Hard Disk Drive

Small parts

(End User Replaceable)

The expansion door, I/O door, rubber feet, and memory door are all replaceable.

To remove the I/O door, open it fully. Flex the door so that the center hinge separates from backcase. Continue to flex until side pins clear holes in back case. To reassemble, simply reverse the procedure.

The expansion door is removed by opening it fully and flexing it in the middle until the pins in the backcase disengage from the slots in the side of the door. To reassemble, reverse the procedure.

The rubber feet are adhered to the bottom case with adhesive.

The memory door snaps on and off.

Icon Assembly and Display Module (HP Authorized Service Providers Only)

To remove the display module and/or Icon Assembly on the OmniBook 5000C, CT, and CTS turn the unit over, raise the feet, and withdraw the two Phillips screws from under the feet in the bottom back corners of the unit (see illustration below).

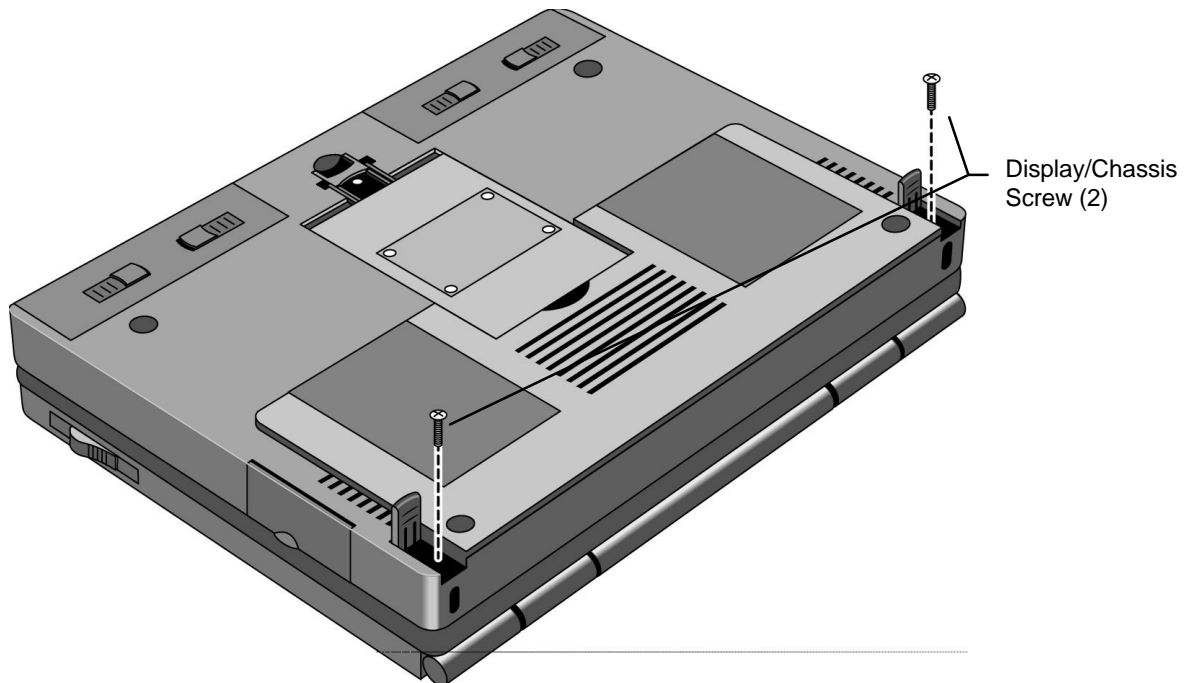


Figure 4 - Display Screws

Turn the unit right side up and dislodge the Icon assembly by placing the thumbs on each edge of the assembly and pushing lightly (see illustration below). The front edge of the Icon Assembly will lift up slightly



Figure 5 - Icon Assembly

Lift the display straight up about 1 inch. The Icon Assembly will lift up with the display. Move the Icon assembly out of the way. The cable from the Icon Assembly to the PC board does not need to be removed if only the display is being removed. Otherwise, slide the connector sleeve up to remove the Icon Assembly cable.

If only the Icon assembly is to be removed, the display may be lowered back into position.

To remove the Display Assembly, remove the two cables attaching the display module to the PC board. Lastly, remove the two screws attaching the grounding straps to the PC board. The display can now be removed the rest of the way.

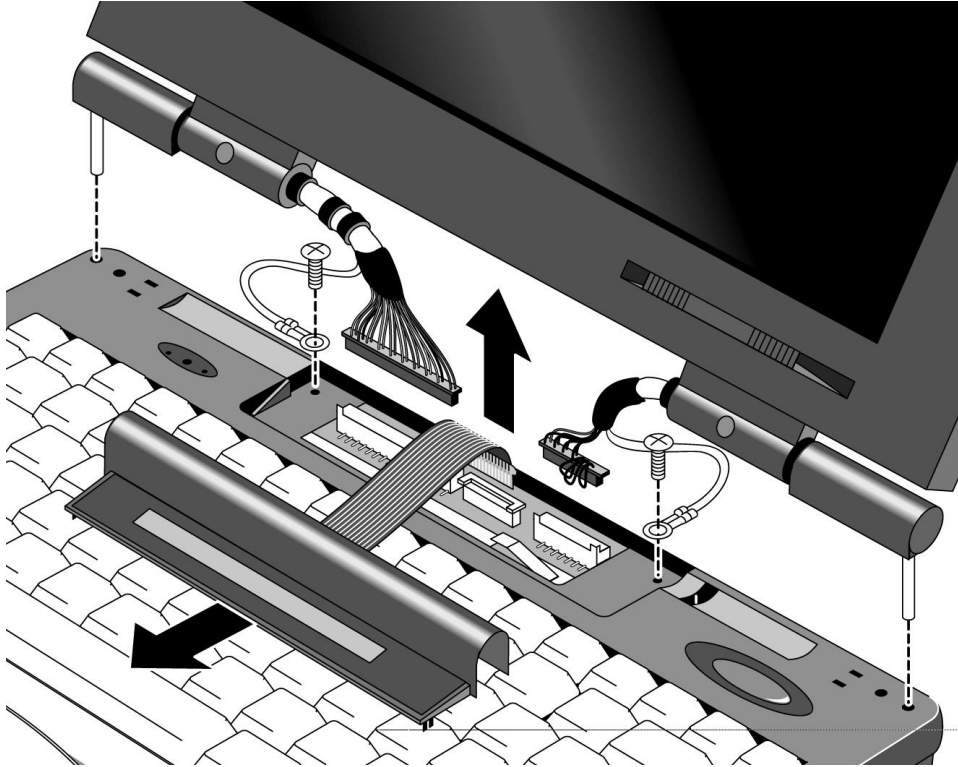


Figure 6 - Display Removal

To reinstall the display module or Icon Assembly, just reverse the above procedure. **Caution: To avoid crimping the Icon Assy Flex Cable, ensure that it is tucked inside of the Icon Assy “tunnel.”** When reinstalling the Display Module, make sure that the two posts on either side of the display line up parallel with their slots in the top case. If they are not parallel, the post will get caught inside the top case before the display is seated completely. If this happens, remove the display and line the posts up properly.

Palm Rest Assembly and Track Ball Assembly (HP Authorized Service Providers Only)

Before removing the Palm Rest Assembly or Track Ball Assembly the battery and the floppy disk drive modules (a second battery may be installed in to the floppy disk drive bay) must be removed. See instructions for removal of these two modules.

In the floppy disk drive and battery bays are four Phillips screws, two in each bay. Remove these screws while the unit is upside down. If the keyboard is to be removed withdraw the two Phillips screws under the Hard Disk Drive as shown in the illustration below.

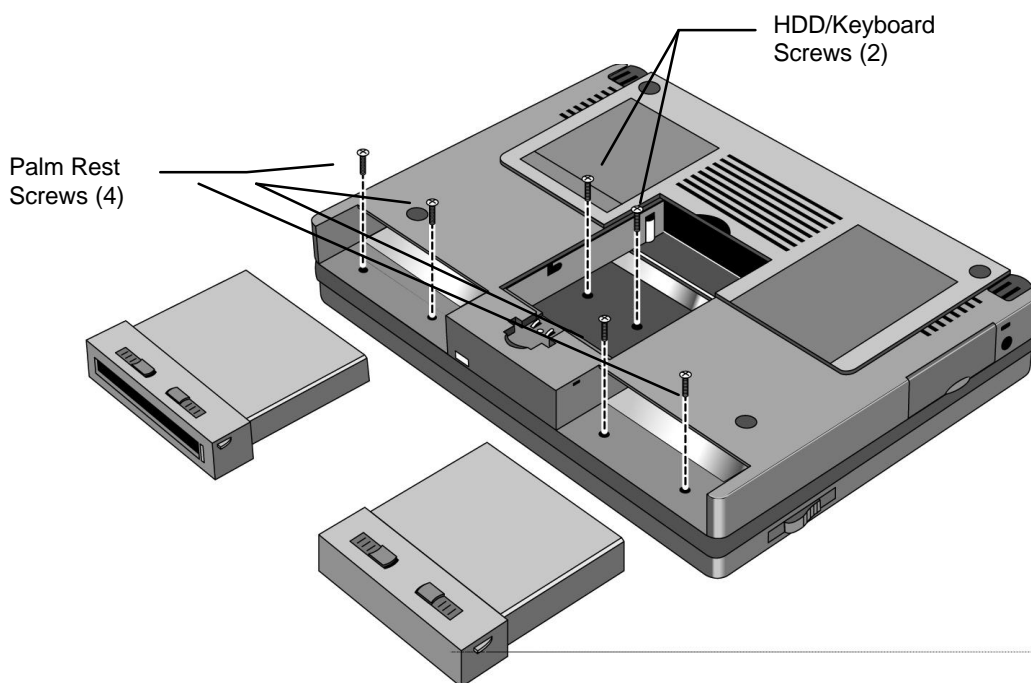


Figure 7 - Lower Case Screws

Turn the unit right side up, open the lid and lift up on the Palmrest. Disconnect the cable attaching the Palmrest to the Track Ball Assembly.

To remove the Track Ball Assembly, disconnect the Track Ball Assembly cable and remove the one screw that holds the Track Ball Assembly in place (see illustration below). The Track Ball Assembly then lifts out.

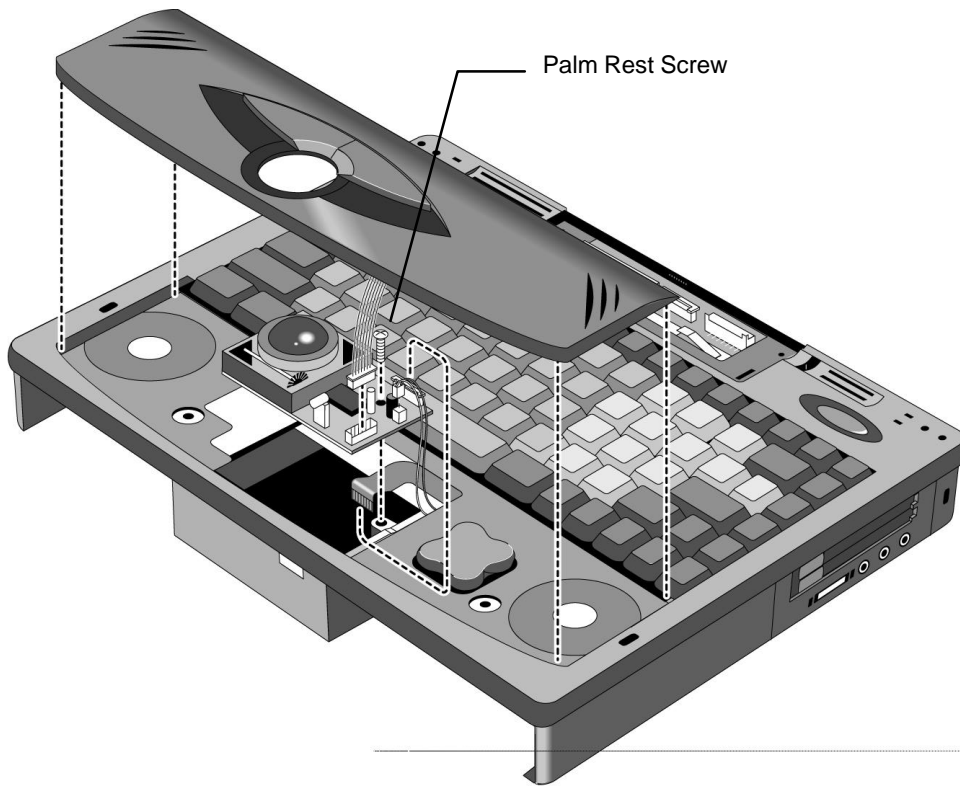


Figure 8 - Palm Rest and Track Ball Assemblies

To replace, reverse the above procedure.

Keyboard Assembly and Power Board (PCB Assy DC Power PI-DC) (HP Authorized Service Providers Only)

To remove the Keyboard Assembly, lift the front edge of the keyboard and rotate the keyboard up. Next, remove the connecting PC board by pulling up on the pull tabs attached to the back. The cables can then be disconnected by sliding the sleeves out on the connecting PC board connectors.

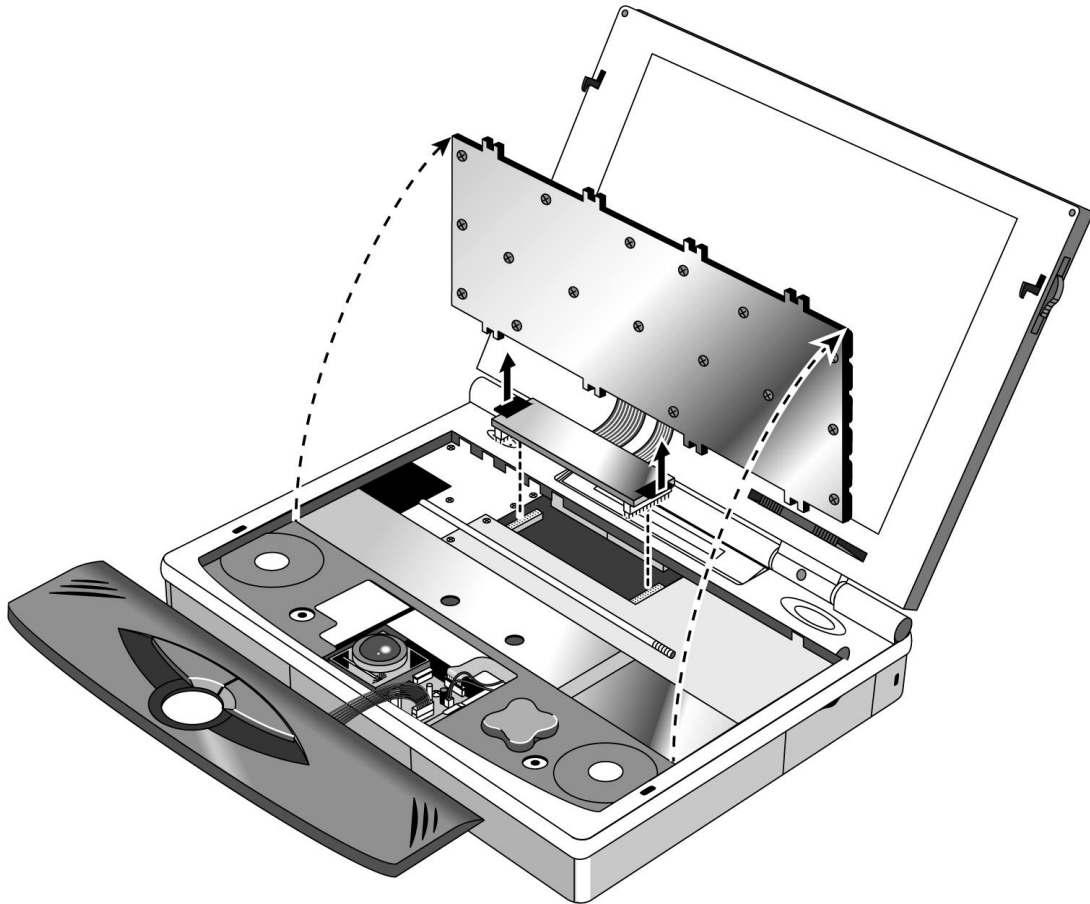


Figure 9 - Keyboard and Power Board

Upper Cover Assembly and Icon Board (PCB Assy PI-ICON) (HP Authorized Service Providers Only)

Required Equipment:

- Phillips Screwdriver

Components to remove prior to Upper Cover:

1. HDD and Battery
2. Icon Assembly and Display Module
3. Palm Rest Assembly
4. Keyboard Assembly and Power Board (PCB Assy DC Power PI-DC)
5. Heat Spreader Assembly

Removal Procedure

1. Remove Battery and Hard Disk Drive.
2. Follow the Icon Assembly and Display Module Removal Procedures to remove these components.
3. Follow the Keyboard Assembly and Power Board Removal Procedure to remove these components.
4. Remove the Heat Spreader by unfastening the two Heat Spreader/CPU Screws, the Display/Chassis Screw, and the Palm Rest Screw (see illustration below). **Caution: Do not remove the Heat Pipe from the Heat Spreader; any flex in the pipe will diminish its effectiveness.**

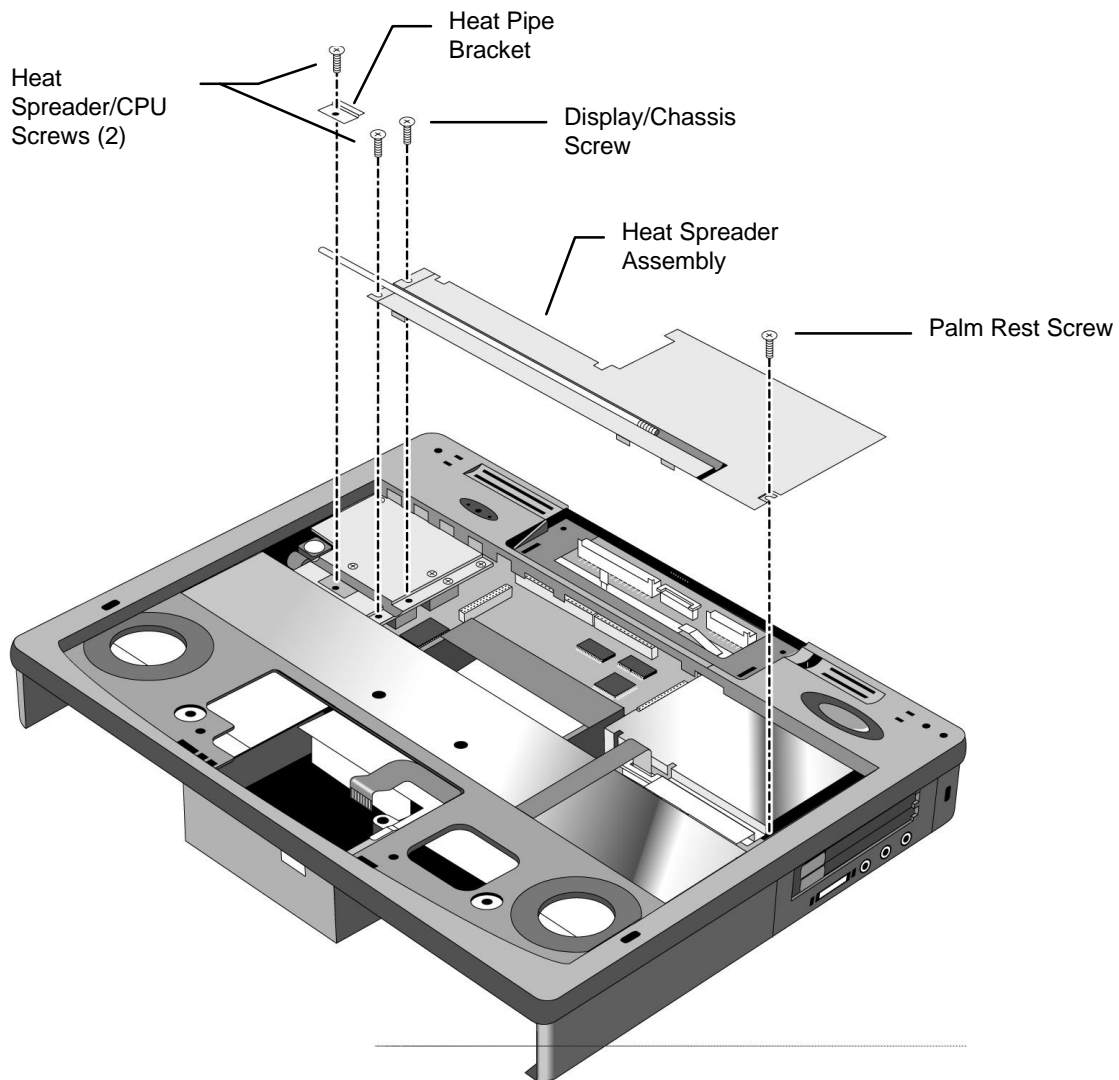


Figure 10 - Heat Spreader Assembly

5. Remove the Upper Cover by removing the Palm Rest Screw on the left side of the cover. Next, pull the right side outward until it comes off the snap. Once the cover clears the snap, the left side will lift free (see illustration below). The Microphone Assembly may dislodge from the Upper Cover during removal. If it does not, gently pull the Microphone Assy from the pocket in the Upper Cover. If necessary, the Microphone Assy may be removed from the Icon Board at this point.

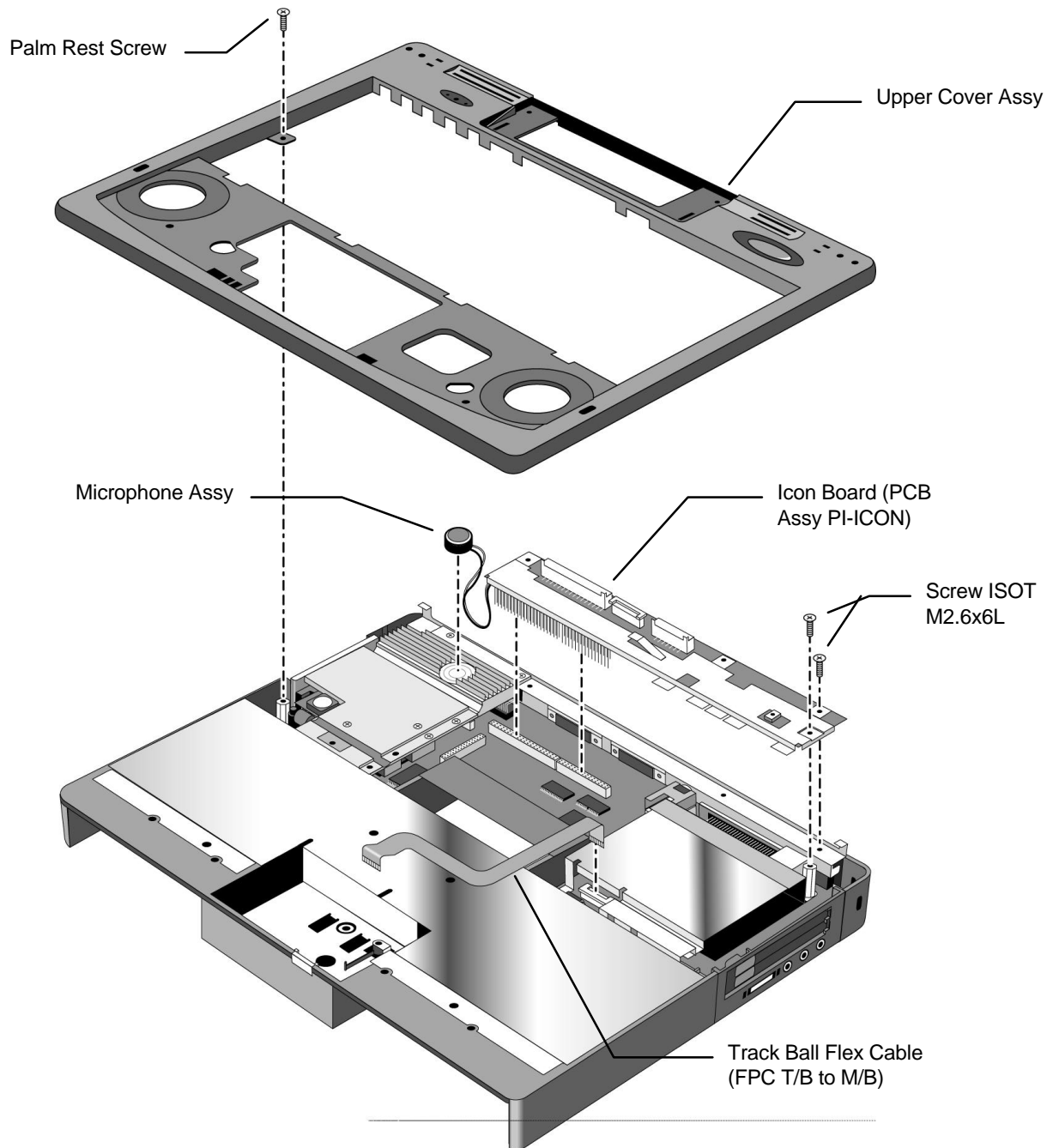


Figure 11 - Upper Cover and Icon Board

7. Remove the two screws in the right corner of the Icon Board (PCD Assy PI-ICON). Gently rock the Icon Board forward and back while pulling upward until the pins dislodge from the connector.

Replacement Procedure:

1. Reverse the *Removal Procedure* with the replacement component(s).

CPU Module and Heat Sink

(HP Authorized Support Providers Only)

Required Equipment:

- Phillips Screwdriver

Components to remove prior to CPU and Heat Sink:

1. HDD and Battery
2. Icon Assembly and Display Module
3. Palm Rest Assembly
4. Keyboard Assembly and Power Board (PCB Assy DC Power PI-DC)
5. Heat Spreader Assembly
6. Upper Cover and Icon Board (PCB Assy PI-ICON)

Removal Procedure

1. Remove Battery and Hard Disk Drive.
2. Follow the Icon Assembly and Display Module Removal Procedures to remove these components.
3. Follow the Keyboard Assembly and Power Board Removal Procedure to remove these components.
4. Follow the Upper Cover and Icon Board (PCB Assy PI-ICON) Removal Procedures to remove these components. Note, the Icon Board does not need to be removed to gain access to the CPU Module and Heat Sink. However, removing it does create additional space for maneuverability
5. Remove the two screws located towards the back of the CPU Module (see below illustration).
6. A portion of the Heat Sink is located underneath the CPU Module. However, removing the Heat Sink prior to the CPU Module facilitates the removal of the CPU Module. To remove the Heat Sink, unfasten the two screws and lift up on the back of the Heat Sink. This will remove the Heat Sink and dislodge the front socket of the CPU Module.
7. The CPU Module can now be removed completely by gently pulling up and rocking the component back and forth. Be aware of the Contact Spring Docking Pin (see below illustration) as it will easily fall free of the System Board.

Replacement Procedure:

1. Reverse the *Removal Procedure* with the replacement component(s).

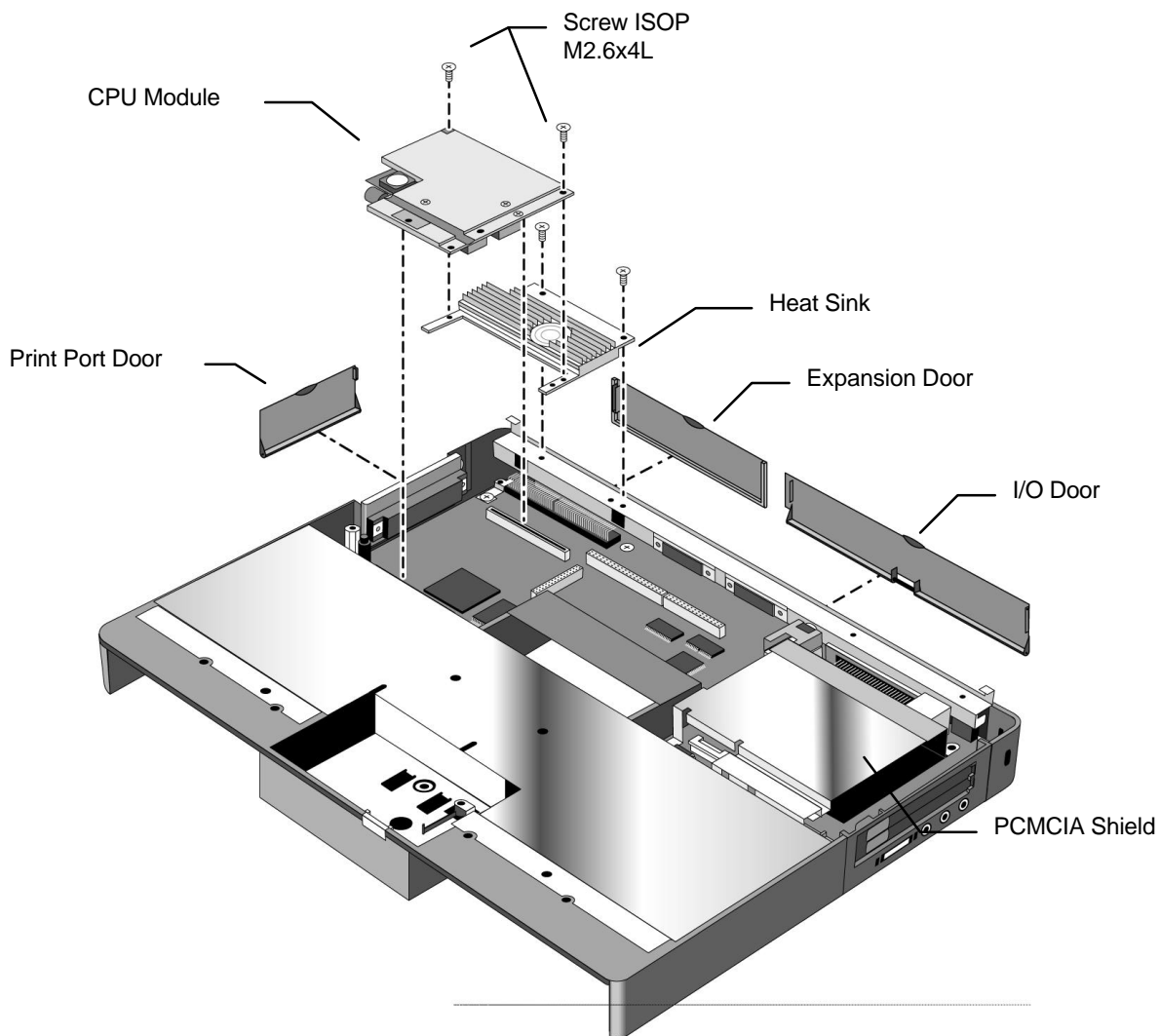


Figure 12 - CPU Module and Heat Sink

System Board (PCB Assy PI-586) (HP Authorized Support Providers Only)

Required Equipment:

- Phillips Screwdriver
- Nutdriver (5 mm or 3/16 in)

Components to remove prior to CPU and Heat Sink:

1. HDD and Battery
2. Icon Assembly and Display Module
3. Palm Rest Assembly
4. Keyboard Assembly and Power Board (PCB Assy DC Power PI-DC)
5. Heat Spreader Assembly
6. Upper Cover and Icon Board (PCB Assy PI-ICON)
7. CPU Module and Heat Sink

Removal Procedure

1. Remove Battery and Hard Disk Drive.
2. Follow the Icon Assembly and Display Module Removal Procedures to remove these components.
3. Follow the Keyboard Assembly and Power Board Removal Procedure to remove these components.
4. Follow the Upper Cover and Icon Board (PCB Assy PI-ICON) Removal Procedures to remove these components.
5. Follow the CPU Module and Heat Sink Removal Procedures to remove these components.
6. Disconnect the Track Ball Flex Cable (FTB T/B to M/B) (see Figure 11).
7. Remove the five Palm Rest Screws and three Standoffs (see below illustration).
8. Lift the PCMCIA Shield off of the System Board.
9. The System Board can now be lifted out. Note that the Bezel Assembly will be removed along with the System Board.

Replacement Procedure:

1. Reverse the *Removal Procedure* with the replacement component(s). Note, the Bezel Assy should be placed in the Lower Cover Assy first. The System Board can then be positioned by inserting the audio ports (right side) through the Bezel and lowering the left side into place.

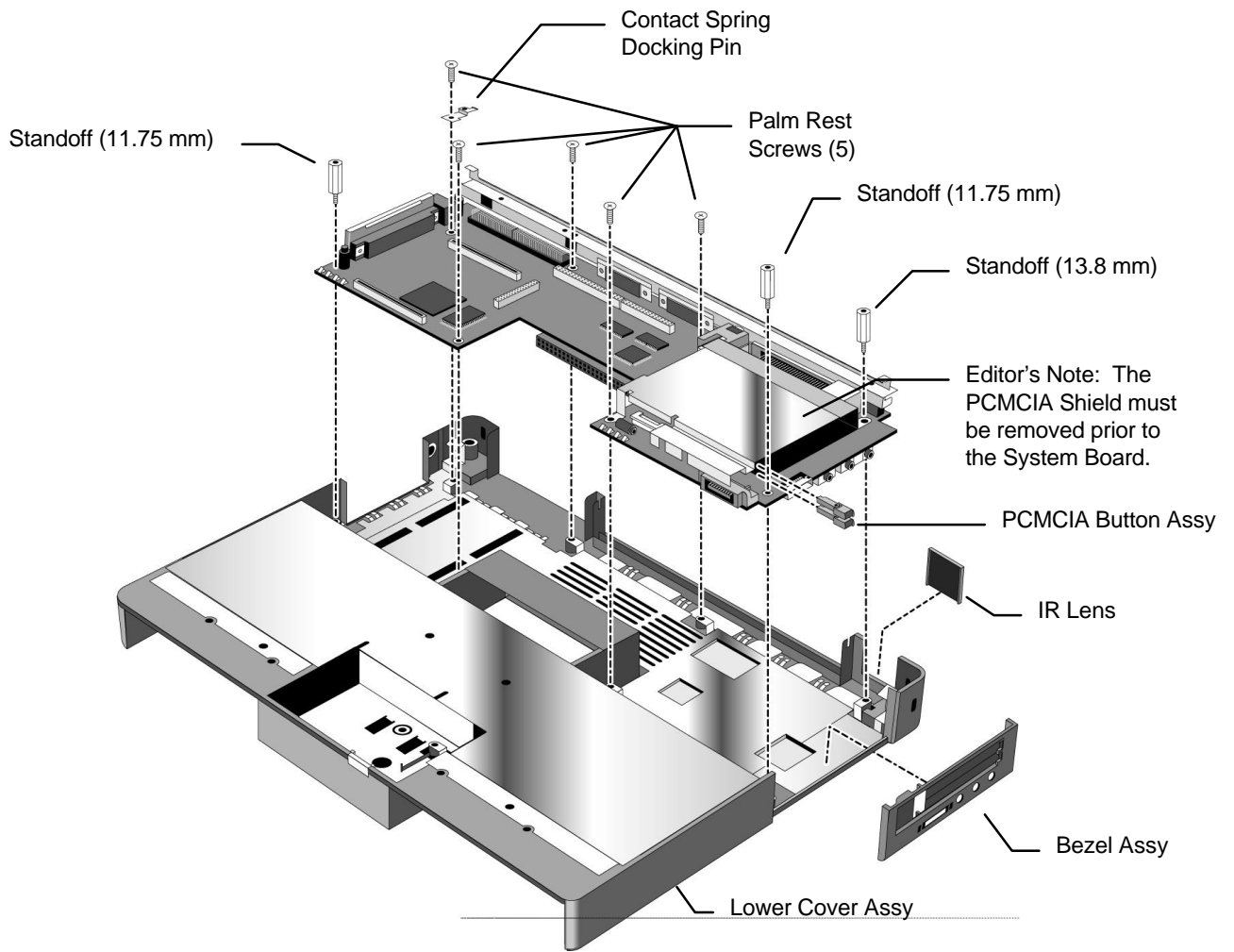
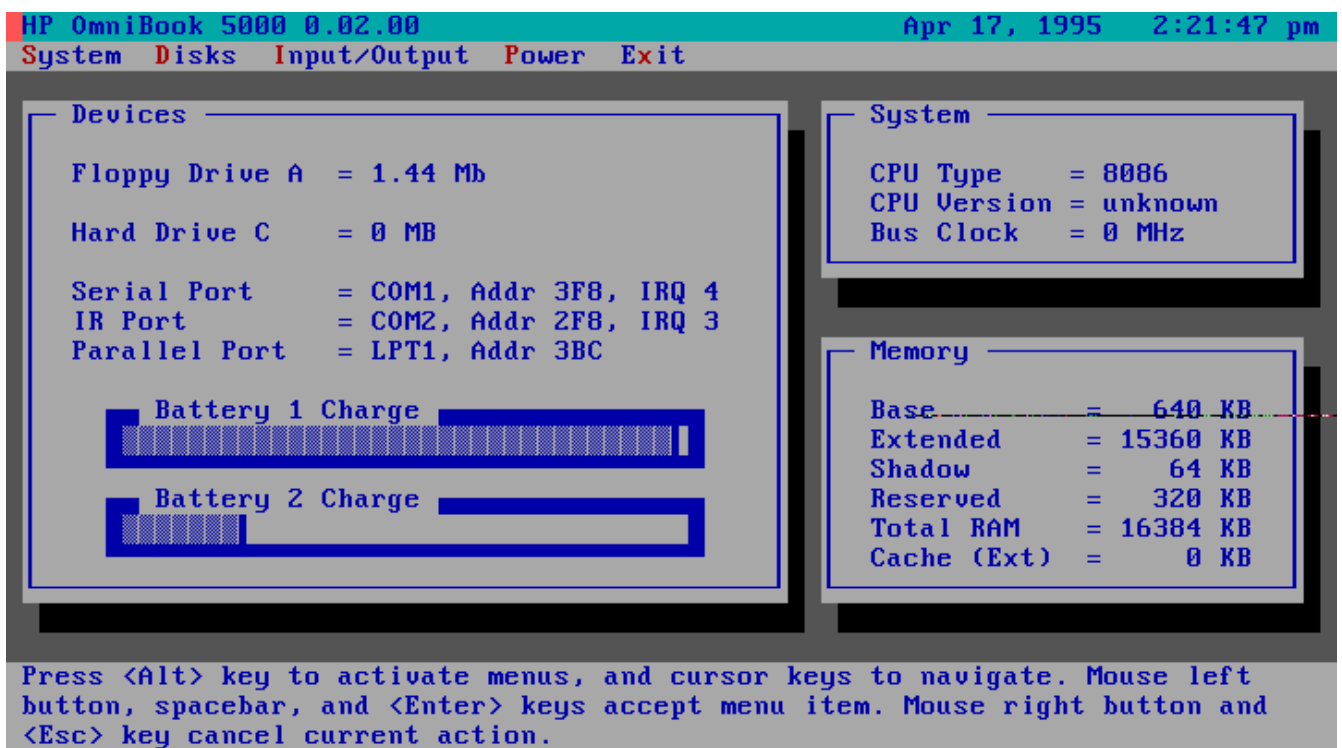


Figure 13 - System Board

Configuration and Setup

Main Configuration Screen

Pressing [fn][f2] invokes the BIOS setup and configuration utility. Users can check system configuration and changes settings using [f] keys from this screen. This is the most accurate place to check battery and system status. Pressing [f3] from this screen exits back to the current application. The setup/configuration utility is operating system independent.



HP OmniBook 5000 0.02.00 Apr 17, 1995 2:21:47 pm

System Disks Input/Output Power Exit

Devices


Floppy Drive A = 1.44 Mb


Hard Drive C = 0 MB

Serial Port = COM1, Addr 3F8, IRQ 4

IR Port = COM2, Addr 2F8, IRQ 3

Parallel Port = LPT1, Addr 3BC

Battery 1 Charge 

Battery 2 Charge 

System

CPU Type = 8086

CPU Version = unknown

Bus Clock = 0 MHz

Memory

Base = 640 KB

Extended = 15360 KB

Shadow = 64 KB

Reserved = 320 KB

Total RAM = 16384 KB

Cache (Ext) = 0 KB

Press <Alt> key to activate menus, and cursor keys to navigate. Mouse left button, spacebar, and <Enter> keys accept menu item. Mouse right button and <Esc> key cancel current action.

Power Screen

The power screen contains the current power level of the main and auxiliary battery. The auxiliary battery charge status does not show up if no auxiliary battery is installed. Power conservation settings consists of the options shown which allow customer selection of "Turn OFF" (instant off), "Auto Save-to-disk", "HDD power-down", and "CPU power-down".

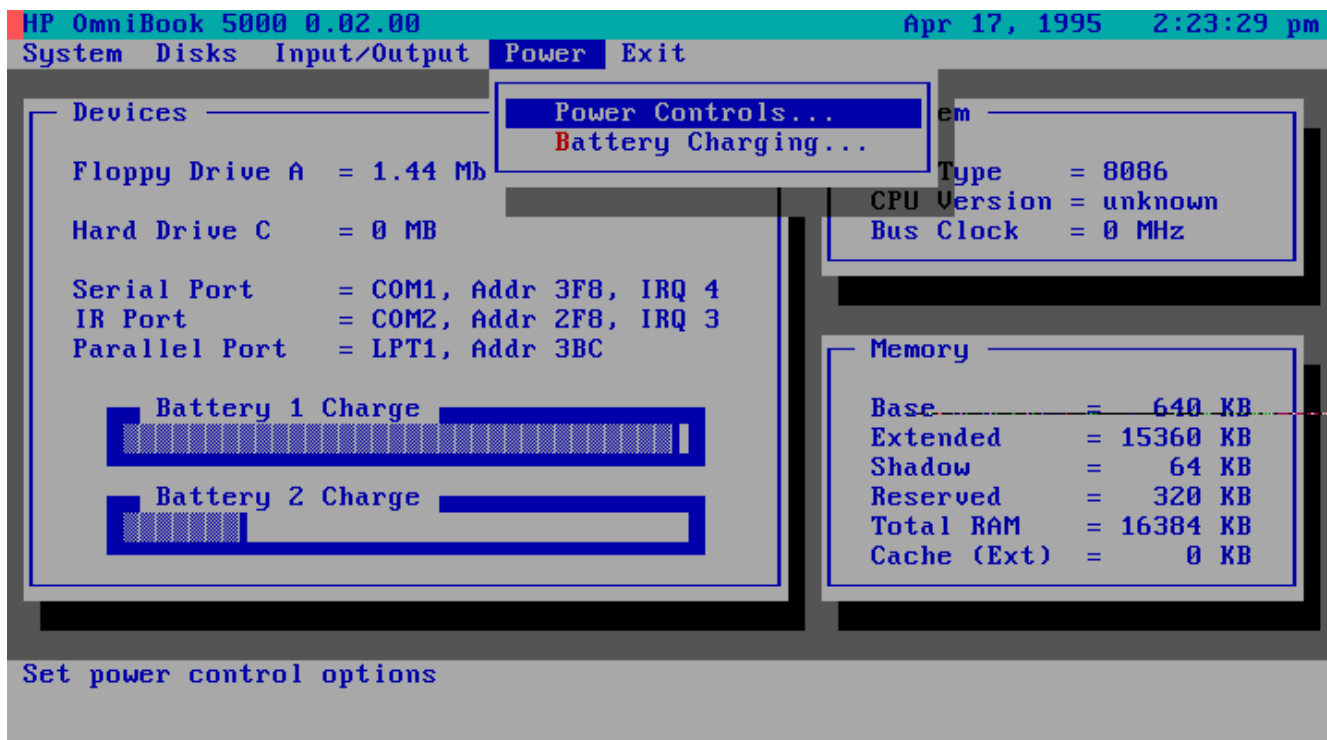


Figure 15 - Power Control Screen

Power Configuration

To implement the power management capabilities, the following settings are set by the user from the power setup screen.

Setting:	Parameters:	Default:	Comments:
Power Saving	Off/On	On	Enables power saving techniques.
Turn OFF	Disable/Time (1 - 30 minutes or never)	3 minutes	How long the system will stay in Run with (no activity). If disabled it will stay in Run.
Auto Save-to-disk	Disable/Time (6 hours to 7 days or never)	1 day	How long the system will be in off before the entire state of the computer the suspend state. If disabled it will stay in the suspend state.
HDD power-down	Disable/Time (1-30 minutes or never)	3 minutes	HDD will turn off, system has ability to run. HDD will spin up when access required.
CPU power-down	512ms- 8seconds	2 sec	CPU clock rate will be reduce if the system has been idle for the selected delay. The clock rate will be restored when system activity is detected.

System Configuration

The system screen contains the processor and memory information for the user to glance at. It also allows the user to set the date and time. The real time clock is not changed until the user exits the setup program. The user can also enable or disable the processor cache.

When the user decides to enable a password, a pop up window requests the old password, new password and confirmation of the new password. Hard drives or mass storage are not affected by the password--only the turn-on condition.

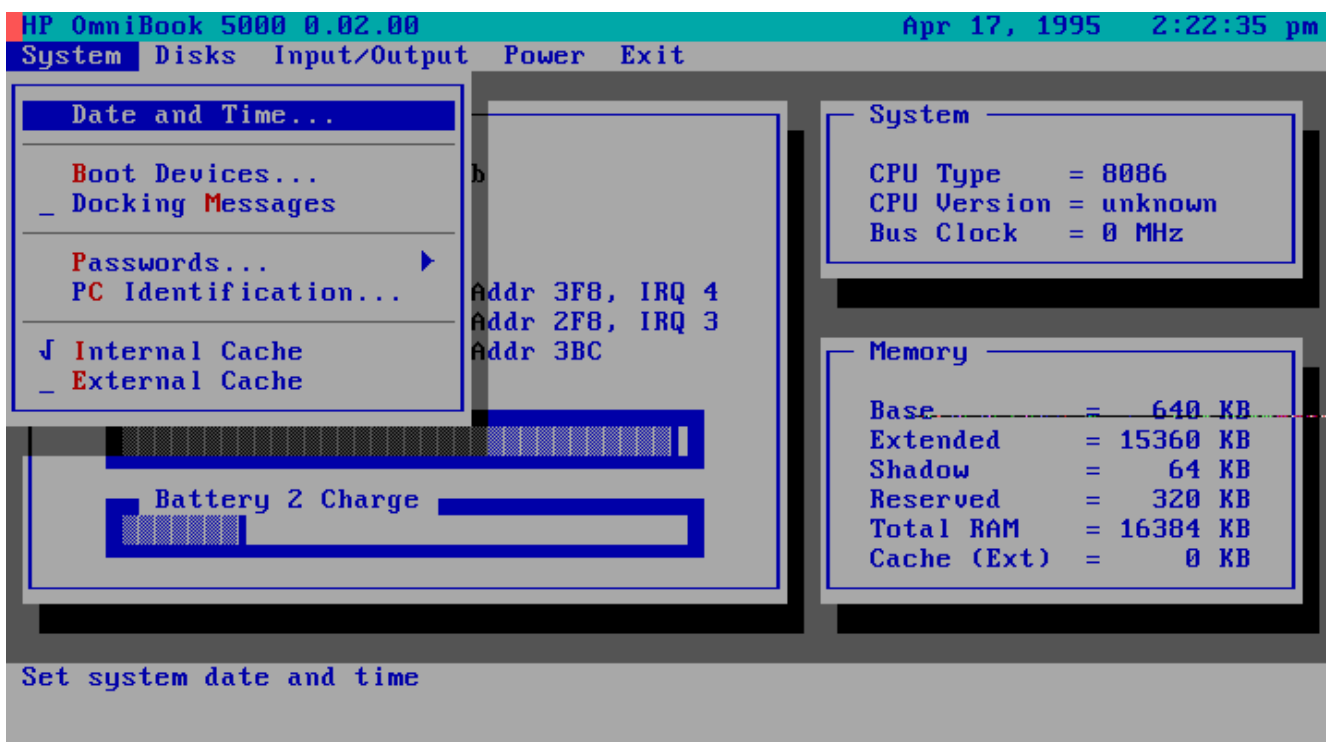


Figure 15 - System Configuration Screen

Input/Output Configuration

Setting	Parameters	Default	Comments
COM Ports	Serial Port (None, COM1, COM4) I/R Port (None, COM1,COM4)	Serial Port: COM1, Addr 3F8, IRQ 4 I/R Port: COM2, Addr 2F8, IRQ 3	
LPT Port	None LPT1, Addr 378 LPT2, Addr 278 LPT3, Addr 3BC	LPT1, Addr 378	
LPT Type	Bi-directional (PS-2) Standard AT (Centronics)	Bi-directional	
Keyboard Setup	Key Delay (1/4 - 1sec) Key Repeat Rate (2cps - 30csp)	Key Delay 1/2 sec Key Repeat Rate 10CPS	
External Devices	VGA Display Device, Television type	VGA Display Device - external VGA if attached, LCD off. Television type: NTSC on option ABA units.	
Audio Ports	Audio volume, Beeper volume	Audio volume: 7 Beeper Volume: 3	

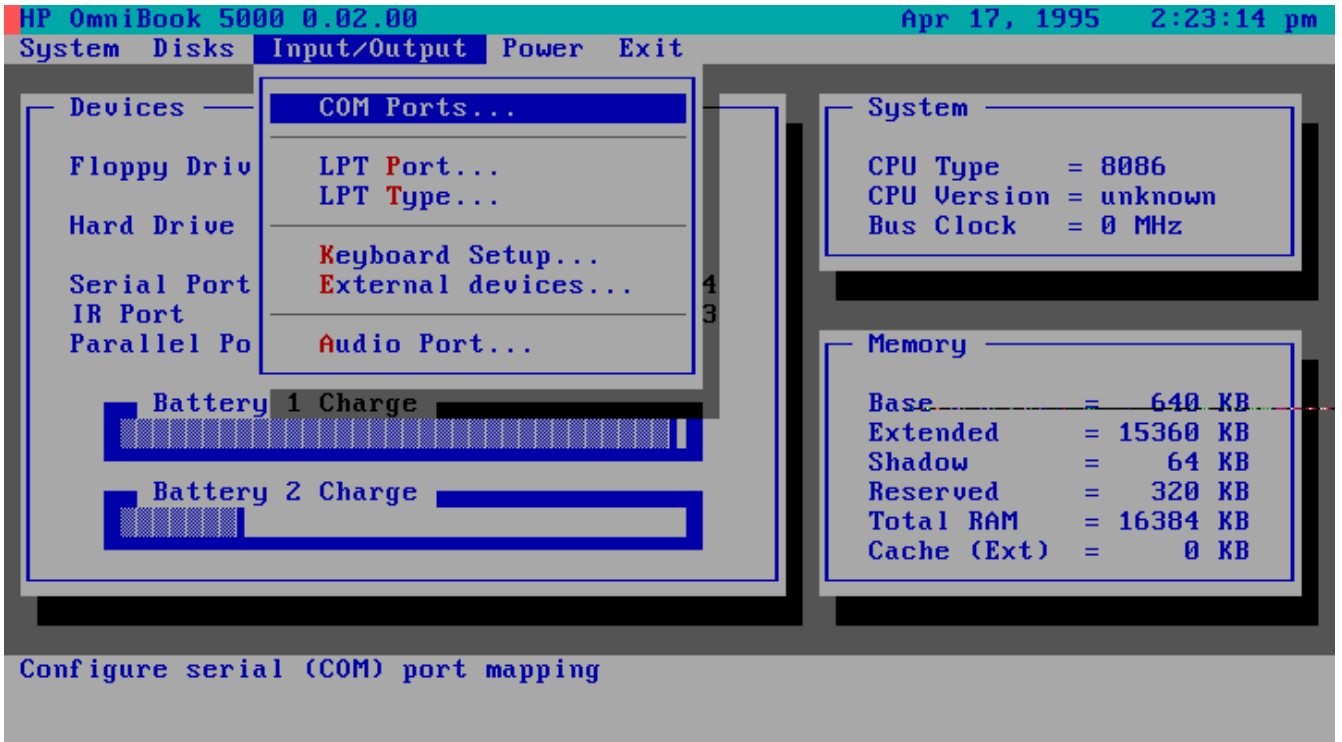


Figure 16 - Input/Output Screen

Disk Configuration

Setting	Parameters	Default	Comments
Floppy Disk Drive Disk A	None, 1.44MB, 2.88MB	1.44MB	
Hard Disk Drive	None, Standard, Custom, Auto-ID	Auto-ID	Also reports disk drive data (# cylinders, # heads, sectors/tracks, landing zone, write precomp)

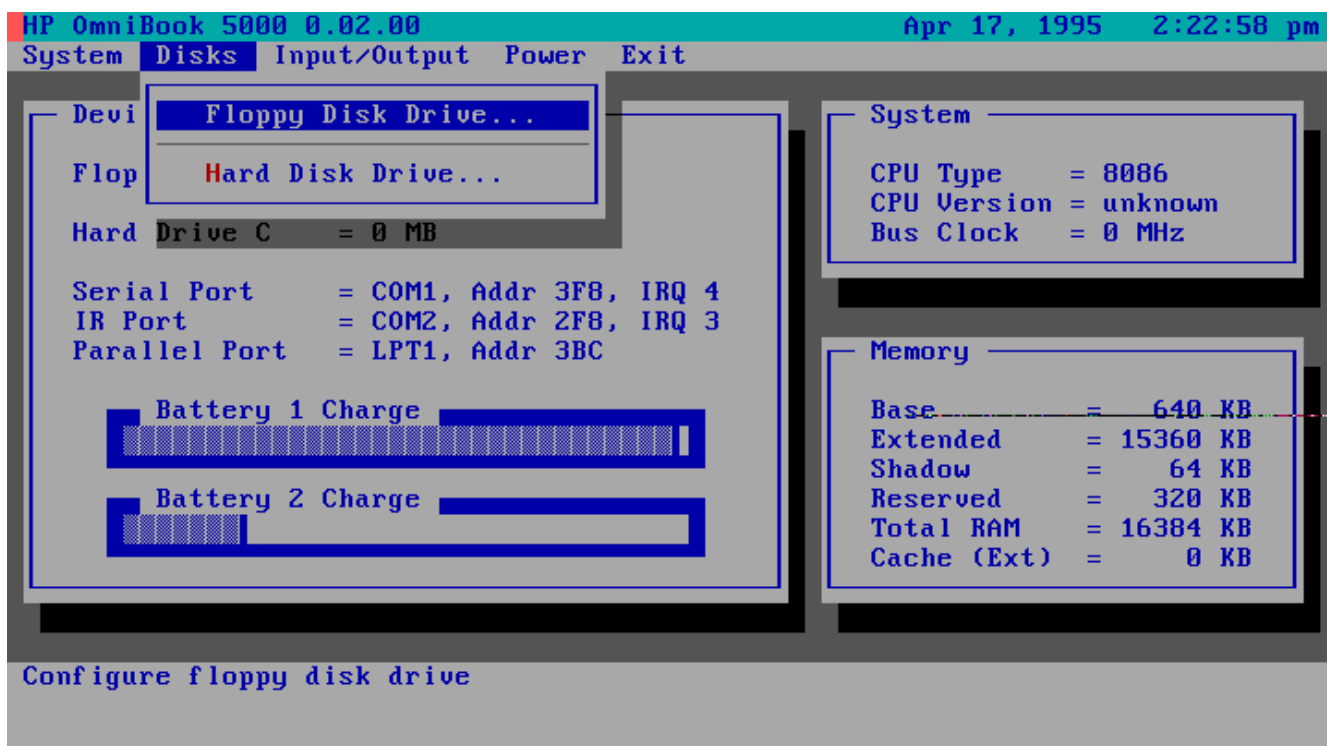


Figure 17 - Disk Configuration Screen

Troubleshooting and Repair

OmniBook Self-Test

The complete self-test procedure is documented in the OmniBook 5000 Operating Guide.

A note about interpreting self-test results.

Self-test alone should not be used to diagnose a hardware problem. If the self-test results are absolutely clear and repeatable, confirm the results with at least two other non-self-test failure symptoms.

The OmniBook 5000 BIOS includes a POST facility that tests a number of hardware and firmware items in the unit at each cold-start (BOOT or RESET).

First POST: BEEP CODES

These multiple beep codes indicate a failure in a simple test of:

- a portion of base memory
- Flash BIOS checksum
- a portion of conventional memory
- a portion of extended memory

If the unit fails to boot:

All accessories are removed, including memory cards, external floppy, port expander, modems, PCMCIA cards, LAN cards, printers, VGA-out cables, external pointing devices, clean AC power is provided (no "chained" battery chargers or auto adapters), and press reset.

If the unit still fails to boot, it requires service.

Beep codes

Beep codes are used to identify a POST error that occurs when the screen is not available. Once the screen is operating, diagnostic messages are reported to the screen. There are beep codes for both fatal and nonfatal system board errors.

Beep Code	Description
none	CPU register test in progress or failure.
1-1-1	CPU Failure
1-1-3	CMOS write/read test in progress or failure. Failure will result in a system halt.
1-1-4	ROM BIOS checksum test in progress or failure. Failure will result in a system halt. Checksum test - All of the values in a given range of locations are added together. The range includes a location which, when added to sum of the ranges, will produce a known result (0). BIOS is in FLASH and can only be fixed through replacement of the flash device (not a field repairable item) Customer units should be returned for repair.
1-2-1	Programmable interval timer 0 test in progress or failure. Failure will result in a system
1-2-2	DMA channel 0 address and count register test in progress or failure. Failure will result in a system halt.
1-2-3	DMA page register write/read test in progress or failure. Failure will result in a system halt.
1-3-1	RAM refresh verification test in progress or failure. Failure will result in a system halt.
1-3-2	SMI RAM Bad. Failure will result in a system halt.
None	First 64K RAM test in progress. No specific test is performed - just indicates that the test is beginning (i.e., no failure).
1-3-3	First 64K RAM chip or data line failure, multi-bit. Failure results in a system halt.
1-4-2	Parity failure first 64K RAM. Failure results in a system halt.
2-1-1/2/3/4	First 64K RAM chip or data line failure on bit x. Failure results in a system halt.
2-2-1/2/3/4	
2-3-1/2/3/4	
2-4-1/2/3/4	
3-1-1	Slave DMA register test in progress or failure. Failure results in a system halt.
3-1-2	Master DMA register test in progress or failure. Failure results in a system halt.

3-1-3	Master interrupt mask register test in progress or failure. Failure results in a system halt.
3-1-4	Slave interrupt mask register test in progress or failure. Failure results in a system halt.
3-2-4	Keyboard controller test in progress or failure. Failure results in a system halt.
3-3-4	Screen memory test in progress or failure. Failure will result in a beep code but not a system halt.
3-4-1	Video Retrace Failure.
3-4-2	Screen retrace test in progress.
3-4-3	Screen retrace test failure
4-2-1	Timer-tick interrupt test in progress or failure. An error message is displayed on the screen. The system does not halt.
4-2-2	Shutdown test in progress or failure. If possible, the BIOS will continue POST, skipping the memory tests.
4-2-3	Gate A20 failure. An error message is displayed on the screen and the memory tests are suspended. The system does not halt.
4-2-4	Unexpected interrupt in protected mode. The system does not half when an unexpected interrupt occurs.
4-3-1	RAM test of memory above 64K in progress or failure. POST will continue.
4-3-2	Programmable interval timer channel 2 test in progress or failure. POST will continue.
4-3-4	Real-time clock text in progress
4-4-1	Serial port test in progress or failure. POST will continue.
4-4-2	Parallel port test in progress or failure. POST will continue.
4-4-3	Math coprocessor test in progress or failure. POST will continue.

**Last POST:
DISPLAY CODES**

There are a number of POST tests that are performed after the BEEP Code tests. Failure of one or more of these tests will result in a displayed failure code (i.e., 03044). It is extremely important not to interpret a failure code immediately as a hardware failure until:

all accessories are removed, including memory cards external floppy, port expander, modems, PCMCIA cards, LAN cards, printers, VGA-out cables, external pointing devices, clean AC power is provided (no "chained" battery chargers or auto adapters), and press reset.

If the unit still fails to boot, it requires service.

NOTE: make sure the display is adjusted to be visible.

PhoenixBIOS POST Messages (Power On Self Test) Within POST, there are three kinds of messages:

Error messages: These messages appear when there is a failure in hardware, software, or firmware.

Informational messages: These messages provide information to the user but require no action.

Beep codes: This kind of warning sounds when POST errors occur and the screen is not available.

Because the OmniBook cannot be repaired by a service center below the FRU level, these messages will provide limited troubleshooting or repair information. However, the support specialist and service technician will be able to identify trends in repairs from these codes.

Message	Possible Cause
Diskette drive failure	The 0 or 1 drive failed or is missing.
Diskette drive x failure where x=0 or x=1	The designated drive has either failed or is missing.
Diskette read failure - press F1 to retry boot (or may also say, press F1 to retry boot, F2 for SETUP utility)	The diskette is either not formatted or is defective.
Display adapter failed; using alternate	The color/monochrome switch is set incorrectly. The primary video adapter failed.
Gate A20 failure	The keyboard controller is not accepting commands, specifically, the enable and disable A20 commands.
Fixed disk configuration error	The specified configuration is not supported or doesn't match the actual hardware
Fixed disk controller failure	The controller card has failed.
Fixed disk failure	The fixed disk may be defective.
Fixed disk read failure -press F1 to retry boot (or may also say press F1 to retry boot, F2 for SETUP utility)	The fixed disk may be configured incorrectly or is defective.
Internal cache test failed -cache is disabled	Faulty cache memory in the 80486 processor chip.
Pointer device failure	The mouse failed.
No boot device available -Press F1 to retry boot (or may also say, press F1 to retry boot, F2 for SETUP utility)	Either diskette drive A:, the fixed disk, or both the diskette and disk are defective.
Message	Possible Cause
No boot sector on fixed disk - press F1 to retry boot (or may also say, press F1 to retry boot, F2 for SETUP utility)	The C: drive is not formatted or is not bootable.
Not a boot diskette - press F1 to retry boot (or may also say, press F1 to retry boot, F2 for SETUP utility)	The diskette in drive A: is not formatted as a bootable diskette.

No timer tick interrupt	The timer chip has failed.
xxxxxh Option ROM checksum failure where xxxxxh is the starting address of the option ROM	The peripheral card contains a defective ROM.
Shutdown failure	Either the keyboard controller is not accepting the reset command or the associated reset logic has failed.
Time of day not set - run SETUP program	Clock not set.
Timer 2 failure	The timer chip has failed.
F2 to enter ROM-based SETUP	Invalid configuration information must be changed.
Invalid configuration information - please run SET'UP	Display adapter is configured incorrectly. Memory size is incorrect. Wrong number of diskette drives. Other configuration errors.
Keyboard clock line failure	The keyboard, the keyboard cable connection, or the keyboard controller is defective.
Keyboard data line failure-	The keyboard controller firmware has failed.
Keyboard controller failure	The keyboard controller firmware has failed.
Keyboard stuck key failure	A key is jammed.
Memory failure at hex-value, read hex-value, expecting hex-value	Circuitry associated with the memory chips has failed.
Unexpected interrupt in protected mode	Hardware interrupt or NMI occurred while in protected mode.
Real time clock failure	The RTC or battery failed.
Message	Possible Cause
nnnk Base Memory	The amount of base memory that tested successfully.
nnnk Extended	The amount of extended memory that tested successfully.
Memory tests terminated by keystroke	This message indicates that a user pressed the spacebar while the memory tests were running and stopped the memory tests.
Press the FI key to continue	This message indicates that an error was found during POST. Pressing the FI key allows the system to attempt to boot.
Beginning memory test Press the SPACEBAR to terminate the memory test	A user can stop the memory tests by pressing the spacebar.
Press the FI key to continue, F2 to nm the Setup utility	This message indicates that an error was found during POST. Pressing the FI key allows the system to attempt to boot. Pressing F2 allows users to run the ROM-based Phoenix SETUP utility to correct configuration information.

Appendix A: Part Numbers

Description	HP Part Number	Exchange Part Number
75N CPU Module	F1126-60906	F1126-69006
90N CPU Module	F1127-60902	F1127-69002
90C CPU Module	F1130-60902	F1130-69002
120C CPU Module	F1198-60901	F1198-69001
VGA/DSTN Display	F1126-60902	F1126-69002
VGA/TFT Display	F1128-60901	F1128-69001
SVGA/TFT Display	F1131-60901	F1131-69001
8MB RAM	F1134-60901	F1134-69001
16MB RAM	F1135-60901	F1135-69001
32MB RAM	F1136-60901	F1136-69001
810 HDD	F1138-60901	F1138-69001
1.2GB HDD	F1139-60901	F1139-69001
540 HDD	F1156-60901	F1156-69001
NiMH Battery	F1073-60901	none
Li-Ion Battery	F1137-60901	none
Keyboard GER	F1125-60902	none
Keyboard FRE	F1125-60903	none
Keyboard SPA	F1125-60904	none
Keyboard ITA	F1125-60905	none
Keyboard SWI	F1125-60906	none
Keyboard DAN	F1125-60907	none
Keyboard SWE/FIN	F1125-60908	none
Keyboard EURO-ENG	F1125-60909	none
Keyboard NOR	F1125-60910	none
Keyboard KOR	F1125-60911	none
Icon Assembly	F1125-60912	none
Y Keyboard Cable	F1125-60913	none
Trackball Assembly	F1125-60921	none
Palmrest Assembly	F1125-60922	none
Keyboard US	F1125-60923	none
Rubber Foot (BACK)	F1081-60933	none
Rubber Foot (FRONT)	F1081-60934	none
Disp/Chas Screw ISOP M2.6x8L Nylok	F1081-60939	none
HDD/KBD Screw ISOT M2.6X5L	F1081-60940	none
Palmrest Screw ISOTM2.6x6L	F1081-60942	none
Plastic Foot	F1125-60914	none
Memory Door	F1125-60915	none
Rubber Display Pad (upper)	F1125-60916	none
Rubber Display Pad (lower)	F1125-60917	none
Print Port Door	F1125-60918	none
I/O Door	F1125-60919	none
Expansion Door	F1125-60920	none
Heat Spreader Assy.	F1125-60924	none
Heat Pipe/Bracket	F1125-60925	none
Heat Sprdr/CPU Screw M2.6x4L	F1125-60926	none
Heat Sprdr/CPU Screw M2.6x3.5L	F1125-60927	none
Conductive Foam	F1125-60929	none

Back Panel Overlay	F1125-60930	none
Floppy Disk Drive Module	F1125-60928	none
IBM 810 HDD	F1199-60901	F1199-69001
Support Plate L	F1125-60931	none
Support Plate R	F1125-60932	none
OB 5000 ENG Rcvy Kt CDRom/Flpy	F1125-60957	none
OB 5000 FRE Rcvy Kt CDRom/Flpy	F1125-60958	none
OB 5000 ITA Rcvy Kt CDRom/Flpy	F1125-60959	none
OB 5000 GER Rcvy Kt CDRom/Flpy	F1125-60960	none
OB 5000 SPA Rcvy Kt CDRom/Flpy	F1125-60961	none
Trackball 25mm	F1125-60933	none
PCB Assy PI-DC R:0	F1125-60934	none
SUB BATTERY SET	F1081-60925	none
FPC T/B TO M/B	F1125-60936	none
Standoff 11.75mm	F1125-60937	none
IR Lens	F1125-60938	none
Heat Sink B	F1125-60939	none
PCMCIA Shield	F1125-60940	none
Heat Sink C	F1125-60941	none
LED Lens	F1125-60942	none
Lower Cover Assy	F1125-60943	none
BEZEL Assy	F1125-60944	none
Upper Cover Assy	F1125-60945	none
Rubber Pad K/B	F1125-60946	none
Standoff 13.8mm	F1125-60947	none
Conduct Sponge 10X1X20mm	F1125-60949	none
PCB Assy PI-586 w/SCSI Rev:F	F1125-60950	F1125-69002
Flash ROM/BIOS Label	F1125-60951	none
I/O Bracket 5000 w/o SCSI	F1125-60952	none
I/O Bracket 5000 w/SCSI	F1125-60953	none
PCB Assy PI-ICON Rev:0	F1125-60954	none
Contact Spring Dock Pin	F1125-60955	none
PCB Assy PI-586 w/o SCSI	F1125-60956	F1125-69003
HDD Plastic Kit	F1125-60962	none
Screw ISOT M2.6x6L	F1125-609063	none
Screw ISOP M2.6x4L	F1125-609064	none
PCMCIA Button Assembly	F1125-609065	none
OB5000 Familiarization Guide	F1125-90048	none