HP OmniBook 4000C/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 × 28.24 × 3.99 cm (7.28 × 11.12 × 1.57 in)
Weight	3.08-3.18 kg (*6.8-7 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-Mhz Intel 486DX2, or 75-, 100-MHz Intel 486DX4	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 9.5-inch diagonal TFT 640×480 backlit color VGA displays 64K colors from a 262K color palette VGA-out supports VGA and SVGA monitors (up to 1024×768×256 colors) Accelerated local bus video with 1-MB VRAM

Power	14.4Vdc Rechargeable Lithium-Ion or NiMH battery Battery life (approximate with one battery): 2 to 3 hrs Battery recharges to high level in 4 hrs using AC adapter while PC is on or off 2-minute low-battery warning AC adapter 100 to 240 Vac (50 to 60 Hz) input; 12 Vdc, 3.3 A output Instant-on maintains computer in ready-to-work state for weeks on a full charge; returns you to your application or file instantly	14.4 Vdc rechargeable NiMH battery pack Battery life (approximate): 3-4 hrs on DSTN DX2/50 2-3 hrs on TFT DX4/100 AC adapter 100 to 240 Vac (50 to 60 Hz) input; 21 Vdc,1.35 A output Suspend-resume power management.	9.6 Vdc rechargeable NiMH or Lithium Ion battery Battery life up to 3.0-3.5 hours. Battery pack recharges to high level in less than 2 hours using AC adapter 2-minute (or less) low-battery warning AC adapter 100 to 240 Vac (50 to 60 Hz) input; 12 Vdc, 2.5 A output 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.
Removable Modules	Floppy disk drive (can be replaced with a second battery for double battery life) Hard disk drive RAM Battery	Floppy disk drive (can be replaced with a second battery for double battery life) Hard disk drive RAM Battery	Hard disk drive RAM Battery
Mass Storage	540-MB, 810-MB, or 1.2-GB hard disks	260-, 340-, 520-, or 810-MB hard disk options	170, 260, or 340 MB hard disk drive
RAM	8- or 16-MB Models upgradable to 64 MB 8-, 16-, or 32-MB RAM cards	4-, 8-MB, or 16-MB RAM models upgradable to 32 MB	4-, 8-, 16- or 24-MB RAM models upgradable to 32MB (CT) 20MB or 24MB (C).

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 (not stereo sound)
Input/Output	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 × 768 × 256) 115,200 - baud, bidirectional infrared Enhanced port replicator connector Floppy drive port

Expandability	One Type III PCMCIA slot (or use as two Type II slots) with 3.3-V or 5-V support ISA-based slots, and parallel, serial, SVGA-out (up to 1024 x 768 x 256), keyboard, PS/2 mouse, MIDI/joystick, audio, and SCSI-2 ports	One Type III PCMCIA slot (or use as two Type II slots) 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)	One Type III PCMCIA slot (or use as two Type II slots) External ultra-thin floppy disk drive (included with product) Enhanced port replicator with EPP parallel, serial, VGA-out (up to 1024 × 768), keyboard, PS/2 or Microsoft$^{®}$ mouse, and SCSI ports; external floppy connector; and optional HP EtherTwist LAN card slot
Pre-installed Software	Microsoft Windows 95 or Microsoft Windows for Workgroups 3.11 * MS-DOS$^{®}$ 6.22 Plug and Play BIOS HP PIM	Microsoft Windows for Workgroups 3.11 MS-DOS 6.2 Laplink Remote Access Easy connection to your desktop PC, network and desktop printers; works via cable or infrared.	Microsoft Windows for Workgroups 3.11 MS-DOS 6.22 Upgrade easily to Windows 95 Plug and Play BIOS LapLink Remote Access Appointment Book HP Financial Calculator Phone Book IrDA infrared printing driver
Security Features	2-level password protection PC ID (tattooing) Kensington lock slots	User password Kensington lock slots	User password Kensington lock slots

OmniBook 4000 Series: Product Features

Description   Advanced performance with flexibility, exceptional user comfort, all-day use and easy access to peripherals.

Models   This is a complete list of all the standard Omnibook models ever made available. Factory special options are not included in this listing. Many of these models are now obsolete.

Refer to the Hewlett-Packard Corporate Price List for cuurently available models and options.

Product	Description	Part Number
HP OmniBook 4000C	DX2/50MHz; 260MB Hard Drive	F1081A
HP OmniBook 4000C	DX2/50MHz; 340MB Hard Drive	F1082A
HP OmniBook 4000C	DX2/50MHz; 520MB Hard Drive	F1083A
HP OmniBook 4000CT*	DX4/75MHz; 340MB Hard Drive	F1157A
HP OmniBook 4000CT*	DX4/75MHz; 520MB Hard Drive	F1158A
HP OmniBook 4000CT*	DX4/75 MHz; 810MB Hard Drive	F1159A
HP OmniBook 4000C	DX4/100MHz; 340MB Hard Drive	F1086A
HP OmniBook 4000C	DX4/100MHz; 520MB Hard Drive	F1087A
HP OmniBook 4000C	DX4/100MHz; 810MB Hard Drive	F1096A
HP OmniBook 4000CT*	DX4/100MHz; 340MB Hard Drive	F1088A
HP OmniBook 4000CT*	DX4/100MHz; 520MB Hard Drive	F1089A
HP OmniBook 4000CT*	DX4/100MHz; 810MB Hard Drive	F1097A
HP OmniBook 4000CT*	DX4/100MHz; 810MB Hard Drive with 16MB RAM	F1160A

* Indicates TFT display

(Note: All others have 8-MB RAM except, F1081A with 4MB RAM and F1160A, which has 16MB RAM)

Accessories	Description	Part Number
	4-MB RAM expansion card	F1076A
	8-MB RAM expansion card	F1077A
	16-MB RAM expansion card	F1078A
	260-MB Hard Disk Drive	F1091A
	340-MB Hard Disk Drive	F1092A
	520-MB Hard Disk Drive	F1093A
	810-MB Hard Disk Drive	F1032A
	3.5 inch Floppy Drive Module	F1079A
	AC Adapter	F1072A
	NiMH Battery Pack Module	F1073A
	External Battery Charger (Charges up to two batteries concurrently)	F1074A
	Automobile Adapter	F1075A
	Enhanced Port Replicator	F1090A

What comes in the box

OmniBook 4000 mainframe

Battery pack

User documentation: manuals, support material, registration card

Companion/utility disks

AC adapter (P/N: F1072A), localized power cord

Brochures for OmniBook accessories and Deskjet 320

Microprocessor

Intel486 DX2 50-MHz

Intel486 DX4 75-MHz

Intel486 DX4 100-MHz

Bus Architecture ISA, Video local Bus

Memory	Main Memory	DX2/50 MHz, Model 260 (F1081A)	4MB RAM
		DX4/100 MHz, Model 810 (F1160A)	16MB RAM
		All other models	8MB
	Max Possible RAM		32MB
	Type of memory boards	HP Proprietary boards, 2 user accessible slots on the bottom case.	
	Expansion Memory board options	4-MB (HP # F1076A)	
		8-MB (HP # F1077A)	
		16-MB (HP # F1078A)	
	Cycle time	70ns	

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: Toshiba for all capacities

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 4000.

   Manufacturer: Canon (subject to change)

Built-in I/O   25 pin bi-directional ECP an EPP parallel port

   SVGA out (up to 1024 x 768 x 256 colors) with simultaneous viewing

   115,000-b/s bi-directional infrared port.

   Expansion Bus Connector for connecting to enhance port replicator (F1090A)

   6-pin mini-DIN keyboard or PS/2 mouse

   Headphone/stereo-out port

   Microphone port

   Stereo-in port

Display/video	The OB4000 DSTN may report the display RAM to be 1024KBs, however, it is 512KB. Later versions have corrected this. It is not a hardware problem but a reporting problem.
	Display RAM is not upgradable.
	Display Manufacturer: Hitachi
	Video graphics controller chip: Western Digital 90c24 rocket chip.
	External video resolution (both types): Supports VGA/SVGA external monitors with up to 1024 x 768 x 256 colors in noninterlaced mode.
	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 connection. (HP external keyboard (101-key) Part number C3756A)

Pointing device: Built in 25MM trackball positioned in the center of the wrist pad 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 type: Removable 14.4-Vdc rechargeable NiMH. NiMH battery <u>does not</u> require complete discharge before recharging. There is no "memory" effect that reduces battery life.

Battery Life; rundown (approx.):

   3-4 hrs on DSTN DX2/50

   2-3 hrs on TFT DX4/100

Recharge time: Approx. 75 minutes in suspend mode or off position. The battery trickle charges while the unit is turned on. It takes several days to gain a full charge while trickle charging.

Power   Low battery signals: Low battery warning at 10 percent of full charge, followed by save to hard disk after five minutes.

Battery life can be doubled by installing second battery in place of the 3.5 " flexible drive. The OmniBook will recognize the additional battery and provide battery status of both batteries (can be installed hot).

Smart Battery: The OmniBook 4000 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 4000 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; 21 Vdc, 1.35A output. Use only an HP F1072A 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.

Optional power accessories from HP:

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

External battery charger	Designed for desktop use. It has an internal power supply and plugs in to the wall. Works with 110/220 volts and 50/60Hz. It also has a power cord to plug into the OmniBook 4000.
	Charges two additional batteries
	HP part number: F1074A
Automobile adapter	HP part number F1075A
NiMH battery pack	HP part number F1073A
AC adapter	HP part number F1072A
Accessory Slots	User available PCMCIA Slots: 2 Type II or 1 Type III (version Two)
	The PCMCIA slots are fully industry compatible and supports SystemSoft Card Services and Socket Service (2.1). The system will support a wide variety of PCMCIA cards.
	PCMCIA controller chip manufacturer: Vadem 386.
Audio Systems	High performance audio: 16-bit stereo sound, Sound Blaster hardware compatible.
	Two stereo speakers with acoustic chambers

Audio Systems	I/O: Headphone/stereo-out port; microphone port; Stereo-in port
	IRQ default setting for soundblaster is 5.
	Sound Manufacturer: ESS
Operating environment	Temperature:
	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 BIOS upgrade in the middle of the process.
Software and Operating System	Microsoft Windows for Workgroups 3.11
	MS-DOS 6.2
	Easy upgrade to Windows 95
	Laplink Remote Access for easy connection to desktop PC, network printers, and other OmniBooks

Supported Operating Systems	MS DOS version 6.22*
	Microsoft Windows for Workgroups 3.11*
	Microsoft Windows 95*
	Microsoft NT workstation 3.51**
	OS/2® version 3.0**
	* Supported to the application level. ** Only setup and configuration supported.
Security	Physical security from Kensignton Lock
	System password: When the password setting is enabled, a window will pop-up to allow the user to enter the old password, enter a new password and to verify the new
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: [alt][shft][f10]

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, it's use is also controlled. Hewlett-Pakard 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

Installing memory
(End User Replaceable)

The OmniBook 4000 family has two memory locations for expanding system RAM. The memory location on the side of the OmniBook that has the battery also has the factory RAM module installed. To add an additional 8MB or 16MB of RAM, use the location on the other side of the unit near the floppy drive. If the base unit has 4MB or 8MB of memory, and you want to expand the memory to more than 20MB or 24MB, then the original 4MB or 8MB module must be replace with a larger module.
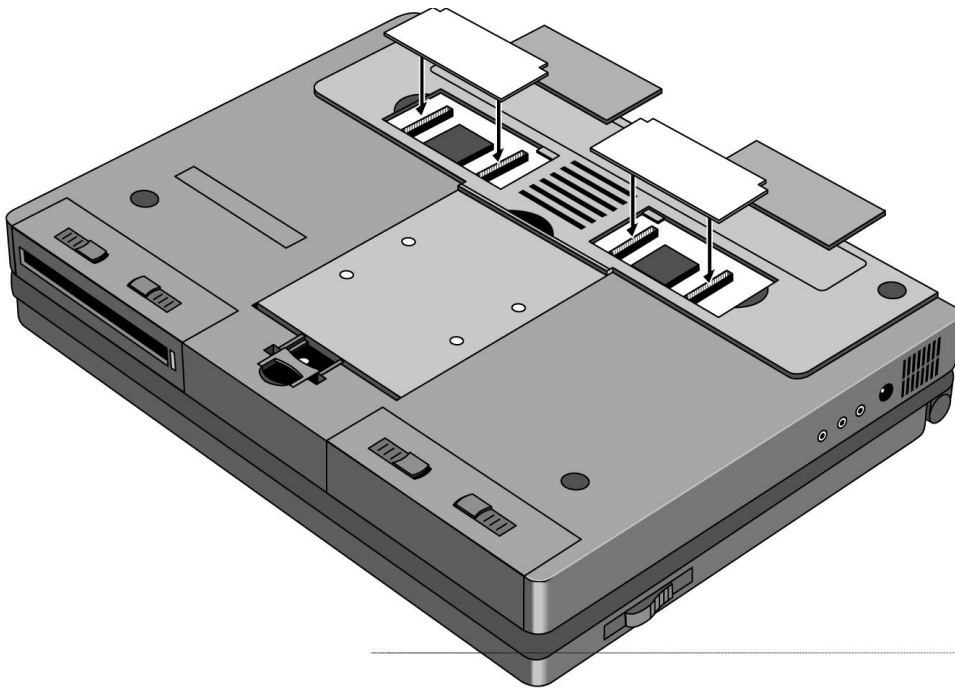
Figure 1 - Memory Doors, Modules, and Slots

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

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 4000.

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

Reverse the procedure to install a new Battery or Floppy Disk Drive Module.
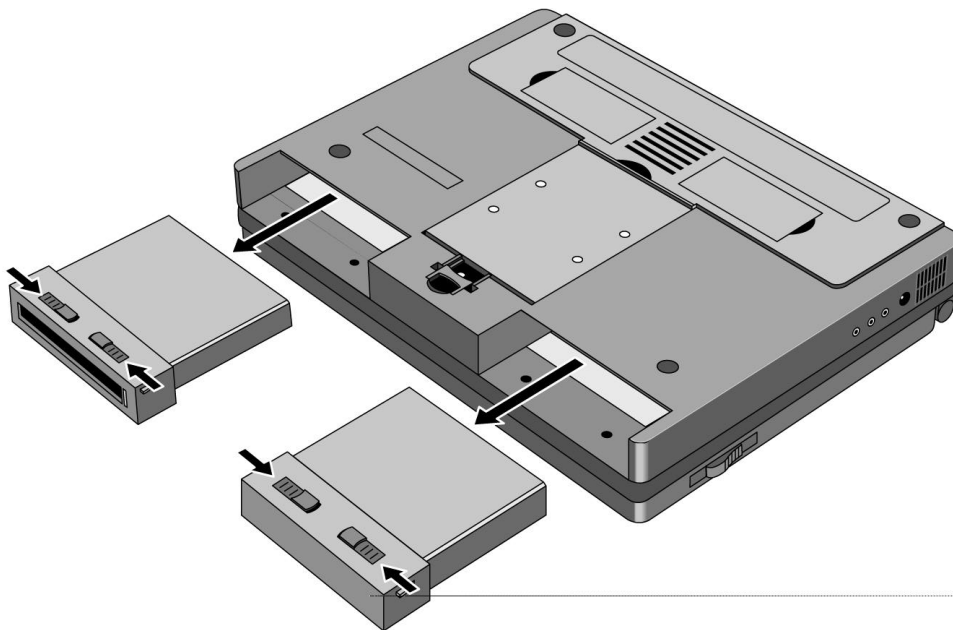
Figure 2 - Floppy Drive and Battery

Hard Disk Drive
(End User Replaceable)

The Hard Disk Drive Module is user replaceable.

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.
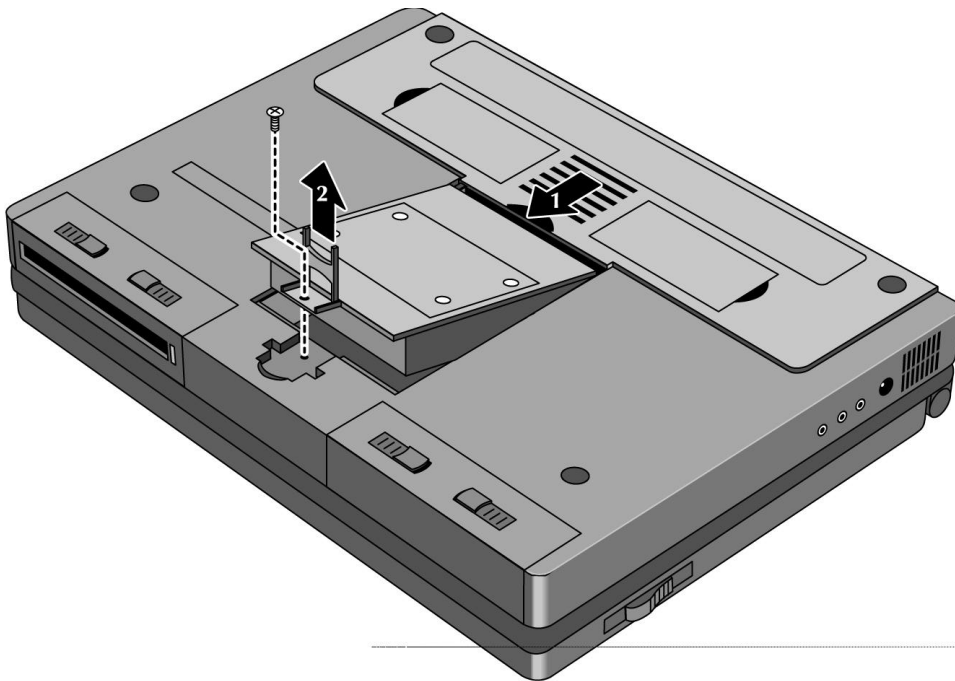
Figure 3 - Hard Disk Drive

Small parts
(End User Replaceable)

The I/R lens, expansion door, I/O door, Rubber feet, memory doors, and PCMCIA door are all replaceable.

The I/R lens snaps in and out from the inside of the I/O door.

To remove the I/O door, open it fully. Flex the door so that the center hinge separates from the 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 PCMCIA door is remove in the same manner as the expansion door.

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

To remove the display module on the OmniBook 4000C and CT turn the unit over and withdraw the two Phillips screws from the bottom back corners of the unit (see diagram below). This is not required if only the ICON assembly is to be removed.

Display/Chassis
Screws
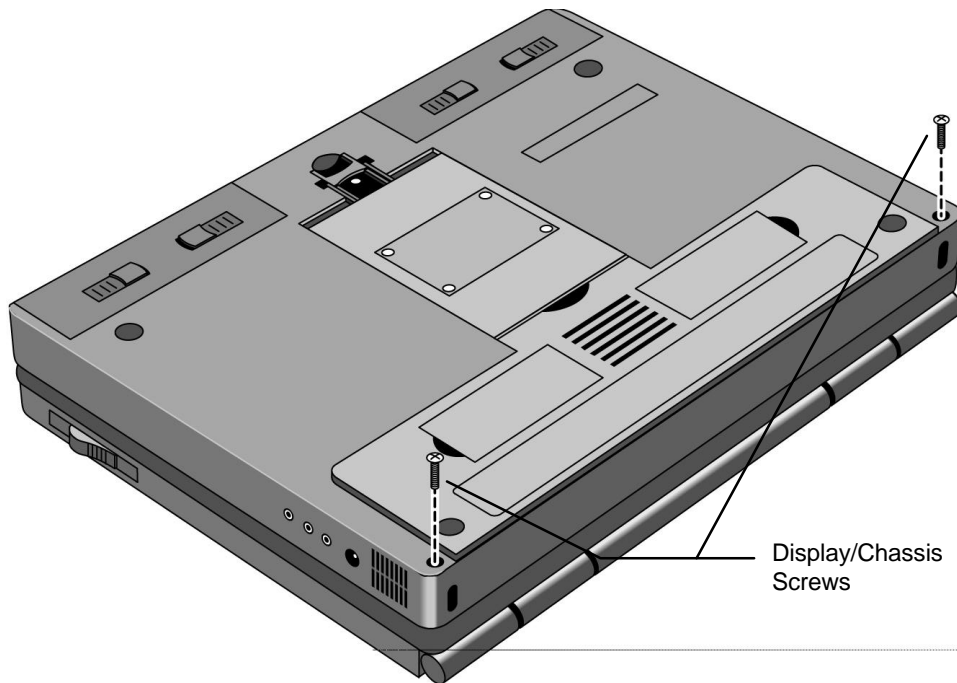
Figure 4 - Display Screws

Turn the unit right side up and remove the Icon assembly by placing the thumbs on each edge of the assembly and pushing lightly (see diagram 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 foward to remove the Icon Assembly cable.

Next, 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.

Display/Chassis Screws
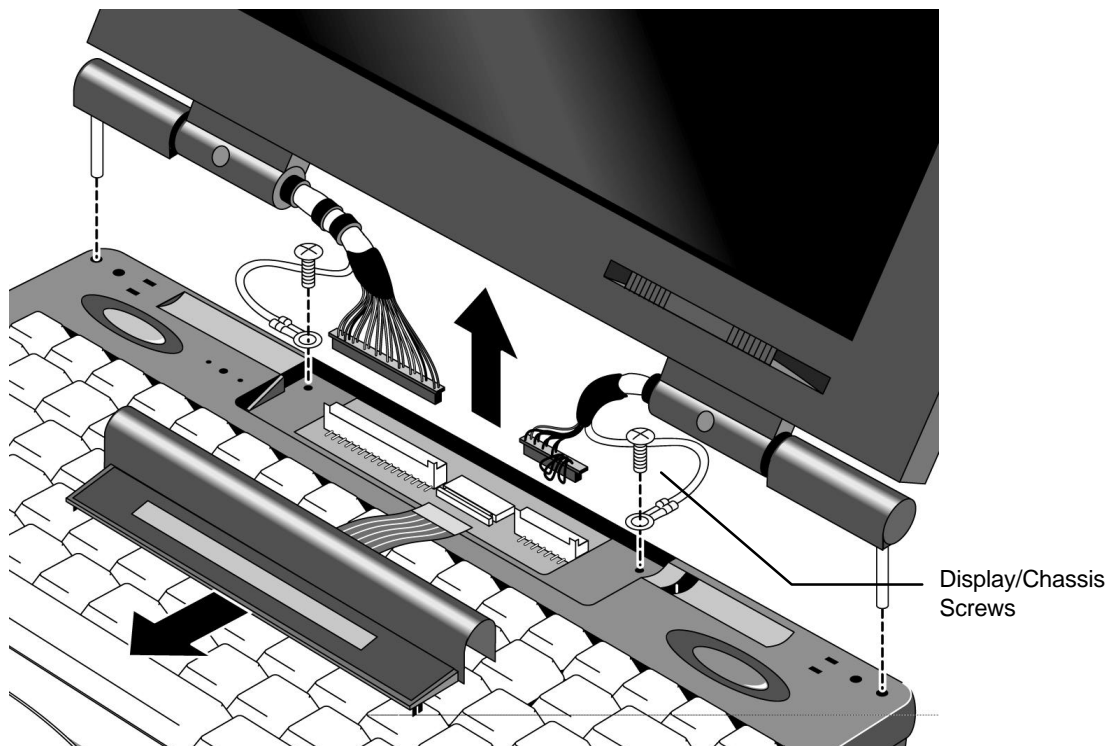
Figure 6 - Display Removal

To reinstall the display module or Icon Assembly, just reverse the above procedure. 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. Also take care that the Icon Assembly flex cable is tucked inside of the "tunnel" of the Icon Assembly. This will prevent the cable from crimping and possibly malfunctioning.

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

Before removing the Palm Rest Assembly or Track Ball Assembly, the battery and the floppy disk drive assembly (a second battery may be installed in to the floppy 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 four screws while the unit is upside down (see illustration below).
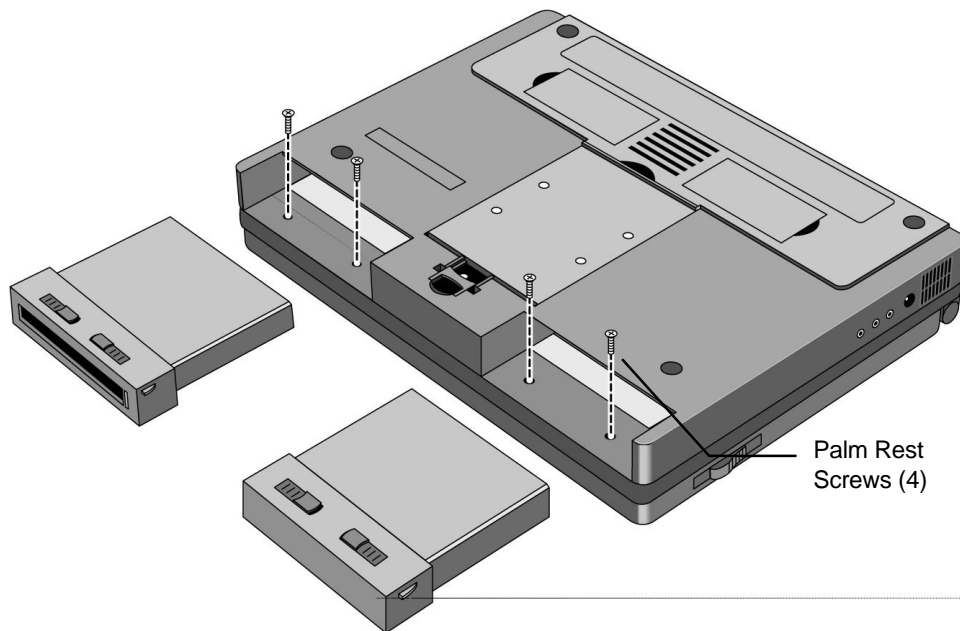
Palm Rest
Screws (4)

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. The Track Ball Assembly then lifts out.

Palm Rest Assembly

Track Ball Assembly

Screw ISOB M2.6x5L

Sub-Battery Assembly
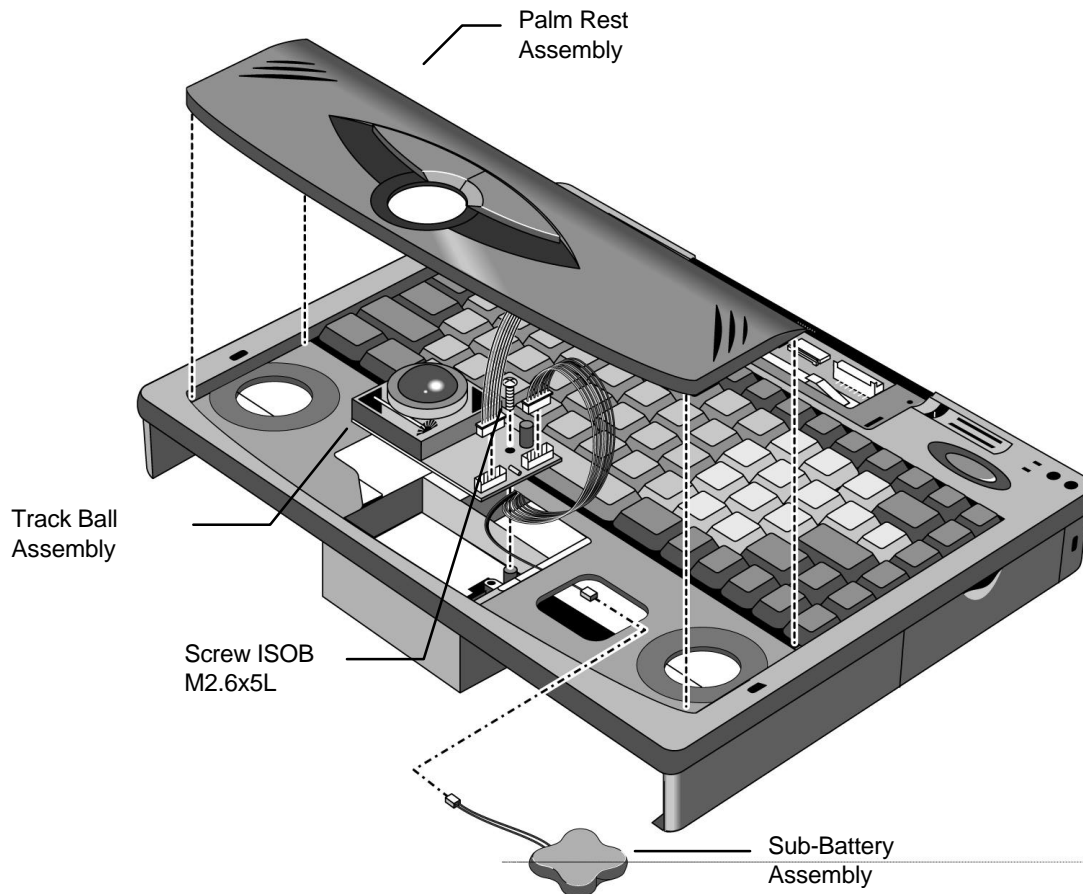
Figure 8 - Palm Rest and Track Ball Assemblies

Reverse the procedure to install a new Palm Rest Assembly or Track Ball Assembly.

Keyboard Assembly
(HP Authorized Support Providers Only)

Required Equipment:
- Phillips Screwdriver

Components to Remove Prior to Keyboard:
1. HDD, FDD, and Battery
2. Palm Rest Assembly (may remain connected)
3. Sound Board (PCB Assy PK-688/PK-AUD) (partial removal)

Removal Procedure:
1. Follow the instructions for removing Battery, Floppy Disk and Hard Drive.
2. Follow the Palm Rest Assembly Removal Procedure. Note the Track Ball does not need to be removed and the Palm Rest may be lifted out without being disconnected.
3. The keyboard can then be lifted out by gently prying up on the front edge.
4. To gain access to the Keyboard flex cables, the Sound Board must be removed (see Figure 9). To remove the Sound Board, lift up on the sides of the board. Note, the Sound Board cannot be completely disconnected at this point - the Upper Cover must be removed to gain full access to the Sound Board.
5. Disconnect the Keyboard flex cables from the zero force insertion slots.

Replacement Procedure:
1. Reverse the procedure to install a new keyboard.
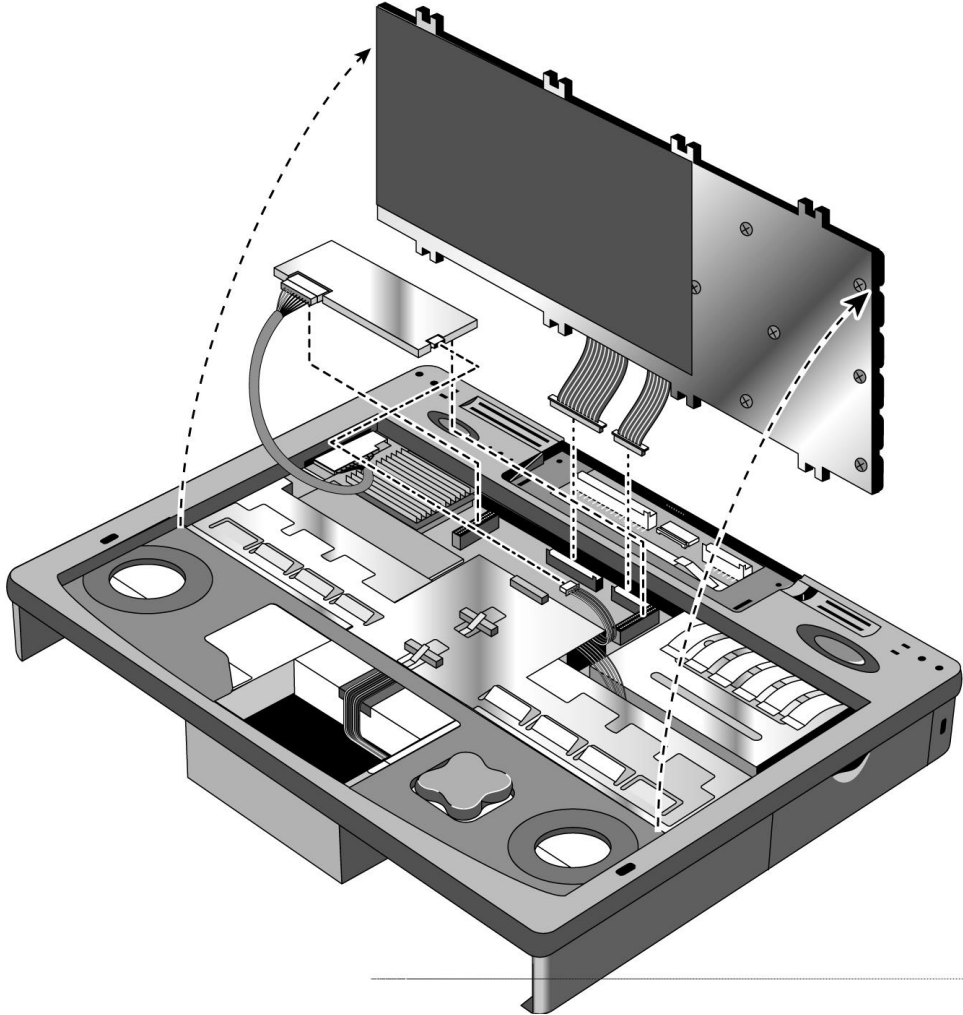
Figure 9 - Keyboard and Sound Board

Power Board (PCA Assy PK-DC)
(HP Authorized Support Providers Only)

Required Equipment:
- Phillips Screwdriver

Components to remove prior Power Board (PCA Assy PK-DC):
1. HDD, FDD, and Battery
2. Palm Rest Assembly (may remain connected)
3. Keyboard (may remain connected)

Removal Procedure:
1. Remove Battery, Floppy Disk Drive, and Hard Disk Drive.
2. Follow the Palm Rest Assembly Removal Procedure to remove this component. Note, the Palm Rest only needs to be lifted out; it may remain connected.
3. Follow the Keyboard Removal Procedure. Note, the Keyboard only needs to be lifted out; it may remain connected.
4. Remove the Power Board by gently rocking back and forth. See Figure 10 for component location.

Replacement Procedure:
1. Simply reverse the above Removal Procedure.

Upper Case, Sound Board (PCB Assy PK-688/PK-AUD), and PCA Display Connect PK-LSP
(HP Authorized Support Providers Only)

Required Equipment:
- Phillips Screwdriver

Components to remove prior Upper Case, Sound Board (PCB Assy PK-688/PK-AUD), and PCA Display Connect PK-LSP:
1. HDD, FDD, and Battery
2. Icon Assembly and Display Module
3. Palm Rest Assembly
4. Keyboard Assembly
5. Power Board (optional)

Removal Procedure:
1. Remove Battery, Floppy Disk Drive, and Hard Disk Drive.
2. Follow the Icon Assembly and Display Module Removal Procedure to remove these components.
3. Follow the Keyboard Removal Procedure. Note, although the Sound Board cannot be completely removed at this point, it is strategic to disconnect the rightmost harness cable at this step (see Figure 9).
4. Additional maneuvering space may be gained by removing the Power Board, however, it is not necessary to do so.
5. Remove the ISOB M2x6L Screw located on the left side of the Upper Case. See Figure 10 for location of this component.
6. Remove the Upper Case by gently prying up at the seam between the Upper Case and Lower Case. The Upper Case will then snap off.
7. At this point, the Upper Case will still have the Sound Board and the Microphone Assembly attached. The Microphone can simply be disconnected from the Sound Board if necessary. The Sound Board may be affixed with a drop of glue to the Upper Case where the Audio Ports meet the plastic. The Audio Ports can be gently pried from the Upper Case plastic if necessary (see Figure 10). Note, that the Sound Board and Audio Ports are a single assembly.
8. Next, remove the three (3) ISOB M2.6x5L screws from the LSP-M/B Shielding Plate and PCA Display Connect PK-LSP. See Figure 10 for locations of these components.
9. The LSP-M/B Shielding Plate can now be removed.
10. Remove the PCA Display Connect PK-LSP by gently rocking back and forth.

Replacement Procedure:
1. Simply reverse the above Removal Procedure.
2. Take note that to reinstall the Audio Ports onto the plastic of the Upper Case does not require a drop of glue. The one screw is sufficient.
3. The LSP-M/B Shielding Plate fits between the plastic of the Lower Case and the strip of shielding affixed along the audio ports holes in the plastic of the Lower Case.

Audio Ports (part of
Sound Board
Assembly)

PCB Assy PK-
688/PK-Aud
(Sound Board)

Screw ISOB
M2x6L

Microphone Assembly

Upper Case

Screw ISOB
M2.6x5L
Qty (3)

PCA Display
Connect PK-LSP

LSP-M/B
Shielding Plate

Screw ISOB
2.6x5L

PCA Assy PK-DC
(Power Board)
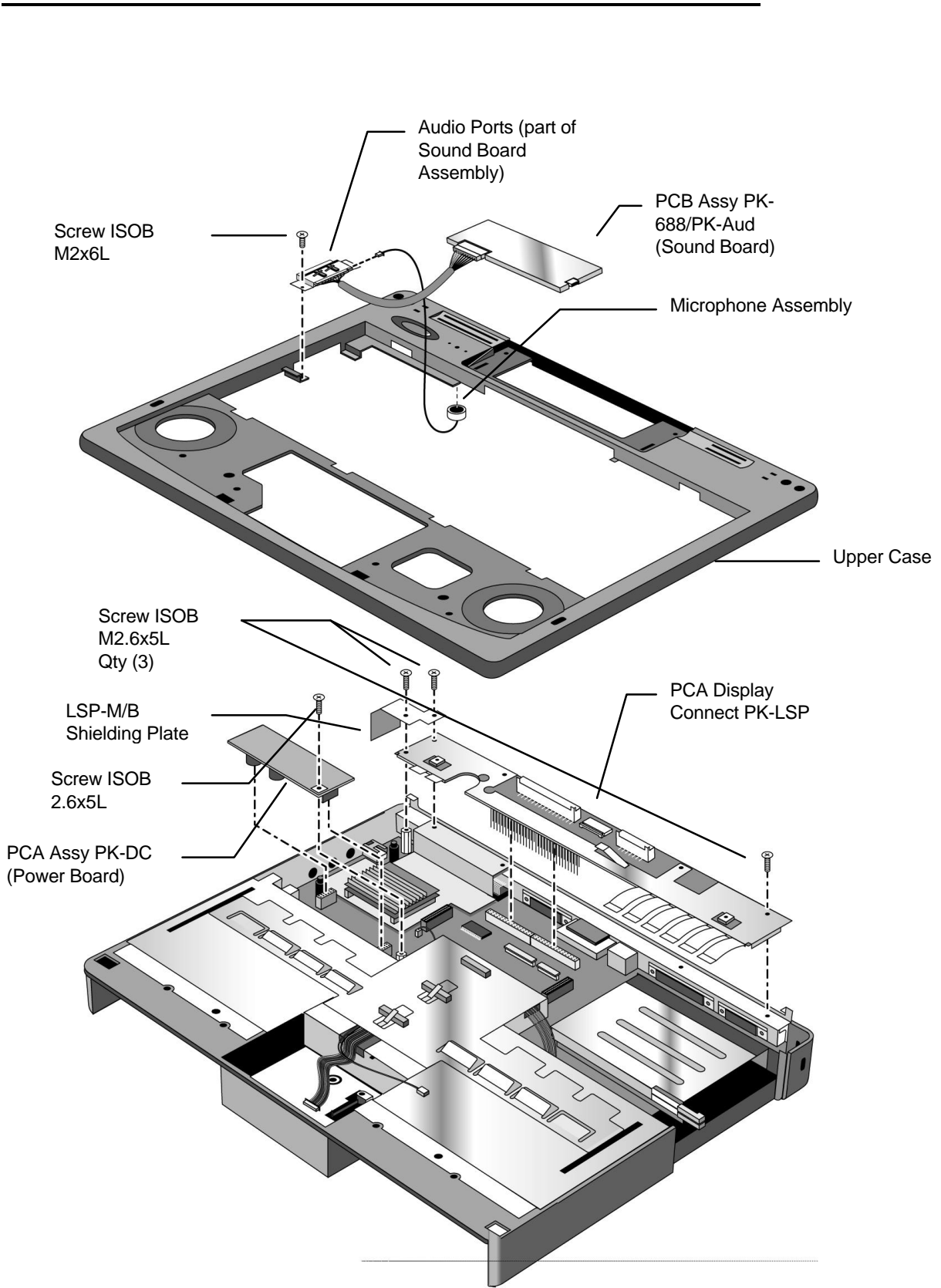
Figure 10 - Upper Case and Display Connect

Keyboard Grounding Plate, CPU, and System Board
(HP Authorized Service Providers Only)

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

Components to remove prior Keyboard Grounding Plate, CPU, and System Board:
1. HDD, FDD, and Battery
2. Icon Assembly and Display Module
3. Palm Rest Assembly
4. Keyboard Assembly
5. Power Board
6. Upper Case, Sound Board, and Display Connect

Removal Procedure:
1. Remove Battery, Floppy Disk Drive, and Hard Disk Drive.
2. Follow the Icon Assembly and Display Module Removal Procedure to remove these components
3. Follow the Palm Rest and Keyboard Assembly Removal Procedures to remove these components.
4. Remove the Power Board by gently rocking back and forth.
5. Remove the Upper Case, Sound Board, and Display Connect by following the corresponding Removal Procedure.
6. Remove the K/B Grounding Plate by unfastening the three (3) ISOB M2.6x5L screws and one (1) 10mm standoff. See Figure 11 for locations of these components. Take note that the Track Ball and Sub Battery-M/B Harnesses must be threaded through the K/B Grounding Plate before it can be freely removed.
7. The CPU may now be removed by gently rocking back and forth. Take care not to dislodge the heat sink from the top of the CPU. If needed, the CPU Shielding Plate may also be removed at this point.
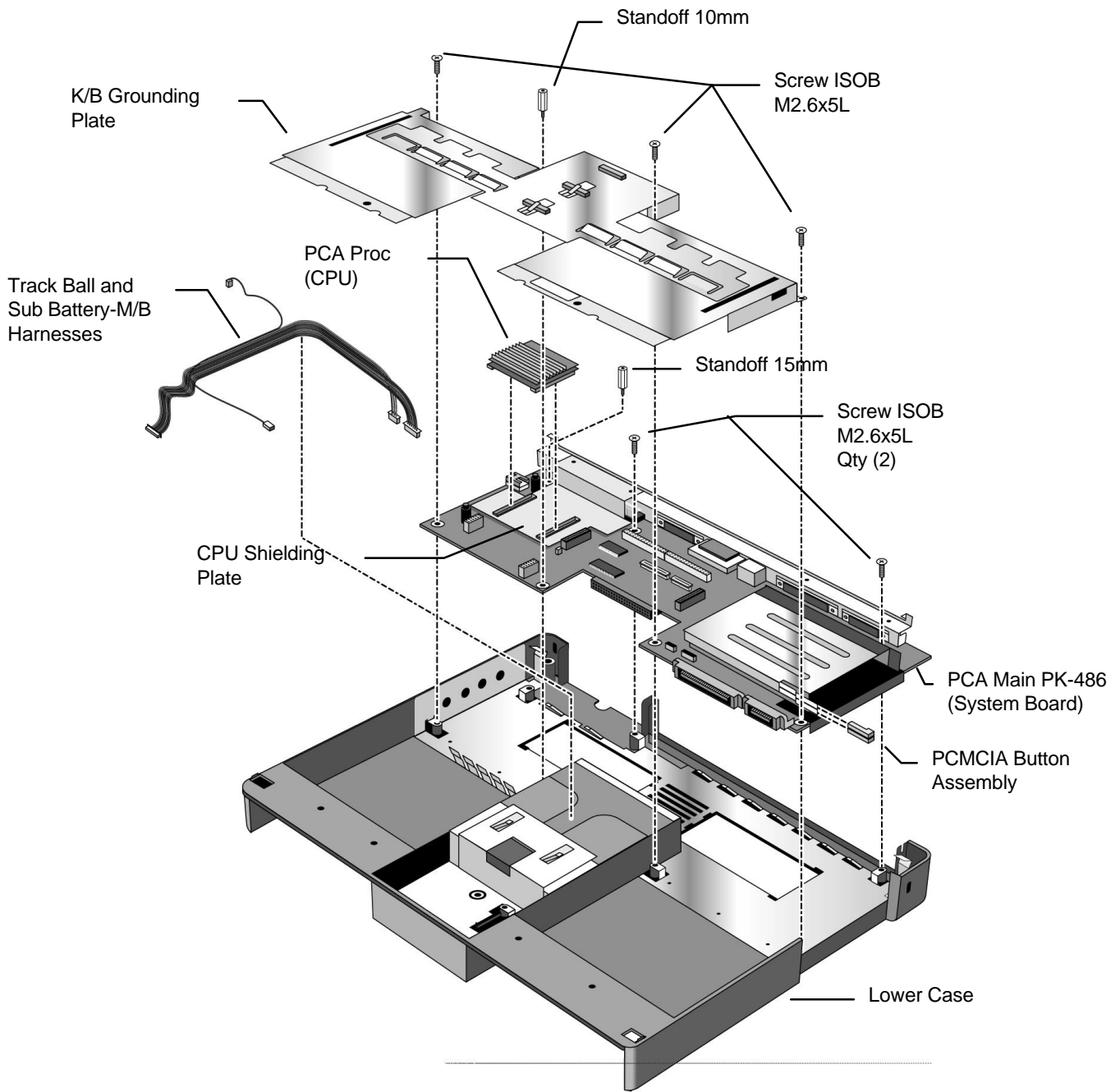
Figure 11 - System Board and Keyboard Grounding Plate

Standoff 10mm

Screw ISOB
M2.6x5L

K/B Grounding
Plate

PCA Proc
(CPU)

Track Ball and
Sub Battery-M/B
Harnesses

Standoff 15mm

Screw ISOB
M2.6x5L
Qty (2)

CPU Shielding
Plate

PCA Main PK-486
(System Board)

PCMCIA Button
Assembly

Lower Case

Enhanced Port Replicator
(Exchange Assembly)

The Enhanced Port Replicator (EPR) for the OmniBook 4000 contains no field replaceable components. If any component of the EPR is defective, the entire unit must be replaced.

Troubleshooting Tips:

- The OmniBook 4000 will only detect one pointing device at a time. Therefore, if an external mouse is connected to the EPR, the track ball will not be active.
- When an external mouse is detached, the pointing devices settings must be manually updated in the Setup for the change to be detected.
- The EPR PCMCIA slots do not receive power when the OmniBook is in Suspend mode.

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.

```
┌─Configuration─────────────────────────────────────────────────────┐
│                                              12/4/94   15:45        │
│  ┌─Power──────────────────────────┐  ┌─Input/Output──────────────┐ │
│  │  Battery Level:  0% ( > > > > > > > > ) 100%  │  Printer Port: Bi-Directional │
│  │                                │  │                           │ │
│  │  Conservation Mode: Custom     │  │  Pointer Device:  Internal │ │
│  │                                │  │                           │ │
│  │  Processor Speed:  Fast        │  │  Display:  LCD            │ │
│  └────────────────────────────────┘  └───────────────────────────┘ │
│  ┌─System─────────────────────────┐  ┌─Disk──────────────────────┐ │
│  │  Processor:  486DX4 - 75MHz    │  │  HDD Capacity:    340KB   │ │
│  │                                │  │                           │ │
│  │  Total Memory:         4096K   │  │  Diskette A:  Enabled     │ │
│  │                                │  └───────────────────────────┘ │
│  │  Cache:  Enabled               │  ┌─Audio─────────────────────┐ │
│  │                                │  │  Right:  0% ( > > > > >   ) 100% │
│  │  Password:  Disabled           │  │  Left:   0% ( > > > > > > ) 100% │
│  └────────────────────────────────┘  └───────────────────────────┘ │
│  Tab=Select item,  Arrows, Numeric, Enter=Change Setting            │
│  F1=Help  F2=Cancel  F3=Exit  F4=Default                            │
│  F5=Power  F6=System  F7=Input/Output  F8=Disk  F9=Audio  F10=Configuration │
└─────────────────────────────────────────────────────────────────────┘
```

Power Screen

The power screen contains the current power level of the main and auxiliary battery. If there is no auxiliary battery, the text is dimmed (or in a passive color). Power conservation settings consists of the options shown. When Custom is selected, "suspend after", "hibernate after" and "HDD stop after" settings can be changed by the user (indicated again by the settings in brackets [xxx]). When any of the other selections are chosen by the user, the system will show the settings that are programmed by the system.

The hibernation setup area is shown to inform the user the size of the file used to save the RAM image to disk. There is no user selectable control in this area.

```
┌─Power──────────────────────────────────────────────────────────────────────┐
│          Main Battery:  0% [ > > > > > > > > ] 100%      Auxillary Battery:  none│
│   ┌─Power Conservation Mode────────────────────────────────────────────────┐│
│   │  [  ] Advanced            Suspend After        [ 5 minutes ]           ││
│   │  [  ] Standard            Hibernate After      [ 30 minutes ]          ││
│   │  [  ] Off                 HDD Stop After       [ 30 seconds ]          ││
│   │  [ * ] Custom                                                          ││
│   └────────────────────────────────────────────────────────────────────────┘│
│   ┌─Processor Speed─────┐  ┌─PCMCIA Power During Suspend─────────────────┐│
│   │   [ * ] Fast        │  │        Slot 1              Slot 2           ││
│   │                     │  │     [ * ] Enabled       [ * ] Enabled       ││
│   │   [  ] Slow         │  │     [  ] Disabled       [  ] Disabled       ││
│   └─────────────────────┘  └──────────────────────────────────────────────┘│
│                                                                              │
│   Tab=Select item,   Arrows, Numeric, Enter=Change Setting                   │
│   F1=Help  F2=Cancel  F3=Exit  F4=Default                                    │
│   F5=Power  F6=System  F7=Input/Output  F8=Disk  F9=Audio  F10=Configuration │
└──────────────────────────────────────────────────────────────────────────────┘
```

Power Configuration

To implement the power management capabilities, the following settings are set by the user from the power setup screen. The CPU doze will automatically occur and will not be user selectable.

Setting:	Parameters:	Default	Comments:
Power Conservation Mode	Advanced; Standard; Off; Custom	Advanced	In advanced mode the user can not change the settings, they are preset.
Suspend After	Disable; Time (1 - 15 minutes)	2 minutes	How long the system will stay in Run with (no activity) until it suspends. If disabled it will stay in Run.
Hibernate After	Disable; Time (5 - 120 minutes)	30 minutes	How long the system will be in the suspend state. If disabled it will stay in the suspend state.
HDD Stop After	Disable; Time (0.5 - 15 minutes)	1 minute	HDD will turn off, system has ability to run. HDD will spin up when access required.
Processor Speed	Fast; Slow	Fast	
PCMCIA Power	Disable; Enable	Enable	Enable power to PCMCIA each slot during suspend.

Power Defaults

Advanced, Standard, Off and Custom, power conservation default values are:

	Advanced	Standard	Off:	Custom
Suspend After	1 minute	2 minutes	Disabled	1 minute
Hibernate After:	15 minutes	60 minutes	Disabled	15 minutes
HDD Stop After:	30 seconds	Disabled	Disabled	30 seconds

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. Password is not tested at resume from suspend.

```
┌─System──────────────────────────────────────────────────────────────────┐
│  Processor:  486DX4 - 75MHz        Total Memory:        4096K             │
│                                    Base Memory:          640K             │
│                                    Extended Memory:     3456K             │
│                                    Reserved              384K             │
│ ┌─Date (1/1/1980)─────────────┐  ┌─Time (12:22:59)─────────────────────┐ │
│ │                             │  │                                     │ │
│ │    [ 03 ] Day               │  │    [ 10 ] Hour                      │ │
│ │                             │  │                                     │ │
│ │    [ 06 ] Month             │  │    [ 19 ] Minute                    │ │
│ │                             │  │                                     │ │
│ │   [ 1994 ] Year             │  │    [ 00 ] Second                    │ │
│ └─────────────────────────────┘  └─────────────────────────────────────┘ │
│ ┌─Processor cache─────────────┐  ┌─Password────────────────────────────┐ │
│ │                             │  │                                     │ │
│ │   [ * ] Enabled             │  │   [   ] Enabled                     │ │
│ │                             │  │                                     │ │
│ │   [   ] Disabled            │  │   [ * ] Disabled                    │ │
│ └─────────────────────────────┘  └─────────────────────────────────────┘ │
│                                                                           │
│  Tab=Select item,  Arrows, Numeric, Enter=Change setting                  │
│  F1=Help  F2=Cancel  F3=Exit  F4=Default                                  │
│  F5=Power  F6=System  F7=Input/Output  F8=Disk  F9=Audio  F10=Configuration│
└───────────────────────────────────────────────────────────────────────────┘
```

Input/Output Configuration

Setting:	Parameters:	Default:	Comments
Printer port	Bi-directional; EPP; ECP	Bi-directional	
IR Port Assignment	COM2	COM2	IR is hard wired to COM2
Pointer device	Internal; External	Internal	
External Fn. key	Enabled; Disabled	Enabled	
Display	LCD; CRT; LCD and CRT	LCD	
LCD gray scale	8, 16, 64	64.00	Dimmed with color display attached
Display mode	Normal;Inverse	Normal	Dimmed with color display attached

```
┌Input / Output───────────────────────────────────────────────────────┐
│ ┌Printer Port────────────────────────────────────────────────────┐   │
│ │   [ * ] Bi-directional                                           │   │
│ │                                                                  │   │
│ │   [   ] Enhanced Parallel                                        │   │
│ │                                                                  │   │
│ │   [   ] Enhanced Capability                                      │   │
│ └──────────────────────────────────────────────────────────────┘   │
│ ┌Pointer Device─────────────────┐ ┌External Fn. Key [  ]───────────┐ │
│ │   [ * ] Internal               │ │   [ * ] Enabled                │ │
│ │   [   ] External               │ │   [   ] Disabled               │ │
│ └────────────────────────────────┘ └────────────────────────────────┘ │
│ ┌Display─────────┐ ┌LCD Gray scale───┐ ┌Display mode───────────────┐  │
│ │  [ * ] LCD      │ │   [ ] 8          │ │                           │  │
│ │  [   ] CRT      │ │   [ ] 16         │ │   [ * ] Normal            │  │
│ │  [   ] LCD and CRT │ │ [ * ] 64       │ │   [   ] Reverse           │  │
│ └─────────────────┘ └─────────────────┘ └───────────────────────────┘  │
│ Tab=Select item,   Arrows, Numeric, Enter=Change Setting             │
│ F1=Help   F2=Cancel   F3=Exit   F4=Default                           │
│ F5=Power   F6=System   F7=Input/Output   F8=Disk   F9=Audio   F10=Configuration │
└───────────────────────────────────────────────────────────────────────┘
```

Disk Configuration

Setting:	Parameters	Default	Comments
Diskette A	Enabled; Disabled	Enabled	
Boot from	FDD first; HDD only	FDD first	
HDD Configuration	Auto; User defined	Auto	

```
┌─Disk────────────────────────────────────────────────────────────────────┐
│  ┌─Diskette A──────────────────────┐  ┌─Boot From:──────────────────────┐ │
│  │   [ * ]  Enabled                │  │   [ * ]  FDD First              │ │
│  │   [   ]  Disabled               │  │   [   ]  HDD only               │ │
│  └─────────────────────────────────┘  └─────────────────────────────────┘ │
│                                                                           │
│  ┌─HDD Configuration───────────────────────────────────────────────────┐ │
│  │   [ * ]  Auto                     Cylinders        842               │ │
│  │                                   Heads             16               │ │
│  │   [   ]  User defined             Sectors           38               │ │
│  └─────────────────────────────────────────────────────────────────────┘ │
│                                                                           │
│                                                                           │
│  Tab=Select item,   Arrows, Numeric, Enter=Change setting                 │
│  F1=Help   F2=Cancel   F3=Exit   F4=Default                               │
│  F5=Power   F6=System   F7=Input/Output   F8=Disk   F9=Audio   F10=Configuration │
└───────────────────────────────────────────────────────────────────────────┘
```

Audio Configuration

The audio screen allows the user to adjust the speaker volume of the system. The user can also select the IRQ, I/O Address and DMA channel of the audio board.

Setting:	Parameters	Default	Comments
Volume Left	Slider	Middle	
Volume Right	Slider	Middle	
IRQ	IRQ5; IRQ7; IRQ9; IRQ10	IRQ7	
DMA channel	DMA0; DMA1; DMA3	DMA1	

```
┌Audio─────────────────────────────────────────────────────────────┐
│ ┌Volume──────────────────────────────────────────────────────────┐│
│ │    Left:  0% [ > > > > >        ] 100%       Right:  0% [ > > > > >       ] 100% ││
│ └──────────────────────────────────────────────────────────────┘│
│ ┌IRQ───────────────────────┐  ┌DMA Channel────────────────────┐│
│ │  [ * ] IRQ5               │  │  [ * ] DMA0                    ││
│ │  [   ] IRQ7               │  │  [   ] DMA1                    ││
│ │  [   ] IRQ9               │  │  [   ] DMA3                    ││
│ │  [   ] IRQ10              │  │                                ││
│ └──────────────────────────┘  └────────────────────────────────┘│
│                                                                    │
│ Tab=Select item,   Arrows, Numeric, Enter=Change setting           │
│ F1=Help   F2=Cancel   F3=Exit   F4=Default                         │
│ F5=Power   F6=System   F7=Input/Output   F8=Disk   F9=Audio   F10=Configuration │
└────────────────────────────────────────────────────────────────────┘
```

Troubleshooting and Repair

Known Hardware Issues

The OmniBook 4000C and CT will not charge the batteries while in "ON" mode.

Certain HP Vectra PCs will not link over I/R with the OB 4000. Refer to the technical newsletter for details.

OmniBook Self-Test

The complete self-test procedure is documented in the OmniBook 4000 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 4000 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 infon-nation 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 provided 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=O or x=1	The designated drive has either failed or is missing.
Diskette read failure - press FI to retry boot (or may also say, press FI 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 disableA20 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 Fl to retry boot (or may also say press Fl 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 Fl to retry boot (or may also say, press Fl 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 Fl to retry boot (or may also say, press Fl to retry boot, F2 for SETUP utility)	The C: drive is not formatted or is not bootable.
Not a boot diskette - press Fl to retry boot (or may also say, press Fl 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 nmning and stopped the memory tests.
Press the Fl key to continue	This message indicates that an error was found during POST. Pressing the Fl 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 Fl key to continue, F2 to nm the Setup utility	This message indicates that an error was found during POST. Pressing the Fl 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
RUBBER FOOT BACK FLAT	F1081-60933	none
RUBBER FOOT FRONT ROUND	F1081-60934	none
NAME PLATE FOR ENGRAVING	F1081-60936	none
PALM REST SCREW FTB 1.7X4L	F1081-60942	none
MICRO PHONE ASSY	F1081-60946	none
OVERLAY-BACK PNL	F1081-80004	none
EXPANSION DOOR	F1081-60930	none
TRACK BALL ASSY	F1081-60914	none
PALM REST ASSY	F1081-60915	none
ICON ASSY FOR PEGASUS	F1081-60916	none
HOOK BUTTON	F1081-60926	none
IR LENS	F1081-60927	none
MEMORY COVER DOOR	F1081-60928	none
PCMCIA DOOR	F1081-60929	none
I/O DOOR	F1081-60931	none
DOOR LATCH EXPANSION & I/O	F1081-60932	none
MODEL NAME PLATE 4000C	F1081-60937	none
MODEL NAME PLATE 4000CT	F1081-60938	none
DISPLAY/CHASSIS SCREW ISOP M2.6x8L	F1081-60939	none
HDD SCREW ISOP M2.6X4L EXTERN	F1081-60940	none
HDD SCREW ISOP M3X6L INTERN	F1081-60941	none
HDD LABEL	F1081-60943	none
HDD COVER	F1081-60944	none
HDD LATCH	F1081-60945	none
THERMAL MOUNTING TAPE	F1081-60947	none
HARNESS TRACK BALL	F1081-60948	none
HARNESS SUB BAT-M/B	F1081-60949	none
INTEL INSIDE STICKER	F1052-80013	none
HDD SHIELDING	F1081-60950	none
HDD SHIELDING FOR 260MB	F1081-60951	none
DISPLAY MODULE DSTN	F1081-60902	F1081-69002
DISPLAY MODULE TFT	F1088-60901	F1088-69001
HDD MODULE 260MB	F1091-60901	F1091-69001
HDD MODULE 340MB	F1092-60901	F1092-69001
HDD MODULE 520MB	F1093-60901	F1093-69001
MEM MODULE 4MB	F1076-60901	F1076-69001
MEM MODULE 8MB	F1077-60901	F1077-69001
MEM MODULE 16MB	F1078-60901	F1078-69001
FDD MODULE	F1079-60901	none
AC ADAPTER	F1072-60901	none
BATTERY PACK	F1073-60901	none
KEYBOARD US	F1081-60904	none
KEYBOARD UK	F1081-60905	none

KEYBOARD GER	F1081-60906	none
KEYBOARD SPA	F1081-60907	none
KEYBOARD FRE	F1081-60908	none
KEYBOARD ITA	F1081-60909	none
KEYBOARD SWI	F1081-60910	none
KEYBOARD DAN	F1081-60911	none
KEYBOARD NOR	F1081-60912	none
KEYBOARD SWE/FIN	F1081-60913	none
PORT REPLICATOR	F1090-60901	none
AUTO ADAPTER	F1075-60901	none
DUMMY RAM CARD	F1081-60935	none
HDD MODULE 810MB	F1132-60901	F1132-69001
EXTERNAL BATTERY CHARGER	F1074-80003	none
OB 4000C/CT ENG Rcvy Flpy Dsk	F1081-60953	none
OB 4000C/CT FRE Rcvy Flpy Dsk	F1081-60954	none
OB 4000C/CT ITA Rcvy Flpy Dsk	F1081-60955	none
OB 4000C/CT GER Rcvy Flpy Dsk	F1081-60956	none
OB 4000C/CT SPA Rcvy Flpy Dsk	F1081-60957	none
Rcvy CDROM Kt-Mult-Lang 4000C/CT	F1081-12001	none
Lower Cover	F1081-60958	none
Upper Case with Button	F1081-60959	none
LCD Back Cover for TFT	F1088-60902	none
LCD Front Cover for TFT	F1088-60903	none
LCD Back Cover for DSTN	F1081-60960	none
LCD Front Cover for DSTN	F1081-60961	none
PCB Assy PK-688/PK-AUD	F1081-60962	none
PCA 50MHZ PROC PK-4D2-50	F1081-60917	F1081-69003
PCA 75MHZ PROC PK-4D4-75	F1081-60952	F1081-69004
PCA 100MHZ PROC PK-4D4-100	F1081-60918	F1081-69005
PCA MAIN W/O CPU PK-486W	F1081-60919	F1081-69006
PCA IR MOD PK-MIR	F1081-60920	none
PCA DISPLAY CONNECT PK-LSP	F1081-60921	none
PCA ASS'Y PK-DC REV:00	F1081-60922	none
SUB BATTERY SET	F1081-60925	none
Conductive Tape 4000	F1081-80020	none
HDD Plastic Kit 4000	F1081-60963	none
Standoff L=15mm	F1081-60964	none
Standoff L=10mm	F1081-60965	none
K/B Grounding Plate	F1081-60966	none
LSP-M/B Shielding Plate	F1081-60967	none
CPU Shielding Plate	F1081-60968	none
Screw ISOB M2x6L	F1081-60969	none
Screw ISOB M2.6x5L	F1081-60970	none
OB4000 Familiarization Guide	F1081-90051	none

Appendix B: Additional Resources

The following table contains resources for additional product related information.

Resource	Number/Address	Comments
HP External Web	http://hpcc998.external.hp.com/mcd/	No usage restriction
HP-MCD Internal Web	http://webmcd.cv.hp.com	Restricted to HP internet access only
HP MCD Service Engineer	svc-eng_mcd@cv.hp.com	Email address for service related questions and issues