HEWLETT PACKARD

Service Manual

HP OmniBook 800CS/CT

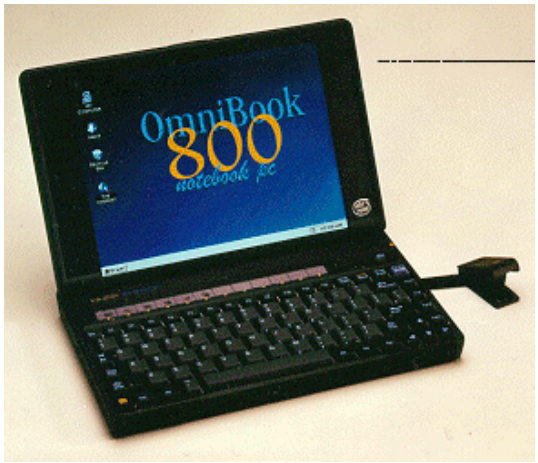

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Table of Contents

List of Figures

List of Tables

Introduction

This document provides reference information for the HP OmniBook 800. It is intended to be used by HP-qualified service personnel to help with the installation, servicing, and repair of these HP OmniBook 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.

The following table lists additional sources where supplementary information can be obtained:

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@om.cv.hp.com	Email address for service related questions and issues

Part 1

Product Overview

- What's New
- Product Features
- Product at a Glance
- Product Comparisons

What's New

This version of the HP OmniBook 800 Service Manual has been updated to include the HP OmniBook 800 with MMX™ Technology (F1360A). The following is a list comparing the technologies of the various models of the OmniBook 800.

Feature	OmniBook 800 with MMX (F1360)	OmniBook 800 (F1171 - F1175)
Processor	Intel Pentium® 166-MHz with MMX Technology	Intel Pentium 100- and 133-MHz processor
Cache	512-KB L2	256-KB L2
Video	NeoMagic NM2093 128-bit accelerated controller with 2MB video RAM and Zoom Video	NeoMagic NM2070 128-bit accelerated controller with 1MB RAM
PC Card	CardBus support	No CardBus support
Desktop Management Interface	Pre-installed DMI 1.1 software	No DMI software installed
Advanced Power Management	APM 1.2	APM 1.1

Product Features

The following two illustrations point out the key external features of the OmniBook 800.

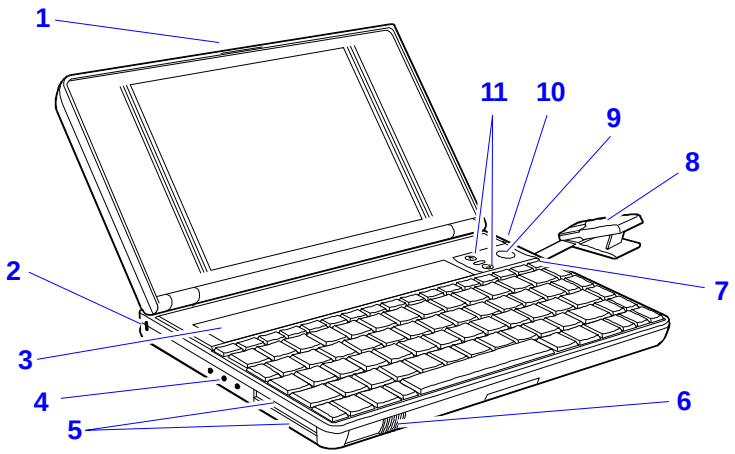


Figure 1 - OmniBook 800 External Features

1. Latch
2. Kensington security connector
3. Fn-key icon strip
4. Sound jacks
5. Card slots
6. Card-eject lever
7. On/Off key
8. Mouse
9. Mouse-eject button
10. Charging light
11. Display adjustments

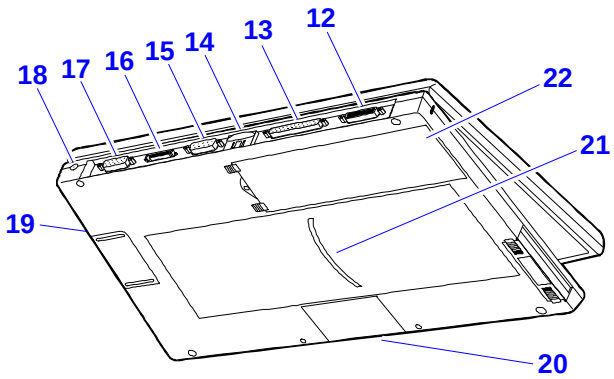


Figure 2 - OmniBook 800 External Features (continued)

12. Docking/SCSI port
13. Parallel port connector
14. Infrared port (IrDA)
15. Serial port connector
16. Floppy drive port
17. VGA output connector
18. AC adapter socket
19. Reset button
20. Memory-expansion slot
21. Identification pocket
22. Battery

Product at a Glance

The following diagram represents all models of the OmniBook 800. Use Table 1 to identify each part for the F1171 - F1175, and F1360 OmniBooks. Refer to the corresponding repair procedure(s) in Part 3 for the exact placement of each component.

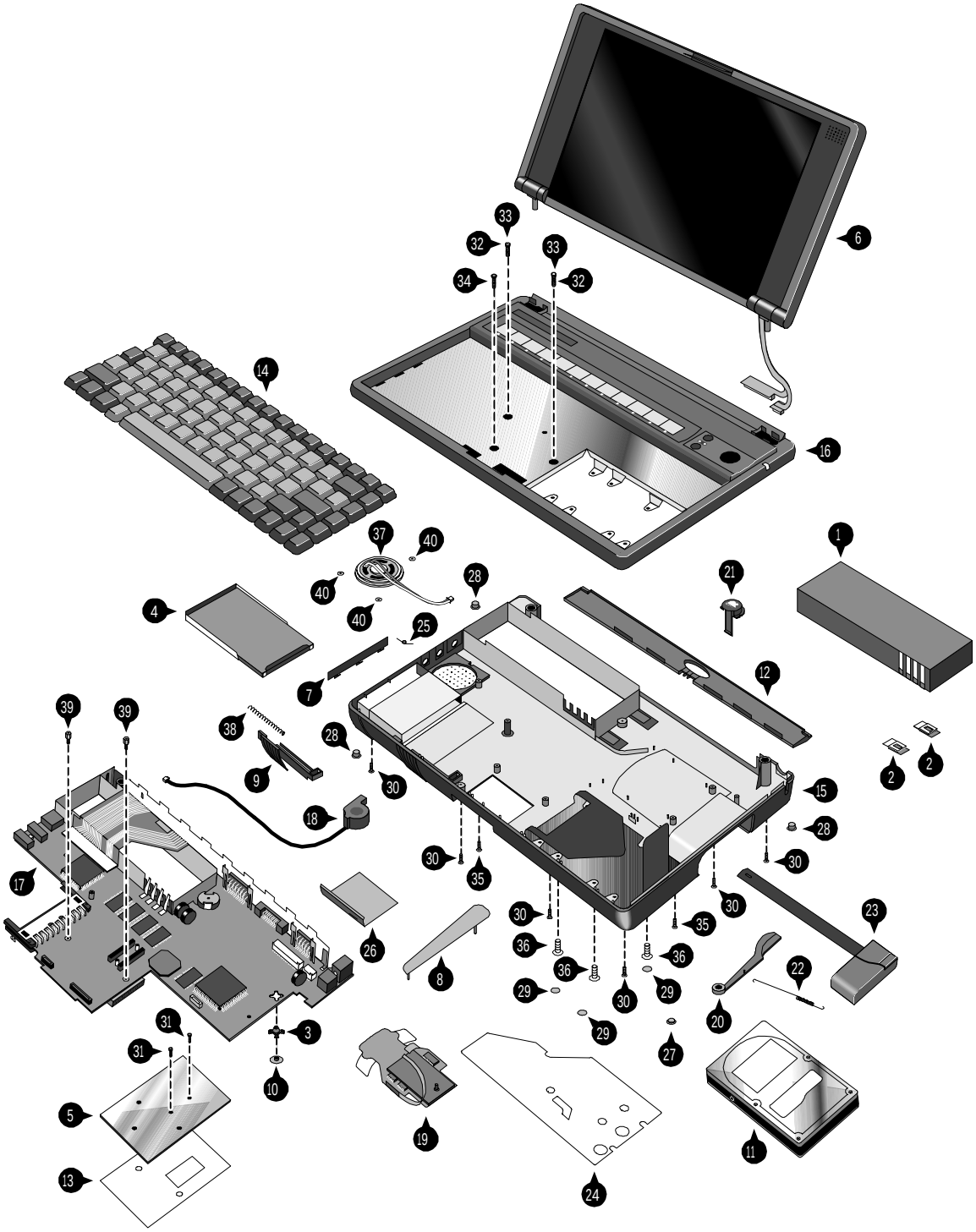


Figure 3 - Exploded Diagram

Table 1 - Parts Identification

	DESCRIPTION	PART NUMBER	EXCHANGE PART NUMBER	CUSTOMER REPLACEABLE	F1171 - F1175	F1360 Only
1	BATTERY - LI-ION	F1121-80002		yes	✓	✓
2	BATTERY LATCH	F1170-40006		yes	✓	✓
3	BUSHING	F1170-40025		no	✓	✓
4	CARD TRAY ASSY	F1052-60005		yes	✓	✓
5	CPU					
	CPU 100MHZ	F1170-60919	F1170-69019	no	✓	
	CPU 133MHZ	F1170-60920	1170-69020	no	✓	
	CPU 166MHZ	F1360-60911	1360-69011	no		✓
6	DISPLAY					
	DISPLAY CSTN	F1170-60902	F1170-69002	no	✓	
	DISPLAY TFT	F1170-60901	F1170-69001	no	✓	
	DISPLAY TFT	F1360-60901	F1360-69001	no		✓
7	DOOR - PIVOT LEFT	F1052-40007		no	✓	✓
8	EJECT ARM LEFT	F1360-40005		no	✓	✓
9	EJECT BUTTON LEFT	F1170-40030		no	✓	✓
10	GROMMET	F1360-40004		no	✓	✓
11	HARD DISK DRIVE					
	810MB HDD	0950-3084	F1191-69001	yes	✓	
	1.44GB HDD	0950-3133	F1170-69012	yes	✓	
	2.1GB HDD	0950-3193	F1360-69012	yes		✓
12	I/O DOOR	F1170-40010		yes	✓	✓
13	INSULATOR - CPU	F1360-20007		no	✓	✓
14	KEYBOARD	*		no	✓	✓
15	KEYBOARD BOTTOMCASE					
	KEYBOARD BTMCASE	F1170-60904		no	✓	
	KEYBOARD BTMCASE	F1360-60904		no		✓
16	KEYBOARD TOPCASE					
	KEYBOARD TOPCASE	F1170-60903		no	✓	
	KEYBOARD TOPCASE	F1360-60903		no		✓
17	LOGIC PCA					
	LOGIC PCA 16MB	F1170-60906	F1170-69006	no	✓	
	LOGIC PCA 16MB	F1360-60906	F1360-69006	no		✓
18	MICROPHONE ASSY	F1067-60012		no	✓	✓
19	PAW ACTIVE	F1170-60909		no	✓	✓
20	PAW EJECT ARM	F1170-40008		no	✓	✓
21	PAW EJECT BUTTON	F1170-40005		no	✓	✓
22	PAW EJECT SPRING	F1030-00016		no	✓	✓
23	PAW MECHANICAL	5061-4390		yes	✓	✓
24	PAW SHIELD	F1170-00009		no	✓	✓
25	PIVOT DOOR SPRING	F1030-00026		no	✓	✓
26	RAM DOOR	F1170-40007		yes	✓	✓
27	RUBBER FEET - FALSE FOOT	F1170-40009		yes	✓	✓
28	RUBBER FEET-SCREW COVER	F1030-40018		yes	✓	✓
29	RUBBER HDD HOLE PLUG	F1170-40018		yes	✓	✓
30	SCREW 2.0 X.4 6MM	0515-2396		yes	✓	✓
31	SCREW M1.6X.35X4	0515-2852		no	✓	✓
32	SCREW M2X.40X4.5WH	0515-2853		no	✓	
33	SCREW M2X.4X11.5WH	0515-2920		no		✓
34	SCREW M2X.4X3.5WH	0515-2921		no		✓
35	SCREW M2X.4X7PH T6	0515-2846		yes	✓	✓
36	SCREW M3X.5X5WH T6	0515-2847		yes	✓	✓
37	SPEAKER	9164-0422		no	✓	✓
38	SPRING EJECT LATCH	F1030-00029		no	✓	✓
39	STANDOFF - HEX	0380-4606		no	✓	
40	TOPY SPRING NUT	0510-1634		no	✓	✓

Note, this is a partial parts list. For a complete parts list, please refer to Appendix F or the Product Support Plan.
* For a complete listing of localized keyboards, please refer to Appendix F or the Product Support Plan.

Product Comparisons

	HP OmniBook 800 with MMX Technology	HP OmniBook 800	HP OmniBook 5700
Size Closed	18.49 × 28.24 × 3.99 cm (7.28 × 11.12 × 1.57 in)	18.49 × 28.24 × 3.99 cm (7.28 × 11.12 × 1.57 in)	29.5 x 22.6 x 4.9 cm (11.6 x 8.9 x 1.93 in)
Weight	1.77 kg (3.90 lb)	1.70 kg (3.75 lb)	3.27 kg (7.2 lb)
Processor	166-MHz Intel Pentium® with MMX Technology	100-, 133-MHz Intel Pentium®	166- or 150-MHz Intel Pentium® with MMX technology
Bus Architecture	32-bit PCI bus	32-bit PCI bus	32-bit PCI bus
Cache	512-KB external L2 cache	256-KB external L2 cache	512-KB burst-synchronous L2 cache
Display Size	• 10.4-inch TFT	• 10.0-inch CSTN • 10.4-inch TFT	• 12.1-inch TFT
Display Resolution	• SVGA TFT 800 x 600 x 64K colors	• SVGA CSTN 800 x 600 x 256 colors • SVGA TFT 800 x 600 x 256 colors	• XGA TFT 1024 x 768 x 64k colors • SVGA TFT 800 x 600 x 16M colors
Pointing Device	pop-up mouse	pop-up mouse	TrackPoint™ III
Video Bus	Accelerated 128-bit PCI bus	Accelerated 128-bit PCI bus	32-bit PCI bus
Video RAM	2MB	1MB	2MB
VGA-out Support	• SVGA-out supports 1024×768×256 at 75 Hz and 800x600x64k at 85 Hz • MPEG software support • Zoomed Video enabled	• SVGA-out supports up to 1024×768×256 colors • MPEG software support	• SVGA-out supports up to 1024 x 768 x 64k colors • Zoomed Video enabled
Video Controller	NeoMagic NM2093	NeoMagic NM2070	C&T 65554
Power	• AC adapter 100 to 240 Vac (50 to 60 Hz) input • 12 Vdc, 3.3 A output	• AC adapter 100 to 240 Vac (50 to 60 Hz) input • 12 Vdc, 3.3 A output	• AC adapter 100 to 240 Vac (50 to 60 Hz) input • 12 Vdc, 3.3 A output
Battery Type	• 7.2 Vdc rechargeable Lithium Ion battery	• 7.2 Vdc rechargeable Lithium Ion battery	• 14.4-Vdc, 2.5-AH rechargeable Lithium-Ion battery • Optional, 14.4-Vdc, 3.75-AH enhanced Lithium Ion battery
Battery Life	Battery life up to 3.0 hours.	Battery life up to 3.0 hours.	1.75 to 2.5 hours with one LiIon battery (enhanced LiIon battery adds 2.5 to 3.75 hours)
Recharge Rate	Battery pack recharges to high level in less than 2.5 hours using AC adapter	Battery pack recharges to high level in less than 2.5 hours using AC adapter	Battery recharges to high level in 4 hours using AC adapter while PC is on or off
Advanced Power	• Instant-on maintains	• Instant-on maintains	• Instant-on maintains

	HP OmniBook 800 with MMX Technology	HP OmniBook 800	HP OmniBook 5700
Management	computer in ready-to-work state for months on a charge. Turn it on again, and you're instantly back where you were. • 2-minute low-battery warning • APM 1.2	computer in ready-to-work state for months on a charge. Turn it on again, and you're instantly back where you were. • 2-minute low-battery warning • APM 1.1	computer in ready-to-work state for weeks on a full charge; returns you to your application or file instantly • 2-minute low-battery warning • APM 1.2
Removable Modules	• Hard disk drive • RAM • Battery	• Hard disk drive • RAM • Battery	• Floppy disk drive • Hard disk drive • RAM • Battery
Hard Disk Drive	• 2.1-billion-byte enhanced-IDE • mode-4, PCI-bus • 12.7 mm	• 810-million-byte, 1.44-billion-byte enhanced-IDE • mode-4, PCI-bus • 12.7 mm	• 3.0 billion-byte or 2.0 billion byte enhanced- IDE
Floppy Disk Drive	External ultra-thin, three-mode floppy disk drive (included with product)	External ultra-thin, three-mode floppy disk drive (included with product)	Internal 3.5-inch, 1.44-MB, standard
CD-ROM Drive	Optional, external 8x speed	Optional, external 8x speed	Optional, internal, 10x
Memory	• 16 MB standard VEDO DRAM • 60 ns • upgradable to 80 MB • 16-, 32-, 64-MB RAM expansion cards	• 16 MB standard VEDO DRAM • 60 ns • upgradable to 80 MB • 8-, 16-, 32-, 64-MB RAM expansion cards	• Self-refreshed FPM DRAM • 16 or 32-MB models, expandable to 128 MB • 8-, 16-, 32-, and 64-MB RAM cards available
Audio	• 16-bit Sound Blaster™ Pro stereo compatible. • Two built-in speakers (not stereo sound)	• 16-bit Sound Blaster™ Pro stereo compatible. • Two built-in speakers (not stereo sound)	• 16-bit with Sound Blaster™ and MIDI support • Stereo sound via two built-in speakers
IO Ports	• 9-pin, 115,200-b/s, RS-232 port • 25-pin EPP/ECP parallel port • SVGA-out (up to 1024 × 768 × 256) • 4 Mbps Fast IRDA • Docking system connector (dock is optional) • SCSI-2 port available with accessory cable (fits in docking port) • Floppy drive port • Headphone/stereo-out	• 9-pin, 115,200-b/s, RS-232 port • 25-pin EPP/ECP parallel port • SVGA-out (up to 1024 × 768 × 256) • 4 Mbps Fast IRDA • Docking system connector (dock is optional) • SCSI-2 port available with accessory cable (fits in docking port) • Floppy drive port • Headphone/stereo-out	• 9-pin, 115,200-bps, RS-232 port • 25-pin bidirectional ECP/EPP parallel port • SVGA-out (up to 1024 x 768 x 64K) • Fast-IR-IRDA compliant @ 4Mbps • Expansion bus connector • PS/2 keyboard/mouse port • Headphone/stereo-out port

	HP OmniBook 800 with MMX Technology	HP OmniBook 800	HP OmniBook 5700
	port • Stereo-in and microphone ports	port • Stereo-in and microphone ports	• Stereo-in and microphone ports • MIDI/joystick port
PCMCIA	• One Type III PCMCIA slot (or use as two Type II slots) • Zoomed video support in upper slot • CardBus-ready	• One Type III PCMCIA slot (or use as two Type II slots)	• One Type III PCMCIA slot (or use as two Type II slots) with 3.3-V or 5-V support • Zoomed video support for lower slot • CardBus support
Docking	Optional docking system with EPP/ECP parallel, serial, VGA-out (up to 1024 × 768), keyboard, PS/2 or Microsoft® mouse, and SCSI-2 ports; external floppy connector; stereo out; and standard half-length ISA/PCI slot.	Optional docking system with EPP/ECP parallel, serial, VGA-out (up to 1024 × 768), keyboard, PS/2 or Microsoft mouse, and SCSI-2 ports; external floppy connector; stereo out; and standard half-length ISA/PCI slot.	Optional docking system with one PCI/ISA and one ISA slot, parallel, serial, SVGA-out (up to 1024 x 768 x 64k), keyboard, PS/2 mouse, MIDI/joystick, audio and SCSI-2
Pre-installed Software	• Microsoft Windows® for Workgroups 3.11 and MS-DOS® 6.22 dual-loaded with Windows 95 • User upgradable Plug and Play BIOS • APM 1.2 • Diagnostic Software • HP PIM and Financial Calculator • DMI 1.1 under Windows 95 with TopTOOLS • On-line documentation	• Microsoft Windows for Workgroups 3.11 and MS-DOS® 6.22 dual-loaded with Windows 95 • User upgradable Plug and Play BIOS • APM 1.1 • Diagnostic Software • HP PIM and Financial Calculator • SystemSoft CardLite and Monarch PC card software • On-line documentation	• Microsoft® Windows® for Workgroups 3.11 and MS-DOS® 6.22 co-loaded with Microsoft Windows 95* • User upgradable Plug and Play BIOS • Advanced Power Management 1.2 • DMI 1.1 under Windows 95 with TopTools • HP PIM and Financial Calculator • On-line documentation
Security Features	• 2-level password protection • Hardware-based hard drive password • Kensington lock slots • System administrator password • PC ID • EEPROM-based serial number for DMI tracking	• 2-level password protection • Optional hardware-based hard drive password • Kensington lock slots • System administrator password • PC ID	• 2-level password protection • Hardware-based hard drive password • Electronic serial number • PC ID (tattooing) • Drive lock • Kensington lock slots
Warranty	Free three-year world-wide warranty (1-year on	Free three-year world-wide warranty (1-year on	Free three-year world-wide warranty (1-year

	HP OmniBook 800 with MMX Technology	HP OmniBook 800	HP OmniBook 5700
	battery and accessories)	battery and accessories)	on battery and accessories)

Part 2

Troubleshooting

- Power-On Self-Test
- OmniBook Diagnostics
- Desktop Management Interface
- System Configuration Utility
- Troubleshooting Tips

Power-On Self-Test

The OmniBook 800 BIOS includes a Power-On Self-Test (POST) facility that tests a number of hardware and firmware items in the unit at each cold-start (BOOT or RESET).

The OmniBook 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.

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 yet available.

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, ensure that

- all accessories are removed, including:
  memory, floppy drive, docking station, modems and other PC Cards, printers, external displays, pointing devices, and keyboard
- 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 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 non-fatal system board errors.

Table 2 - POST Beep Codes

Beep Code	Description
S-S-S-P-S-S-L-P	The DMA page registers are faulty.
S-S-S-P-S-L-S-P	The refresh circuitry is faulty
S-S-S-P-S-L-L-P	The ROM checksum is incorrect
S-S-S-P-L-S-S-P	The CMOS RAM test failed
S-S-S-P-L-S-L-P	The DMA controller is faulty
S-S-S-P-L-L-S-P	The interrupt controller failed
S-S-S-P-L-L-L-P	The 8042 keyboard controller failed
S-S-L-P-S-S-S-P	No video adapter was found
S-S-L-P-S-S-L-P	No RAM installed. No message is displayed.

Display Codes

There are a number of Power On Self Test (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 (such as 03044). It is extremely important not to interpret a failure code immediately as a hardware failure. The failure should be confirmed with a clean boot. A clean boot is defined as pressing the reset button after removing all accessories (including additional memory, floppy drive, modems, PC cards, and printers) and providing a reliable power source. Note, make sure the display is adjusted to be visible.

The following tables lists common PC error messages. Not all of these messages will appear on every model of the OmniBook 800.

Table 3 - POST Display Codes

Message	Possible Cause
CLOCK NOT TICKING CORRECTLY	The real time clock is not ticking.
COLOR/MONO SWITCH INCORRECT	The COLOR/MONO switch on the system board is incorrect for the installed hardware.
CMOS CHECKSUM INVALID - RUN SCU	CMOS RAM information has been corrupted and needs to be reinitialized via the System Configuration Utility.
CMOS FAILURE - RUN SCU	CMOS RAM has lost power and needs to be reinitialized via the System Configuration Utility.
FLOPPY CONTROLLER FAILED	The floppy controller failed to respond to the reset command. Power down the system and check all appropriate connections. It the floppy controller continues to fail, you may need to replace it.
FLOPPY DISK TRACK 0 FAILED	The floppy drive cannot read track 0 of the floppy disk in the drive. Try another diskette. If the problem persists, you may need to replace the floppy drive.
FLOPPY INFORMATION INVALID - RUN SCU	The drive parameters stored in CMOS do not match the floppy drives detected in the system.
HARD DISK CONTROLLER ERROR	The hard disk controller failed to respond to the reset command. Possible solutions: 1) Check the drive parameters. 2) Power down the system and check all appropriate connections. If the problem persists, you may need to replace the hard disk controller.
HARDWARE INFO DOES NOT MATCH VIDEO CARD - RUN SCU	The video adapter type specified in CMOS RAM does not match the installed hardware.
KEYBOARD CONTROLLER FAILURE	The keyboard failed the self-test command. Check to see if the keyboard controller is properly installed. If the problem continues, replace the controller.

Message	Possible Cause
KEYBOARD FAILURE	The keyboard failed to respond to the RESET ID Command.
MACHINE IS LOCKED - TURN KEY	The system will not continue the boot sequence until you insert the key into the key lock and turn it.
NO BOOTABLE FLOPPY DRIVE 0 INSTALLED	No bootable floppy drive was detected. Possible solutions: 1) Power down the system and check all appropriate connections, cables, etc. 2) In configurations where no floppy drive is installed, run System Configuration Utility and make sure the diskette drive configuration item is set to “None”. 3) Replace the diskette drive if necessary.
NO INTERRUPTS FROM TIMER 0	The periodic timer interrupt is not occurring.
RAM PARITY ERROR AT LOCATION xxxx	A RAM parity error occurred at the specified (hexadecimal) location.
ROM AT xxxx (LENGTH YYYY) WITH NON-ZERO CHECKSUM (zz)	An illegal adapter ROM was located at the specified address. An external adapter (such as a video card) may be causing a conflict.
TIME/DATE CORRUPT - RUN SCU	The time and date stored in the real time clock have been corrupted, possibly by a power loss.
UNEXPECTED AMOUNT OF MEMORY - RUN SCU	The amount of memory detected by POST does not match the amount specified in CMOS RAM.
CMOS RAM TEST FAILED	A walking built test of CMOS RAM locations 0E (Hex) - 3F (Hex) failed.
DMA CONTROLLER FAULTY	A sequential read/write of the transfer count and transfer address registers within the primary and secondary DMA controllers failed.
FAULTY DMA PAGE REGISTERS	A walking bit read/write of the 16 DMA controller page registers starting at location 80 Hex failed.
FAULTY REFRESH CIRCUIT	A continuous read/write test of port 61h found that bit 4 (Refresh Detect) failed to toggle within an allotted amount of time.
INTERRUPT CONTROLLER FAILED	A sequential read/write of various Interrupt Controller registers failed.
ROM CHECKSUM INCORRECT	A checksum of the ROM BIOS does not match the byte value at F000:FFFF.

OmniBook Diagnostics

The OmniBook diagnostics program provides an effective tool for diagnosing and isolating a hardware problem. The diagnostics software is intended for use in concert with additional troubleshooting methods to accurately determine the cause of trouble. The diagnostics program is not designed for unassisted end customer use.

Diag is a DOS program developed to test the OmniBook 800 computer and docking station. For the most part Diag is a stand-alone program, testing components and subsystems independently. Some tests require "loopback" adapters for complete testing, and some tests require other hardware (e.g. SCSI devices). Basic knowledge of running software is assumed.

Running the diagnostics program

A "clean boot" is the environment from which to run Diag. For a system that normally boots up to Windows for Workgroups, press F5 at bootup. For a Windows 95 system, press Shift+F5. Alternatively, the CONFIG.SYS and AUTOEXEC.BAT files may be modified to exclude drivers and/or launch Diag if desired. Please note that the SCSI tests do require loading some drivers; those drivers will be addressed in the context of those tests.

The diagnostic program is located in the **c:\omnibook\diag** directory and is invoked by typing **diag** followed by the Enter key.

Main diagnostic screen

The OmniBook diagnostic program is controlled primarily from a single screen. The top two thirds of the screen reports the tests selected and test results. The bottom third is used to scroll test results as the tests run. Thirty tests are listed under the Menu heading. See Figure 4 for a sample of the main diagnostic screen.

Tests selected for looped running show a test level of 1 to 3 to the left of the test name. When a test ends, the status of the test and the date and time are reported. As a test runs, ongoing status can be reported either on the same line as the test, or scrolled into the bottom region. When looping tests are performed, the bottom line reports when the loops begun and which loop is currently running. If a test ever fails, a red 'x' appears to the left of the test name. The version of Diag is reported near the bottom of the display, as is the version of the BIOS. External monitor colors can be checked at a glance with the RED GREEN and BLUE colored text boxes.

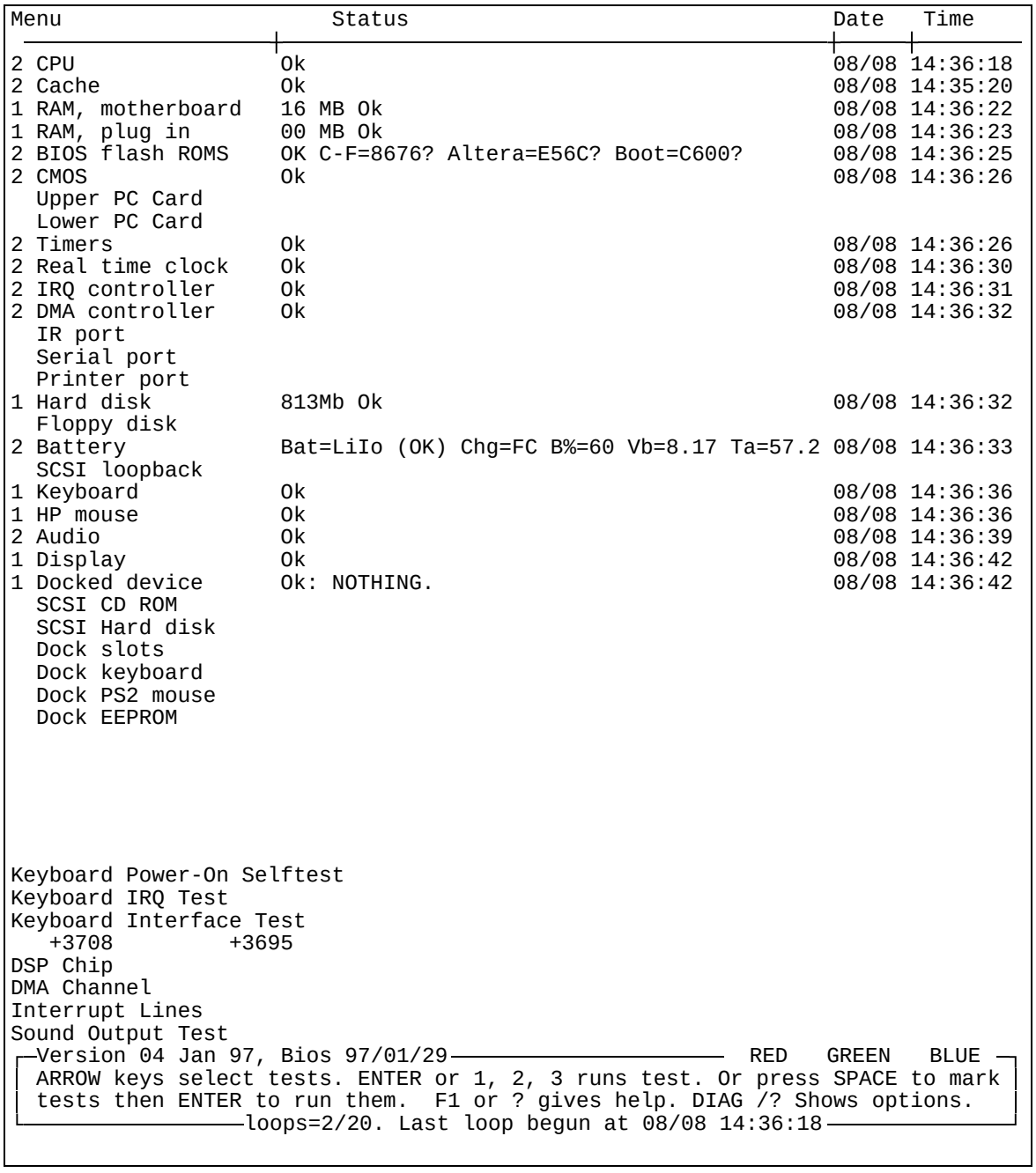


Figure 4 - Main Diagnostic Screen

Running selected tests

Tests may be initiated individually, or as a group. Some tests may be run at different levels. In general, tests that can take a long time to be fully checked have levels that permit testing more quickly while still providing a reasonable level of testing. An unselected test has a <Space> before the test name. A test at a quick level has a <1> before the test name. A standard level test has a <2> before the test name. A long test has a <3> before the test name. Every test has a standard level. Some tests also have a quick level, and some tests also have a long level. Some have both quick and long.

The name of the currently selected test is always shown inversed.

To help monitor the progress of testing, the LEDs (near the On button) blink about once per second from green to off. If a test has failed the LEDs blink from red to off. When Diag finishes testing, the LEDs blink rapidly. If the system locks up for some reason, the LEDs generally stop blinking.

Alternative methods for running tests

Individual tests may be run by moving the highlight to the desired test and running it. Move the highlight and run the tests by the following means:

Keyboard – cursor <Up> and <Down> keys to select, <Enter> to run. Also <Space> to specify a test level, <Backspace> to cancel a test, <Esc> to exit Diag. Many other features and options are also available from the keyboard.

Contrast/Brightness buttons – <Down> to select (mimics the Down key), <Up> to run (mimics the Enter key). This is most useful on production units that have no keyboard. For checking "Newton rings" during display testing, it is necessary to adjust the contrast. To have the contrast keys operate normally, press both at once. To have them mimic the Down and Enter keys, press both again.

Mouse – when the -m command line option is specified, use the top or bottom "bumper" to select, and left button to run. Also use the right button to specify test level (space), right bumper to cancel a test (Backspace), and left bumper to exit Diag (Esc).

Serial – same keys as with a keyboard, but from a remote system (HP 100LX, etc) connected into the RS232 port on the OmniBook. The remote computer's serial port should be configured for 9600,N,8,1. The communication program Kermit is well suited to communicate with Diag, in that it sends cursor and function key codes as PC key codes (e.g. <Up> transmits <NULL> then <;>). Controlling Diag via the serial port permits the same level of control of modes and toggles as does direct keyboard control. Please note that the serial test cannot be run when the serial port is used for control (though the serial port gets a decent workout controlling Diag anyway).

Special test hardware requirements

The following tests require the following hardware to operate:

- The Upper/Lower PC Card tests require a Sycard test card and a modified extender card.
- The IR port test requires another OmniBook 800 running the fast IR test.
- The Serial port test requires an HP RS-232 serial loop back connector.
- The Printer port test requires an HP parallel port loop back connector.
- The SCSI test requires an HP SCSI port loop back connector.
- The SCSI CD ROM test requires a CD ROM device connected by SCSI cable.
- The SCSI Hard disk test requires a Hard disk connected by SCSI cable.
- The Dock slots test are currently unimplemented.
- The Dock keyboard test requires a docking station and an external keyboard.
- The Dock PS2 mouse test requires a docking station and a PS2 mouse.
- The Dock EEPROM test requires a docking station.

Loop Back Connectors

In order to run the RS232 serial port, parallel port, and SCSI port self-test, a loop back connector is needed. The loop back may be placed on either the OmniBook port or at the end of the corresponding cable. This feature is also helpful in diagnosing a defective serial, parallel, or SCSI cable.

Loop back connectors may be purchased or can easily be constructed. The following illustrations identify the correct pin-out configurations for the serial, parallel, and scsi loop back connectors.

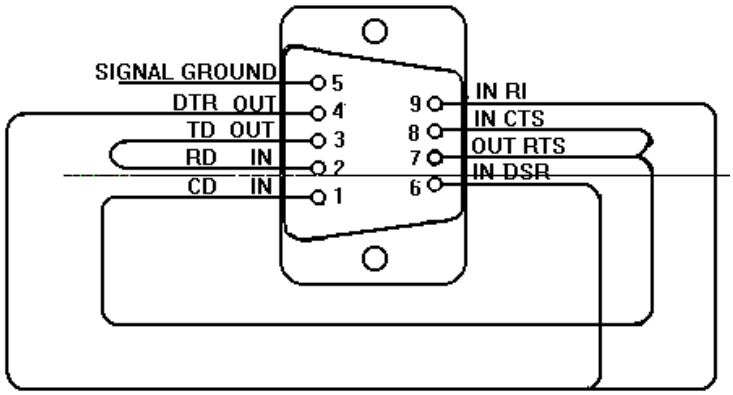


Figure 5 - Serial Loop Back Connector

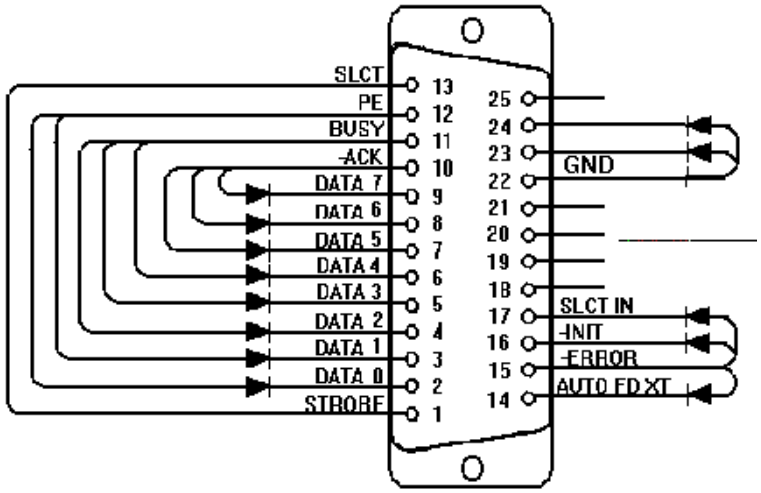
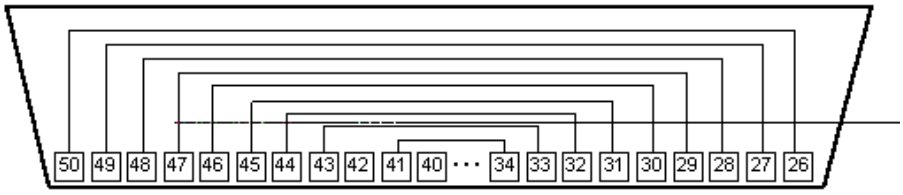


Figure 6 - Parallel Loop Back Connector

MALE 50-PIN HIGH DENSITY (BACK OF CONNECTOR VIEW)



Connections:

Pin 26 - 50 Pin 27 - 49 Pin 28 - 48 Pin 29 - 47

Pin 30 - 46 Pin 31 - 45 Pin 32 - 44 Pin 33 - 43 Pin 34 - 41

Figure 7 - SCSI Loop Back Connector

PCMCIA Type III extender card

The PCMCIA test that makes use of SyCard Technology's SyCard also requires an extender card modified with two jumpers or with solder bridges. In order for the Sycard to be detected, CD1- and GND must be shorted together, and GND with CD2- must also be shorted together. These are both pairs of endmost pins on the extender. Once these jumpers or solder bridges are added, the SyCard will successfully be detected and the SyCard tests can be performed. See Figure 8.

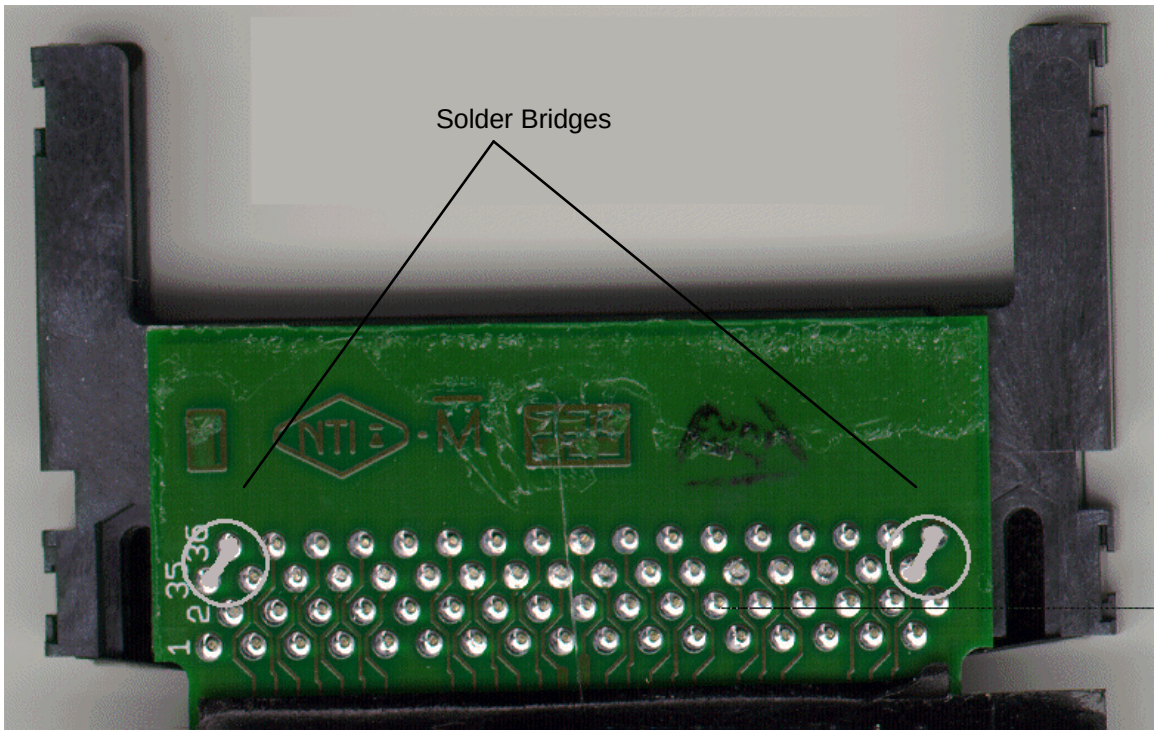


Figure 8 - SyCard Solder Bridges

Command line options

When Diag is run, either from the command line, or from a batch file, a number of switches (or options) may be included to "customize" the operation of Diag. Switches must be specified separately, and must begin with either a - or a / character. Upper or lower case may be used as desired. Switches may be used in any order. The switches, a brief description, and their use are described below:

Table 4 - Diagnotic Command Line Options

Switch	Description
-?	Report the standard command line options available.
-!	Report standard and hidden command line and keyboard commands available.
-cNxxxx	Specify Nth ROM checksum. The "BIOS flash ROMs" test the flash memory for correctness. In order for Diag to maintain usefulness in the face of new and different BIOSes, a way is needed to specify the BIOS ROM values. Though the test will not fail (as of this writing) if the checksums are not specified, a '?' will show after a sum to indicate checksum uncertainty. All three checksums must be specified to fully qualify the ROMs. As an example, to test a build with the 960701.ROM, the user would enter: Diag -c121E9 -c2D631 -c3C600. Batch files that need to work with both F1175 and F1360 OmniBooks may specify two checksums after each switch, the first one for the F1175 and the second one for the F1360. For example, to test the 970121 ROMs for both units, use the following switches: -c1B7386A45 -c2DC8CDC8C -c316001600.
-d	Select Dock tests only. For testers wishing to test docks, this switch restricts the test shown to those that pertain to the dock only. The set of tests shown in this mode include the following: Serial port, Printer port, SCSI loopback, Audio, Floppy disk, Docked device, Dock keyboard, Dock PS2 mouse, Dock EEPROM.
-f	Run Fast IR loopback mode on startup. The IR port test needs a computer running in "passive" mode to send IR data back to the computer being tested. An IR test station can be automated by having the passive computer run Diag with the -f option in its AUTOEXEC.BAT file. The key <Alt+F> can also be used to put the computer into passive mode. Press <Esc> to exit from passive mode.
-k<file>	Run a Keyboard macro file. This switch is by far the most powerful and versatile in that it lets the operator set up different configurations and test sequences and play them back later just as though they were typing the commands from the keyboard. For information on creating a keyboard macro file, see the <Alt+R> command.
-m	Enable Mouse keyboard control. For units that do not have a keyboard, use this option to control Diag with a mouse. For more information on this feature, see the <Alt+M> command
-r<test#>	Run nth test and return exit code. For testing from a batch file, this switch can be used to run a single test and return the test result in the errorlevel. 0=pass, 1=fail, 2=aborted, 3=no loop/can't run. Tests are specified by ordinal number counting from 1 at the top. Use the -1, -2, -3 option below to set the test level.
-s	Disable control via Serial port. By default, the serial port can be used to control Diag via a host computer (running Kermit connected at 9600, N, 8, 1) when no keyboard is available, the unit cannot be easily accessed for entering commands, or remote automated operation is needed. Serial control is always automatically disabled during the serial port test, but if the serial port is used for other activities, use this switch to completely disable control.
-x	Test for the eXtra key on foreign keyboards. Foreign keyboards have an extra key to the left of the space key. To include this key in the internal keyboard test, add a -X parameter when running Diag. Because the keyboard test is scancode based (not ASCII character), the key names are NOT localized to their foreign equivalents.

	Also some key caps have characters that cannot be displayed with the text characters available. Therefore, when running the keyboard test on a foreign keyboard, the POSITION of the key within the keyboard should match the POSITION of the key shown on the display, not necessarily the character printed on the key (although in nearly all cases, it does match). When -x is specified, the extra key appears as >< before the SP key.
-1	Mark all tests for quickest test available. This has the same effect as using the <M> command once and is mainly used with the -r switch.
-2	Mark all tests for standard test available. This has the same effect as using the <M> command twice and is mainly used with the -r switch
-3	Mark all tests for longest test available. This has the same effect as using the <M> command thrice and is mainly used with the -r switch.
EDOCK	An undocumented/hidden Diag switch: Set the dock serial number. Use this undocumented switch to set the dock serial number in the dock EEPROM. The date and time must be valid, and the date must be Jan 1 1996 or later. The serial number is set to the following code: MDDHHMMS where M is month 1-9 A-C, DD is day 01-31, HH is hour 00-23, MM is minute 00-59, and S is seconds 0-5 (tens of seconds only).

User interface commands

The user interface commands of the diagnostics program are divided into three groups: commands that select tests, commands that toggle test settings, and commands that set test parameters.

Commands for test selection

The following table describes the various commands used to select test within the diagnostics program.

Table 5 - Diagnostic Test Selection Commands

Command	Description
Down	Highlight the next test. At the bottom, wrap to the top test.
Up	Highlight previous test. At the top, wrap to the bottom test.
Home	Highlight the top test.
End	Highlight the bottom test.
Space	Mark the highlighted test. Tests that permit multiple levels progress from the quickest test to the longest test then back to not selected.
M	Mark all tests. If no tests are selected, <M> will select all tests to run at the quickest possible level. Another <M> sets all tests to the standard level. Another <M> sets the longest possible level. Another <M> unselects all tests. If any other mixture of tests is selected all tests are unselected.
Enter	Run all selected tests. <Enter> is used to begin running a group of selected tests. If no tests are selected, the highlighted test is run at the standard level.
1 2 3	Run highlighted test ONLY (short, standard, long). If short or long is not available for the specified test, the standard test is run.
<Backspace>	Stop current test. The <Backspace> key is universally used to abort a test that is running. Some tests may not be able to quickly respond to the keyboard and it may be necessary to depress the key a few times or hold the key down for it to be recognized.
Esc	Exit Self-test. Upon exit, the Diag display is cleared and the DOS display is restored. Every attempt is made to restore all settings to their previous state

	upon exit (no reboot necessary in most cases).
Alt+F12	Dump the text screen to a file named DIAG.xxx where xxx begins at 000 and increases by one each time another screen dump is captured. Screen dumps from previous runs of Diag are preserved.
? or F1	Display a help screen of keyboard commands.

Commands for toggling test settings

The following table describes the various commands used to toggle test settings within the diagnostics program.

Table 6 - Diagnostic Commands for Toggling Settings

Command	Description
Ctrl+C	Toggle battery Charging on/off. This command sends a request to the charging software in the BIOS to enable charging / disable charging.
Ctrl+E	Toggle ignore Errors on/off (continue after error when on). Normally Diag stops looping when an error occurs, but with this command, Diag will continue to loop until all requested loops are complete.
Ctrl+L	Toggle Logging to disk file (errors, all, all+status, none). This command appends results to the file DIAG.LOG on the current drive and directory from which Diag was run. The data logged is either: 1) only tests which fail, 2) all tests results, 3) all test results, and all messages shown in the lower status window, or 4) none. For looping tests, the loop count and time is logged at the start of each loop. If a floppy or hard disk critical error happens when logging results, the normal “Abort, Retry, Ignore” message may not be visible depending on the display mode. A special error handler has been incorporated into diag to handle this case. A flashing message will appear on the top line should an error of this type occur. Press A, R, or I to continue. If no keyboard is available, press the Contrast Up button to Retry, or the contrast Down button to Ignore the error.
Ctrl+N	Toggle Noise (beep & flash) at test completion. When a test or set of tests completes, Diag waits for the user to enter more commands. To help notify the operator of when this happens, use Ctrl+N to cause Diag to invert the display and sound a noise until the user responds in some way.
Ctrl+P	Toggle Power management on/off. Tests that require measuring power levels may require that Power management be on or off. This can be controlled directly with this command.
Ctrl+T	Toggle between the four types of mouse tests. The HP mouse tests are 1) text mode mouse test, 2) graphic mode sine wave mouse test, 3) combined text and sine tests, and 4) graphic draw mode test.
Ctrl+V	Toggle Verbose test status reporting. Some tests can report more detailed information. These tests include: all dock related tests (reports voltages), the HP and External mouse tests (reports x/y data and button status).
Ctrl+W	Toggle printing to Wired serial port (errors, all, all+status, none). Like the <Ctrl+L> command that logs results to disk, this command similarly logs results to the com 1 serial port.
Alt+A	Toggle cAche on/off. If it is necessary to disable the cache, use this command. Processor level commands are used to perform this operation.
Alt+K	Toggle miKe on & line off, mike off & line on, both off.
Alt+M	Toggle program control with Mouse on or off. Like the -m command line option, Alt+M enables controlling Diag with a mouse. The mouse actions listed below have the following keyboard equivalents:

Mouse switch	Key	Action

		Top Bumper	<Up>	Highlight previous test.
		Bottom Bumper	<Down>	Highlight next test.
		Left Button	<Enter>	Run current or selected tests.
		Right Button	<Space>	Mark highlighted test.
		Right Bumper	<Backspace>	Cancel currently running test.
		Left Bumper	<Esc>	Exit Diag.
Alt+P	Toggle 'Prompt to retry test after a failure.' Sometimes it is useful to trap failures and give the operator another opportunity to run a test before logging the test as failed. When this option is enabled, if a test failed (other than user aborted) the user is prompted with "Retry test now?". If <Y> is pressed, the test is immediately run again and no logging whatsoever of the failure is recorded anywhere. This option has been useful for running tests manually where test fixtures need to be installed prior to testing.			
Alt+R	Record keystrokes in a file for configuring tests. Used to record keystrokes for later recall, the user is prompted for the name of a file to store the keystroke names in (note that the extension used with the keyfile is automatically set to .KEY). Once a unique name has been entered, every key press is recorded to the file (except keys pressed during the execution of an individual test) until <Alt+R> is pressed again, or Diag is exited. If Diag is exited, the final <Esc> key is included in the key file. Please note that macro files run when Diag first starts up, and that any keys pressed before <Alt+R> is pressed will NOT be included. In particular, keys that select tests or test settings should be avoided before recording a keyboard macro file. If you wish to avoid having to wait until AFTER a set of tests is run to save the keyboard macro file simply enter all the keys you need UP TO WHERE YOU WOULD PRESS THE ENTER KEY. At this point, press <Esc> to exit Diag, then use EDIT or another ASCII text editor to add "<Enter>" to the end of the file.			
Alt+S	Toggle Suspend hard disk at end of test. The hard disk can either be left spinning (default) at the end of its test, or spun down and stopped.			
Alt+T	Toggle 1000Hz Tone on/off. The PC speaker generates a 1000Hz tone when this option is enabled.			
Alt+V	Toggle Videos used between both, external, and internal. Diag can drive either or both displays. When Diag is first run, the currently selected displays continue to function (whatever the user has specified). The first <Alt+V> enables both displays, the second enables the external display only, and the third enables the internal display only.			
Alt+W	Walk through tests. Sometimes it is useful to advance slowly through a particular test. By enabling this option, Diag will beep and wait for a keypress each time the test would normally just check to see if the <Backspace> key was pressed.			

The following two-key commands are hidden from general use:

Table 7 - Diagnostic Hidden Commands

Command	Description
Alt+E + Alt+C	Set the lost mickey Count threshold. Use this command to specify the minimum number of "lost mickeys" at which a mouse "mickey" error can occur. The default value is 530 mickeys. See also the Alt+E + Alt+T command, and the mouse test section.
Alt+E + Alt+D	Show dock EEPROM serial number (hidden function). Use this command to verify the dock serial number is set.
Alt+E + Alt+H	Set the Horizontal lost calibration speed thresholds used in the graphic draw mouse test. The defaults limits are 300 to 500.

Alt+E + Alt+V	Set the Vertical lost calibration speed thresholds used in the graphic draw mouse test. The defaults limits are 200 to 400.
Alt+E + Alt+M	Set mouse bumper failure threshold. The default number of mickeys for this is 1000. The number reflects how much bumper compression is permitted before a bumper is rejected.
Alt+E + Atl+S	Set sine mouse test threshold. For mice that exhibit sine wave patterns along the left side of the screen, use this key to specify how much will be tolerated. The default value is 10.
Alt+E + Alt+T	Set the lost mickey Time threshold. Use this command to specify the minimum number of "timer tics" at which a mouse "mickey" error can occur. The default value is 10 timer tics. See the Alt+E + Alt+C command and the mouse test section.
Alt+E + Alt+Z	Shell out from Diag to a command prompt. This can be used to run small tasks, (e.g. copy files) without losing any current diagnostic settings. When ready to return to Diag, type EXIT.

Commands for setting test parameters

The following table describes the various commands used to set test parameters within the diagnostics program.

Table 8 - Diagnostic Test Parameters

Command	Description
#	Set loop count limit for looping tests. By default 1 loop is run. If 0 loops are specified, Diag will loop indefinitely. Other values will loop for the count specified.
Ctrl+A	Set wakeup Alarm delay after suspend. The OmniBook can be set to automatically wake up after a suspend by setting a wakeup alarm of 1 to 59 hours, minutes, or seconds. By default, no wakeup is scheduled. If an alarm delay has been set and multiple test loops are set then Diag will automatically suspend at the completion of each loop.
Ctrl+D	Set loop Delay interval. By default, looped testing runs as rapidly as possible with no delays between loops. This command lets the user specify that each loop of testing start from 1 to 59 hours, minutes, or seconds after the previous loop started. No delay will occur if the tests have already run for the specified delay time (for example, if 2 minutes of delay are specified and the tests selected ran for 2 minutes 10 seconds, then no delay would occur at the end of the loop.
Ctrl+H	Report System Hardware found. This test reports on various OmniBook components. The following are reported: CPU speed (100, 133, 150, etc); Display technology (TFT, DSTN); Hard disk capacity (814M, 1.4G, etc); Cache size (256, 512, etc) and state (ON,OFF); OS version (varies); system RAM (16M, 24M, … 80M); and disk volume id (varies).
Ctrl+R	Set Retries before reporting disk error. By default, 5 retries are permitted before a disk error is reported. Specifying fewer retries will detect marginal media more quickly. A related feature of Diag regarding soft read errors (checksum errors), is that these sectors will be written back to disk to repair the checksum error.
Ctrl+S	Enter Suspend state. This command will put the OmniBook into an off state similar to pressing the Off key. Once suspended, the OmniBook will remain off indefinitely unless a wakeup alarm has been set with <Ctrl+A>.
Alt+B	Set Brightness 0-255. Specify a display brightness from 0 to 255 with this command. This exceeds the normal range permitted with the brightness buttons and can result in a blank display. Repeat the command with a less extreme value to restore the display.

Alt+C	Set Contrast 0-255. Systems with a DSTN display can specify a display contrast from 0 to 255. This exceeds the normal range permitted with the contrast buttons and can result in a blank display. Repeat the command with a less extreme value to restore the display.
Alt+D	Set device type that should be found in the dock port. Once specified, the "Docked device" test will only pass if the correct device is found. The OmniBook dock port can accept either a SCSI cable for connection to a tower, or a dock device. Specify N, S, or D when prompted for nothing, SCSI cable, or dock.
Alt+F	Set Fast IR loopback mode. The fast I/R test requires two OmniBooks with their I/R ports directed at each other. One OmniBook must be run in fast IR loopback mode. To put an OmniBook into this mode either use this command or use the /f command line option when starting Diag. To exit this mode press the <Esc> key.
Alt+I	Enter Idle state. This command puts the OmniBook in a low power state while still maintaining full readiness to run. Press any key to resume.
Alt+N	Enter a Note to log to disk file. When logging to a disk file has been enabled with <Ctrl+L>, this command can be used to permit entering a line of text, then logging the text to the log file DIAG.LOG

Details on using the diagnostic tests

Details for the various tests are described below. The levels permitted for each test and a brief note on hardware or other options are described.

Numerous tests involve pattern testing to determine if the hardware can accept the various data combinations required. Tests that make use of 18 data patterns use the following pattern set: 0FFFFh, 00000h, 0F0F0h, 0AAAAh, 05555h, 08080h, 04040h, 2020h, 01010h, 00808h, 00404h, 00202h, 00101h, 01111h, 02222h, 04444h, and 08888h. These data patterns are used in place of "walking bits", "checkerboards", and "bit stuck high/low".

CPU

Level: 2. The CPU test contains numerous subtests as follows. The CPU register test writes the 18 data patterns to the registers and reads them back to verify correctness. The CPU arithmetic test performs ACD, ADD, DEC, DIV, IDIV, IMUL, INC, MUL, SBB and SUB with 16 and 32 bit operands. The CPU logical test performs AND, NOT, OR, and XOR with 16 and 32 bit operands. The CPU string test performs LODS, MOVS, SCAS, and STOS with 16 and 32 bit operands. The CPU interrupts / exceptions tests software interrupts and real-mode accessible exceptions; if Diag is running in a DOS box, Windows prevents testing all exceptions but divide by 0. The coprocessor tests the numeric coprocessor register stack, exception handling, arithmetic, comparison, and transcendental operations. Failures are reported by register and operation. A final test of CPU speed is performed to ensure measured speed is within 10% of the expected value, values below this will fail the test.

Cache

Level: 2. This tests the translation lookaside buffer and the Pentium on-chip cache first with register addressability, then with the 18 test patterns. No memory managers may be installed for this test to run.

RAM, motherboard

Levels: 1,2,3. The level 1 test performs an address test only with the 18 data patterns. The level 2 test performs a pattern test, address test, bus throughput, and code test. The level 3 test does what level 2 does except the pattern and address tests are repeated 10 times. The

operation of all tests depend on the presence or absence of XMS or EMS drivers. In general, if there is no XMS and no EMS driver, then memory will be accessed directly in pseudo-32-bit mode (i.e. with 4 GB selectors but from real code), if there is an XMS/EMS driver, the XMS driver will be used to access memory. The recommended environment is real mode without XMS or EMS drivers (i.e. a clean boot).

Pattern testing and address testing are similar. The pattern test sequentially writes the 18 patterns to memory and reads them back. The address test uses each individual memory location as the pattern data, but otherwise the test functions just like a pattern test.

Base memory is always pattern/address tested in 16-KB blocks. Extended memory, if no EMS/XMS drivers are present, will be tested in blocks of up to 1MB. The contents of the memory is not preserved.

Bus throughput testing is only available for base memory. The test reads memory using a tight REP LODSD loop, not checking the actual data, but looking out for parity errors (from the memory, cache, and interface chips).

Code test is only available for extended memory. The test writes a 1-MB program to memory, switches the CPU to protected mode and runs the program that is in extended memory. This approach tests not only the data cache and fetch of a CPU, but also the code cache and fetch. Exceptions and parity errors are also monitored in protected mode.

RAM, plug in

Levels: 1,2,3. These tests are identical to the RAM, motherboard tests except the RAM on the plug in card is tested.

BIOS

Level: 2 - command line option. This tests the 256k bytes of flash ROM memory. Depending on whether or not checksums are specified on the command line (with -C1xxxx -C2xxxx and -C3xxxx) the test either confirms the checksums specified or just reports the checksums found. If the checksums are unknown, run this test manually once to determine their value, then use these values for regular testing by specifying the checksums reported on the command line when Diag runs. The BIOS is logically divided into three sections named: C-F (BIOS memory C000:0000 to F000:7FFF), Altera (BIOS memory F000:8000 to F000:BFFF), and Boot (BIOS memory from F000:C000 to F000:FFFF).

CMOS

Level: 2. This tests CMOS addresses 010h - 03Fh of the nonvolatile real time clock CMOS RAM with the 18 data patterns, and tests for a correct CMOS checksum.

Upper PC Card

Level: 2. This test uses the Sycard Technology PCMCIA test to check the TI PCI-1130,1131 controller. The controller is checked for I/O signals, VCC and VPP voltages, proper audio signal generation, INPACK number generation, 3.3 and 5 volt operation and other aspects as detailed in the following listing of a typical test result. Please note that during the Audio out test a 1KHz tone should be heard. The Sycard test card is manufactured by Sycard Technology of Santa Clara, California.

```
Sycard Technology PCCtest 27x/37x software v1.50a
Looking for Texas Instruments PCI-1130 PCI Controller…
  TI PCI-1130 Found at Bus 00, Function 00, Device 04
  TI PCI-1130 Successfully Configured for I/O address
3E0/3E1
Testing Slot 0
Socket Controller = Texas Instruments PCI-1130
Checking Socket Controller….....Passed
Power on delay (Vcc = 5 volt)….....Complete
Basic operational test….....Passed
Data pattern test….....Passed
Address pattern test….....Passed
Status bit pattern test….....Passed
Wait bit test….....Passed
Reset test….....Passed
INPACK test….....Passed
Card voltage test….....Passed
Audio out test….....Complete
Power on delay (Vcc = 3.3 volt)….....Complete
Card voltage test (Vcc = 3.3 volt)…..Passed
Test completed with 0 errors - PASSED
```

Figure 9 - Sycard Test Results

The OmniBook model F1360 supports zoom video and Cardbus. If a Sycard model 450 PCMCIA socket tester is found (in the upper slot only), a zoom video test will be run on that slot.

Lower PC Card

Level: 2. This test operates like the upper PC card test, but for the lower slot. Manual insertion is generally required to test both slots.

Timers

Level: 2. This test checks that all three system timers are counting correctly, and that the control lines of programmable clock 2 are functioning properly.

Real time clock

Level: 2. This test checks for generation of IRQ0, generation of interrupt 1C, time updates, periodic interrupt, alarm interrupt, and time/date roll-over.

IRQ controller

Level: 2. This test checks the IRQ controllers' mask register, request register, in-service register, poll command, and EOI commands. Note that Windows prevents testing the poll command.

DMA controller

Level: 2. This test checks the DMA registers and page registers with the pattern registers, then a DMA read/write transfer is tested. Note that Windows prevents testing the DMA controller.

IR port

Level: 2. This test requires a second OmniBook running in fast IR loopback mode. The second OmniBook can be put in fast IR loopback mode either by running Diag with the /F command line option, or by first running Diag then pressing Alt+F. When in loopback mode, all IR data

received is echoed back to the host. The IR port is first tested in slow mode by sending / receiving data packets at 115K baud. If this passes, then data packets are transmitted in high speed at 1 megabit then 4 megabit. These IR transmission tests are repeated 3 times.

Serial port

Levels: 1,2. The level 1 test checks the internal operation of the serial port and does not require a loopback. The internal registers are pattern tested to ensure the port can interrupt the system. Then an internal loopback tests for proper internal character transmission. Finally, operation of RTS, DTR, CTS, and DSR status signals are checked.

The level 2 test performs what level 1 does plus a test at various baud rates for successful transmission of characters through a loop back connector.

Printer port

Level: 2. This test checks for command and data ports with the 18 data patterns, then uses the parallel loopback connector for proper operation of signal lines and IRQ generation.

Hard disk

Levels: 1,2,3. The level 1 test checks to ensure the internal drive signals are functioning correctly; if no errors occur the capacity of the drive is reported. The level 2 test checks all sectors on the outermost and innermost tracks as follows: a sector of data is read, the data is inverted and written, the data is read again and verified for correctness, finally the original data is written back. At level 3, all data between the inner and outer tracks are read to ensure data integrity. Any failure aborts further testing.

Note that the internal hard disk remaps the physical characteristics of the drive to a logical collection of tracks, heads and sectors.

Floppy disk

Levels: 1,2,3. This test operates similarly to the hard disk test. Note that the level 1 test does not require that the floppy disk be connected.

Battery

Level: 2. This test simply reports the status of the charging system: battery type (none or lithium ion); charge state (NA - battery powered (no AC), NC - no charging, the battery is full, FC - fast charging, TC - trickle charging, or EC - error charging); percent of battery charged (0 - 100); battery voltage, and ambient system temperature (Celsius).

SCSI loopback

Levels: 1,2,3. The level 1 test requires a dock or SCSI cable, the devices are checked for properly terminated signals. At level 2, an attached loopback device checks for opens and shorts. At level 3, the level 2 test is run, then the user is prompted to remove the loopback, then the level 1 test is run.

Keyboard

Levels: 1,2. The level 1 keyboard test checks that the keyboard responds appropriately to commands sent from the CPU. The level 2 keyboard test also checks that each key functions properly. The level 2 test passes when each key has been pressed or aborts if the <Space> or <Esc> key is pressed three times in a row. The special keys that do not generate key codes (<Fn>, <Contrast-Up>, and <Contrast-down>) are tested after the other keys have been tested. Press the key when prompted to complete the keyboard test. The display shown during the main test mirrors the layout of the OmniBook keyboard.

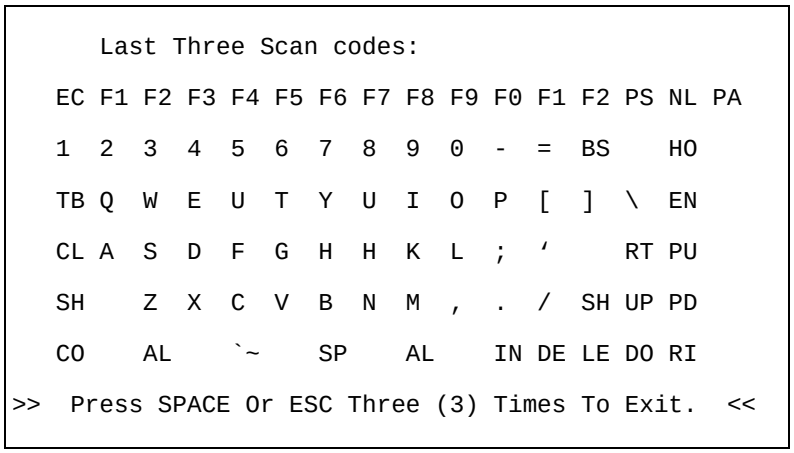


Figure 10 - Keyboard Test Screen

HP mouse

Levels: 1,2. The HP mouse consists of a pop-up device with two mouse buttons. A sliding bar holds this to the computer. Internal sensors detect when the mouse is against a top, bottom, inner or outer edge. The output from the mouse is scaled so that moving the mouse from top to bottom or left to right will match the physical dimensions of the display.

The level 1 checks that the mouse responds properly to reset and related commands. The level 2 test lets you operate the mouse and check for button, bumper, and motion activity in both graphical or textual ways. The mouse test can be set to run in any of four modes selected using the <Ctrl+T> key to toggle from mode to mode. The first and default mode presents the mouse test screen used for testing general mouse movement, bumper, and button functionality. The second mode is designed for measuring the “sine” mouse characteristics. The third mode runs both the first and second modes. The fourth mode lets the operator draw on the screen similar to how Paintbrush operates to test for button use and motion continuity. Each test is described separately below.

Text mode mouse test

This is the default mouse test. The upper right corner of the screen shows the HP mouse, drawn with line characters. In and around the mouse are names for mouse events. Initially, all events are blinking to indicate that they have not been tested. When an event is active, it is displayed in red text on a green background. After an event becomes inactive, it is displayed in green on a black background.

The mouse is first tested in “I/O” mode: bumpers are observable as switches and do not cause the mouse position to change (as is the normal case). After all switches have been operated and the mouse moved in all directions, press a key to conclude the I/O mode test and begin the PS2 mode test. In the PS2 mode, the bumpers are no longer detectable switches but rather cause

the mouse position to change. Press both buttons and move the mouse in all directions, then press a key again to exit the test. This will end the text mode mouse test.

IMPORTANT NOTE ON THE USE OF BOTH BUTTONS: any time both buttons are pressed down, a release of just one button will NOT be recognized. BOTH buttons must be released to clear the button status.

If verbose mode is enabled with Ctrl+V, then all switch changes are reported in a scrolling window along the left edge. The following codes are used to report the various switches:

IN	the left, or inner bumper is engaged
OUT	the right, or outer bumper is engaged
TOP	the top bumper is engaged
BOT	the bottom bumper is engaged
LEFT	the left mouse button is engaged
RIGHT	the right mouse button is engaged

Note: in PS2 mode, only LEFT and RIGHT are reported.

Whenever a button or switch engages or disengages, the current state of all switches and the current mouse position is scrolled up into the display, and then the new state of the switches is reported. If it is a button that is pressed, then the mouse position variables are also cleared to 0.

Mouse positions are indicated in a unit called mickeys, and there are roughly 2950 mickeys in the horizontal (X) direction, and 1695 mickeys in the vertical (Y) direction. If the mouse is moved very rapidly (faster than practical use will permit), signal loss occurs. To test for acceptable signal strength the mouse should be moved right and left against both edge stops repeatedly. After each full cycle, the time taken to complete the cycle together with the count of lost mickeys is displayed in a table in the lower right portion of the screen. If the number of lost mickeys is greater than the set limit and the time to complete the cycle is also longer than the set limit, then Diag will report a MICKEY error. To clear the table of results (either to retest or run the test in the perpendicular direction) press both mouse buttons simultaneously.

The TIC column reports the number of timer tics ($1/18^{th}$ of a second per tic) taken to move from one bumper to the opposite one and back again. The CUR column reports the number of mickeys off for the current motion cycle. The MIN column reports the minimum counts ever recorded at that speed. The AVG column reports the average number of counts at that speed. The MAX column reports the maximum counts ever recorded at that speed.

A sample screen dump for the text mode mouse test appears below. The results on the left half of the display were generated from having verbose mode enabled with Ctrl+V. The results in the lower right corner were generated by moving the mouse right and left against the bumpers.

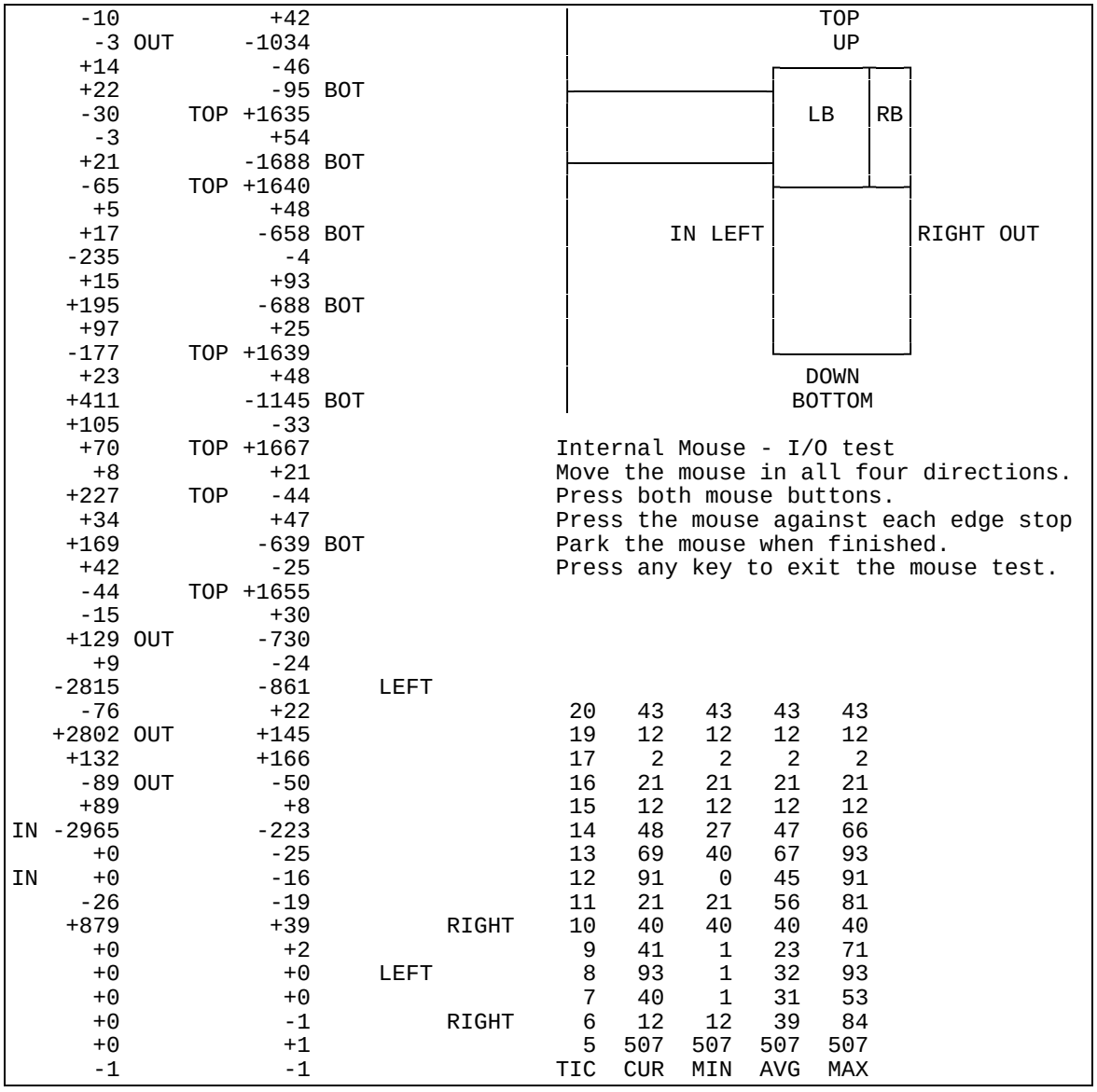


Figure 11 - Mouse Test Screen (text mode)

Graphic mode mouse sine test

This mouse test is used to measure the maximum “sine effect” of the mouse. To select this test, press <Ctrl+T> once before running the mouse test. When run, the screen switches to an 800x600 graphic mode, a blue box is drawn scaled to the expected distance the mouse can move, and a prompt appears along top line as follows:

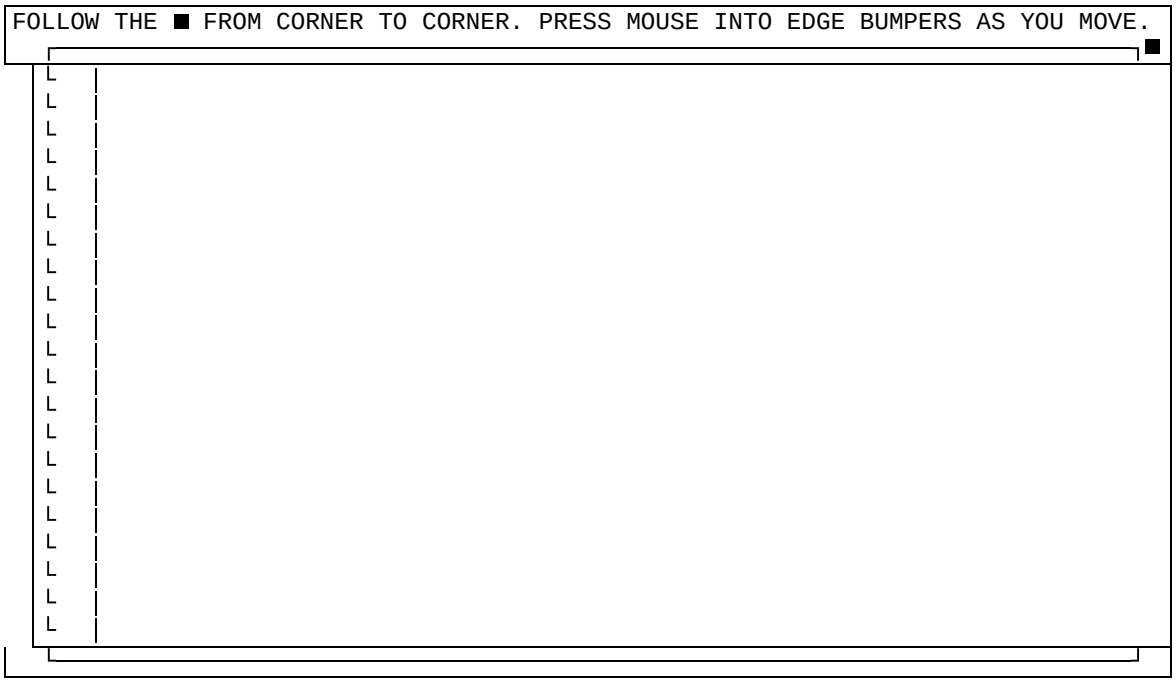


Figure 12 - Mouse Test Screen (graphics mode)

As the prompt indicates, to run this test, you must move the mouse to the corner where the white box is displayed (initially the top right corner). When you activate BOTH bumpers at that corner, the white box moves counterclockwise to the next corner. KEEP THE MOUSE PRESSED AGAINST THE TOP BUMPER AS YOU MOVE. In order to ensure the mouse is moving in a straight line, the mouse must stay in contact with the bumper. As you move the mouse, the path of the mouse is drawn on the display. Move the mouse all the way to the top left corner and press the mouse into the top left corner (careful not to press so hard that you "park" the mouse). Once you engage BOTH bumpers at the new corner, the white box will advance to the next corner. It is important to observe the white box to ensure that you have indeed engaged BOTH bumpers at the corner you are moving to. To help you know when a bumper is engaged, a white bar is displayed along an edge whenever the bumper for that edge is engaged. Continue to move the mouse counterclockwise until you reach the lower right corner. At this point you should see a red trail of dots indicating the path the mouse has traveled. This completes the first test cycle. Now continue moving the mouse to the top right corner again to begin the second (and last) test cycle. Blue is used during the second cycle to distinguish the first cycle from the second. SUCCESSFUL OPERATION OF THIS TEST REQUIRES THAT THE MOUSE BE MOVED TO THE CORNER WHERE THE WHITE BOX APPEARS; WHEN YOU GET TO THE CORNER, GENTLY PRESS THE MOUSE INTO THE CORNER UNTIL BOTH BUMPERS ARE ENGAGED. WHEN THIS IS DONE, THE WHITE BLOCK WILL ADVANCE TO THE NEXT CORNER.

As the mouse moves, the status of the mouse is reported along the top line, for example:
Cycle=1/2, X=1050,Y=1, Err^=3 Errv=0 TopEdgeErr=0 BotEdgeErr=0

Cycle	indicates which test cycle is in progress.
X	indicates the X position (0 is the left edge).
Y	indicates the Y position (0 is the top edge).
Err^	indicates the current maximum error drift upward.
Errv	indicates the current maximum error drift downward.
TopEdgeErr	indicates the maximum total sine error along the top edge.

BotEdgeErr	indicates the maximum total sine error along the bottom edge.

When the two cycles are complete, the maximum of the top and bottom errors is compared against a test threshold. If above, the test fails, else the test passes. The default threshold is 10 pixels. The threshold can be set with the command key <Alt+E><Alt+S>.

NOTE: for test stations that have no “bumpers” to indicate edge detection, the operator must move the mouse to the top right corner, then press either mouse button to indicate the mouse is in position. Proceed counterclockwise as normally, keeping the mouse pressed against the edge of the test fixture.

Text mouse and graphic sine mouse tests selected.
This test simply combines the first and second mouse tests. Note that the sine test is not repeated after the PS-2 text mode mouse test.

Graphic draw screen mouse test selected.
This test lets the operator draw on the display to visually inspect for the degree of mouse sine. Hold the left button to draw in blue, the right to draw in yellow, and both to draw in green. The cursor is a red heart shape. The prompt for the test is as follows:

LEFT=BLUE RIGHT=YELLOW BOTH=GREEN. ENTER OR ^ TO PASS, OTHERS FAIL

The raw mouse coordinate position is also reported to the right of the prompt. Additionally, as bumper or button events occur, these events are reported on the right end of the top line as rightward scrolling text that changes from white to red as new events occur. The characters L, R, and four arrows pointing to each side indicate the event that has just occurred.

The mouse can be toggled between manual and automatic calibration. The current selection is indicated by the word MANU or AUTO in the top left corner. Change the selection by pressing the mouse into the top left corner. When manual calibration is selected, move the mouse to each edge to calibrate the mouse (permit movement to all screen positions). When automatic calibration is selected, move the mouse to an edge and hold it there to calibrate the mouse.

After drawing as desired, press <Enter> or the contrast up button (^) to indicate pass, any other to indicate failure.

This test is can also be used for determining button signal strength at various positions on the screen. Hold both buttons and draw to all regions of the display. Green dots only should appear on the screen as you draw. Blue or yellow (or nothing at all) indicate button signal strength loss.

Mouse Calibration testing. To begin measuring lost calibration due to speed in the vertical [horizontal] direction, move the mouse against the upper [left] edge and press the left mouse button. The top line will prompt the operator to move the mouse in the selected direction. With each sweep of the mouse the speed will be displayed within the expected speed range (e.g. a speed of 400 when the low limit is 300 and the high limit is 500 shows as: 300<400<500). If the speed is below the low limit the pixels are colored blue, if above the high limit they are colored red, if within the limits they are colored white. To end speed testing with success, press <Enter> or <Contrast_Up>. Press any other key to end with failure. To resume normal draw mode, move the mouse to either the bottom or right edge and press the left button. If failure is returned, the message “Vertical calibration lost”, or “Horizontal calibration lost” is reported.

Audio

Level: 2. This test checks the SoundBlaster compatible audio sound system. The DSP chip, DMA Channel, and Interrupt Lines are checked for proper operation. An audible sound test completes the test; a bong sound alternating between left and right speakers should be heard.

Display

Levels: 1,2,3. This test checks multiple display subsystems. When manual testing is done, the display pixels are first tested with 7 operator-paced test patterns: one each for white, red, green, blue, and black; then a vertical stripe pattern followed by a random display pattern. Press Enter or Contrast Up to pass, Esc or Contrast Down to fail, until the automated test begins. The automated display test first tests video memory by flipping to all video modes supported while writing / reading the video buffer with the 18 test patterns. Lastly, the VGA controller registers and VGA color-DAC registers are tested for proper operation.

Docked device

Levels: 1,2. The dock port can be left unconnected, connected to a SCSI tower via SCSI cable or connected to a dock. The level 1 test simply reports what is connected. If a specific device has been specified with the <Alt+D> command, then the test will report an error if anything other than that which what was specified is found. If a dock is connected and level 2 is selected, then the dock LED's and latch are tested by blinking the selected LED and locking/unlocking. Respond 'Y' or 'N' as prompted to pass or fail each test depending on the observed performance.

SCSI CD ROM

Levels: 1,2. This test checks a SCSI CD ROM using the MSCDEX API. Instead of a clean boot, drivers must be loaded in CONFIG.SYS and AUTOEXEC.BAT. The following are a minimum driver set to enable SCSI CD's as well as SCSI hard disks. Note: the directories listed below are the default.

CONFIG.SYS:
devicehigh=c:\scsi\aspi8xx.sys /v
devicehigh=c:\scsi\symcd.sys /d:aspicd0
devicehigh=c:\scsi\symdisk.sys

AUTOEXEC.BAT:
c:\windows\command\mscdex /d:aspicd0 /m:12 /l:H

The level 1 test does a quick random scan of the CD. The level 2 test does a linear scan, random scan, and a funnel scan of the CD to test for proper operation.

SCSI Hard disk

Levels: 1,2,3. This test operates similarly to the hard disk test. If multiple SCSI hard disks are present, only the first disk is tested. Load the SCSI hard disk drivers in CONFIG.SYS and AUTOEXEC.BAT before running this test.

Dock slots

This test is unimplemented at this time.

Dock keyboard

Levels: 1,2. This test operates like the Keyboard test except that it uses a standard 101 key keyboard connected to the dock. The display shown during this test mirrors the layout of a standard 101 key keyboard. Its operation is similar to the internal keyboard test, but for an external keyboard.

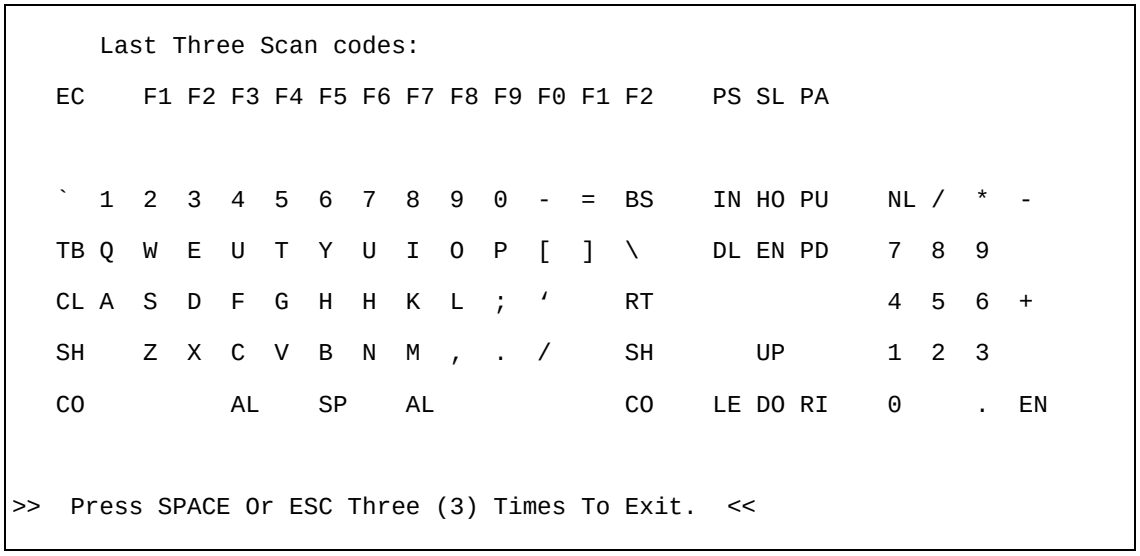


Figure 13 - Dock Keyboard Test Screen

Dock PS2 mouse

Levels: 1,2. This test operates much in the same way that the internal mouse test works.

Dock EEPROM

Level: 2. This test checks each of the 512 EEPROM bytes. Each byte is inverted and written, then read back to ensure the inverted data is found. The original data is written back, restoring the original data.

Desktop Management Interface (DMI)

The Desktop Management Task Force (DMTF) was founded in 1992 by a group of leading computer manufacturers, including Hewlett-Packard, to define a standard method of managing the physical and logical components of personal computers. The result of these efforts is the Desktop Management Interface (DMI).

Description of DMI

DMI is basically a set of rules for accessing information about a personal computer. Using DMI, an application program can determine, for example, which hardware and software components are present in a personal computer, the operating system that is being used, and the number of accessory board slots that are available. Using the DMI interface, a local or remote application program can check what hardware and software components are installed on your computer, how well they are working, and whether any needs replacing.

All this information is stored in a special Management Information Format (MIF) file, installed on each personal computer as part of the DMI package. The MIF file specifies information about components at two levels:

- **Groups** contain all the information concerning a particular hardware or software component. If more than one component of the same type is present, as is often the case with serial ports and hard disk drives, a group is repeated.
- **Attributes** are specific items of information relating to a group. Attributes of the Mouse group, for example, include the number of mouse buttons and the name and version number of the mouse driver being used.

Hewlett-Packard has developed a number of extensions to DMI to allow the enhanced features of HP OmniBook Notebook PCs to be managed with DMI. These extensions cover:

- Administrator and user passwords.
- Tattooing: a string of characters that uniquely identifies the computer.

Note: The DMI software package included with the OmniBook can only be used with the HP OmniBook Notebook PC.

For full details of the structure of the MIF file, including an explanation of the meaning of the fields of groups and attributes and how to write an application program that accesses this information, you can access the DMTF FTP server ftp.dmtf.org or the DMTF Web Pages at the URL www.dmtf.org .

Contents of the DMI Package

The DMI software and associated documentation is supplied either pre-installed on the OmniBook's hard disk drive or on two flexible disks. The contents of the package are the same in both cases.

Since the information accessed by the DMI software is specific to a particular computer, it must be installed on each computer separately.

The following software is supplied with the DMI package:

- A Microsoft Windows utility, SETUP.EXE, to install and initialize the DMI software.
- A Windows utility, HP TopTools. After DMI is installed, this utility can be used to display information about the computer through the DMI.
- A Management Information Format (MIF) file. This file contains information about everything on the computer that can be controlled using DMI facilities, and is initialized during installation.
- A component code, identifying the version of MIF file to use for specific models of HP OmniBook Notebook PCs.
- Windows-compatible DMTF Service Layer software, which controls access to the DMI.
- A client agent. The HP Remote DMI Agent is a DMI application and also a network server-side stream-based application. The Remote Agent is listening for Remote Application connection requests. If the main window of the Remote Agent is hidden, then no icon will appear on the screen when it is running.

Figure 14 provides a visual representation of the many components of the DMI package.

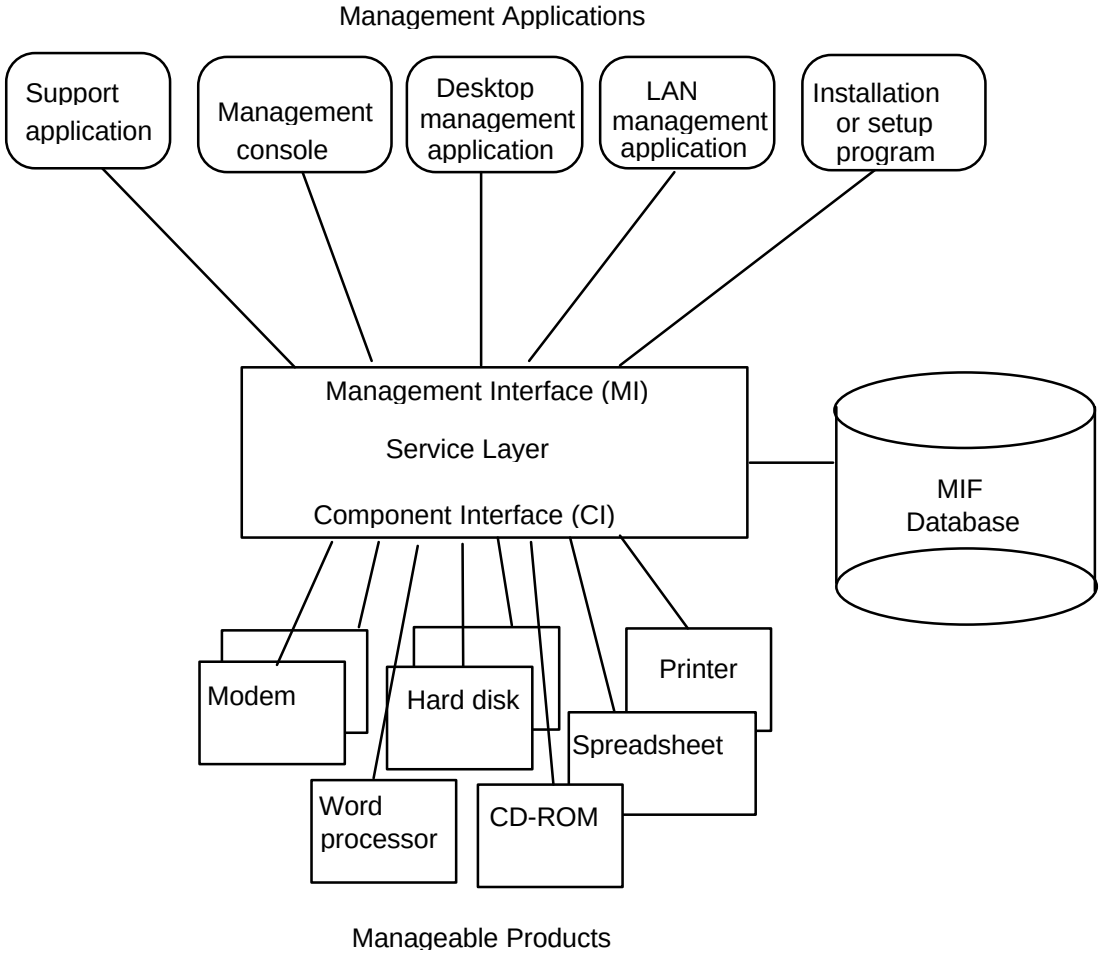


Figure 14 - DMI Components

Installing the DMI Package from Windows 95

The DMI package is included with the OmniBook, but it must be properly installed before it can be used. The following steps explain how.

To install the DMI preloaded on the hard disk:

- Start Windows 95, if it is not already running.
- Click on “Start”.
- Go to “Programs - HP DMI”.
- Select and run “SETUP”.

To alternatively install the DMI from floppy disks;

- Copy the DMI software from the \omnibook\drivers\win95\dmi directory of either the hard disk or Recovery CD to two floppy diskettes (copy contents of the \disk1 subdirectory to diskette #1 and contents of the \disk2 subdirectory to diskette #2).
- Start Windows 95, if it is not already running.
- Insert diskette #1 into the floppy drive.
- Select and run the SETUP program from the diskette #1.

Uninstalling the DMI Package from Windows 95

- Go to the HP DMI group.
- Launch the program “Uninstall DMI”.
- Reboot the PC.

Using the DMI Interface

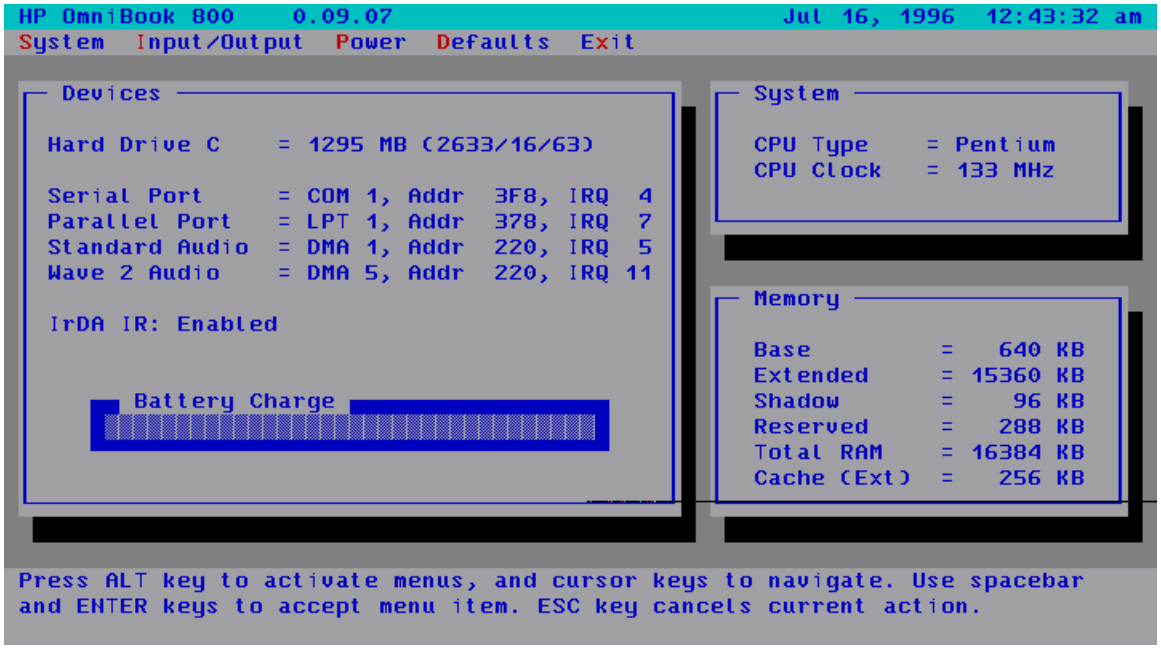
For a complete explanation of how to fully take advantage of DMI, the following documentation is provided with the OmniBook:

- A README.TXT file.
- A Windows online help file describing Hewlett-Packard’s implementation of DMI (group and attribute definitions). Since not all Hewlett-Packard enhanced features are supported on all models, this document also describes any restrictions that apply.

Setup and Configuration

The System Configuration Utility (SCU) is an operating system independent pop-up program. It can only be accessed at boot-time by pressing F2.

SCU Main Screen



System Menu Screen

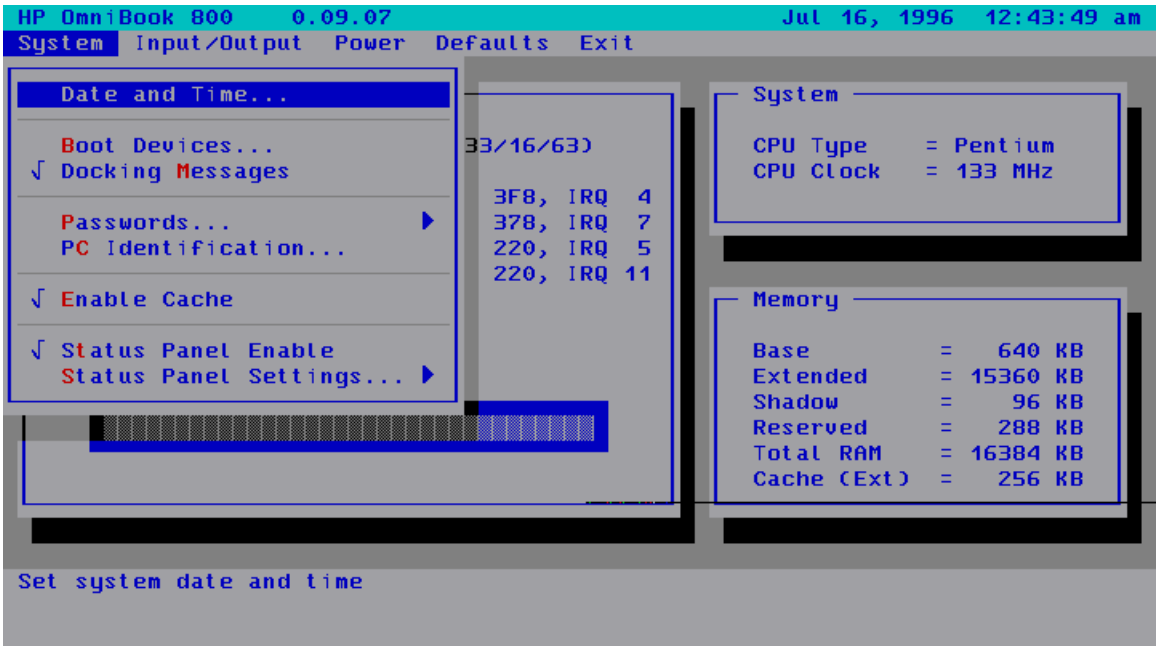


Table 9 - System Menu Settings

Setting	Parameters	Default	Comment
Date and Time…	Day; Month; Year; Hour; Minute; Second	n/a	Enter appropriate settings for time and date.
Boot Devices…			
Boot Device	FDD First; HDD First	FDD First	Booting from HDD first is useful for protecting a computer from becoming infected by a boot-sector virus.
CardBus Mode	Legacy; Disable; CardBus Mode	Legacy	Available only on F1360. Determines the BIOS power up mode for the CardBus controller.
Boot Configuration	Full; Boot devices only; Auto-detect	Auto-Detect	Fully configures all PnP devices; Boot devices only is used with Win95; Auto-detect will configure for the loaded OS.
Fast Boot	Selected; not selected	Not selected	Fast Boot skips RAM test.
Force PCI Bridge Configuration	Selected; not selected	Not selected	Configure PCI bridge for use with Windows NT 3.51. Do not select this option for other operating systems.
Hot Dock: OS Configure PCI	Selected; not selected	Not selected	Available only on F1360. Allows the OS to configure PCI devices at hot-dock.

Docking Messages	Selected; not selected	Selected	Not available if Boot devices only is selected in Boot Devices submenu.
Passwords…			
Password options…			
User Password required to:	Turn ON, Always; Turn ON, after FN-OFF; Undock; Save Setup changes	no selections	Password is required before proceeding beyond the selected items, and is ALWAYS required to save changes to these checkboxes.
Admin Password required to save changes to PC ID	Selected; not selected	Not selected	Admin password can be used in place of any user password.
Disable hard disk drive lock	Selected; not selected	Not selected	Check to remove password locking of hard drive.
Set Admin password		none	Allows entry of Admin password.
Set User password		none	Allows entry of User password.
PC Identification		blank	The text entered (max of 4 lines of 24 chars) will be displayed at boot.
Enable Cache	Selected; not selected	Selected	Enable cache for faster performance.
Status Panel Enable	Selected; not selected	Selected	Enable status panel.
Status Panel Settings…			
Status Panel Position	Upper left; Lower left; Upper right; Lower right	Lower right	Determine where status panel appears in the display.
Items to Show in SP			Determine what items are displayed in the status panel, and when they are displayed
Battery Status	Always; Never; Only when low.	Always	
Keyboard Status	Always; Never; Only when locked.	Only when locked	
Hard Drive Status	Always; Never; Only when active	Only when active	

Password Configuration

The Password Options dialog allows the User and an Administrator to control access to certain portions of the OmniBook.

If an Administrator Password is set, then modification of the PC Identification Strings or some SCU settings may be restricted by checking the appropriate checkboxes. Note that even if an Administrator Password is required to *Save setup changes*, the User Password (and its associated options) can still be changed without knowing the Administrator Password.

The *Save setup changes* option does ***not*** apply to changing PC Identification (PCID) Strings.

The ability to change PCID strings can only be restricted by the *Save modifications to the PC ID texts* checkbox available under Admin Password.

If the User Password is set, then access to the machine may be restricted (at ***every*** turn-on, or only at turn-ons ***after*** the machine was turned off by pressing FN+OFF). Also, if *Undock* is checked, a password will be required before the machine can be undocked. Also, the User Password may be required before some changes to the SCU, even if no Administrator Password has been entered.

The following table illustrates which SCU settings are subject to password protection.

Table 10 - System Password Matrix

SCU Feature	Password Never Required	Password may be Required
Date/Time	X	
Boot Devices		User or Admin
PC ID		Admin only
Status Panel	X	
HDD Configuration		User or Admin
COM Ports		User or Admin
LPT Port/LPT Type		User or Admin
Keyboard Setup	X	
External Devices	X	
Power Management	X	
Basic/Advanced Audio		User or Admin
User PW or User PW Options		User or Admin
Admin PW when none currently exists		User
Admin PW or Admin PW Options (Admin PW exists)		Admin

As mentioned above, PC Identification can only be password-protected via the Administrator Password PC ID option.

Any time a password is required, the Administrator password (if defined) may be entered, however, ***only*** the Administrator password may be (successfully) entered to satisfy the conditions checked in the *Administrator Password required to:* group box.

Input/Output Menu Screen

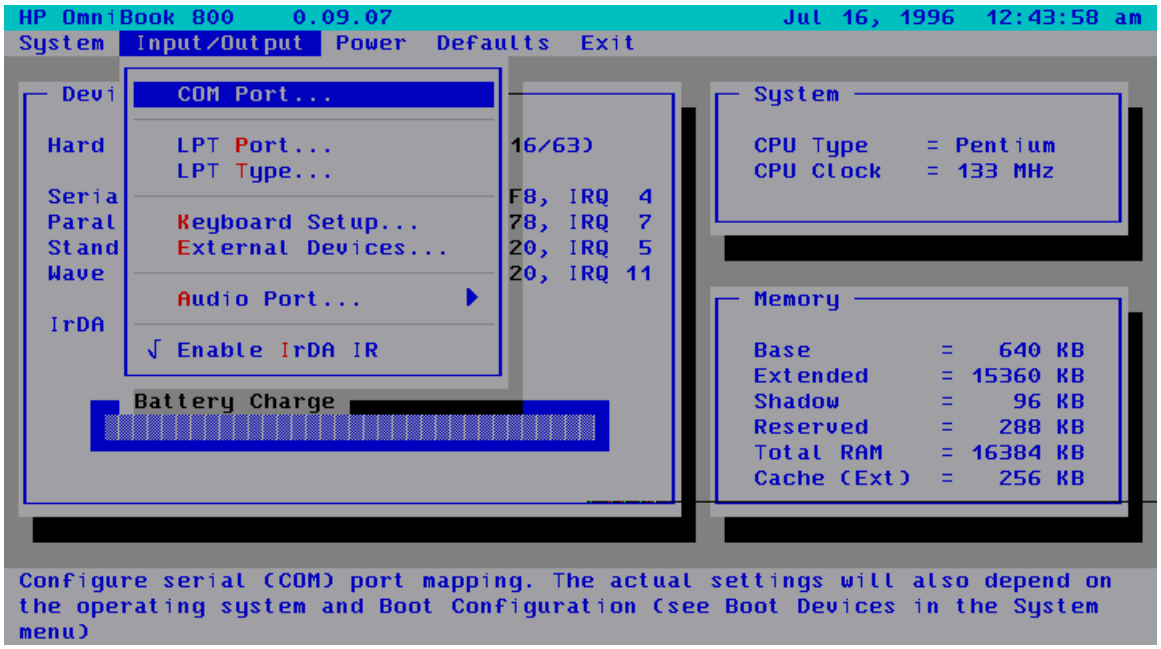


Table 11 - Input/Output Menu Settings

Setting	Parameters	Default	Comment
COM Ports…			
Serial Port:	None COM1, Addr 3F8, IRQ 4 COM2, Addr 2F8, IRQ 3 COM3, Addr 3E8, IRQ 4 COM4, Addr 2E8, IRQ 3	COM1, Addr 3F8, IRQ 4	The serial port will be mapped to the selected COM port. The actual settings will also depend on the operating system and Boot Configuration.
LPT Port			
Printer Port	None LPT1, Addr 378, IRQ7 LPT2, Addr 278, IRQ5	LPT1, Addr 378, IRQ7	The parallel printer port will be mapped to the selected LPT port. The actual settings will also depend on the operating system and Boot Configuration.
LPT Type			
Port Definition	Standard AT (Centronics) Bidirectional (PS-2)	Bidirectional (PS-2)	Select the parallel port definition.
Keyboard Setup…			
Key Delay	¼ sec; ½ sec; ¾ sec; 1 sec	½ sec	Select the delay period to wait (after a key is pressed) before it will begin to repeat.

Setting	Parameters	Default	Comment
Key Repeat Rate	2 cps; 6 cps; 10 cps; 15 cps; 20 cps; 30 cps	10 cps	Select the rate at which keys will be repeated when they are held down longer than the Key Delay period.
Keyboard Numlock	Selected, Not selected	Not selected	Start computer with NUM LOCK enabled.
External Devices…			
VGA Display device	External VGA if attached, LCD off; Both external VGA and LCD	External VGA if attached, LCD off;	When 'External VGA…' is selected, if an external VGA monitor is detected, it will be enabled and the LCD will be turned off. When 'Both external VGA…' is selected, both are ALWAYS on.
Force recognition of external VGA	Selected; Not selected	Not selected	Available only when Both external VGA and LCD is selected.
Enable External FN Key	Selected; Not selected	Selected	When enabled, CTRL + ALT on external keyboard acts as FN key.
Ignore External Pointing Device	Selected; Not selected	Not selected	This will ignore any external pointing device.
Audio Port…			
Basic Audio…			
Disable internal	Selected; not selected.	Not selected.	Disabling internal sound board removes any possible conflict with a sound board installed in the dock.
Beeper volume:	0-7	4	
Audio volume	0-7	4	Sets master volume, not volume ceiling.
Advanced Audio…			If Boot devices only is
Audio			selected in Boot Devices
IRQ	5, 7, 9, 10	5	menu, then the Advanced
DMA Channel	0, 1, 3	1	Audio menu will be
Address	220, 230, 240, 250	220	disabled.
Wave 2 Audio			
IRQ	11	11	IRQ is fixed at 11
DMA	0, 5, 6	5	
Video Stretched	Selected; not selected	Not Selected	Option available on F1360 only. Set video to Stretched or Centered mode (if hardware capable).
Enabled IrDA IR	Selected; not selected	Selected	Allocate resources needed to enable IrDA Infrared Port.

Power Menu Screen

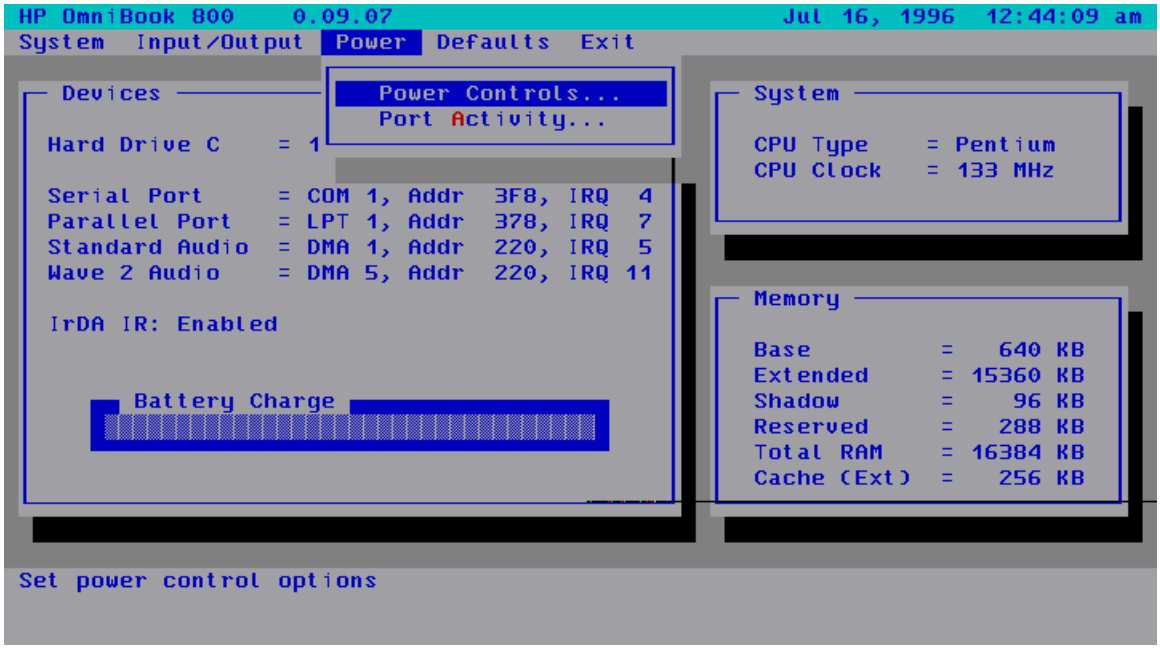


Table 12 - Power Menu Settings

Setting	Parameters	Default	Comment
Power Controls			
CPU Power Management	Maximum; Moderate; None	Maximum	Determine the amount of CPU-related power savings.
Auto Turn-off w/Battery:	Never; after 1, 2, 3, 4, 5, 10, 15, 20, or 30 minutes	after 3 minutes	When the system has been idle for the selected period, the computer will be turned off. (Battery power only.)
HDD power-down w/Battery:	Never; after 1, 2, 3, 4, 5, 10, or 15 minutes	1 minute	The hard disk will be powered down if there has been no disk access for the selected period. Hard disk power will be restored when the disk is needed again. (Battery power only.)
Auto Turn-off w/AC:	Never; after 1, 2, 3, 4, 5, 10, 15, 20, or 30 minutes	Never	The hard disk and display are powered down if there is no disk access or user input for the selected period. Hard disk power is restored when the disk is needed again. Display power is restored when the ON key is pressed.
Enable audio power savings	Selected; Not selected	Not selected	Enables power-down of audio analog when idle. Also shuts off line-in.
Port Activity			
Auto Turn-off, Even if Active	IRQ3, IRQ4, IRQ5, IRQ7, IRQ9, IRQ10, IRQ11, IRQ15	none selected (all selected on F1360 only)	Indicate IRQ activity that should be ignored with regard to automatic turn-off.

Default Menu Screen

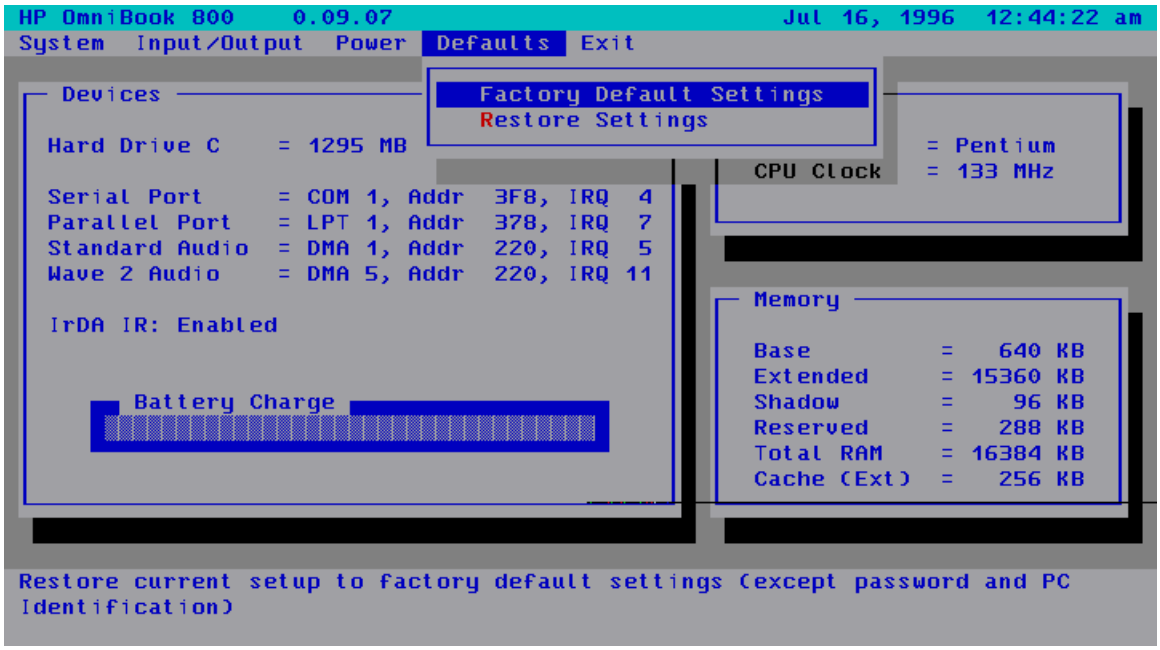


Table 13 - Default Menu Settings

Setting	Parameters	Default	Comment
Factory Default Settings	n/a		Restore current setup to factory default settings (except password and PC Identification).
Restore Settings	n/a		Restore current setup to settings at SCU startup (except password and PC Identification).

Exit Menu Screen

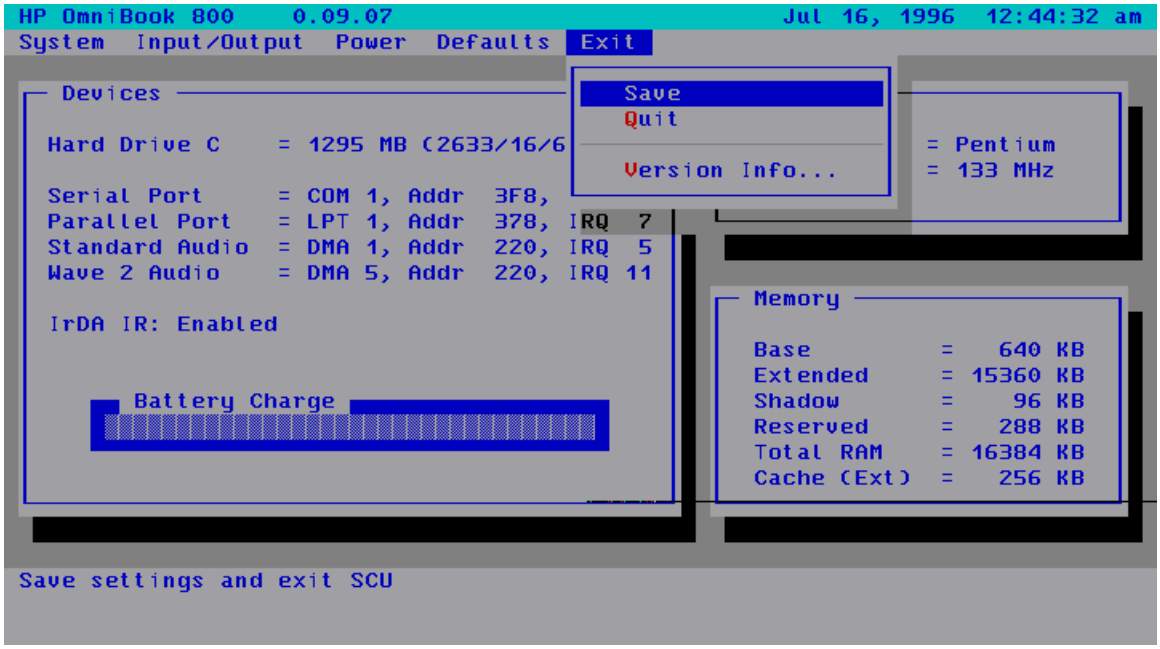


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Table 14 - Exit Menu Settings

Setting	Parameters	Default	Comment
Save	n/a		Save settings and exit SCU. The OmniBook will automatically reboot.
Quit	n/a		Exit SCU without saving settings.
Version Info…	n/a		Report current BIOS version info.

Troubleshooting Tips

This section provides various troubleshooting tips for the OmniBook 800 and its accessories. As with all troubleshooting, these tips should be combined with other techniques and tools to effectively diagnose hardware issues.

OmniBook Components

The following table lists various symptoms of several OmniBook components. Troubleshooting techniques are then listed for both Call Center and Repair Center Personnel.

Table 15 - OmniBook Troubleshooting Tips

Symptom	Call Center	Repair Center
Mouse		
Cursor moves on its own	Is the link warped? (The link is the flat piece of plastic connecting the mouse to the computer) If so, send the customer a new mouse. Otherwise, send in for repair.	Mouse grommet (Service Note 800-08). Alternatively, inspect for a burr on a contact inside the hole the grommet fits in on the logic board (carefully file off the burr). Sticking can be an open or missing resistor on the logic board. Replace logic assy.
Cursor floats in direction different for mouse movement		
Cursor sticks to one side of display after mouse has moved in opposite direction		
Cursor won't go to edge of display	Press firmly with mouse when reaching edge of screen. If problem still occurs, send in for repair.	Mouse grommet or paw active assy; if cursor won't move at all, most probably a bad paw active assy. Also could be an open resistor on logic board.
Cursor jitters	Send in for repair	Paw active assy or warped link.
Mouse button press not recognized	Does customer have access to another OB with a mouse? If so, swap mouse. If OB works now, send a new mouse. If not, send in for repair.	Mouse or paw active assembly
Stiff up/down motion	Send in for repair	Paw active assembly (Service Note 800-10)
Fine positioning of cursor difficult	Some vertical backlash on the right side of the display is normal. It requires slightly more mouse movement on the right side before the cursor moves.	Paw active assembly
Display		
Brightness does not adjust	The adjustment steps are very small and may not be very noticeable. Also, TFT display will not darken as much as a CSTN, so customer's previous experiences with notebooks may affect expectation.	Verify brightness adjusts properly. If ineffective, replace display.
Garbage on display when first turned on	Try a hard reset. If this doesn't help, send in for repair.	Replace logic PCA if problem occurs on both internal and

Symptom	Call Center	Repair Center
		external displays.
Screen white	Send in for repair.	Replace display
Bright or missing pixels or lines	Explain display spec for missing pixels. Send in for repair if it fails display spec criteria.	Replace display if it fails display spec criteria.
Intermittent or no display	Press [Fn]+[SysRq]. If ineffective, send in for repair.	Check for display cable pinched in case parts.
Power/battery		
Short battery life	Turn display brightness down. New BIOS v 1.02.00 Set Computer and Hard Drive "Idle Time Before Turn-off" to equal values (Select OmniBook Power Management in Control Panel). Remove any PCMCIA cards and run PWR800.exe If above ineffective, send in for repair.	New BIOS v 1.02.00 Run PWR800.exe to measure) battery life (program obtainable from the MCD Internal Web at http//webmcd.cv.hp.com/prodsupp/ob800/software/index.htm
Battery gauge falls rapidly	Normal behavior at higher levels. Does the customer have another battery to try?	
Battery won't charge	Does customer have access to another battery and ac adapter? If so, have them try different combinations to isolate to battery, ac adapter or OmniBook, and send defective component in for replacement. If not, send in all 3 for repair.	Isolate to defective component (battery, ac adapter or logic board).
Computer won't turn on/won't boot		
On ac or battery	Is the charge light on when on AC? If not, try another AC adapter if available. If yes, hard reset. If no response, remove battery and AC, letting computer sit for a minute. Reinsert battery and press reset button. If this works, update the BIOS. Any sound? If yes, plug in external display and press [Fn]+[SysRq].	Check for display cable pinched in case parts. Is charge light on when on AC? If no, replace CPU board first, then logic board. If yes, try to boot off a floppy. If this works, reburn BIOS. If it's still bad, then replace HD. If still bad, replace logic board and reinstall old HD.
On battery (OK on ac)	What does the fuel gauge read? If empty, press [f4]+[ON]. If still empty, does customer have a 2nd battery to try? If not, send in for repair.	Try a known good battery first. Examine battery contacts for contamination or physical damage. Then replace logic board.
Error message: "Invalid system disk"	If floppy drive is connected, check for non-system (boot) floppy disk in drive. If so, remove floppy and reset. Use recovery CD to rebuild system if still bad.	Will computer boot off floppy drive? If yes, verify keyboard support plate is of later design or has I/O insulator (see Service Note 800-09). Verify hard drive insulator is above the keyboard support plate tabs
Error message: "Floppy disk		

Symptom	Call Center	Repair Center
fault – insert valid boot disk and press any key”		and not trapped under them (where they can short hard drive PCA). Then try another hard drive. If problem is solved,
Error message: “Auto IDE error” or “HDD not ready”	Verify latest BIOS (v1.02.00). Send in for repair.	original HD may be corrupted, have a virus or be defective. If problem persists, reinstall old HD and try replacing the CPU board and if that doesn’t work, then replace the logic board.
Lockup/computer freezes		
After warm docking	Verify latest BIOS (v1.02.00).	New BIOS v 1.02.00
After hot docking	Does the user have an external monitor? If so, BIOS versions after 1.00.00 may exhibit this problem about 5% of the time. A future revision of the BIOS will address this issue.	
After undocking	Is there a card in dock? Remove card from undocked configuration. Is the user an HP COE user? If so, does the user use COE Connect and COE Disconnect? If not, refer them to their IT dept. for instructions.	
While booting	Press reset button. If ineffective, can user boot from floppy? If no, send in for repair. If yes, run CHKDSK /f on hard drive, then attempt to boot from HD again.	Can you boot from floppy? If no, replace CPU first, then logic board. If yes, run CHKDSK /f on hard drive, then attempt to boot from HD again. Run Scandisk to check for HD platter defects. Verify keyboard support plate is of later design or has I/O insulator (Service Note 800-09).
After turning on	New BIOS v 1.02.00	New BIOS v 1.02.00. Try replacing HD, then CPU, and then logic board.
When shutting down, during “Windows 95 Shutting Down” screen	Microsoft has a web page to help with these problems, which are usually the result of driver conflicts. (www.microsoft.com/kb/articles/q145/9/26.htm) If HP COE user, make certain they are using COE Disconnect. Refer them to their IT department.	
Keyboard		
Keys stiff	Is customer comparing OB800 keyboard to other notebook or desktop keyboards? Is customer	If the keyboard is stiff, replace with a new keyboard of datecode Aug 1 or later.

Symptom	Call Center	Repair Center
	comparing it to another OB800? Is customer a heavy user?	
Some or all keys not working	Remove the 2 keyboard screws and check keyboard flex cable connections visually. If not aligned properly in the connector, send in for repair. These connectors can be damaged if the proper tool is not used to disconnect the cables.	Check keyboard flex connection. If OK, try another keyboard. If still bad, replace logic board.
Computer noisy but working		
HDD "clunking or scratchy"	Was the computer dropped? Back the drive up immediately!	Replace HD. Check computer case for evidence of customer abuse.
Buzzing or whining	Back the drive up immediately! Is the sound present when HD not spinning? Is there a PCMCIA hard drive in the slot that is making the noise? Does pressing a key cause the sound to change? If yes, then this is probably power supply noise. Only if it is very objectionable should computer be sent in for repair.	Replace logic board.
Miscellaneous		
Computer does not resume after: • Being suspended • A reset • An alarm from an application	Try using reset button. Check BIOS version and install latest (v1.02.00). Otherwise, send in for repair.	Replace CPU board (see Service Note 800-02A).
File corruption	Run a virus scan program. Boot to DOS and run CHKDSK to look for lost clusters, cross-linked chains. If present, run CHKDSK /f to fix. Then run Scandisk surface scan to test for damaged HD platter. Use Recovery CD to recover Omnibook files corrupted. If computer still has problems, return for repair.	Try steps at left. If keyboard support plate of old design (without notch), add I/O insulator to plate above HD connector (see Service Note 800-09). Check for latest BIOS (v 1.02.00). Run a virus checker.
Computer gets hot	It is normal for computer to get hot, especially when charging. DOS applications (games?) and poorly written Windows applications can contribute. Run System Monitor and look at CPU activity. Suspend applications that drive CPU usage toward 100%. PCMCIA modem cards normally get very hot when in use.	
Computer won't time out	Does the cursor jitter? If so,	Does the cursor jitter? This will

Symptom	Call Center	Repair Center
(i.e., doesn't automatically turn off after a preset interval)	send in for repair. If not, check the timeout settings in Omnibook Power Management in the Control Panel. Set hard drive timeout = computer timeout. A future BIOS will address this issue.	prevent timeout. If so, replace paw active assembly.
Computer pauses and won't permit kybd or mouse input for a few seconds	This is probably normal W95 behavior. The operating system processes events in the background and sometimes these interfere with the responsiveness of the application. If the hard disk has spun down to conserve power, it can take up to five seconds to spin back up. You can hear this happen. You can set the hard drive timeout equal to the computer timeout such that this does not happen often. COE users should use COE Disconnect and recognize that various COE activities (like virus scans) are happening in the background. Some file browsers (like the one in PowerPoint in the Insert Picture dialog box) will process and display a graphic image before they respond to keys. This can take twenty seconds. File browsers may wait for broken/non-existent network connections to time out.	
PCMCIA cards recognized but not available for use.	If this occurs with PCMCIA HD, flash card or LAN card, it may be the computer has run out of IRQ's. Check in System Properties for available IRQ's. If card is an ATA card, install new driver, SSHP800.VXD (see Service Note 800-03). Also try the card in another machine and/or run diagnostics on the card.	If card is an ATA card, install new driver, SSHP800.VXD (see Service Note 800-03).
If HP COE customer, modems/PCMCIA cards not recognized consistently	See local IT dept for a PC COE Reliability Tracker patch which solves this problem.	
Difficult to install RAM expansion door	Was RAM expansion just added? Does door work without RAM expansion? If yes to both, send in RAM for replacement.	Was RAM expansion just added? Does door work without RAM expansion? See Service Note 800-11.

Symptom	Call Center	Repair Center
Dock latch jammed, won't permit computer to dock	Try manual undocking to get the system apart. See dock User's Guide (pg 1-13 English or appropriate language's page) for procedure. Send in dock for repair.	Replace dock
Clock won't keep time	In Control Panel, click on Power. Power Management must be set to Advanced. Has the computer ever failed to resume and had a dead battery (causing the clock to stop)? If so, replace the BIOS.	Verify that Power Management is set to Advanced. Test clock accuracy with unit suspended. If still not accurate, replace logic and retest.
Computer runs slow	See: "Computer pauses and won't permit keyboard or mouse input for a few seconds." Make sure cache is enabled in SCU. If yes, then press [Fn][+]. One beep indicates slow mode, 2 beeps fast mode. If problem persists, send in for repair.	Verify problem and replace CPU first, then logic board.
Hard drive errors	Can use Spin Rite 4 to thoroughly diagnose the problem.	
RAM module does not fit into OmniBook connector	If the RAM module does not connect 1000% try another module. A few of the RAM modules received from the vendor are out of alignment.	

CD ROM Drive Troubleshooting

The following table lists several troubleshooting tips specifically for the optional CD-ROM drive.

Table 16 - CD-ROM Troubleshooting Tips

Trouble	Possible Causes	Solutions
• The POWER switch is ON, but nothing appears on the CD-ROM display.	• The power cable is not plugged into the OmniBook connector or the DC IN jack. • The batteries are not installed correctly or are dead.	• Plug in the power cable correctly. • Install the batteries correctly or replace with new ones.

Trouble	Possible Causes	Solutions
• The CD-ROM drive is not accessible from the OmniBook.	• For Windows 95, the CD-ROM drive was not turned on when you plugged it into the OmniBook. • For Windows for Workgroups, the CD-ROM drive was not turned on when you rebooted the OmniBook.	• Turn on the drive, then click Start, Eject PC. When prompted, unplug and reconnect the SCSI adapter cable to the OmniBook. • Turn on the drive, then exit Windows and press CTRL+ALT+DEL to reboot.
• The data from the CD is not properly transmitted to the OmniBook.	• The SCSI adapter cable is not connected properly. • Devices with duplicate SCSI ID numbers are connected to the OmniBook. • SCSI termination on the CD-ROM drive is OFF. • There is a problem with the OmniBook software.	• Connect the SCSI adapter cable correctly. • Make sure each SCSI device connected to the OmniBook has a unique ID number. • Change the terminator switch (switch 4) on the CD-ROM drive from OFF to ON. • See the OmniBook User's Guide.
• A "no dISC" message appears on the display after inserting a CD, the sound skips, or data can not be read.	• The CD is upside down. • The CD is dirty. • The CD is damaged. • There is moisture on the CD-ROM drive or the CD, possibly due to temperature change condensation.	• Reinsert the CD with the label side up. • Clean the CD with a soft, dry cloth. • Replace with new CD. • Remove the CD from the CD-ROM drive and do not use for 1 hour.
• The CD-ROM drive does not play sound.	• Headphones or amplified speakers are not connected to the CD-ROM drive. • VOLUME control is set to "0".	• Connect the headphones or amplified speakers to the CD-ROM drive PHONES jack. • Set the VOLUME control to a higher number.
• The control buttons do not function.	• CD-ROM drive has been playing audio CD controlled by OmniBook software.	• Open and close the disk cover.
• The control buttons and POWER switch do not function.		• Disconnect the CD-ROM power cable and remove the batteries, then reconnect the power cable and reinstall the batteries.

Resolving Docking Station Operating Problems

Below are several scenarios of Docking Station operating problems. Possible causes and troubleshooting tips are provided for each.

If a serial or parallel device, external display, or floppy drive doesn't work

- Make sure the OmniBook is fully inserted in the docking system. Connection should be snug.
- If the green light on the docking system isn't on, check power to the docking system, then try undocking and docking again.

If an external PS/2 mouse or keyboard doesn't work

- Make sure the OmniBook is fully inserted in the docking system. Connection should be snug.

- Make sure the mouse is plugged into the correct port. The mouse and keyboard ports look the same.
- Turn the system off and on.
- Reboot the system.
- Undock the OmniBook, unplug and reconnect the ac adapter, then dock again.

If network connections don't work

- Make sure that the LAN cable is connected.
- You normally lose connections when you turn off the system or undock. See if your network software has a reconnect feature.
- Check your configuration files to make sure that the network drivers are properly installed.
- If the green light on the docking system isn't on, check power to the docking system, then try undocking and docking again.
- Check that there is no address or interrupt conflict. Check these settings on the network board—or, if the board has configuration software, check the settings using that software—see the manual for the network board. Also check these settings in your network software.

If SCSI devices don't work

- Try rebooting and selecting a startup option that loads the SCSI drivers.
- Check the device id for conflicts.
- Make sure you turn on the SCSI devices before you reboot the system. They're configured at boot time.
- Check your connections and SCSI termination.
- Check your configuration files to make sure that the SCSI drivers are properly installed.
- Try pushing the OmniBook into the docking system a bit harder.
- If the green light on the docking system isn't on, check power to the docking system, then try undocking and docking again.
- Check that there is no address or interrupt conflict. The SCSI interface normally uses I/O address 3100F and interrupt 10.

If a network-enabled system locks up when rebooting

The following hints apply to Windows for Workgroups only:

- Edit AUTOEXEC.BAT to disable Windows for Workgroups network support for all non-network startup options. Add the /N switch to the WIN command (win /n) for each of the non-network options.
- Edit CONFIG.SYS and AUTOEXEC.BAT to load network drivers only for the "Docking system" startup option, and not for undocked startup options.

For other operating systems:

- Check any available online tools—Device Wizard in Windows 95, for example—or check with your system administrator.

Resolving OmniBook Docking Problems

Below are several scenarios of problems that may occur when docking the OmniBook. Possible causes and troubleshooting tips are provided for each.

If your docking password isn't accepted

- Check whether Num Lock is off.
- If you've forgotten your password, have your OmniBook at hand and call Hewlett-Packard support. See your OmniBook *Support and Service* booklet.

If the OmniBook isn't released after pressing the Undock button

- If you're using a password, make sure it's accepted.
- If you're prompted about shutting down devices, and if no applications are using those devices, press ENTER. Otherwise, close those applications and try undocking again.
- To override the undocking software, press a paper clip or other thin object into the security opening in the docking system. Hold it in while sliding one release latch forward.

Part 3

Hardware Repair

- Battery
- Memory
- Hard Disk Drive
- Mouse
- Small Parts
- Keyboard
- Display
- CPU
- Logic PCA
- Paw Active
- Other Components and Accessories

CAUTION:	**Always provide proper grounding when performing any of the following repairs. An electrostatic discharge may cause irreparable damage to the OmniBook and its components**

Battery
(End User Replaceable)

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

Required Equipment

- none

Removal Procedure

1. Turn the OmniBook off. If ac power is plugged in, don't remove the ac power while the battery is out.
2. Turn the unit over and slide the two latches away from body of battery and lift the battery out. See Figure 15.

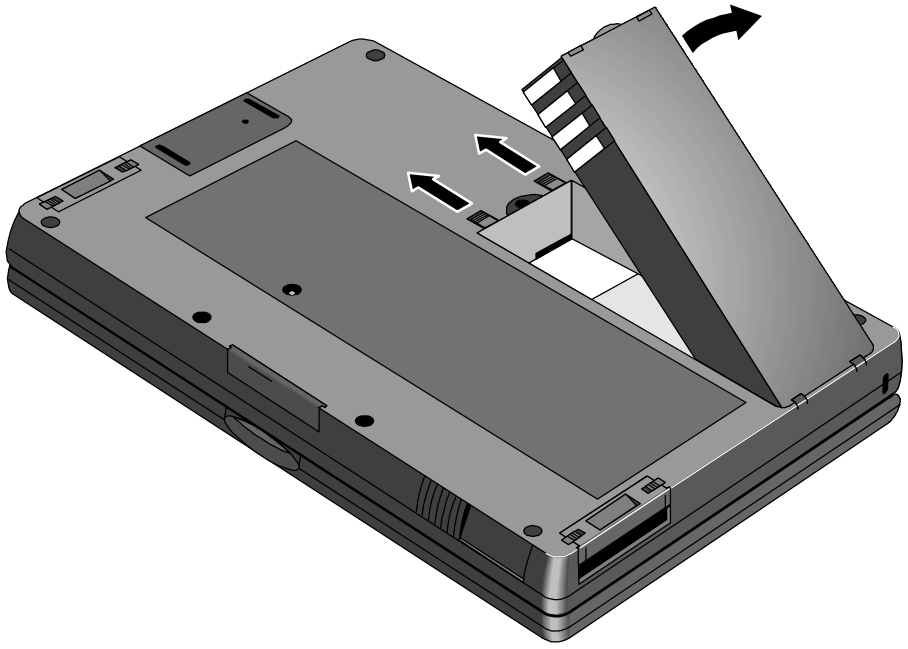

Figure 15 - Removing the Battery

Replacement Procedure

1. Insert the new battery pack so the metal battery contacts on the pack line up with the contacts in the compartment, then latch the cover.

Memory
(End User Replaceable)

Required Equipment

- none

CAUTION: **To avoid damage due to electrostatic discharge, handle the memory module by the edges only.**

Removal Procedure

1. Exit all applications, including Windows.
2. Remove the ac adapter and battery from the OmniBook.
3. Turn the unit upside down and slide the memory cover off by using the two finger grips. See Figure 18 on page 52.
4. To remove the Memory Module, gently lift up the front of the module to disengage the pins.

CAUTION: **If the memory module is an older model of the 32-MB RAM (see Figure 17) take care not to crimp the flex cable end when removing or replacing.**

Figure 16 - 8- and 16-MB Memory Modules

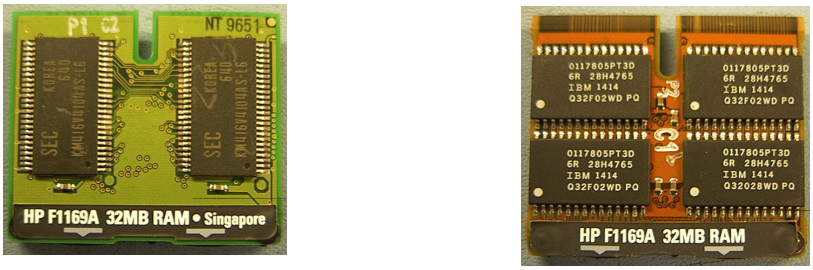

Figure 17 - New and Old 32-MB Memory Module (respectively)

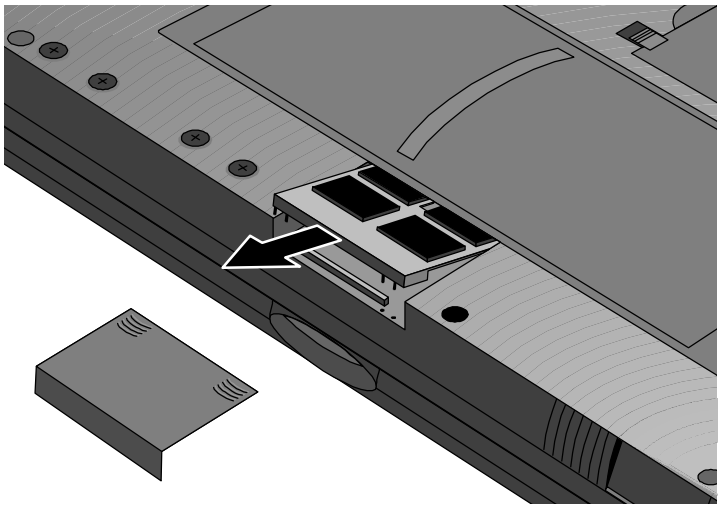

Figure 18 - Removing the Memory Module

Replacement Procedure

1. To replace, position the non-connector end first, then press the front of the module down into the connector.

CAUTION: Apply pressure to the memory module only on the connector to avoid damaging the circuit board.

Hard Disk Drive
(End User Replaceable)

Required Equipment
- Torx #6 screwdriver

Removal Procedure
1. Exit all applications, including Windows.
2. Turn the OmniBook off and remove the battery and ac adapter.
3. Use a Torx-T6 screwdriver to remove the two keyboard screws and the three hard drive screws (the exact location of the hard drive screws vary with the manufacturer of hard drive). See Figure 19.

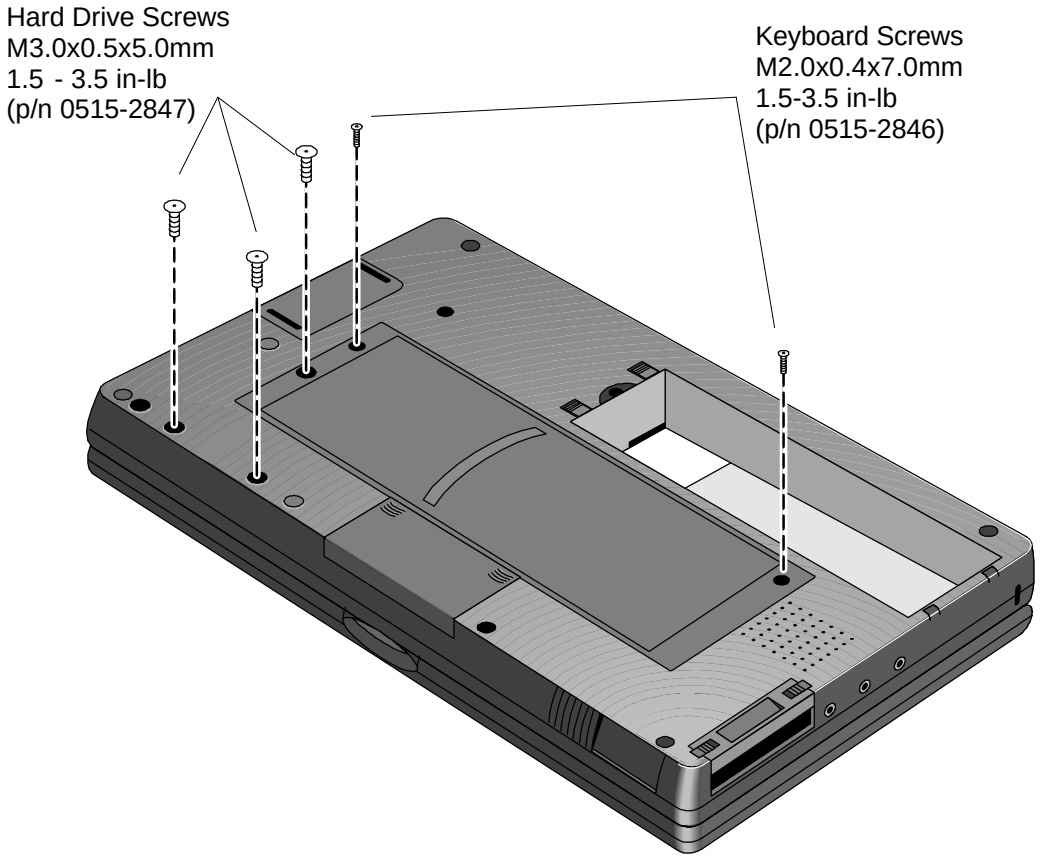

Figure 19 - Hard Drive Screws

4. Turn the OmniBook over and open the cover. Grasp the top edge of the Keyboard and fold out gently. Note – the Keyboard Flex Cables do not need to be disconnected. See Figure 20 on page 54.

CAUTION: To avoid damage due to keyboard flex cables, do not pull the cables out of the connectors or pick up the OmniBook while the keyboard is still connected.

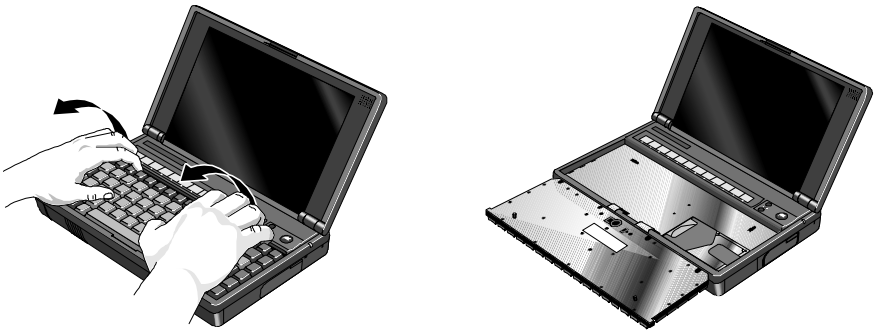

Figure 20 - Folding the Keyboard Open

5. Disengage the hard drive connectors by grasping the **left** flap of the plastic insulator and gently pulling straight to the right as shown in Figure 21.

CAUTION: **To avoid damage to the hard drive connector, do not pull the hard drive insulator up or at an angle – only straight to the right.**

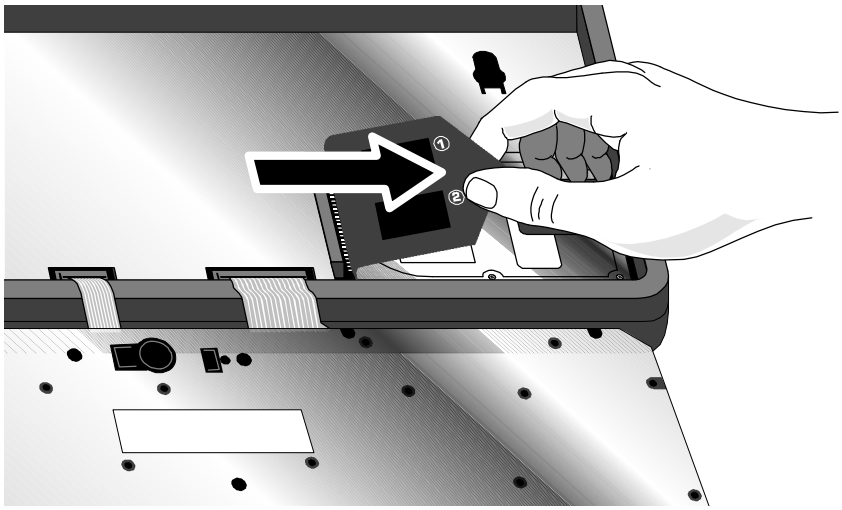

Figure 21 - Hard Drive Removal

6. Lift up on the insulator sheet and remove the hard drive. See Figure 22. The insulator sheet stays in place.

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

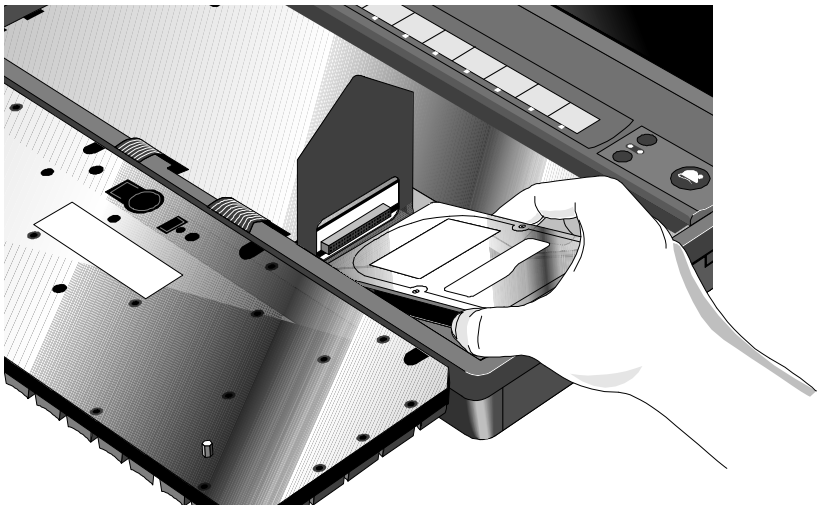

Figure 22 - Hard Drive Removal (continued)

Replacement Procedure

1. If the new hard drive is from a different manufacturer than the old one, it may have screws in different positions. Determine which mounting holes in the bottom case are needed; then, if necessary, push out the rubber screw-hole covers from the inside of the bottom case. (From the outside of the computer, insert the rubber covers into the holes that are not needed.)
2. If the new hard drive has screws in different positions from the old one, the insulator sheet will also need to be adjusted. Compare the location of the screw-holes in the new hard drive with those in the insulator sheet. If there is *no* screw at position A, then *unfold* the flap at position A, and lay it flat before laying the hard drive down on the insulator. See Figure 23.

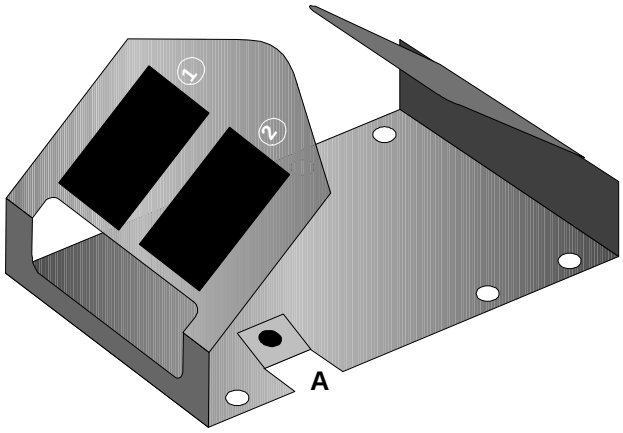

Figure 23 - Hard Drive Insulator Flap

3. Holding the new hard drive by its edges, lay it in place. Grasp the **right** flap of the insulator and pull to the left to engage the connection between the hard drive and the computer. See Figure 24 on page 56. If the hard drive's connectors do not engage the computer's connectors, pull the hard drive back out and try again. Then fold the insulator sheet back over the hard drive.

CAUTION: Do not force the drive into the connector or the pins may bend and cause damage to the hard drive.

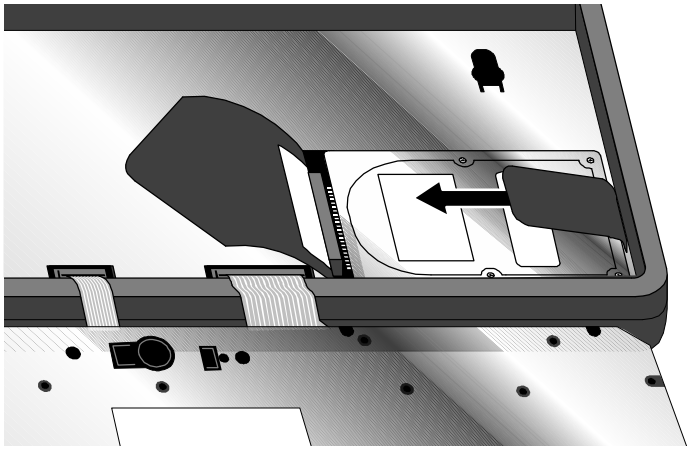

Figure 24 - Inserting the Hard Drive

4. Holding the Keyboard in place, so as not to damage the flex cables, turn the OmniBook over and re-insert the three hard drive screws removed in step one. Note, it may be necessary to support the hard drive with one hand in order for the screws to engage.

CAUTION: Do not over-tighten the hard drive screws—screw just until you feel resistance (1.7 in.-lbs.). If the screws are over-tightened, the HDD may not function properly.

5. Fold the Keyboard in place and tuck the Keyboard Flex Cables into the frame of the OmniBook. See Figure 25.

CAUTION: To avoid damage to the keyboard flex cables, they must be positioned properly in the OmniBook frame.

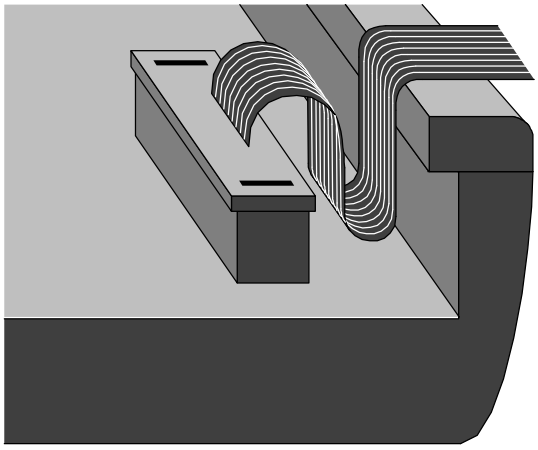

Figure 25 - Proper Keyboard Flex Cable Position

6. Replace the two Keyboard Screws and the remainder of the components and reboot.

Hard Disk Drive Breather Holes

Hard drives used in the OmniBook 800 have a breather hole located on the metal side of the drive (see Figure 26 for location of breather holes for both IBM® and Toshiba). The hole is necessary to provide pressure equilibrium. The breather holes must not be obstructed. Any labels covering this breather hole must be removed to prevent data loss on the hard drive.

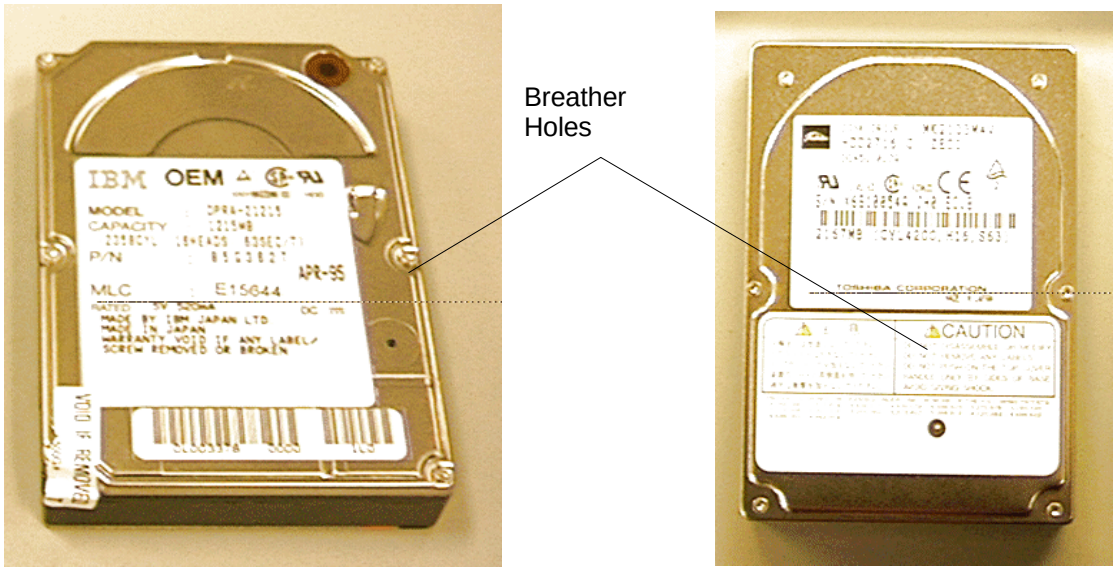

Figure 26 - IBM and Toshiba Hard Drive Breather Holes (respectively)

Just below the metal surface of the drive, a white material can be seen through the breather hole. This is a filter and should not be disturbed. A drive with this filter damaged should be considered defective.

Mouse
(End User Replaceable)

Required Equipment
- none

Removal Procedure
1. Press the mouse-eject button to eject the mouse.
2. Pull the mouse firmly away from the OmniBook (see Figure 27). The entire mouse assembly will pull free.

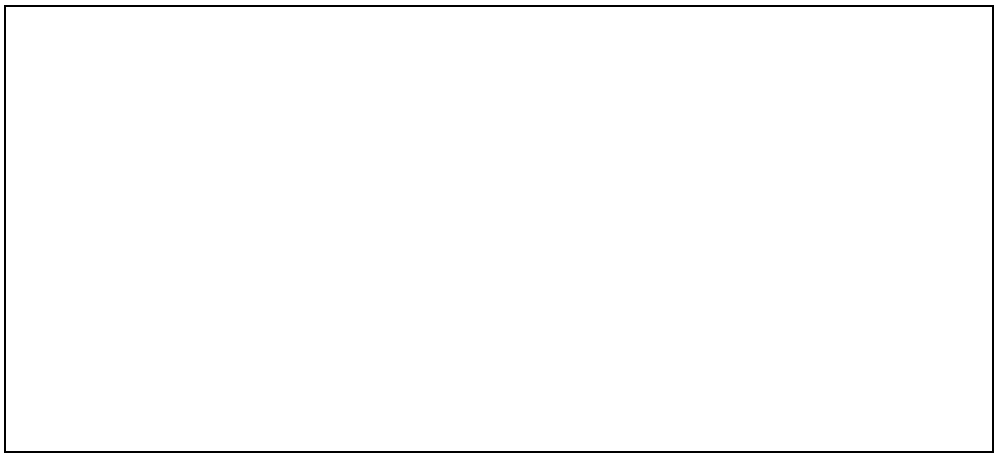

Figure 27 - Removing the Mouse

Replacement Procedure
1. Place the end of the mouse “stick” into the mouse housing.
2. Slide the mouse into the slot and firmly push the mouse until it is completely flush with the side of the OmniBook.

Small Parts
(End User Replaceable)

The following small parts are all end user replaceable.

Battery Latch

Once the battery is removed (refer to the *Battery Removal Procedure* on page 50), the battery latches will slide out of the bottom case. To replace, align the sides of the latches with the grooves in the slots. Press firmly into place.

I/O Door

To remove the I/O door, open it fully. Flex the middle of the door until the side pins clear the holes in the back case. Reverse to replace.

Memory Cover

Slide the memory cover off by using the two finger grips. Replace by aligning the edges of the cover with the slots on the bottom case. Slide firmly into place.

PCMCIA Card Tray

Slide the two tray latches toward each other. Pull the tray out of the card slot. If present, remove the PCMCIA card from the tray. To replace the tray, insert into the appropriate card slot. Slide the two latches away from each other to secure the tray.

Rubber Feet

Place a probe or similar device between the rubber foot and the plastic of the bottom case. Pry upward to pop the foot out. To replace, firmly press the foot into the hole.

Keyboard
(HP Authorized Service Providers Only)

Required Equipment
- Torx #6 screwdriver

Removal Procedure
1. Exit all applications, including Windows.
2. Turn the OmniBook off and remove the battery and ac adapter.
3. Remove the two keyboard screws from the bottom case. See Figure 28.

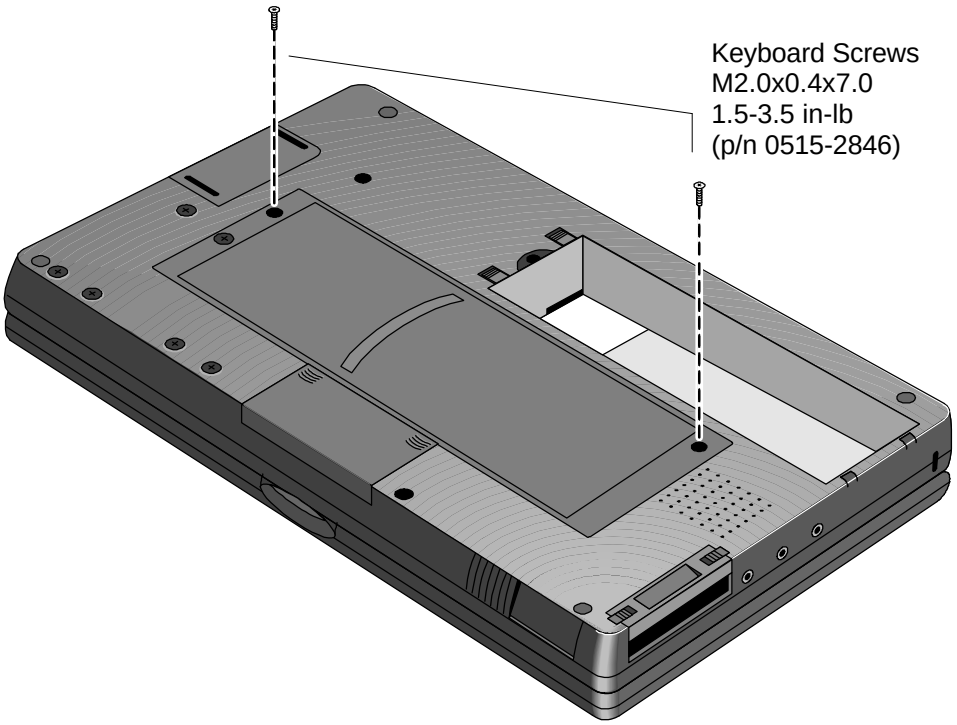

Figure 28 - Keyboard Screws

4. Remove the keyboard by inserting your fingertips between the top row of keys and the case and then lifting. Then fold the keyboard *gently* forward so that it lies upside down on the table. *Do not pick up the computer while the keyboard is in this position.* See Figure 29.

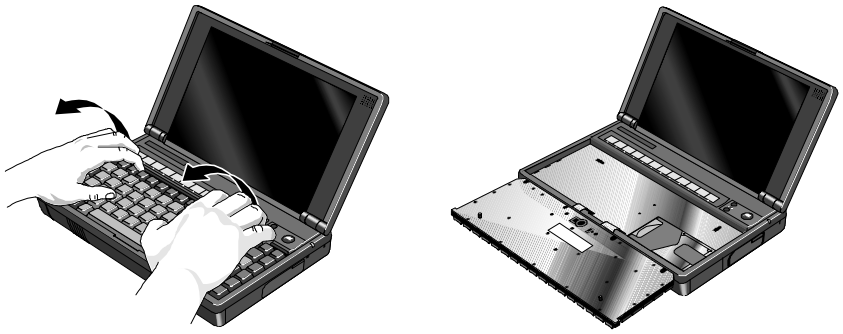

Figure 29 - Folding the Keyboard Open

5. Lastly, remove the keyboard flex cables from the zero insertion force slots. If available, use the provided Keyboard Flex Cable Removal Tool (part number 5182-7482) to assist in "opening" the zero insertion force slots. Otherwise, a pick may be used to *gently* lift up the top of the slots. See Figure 30.

CAUTION: To avoid damage to the solder joints, do not open the zero force insertion connectors by prying against the case of the OmniBook.

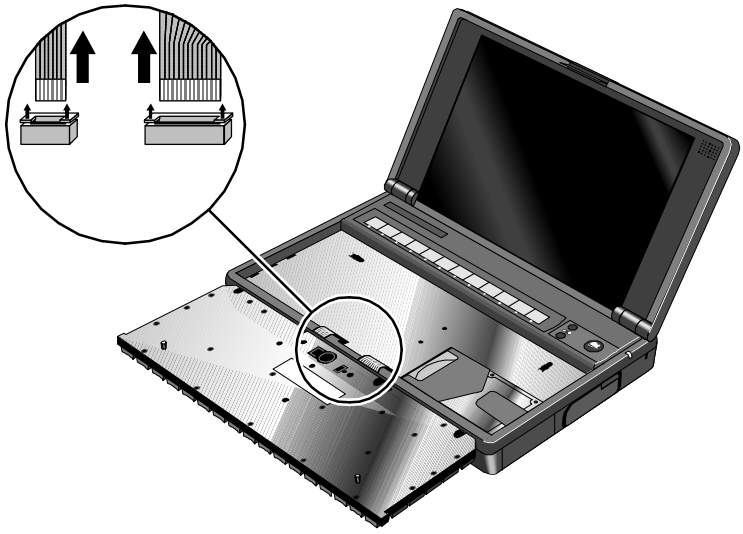

Figure 30 - Keyboard Flex Cables

Replacement Procedure

1. To replace, reverse the Removal Procedure. Once reconnected, the keyboard flex cables must be tucked properly into the frame. See Figure 31.

CAUTION: To ensure a proper connection, be sure to place the keyboard flex cables securely into the zero insertion force connectors.
To avoid damage to the keyboard flex cables, do not allow them to fold under the keyboard.

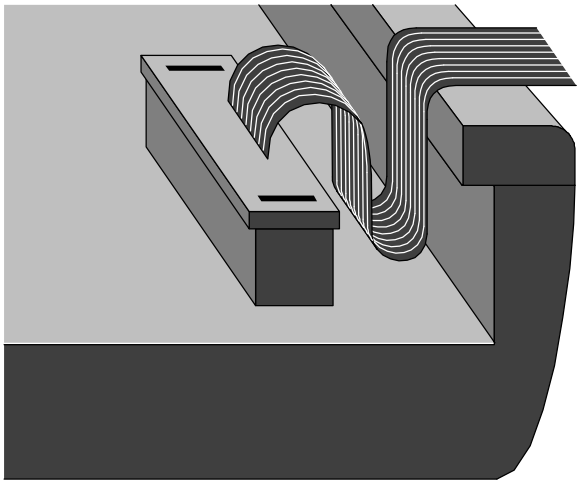

Figure 31 - Keyboard Flex Cable Placement

Display
(HP Authorized Service Providers Only)

Required Equipment
- Torx #6 screwdriver

Removal Procedure
1. Exit all applications, including Windows.
2. Turn the OmniBook off and remove the battery and ac adapter.
3. Follow the *Hard Disk Drive Removal Procedure* on page 53 and the *Keyboard Removal Procedure* on page 60 to remove these components.
4. Remove the three rubber feet and six screws from the bottom case. See Figure 32.

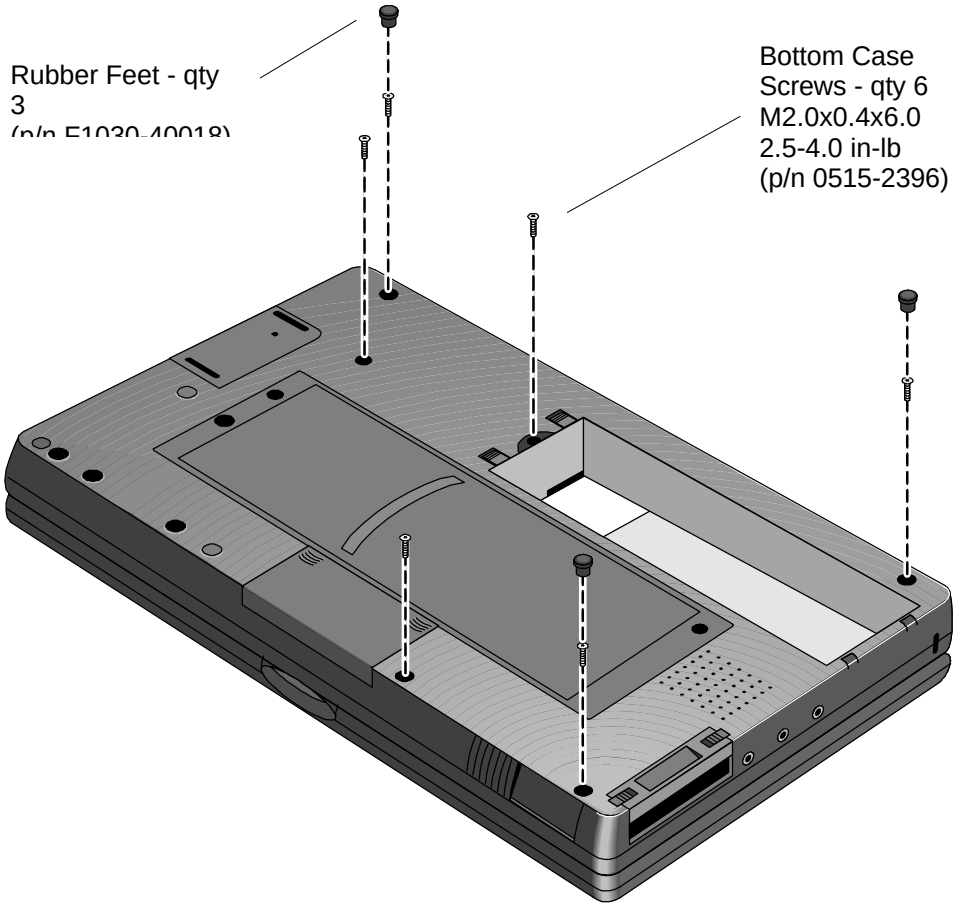

Figure 32 - Bottom Case Screws and Rubber Feet

5. Remove the Keyboard Support Plate Screws. Refer to Figure 33 for proper placement of screws for each of the OmniBook 800s. The F1360 has three screws, while the F1171-F1175 only have two. **Note – If the Keyboard Support Plate Screws are impossible to unfasten (due to thread corrosion or stripped head), remove the CPU Screws instead, which can be accessed from the Keyboard Support Plate. The Top Case and Display**

Assembly can then be removed with the CPU still attached to the underside of the Keyboard Support Plate. This avoids causing damage to the CPU or Logic PCA.

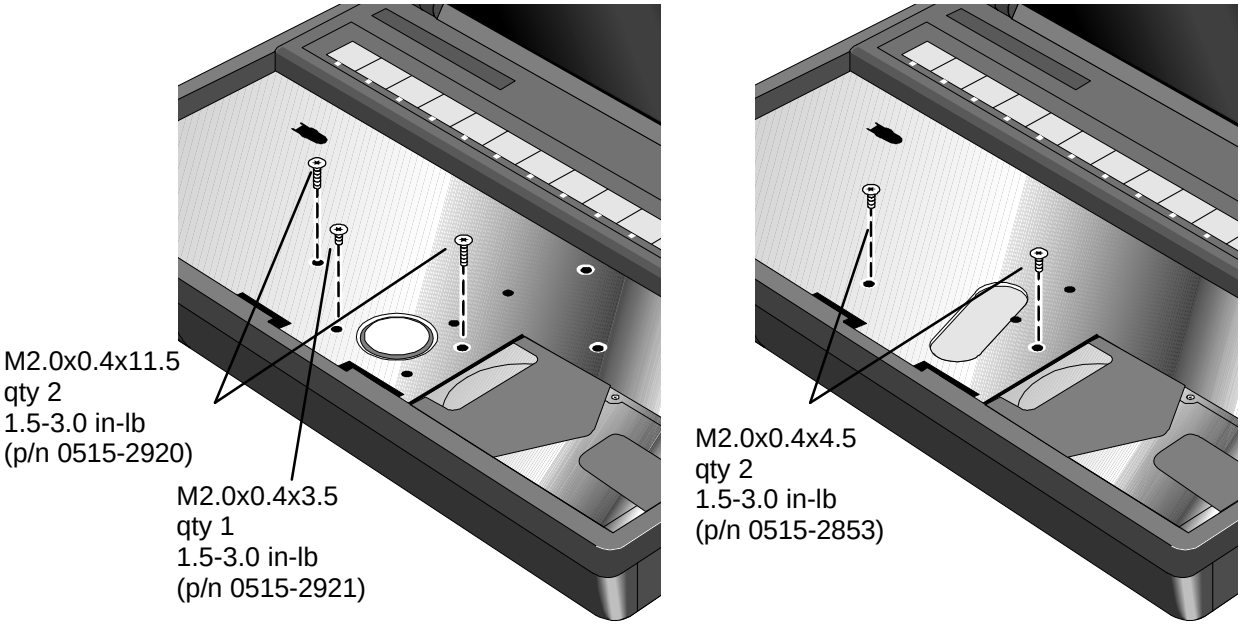

Figure 33 - Keyboard Support Plate Screws

6. Close the cover and gently pry the Top Case and Display Assembly from the Bottom Case along the case seam. See Figure 34 on page 64 and Figure 35 on page 65. **Take caution of the Display Flex Cable(s) still connected to the Bottom Case, as it is the only component now holding the Top Case and Display Assembly to the Bottom Case; do not lay the Top Case and Display Assembly down at this point.**

CAUTION: To avoid damage to the display cables, take care not to pull the cables out of the connector while prying open the case.

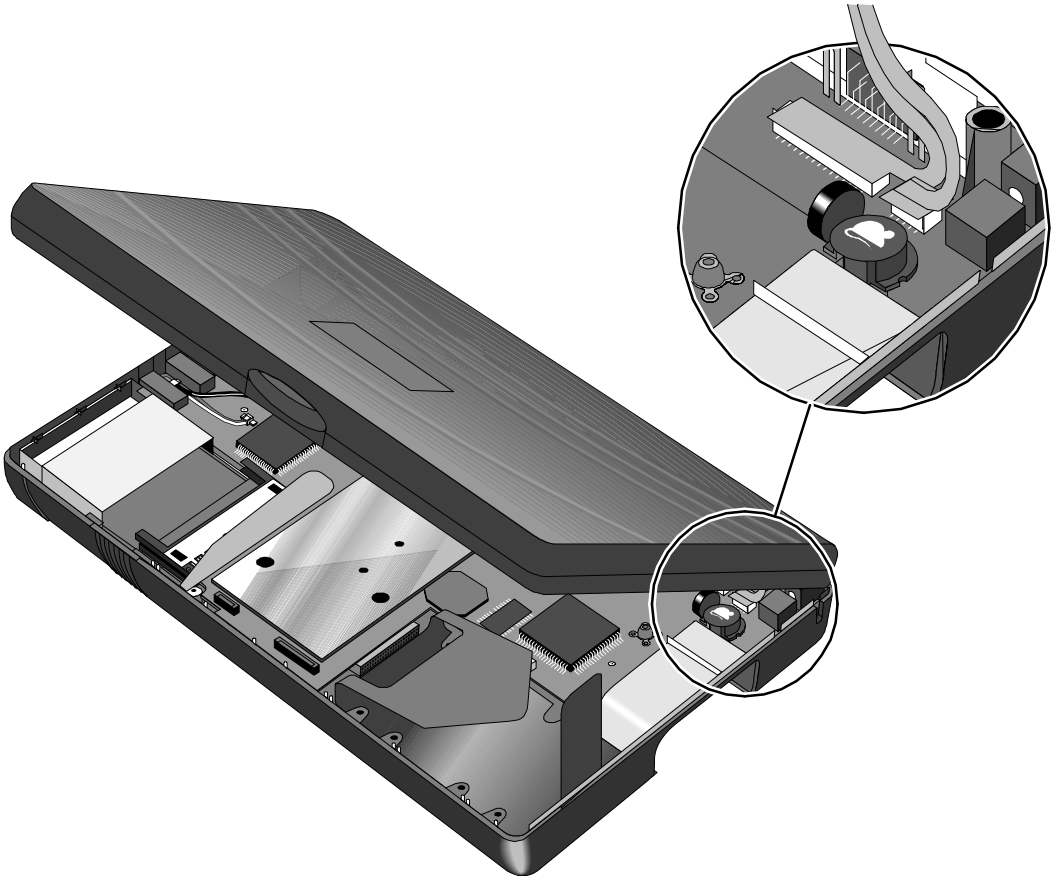

Figure 34 - Display Flex Cables

7. Note -- TFT displays (OmniBook 800CT) have **two** Display Flex Cables, while DSTN displays (OmniBook 800CS) only have one. *Take care to properly remove **both** cables on TFT units (the smaller cable may be hidden under the larger cable).* While still supporting the Top Case and Display Assembly, remove the Display Flex Cable(s) from the connector slot(s).

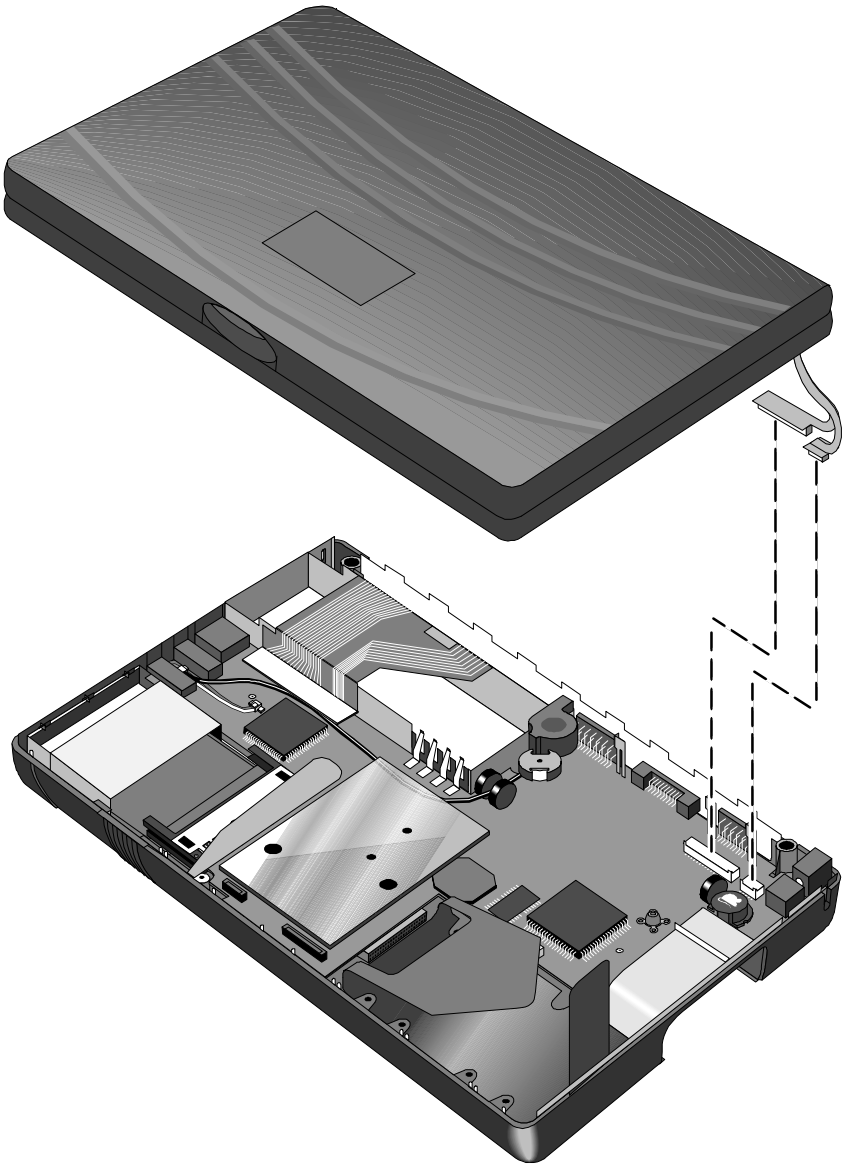

Figure 35 - Top Case and Display Removal

8. To separate the Display from the Top Case, thread the Display Flex Cable(s) through the opening of the Top Case.

Replacement Procedure

1. If the replacement Display arrived without an Intel Inside sticker, one will need to be placed equidistant between the edges of the Display. For the F1360 OmniBooks, the sticker is placed about 7mm above the hinge. For F1171 - F1175 OmniBooks, the sticker is placed about 10mm above the hinge. See Figure 36 for examples.

Intel Inside Sticker for F1360 only (p/n 7121-7455)

Intel Inside Sticker for F1171 - F1175 (p/n 5182-5113)

Figure 36 - Intel Inside Sticker Placement

2. Thread the Display Flex Cable(s) of the replacement Display through the opening in the Top Case and "close" the assembly comprising of the Top Case and Display Assembly.
3. Firmly place the Display Flex Cables(s) into the connector(s) on the Logic PCA.
4. Snap the Top Case and Display assembly in place and replace the keyboard support screws. **Note – For F1360 only, the two long screws *MUST* be replaced before the short screw.**

CAUTION: Use care when replacing the top case and display assembly so as not to pinch the display flex cables between the top case I/O backplane. *Always* inspect the back seam of the OmniBook to ensure the cables are not pinched.

5. Replace the remainder of the components and reboot.

CPU
(HP Authorized Service Providers Only)

Required Equipment
- Torx #6 screwdriver

Removal Procedure
1. Follow the *Display Removal Procedure* to gain access to the CPU.
2. Remove the two CPU screws (see Figure 37).
3. Gently rock the CPU back and forth from front to back to remove from the connector.

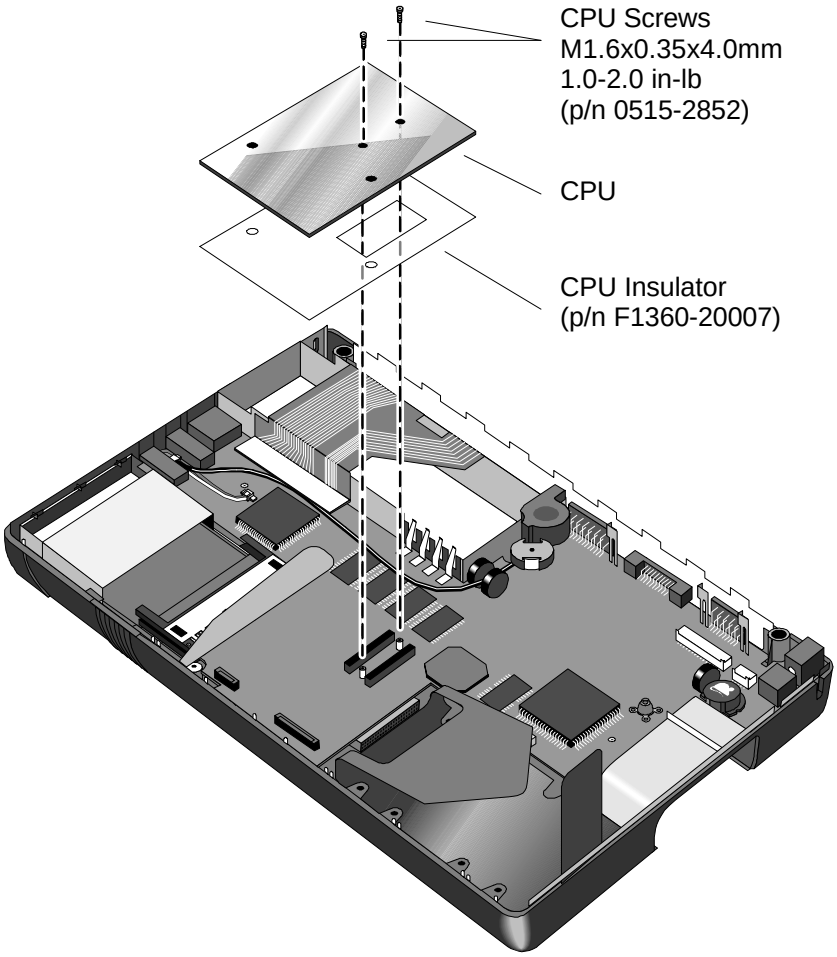

Figure 37 - Removing the CPU

Replacement Procedure
1. Ensure the CPU Insulator is positioned over the CPU connector on the Logic PCA.
2. Position the replacement CPU over the connector on the Logic PCA and press firmly but gently. **For F1360 units, please refer to the *Heat Transfer Disk* information on page 68.**

CAUTION: To avoid damage, apply pressure to the CPU only directly above the connector.

3. Replace the remainder of the components and reboot.

Heat Transfer Disk

(The following information applies to F1360 units only.)

With each replacement of the CPU, a new Heat Transfer Disk must be placed on the underside of the Top Case. See Figure 38. Simply pull back the Keyboard Support Insulator, remove the old Heat Transfer Disk, center the new Heat Transfer Disk in the indentation and reposition the Insulator. Ensure the rectangle opening in the Insulator is positioned squarely over the Heat Transfer Disk so that the edges of the Insulator opening retain the disk.

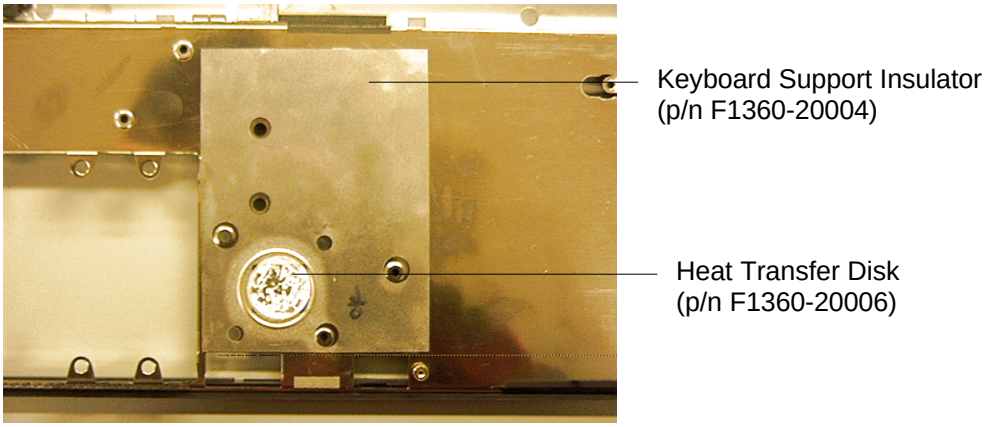

Figure 38 - Heat Transfer Disk and Keyboard Support Insulator

The heat generated by the CPU must be transferred through the CPU Thermal Coupling to the Heat Transfer Disk. See Figure 39. The material used to facilitate the heat transfer is a paraffin-based thermally conductive wax. When heated, the wax on the disk melts and flows to fill in thermally restrictive air gaps between the Top Case and the CPU.

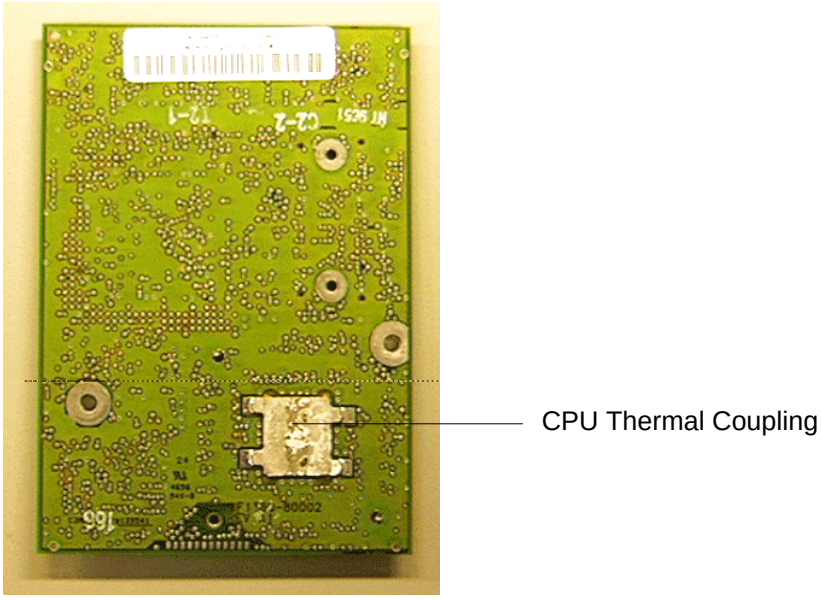

Figure 39 - CPU Thermal Coupling

Under normal conditions, it is important not to disturb the wax residue on the Top Case and CPU. If the Top Case is replaced, it will have a new Heat Transfer Disk already in place on the Keyboard Support Plate. However, to ensure the integrity of the heat transfer, this Heat Transfer Disk should be replaced with a new disk after installation of the new Top Case Assembly.

Logic PCA Board
(HP Authorized Service Providers Only)

Electronic Serial Number

The OmniBook 800 (F1360 only) is shipped with an electronic serial number programmed in EEPROM on the Logic PCA Board. This built-in serial number will help MIS managers in tracking assets and software configuration. Serial numbers can also be used for security and in tracking lost or stolen notebooks. The Desktop Management Interface (DMI) TopTools application shipped with the OmniBook can be used to read the serial number locally and across a network.

Programming the Electronic Serial Number

All replacement Logic PCA Boards will arrive with a temporary serial number programmed in EEPROM. The following procedure provides the steps necessary to reprogram the electronic serial number.

1. After installation of the replacement Logic PCA Board and upon reboot, the OmniBook will halt with this prompt:
   INVALID ELECTRONIC SERIAL NUMBER
   PRESS ANY KEY TO CONTINUE
2. After a key is pressed, the OmniBook will continue a normal boot process. The HP Authorized Service Provider must program a valid serial number before the OmniBook can be shipped to the customer.
3. Run the ESN.EXE program located in the c:\omnibook\diag directory.
4. The ESN program will prompt for a valid serial number.
5. Enter the serial number located on the bottom of the OmniBook. The ESN program will burn the serial number into EEPROM.

Overriding an Incorrect Electronic Serial Number

If an incorrect serial number is inadvertently burned into EEPROM, it can be corrected. Perform the following steps:

1. Run the ESN.EXE program located in the c:\omnibook\diag directory.
2. The ESN program will prompt to confirm that the serial number is incorrect. It will then generate a five (5) digit number key.
3. The HP Authorized Service Provider must contact Hewlett-Packard Technical Support at this point.
4. HP Technical Support will ask for a CZ authorization number and the five (5) digit number (from step 2).
5. HP Technical Support will provide a validation key to the HP Authorized Service Provider.
6. Enter the validation key. This will reset the electronic serial number with a temporary number.
7. Follow the above steps in **Programming the Electronic Serial Number** to enter the correct serial number.

Note, updating the BIOS on the OmniBook will **not** affect the electronic serial number.

Required Equipment

- Torx #6 screwdriver
- 5mm hexdriver (F1171 & F1175 only)

Removal Procedure

1. Follow the *Display Removal Procedure* to gain access to the Logic PCA.
2. For convenience, the Microphone Assembly may be removed at this point. See Figure 40.

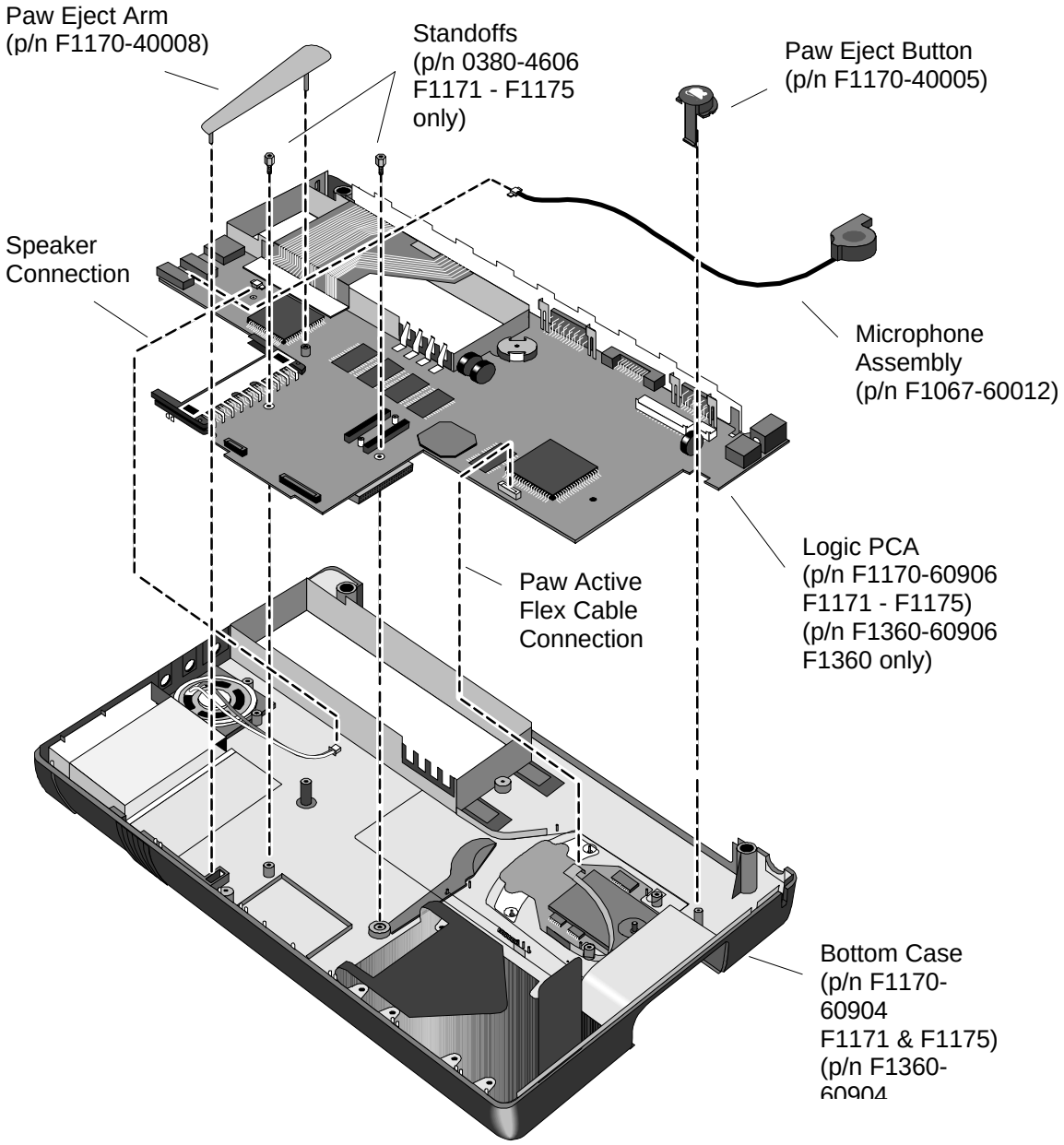

Figure 40 - Logic PCA Removal

3. The Eject Button and Spring along with the Pivot Door and Spring do not need to be removed to replace the Logic PCA. However, both of these springs are easily dislodged at this point and can become lost. It is best to remove them and set them aside.

4. Remove the Paw Eject Arm, Paw Eject Button, two standoffs (F1171 - F1175 only, the CPU must be removed to gain access to the two standoffs), and disconnect the Paw Active Flex Cable and the Speaker Cable.
5. Remove the Logic PCA from the bottom case by first lifting up on the right-hand side . **Note – the Logic PCA fits snugly into the bottom case. Removing it will require a little force; take care not to damage the I/O port connectors by lifting up on them.**

Replacement Procedure

1. To replace the Logic PCA, reverse the above procedure. Ensure that the Grommet and Bushing are in place on the Logic PCA (see
2. Figure 41).

CAUTION: To avoid damage to the OmniBook components, ensure the paw active flex cable is completely and squarely inserted into the zero insertion force connector.

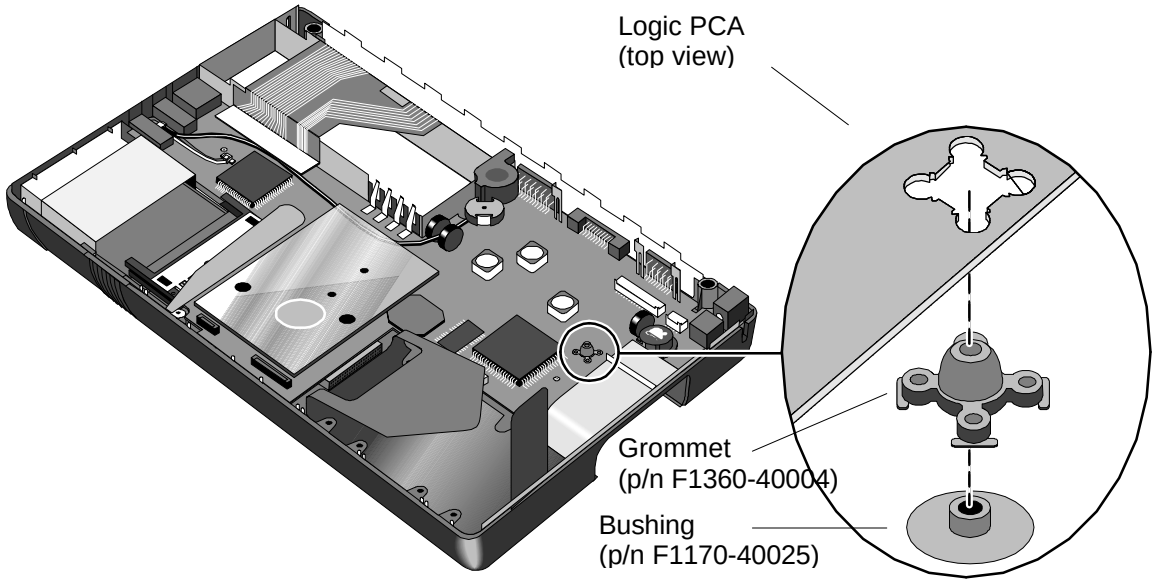

Figure 41 - Grommet and Bushing Placement

Paw Active
(HP Authorized Service Providers Only)

Required Equipment
- Torx #6 screwdriver
- 5mm hexdriver (F1171 - F1175 only)

Removal Procedure
1. Follow the *Logic Board PCA Removal Procedure* to gain access to the Paw Active.
2. Remove the Paw Shield. Refer to Figure 42 for location of components.

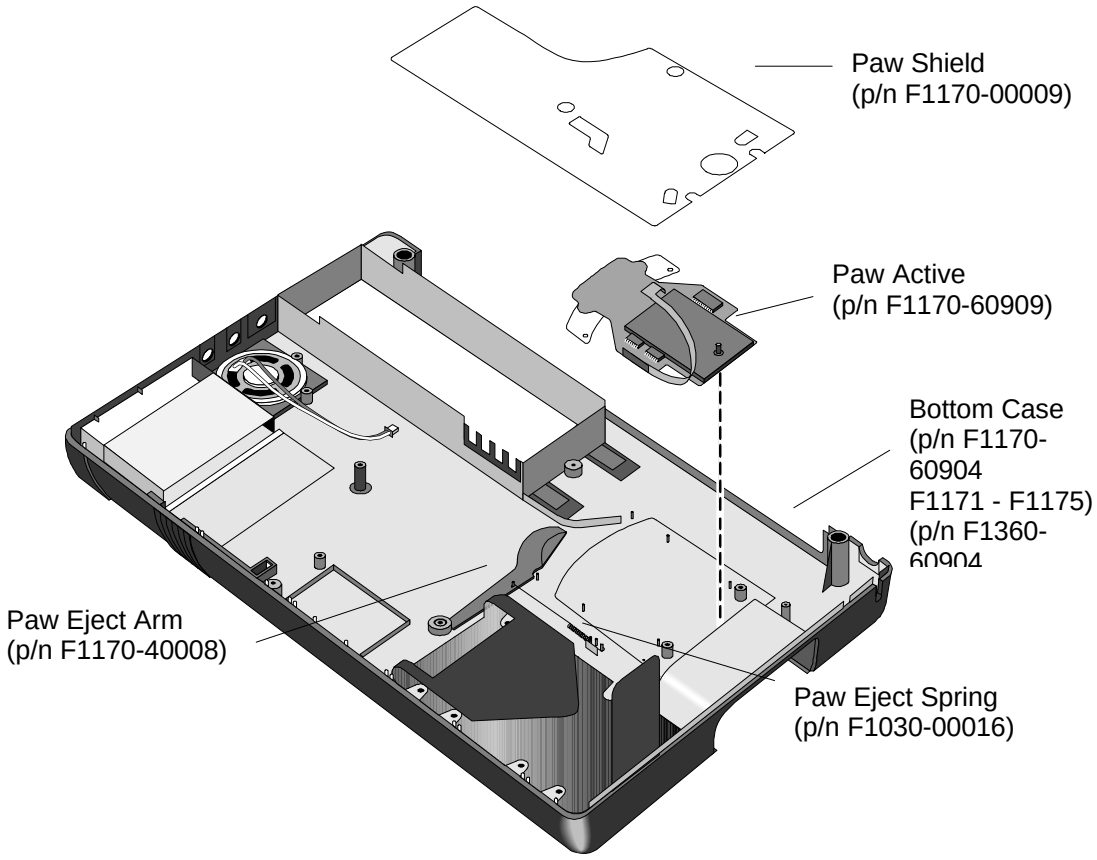

Figure 42 - Paw Active Removal

3. The Paw Eject Arm and Paw Eject Spring may be removed at this point for convenience.
4. Lift the Paw Active from the plastic posts holding it in place.

Replacement Procedure
1. To replace the Paw Active, reverse the steps in the Removal Procedure.

CAUTION: To avoid damage to the OmniBook components, ensure the paw active flex cable is completely and squarely inserted into the zero insertion force connector.

Other Components and Accessories
(HP Authorized Service Providers Only)

The below table list additional replaceable components and the disassembly procedure(s) necessary to gain access to each.

Component	Disassembly Procedure(s)/Page #	Equipment	Special Notes
CD-ROM Drive	• n/a	• none	This accessory contains no repairable parts. The entire unit must be exchanged.
Docking Station	• n/a	• none	This accessory contains no repairable parts. The entire unit must be exchanged.
Top Case	• Display	• Torx #6 screwdriver	
Bottom Case	• Logic PCA Board • Paw Active	• Torx #6 screwdriver • 5mm hexdriver (F1171 - F1175 only)	
Grommet Bushing	• Logic PCA Board	• Torx #6 screwdriver • 5mm hexdriver (F1171 - F1175 only)	
Mouse Button Latch	• Display	• Torx #6 screwdriver	Also need to remove the Topcase.
Mylar Mouse Shield	• Logic PCA Board	• Torx #6 screwdriver • 5mm hexdriver (F1171 - F1175 only)	
Eject Button Eject Arm Eject Arm Spring	• Display	• Torx #6 screwdriver	Also need to remove the Topcase.
Pivot Door Pivot Door Spring	• Display	• Torx #6 screwdriver	Also need to remove the Topcase.
Speaker	Logic PCA Board	• Torx #6 screwdriver • 5mm hexdriver (F1171 - F1175 only)	Remove the three topy spring nuts with a probe or similar device.

Appendices

- A - Technical Specifications
- B - Hewlett-Packard Password Removal Policy
- C - Hewlett-Packard TFT Display Quality Statement
- D - OmniBook Diagnostics BIOS Checksums
- E - OmniBook Diagnostics Error Messages
- F - Part Numbers

Appendix A - Technical Specifications

Mass Storage Specifications

Hard Disk Drive

The hard disk drive can be removed by the user for easy upgrades.

Hard drive manufacturers are subject to change without notice.

Table 17 - Hard Disk Drive Specifications

	810-million-byte Hard Drive	1.44-billion-byte Hard Drive	2.1-billion-byte Hard Drive
Manufacturer	Toshiba	IBM	Toshiba
Size	12.7-mm (2.5-in)	12.7-mm (2.5-in)	12.7-mm (2.5-in)
Interface	ATA-2 Interface	ATA-3 Interface	ATA-3 Interface
Recording Method	Peek Detect	PRML (Partial Response Maximum Likelihood)	PRML (Partial Response Maximum Likelihood)
Heads	Thin Film	MR (Magneto Resistive)	MR (Magneto Resistive)
Average seek (read)	13 ms	13 ms	13 ms
Track to track seek	3 ms	4 ms	3 ms
Full Track	25 ms	23 ms (read) 24 ms (write)	25 ms
Average latency	7.14 ms	7.5 ms	7.14 ms
Rotational speed	4200 +/- 0.1% rpm	4200 rpm	4,200 +/- 0.1% rpm
Media Transfer rate	24.7 (inner), 44.9 (outer) Mbits/sec	40 (inner), 61 (outer) Mbits/sec	38.6 - 69.8 Mbits/sec
Buffer to host	16.6 Mbytes/sec	16.6 Mbytes/sec	16.6 Mbytes/sec
Buffer size	128 KB	96 KB	128 KB
Spindle start time	5 sec	2.3 sec	5 sec
Reliability:			
MTBF: Power-on Hours	300,000 hours	300,000 hours	300,000 hours
Unrecoverable errors	1.0E-13 bits transfer	1.0E-13 bits transfer	1.0E-13 bits transfer
Configuration:			
Sector Size	512 Bytes	512 Bytes	512 Bytes
User Cylinders	2,920	2,800	5,160
Data Heads	6	4	6
Disks	3	2	3

Floppy Disk Drive

The floppy disk drive connects to a dedicated port, leaving the parallel port free. It is hot-swappable and configurable as drive A.

Floppy disk drive manufacturers are subject to change without notice.

Table 18 - Floppy Disk Drive Specifications

	3.5-inch Floppy Drive		
Manufacturer	TEAC		
Size	10.67 cm (W) x 14.48 cm (D) x 1.40 cm (H) (4.2 in (W) x 5.7 in (D) x 0.55 in (H))		
Weight	250g (0.55 lbs)		
Data Capacity	1.44MB (formatted) 2M (unformatted)	1.2MB (formatted) 1.6M (unformatted)	724KB (formatted) 1M (unformatted)
Data Transfer Rate	500k bits/sec		250k bits/sec
Disk Rotational Speed	300rpm	360 rpm	300rpm
Track Density	135tpi		
Cylinders	80		
Track-to-track Time	3ms		
Average Seek Time	94ms		
Start Time	480ms		
Average latency	100ms	83.3ms	100ms
Mean Time Between Failures	30,000 hours		
Error Rate			
Soft (recoverable)	1 or less per 10^9 bits read		
Hard (unrecoverable)	1 or less per 10^{12} bits read		
Seek	1 or less per 10^6 bits read		

CD-ROM Drive

The CD-ROM Drive is an accessory to the HP OmniBook 800 and can be purchased separately. It is a SCSI device that connects to the OmniBook's docking port via a proprietary docking-connector-to-SCSI cable. The CD-ROM is can be powered with six AA batteries or by daisy-chaining to the OmniBook's ac adapter.

CD-ROM drive manufacturers are subject to change without notice.

Table 19 - CD-ROM Drive Specifications

	4x CD-ROM Drive	8x CD-ROM Drive
Manufacturer	Panasonic	Panasonic
Size	138mm x 196mm x 37mm (WxDxH)	138mm x 196mm x 37mm (WxDxH)
Weight	450g (without battery)	430g (without battery)
Interface	SCSI-2	SCSI-2
Transfer Rate	150 KB/s Normal Speed 300 KB/s Double Speed 600 KB/s Quad Speed	150 KB/s Normal Speed 1200KB/s Octo Speed
Buffer	128 KB	128 KB
Access Speed	350 ms (1/3 stroke; ac adapter) 600 ms (full stroke; ac adapter) 990 ms (1/3 stroke; alkaline battery) 1500 ms (full stroke; alkaline battery)	180 ms (1/3 stroke: ac adapter) 300 ms (full stroke: ac adapter)
Start up Time	< 30 secs	< 10 secs

Modes	CD-DA, CD-ROM, CD-ROM XA (except for ADPCM), Photo CD®, CD R, Video CD, CD-I	CD-DA, CD-ROM, CD-Extra, CD-ROM XA (except for ADPCM), Photo CD®, CD R, Video CD, CD-I
Mean Time Between Failures	25,000 hours	25,000 hours

System Resources

The following tables list the various system resources for each OmniBook 800 model.

System Interrupts (IRQs)

Table 20 - Interrupts for F1171 - F1175

0	System timer
1	Keyboard
2	Redirect IRQ 9
3	Free (COM2 or COM4 if modem installed)
4	COM1 and COM3 (external serial port)
5	ESS Sound Chip
6	Floppy drive
7	LPT1 (external parallel port)
8	Real-time clock
9	Free
10	SCSI
11	Wave 2 (sound)
12	Mouse
13	Math co-processor
14	Internal hard disk (primary IDE controller)
15	Infrared when undocked, PCI Card when docked (if installed)

Table 21 - Interrupts for F1360

0	System timer
1	Keyboard
2	Redirect IRQ 9
3	Free (COM2 or COM4 if modem installed)
4	COM1 and COM3
5	Sound
6	Floppy drive
7	LPT1 (or LAN)
8	Real-time clock
9	Free
10	Infrared/SCSI
11	Free
12	Mouse
13	Math co-processor
14	Internal hard disk (primary IDE controller)
15	Free

DMA Channels

Table 22 - DMA Channels for F1171 - F1175, and F1360

0	Free
1	Sound
2	Floppy drive
3	Free
4	DMA Controller
5	Wave 2
6	Free
7	Free

Memory Map

Table 23 - Memory Map for F1171 - F1175

F0000 - FFFFF	64K	System BIOS
EC000 - EFFFF	16K	PCI BIOS
E8800 - EBFFF	14K	Plug-n-Play BIOS
E8000 - E87FF	2K	Enhanced Parallel Port
D2000 - E7FFF	90K	Free
D0000 - D1FFF	8K	PCMCIA Memory
CA000 - CFFFF	24K	Free
C0000 - C9FFF	40K	NeoMagic Video

Table 24 - Memory Map for F1360

E8800 - FFFFF	82K	Plug-n-Play, ISA, and PCI System BIOS
E8000 - E87FF	2K	Enhanced Parallel Port
D2000 - E7FFF	90K	Free
D0000 - D1FFF	8K	PC Card (can be expanded if necessary)
CA000 - CFFFF	24K	Free
C0000 - C9FFF	40K	NeoMagic Video

I/O Addresses

Table 25 - I/O Address for F1171 - F1175

1F0 - 1F7	Internal Hard Disk
220 - 22F	ESS Sound
2F8 - 2FF	COM 2 (if modem installed)
330 - 331	Wave 2 (sound)
378 - 37A	LPT1 (external parallel port)
388 - 38B	Sound
3B0 - 3BF	NeoMagic Video Adapter
3C0 - 3CF	NeoMagic Video Adapter
3E0 - 3E1	PCMCIA Bridge on PCI
3F0 - 3F5	Floppy Controller
3F6	Internal Hard Disk
3F7	Floppy Controller
3F8 - 3FF	COM1 (external serial support)
3000 - 301F	PIC Infrared Controller
4100 - 41FF	SymBIOS SCSI on PCI
FFFF	Plug-n-Play

Table 26 - I/O Addresses for F1360

1F0 - 1F7	Internal Hard Disk
220 - 22F	ESS Sound
2F8 - 2FF	COM 2 (if modem installed)
330 - 331	Wave 2 (sound)
378 - 37A	LPT1 (external parallel port)
388 - 38B	Sound
3B0 - 3DF	NeoMagic Video Adapter
3E0 - 3E1	PC Card Bridge on PCI
3F0 - 3F5	Floppy Controller
3F6	Internal Hard Disk
3F7	Floppy Controller
3F8 - 3FF	COM1 (external serial support)
3000 - 301F	PCI Infrared Controller
4100 - 41FF	SymBIOS SCSI on PCI

Appendix B - Hewlett-Packard Password Removal Policy

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][Shift][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.)

The password descramble programs for the HP OmniBook Notebook 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 the program being protected, 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 he or she is the owner of the unit. The statement can be a fax copy of the document. The fact that the unit is in the hands of an HP representative on behalf of the customer is not evidence of ownership. In addition, HP will not 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 are subject to standard record 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.

Appendix C - Hewlett-Packard TFT Display Quality Statement

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.*

HP OmniBook TFT displays meet or exceed all TFT manufacturers' 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 customers' 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, OmniBook 800CT, OmniBook 5000CT, OmniBook 5500CT, and OmniBook 5700CT 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 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 its ability to produce displays with fewer inherent cosmetic imperfections and we will adjust our HP guidelines as the improvements are implemented.

Appendix D - OmniBook Diagnostics BIOS Checksums

When running the OmniBook diagnostics program, these checksums can be specified on the command line with the -c option.

Table 27 - OmniBook F1171 - F1175 BIOS Checksums

ROMDATE	C_F -C1	Altera -C2	Boot -C3	Total SUM
960808	3E55	DC8C	C600	A0E1
960910	258F	DC8C	1900	DB1B
960917	D040	DC8C	1900	85CC
961009	3C32	DC8C	0900	E1BE
961011	4024	DC8C	0900	E5B0
961018	5091	DC8C	0900	F61D
961025	3E93	DC8C	3500	101F
961028	3E93	DC8C	3500	101F
961031	9743	DC8C	3500	68CF
961111	7690	DC8C	3500	481C
961127	39C9	DC8C	3500	0B55
961209	5B2A	DC8C	1600	0DB6
961219	3F4A	DC8C	1600	F1D6
961231	2911	DC8C	1600	DB9D
970107	C12B	DC8C	1600	73B7
970110	952B	DC8C	1600	47B7
970113	E558	DC8C	1600	97E4
970121	B738	DC8C	1600	69C4

Table 28 - OmniBook F1360 BIOS Checksums

ROMDATE	C_F -C1	Altera -C2	Boot -C3	Total SUM
961018	DC97	DC8C	0900	8223
961025	CA99	DC8C	3500	9C25
961028	CA99	DC8C	3500	9C25
961031	2349	DC8C	3500	F4D5
961111	C19B	DC8C	3500	9327
961127	84D4	DC8C	3500	5660
961209	A635	DC8C	1600	58C1
961219	2CF6	DC8C	1600	DF82
961231	16BD	DC8C	1600	C949
970107	AED7	DC8C	1600	6163
970110	47D2	DC8C	1600	FA5E
970113	97FF	DC8C	1600	4A8B
970121	6A45	DC8C	1600	1CD1

Appendix E - OmniBook Diagnostics Error Messages

The following are messages that may appear when running the OmniBook diagnostics program.

Hewlett-Packard supplied test messages

The following test messages were supplied by Hewlett-Packard.

CPU

XXXMHz CPU, speed=XXX (failed).

BIOS flash roms

OK C-F=XXXX Altera=XXXX Boot=XXXX
FAIL C-F=XXXX#YYYY ...

PCMCIA CARDS (SyCard supplied)

Failed: no extender card
Failed: no SyCard
Voltage Sense 1 (VS1) Error - Stuck Low
Voltage Sense 1 (VS1) Error - Stuck High
Voltage Sense 2 (VS2) Error - Stuck Low
Voltage Sense 2 (VS2) Error - Stuck High
Error - INPACK failure
DMA Write Error - expected XX, received XX
DMA cycle did not complete:
  Timeout error
  Read Data error
  Missing TC error
  Premature TC error
  Write Data error
  Unknown DMA error
  on DMA channel X
DMA Status Check Error - XXXX
DMA Not Complete - 8237A Status = XX
ERROR - Texas Instruments PCI-1130 not found on PCI Bus
Socket control r/w error - wrote XX, read back XX @ offset XX
Databook Socket control r/w error 2 - wrote XX, read back XX @ offset XX
Basic 8 bit I/O read/write failure, wrote XX, read XX
Basic 16 bit I/O read/write failure, wrote XXXX, read XXXX
Basic 16 bit common memory R/W failure, wrote XXXX, read XXXX
16 bit memory read error, wrote 4321, read XXXX
Data Error, expected XXXX, received XXXX
Vcc tolerance error (3.3V) = N.NN)
Vcc tolerance error (5V) = N.NN)
Vpp2 tolerance error (12V) = N.NN)
Vpp1 tolerance error (3.3V) = N.NN)
Vpp1 tolerance error (5V) = N.NN)
Vpp2 tolerance error (3.3V) = N.NN)
Vpp2 tolerance error (5V) = N.NN)
Vpp1 tolerance error (0V) = N.NN)
Vpp2 tolerance error (0V) = N.NN)

Vpp2 tolerance error (12V) = N.NN)
Card Vpp2 12V = N.NN (XX)
Vpp2 tolerance error (3.3V) = N.NN)
Vpp2 tolerance error (3.3V) = N.NN)
Vpp2 tolerance error (5V) = N.NN)
Vpp1 tolerance error (12V) = N.NN)
-REG bit error - stuck high
-REG bit error - stuck low
Address miscompare, access = XXXXXXXX, latched = XXXXXXXX
Address miscompare, access = XXXXXXXX, latched = XXXXXXXX
Error - Wait bit has no effect
BVD1/-STSCNG (Pin 63) error - stuck low
BVD1/-STSCNG (Pin 63) error - stuck high
BVD2/-SPKR (Pin 62) error - stuck low
BVD2/-SPKR (Pin 62) error - stuck high
WP/-IOIS16 (Pin 33) error - stuck low
READY/-IREQ (Pin 16) error - stuck low
Reset error - stuck low
Reset error - stuck high
Card Detect Error -CD1 stuck high
Card Detect Error -CD1 stuck low

Disk Drives (SCSI HD / internal HD / Floppy)

Internal Diag error: not enough memory for disk buffer.
Failed: no scsi or dock connection.
Error X resetting drive.
Error reading drive parameters.
Failed: no formatted Floppy in drive.
Failed: disk is write protected.

Error: data read does not match data written.
(Note: when the above error occurs, the status window will report the
offset where the mismatch occurred and four bytes of expected and actual
data as follows: Data ERROR offset NNN wrote:XX-XX-XX-XX read:XX-XX-XX-XX)

Error X at track T, head H, sector S.

1.4Mb/813Mb/1.4Gb Ok SeekRetries=N, ReadRetries=N, WriteRetriees=N

The codes reported translate to the following errors:

0x00 successful completion
0x01 invalid function in AH or invalid parameter
0x02 address mark not found
0x03 disk write-protected
0x04 sector not found/read error
0x05 reset failed (hard disk)
0x06 disk changed (floppy)
0x07 drive parameter activity failed (hard disk)
0x08 DMA overrun
0x09 data boundary error attempted DMA across 64K boundary or >80h sectors
0x0A bad sector detected (hard disk)
0x0B bad track detected (hard disk)
0x0C unsupported track or invalid media
0x0D invalid number of sectors on format (PS/2 hard disk)

0x0E control data address mark detected (hard disk)
0x0F DMA arbitration level out of range (hard disk)
0x10 uncorrectable CRC or ECC error on read
0x11 data ECC corrected (hard disk)
0x20 controller failure
0x31 no such drive (Compaq)
0x32 incorrect drive type stored in CMOS (Compaq)
0x40 seek failed
0x80 timeout (not ready)
0xAA drive not ready (hard disk)
0xBB undefined error (hard disk)
0xCC write fault (hard disk)
0xE0 status register error (hard disk)
0xFF sense operation failed (hard disk)

Battery

Battery type = None (OK), LiIo (OK), NiMH (OK), ERROR (BIOS not sure)
Charge state = NA (no bat), NC (no charger), FC (fast charge),
TC (trickle charge), EC (error charging), WC (waiting to charge)
B%=100 (percent of battery charged)
Vb=8.57 (battery voltage)
Ta=37.9 (Ambient temperature)

SCSI loopback test

Failure: "X" Register Read/Write Error
Failure: NO CABLE, Couldn't find SCSI controller #N
Failure: "X" Pin #N ("X") is stuck low.
Failure: "X" Pin #N ("X") is stuck high.
Failure: "X" Interrupt line problem
Failure: "X" can't Bus Master
Failure: "X" can't issue interrupt

HP mouse

Unable to prepare internal mouse for i/o.
Failed: "X" bumper ON while moving "X".
Failed: "X" bumper and movement "X" at the same time.
Failed: (one or more of LEFT RIGHT UP DOWN TOP BOTTOM IN OUT)
Failed: HMICKEYS or VMICKEYS
Failed: Vertical calibration lost
Failed: Horizontal calibration lost

Docked device

Ok: NOTHING
Ok: 800 DOCK
Failed: Red LED
Failed: Green LED
Failed: Dock Lock
Ok: SCSI CABLE
Error: UNCLEAR

Dock PS2 mouse

Failed: no dock connected for PS2 mouse.
Failure code N ("X" while enabling external PS2 mouse.
Failed: (one or more of LEFT RIGHT UP DOWN)

Dock EEPROM

FAILED at XXXX: wrote XX read XX.

System hardware configuration (invoked with Ctrl+H)
Cpu speed (CPU=100 133)
Display type (DSP=DSTN or TFT)
Hard disk size (HD=814M .. 1.3G)
L2 Cache (L2=000 or 256), On or Off
Op Sys Version (OS=0.04.09...)
Ram memory (RAM=08 .. 80)
Volume ID (VOL=1ORID14ABA...)

Watergate Software supplied test messages

The following test messages were supplied by Watergate Software.

CPU test responses

General Register Test	"AX", "BX", "CX", "DX" -- " FAILED" "EAX", "EBX", "ECX", "EDX" -- "FAILED
Index Register Test	"SI", "DI" -- "FAILED" "ESI", "EDI" -- "FAILED
Pointer Register Test	"BP", "SP" -- "FAILED" "EBP", "ESP" -- "FAILED
Segment Register Test	"DS", "ES", "SS" -- "FAILED" "FS", "GS" -- "FAILED"
Flag Register Test	"CF", "PF", "AF", "ZF", "SF", "IF", "DF", "OF" -- "FAILED"
Simple Arithmetic	"ADC", "ADD", "DEC", "DIV", "IDIV", "IMUL", "INC", "MUL", "SBB", "SUB" -- "FAILED" "ADC32", "ADD32", "DEC32", "DIV32", "IDIV32", "IMUL32", "INC32", "MUL32", "SBB32", "SUB32" -- "FAILED"
Logical Operations	"AND", "NOT", "OR", "XOR" -- "FAILED" "AND32", "NOT32", "OR 32", "XOR 32" -- "FAILED"
String Operations	"LODSB", "MOVSB", "SCASB", "STOSB" -- "FAILED" "LODSW", "MOVSW", "SCASW", "STOSW" -- "FAILED" "LODSD", "MOVSD", "SCASD", "STOSD" -- "FAILED"
Shift/Rotate	"RCL", "RCR", "ROL", "ROR","SHL","SHR" -- "FAILED" "RCL32", "RCR 32", "ROL32", "ROR 32","SHL32","SHR 32" -- "FAILED"
Interrupts	"INT XXXH Failed"
Exceptions	"Divide", "InvOpCode","CoProc" -- "FAILED"

Co-CPU test responses

Register Stack	"Registers", "ST-Pointer" "FLDLZ","FLDPI","FLDLN2","FLDLG2","FLDL2T","FLDL2E","FLD1" -- "FAILED"
Exceptions	"InvOp", "DenOp", "ZeroDiv", "OverF", "UnderF","Prec", "StackF" -- "FAILED"
Arithmetics	"FADD","FDIV","FIADD","FIDIV","FIMUL","FISUB","FMUL","FSUB" -- "FAILED" "FABS","FCHS","FPREM","FRNDINT","FSCALE","FSQRT","FXTRACT" -- "FAILED" "FPREM1" -- "FAILED"

Comparison	"FBLD/FBSTP", "FILD/FIST","FLD/FST","FXCH" -- "FAILED" "FCOM","FICOM","FTST","FXAM" -- "FAILED" "FUCOM" -- "FAILED"
Trigonometry	"F2XM1","FPATAN","FPTAN","FYL2X","FYL2XP1" -- "FAILED" "FCOS","FSIN","FSINCOS" -- "FAILED"

Memory test responses

Suspend RAM test	"Failed: memory manager loaded"
Extended Pattern And Address Test	"Could not allocate buffer" "BIOS reports no extended memory available" "Error at address XXXXXXXXH" "Parity Error at blocks XXXXXXXH-YYYYYYYYH" "Parity Error at blocks XXXXXXXH-YYYYYYYYH" "Test aborted at block XXXXXXXH"
Base/UMB Pattern And Address Test	"Error at memory paragraph XXXXH" "Parity Error at paragraphs XXXXH-YYYYH" "Test aborted at paragraph XXXXH"
Base/UMB Bus Throughput Test	"Error at segment XXXXH" "Bus Throughput Test aborted at segment XXXXH"
EMS Bus Throughput Test	"Not Enough EMS Memory Available!" "Could Not Allocate EMS Memory!" "Error at segment XXXXH" "Could Not Establish EMS Page Frame Location!"
EMS Pattern And Address Test	"Error on page XXXXX" "Parity Error on page XXXXX" "Test aborted at EMS page XXXXX"
Code Test	"BIOS reports no extended memory available" “PC-DOCTOR encountered an unexpected exception while code-testing memory in protected mode. System halted (this error is unrecoverable).’”

Cache test responses

Cache Test	“Error at memory block XXXXXXXH” “Parity Error at blocks XXXXXXH-YYYYYYYH” “Test aborted at block XXXXXXXXH”

VGA test responses

Video Pages	"Aborted at mode XXXH (III)" "Mode XXXH (III) page Y failed"
Video Memory	"Pattern Error in mode XXXH (III) plane Y, bits XXXXH Failed" "Pattern Error in mode XXXH (III) bits XXXXH Failed"
Color Registers	"Could not initialize mode 13H" "DAC-register N " -- "Red ", "Green ", "Blue " -- "FAILED"
VGA Controller Registers	"Video RAM Enable" -- "FAILED" "Video IRQ" -- "FAILED" "Map Mask Register" -- "FAILED" "Set/Reset Register" -- "FAILED" "Enable Set/Reset Register" -- "FAILED" "Color Compare Register" -- "FAILED" "Data Rotate Register" -- "FAILED" "Read Map Select Register" -- "FAILED"

	"Mode Register" -- "FAILED" "Color Don't Care Register" -- "FAILED" "Bit Mask Register"

Timer chip test responses

Timer chip test	"Clock 0 Not Counting", "Clock 1 Not Counting" -- "FAILED" "Clock 2 Not Counting" "Could Not Control Clock 2"

CMOS RAM test responses

CMOS RAM Test	"Addr XXH Failed, In YYH, Out ZZH" "CMOS Checksum Failed, ChkSum is XXH, not YYH", "CMOS Pattern Test" -- "FAILED"

Sound test responses

DSP	"No sound card detected" "DSP Chip Data Path Failed"
DMA	"No sound card detected" "No DMA Request Generated"
Interrupt	"No sound card detected" "No interrupt generated"
Sound output	"No sound card detected"

Keyboard test responses

Keyboard Test	"Failed: Fn key" "Failed: Contrast Up button" "Failed: Contrast Down button"
	"Windows prevents keyboard testing" "OS/2 prevents keyboard testing" "Could not test keyboard because of stuck key(s)" "Keyboard Power-On Selftest Failed" "Keyboard IRQ Failed" "Keyboard clock line stuck low" "Keyboard clock line stuck high" "Keyboard data line stuck low" "Keyboard data line stuck high" "Interface chip internal diagnostics error"

Manual keyboard test

Manual Keyboard Test	"Error reading KBD file." "Test aborted before all keys were pressed."

LPT test responses

Registers Test	"Wrote XXH, Read YYH"
External Loopback	"Interrupt Failed" "DATA0-->ERROR" "STROBE-->SLCT"

PCDR LOOPBACK PLUGS	"AUTOFD-->PE" "INIT-->ACK" "SLCTIN-->BUSY"
ACER LOOPBACK PLUGS	"DATA1-->SLCT" "DATA2-->PE" "DATA3-->ACK" "DATA4-->BUSY"

COM test responses

Registers	"Baud rate divisor failed" "Divisor latch access bit failed" "Line control register pattern test failed" "Modem control register failed" "Interrupt failed. It was not generated."
Loopback Tests (Internal/External)	"RTS-->CTS", "DTR-->DSR", "Delta-CTS", "Delta-DSR" -- "FAILED" "Test aborted at XXXX BPS" "Send timeout at XXXX BPS" "Wrong character count at XXXX BPS (YY vs 96)" "Data at XX should be YY, it is ZZ" "Received data miscompare at XXXX BPS"

IRQ test resonses

IRQ Test	"IRQ Controller 0", "IRQ Controller 1" "(Masking)","(IRR)","(ISR)", "(PollCmd)","(NS-EOI)","(S-EOI)"

DMA test responses

DMA Test	"Channel N register patterns failed" "Channel N page register patterns failed" "Channel N DMA transfer failed (with termination or no data or XX NMIs)

HD test responses

HD Test	"HD XX SelfTest Failed: FC=YY ER=ZZ SR=AA CS=BB", "Error Seeking To Track XXX" "Error verifying track XXX"

FD test responses

FD Test	"Error verifying track XXX" "Sector Read Failed" "Could not establish drive parameters" "Error seeking to track 0" "Error Seeking To Track XXX" "Error verifying track XXX Head YYY"
WRITE TESTS	"Could not allocate buffer segment" "Error writing track XX Head YY" "Error reading track XX Head YY" "Error in data of track XX Head YY"

CD ROM test responses

CD ROM Test	"Invalid Drive"; "Not Ready"; "Error Code XX (II)" "Error reading sector

Appendix F - Part Numbers

PART #	EXCHANGE PART #	DESCRIPTION	CUSTOMER REPLACEABLE	F1171 - F1175	F1360
0380-4606		STANDOFF - HEX	no	✓	
0515-1634		TOPY SPRING NUT	no	✓	✓
0515-2396		SCREW 2.0 X.4 6MM	yes	✓	✓
0515-2846		SCREW M2X.4X7PH T6	yes	✓	✓
0515-2847		SCREW M3X.5X5WH T6	yes	✓	✓
0515-2852		SCREW M1.6X.35X4	no	✓	✓
0515-2853		SCREW M2X.40X4.5WH	no	✓	
0515-2920		SCREW M2X.4X11.5WH	no		✓
0515-2921		SCREW M2X.4X3.5WH	no		✓
5182-5110		LABEL PROD ID/CS	yes	✓	
5182-5111		LABEL PROD ID/CT	yes	✓	✓
5182-5113		LABEL - INTEL	no	✓	
5182-7482		KEYBOARD REMOVAL TOOL	no	✓	✓
7121-7455		LABEL - INTEL MMX	no		✓
8120-6921		FLOPPY DRIVE CABLE	yes	✓	✓
9164-0422		SPEAKER	no	✓	✓
F1030-00016		PAW EJECT SPRING	no	✓	✓
F1030-00026		PIVOT DOOR SPRING	no	✓	✓
F1030-00029		SPRING EJECT LATCH	no	✓	✓
F1030-40018		RUBBER FEET-SCREW COVER	yes	✓	✓
F1030-80063		FFC-THETA	no	✓	✓
F1052-40007		DOOR - PIVOT LEFT	no	✓	✓
F1052-60005		CARD TRAY ASSY	yes	✓	✓
F1065-40019		IR LENS	no	✓	✓
F1065-80010		LBL-CONTRAST CSTN	yes	✓	
F1065-90042		BUSINESS CARD	yes	✓	✓
F1067-20004		I/O INSULATOR	no	✓	
F1067-60012		MICROPHONE ASSY	no	✓	✓
F1067-80008		LBL-CONTRAST TFT	yes	✓	✓
F1170-00009		PAW SHIELD	no	✓	✓
F1170-40005		PAW EJECT BUTTON	no	✓	✓
F1170-40006		BATTERY LATCH	yes	✓	✓
F1170-40007		RAM DOOR	yes	✓	✓
F1170-40008		PAW EJECT ARM	no	✓	✓
F1170-40009		RUBBER FEET - FALSE FOOT	yes	✓	✓
F1170-40010		I/O DOOR	yes	✓	✓
F1170-40018		RUBBER HDD HOLE PLUG	yes	✓	✓
F1170-40025		BUSHING	no	✓	✓
F1170-40030		EJECT BUTTON LEFT	no	✓	✓
F1170-60901	F1170-69001	SVC DISPLAY TFT	no	✓	
F1170-60902	F1170-69002	SVC DISPLAY CSTN	no	✓	

PART #	EXCHANGE PART #	DESCRIPTION	CUSTOMER REPLACEABLE	F1171 - F1175	F1360
F1170-60903		SVC KYBRD TOPCASE	no	✓	
F1170-60904		SVC KYBRD BTMCASE	no	✓	
F1170-60906	F1170-69006	SVC LOGIC PCA 16MB	no	✓	
F1170-60909		SVC PAW ACTIVE	no	✓	✓
F1170-60919	F1170-69019	SVC CPU 100MHZ	no	✓	
F1170-60920	F1170-69020	SVC CPU 133MHZ	no	✓	
F1170-80020		REGULATORY LABEL	no	✓	
F1170-80023		OL FN ICON WIN95	yes	✓	✓
F1170-80036		OL FN ICON WFW3.11	yes	✓	✓
F1360-20004		INSULATOR-KYBD SPRT	no		✓
F1360-20006		DISK - HEAT XFER	no		✓
F1360-20007		INSULATOR - CPU	no	✓	✓
F1360-40004		GROMMET	no	✓	✓
F1360-40005		EJECT ARM LEFT	no	✓	✓
F1360-60901	F1360-69001	SVC DISPLAY TFT	no		✓
F1360-60903		SVC KYBRD TOPCASE	no		✓
F1360-60904		SVC KYBRD BTMCASE	no		✓
F1360-60906	F1360-69006	SVC LOGIC PCA 16MB	no		✓
F1360-60911	F1360-69011	SVC CPU 166MHZ	no		✓
F1360-80029		REGULATORY LABEL	no		✓
ACCESSORIES					
0950-3043		AC/DC ADAPTER 40W	yes	✓	✓
0950-3083		FLOPPY DRIVE	yes	✓	✓
0950-3084	F1191-69001	810MB HDD	yes	✓	
0950-3133	F1170-69012	1.44GB HDD	yes	✓	
0950-3163		SVC CD-ROM (8X)	yes	✓	✓
0950-3193	F1360-69012	2.1GB HDD	yes		✓
5061-4390		PAW MECHANICAL	yes	✓	✓
F1063-80003		EXTERNAL BATTERY CHARGER	yes	✓	✓
F1064-60901		AUTO ADAPTOR	yes	✓	✓
F1119-60001	F1119-69001	SVC 64MB RAM	yes	✓	✓
F1121-80002		LI-ION BATTERY	yes	✓	✓
F1140-60901		AC/DC ADAPTOR 60W	yes	✓	✓
F1167-60001	F1167-69001	SVC 8MB RAM	yes	✓	✓
F1168-60001	F1168-69001	SVC 16MB RAM	yes	✓	✓
F1169-60001	F1169-69001	SVC 32MB RAM	yes	✓	✓
F1177-60901	F1177-69001	SVC DOCKING SYSTEM	yes	✓	✓
F1182-80001		SCSI CABLE	yes	✓	✓
F1196-80001		CD-ROM POWER CABLE	yes	✓	✓
POWER CORDS					
8120-2104		PWR CORD SWISS	yes	✓	✓
8120-2956		PWR CORD DANISH	yes	✓	✓
8120-4211		PWR CORD S. AFRICA	yes	✓	✓
8120-5342		PWR CORD JAPAN	yes	✓	✓

PART #	EXCHANGE PART #	DESCRIPTION	CUSTOMER REPLACEABLE	F1171 - F1175	F1360
8120-6260		PWR CORD US	yes	✓	✓
8120-6261		PWR CORD UK	yes	✓	✓
8120-6262		PWR CORD EUROPE	yes	✓	✓
8120-6346		PWR CORD AUSTRALIA	yes	✓	✓
MANUALS					
5965-0204		SUPP BKLT US	yes	✓	✓
5965-0205		SUPP BKLT GERMAN	yes	✓	✓
5965-0206		SUPP BKLT FRENCH	yes	✓	✓
5965-0207		SUPP BKLT SPANISH	yes	✓	✓
5965-0208		SUPP BKLT ITALIAN	yes	✓	✓
5965-0241		SUPP BKLT-MULTILANG	yes		✓
5965-0242		ADDEND. SHEET - MULTI	yes	✓	✓
F1170-90001		GET START ENGLISH	yes	✓	
F1170-90002		GET START E,G,F,S,I,P	yes	✓	
F1170-90003		GET START E,D,S,F,N	yes	✓	
F1170-90004		GET START JAPAN	yes	✓	
F1170-90005		GET START KOREA	yes	✓	
F1170-90012		USERS GUIDE KOREA	yes	✓	
F1170-90014		USERS GUIDE JAPAN	yes	✓	
F1170-90049		OB800 FAMILIARIZATION GUIDE	yes	✓	
F1170-90051		OB LIGHTWEIGHT GROUP TRAINING KIT	yes	✓	✓
F1360-90001		SETUP GUIDE ENGLISH	yes		✓
F1360-90002		SETUP GUIDE E,G,F,S,I	yes		✓
F1360-90003		SETUP GUIDE E,D,S,F,N	yes		✓
F1360-90049		SERVICE MANUAL-OB800	yes		✓
KEYBOARDS					
F1170-80005		KYBRD US	no	✓	✓
F1170-80006		KYBRD GERMAN	no	✓	✓
F1170-80007		KYBRD SPANISH	no	✓	✓
F1170-80008		KYBRD FRENCH	no	✓	✓
F1170-80009		KYBRD KOREA	no	✓	✓
F1170-80010		KYBRD UK	no	✓	✓
F1170-80011		KYBRD SWEDISH	no	✓	✓
F1170-80012		KYBRD SWISS	no	✓	✓
F1170-80013		KYBRD DANISH	no	✓	✓
F1170-80014		KYBRD NORDIC	no	✓	✓
F1170-80015		KYBRD ITALIAN	no	✓	✓
F1170-80016		KYBRD JAPAN	no	✓	✓
F1170-80037		KYBRD FRENCH CANADIAN	no	✓	✓
RECOVERY KITS					
F1170-60911		RECOVERY KIT - ENGLISH	yes	✓	
F1170-60912		RECOVERY KIT -	yes	✓	

PART #	EXCHANGE PART #	DESCRIPTION	CUSTOMER REPLACEABLE	F1171 - F1175	F1360
		FRENCH			
F1170-60913		RECOVERY KIT - ITALIAN	yes	✓	
F1170-60914		RECOVERY KIT - GERMAN	yes	✓	
F1170-60915		RECOVERY KIT - SPANISH	yes	✓	
F1170-60918		RECOVERY KIT - SWEDISH	yes	✓	
F1360-60912		RECOVERY KIT - ENGLISH	yes		✓
F1360-60913		RECOVERY KIT - FRENCH	yes		✓
F1360-60914		RECOVERY KIT - ITALIAN	yes		✓
F1360-60915		RECOVERY KIT - GERMAN	yes		✓
F1360-60916		RECOVERY KIT - SPANISH	yes		✓
F1360-60917		RECOVERY KIT - SWEDISH	yes		✓

HP Part Number
F1360-90049