COMPAQ

Maintenance and Service Guide
Compaq Evo Notebook N1000 Series
and Compaq Presario 1500 Series
Mobile PC

Document Part Number: 279372-001

July 2002

This guide is a troubleshooting reference used for maintaining
and servicing the notebook. It provides comprehensive
information on identifying computer features, components, and
spare parts, troubleshooting computer problems, and performing
computer disassembly procedures.

Maintenance and Service Guide
First Edition July 2002
Document Part Number: 279372-001

Contents

1 Product Description

2 Troubleshooting

6 Specifications

A Connector Pin Assignments

B Power Cord Set Requirements

C Screw Listing

Index

1

Product Description

The Compaq Evo Notebook N1000 and Presario 1500 Series of Personal Computers offer advanced modularity, Intel Mobile Pentium 4 and Intel Celeron processors with SpeedStep technology and 64-bit architecture, industry-leading Accelerated Graphics Port (AGP) implementation, and extensive multimedia support.

Figure 1-1. Compaq Evo Notebook N1000 and Presario 1500

1.1 Models

Computer models are shown in Tables 1-1 through 1-3.

Table 1-1
Compaq Evo Notebook N1000 and Presario 1500
Model Naming Conventions

Key									
N1000	P	220	P5	40	V	C	51	O	XXXXXX-XXX
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**

Key	Description	Options	
1	Brand/Series designator	N = Evo Notebook P = Presario	1000 = 1000 Series 1500 = 1500 Series
2	Processor type	P = Intel Pentium 4	C = Intel Celeron
3	Processor speed	220 = 2.2 GHz 200 = 2.0 GHz 180 = 1.8 GHz 170 = 1.7 GHz	160 = 1.6 GHz 150 = 1.5 GHz 140 = 1.4 GHz
4	Display type/ size/resolution	P = SXGA+ (1400 × 1050) X = XGA (1024 × 768)	5 = 15.x inch 4 = 14.x inch
5	Hard drive size	60 = 60 GB 40 = 40 GB	30 = 30 GB 20 = 20 GB
6	Optical drive designator	V = DVD-ROM drive W = DVD-RW drive	D = CD-ROM drive R = CD-RW drive
7	Integrated communication	M = Modem 0 = None	C = Modem/NIC combination card
8	RAM	51 = 512 MB 38 = 384 MB	25 = 256 MB 12 = 128 MB
9	Operating system	2 = Windows 2000	O = Windows XP Pro E = Windows XP Home
10	SKU#		

Table 1-2
Compaq Evo Notebook N1000 Models

The following Evo Notebook N1000 models use config. code **KQDZ** and feature:

- Dual Stick pointing device (TouchPad and pointing stick)
- 8-cell, 4.0-Ah lithium ion (Li ion) battery pack
- 3-year warranty
- diskette drive
- 32 MB of discrete video memory

N1000	P	180	P5	40	W	C	25	O	
Australia				470038-699					
N1000	P	180	P5	40	W	C	25	2	
Australia				470038-700					
N1000	P	180	X4	40	W	C	25	O	
Australia				470038-697					
N1000	P	180	X4	40	W	C	25	2	
Australia				470038-698					
N1000	P	170	X5	30	W	C	25	O	
Asia Pacific Australia French Canada				470038-336 470038-333 470039-985		Korea United States		470038-341 470037-782	
N1000	P	170	X5	30	W	C	25	2	
Asia Pacific Australia French Canada				470038-335 470038-334 470039-988		Korea United States		470038-342 470037-783	
N1000	P	170	X4	30	V	C	25	O	
Australia				470038-695					
N1000	P	170	X4	30	V	C	25	2	
Australia				470038-696					

Table 1-2
Compaq Evo Notebook N1000 Models *(Continued)*

The following Evo Notebook N1000 models use config. code **KT2Z** and feature:
- TouchPad pointing device
- 8-cell, 4.0-Ah Li ion battery pack
- 2-year warranty
- diskette drive
- 32 MB of discrete video memory

N1000	P	220	P5	30	W	C	25	O	
Germany				470036-634					
N1000	P	220	P5	30	W	C	25	2	
Germany				470036-635					
N1000	P	200	X4	20	V	C	25	O	
Germany				470036-632					
N1000	P	200	X5	20	V	C	25	2	
Germany				470036-633					

Table 1-2
Compaq Evo Notebook N1000 Models *(Continued)*

The following Evo Notebook N1000 models use config. code **KQFZ** and feature:

■ TouchPad
■ 8-cell, 4.0-Ah Li ion battery pack
■ 1-year warranty
■ diskette drive
■ 32 MB of discrete video memory

N1000	P	220	P5	40	W	C	25	O	
Japan				470036-636		Japan (English)			470036-639

N1000	P	220	P5	30	W	C	25	O	
Belgium				470036-696		Portugal			470036-739
Czech Republic				470036-700		Russia			470036-743
Denmark				470036-704		Saudi Arabia			470036-692
France				470036-707		Slovenia			470036-748
French Canada				470038-312		Spain			470036-751
Greece/Poland				470036-712		Sweden/Finland			470036-756
Hungary				470036-715		Switzerland			470036-759
Israel				470036-720		Turkey			470036-764
Italy				470036-723		United Kingdom			470036-767
The Netherlands				470036-730		United States			470038-311
Norway				470036-733					

N1000	P	220	P5	30	W	C	25	2	
Belgium				470036-697		Portugal			470036-741
Czech Republic				470036-701		Russia			470036-742
Denmark				470036-705		Saudi Arabia			470036-693
France				470036-706		Slovenia			470036-749
Greece/Poland				470036-713		Spain			470036-750
Hungary				470036-714		Sweden/Finland			470036-757
Israel				470036-721		Switzerland			470036-758
Italy				470036-722		Turkey			470036-765
The Netherlands				470036-731		United Kingdom			470036-766
Norway				470036-732					

N1000	P	220	P5	30	V	C	25	O	
Taiwan				470038-800					

Table 1-2
Compaq Evo Notebook N1000 Models *(Continued)*

N1000	P	220	P5	30	V	C	25	2	
Taiwan				470038-801					
N1000	P	220	X5	30	W	C	25	O	
Latin America				470037-832		Latin America (NAFTA)			470037-833
N1000	P	200	P5	30	V	C	25	O	
Hong Kong				470038-807					
N1000	P	200	X5	30	W	C	25	O	
Asia Pacific Australia French Canada Korea Latin America				470037-828 470037-824 470036-619 470037-829 470036-616		Latin America (NAFTA) Thailand United States			470036-617 470037-825 470036-618
N1000	P	200	X5	30	W	C	25	2	
French Canada Latin America				4770036-620 4770036-622		Latin America (NAFTA) United States			4770036-623 4770036-621
N1000	P	200	X5	20	W	C	25	O	
Latin America				4770037-831		Latin America (NAFTA)			470037-834
N1000	P	200	X5	20	D	C	12	O	
Asia Pacific Australia Japan Japan (English)				470037-957 470037-953 470036-638 470036-641		Korea Taiwan Thailand			470037-960 470038-782 470037-956
N1000	P	200	X5	20	D	C	12	2	
Japan Japan (English)				470036-637 470036-640		Taiwan			470038-783

Table 1-2
Compaq Evo Notebook N1000 Models *(Continued)*

N1000	P	200	X4	30	W	C	25	O	
Brazil				470038-304		Latin America			470038-305
Latin America				470038-299		(NAFTA)			
						United States			470038-310

N1000	P	200	X4	30	V	C	25	O	
People's Republic of China									470038-791

N1000	P	200	X4	20	V	C	25	O	
Asia Pacific				470037-837		The Netherlands			470036-727
Australia				470037-835		Norway			470036-735
Belgium				470036-694		Portugal			470036-736
Czech Republic				470036-698		Russia			470036-745
Denmark				470036-702		Saudi Arabia			470036-689
France				470036-709		Slovenia			470036-746
French Canada				470036-629		Spain			470036-753
Greece/Poland				470036-710		Sweden/Finland			470036-754
Hungary				470036-717		Switzerland			470036-761
Israel				470036-718		Taiwan			470038-803
Italy				470036-725		Thailand			470037-836
Korea				470037-838		Turkey			470036-762
Latin America				470036-625		United Kingdom			470036-769
Latin America (NAFTA)				470036-624		United States			470036-628

Table 1-2
Compaq Evo Notebook N1000 Models *(Continued)*

N1000	P	200	X4	20	V	C	25	2	

Belgium	470036-695		Norway	470036-734
Czech Republic	470036-699		Portugal	470036-737
Denmark	470036-703		Russia	470036-744
France	470036-708		Saudi Arabia	470036-690
French Canada	470036-630		Slovenia	470036-747
Greece/Poland	470036-711		Spain	470036-752
Hungary	470036-716		Sweden/Finland	470036-755
Israel	470036-719		Switzerland	470036-760
Italy	470036-724		Taiwan	470038-802
Latin America	470036-626		Turkey	470036-763
Latin America (NAFTA)	470036-627		United Kingdom	470036-768
			United States	470036-631
The Netherlands	470036-728			

N1000	P	200	X4	20	D	C	12	O	

Hong Kong	470038-804	People's Republic of China	470038-790

N1000	P	160	X4	30	W	C	25	O	

Brazil	470038-303	Latin America (NAFTA)	470038-306
Latin America	470038-300	United States	470038-309

N1000	P	150	X4	20	V	C	25	O	

Brazil	470038-302	Latin America (NAFTA)	470038-307
Latin America	470038-301	United States	470038-308

N1000	C	150	X4	20	V	C	25	O	

Asia Pacific	470037-827	Korea	470037-830
Australia	470037-823	Thailand	470037-826
French Canada	470037-787	United States	470037-785

N1000	C	150	X4	20	V	C	25	2	

French Canada	4770037-786	United States	470037-784

Table 1-2
Compaq Evo Notebook N1000 Models *(Continued)*

N1000	C	150	X4	20	D	C	12	O	
Asia Pacific 470037-958 Australia 470037-954 Hong Kong 470038-805 Japan 470037-949 Japan (English) 470037-951						Korea 470037-959 Taiwan 470038-793 Thailand 470037-955 United States 470041-410			
N1000	C	150	X4	20	D	C	12	2	
Japan 470037-950						Japan (English) 470037-952			
N1000	C	150	X4	20	D	C	12	E	
Japan 470038-313						Japan (English) 470038-314			
N1000	C	140	X4	20	D	C	12	E	
United States (NAFTA) 470040-456									

Table 1-3
Compaq Presario 1500 Models

The following Presario 1500 notebook models use config. code **KT2Z** and feature:

■ TouchPad
■ 8-cell, 4.0-Ah Li ion battery pack
■ 2-year warranty
■ diskette drive
■ 32 MB of discrete video memory

P1510	P	220	X5	30	W	C	25	E	

Belgium	470036-664	Norway	470036-671
Denmark	470036-665	Portugal	470038-279
Germany	470036-667	Spain	470038-284
Italy	470036-599	Sweden/Finland	470036-673
The Netherlands	470036-670		

P1505	P	200	X4	20	W	C	25	E	

Belgium	470036-663	Norway	470036-672
Denmark	470036-597	Portugal	470038-280
Germany	470036-666	Spain	470038-283
Italy	470036-668	Sweden/Finland	470036-598
The Netherlands	470036-669		

Table 1-3
Compaq Presario 1500 Models *(Continued)*

The following Presario 1500 notebook models use config. code **KQFZ** and feature:

■ TouchPad
■ 8-cell, 4.0-Ah Li ion battery pack
■ 1-year warranty
■ diskette drive
■ 32 MB of discrete video memory

P1510	P	220	P5	40	W	C	51	E	
United States				470036-657					

P1510	P	220	X5	30	W	C	25	E	
Czech Republic				470036-772		Russia			470036-786
Europe International				470036-775		Saudi Arabia			470036-771
France				470036-776		Slovenia			470036-787
Greece/Poland				470036-778		Switzerland			470036-596
Hungary				470036-779		Turkey			470036-795
Israel				470036-782		United Kingdom			470036-796

P1502	P	220	X5	30	W	C	51	E	
Latin America				470036-600		Latin America (NAFTA)			470036-799

P1500	P	220	X5	30	W	C	25	E	
Asia Pacific				470036-808		Korea			470036-816
Australia				470036-800		Thailand			470038-324

Table 1-3
Compaq Presario 1500 Models *(Continued)*

P1510	P	200	P5	40	W	C	51	E	
French Canada			470036-593			Canada			470037-841
P1501	P	200	X5	30	W	C	25	E	
Korea			470036-815						
P1507	P	200	X5	30	V	C	25	E	
India			470038-332						
P1505	P	200	X5	20	W	C	25	E	
Czech Republic Europe International France Greece/Poland Hungary Israel			470036-773 470036-774 470036-777 470036-594 470036-780 470036-781			Russia Saudi Arabia Slovenia Switzerland Turkey United Kingdom			470036-785 470036-770 470036-788 470036-792 470036-794 470036-797
P1504	P	200	X5	20	V	C	25	E	
Korea			470037-904						
P1506	P	200	X4	30	V	C	12	E	
India			470038-327						
P1501	P	200	X4	20	W	C	25	E	
Latin America			470036-601			Latin America (NAFTA)			470036-602
P1500	P	200	X4	20	W	C	25	E	
Taiwan			470038-812						

Table 1-3
Compaq Presario 1500 Models *(Continued)*

P1500	P	200	X4	20	W	C	25	E	
Australia				470036-818					
P1503	P	200	X4	20	D	C	25	E	
Asia Pacific Korea			470036-805 470067-813			Thailand		470036-804	
P1505	P	200	X4	20	D	C	12	E	
India				470038-326					
P1501	P	160	P5	30	W	C	25	E	
United States				470037-317					
P1505	P	160	X5	30	W	C	25	E	
United States				470037-316					
P1500	P	160	X4	20	V	C	25	E	
Hong Kong				470038-810					
P1500	P	160	X4	20	V	C	12	E	
People's Republic of China				470037-319					
P1500	P	150	X4	30	D	C	12	E	
Taiwan				470037-320					
P1500	C	150	X4	20	W	C	25	E	
United States				470038-813					
P1500	C	150	X4	20	D	C	12	E	
Taiwan				470038-811					

1.2 Features

The notebook has the following features:

■ The following processors are available, varying by notebook model:

❏ The Evo Notebook N1000 features an Intel Mobile Pentium 4 2.2-, 2.0-, 1.8-, 1.7-, 1.6-, or 1.5-GHz processor with 512-KB integrated L2 cache, or an Intel Celeron 1.5- or 1.4-GHz processor with 256-KB integrated L2 cache.

❏ The Presario 1500 features an Intel Mobile Pentium 4 2.2-, 2.0-, 1.6-, or 1.5-GHz processor with 512-KB integrated L2 cache, or an Intel Celeron 1.5-GHz processor with 256-KB integrated L2 cache.

■ ATI P7 graphics accelerator with 32 MB of shared Synchronous DRAM (SDRAM) and 4X AGP graphics card

■ 128-MB high-performance SDRAM, expandable to 1.0 GB

■ Microsoft Windows 2000, Windows XP Home, or Windows XP Professional, varying by computer model

■ 15.0-inch SXGA+ (1400 × 1050) or XGA (1024 × 768), or 14.1-inch XGA (1024 × 768), TFT display with over 16.7 million colors, varying by computer model

■ Full-size Windows 98 keyboard with:

❏ TouchPad pointing device (Evo Notebook N1000 and Presario 1500 models)

❏ Dual Stick (TouchPad and point stick; Evo Notebook N1000 models only)

■ Network interface card (NIC) integrated on the system board, with a mini PCI V.92 modem

■ Integrated wireless support of 802.11b and Bluetooth devices through MultiPort

- Support for one Type I or II PC Card slot with support for both 32-bit CardBus and 16-bit PC Cards

- External 65 W AC adapter with power cord

- 8-cell Li ion battery pack

- 40-, 30-, or 20-GB high-capacity hard drive, varying by computer model

- 1.44-MB diskette drive

- Support for the following drives through the fixed optical drive:

  - 24X Max CD-ROM drive
  - 16X Max CD-RW drive
  - 8X Max DVD-ROM drive
  - 8X Max DVD-ROM/CD-RW combination drive

- Connectors for:

  - RJ-45 network
  - RJ-11 modem
  - Universal serial bus
  - Parallel devices
  - External monitor
  - AC power
  - Stereo line out/headphone
  - Mono microphone
  - S-video
  - Port replicator
  - Infrared
  - 1394 digital input

- JBL Pro stereo speakers with bass reflex

- Dolby Digital certified sound

1.3 Clearing a Password

If the notebook you are servicing has an unknown password, follow these steps to clear the password. These steps also clear CMOS:

1. Prepare the computer for disassembly (refer to Section 5.3, "Preparing the Computer for Disassembly," for more information).

2. Remove the RTC battery (refer to Section 5.7, "Disk Cell RTC Battery").

3. Wait approximately five minutes.

4. Replace the RTC battery and reassemble the computer.

5. Connect AC power to the computer. Do **not** reinsert any battery packs at this time.

6. Turn on the computer.

All passwords and all CMOS settings have been cleared.

1.4 Power Management

The computer comes with power management features that extend battery operating time and conserve power. The computer supports the following power management features:

■ Standby

■ Hibernation

■ Setting customization by the user

■ Hotkeys for setting level of performance

■ Smart battery that provides an accurate battery power gauge

■ Battery calibration

■ Lid switch suspend/resume

■ Power/Suspend button

■ Advanced Configuration and Power Management (ACP) compliance

1.5 Computer External Components

The external components on the front and right side of the computer are shown in Figure 1-2 and described in Table 1-4.

Figure 1-2. Front and Right Side Components

Table 1-4
Front and Right Side Components

Item	Component	Function
1	Stereo speakers (2)	Produce stereo sound.
2	Power/Standby light	On: Power is turned on.
		Off: Power is turned off.
		Blinking: Computer is in Standby mode.

Table 1-4
Front and Right Side Components *(Continued)*

Item	Component	Function
3	Display release latch	Opens the computer.
4	Battery light	On: A battery pack is charging.
		Blinking: A battery pack that is the only available power source has reached a low-battery condition.
5	Battery bay	Accepts an 8-cell Li ion battery pack.
6	Optical drive bay	Accepts a CD-ROM, CD-RW, DVD-ROM, or DVD/CD-RW combination drive.
7	Infrared port	Provides wireless communication between the computer and another infrared-equipped device using an infrared beam.
8	1394 jack	Connects IEEE 1394-compliant products, such as digital camcorders, video editing equipment, VCRs, cameras, and audio players. A 1394 firewire cable is required for use with this jack.

The computer rear panel and left side components are shown in Figure 1-3 and described in Table 1-5.
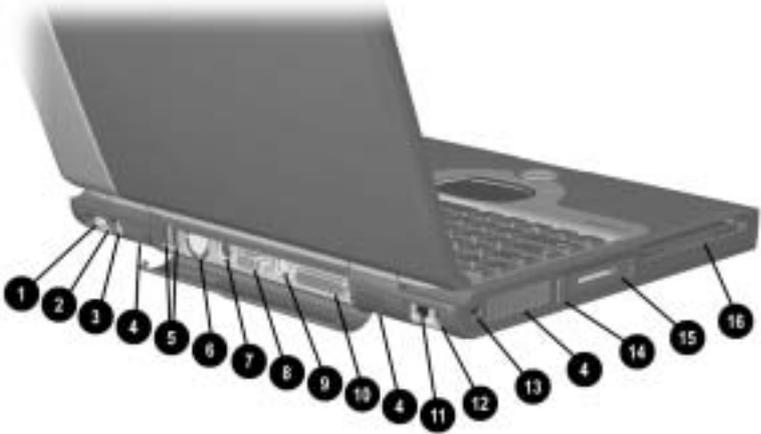
Figure 1-3. Rear Panel and Left Side Components

Table 1-5
Rear Panel and Left Side Components

Item	Component	Function
1	Mono microphone jack	Connects a mono microphone, disabling the built-in microphone.
2	Stereo speaker/ headphone jack	Connects stereo speakers, headphones, headset, or television audio.
3	DC power jack	Connects any one of the following:
		■ AC adapter
		■ Optional automobile power adapter/charger
		■ Optional aircraft power adapter

Table 1-5
Rear Panel and Left Side Components *(Continued)*

Item	Component	Function
4	Vents	Allow airflow to cool internal components.
	△ **CAUTION:** To prevent damage, the computer shuts down if an overheating condition occurs. Do not block the cooling vent. Avoid placing the computer on a blanket, rug, or other flexible surface that may cover the vent area.	
5	USB connectors (2)	Connect USB devices.
6	Fan	Provides airflow to cool internal components.
7	S-Video connector	Connects a television, VCR, camcorder, or overhead projector.
8	External monitor connector	Connects an external monitor or overhead projector.
9	External keyboard/mouse connector	Connects an optional full-sized keyboard or mouse. An optional splitter/adapter allows both an external keyboard and mouse to be used at the same time.
10	Parallel connector	Connects a parallel device.
11	RJ-45 network jack	Connects the network cable. A network cable is not included with the computer.
12	RJ-11 modem jack	Connects the modem cable to an internal modem. A modem cable is included with internal modem models.
13	Security cable slot	Attaches an optional security cable to the computer.
14	PC Card eject button	Ejects a PC Card from the PC Card slot.
15	PC Card slot	Supports a 32-bit (CardBus) or 16-bit PC Card.
16	Diskette drive	Accepts diskettes.

The computer keyboard components are shown in Figure 1-4 and described in Table 1-6.
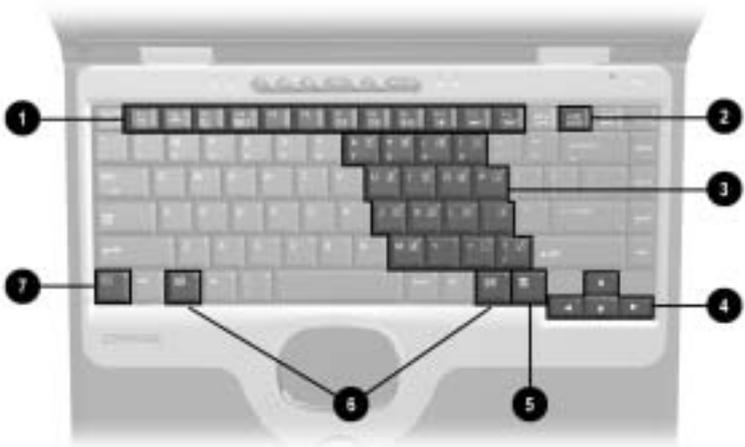
Figure 1-4. Keyboard Components

Table 1-6
Keyboard Components

Item	Component	Function
1	**F1** through **F12** function keys	Perform preset functions.
2	**Num lock** key	Turns on the numeric lock function.
		On: Num lock is on and the embedded numeric keypad is enabled.

Table 1-6
Keyboard Components *(Continued)*

Item	Component	Function
3	Embedded numeric keypad	Converts keys to numeric keypad.
4	Cursor control keys	Move the cursor around the screen.
5	Windows application key	Displays a menu when using a Microsoft application. The menu is the same one that is displayed by pressing the right mouse button.
6	Windows logo keys	Display the Windows Start menu.
7	**Fn** key	Used with hotkeys to perform preset hotkey functions.

The computer top components are shown in Figure 1-5 and described in Table 1-7.
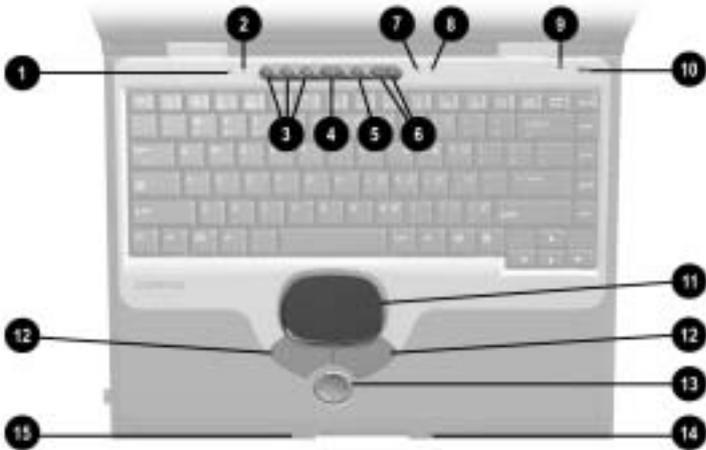
Figure 1-5. Top Components

Table 1-7
Top Components

Item	Component	Function
1	Power light	On: Power is turned on.
		Blinking: Computer is in Standby. The power light also blinks if a battery pack that is the only available power source reaches a low-battery condition.
2	Num lock light	On: Num lock is on and the embedded numeric keypad is enabled.
3	Easy Access Buttons (3)	Provide quick access to the Internet. Refer to the Hardware Guide that ships with the computer for information about these buttons.

Table 1-7
Top Components *(Continued)*

Item	Component	Function
4	Power button	Turns on the computer. Use the operating system Shut Down command to turn off the computer.
5	Digital audio button	Launches Windows Media Player to play MP3 music.
6	Volume control buttons	Adjust the volume of the stereo speakers.
7	Caps lock light	On: Caps lock is on.
8	Drive indicator light	Turns on when the hard drive, CD-, or DVD-ROM drive is accessed.
9	Display lid switch	Turns off the computer display if the computer is closed while on.
10	Microphone	Allows for audio input.
11	TouchPad	Moves the mouse cursor, selects, and activates.
12	TouchPad buttons	Function like the left and right mouse buttons on an external mouse.
13	EasyScroll	Scrolls the screen left, right, up, and down.
14	Battery power light	On: A battery pack is charging. Blinking: A battery pack that is the only available power source has reached a low-battery condition.
15	Power/Standby light	On: Power is turned on. Off: Power is turned off. Blinking: Computer is in Standby mode.

The external components on the bottom of the computer are shown in Figure 1-6 and described in Table 1-8.
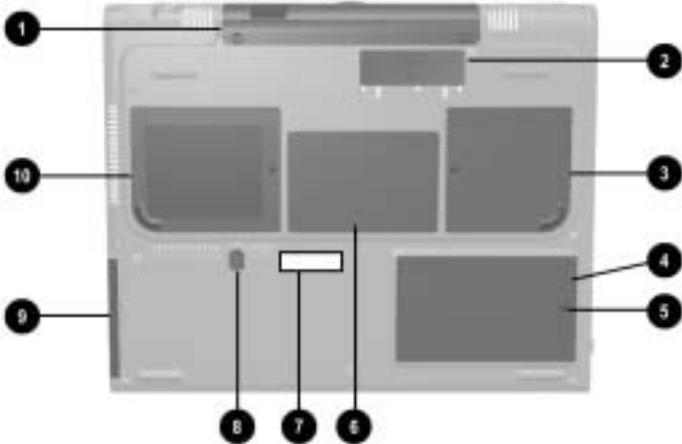
Figure 1-6. Bottom Components

Table 1-8
Bottom Components

Item	Component	Function
1	Connector cover	Protects the parallel, external monitor, external keyboard/mouse, and USB connectors.
2	Docking connector	Connects the computer to an optional port replicator.

Table 1-8
Bottom Components *(Continued)*

Item	Component	Function
3	Mini PCI communications compartment	Contains the mini PCI modem card.
4	Hard drive bay	Supports the primary hard drive. The hard drive is secured to the computer by one screw.
5	Hard drive retention screw	Secures the hard drive to the computer.
6	Certificate of Authenticity label	Contains the Product Key, which may need to be entered before using some Windows operating systems.
7	Serial number	Identifies the computer; needed when you call Compaq customer support.
8	Battery pack release switch	Releases the battery pack from the battery compartment.
9	Battery bay	Accepts an 8-cell Li ion battery pack.
10	Memory expansion compartment	Covers the memory expansion compartment that contains two memory expansion slots for memory expansion boards.

1.6 Design Overview

This section presents a design overview of key parts and features of the computer. Refer to Chapter 3, "Illustrated Parts Catalog," to identify replacement parts and Chapter 5, "Removal and Replacement Procedures," for disassembly steps. The system board provides the following device connections:

■ Memory expansion board

■ Hard drive

■ Display

■ Keyboard/TouchPad or pointing stick

■ Audio

■ Intel Mobile Pentium 4 processors with SpeedStep technology or Intel Celeron processors

■ Fan

■ PC Card

■ Modem or modem/NIC

The computer uses an electrical fan for ventilation. The fan is controlled by a temperature sensor and is designed to turn on automatically when high-temperature conditions exist. These conditions are affected by high external temperatures, system power consumption, power management/battery conservation configurations, battery fast charging, and software applications. Exhaust air is displaced through the ventilation grill located on the left side of the computer.

$\triangle$ **CAUTION:** To properly ventilate the computer, allow at least a 7.6-cm (3-inch) clearance on the left and right sides of the computer.

2

Troubleshooting

⚠ **WARNING:** Only authorized technicians trained by Compaq should repair this equipment. All troubleshooting and repair procedures are detailed to allow only subassembly/module level repair. Because of the complexity of the individual boards and subassemblies, no one should attempt to make repairs at the component level or make modifications to any printed wiring board. Improper repairs can create a safety hazard. Any indication of component replacement or printed wiring board modification may void any warranty or exchange allowances.

2.1 Computer Setup and Diagnostics Utilities

Selecting Computer Setup or Compaq Diagnostics

The computer features two Compaq system management utilities:

■ **Computer Setup**—A system information and customization utility that can be used even when your operating system is not working or will not load. This utility includes settings that are not available in Windows.

■ **Compaq Diagnostics**—A system information and diagnostic utility that is used within your Windows operating system. Use this utility whenever possible to:

❏ Display system information.

❏ Test system components.

❏ Troubleshoot a device configuration problem in Windows 2000, Windows XP Professional, or Windows XP Home.

Using Computer Setup

Information and settings in Computer Setup are accessed from the File, Security, or Advanced menus:

1. Turn on or restart the computer. Press **F10** while the F10 = ROM Based Setup message is displayed in the lower-left corner of the screen.

   ❏ To change the language, press **F2.**

   ❏ To view navigation information, press **F1.**

   ❏ To return to the Computer Setup menu, press **esc.**

2. Select the File, Security, or Advanced menu.

3. To close Computer Setup and restart the computer:

   ❏ Select File > Save Changes and Exit and press **enter.**

   or

   ❏ Select File > Ignore Changes and Exit and press **enter.**

4. When you are prompted to confirm your action, press **F10.**

Selecting from the File Menu

Table 2-1
File Menu

Select	To Do This
System Information	■ View identification information about the computer, a docking base, and any battery packs in the system. ■ View specification information about the processor, memory and cache size, and system ROM.
Save to Floppy	Save system configuration settings to a diskette.
Restore from Floppy	Restore system configuration settings from a diskette.
Restore Defaults	Replace configuration settings in Computer Setup with factory default settings. (Identification information is retained.)
Ignore Changes and Exit	Cancel changes entered during the current session, then exit and restart the computer.
Save Changes and Exit	Save changes entered during the current session, then exit and restart the computer.

Selecting from the Security Menu

Table 2-2
Security Menu

Select	To Do This
Setup Password	Enter, change, or delete a setup password. (The setup password is called an administrator password in Compaq Computer Security, a program accessed from the Windows Control Panel.)
Power-on Password	Enter, change, or delete a power-on password.
DriveLock Passwords	Enable/disable DriveLock; change a DriveLock User or Master password.
	✎ Drive Lock Settings are accessible only when you enter Computer Setup by turning on (not restarting) the computer.
Password Options Password options can be selected only when a power-on password has been set.	Enable/disable: ■ QuickLock ■ QuickLock on Standby ■ QuickBlank ✎ To enable QuickLock on Standby or QuickBlank, you must first enable QuickLock.
Device Security	Enable/disable: ■ Ports or diskette drives* ■ Diskette write* ■ CD-ROM or diskette startup ✎ Settings for a DVD-ROM can be entered in the CD-ROM field.
System IDs	Enter identification numbers for the computer, a docking base, and all battery packs in the system.

*Not applicable to SuperDisk LS-120 drives.

Selecting from the Advanced Menu

Table 2-3
Advanced Menu

Select	To Do This
Language (or press **F2**)	Change the Computer Setup language.
Boot Options	Enable/disable:
	■ QuickBoot, which starts the computer more quickly by eliminating some startup tests. (If you suspect a memory failure and want to test memory automatically during startup, disable QuickBoot.)
	■ MultiBoot, which sets a startup sequence that can include most bootable devices and media in the system.
Device Options	■ Enable/disable the embedded numeric keypad at startup.
	■ Enable/disable multiple standard pointing devices at startup. (To set the computer to support only a single, usually nonstandard, pointing device at startup, select Disable.)
	■ Enable/disable USB legacy support for a USB keyboard. (When USB legacy support is enabled, the keyboard works even when a Windows operating system is not loaded.)
	■ Set an optional external monitor or overhead projector connected to a video card in a docking base as the primary device. (When the computer display is set as secondary, the computer must be shut down before undocking from a docking base.)

Table 2-3
Advanced Menu *(Continued)*

Select	To Do This
Device Options *(continued)*	■ Change the parallel port mode from Enhanced Parallel Port (EPP, the default setting) to standard, bidirectional, EPP or Enhanced Capabilities Port (ECP).
	■ Set video-out mode to NTSC (default), PAL, NTSC-J, or PAL-M.*
	■ Enable/disable all settings in the SpeedStep window. (When Disable is selected, the computer runs in Battery Optimized mode.)
	■ Specify how the computer recognizes multiple identical docking bases that are identically equipped. (Select Disable to recognize the docking bases as a single docking base; select Enable to recognize the docking bases individually, by serial number.)
	■ Enable/disable the reporting of the processor serial number by the processor to the software.
HDD Self Test Options	Run a quick comprehensive self test on hard drives in the system that support the test features.

* Video modes vary even within regions. However, NTSC is common in North America; PAL, in Europe, Africa, and the Middle East; NTSC-J, in Japan; and PAL-M, in Brazil. Other South and Central American regions may use NTSC, PAL, or PAL-M.

2.2 Using Compaq Diagnostics

When you access Compaq Diagnostics, a scan of all system components is displayed on the screen before the Compaq Diagnostics window opens.

You can display more or less information from anywhere within Compaq Diagnostics by selecting Level on the menu bar.

Compaq Diagnostics is designed to test Compaq components. If non-Compaq components are tested, the results may be inconclusive.

Obtaining, Saving, or Printing Configuration Information

1. Access Compaq Diagnostics by selecting Start > Settings > Control Panel > Compaq Diagnostics.

2. Select Categories, then select a category from the drop-down list.

   ❏ To save the information, select File > Save As.

   ❏ To print the information, select File > Print.

3. To close Compaq Diagnostics, select File > Exit.

Obtaining, Saving, or Printing Diagnostic Test Information

1. Access Compaq Diagnostics by selecting Start > Settings > Control Panel > Compaq Diagnostics.

2. Select the Test tab.

3. In the scroll box, select the category or device you want to test.

4. Select a test type:

   ❏ **Quick Test**—Runs a quick, general test on each device in a selected category.

   ❏ **Complete Test**—Performs maximum testing on each device in a selected category.

   ❏ **Custom Test**—Performs maximum testing on a selected device.

   ◆ To run all tests for your selected device, click Check All.

   ◆ To run only the tests you select, click Uncheck All, then select the checkbox for each test you want to run.

5. Select a test mode:

❏ **Interactive Mode**—Provides maximum control over the
   testing process. You determine whether the test was
   passed or failed, and you may be prompted to insert or
   remove devices.

❏ **Unattended Mode**—Does not display prompts. If errors
   are found, they are displayed when testing is complete.

6. Click Begin Testing.

7. Select a tab to view a test report:

❏ **Status tab**—Summarizes the tests run, passed, and failed
   during the current testing session.

❏ **Log tab**—Lists tests run on the system, the number of
   times each test has run, the number of errors found on
   each test, and the total run time of each test.

❏ **Error tab**—Lists all errors found in the computer with
   their error codes.

8. Select a tab to save the report:

❏ **Log tab**—Select Save.

❏ **Error tab**—Select Save.

9. Select a tab to print the report:

❏ **Log tab**—Select File > Save As, then print the file from
   your folder.

2.3 Troubleshooting Flowcharts

Table 2-4
Troubleshooting Flowcharts Overview

Flowchart	Description
2.1	Initial Troubleshooting
2.2	No Power, Part 1
2.3	No Power, Part 2
2.4	No Power, Part 3
2.5	No Power, Part 4
2.6	No Video, Part 1
2.7	No Video, Part 2
2.8	Nonfunctioning Docking Station
2.9	No Operating System (OS) Loading
2.10	No OS Loading From Hard Drive, Part 1
2.11	No OS Loading From Hard Drive, Part 2
2.12	No OS Loading From Hard Drive, Part 3
2.13	No OS Loading From Diskette Drive
2.14	No OS Loading From CD- or DVD-ROM Drive
2.15	No Audio, Part 1
2.16	No Audio, Part 2
2.17	Nonfunctioning Device
2.18	Nonfunctioning Keyboard
2.19	Nonfunctioning Pointing Device
2.20	No Network or Modem Connection

Flowchart 2.1 - Initial Troubleshooting

Begin troubleshooting.

Is there power? — N → Go to Flowchart 2.2, No Power, Part 1.

Y

Beeps, LEDs, or error messages? — N → Check LED board, speaker connections.

Y

Is there video? (no boot) — N → Go to Flowchart 2.6, No Video, Part 1.

Y

Is the OS loading? — N → Go to Flowchart 2.9, No OS Loading.

Y

Is there sound? — N → Go to Flowchart 2.15, No Audio.

Y

All drives working? — N → Go to Flowchart 2.17, Nonfunctioning Device.

Y

Keyboard/ pointing device working? — N → Go to Flowchart 2.18, Nonfunctioning Keyboard, or Flowchart 2.19, Nonfunctioning Pointing Device.

Y

Connecting to network or modem? — N → Go to Flowchart 2.20, No Network or Modem Connection.

Y

End

Flowchart 2.2 - No Power, Part 1

```
┌──────────────┐
│  No power    │
│ (power LED   │
│   is off).   │
└──────┬───────┘
       │
       ▼
┌──────────────┐
│ Remove from  │
│docking station│
│(if applicable).│
└──────┬───────┘
       │
       ▼
```

No power (power LED is off). → Remove from docking station (if applicable). →

Power up on battery power? — N → *Reset power. → Power up on battery power? — N → Go to Flowchart 2.3, No Power, Part 2.

(Y from first "Power up on battery power?" and Y from second) →

Power up on AC power? — N → *Reset power. → Power up on AC power? — N → Go to Flowchart 2.4, No Power, Part 3.

(Y from first "Power up on AC power?" and Y from second) →

Power up in docking station? — Y → Done

* On some models there is a separate reset button. On some models the computer may be reset using the Standby switch and either the lid switch or the main power switch.

Power up in docking station? — N →

1. Reseat the power cables in the docking station and at the AC outlet.
2. Ensure that the AC power source is active.
3. Ensure that the power strip is working.

→ Power up in docking station? — Y → Done

Power up in docking station? — N → Go to Flowchart 2.8, Nonfunctioning Docking Station.

Flowchart 2.3 - No Power, Part 2

```
┌─────────────────┐
│  Continued from  │
│  Flowchart 2.2,  │
│ No Power, Part 1.│
└─────────────────┘
         │
         ▼
┌─────────────────┐
│ Visually check for│
│ debris in battery │
│ socket and clean  │
│   if necessary.   │
└─────────────────┘
         │
         ▼              Y
    ◇ Power on? ──────────────▶  ┌─────────┐
                                 │  Done   │
         │ N                     └─────────┘
         ▼
┌─────────────────┐
│ Check battery by │
│   recharging,    │
│   moving it to   │
│another computer, │
│  or replacing it.│
└─────────────────┘
         │
         ▼              N
    ◇ Power on? ──────────────▶  ┌─────────────┐
                                 │   Replace   │
         │ Y                     │ power supply│
         ▼                       │(if applicable).│
    ┌─────────┐                  └─────────────┘
    │  Done   │                       │
    └─────────┘                       ▼             N
                                 ◇ Power on? ──────────▶ ┌─────────────┐
                                                         │   Go to     │
                                      │ Y                │Flowchart 2.4,│
                                      ▼                  │  No Power,  │
                                 ┌─────────┐             │   Part 3.   │
                                 │  Done   │             └─────────────┘
                                 └─────────┘
```

Flowchart 2.4 - No Power, Part 3

```
┌──────────────────┐
│ Continued from   │
│ Flowchart 2.3,   │
│ No Power, Part 2.│
└──────────────────┘
         │
         ▼
┌──────────────────┐
│ Plug directly    │
│ into AC outlet.  │
└──────────────────┘
         │
         ▼          Y
    ╱Power LED╲ ──────────► ┌──────────┐
    ╲  on?   ╱              │   Done   │
         │ N               └──────────┘
         ▼
┌──────────────────┐
│ Reseat AC adapter│
│ in computer and  │
│ at power source. │
└──────────────────┘
         │          Y
    ╱Power on?╲ ──────────► ┌──────────┐
    ╲        ╱              │   Done   │
         │ N               └──────────┘
         ▼          N
    ╱  Power  ╲ ──────────► ┌──────────┐
    ╲ outlet  ╱             │   Try    │
    ╱ active? ╲             │different │
         │ Y               │  outlet. │
         ▼                  └──────────┘
┌──────────────────┐
│ Replace          │
│ power cord.      │
└──────────────────┘
         │          Y
    ╱Power on?╲ ──────────► ┌──────────┐
    ╲        ╱              │   Done   │
         │ N               └──────────┘
```

```
                          External
    ╱ Internal or ╲ ──────────► ┌──────────────┐
    ╲  external AC ╱            │ Replace      │
    ╱  adapter?   ╲             │ external     │
         │ Internal           │ AC adapter.  │
         ▼                      └──────────────┘
┌──────────────┐                      │ N
│ Go to        │                      ▼
│ Flowchart 2.5│◄────── ╱Power on?╲
│ No Power,    │        ╲        ╱
│ Part 4.      │             │ Y
└──────────────┘             ▼
                      ┌──────────┐
                      │   Done   │
                      └──────────┘
```

Flowchart 2.5 - No Power, Part 4

```
┌─────────────────┐
│  Continued from │
│  Flowchart 2.4, │
│ No Power, Part 3.│
└─────────────────┘
         │
         ▼
┌─────────────────┐
│      Open       │
│    computer.    │
└─────────────────┘
         │
         ▼
                    Y      ┌─────────────────┐
      ◇                    │  Reseat loose   │
   Loose or        ───────▶│ components and  │
   damaged                 │    boards and   │
   parts?                  │     replace     │
      ◇                    │ damaged items.  │
         │                 └─────────────────┘
       N │
         ▼
┌─────────────────┐
│      Close      │
│  computer and   │
│     retest.     │
└─────────────────┘
         │
         ▼
                    N      ┌──────────────────────────────────┐
      ◇                    │ Replace the following items (if  │
   Power on?       ───────▶│ applicable). Check computer      │
      ◇                    │ operation after each replacement:│
         │                 │                                  │
       Y │                 │ 1. Internal DC-DC converter*     │
         ▼                 │ 2. Internal AC adapter           │
┌─────────────────┐        │ 3. Processor board*              │
│      Done       │        │ 4. System board*                 │
└─────────────────┘        │                                  │
                           │ *Replace these items as a set to │
                           │ prevent shorting out among       │
                           │ components.                      │
                           └──────────────────────────────────┘
```

Flowchart 2.6 - No Video, Part 1

No video.

Stand-alone or docking station?

Docking station → Go to Flowchart 2.7, No Video, Part 2.

* To change from internal to external display, use the hotkey combination.

Stand-alone

Internal or external display*?

Internal → Adjust brightness. → Video OK? — Y → Done

N → Press lid switch to ensure operation. → Video OK? — Y → Done

A

External

Adjust brightness. → Video OK? — Y → Done

N → Check for bent pins on cable.

N → Video OK? — Y → Done

Replace the following one at a time. Test after each replacement.
1. Cable between notebook and computer display (if applicable)
2. Inverter board (if applicable)
3. Display
4. System board

Video OK? → N → Try another display. → Internal and external video OK? — N → Replace system board.

Y → Done

Y → Done

Flowchart 2.7 - No Video, Part 2

```
┌─────────────────┐
│ Continued from  │
│ Flowchart 2.6,  │
│ No Video, Part 1.│
└─────────────────┘
         │
         ▼
┌─────────────────┐
│ Remove notebook │
│  from docking   │
│   station, if   │
│   connected.    │
└─────────────────┘
         │
         ▼
┌─────────────────┐              ┌─────────────────┐
│     Adjust      │              │ Check brightness│
│     display     │              │   of external   │
│   brightness.   │              │    monitor.     │
└─────────────────┘              └─────────────────┘
         │                                │
         ▼          N                     ▼          Y
     ◇─────────◇  ┌─────────────┐     ◇─────────◇  ┌─────────┐
     │Video OK?│─▶│ Go to "A" in│     │Video OK?│─▶│  Done   │
     ◇─────────◇  │Flowchart 2.6,│    ◇─────────◇  └─────────┘
         │        │No Video, Part 1.│     │
       Y │        └─────────────┘      N │
         ▼                                ▼
┌───────────────────────────┐    ┌─────────────────┐
│ Check that notebook is    │    │  Try another    │
│ properly seated in docking│    │   external      │
│ station, for bent pins on │    │   monitor.      │
│ cable, and for monitor    │    └─────────────────┘
│ connection.               │             │
└───────────────────────────┘             ▼          Y
         │           Y              ◇─────────────◇  ┌─────────┐
         ▼     ┌─────────┐          │  Internal   │─▶│  Done   │
     ◇─────────◇ │  Done │          │ and external│  └─────────┘
     │Video OK?│▶│       │          │  video OK?  │
     ◇─────────◇ └───────┘          ◇─────────────◇
         │                                │
       N │                              N │
         ▼                                ▼
┌─────────────────┐              ┌─────────────────┐
│ Adjust external │              │     Go to       │
│ monitor display.│              │ Flowchart 2.8,  │
└─────────────────┘              │ Nonfunctioning  │
                                 │ Docking Station.│
                                 └─────────────────┘
```

Flowchart 2.8 - Nonfunctioning Docking Station (if applicable)

```
┌─────────────────┐
│ Nonfunctioning  │
│ docking station.│
└─────────────────┘
         │
         ▼
┌─────────────────┐
│ Reseat power    │
│ cord in docking │
│ station and     │
│ power outlet.   │
└─────────────────┘
         │
         ▼
┌─────────────────┐                    ┌─────────────────┐
│ Check voltage   │                    │ Reinstall       │
│ setting on      │                    │ notebook into   │
│ docking station.│                    │ docking station.│
└─────────────────┘                    └─────────────────┘
         │                                      │
         ▼                                      ▼
┌─────────────────┐                          Docking    Y   ┌──────────┐
│ Reset monitor   │                          station  ─────▶│   Done   │
│ cable connector │                          operating?     └──────────┘
│ at docking      │                             N
│ station.        │                             │
└─────────────────┘                             ▼
         │                            ┌────────────────────────────────┐
         ▼                            │ Replace the following docking  │
      Docking    Y   ┌──────────┐     │ station components one at a     │
      station  ─────▶│   Done   │     │ time. Check computer operation │
      operating?     └──────────┘     │ after each replacement.        │
         N                            │                                │
         │                            │ 1. Power supply                │
         ▼                            │ 2. I/O board                   │
┌─────────────────┐                   │ 3. Backplane board             │
│ Remove          │                   │ 4. Switch box                  │
│ notebook, reseat│                   │ 5. Docking motor mechanism     │
│ all internal    │                   └────────────────────────────────┘
│ parts, and      │
│ replace any     │
│ damaged items in│
│ docking station.│
└─────────────────┘
```

Flowchart 2.9 - No Operating System (OS) Loading

```
┌─────────────┐
│   No OS     │
│  loading.*  │
└─────────────┘
       │
       ▼
┌─────────────┐        * Before beginning troubleshooting, always
│Reseat power │        check cable connections, cable ends, and
│cord in docking│      drives for bent or damaged pins.
│ station and │
│power outlet.│
└─────────────┘
       │
       │        ┌─────────────────┐
       ├───────▶│  No OS loading  │
       │        │ from hard drive,│
       │        │go to Flowchart 2.10,│
       │        │ No OS Loading from│
       │        │ Hard Drive, Part 1.│
       │        └─────────────────┘
       │
       │        ┌─────────────────┐
       ├───────▶│  No OS loading  │
       │        │from diskette drive,│
       │        │go to Flowchart 2.13,│
       │        │ No OS Loading from│
       │        │ Diskette Drive. │
       │        └─────────────────┘
       │
       │        ┌─────────────────┐
       └───────▶│  No OS loading  │
                │   from CD- or   │
                │ DVD-ROM drive,  │
                │go to Flowchart 2.14,│
                │  No OS Loading  │
                │   from CD- or   │
                │ DVD-ROM Drive.  │
                └─────────────────┘
```

Flowchart 2.10 - No OS Loading from Hard Drive, Part 1

```
┌─────────────┐
│  OS not     │
│ loading from│
│ hard drive. │
└─────────────┘
       │
       ▼
      ╱╲              Y      ┌──────────────┐
     ╱  ╲                    │   Go to      │
    ╱Nonsystem╲──────────────▶│ Flowchart 2.11,│
    ╲disk message?╱           │  No OS Loading │
     ╲  ╱                     │ from Hard Drive,│
      ╲╱                      │    Part 2.    │
       │ N                    └──────────────┘
       ▼
┌─────────────┐
│  Reseat     │
│  external   │
│ hard drive. │
└─────────────┘
       │
       ▼
      ╱╲              Y      ┌──────────────┐
     ╱  ╲                    │              │
    ╱ OS    ╲─────────────────▶│    Done      │
    ╲loading?╱                │              │
     ╲  ╱                     └──────────────┘
      ╲╱
       │ N
       ▼
      ╱╲       N
     ╱  ╲ ──────────────────────┐
    ╱Boot from╲                 │
    ╲  CD?   ╱                  │
     ╲  ╱                       │
      ╲╱                        ▼
  Y    │                       ╱╲         N     ┌──────────────┐
       ▼                      ╱  ╲              │   Go to      │
┌─────────────┐              ╱Boot from╲─────────▶│ Flowchart 2.13,│
│ Check the setup│           ╲diskette?╱          │   No OS      │
│ utility for correct│        ╲  ╱               │ Loading from │
│ booting order. │             ╲╱                │ Diskette Drive.│
└─────────────┘              Y  │                └──────────────┘
       │                        ▼
       ▼              N   ┌──────────────┐
      ╱╲ ──────────────▶  │ Change boot  │
     ╱  ╲                 │priority through│
    ╱Boot from╲           │the setup utility│
    ╲hard drive?╱         │ and reboot.  │
     ╲  ╱                 └──────────────┘
      ╲╱                         │ N
  Y    │                         ▼
       ▼                        ╱╲        N    ┌──────────────┐
┌─────────────┐                ╱  ╲            │   Go to      │
│             │◀──────────────╱Boot from╲───────▶│ Flowchart 2.17,│
│    Done     │               ╲hard drive?╱      │ Nonfunctioning│
│             │                ╲  ╱             │   Device.    │
└─────────────┘                 ╲╱              └──────────────┘
                              Y  │
```

Flowchart 2.11 - No OS Loading from Hard Drive, Part 2

Continued from Flowchart 2.10, No OS Loading from Hard Drive, Part 1.

CD or diskette in drive?
— N → 1. Replace hard drive. 2. Replace system board.

Y ↓

Remove diskette and reboot.

Boot from hard drive? — Y → Done

N ↓

Boot from diskette drive? — N → Go to Flowchart 2.13, No OS Loading from Diskette Drive.

Y ↓

Hard drive accessible? — N →

Y ↓

Go to Flowchart 2.12, No OS Loading from Hard Drive, Part 3.

Reseat hard drive.

Hard drive accessible? — Y → Done

N ↓

Run FDISK.

Hard drive partitioned? — N → Create partition, then format hard drive to bootable C:\ prompt.

Y ↓

Hard drive formatted? — N → Format hard drive and bring to a bootable C:\ prompt.

Y ↓

Load OS using Restore CD (if applicable).

Computer booted? — Y → Done

N ↓

Go to Flowchart 2.12, No OS Loading from Hard Drive, Part 3.

Flowchart 2.12 - No OS Loading from Hard Drive, Part 3

```
┌─────────────────┐
│ Continued from  │
│ Flowchart 2.11, │
│ No OS Loading   │
│ from Hard Drive,│
│ Part 2.         │
└─────────────────┘
```

Flowchart 2.13 - No OS Loading from Diskette Drive

```
OS not loading          Reseat              OS          Y      Done
from            →       diskette     →    loading?   →
diskette drive.         drive.                 │
                                               │ N
                                               ↓

Nonsystem      Y                      Bootable      N    Install bootable
disk message?  →                      diskette  →        diskette and
   │                                  in drive?         reboot computer.
   │ N                                    │ Y
   ↓                                      ↓
Boot          N     Go to            Check diskette
from another  →     Flowchart 2.17,  for system files.
device?             Nonfunctioning   Try different
   │ Y              Device.          diskette.
   ↓                                      │
Diskette      N     Enable drive          ↓
drive enabled →     and cold boot    Nonsystem      Y    1. Replace
in the setup        computer.        disk error?   →        diskette drive.
utility?                                │                 2. Replace
   │ Y                                  │ N                  system board.
   ↓                                    ↓
Diskette      Y     Clear CMOS.       OS          Y      Done
drive boot    →     Refer to        loading?   →
order?              Section 1.3,        │ N
   │ N              "Clearing a
   ↓                Password," for
Change boot         instructions.
priority using          │
the setup utility.      ↓
                    Go to
                    Flowchart 2.17,
                    Nonfunctioning
                    Device.
```

Flowchart 2.14 - No OS Loading from CD- or DVD-ROM Drive

```
No OS              Y              N            Install
loading from    Disc        Bootable        bootable disc
CD- or          in drive?   disc in         and reboot
DVD-ROM Drive.              drive?           computer.
                  N              Y

              Install         Try another
              bootable disc.  bootable disc.
```

```
        Y
Boots from        Done
CD or DVD?
  N

Reseat      Y
drive.    Boots from        Done
          CD or DVD?
            N

                         N     Go to
          Booting              Flowchart 2.17,
          from another         Nonfunctioning
          device?              Device.
            Y

          Booting    Y   Clear CMOS.        Go to
          order          Refer to           Flowchart 2.17,
          correct?       Section 1.3,       Nonfunctioning
            N            "Clearing a        Device.
                         Password," for
                         instructions.
          Correct boot
          order using
          the setup utility.
```

Flowchart 2.15 - No Audio, Part 1

```
┌──────────────┐     ┌──────────────┐          ◇            ┌──────────────┐
│              │     │ Turn up audio│         ╱ ╲     Y     │              │
│  No audio.   │────▶│ internally or│────▶  ╱Audio?╲────────▶│    Done      │
│              │     │  externally. │       ╲      ╱         │              │
└──────────────┘     └──────────────┘         ╲ ╱            └──────────────┘
                                                ◇
                                                │ N
```

```
        ◇                                      ◇
      ╱ ╲      Y     ┌──────────────┐        ╱ ╲      N     ┌──────────────┐
    ╱Notebook╲──────▶│              │──────▶╱Internal╲──────▶│   Go to      │
   ╱ docking  ╲      │    Undock    │       ╲ audio? ╱       │ Flowchart 2.16,│
   ╲ station  ╱      │              │        ╲      ╱        │ No Audio, Part 2.│
    ╲(if appl.)╱     └──────────────┘          ╲ ╱           └──────────────┘
      ╲ ╱                                        │ Y
       ◇
       │ N
       ▼
┌──────────────┐
│   Go to      │
│ Flowchart 2.16,│
│ No Audio, Part 2.│
└──────────────┘
```

```
                    ┌─────────────────────────────────────────────┐
                    │ Replace the following docking station        │
                    │ components one at a time as applicable.       │
                    │ Check after each change.                      │
                    │                                               │
                    │ 1. Reseat docking station audio cable.        │
                    │ 2. Replace audio cable.                       │
                    │ 3. Replace speaker.                           │
                    │ 4. Replace docking station audio board.       │
                    │ 5. Replace backplane board.                   │
                    │ 6. Replace I/O board.                         │
                    └─────────────────────────────────────────────┘
                                        │
                                        ▼
┌──────────────┐                       ◇
│   Go to      │                     ╱ ╲      Y     ┌──────────────┐
│ Flowchart 2.17,│◀──────────────────╱Audio?╲────────▶│    Done      │
│ Nonfunctioning│                    ╲      ╱         │              │
│   Device.    │                      ╲ ╱            └──────────────┘
└──────────────┘                       ◇
                                       │ N
```

Flowchart 2.16 - No Audio, Part 2

```
┌─────────────────┐
│ Continued from  │
│ Flowchart 2.15, │
│ No Audio, Part 1.│
└─────────────────┘
```

Audio driver in OS configured? — N → Reload audio drivers.

Y

Correct drivers for application? — N → Load drivers and set configuration in OS.

Y

Connect to external speaker.

Audio? — N → Replace audio board and speaker connections in notebook (if applicable). → Audio? — Y → Done

Y ─────────────────────────────┐ N

1. Replace internal speakers.
2. Replace audio board (if applicable).
3. Replace system board.

Flowchart 2.17 - Nonfunctioning Device

```
                    ┌─────────────────┐
                    │  Nonfunctioning │
                    │     device.     │
                    └─────────────────┘
                             │
                             ▼
                    ┌─────────────────┐
                    │     Reseat      │
                    │     device.     │
                    └─────────────────┘
                             │
                             ▼
              ┌──────────────────────────────────┐
              │  Unplug the nonfunctioning device │
              │  from the notebook and inspect    │
              │  cables and plugs for bent or     │
              │  broken pins or other damage.     │
              └──────────────────────────────────┘
                             │
                             ▼
                                        Y
   ┌─────────┐         ╱─────────────╲          ┌──────────┐
   │  Clear  │◄────────   Any physical  ────────►│ Fix or   │
   │  CMOS.  │         ╲ device detected?╱        │ replace  │
   └─────────┘          ╲─────────────╱          │ broken   │
        │                     N                   │ item.    │
        │                                         └──────────┘
        ▼
┌──────────────┐  ┌──────────────┐         ┌──────────────┐
│Reattach      │  │Possible bad  │         │ Go to        │
│device. Close │  │hard drive.   │────────►│ Flowchart    │
│notebook,     │  │Replace drive.│         │ 2.9,         │
│plug in power,│  └──────────────┘         │ No OS        │
│and reboot.   │                           │ Loading.     │
└──────────────┘                           └──────────────┘
        │                                         ▲
        ▼          N                              │    N
   ╱─────────╲        ┌──────────────┐       ╱─────────╲
  ╱  Device   ╲───────│Possible bad  │──────►  Device   ╲
 ╲   boots    ╱       │NIC. Replace  │      ╲   boots    ╱
  ╲ properly?╱        │card. If      │       ╲ properly?╱
   ╲───────╱          │integrated NIC,│       ╲───────╱
     Y               │replace system│          Y
     │                │board.        │          │
     ▼                └──────────────┘          ▼
┌──────────┐          ┌──────────────┐     ┌──────────┐
│  Done    │          │Possible bad  │     │  Done    │
│          │          │diskette drive│     │          │
└──────────┘          │Replace drive.│     └──────────┘
                      └──────────────┘
```

Flowchart 2.18 - Nonfunctioning Keyboard

```
        ┌──────────────┐
        │  Keyboard    │
        │ not operating│
        │  properly.   │
        └──────┬───────┘
               │
               ▼
     ┌──────────────────┐
     │ Connect notebook │
     │ to good external │
     │    keyboard.     │
     └────────┬─────────┘
              │
              ▼           N
          ╱───────╲          ┌──────────┐
         ╱ External ╲─────────│ Replace  │
        ╱  device    ╲        │ system   │
        ╲   works?   ╱        │  board.  │
         ╲          ╱         └──────────┘
          ╲────────╱
              │ Y
              ▼
     ┌──────────────┐
     │Reseat internal│
     │  keyboard    │
     │  connector   │
     │(if applicable)│
     └──────┬───────┘
            │
            ▼          N
         ╱──────╲          ┌──────────────┐
        ╱        ╲─────────│Replace internal│
        ╲  OK?   ╱         │ keyboard or  │
         ╲      ╱          │    cable.    │
          ╲────╱           └──────┬───────┘
            │ Y                   │
            ▼                     ▼          Y
     ┌──────────┐             ╱──────╲         ┌──────────┐
     │          │            ╱        ╲────────│          │
     │   Done   │            ╲  OK?   ╱        │   Done   │
     │          │             ╲      ╱         │          │
     └──────────┘              ╲────╱          └──────────┘
                                 │ N
                                 ▼
                          ┌──────────┐
                          │ Replace  │
                          │ system   │
                          │  board.  │
                          └──────────┘
```

Flowchart 2.19 - Nonfunctioning Pointing Device

```
┌──────────────────┐
│  Pointing device │
│   not operating  │
│     properly.    │
└──────────────────┘
          │
          ▼
┌──────────────────┐
│ Connect notebook │
│  to good external│
│  pointing device.│
└──────────────────┘
          │
          ▼
        ╱╲                     N      ┌──────────────┐
       ╱External╲  ─────────────────> │   Replace    │
       ╲device   ╱                    │   system     │
        ╲works? ╱                     │   board.     │
          ╲╱                          └──────────────┘
          │ Y
          ▼
┌──────────────────┐
│ Reseat internal  │
│ pointing device  │
│    connector     │
│ (if applicable). │
└──────────────────┘
          │
          ▼
        ╱╲           N        ┌──────────────────┐
       ╱   ╲  ────────────────> │ Replace internal │
       ╲OK?╱                   │ pointing device  │
        ╲ ╱                    │    or cable.     │
         ╲╱                    └──────────────────┘
          │ Y                           │
          ▼                             ▼
┌──────────────┐                      ╱╲         Y     ┌──────────────┐
│              │                     ╱   ╲ ───────────> │              │
│     Done     │                    ╲OK?╱              │     Done     │
│              │                     ╲ ╱               │              │
└──────────────┘                      ╲╱               └──────────────┘
                                 N    │
                                      ▼
                              ┌──────────────┐
                              │   Replace    │
                              │   system     │
                              │   board.     │
                              └──────────────┘
```

Flowchart 2.20 - No Network or Modem Connection

```
┌─────────────┐
│ No network  │
│ or modem    │
│ connection. │
└─────────────┘
       │
       ▼
      ╱╲          N    ┌─────────────┐
     ╱  ╲──────────────│ Replace jack│
    ╱ Network╲         │ or have jack│
   ╱ or modem ╲        │ activated.  │
   ╲  jack   ╱         └─────────────┘
    ╲active?╱
     ╲  ╱
      ╲╱
   Y  │
      ▼
      ╱╲          Y    ┌─────────────┐
     ╱  ╲──────────────│  Connect    │
    ╱Digital╲          │to nondigital│
    ╲ line? ╱          │   line.     │
     ╲    ╱            └─────────────┘
      ╲╱
   N  │
      ▼
      ╱╲          N    ┌─────────────┐              ╱╲          Y    ┌──────┐
     ╱  ╲──────────────│  Reload     │             ╱  ╲──────────────│ Done │
    ╱NIC/modem╲        │drivers and  │────────────╱ OK? ╲           └──────┘
    ╲configured╱       │reconfigure. │            ╲    ╱
     ╲in OS? ╱         └─────────────┘             ╲╱
      ╲╱                                        N  │
   Y  │                                            ▼
      ▼                                    ┌─────────────┐
┌─────────────┐                            │  Replace    │
│ Disconnect  │                            │ NIC/modem   │
│ all power   │                            │(if applicable)│
│ from the    │                            └─────────────┘
│ notebook    │                                   │
│ and open.   │                                   ▼
└─────────────┘                                   ╱╲          Y    ┌──────┐
      │                                          ╱  ╲──────────────│ Done │
      ▼                                         ╱ OK? ╲           └──────┘
┌─────────────┐                                 ╲    ╱
│  Reseat     │                                  ╲╱
│ NIC/modem   │                               N  │
│(if applicable)│                                ▼
└─────────────┘                           ┌─────────────┐
                                          │  Replace    │
                                          │  system     │
                                          │  board.     │
                                          └─────────────┘
```

3

Illustrated Parts Catalog

This chapter provides an illustrated parts breakdown and a reference for spare part numbers and option part numbers.

3.1 Serial Number Location

When ordering parts or requesting information, provide the computer serial number and model number located on the bottom of the computer (Figure 3-1).
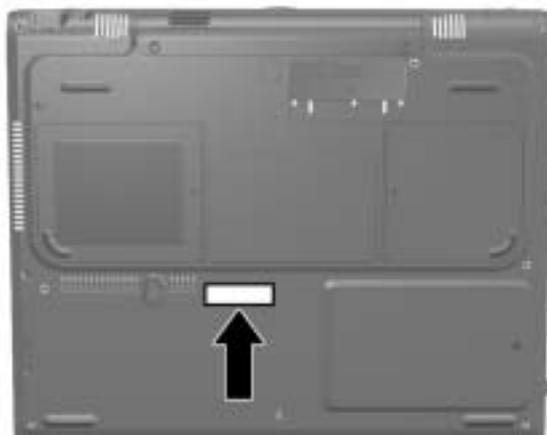
Figure 3-1. Serial Number Location

3.2 Computer System Major Components
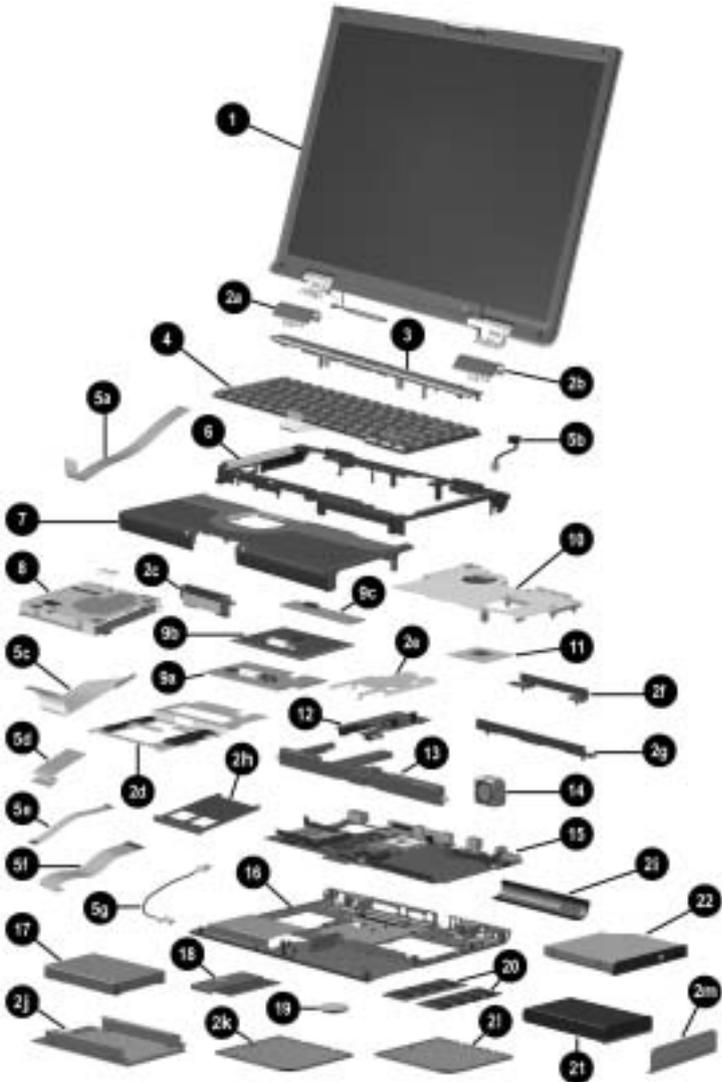
Figure 3-2. Computer System Major Components

Table 3-1
Spare Parts: Computer System Major Components

Item	Description	Spare Part Number
1	**Displays**	
	Contain parts with carbon finish for use with Evo Notebook N1000 models	
	15.0-inch, TFT, SXGA+	291643-001
	15.0-inch, TFT, XGA	291642-001
	14.1-inch, XGA	291641-001
	Contain parts with silver finish for use with Presario 1500 models	
	15-inch, TFT, SXGA+	286754-001
	15-inch, TFT, XGA	285521-001
	14-inch, TFT, XGA	285520-001
	Display inverter board (not illustrated)	293348-001

Figure 3-2. Computer System Major Components

Table 3-1
Spare Parts: Computer System Major Components *(Continued)*

Item	Description	Spare Part Number
	Miscellaneous Plastics/Hardware Kit, includes:	285541-001
2a	Left hinge cover	
2b	Right hinge cover	
2c	*Display assembly release	
2d	TouchPad bracket	
2e	Charger board shield	
2f	Optical drive rear alignment rail	
2g	Optical drive front alignment rail	
2h	PC Card space saver	
2i	*Connector cover	
2j	*Hard drive bracket	
2k	*Mini PCI compartment cover	
2l	*Memory expansion compartment cover	
2m	*Battery bezel	
	*Includes two of each part, one with carbon finish for use with Evo Notebook N1000 models and one with silver finish for use with Presario 1500 models	
	Not illustrated: Computer feet	
3	**LED cover**	295736-001

Figure 3-2. Computer System Major Components

Table 3-1
Spare Parts: Computer System Major Components *(Continued)*

Item	Description		Spare Part Number
4	**Keyboards** (for use only with TouchPad notebook models)		

Description	Spare Part Number	Description	Spare Part Number
Arabic	285530-171	Korean	285530-AD1
Belgian	285530-181	Latin American	
Brazilian	285530-201	Spanish	285530-161
Chinese	285530-AA1	Norwegian	285530-091
Czech	285530-221	Portuguese	285530-131
Danish	285530-081	Russian	285530-251
French	285530-051	Slovakian	285530-231
French		Spanish	285530-071
Canadian	285530-121	Swedish	285530-101
German	285530-041	Swiss	285530-111
Hebrew	285530-BB1	Taiwanese	285530-AB1
Hungarian	285530-211	Thai	285530-281
International	285530-002	Turkish	285530-141
Italian	285530-061	U.K. English	285530-031
Japanese	285530-291	U.S. English	285530-001

Keyboards with pointing stick (for use only with Dual Stick notebook models)

Description	Spare Part Number	Description	Spare Part Number
Arabic	285531-171	Latin American	
Belgian	285531-181	Spanish	285531-161
Brazilian	285531-201	Norwegian	285531-091
Czech	285531-221	Portuguese	285531-131
Danish	285531-081	Russian	285531-251
French	285531-051	Slovakian	285531-231
French		Spanish	285531-071
Canadian	285531-121	Swedish	285531-101
German	285531-041	Swiss	285531-111
Hebrew	285531-BB1	Taiwanese	285531-AB1
Hungarian	285531-211	Thai	285531-281
International	285531-002	Turkish	285531-141
Italian	285531-061	U.K. English	285531-031
Japanese	285531-291	U.S. English	285531-001
Korean	285531-AD1		

Figure 3-2. Computer System Major Components

Table 3-1
Spare Parts: Computer System Major Components *(Continued)*

Item	Description	Spare Part Number
	Miscellaneous Cable Kit, includes:	285540-001
5a	Keyboard-to-TouchButton board cable (for use only with Dual Stick notebook models)	
5b	Microphone	
5c	Diskette drive cable	
5d	Pointing stick-to-TouchButton board cable (for use only with Dual Stick notebook models)	
5e	TouchButton board-to-TouchPad cable	
5f	System board-to-TouchButton board cable	
5g	Modem cable	
6	**Top cover**	285535-001
7	**Palm rests**	
	Contains parts with carbon finish for use with Evo Notebook N1000 models	
	For use only with TouchPad notebook models	291645-001
	For use only with Dual Stick notebook models	291646-001
	Contains parts with silver finish for use with Presario 1500 models	
	For use only with TouchPad notebook models	285533-001
	For use only with Dual Stick notebook models	285534-001
8	**Diskette drives**	
	For use only with TouchPad notebook models	285539-001
	For use only with Dual Stick notebook models	291647-001

Figure 3-2. Computer System Major Components

Table 3-1
Spare Parts: Computer System Major Components *(Continued)*

Item	Description	Spare Part Number
	TouchPad—The TouchPad components for TouchPad notebook models consist of the TouchPad, TouchPad bracket, and TouchButton board. These components are different than the corresponding components for the Dual Stick notebook models.	
	The TouchPad components for Dual Stick notebook models consist of the TouchPad, TouchPad bracket, TouchButton board, and the pointing stick board.	
	All TouchPad components are included with the appropriate palm rest for each notebook model. Refer to item 7, "Palm rests," for more information.	
	All TouchPad component cables are included in the Miscellaneous Cable Kit. Refer to item 5, "Miscellaneous Cable Kit," for more information.	
9a	TouchPad without pointing stick cable connector (for use only on TouchPad notebook models) TouchPad with pointing stick connector (for use only on Dual Stick notebook models)	
9b	TouchButton board without pointing stick cable connector (for use only on TouchPad notebook models) TouchButton board with pointing stick cable connector (for use only on Dual Stick notebook models)	
9c	Pointing stick board (for use only on Dual Stick notebook models)	
10	**Heat spreaders**	
	For use only on Evo Notebook N1000 models	291648-001
	For use only on Presario 1500 models	285544-001

Figure 3-2. Computer System Major Components

Table 3-1
Spare Parts: Computer System Major Components *(Continued)*

Item	Description	Spare Part Number
11	**Processors**	
	Intel Mobile Pentium 4 2.2-GHz processor with SpeedStep technology (P4-M)	286753-001
	Intel Mobile Pentium 4 2.0-GHz processor with SpeedStep technology (P4-M)	286752-001
	Intel Mobile Pentium 4 1.8-GHz processor with SpeedStep technology (P4-M)	286751-001
	Intel Mobile Pentium 4 1.7-GHz processor with SpeedStep technology (P4-M)	285519-001
	Intel Mobile Pentium 4 1.6-GHz processor with SpeedStep technology (P4-M)	285518-001
	Intel Mobile Pentium 4 1.5-GHz processor with SpeedStep technology (P4-M)	285517-001
	Intel Mobile Pentium 4 1.6-GHz processor (P4-C)	303725-001
	Intel Mobile Pentium 4 1.5-GHz processor (P4-C)	303724-001
	Intel Celeron 1.5-GHz processor	301643-001
	Intel Celeron 1.4-GHz processor	303528-001
12	**Charger board**	285525-001
13	**Speaker assembly**	285538-001
14	**Fan**	285543-001
15	**System board** (does not contain memory)	285515-001
16	**Base enclosures** (includes shields)	
	Contain parts with carbon finish for use with Evo Notebook N1000 models	291644-001
	Contain parts with silver finish for use with Presario 1500 models	285532-001

Figure 3-2. Computer System Major Components

Table 3-1
Spare Parts: Computer System Major Components *(Continued)*

Item	Description	Spare Part Number
17	**Hard drives**	
	60 GB	303527-001
	40 GB	273491-001
	30 GB	192406-001
	20 GB	288291-001
18	**Mini PCI communications boards**	
	U.S. modem	248776-001
	International modem	285545-001
19	**Disk cell RTC battery, 3 volt, 36 MAh, Li ion**	279769-001
20	**Memory expansion boards**	
	512 MB	285524-001
	256 MB	285523-001
	128 MB	285522-001
21	**Battery packs**	
	8 cell, 62 Wh, 4.0 Ah, Li ion	289053-001
	8 cell, 58 Wh, 3.6 Ah, Li ion	281766-001
22	**Optical drives**	
	24X Max CD-ROM drive	285526-001
	8X Max DVD-ROM drive	285526-001
	24X Max DVD-ROM/CD-RW combination drive	304691-001
	8X Max DVD-ROM/CD-RW combination drive	285529-001

3.3 Miscellaneous Plastics/Hardware Kit
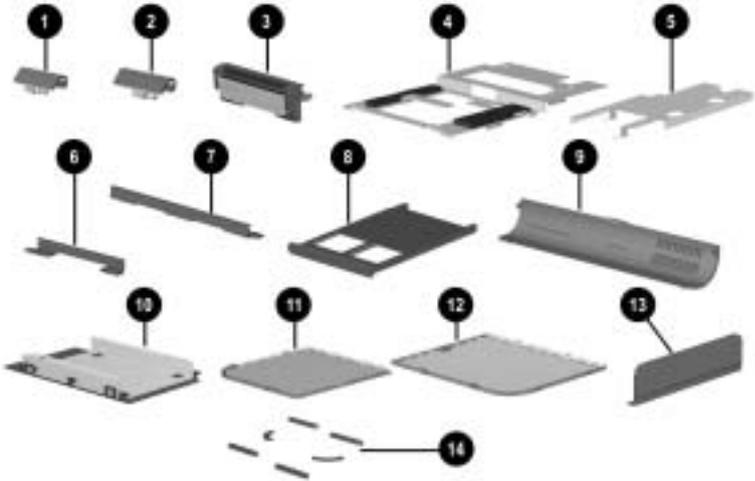
Figure 3-3. Miscellaneous Plastics/Hardware Kit Components

Table 3-2
Miscellaneous Plastics/Hardware Kit Components
Spare Part Number 285541-001

Item	Description	Item	Description
1	Left hinge cover	8	PC Card space saver
2	Right hinge cover	9	*Connector cover
3	*Display release assembly	10	*Hard drive bracket
4	TouchPad bracket	11	*Mini PCI compartment cover
5	Charger board shield	12	*Memory expansion compartment cover
6	Optical drive rear alignment rail	13	*Battery bezel
7	Optical drive front alignment rail	14	Computer feet

*Includes two of each part, one with carbon finish for use with Evo Notebook N1000 models and one with silver finish for use with Presario 1500 models

3.4 Miscellaneous Cable Kit
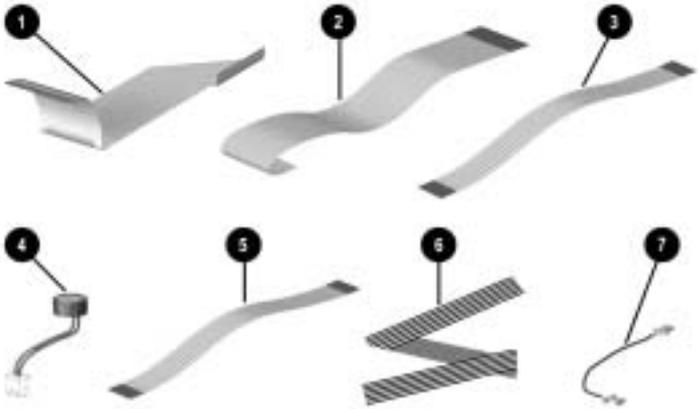
Figure 3-4. Miscellaneous Cable Kit Components

Table 3-3
Miscellaneous Cable Kit Components
Spare Part Number 285540-001

Item	Description
1	Diskette drive cable
2	TouchButton board-to-TouchPad cable
3	TouchButton board-to-system board cable
4	Microphone
5	TouchButton board-to-pointing stick board cable (for use only with Dual Stick notebook models)
6	Keyboard-to-TouchPad cable (for use only with Dual Stick notebook models)
7	Modem cable

3.5 Mass Storage Devices
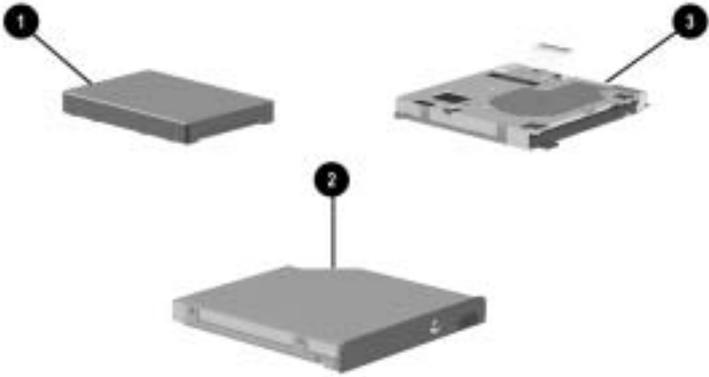
Figure 3-5. Mass Storage Devices

**Table 3-4
Mass Storage Devices**

Item	Description	Spare Part Number
1	**Hard drives**	
	60 GB	303527-001
	40 GB	273491-001
	30 GB	192406-001
	20 GB	288291-001
2	**Diskette drives**	
	For use only with TouchPad notebook models	285539-001
	For use only with Dual Stick notebook models	291647-001
3	**Optical drives**	
	24X Max CD-ROM drive	285526-001
	8X Max DVD-ROM drive	285527-001
	24X Max DVD-ROM/CD-RW combination drive	304691-001
	8X Max DVD-ROM/CD-RW combination drive	285529-001

3.6 Miscellaneous

Table 3-5
Spare Parts: Miscellaneous (not illustrated)

Description	Spare Part Number
Logo Kit	285547-001
Screw Kit, includes the following screws (Refer to Appendix C, "Screw Listing," for more information on screw specifications and usage.)	285542-001

■ Torx T8 Metric 2.5 × 5.0	■ Phillips Metric 3.0 × 3.0
■ Torx T8 Metric 2.5 × 8.0	■ Phillips Metric 2.5 × 4.0
■ Torx T8 Metric 2.5 × 9.0	■ Phillips Metric 2.0 × 4.5
■ Torx T8 Metric 2.5 × 14.0 shoulder screw	

Description	Spare Part Number
Common Port Replicator	285289-001
Advanced Port Replicator	288502-001
AC adapter (90 W, 3 wire, slim line)	286755-001
Power cords, 3 wire	

Danish	170513-081	Swiss	170513-115
International	170513-002	U.K. English	170513-031
Italian	170513-061	U.S. English	170513-001

4

Removal and Replacement Preliminaries

This chapter provides essential information for proper and safe removal and replacement service.

4.1 Tools Required

You will need the following tools to complete the removal and replacement procedures:

- Magnetic screwdriver
- Phillips P0 screwdriver
- Torx T8 screwdriver
- Tool kit (includes connector removal tool, loopback plugs, and case utility tool)

4.2 Service Considerations

The following sections include some of the considerations that you should keep in mind during disassembly and assembly procedures.

✎ As you remove each subassembly from the computer, place the subassembly (and all accompanying screws) away from the work area to prevent damage.

Plastic Parts

Using excessive force during disassembly and reassembly can damage plastic parts. Use care when handling the plastic parts. Apply pressure only at the points designated in the maintenance instructions.

Cables and Connectors

Cables must be handled with extreme care to avoid damage. Apply only the tension required to unseat or seat the cables during removal and insertion. Handle cables by the connector whenever possible. In all cases, avoid bending, twisting, or tearing cables. Ensure that cables are routed in such a way that they cannot be caught or snagged by parts being removed or replaced. Handle flex cables with extreme care; these cables tear easily.

⚠ **CAUTION:** When servicing the computer, ensure that cables are placed in their proper locations during the reassembly process. Improper cable placement can damage the computer.

4.3 Preventing Damage to Removable Drives

Removable drives are fragile components that must be handled with care. To prevent damage to the computer, damage to a removable drive, or loss of information, observe the following precautions:

■ Before removing or inserting a hard drive, shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, then shut it down.

■ Before removing a diskette drive or optical drive, ensure that a diskette or disc is not in the drive. Ensure that the optical drive tray is closed.

■ Before handling a drive, ensure that you are discharged of static electricity. While handling a drive, avoid touching the connector.

■ Handle drives on surfaces that have at least one inch of shock-proof foam.

■ Avoid dropping drives from any height onto any surface.

■ After removing a hard drive, CD-ROM drive, or a diskette drive, place it in a static-proof bag.

■ Avoid exposing a hard drive to products that have magnetic fields, such as monitors or speakers.

■ Avoid exposing a drive to temperature extremes or to liquids.

■ If a drive must be mailed, place the drive in a bubble-pack mailer or other suitable form of protective packaging and label the package "Fragile: Handle With Care."

4.4 Preventing Electrostatic Damage

Many electronic components are sensitive to electrostatic discharge (ESD). Circuitry design and structure determine the degree of sensitivity. Networks built into many integrated circuits provide some protection, but in many cases the discharge contains enough power to alter device parameters or melt silicon junctions.

A sudden discharge of static electricity from a finger or other conductor can destroy static-sensitive devices or microcircuitry. Often the spark is neither felt nor heard, but damage occurs.

An electronic device exposed to electrostatic discharge may not be affected at all and can work perfectly throughout a normal cycle. Or the device may function normally for a while, then degrade in the internal layers, reducing its life expectancy.

4.5 Packaging and Transporting Precautions

Use the following grounding precautions when packaging and transporting equipment:

■ To avoid hand contact, transport products in static-safe containers, such as tubes, bags, or boxes.

■ Protect all electrostatic-sensitive parts and assemblies with conductive or approved containers or packaging.

■ Keep electrostatic-sensitive parts in their containers until the parts arrive at static-free workstations.

■ Place items on a grounded surface before removing items from their containers.

■ Always be properly grounded when touching a sensitive component or assembly.

■ Store reusable electrostatic-sensitive parts from assemblies in protective packaging or nonconductive foam.

■ Use transporters and conveyers made of antistatic belts and roller bushings. Ensure that mechanized equipment used for moving materials is wired to ground and that proper materials are selected to avoid static charging. When grounding is not possible, use an ionizer to dissipate electric charges.

4.6 Workstation Precautions

Use the following grounding precautions at workstations:

■ Cover the workstation with approved static-dissipative material (refer to Table 4-2).

■ Use a wrist strap connected to a properly grounded work surface and use properly grounded tools and equipment.

■ Use conductive field service tools, such as cutters, screwdrivers, and vacuums.

■ When using fixtures that must directly contact dissipative surfaces, only use fixtures made of static-safe materials.

■ Keep the work area free of nonconductive materials, such as ordinary plastic assembly aids and Styrofoam.

■ Handle electrostatic-sensitive components, parts, and assemblies by the case or PCM laminate. Handle these items only at static-free workstations.

■ Avoid contact with pins, leads, or circuitry.

■ Turn off power and input signals before inserting or removing connectors or test equipment.

4.7 Grounding Equipment and Methods

Grounding equipment must include either a wrist strap or a foot strap at a grounded workstation.

■ When seated, wear a wrist strap connected to a grounded system. Wrist straps are flexible straps with a minimum of one megohm ±10% resistance in the ground cords. To provide proper ground, wear a strap snugly against the skin at all times. On grounded mats with banana-plug connectors, connect a wrist strap with alligator clips.

■ When standing, use foot straps and a grounded floor mat. Foot straps (heel, toe, or boot straps) can be used at standing workstations and are compatible with most types of shoes or boots. On conductive floors or dissipative floor mats, use foot straps on both feet with a minimum of one-megohm resistance between the operator and ground. To be effective, the conductive strips must be worn in contact with the skin.

Other grounding equipment recommended for use in preventing electrostatic damage includes:

■ Antistatic tape

■ Antistatic smocks, aprons, and sleeve protectors

■ Conductive bins and other assembly or soldering aids

■ Nonconductive foam

■ Conductive tabletop workstations with ground cords of one-megohm resistance

■ Static-dissipative tables or floor mats with hard ties to the ground

■ Field service kits

■ Static awareness labels

■ Material-handling packages

■ Nonconductive plastic bags, tubes, or boxes

■ Metal tote boxes

■ Electrostatic voltage levels and protective materials

Table 4-1 shows how humidity affects the electrostatic voltage levels generated by different activities.

Table 4-1
Typical Electrostatic Voltage Levels

	Relative Humidity		
Event	**10%**	**40%**	**55%**
Walking across carpet	35,000 V	15,000 V	7,500 V
Walking across vinyl floor	12,000 V	5,000 V	3,000 V
Motions of bench worker	6,000 V	800 V	400 V
Removing DIPS from plastic tube	2,000 V	700 V	400 V
Removing DIPS from vinyl tray	11,500 V	4,000 V	2,000 V
Removing DIPS from Styrofoam	14,500 V	5,000 V	3,500 V
Removing bubble pack from PCB	26,500 V	20,000 V	7,000 V
Packing PCBs in foam-lined box	21,000 V	11,000 V	5,000 V

✎ A product can be degraded by as little as 700 V.

Table 4-2 lists the shielding protection provided by antistatic bags and floor mats.

Table 4-2
Static-Shielding Materials

Material	Use	Voltage Protection Level
Antistatic plastic	Bags	1,500 V
Carbon-loaded plastic	Floor mats	7,500 V
Metallized laminate	Floor mats	5,000 V

5

Removal and Replacement Procedures

This chapter provides removal and replacement procedures.

There are 57 screws, in seven different sizes, that must be removed and replaced when servicing the computer. Make special note of each screw size and location during removal and replacement.

Refer to Appendix C, "Screw Listing," for detailed information on screw sizes, locations, and usage.

5.1 Serial Number

Report the computer serial number to Compaq when requesting information or ordering spare parts. The serial number is located on the bottom of the computer as indicated in Figure 5-1.
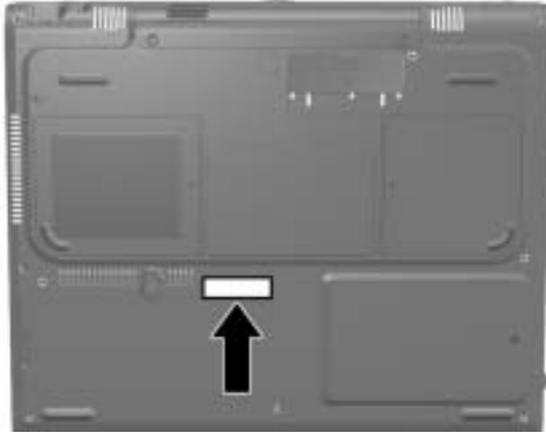
Figure 5-1. Serial Number Location

5.2 Disassembly Sequence Chart

Use the following chart to determine the section number to be referenced when removing computer components.

Disassembly Sequence Chart

Section	Description	# of Screws Removed
5.3	Preparing the computer for disassembly	
	Battery pack	0
	Optical drive	2
	Hard drive	1 to remove the hard drive 4 to remove the hard drive from hard drive bracket
5.4	Computer feet	0
5.5	Memory expansion board	1
5.6	Mini PCI communications board	1
5.7	Disk cell RTC battery	0
5.8	Connector cover	2
5.9	LED cover	2
5.10	Keyboard	0
5.11	Heat spreader	7
5.12	Processor	0
5.13	Display	6
5.14	Palm rest	6
5.15	Diskette drive	3

Disassembly Sequence Chart *(Continued)*

Section	Description	# of Screws Removed
5.16	TouchPad and TouchButton	4 on TouchPad models 5 on Dual Stick models
5.17	Display release assembly	2
5.18	Charger board	3
5.19	Speaker assembly	0
5.20	Top cover	5
5.21	Fan	0
5.22	System board	7
5.23	Modem cable	1

5.3 Preparing the Computer for Disassembly

Perform the following steps before disassembling the computer:

1. Turn off the computer.

2. Disconnect the AC adapter and all external devices.

Battery Packs
Spare Part Number Information

---

8 cell, 62 W hour, 4.0 Ah, Li ion	289053-001
8 cell, 58 W hour, 3.6 Ah, Li ion	281766-001

---

3. Remove the battery pack by following these steps:

    a. Turn the computer bottom side up with the left side facing forward.

    b. Slide and hold the battery release latch ❶ toward the back of the computer (Figure 5-2).

    c. Use the notch in the battery bay to slide the battery pack out of the battery bay ❷.

    d. Remove the battery pack.
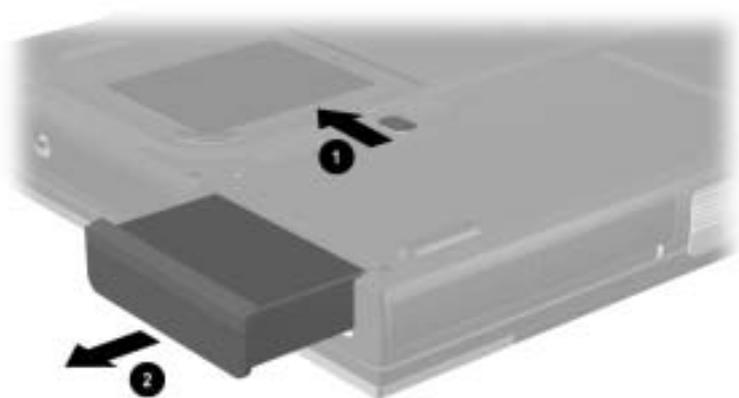
Figure 5-2. Releasing the Battery Pack

Reverse the preceding procedures to install the battery pack.

4. To remove the battery bezel, slide the bezel straight down (Figure 5-3).
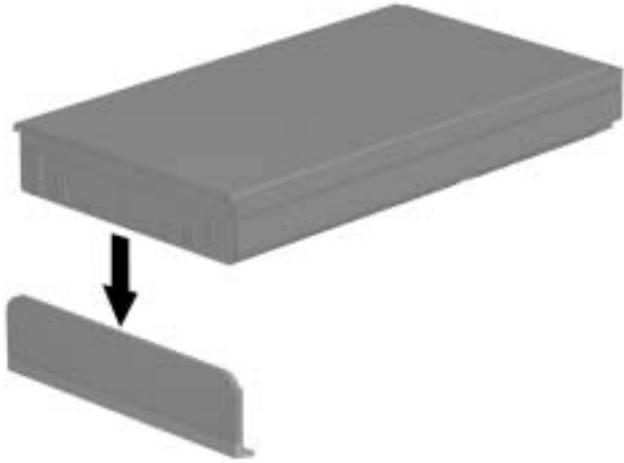
Figure 5-3. Removing the Battery Bezel

✎ Battery bezels are available with carbon finish for Evo Notebook N1000 models and silver finish for Presario 1500 models, and are included in the Miscellaneous Plastics/Hardware Kit, spare part number 285541-001.

Reverse the preceding procedures to install the battery bezel.

Optical Drives
Spare Part Number Information

24X Max CD-ROM drive	285526-001
8X Max DVD-ROM drive	285527-001
24X Max DVD-ROM/CD-RW combination drive	304691-001
8X Max DVD-ROM/CD-RW combination drive	285529-001

5. Remove the optical drive by following these steps:

   a. Turn the computer bottom side up with the left side facing forward.

   b. Remove the two TM2.5 × 5.0 screws that secure the optical drive to the base enclosure (Figure 5-4).
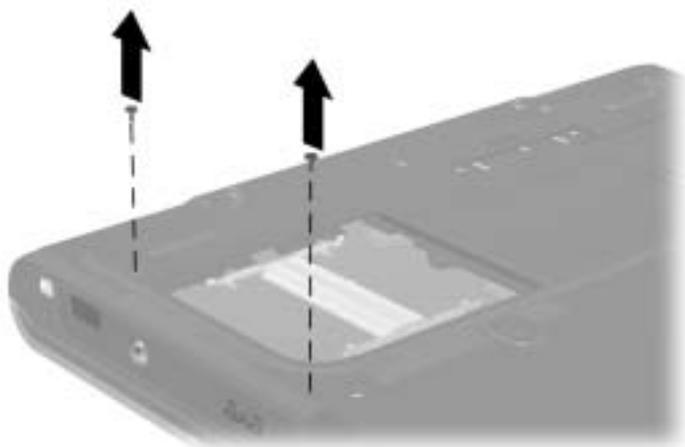
Figure 5-4. Removing the Optical Drive Screws

c. Turn the computer top side up with the right side facing forward.

d. Insert a paper clip or similar thin metal rod into the manual release hole on the front bezel of the optical drive ❶ (Figure 5-5). Press firmly.

e. Grasp the drive bezel and slide the drive out of the optical drive bay ❷.
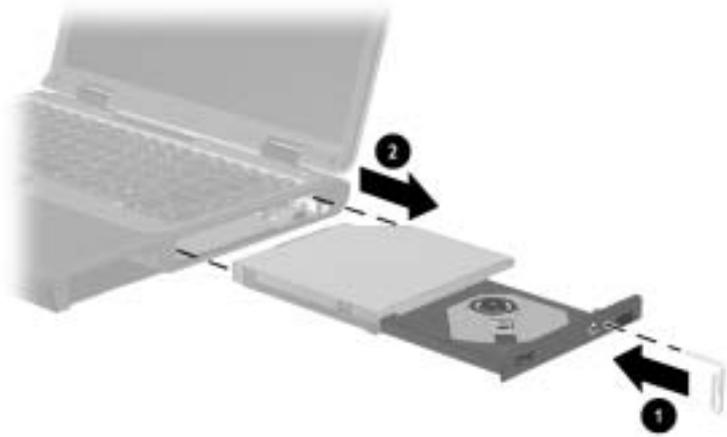
Figure 5-5. Removing an Optical Drive

Reverse the preceding procedures to install a optical drive.

Hard Drives
Spare Part Number Information

60 GB	303527-001
40 GB	273491-001
30 GB	192406-001
20 GB	288291-001

6. Remove the hard drive by following these steps:

   a. Turn the computer bottom side up with the right side facing forward.

   b. Remove the TM2.5 ×8.0 hard drive retention screw ❶ (Figure 5-6).

   c. Slide the hard drive forward ❷ to unseat the hard drive connector from the system board.
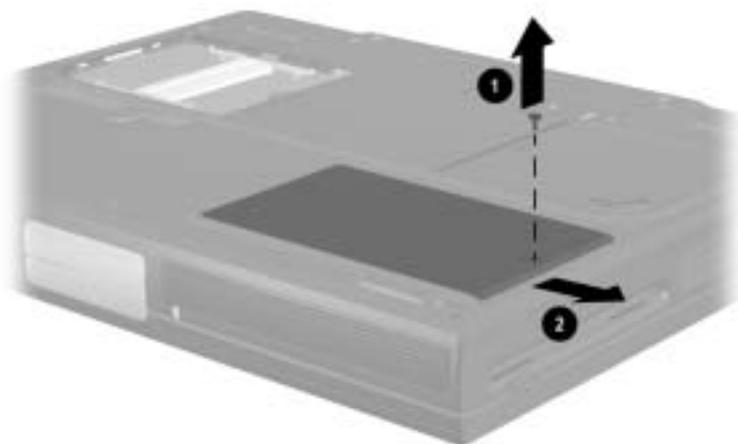
Figure 5-6. Removing the Hard Drive Screw

d. Lift the front edge of the hard drive ❶ until it rests at an angle (Figure 5-7).

e. Remove the hard drive from the hard drive bay ❷.
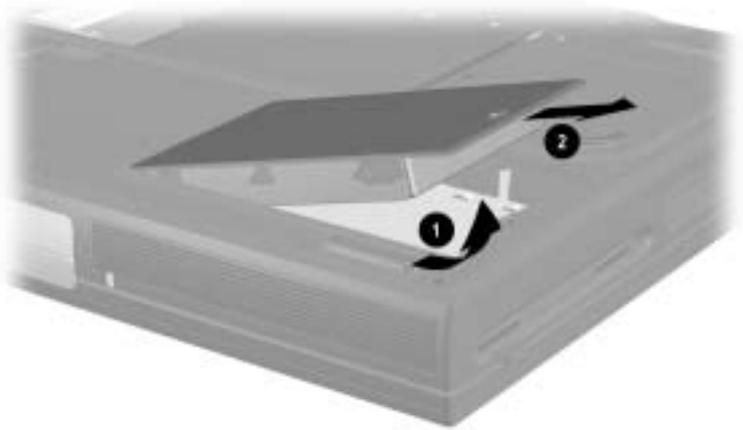
Figure 5-7. Removing the Hard Drive

7. Remove the four PM3.0 × 3.0 screws ❶ that secure the hard drive to the hard drive bracket (Figure 5-8).

8. Slide the hard drive out of the hard drive bracket ❷.
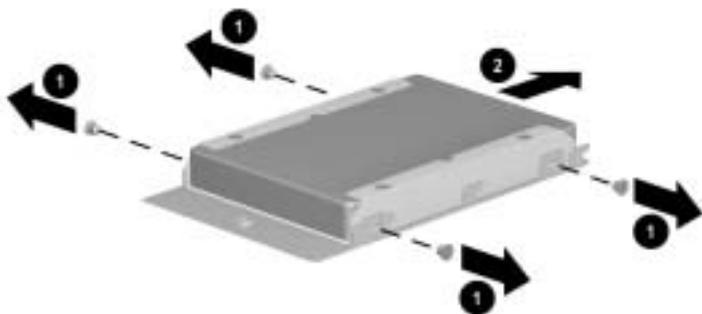
Figure 5-8. Removing the Hard Drive Bracket

✎ Hard drive brackets are available with carbon finish for Evo Notebook N1000 models and silver finish for Presario 1500 models, and are included in the Miscellaneous Plastics/Hardware Kit, spare part number 285541-001.

Reverse the preceding procedures to install the hard drive and hard drive bracket.

5.4 Computer Feet

The computer feet are adhesive-backed rubber pads. The computer feet are included in the Miscellaneous Plastics/Hardware Kit, spare part number 285541-001. The computer feet attach to the base enclosure as illustrated in Figure 5-9.
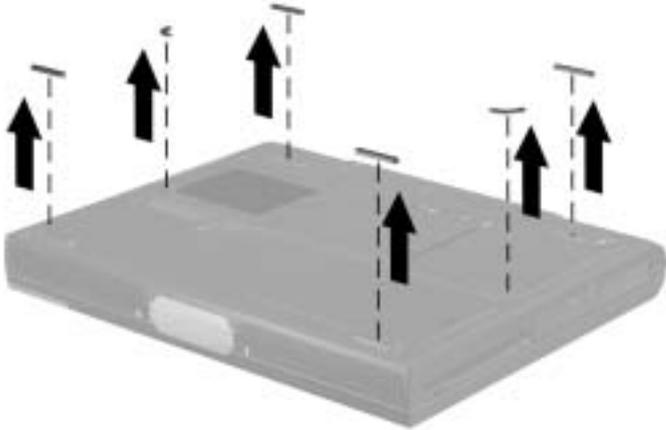
Figure 5-9. Replacing the Computer Feet

5.5 Memory Expansion Board

Memory Expansion Boards
Spare Part Number Information

512 MB	285524-001
256 MB	285523-001
128 MB	285222-001

1. Prepare the computer for disassembly (Section 5.3).

2. Turn the computer bottom side up with the front facing forward.

3. Remove the PM2.5 × 4.0 screw ❶ that secures the memory expansion compartment cover to the base enclosure (Figure 5-10).

4. Slide the cover to the right ❷.

5. Lift the right edge of the cover and swing it to the left ❸.

6. Remove the cover.
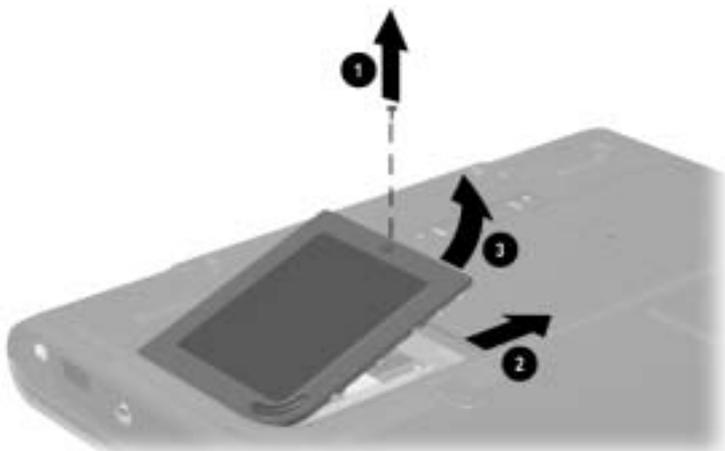
Figure 5-10. Removing the Memory Expansion Compartment Cover

✎ Memory expansion compartment covers are available with carbon finish for Evo Notebook N1000 models and silver finish for Presario 1500 models, and are included in the Miscellaneous Plastics/Hardware Kit, spare part number 285541-001.

7. Spread the memory expansion slot retaining tabs ❶ to release the memory expansion board. The board tilts up at a 45-degree angle (Figure 5-11).

8. Remove the board by pulling it away from the connector at a 45-degree angle ❷.
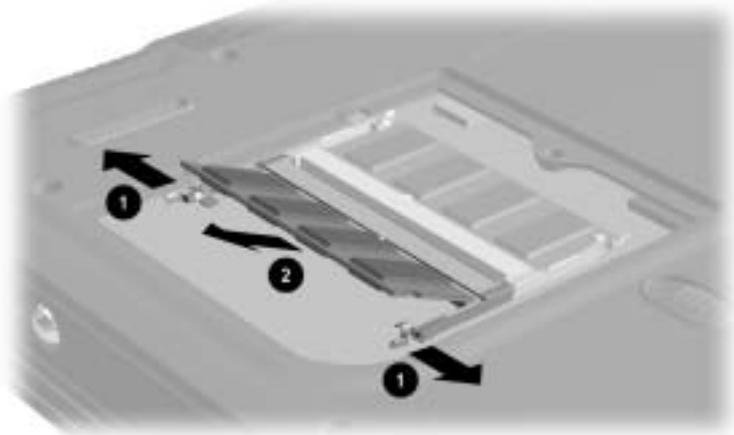
Figure 5-11. Removing a Memory Expansion Board

Reverse the preceding procedures to install a memory expansion board.

5.6 Mini PCI Communications Board

**Mini PCI Communication Boards
Spare Part Number Information**

U.S. modem	248776-001
International modem	285545-001

1. Prepare the computer for disassembly (Section 5.3).

2. Turn the computer bottom side up with the rear panel facing forward.

3. Remove the PM2.5 × 4.0 screw ❶ that secures the mini PCI compartment cover to the base enclosure (Figure 5-12).

4. Slide the cover to the left ❷.

5. Lift the left edge of the cover and swing it to the right ❸.

6. Remove the cover.
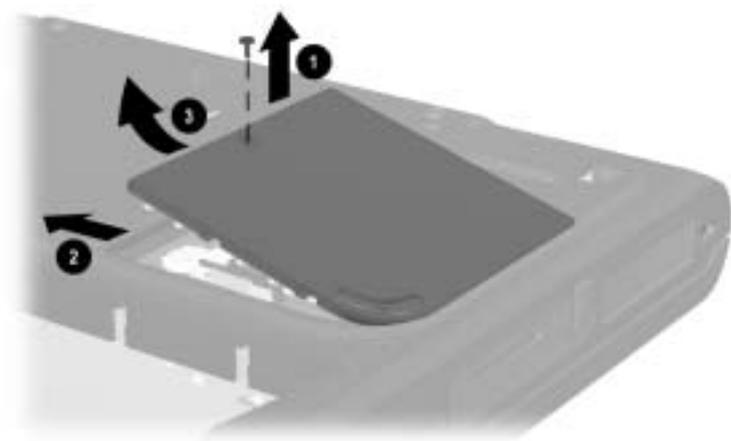
Figure 5-12. Removing the Mini PCI Communications Slot Cover

✎ Mini PCI compartment covers are available with carbon finish for Evo Notebook N1000 models and silver finish for Presario 1500 models, and are included in the Miscellaneous Plastics/Hardware Kit, spare part number 285541-001.

7. Disconnect the modem cable from the mini PCI
   communications board ❶ (Figure 5-13).

8. Spread the retaining tabs ❷ on each side of the mini PCI
   communications board. The board releases and rests at an
   angle.

9. Remove the board by pulling it away from the socket at an
   angle ❸.
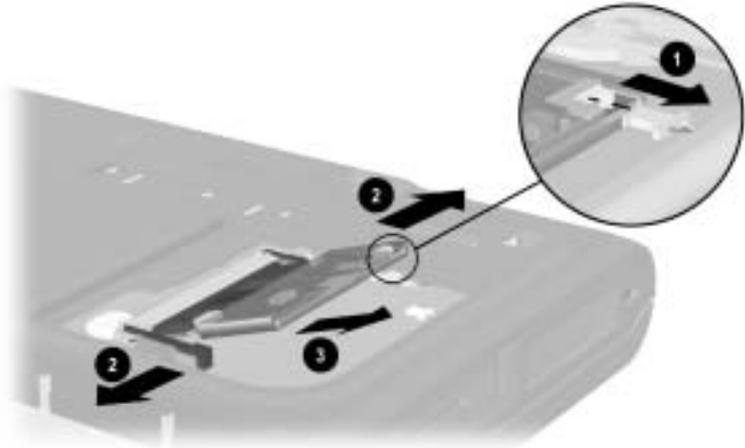
Figure 5-13. Removing a Mini PCI Communications Board

Reverse the preceding procedures to install a mini PCI
communications board.

5.7 Disk Cell RTC Battery

**Disk Cell RTC Battery
Spare Part Number Information**

Disk cell RTC battery	279769-001

1. Prepare the computer for disassembly (Section 5.3).

2. Remove the mini PCI compartment cover (Section 5.6).

3. Remove the RTC battery from its socket on the system board (Figure 5-14).
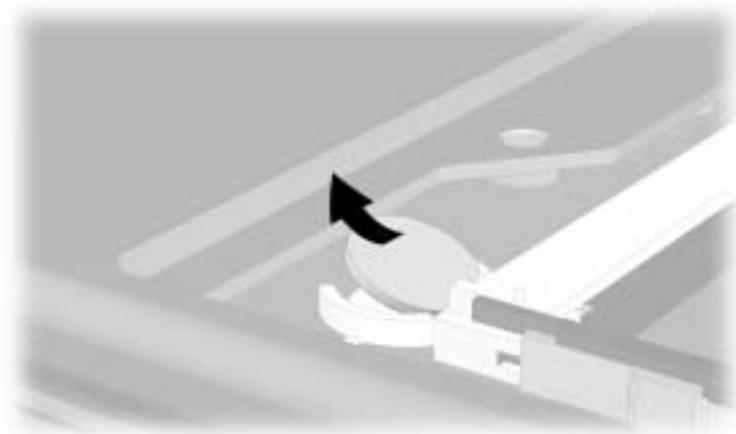
Figure 5-14. Removing the Disk Cell RTC Battery

✎ The computer uses a CR1220 lithium disk cell battery. When replacing the RTC battery, insert the battery with the "+" sign facing up.

5.8 Connector Cover

✎ The connector cover is available with carbon finish for Evo Notebook N1000 models and silver finish for Presario 1500 models, and are included in the Miscellaneous Plastics/Hardware Kit, spare part number 285541-001.

1. Prepare the computer for disassembly (Section 5.3).

2. Turn the computer bottom side up with the rear panel facing forward.

3. Remove the two TM2.5 × 5.0 screws ❶ that secure the connector cover to the base enclosure (Figure 5-15).

4. Open the connector cover ❷.

5. Remove the connector cover from the base enclosure ❸.
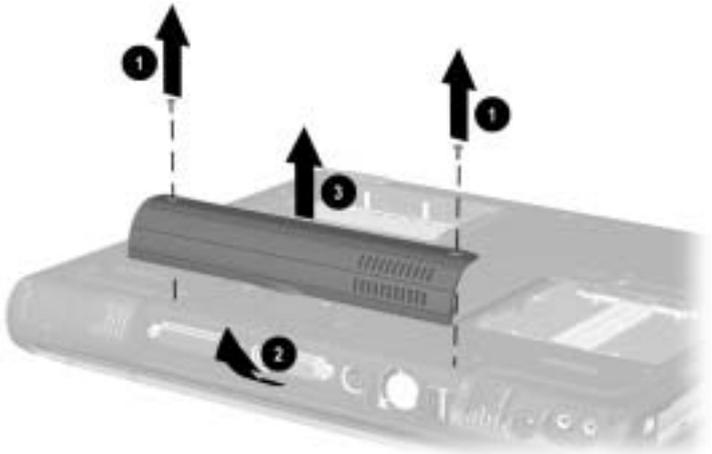
Figure 5-15. Removing the Connector Cover

Reverse the preceding procedures to install the connector cover.

5.9 LED Cover

LED Cover
Spare Part Number Information

LED cover	295736-001

1. Prepare the computer for disassembly (Section 5.3).

2. Turn the computer bottom side up with the rear panel facing forward.

3. Remove the two TM2.5 × 8.0 screws that secure the LED cover to the base enclosure (Figure 5-16).
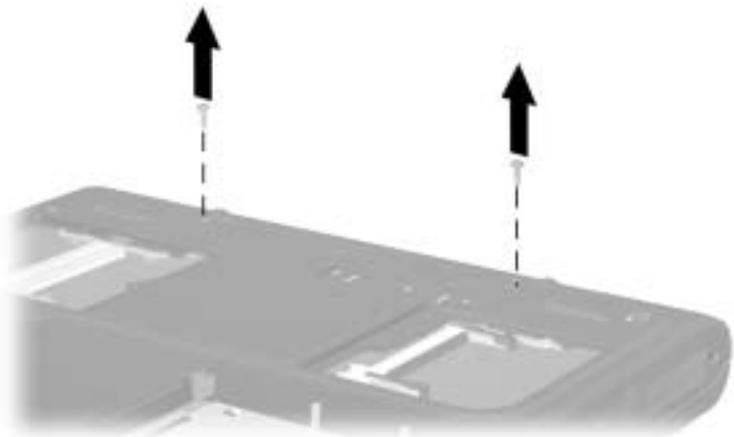
Figure 5-16. Removing the LED Cover Screws

4. Turn the computer top side up with the front facing forward.

5. Open the computer.

6. Press down and hold the **F1** and **F2** keys.

7. Insert a pointed tool into the notch in the LED cover ❶ between the **F1** and **F2** keys and lift up (Figure 5-17).

8. Press down and hold the **Pause** and **Scroll** keys.

9. Insert a pointed tool into the notch in the LED cover ❷ between the **Pause** and **Scroll** keys and lift up.

10. Remove the LED cover ❸.
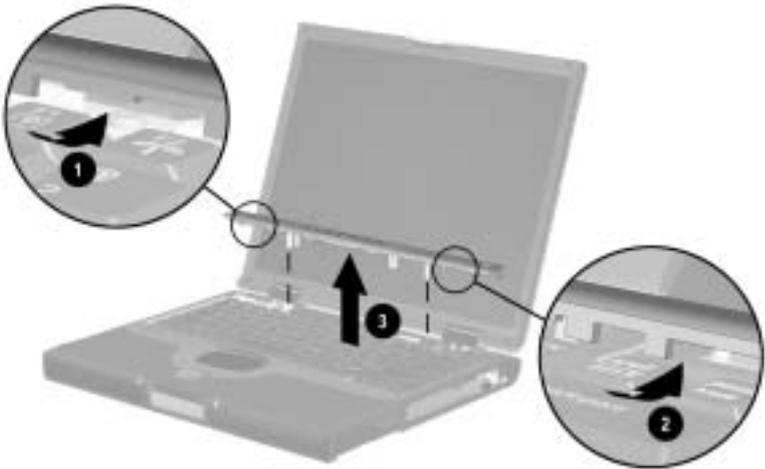
Figure 5-17. Removing the LED Cover

Reverse the preceding procedures to install the LED cover.

5.10 Keyboard

**Keyboards
Spare Part Number Information**

For use only with TouchPad notebook models

Arabic	285530-171	Korean	285530-AD1
Belgian	285530-181	Latin American Spanish	285530-161
Brazilian	285530-201	Norwegian	285530-091
Chinese	285530-AA1	Portuguese	285530-131
Czech	285530-221	Russian	285530-251
Danish	285530-081	Slovakian	285530-231
French	285530-051	Spanish	285530-071
French Canadian	285530-121	Swedish	285530-101
German	285530-041	Swiss	285530-111
Hebrew	285530-BB1	Taiwanese	285530-AB1
Hungarian	285530-211	Turkish	285530-141
International	285530-002	U.K. English	285530-031
Italian	285530-061	U.S. English	285530-001
Japanese	285530-291		

For use only with Dual Stick notebook models (includes pointing stick)

Arabic	285531-171	Latin American Spanish	285531-161
Belgian	285531-181	Norwegian	285531-091
Brazilian	285531-201	Portuguese	285531-131
Czech	285531-221	Russian	285531-251
Danish	285531-081	Slovakian	285531-231
French	285531-051	Spanish	285531-071
French Canadian	285531-121	Swedish	285531-101
German	285531-041	Swiss	285531-111
Hebrew	285531-BB1	Taiwanese	285531-AB1
Hungarian	285531-211	Thai	285531-281
International	285531-002	Turkish	285531-141
Italian	285531-061	U.K. English	285531-031
Japanese	285531-291	U.S. English	285531-001
Korean	285531-AD1		

1. Prepare the computer for disassembly (Section 5.3).

2. Remove the LED cover (Section 5.9).

3. Lift the back edge of the keyboard and swing it forward until it rests on the palm rest (Figure 5-18).

Figure 5-18. Releasing the Keyboard

4. Release the ZIF connector ❶ to which the keyboard cable is
   connected and disconnect the keyboard cable ❷ from the
   system board (Figure 5-19).

✎ Dual Stick notebook models have an additional cable that must
be disconnected. Release the ZIF connector ❸ to which the
keyboard-to-TouchPad cable is attached and disconnect the
cable ❹ from the keyboard.

Figure 5-19. Disconnecting the Keyboard-to-TouchPad Cable

5. Remove the keyboard.

Reverse the preceding procedures to install the keyboard.

5.11 Heat Spreader

**Heat Spreaders
Spare Part Number Information**

For use only on Evo Notebook N1000 models	291648-001
For use only on Presario 1500 models	285544-001

1. Prepare the computer for disassembly (Section 5.3).

2. Remove the LED cover (Section 5.9).

3. Remove the keyboard (Section 5.10).

4. Disconnect the fan cable ❶ from the system board
   (Figure 5-20).

5. Remove the following screws:

   ❏ One TM2.5 × 5.0 screw ❷ next to the fan

   ❏ One TM2.5 × 5.0 screw ❸ that secures the display video
   cable ground loop

   ❏ Four spring-loaded TM2.5 × 14.0 shoulder screws ❹

✎ The four spring-loaded shoulder screws should be removed and
installed in the "1," "2," "3," "4" sequence stamped on the heat
spreader adjacent to each screwhole.

   ❏ One TM2.5 × 8.0 screw ❺ next to the keyboard and
   TouchPad ZIF connectors
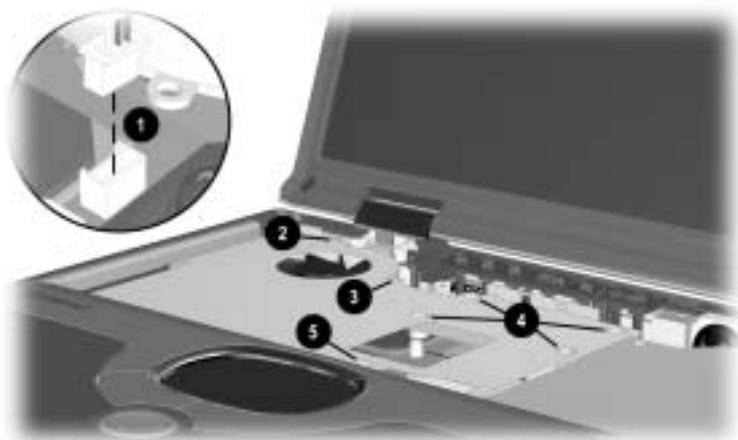
Figure 5-20. Removing the Heat Spreader Screws

6. Remove the display video cable ❶ from the routing channel in the heat spreader (Figure 5-21).

7. Lift the right side of the heat spreader until it rests at an angle ❷.

8. Slide the heat spreader to the right at an angle ❸ and remove the heat spreader from the base enclosure.
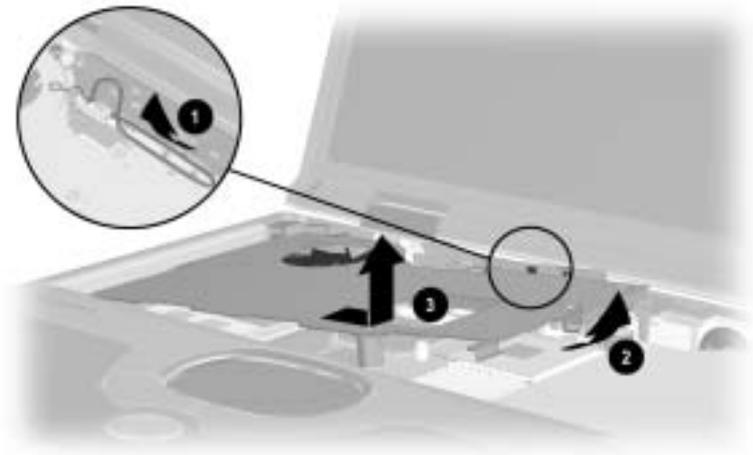
Figure 5-21. Removing the Heat Spreader

Reverse the preceding procedures to install the heat spreader.

5.12 Processor

**Processors
Spare Part Number Information**

Intel Mobile Pentium 4 2.2-GHz processor with SpeedStep technology (P4-M)	286753-001
Intel Mobile Pentium 4 2.0-GHz processor with SpeedStep technology (P4-M)	286752-001
Intel Mobile Pentium 4 1.8-GHz processor with SpeedStep technology (P4-M)	286751-001
Intel Mobile Pentium 4 1.7-GHz processor with SpeedStep technology (P4-M)	285519-001
Intel Mobile Pentium 4 1.6-GHz processor with SpeedStep technology (P4-M)	285518-001
Intel Mobile Pentium 4 1.5-GHz processor with SpeedStep technology (P4-M)	285517-001
Intel Mobile Pentium 4 1.6-GHz processor (P4-C)	303725-001
Intel Mobile Pentium 4 1.5-GHz processor (P4-C)	303724-001
Intel Celeron 1.5-GHz processor	301643-001
Intel Celeron 1.4-GHz processor	303528-001

1. Prepare the computer for disassembly (Section 5.3) and remove the following components:

   a. LED cover (Section 5.9)

   b. Keyboard (Section 5.10)

   c. Heat spreader (Section 5.11)

2. Slide the left end of the processor release bar ❶ forward until it clears the clip on the processor bracket (Figure 5-22).

3. Swing the processor release bar up and to the right ❷ until it rests in an upright position.

4. Lift the processor straight up ❸ and remove it from the processor socket.

✎ When installing the processor, make sure the gold triangle ❹ is in the lower right corner.
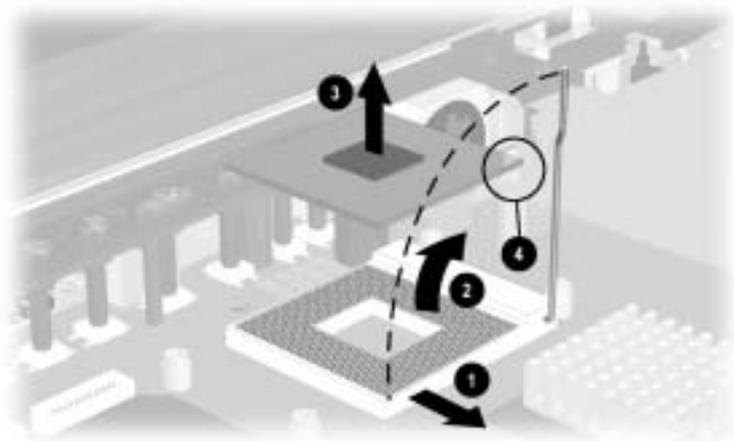
Figure 5-22. Removing the Processor

Reverse the preceding procedures to install the processor.

5.13 Display

Displays
Spare Part Number Information

Contain parts with carbon finish for use with Evo Notebook N1000 models	
15.0-inch, TFT, SXGA+	291643-001
15.0-inch, TFT, XGA	291642-001
14.1-inch, XGA	291641-001
Contain parts with silver finish for use with Presario 1500 models	
15-inch, TFT, SXGA+	286754-001
15-inch, TFT, XGA	285521-001
14-inch, TFT, XGA	285520-001
Display inverter board (not illustrated)	293348-001

1. Prepare the computer for disassembly (Section 5.3).

2. Remove the LED cover (Section 5.9).

3. Remove the keyboard (Section 5.10).

4. Remove the TM2.5 × 5.0 screw ❶ that secures the display video ground cable to the heat spreader (Figure 5-23).

5. Disconnect the display video cable ❷ from the system board.

6. Remove the display video cable from the routing channels in the heat spreader and the top cover ❸.

7. Remove the TM2.5 × 5.0 screw ❹ that secures the display inverter ground cable to the heat spreader.

8. Disconnect the display inverter cable ❺ from the system board.
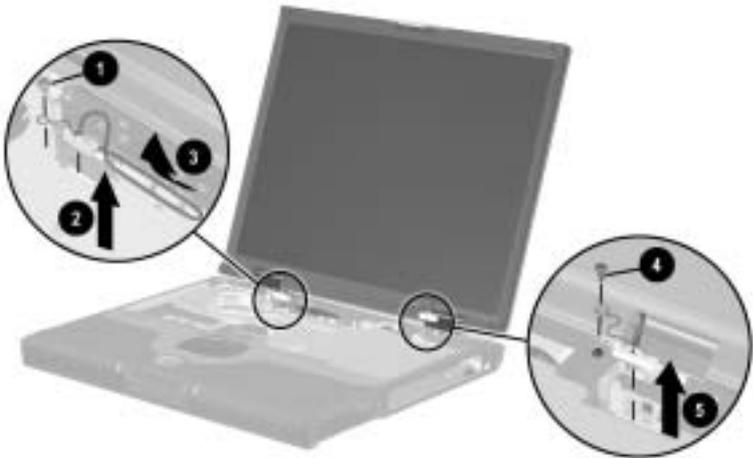
Figure 5-23. Removing the Display Screws and Disconnecting the Display Cables

⚠ **CAUTION:** Make sure the display is supported when removing the following screws. The display is secured to the computer only by these screws and will fall if not supported during screw removal.

9. Remove the four TM2.5 × 9.0 screws ❶ that secure the display to the base enclosure (Figure 5-24).

10. Remove the display from the base enclosure ❷.

Figure 5-24. Removing the Display

11. If necessary, remove the display hinge covers by pressing up on the bottom of the covers from behind the display assembly (Figure 5-25). Note that the hinge covers are not interchangeable.
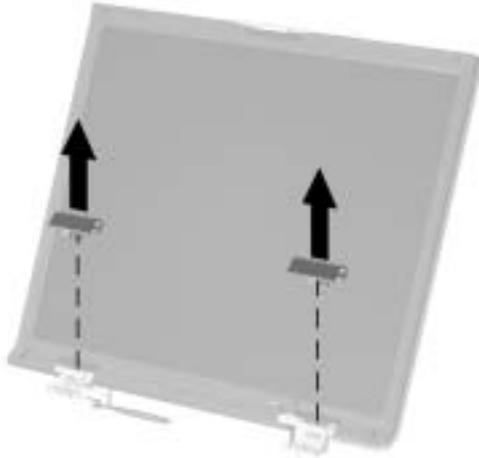
Figure 5-25. Removing the Display Hinge Covers

✎ The display hinge covers are included in the Miscellaneous Plastics/Hardware Kit, spare part number 285541-001.

When installing the display, install the screws in the "1," "2," "3," "4" sequence shown in the Figure 5-26.

Figure 5-26. Installing the Display Screws

5.14 Palm Rest

**Palm Rests
Spare Part Number Information**

Contains parts with carbon finish for use with Evo Notebook N1000 models	
For use only with TouchPad notebook models	291645-001
For use only with Dual Stick notebook models	291646-001
Contains parts with silver finish for use with Presario 1500 models	
For use only with TouchPad notebook models	285533-001
For use only with Dual Stick notebook models	285534-001

✎ When replacing the palm rest, ensure that the following components are removed from the old palm rest and installed on the new palm rest:

- Diskette drive (Section 5.15)
- TouchPad components (Section 5.16)
- Display release assembly (Section 5.17)

1. Prepare the computer for disassembly (Section 5.3).

2. Close the computer.

3. Turn the computer bottom side up with the front facing forward.

4. Remove the five TM2.5 × 8.0 screws ❶ that secure the palm rest to the base enclosure (Figure 5-27).

5. Remove the TM2.5 × 5.0 screw ❷ that secures the palm rest to the base enclosure in the battery bay.
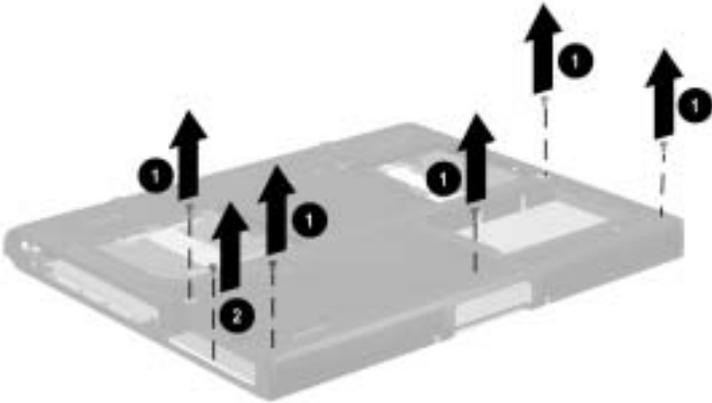
Figure 5-27. Removing the Palm Rest Screws

6. Turn the computer top side up with the front facing forward.

7. Open the computer.

8. Lift the front edge of the palm rest and swing it up and back ❶ until it rests on the top cover (Figure 5-28).

9. Release the ZIF connector to which the diskette drive cable is attached ❷ and disconnect the diskette drive cable ❸ from the system board.

10. Release the ZIF connector to which the system board-to-TouchButton board cable is attached ❹ and disconnect the cable ❺ from the TouchButton board.
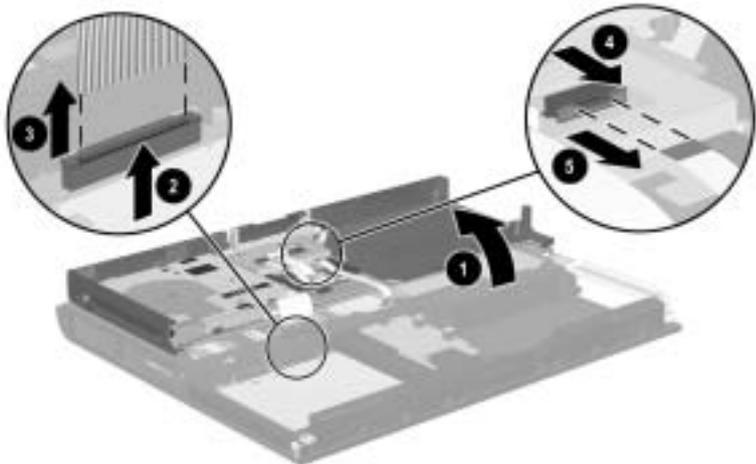
Figure 5-28. Removing the Palm Rest

✎ Dual Stick notebook models have an additional cable that must be disconnected. Release the ZIF connector ❶ to which the keyboard-to-TouchPad cable is attached and disconnect the cable ❷ from the TouchPad (Figure 5-29).
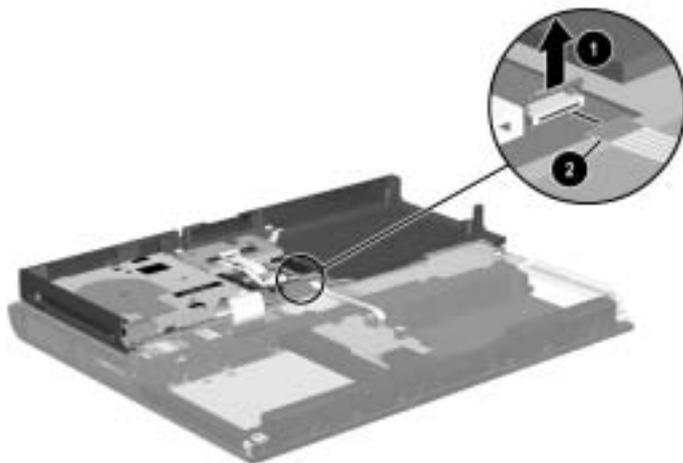
Figure 5-29. Disconnecting the Keyboard-to-TouchPad Cable

✎ The keyboard-to-TouchPad cable is included in the Miscellaneous Cable Kit, spare part number 285540-001.

11. Remove the palm rest from the base enclosure.

Reverse the preceding procedures to install the palm rest.

5.15 Diskette Drive

Diskette Drives
Spare Part Number Information

For use with TouchPad only notebook models	285539-001
For use with Dual Stick notebook models	291647-001
The diskette drive cable is included in Miscellaneous Cable Kit, spare part number 285540-001	

1. Prepare the computer for disassembly (Section 5.3).

2. Remove the palm rest (Section 5.14).

3. Turn the palm rest bottom side up with the speaker grilles facing away from you.

4. Remove the three TM2.5 × 5.0 screws ❶ that secure the diskette drive to the palm rest (Figure 5-30).

5. Remove the diskette drive ❷ from the palm rest.
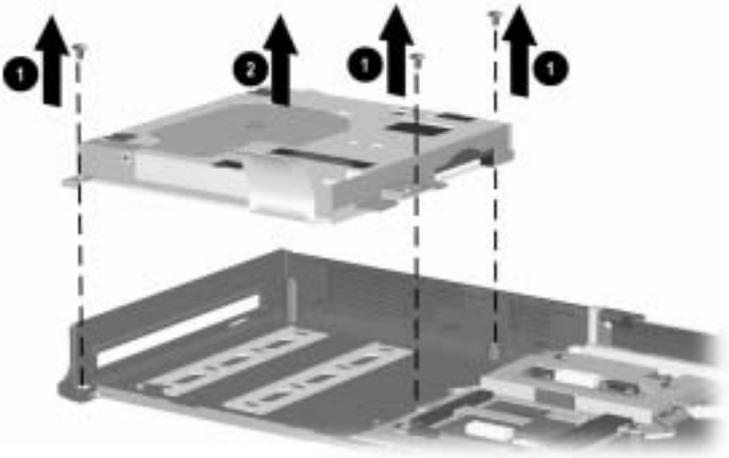
Figure 5-30. Removing the Diskette Drive

6. Release the ZIF connector ❶ to which the diskette drive cable is connected and disconnect the diskette drive cable ❷ from the drive (Figure 5-31).

7. Remove the diskette drive cable.
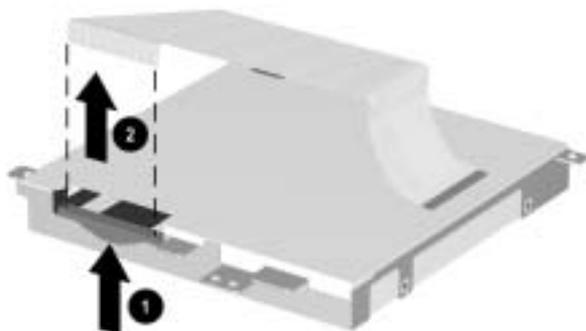
Figure 5-31. Removing the Diskette Drive Cable

Reverse the preceding procedures to install the diskette drive.

5.16 TouchPad Components

**TouchPad Components
Spare Part Number Information**

The TouchPad components for TouchPad notebook models consist of the TouchPad, TouchPad bracket, and TouchButton board. These components are different than the corresponding components for the Dual Stick notebook models.

The TouchPad components for Dual Stick notebook models consist of the TouchPad, TouchPad bracket, TouchButton board, and the pointing stick board.

All TouchPad components are included with the appropriate palm rest for each notebook model. Refer to item 7, "Palm rests," for more information.

All TouchPad component cables are included in the Miscellaneous Cable Kit. Refer to item 5, "Miscellaneous Cable Kit," for more information.

1. Prepare the computer for disassembly (Section 5.3).

2. Remove the palm rest (Section 5.14).

3. Remove the diskette drive (Section 5.15).

4. Turn the palm rest bottom side up with the speaker grilles facing away from you.

5. Disconnect both ends of the TouchPad-to-TouchButton board cable ❶ from the low insertion force (LIF) connectors on the TouchPad ❷ and TouchButton board ❸ (Figure 5-32).

6. Remove the TouchPad-to-TouchButton board cable.
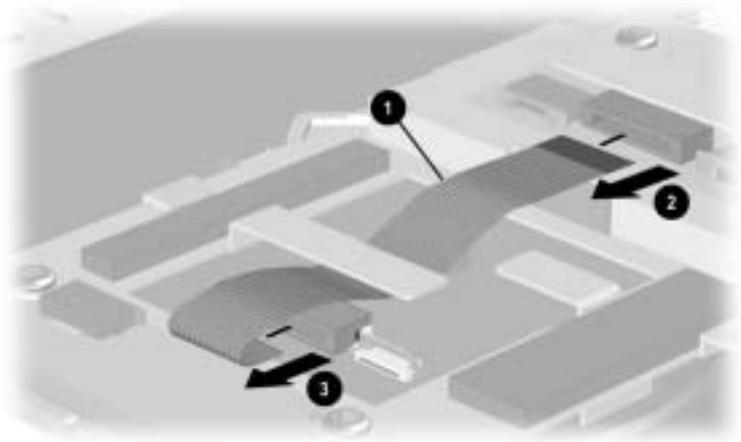
Figure 5-32. Removing the TouchPad-to-TouchButton Board Cable

7. Remove the four TM2.5 × 5.0 screws ❶ that secure the TouchPad, TouchButton board, and TouchPad bracket to the palm rest (Figure 5-33).

8. Remove the TouchPad bracket ❷, TouchButton board ❸, and TouchPad ❹ from the palm rest.
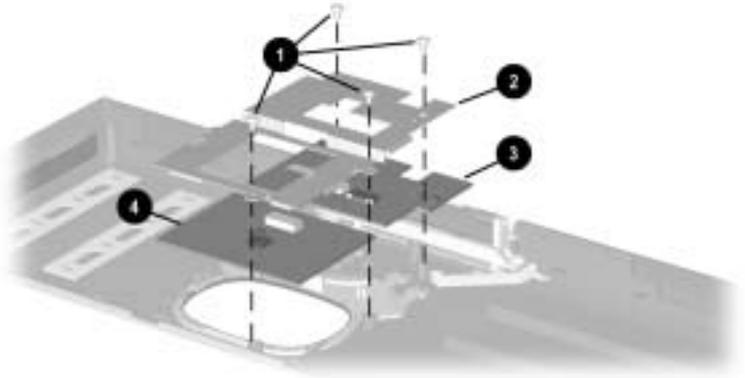
Figure 5-33. Removing the TouchPad Components on TouchPad Models

✎ Dual Stick notebook models have a different TouchPad configuration. An additional cable, screw, and board must be removed. Steps 9 through 13 apply to Dual Stick models only.

9. Release the ZIF connector ❶ on the pointing stick board to which the TouchButton board-to-pointing stick board cable is attached and disconnect the cable ❷ (Figure 5-34).

10. Release the ZIF connector ❸ on the TouchButton board to which the TouchButton board-to-pointing stick board cable is attached and disconnect the cable ❹.

11. Disconnect both ends of the TouchPad-to-TouchButton board cable from the LIF connectors on the TouchButton board ❺ and TouchPad ❻.
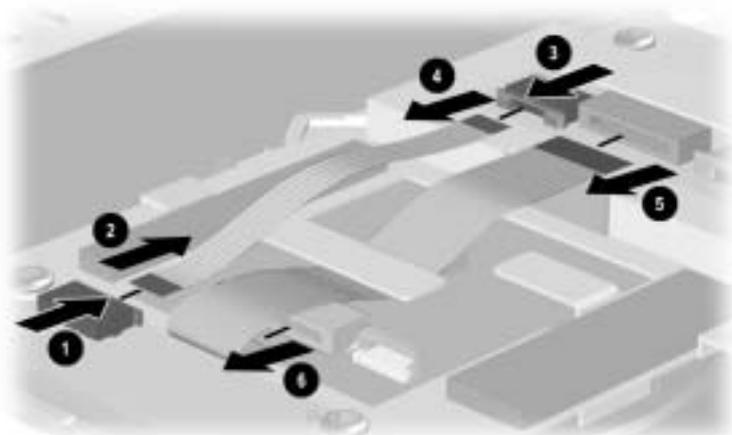
Figure 5-34. Disconnecting the TouchPad-to-TouchButton Board and TouchButton Board-to-Pointing Stick Board Cables

12. Remove the five TM2.5 × 5.0 screws ❶ that secure the TouchPad, TouchButton board, TouchPad bracket, and pointing stick board to the palm rest (Figure 5-35).

13. Remove the TouchPad bracket ❷, pointing stick board ❸, TouchPad ❹, and TouchButton board ❺ from the palm rest.
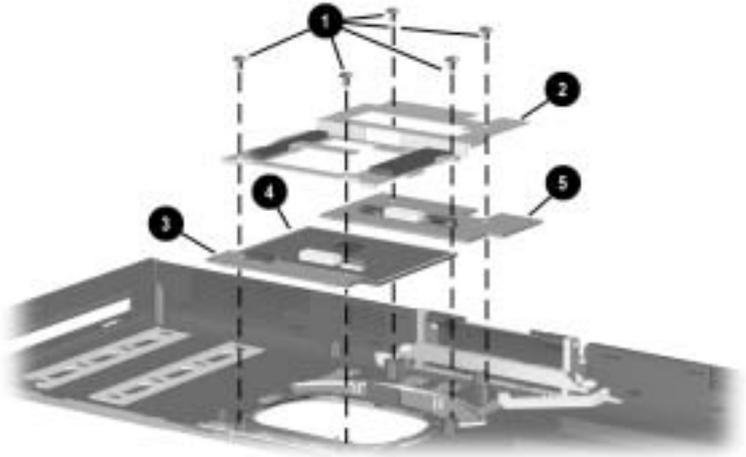
Figure 5-35. Removing the TouchPad Components on Dual Stick Models

Reverse the preceding procedures to install the TouchPad components.

5.17 Display Release Assembly

✎ The display release assembly is included in the Miscellaneous Plastics/Hardware Kit, spare part number 285541-001.

1. Prepare the computer for disassembly (Section 5.3).

2. Remove the palm rest (Section 5.14).

3. Turn the palm rest bottom side up with the speaker grilles facing forward.

4. Remove the two TM2.5 × 5.0 screws ❶ that secure the display release assembly to the palm rest (Figure 5-36).

5. Remove the assembly ❷ from the palm rest.
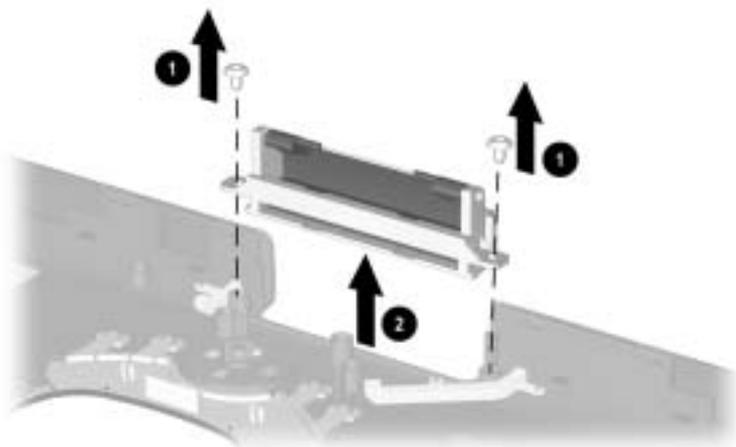
Figure 5-36. Removing the Display Release Assembly

Reverse the preceding procedures to install the display release assembly.

5.18 Charger Board

**Charger Board
Spare Part Number Information**

Charger board   285525-001

The charger board shield is included in the Miscellaneous
Plastics/Hardware Kit, spare part number 285541-001.

1. Prepare the computer for disassembly (Section 5.3).

2. Remove the palm rest (Section 5.14).

3. Remove the three TM2.5 × 5.0 screws ❶ that secure the
   charger board to the base enclosure (Figure 5-37).

4. Lift the front edge of the charger board shield ❷ until it clears
   the base enclosure, then slide the shield forward to remove it.

5. Lift up on the back edge of the charger board ❸ to disconnect it from the system board.

6. Remove the charger board ❹ from the base enclosure.
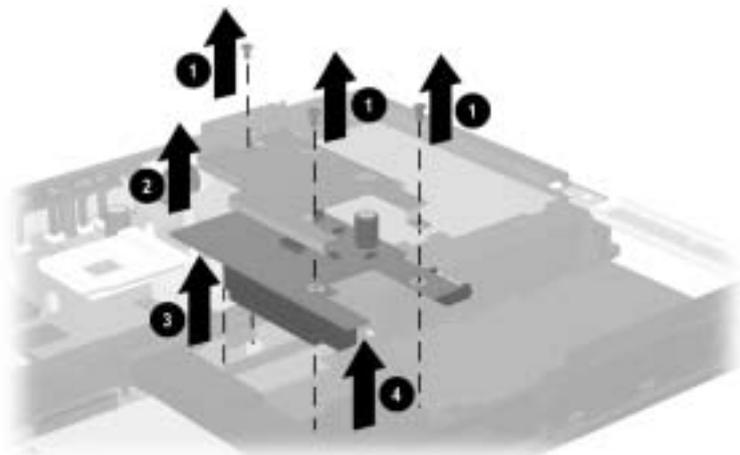
Figure 5-37. Removing the Charger Board

Reverse the preceding procedures to install the charger board.

5.19 Speaker Assembly

**Speaker Assembly
Spare Part Number Information**

Speaker assembly	285538-001

1. Prepare the computer for disassembly (Section 5.3).

2. Remove the palm rest (Section 5.14).

3. Remove the charger board (Section 5.18).

4. Disconnect the speaker cable ❶ from the system board (Figure 5-38).

5. Swing the battery bay support bracket ❷ to the right until it clears the right edge of the speaker assembly.

6. Lift the front edge of the speaker assembly until it rests at an angle ❸.

7. Slide the speaker assembly forward and remove it ❹ from the base enclosure.
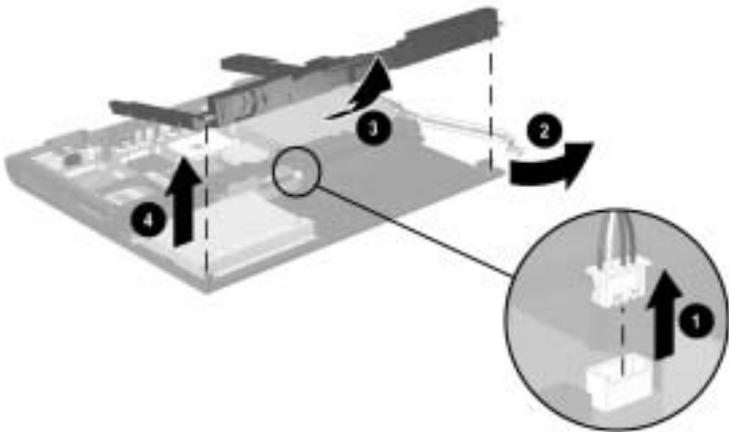
Figure 5-38. Removing the Speaker Assembly

Reverse the preceding procedures to install the speaker assembly.

5.20 Top Cover

**Top Cover
Spare Part Number Information**

Top cover	285535-001

✎ When replacing the top cover, ensure that the microphone is removed from the old top cover and installed on the new top cover.

1. Prepare the computer for disassembly (Section 5.3) and remove the following components:

   a. LED cover (Section 5.9)

   b. Keyboard (Section 5.10)

   c. Heat spreader (Section 5.11)

   d. Display (Section 5.13)

   e. Palm rest (Section 5.14)

2. Turn the base enclosure bottom side up with the rear panel facing forward.

3. Remove the two TM2.5 × 8.0 screws that secure the top cover to the base enclosure (Figure 5-39).
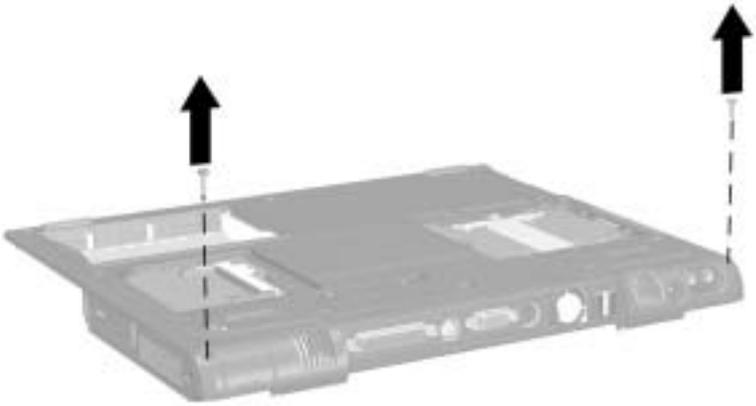
Figure 5-39. Removing the Top Cover Screws

4. Turn the base enclosure top side up with the front facing forward.

5. Remove the three TM2.5 × 5.0 screws ❶ that secure the top cover to the base enclosure (Figure 5-40).

6. Lift the top cover straight up ❷ approximately one inch, then slide it forward ❸ until the microphone cable ❹ is exposed.

7. Disconnect the microphone cable ❺ from the system board.

8. Remove the microphone ❻ from the top cover.

9. Remove the top cover from the base enclosure.
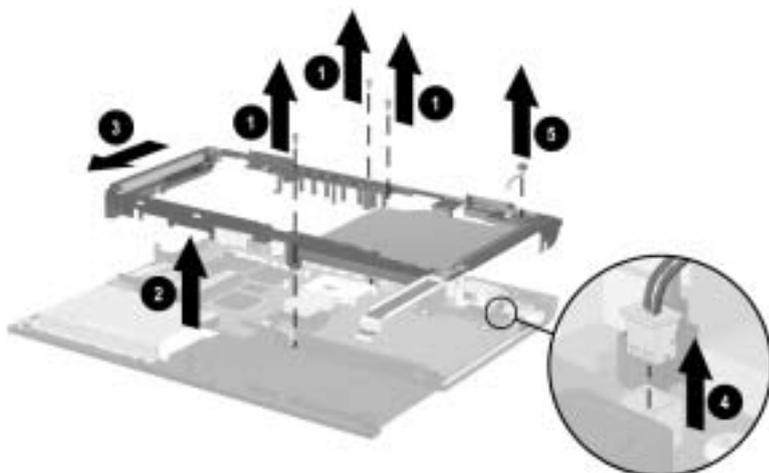
Figure 5-40. Removing the Top Cover and Microphone

✎ The microphone is included in the Miscellaneous Cable Kit, spare part number 285540-001.

✎ After the top cover is removed, the system board-to-TouchButton board cable can be removed. The system board-to-TouchButton board cable is included in the Miscellaneous Cable Kit, spare part number 285540-001.

10. Release the ZIF connector ❶ to which the system board-to-TouchButton board cable is attached and disconnect the cable ❷ from the system board (Figure 5-41).
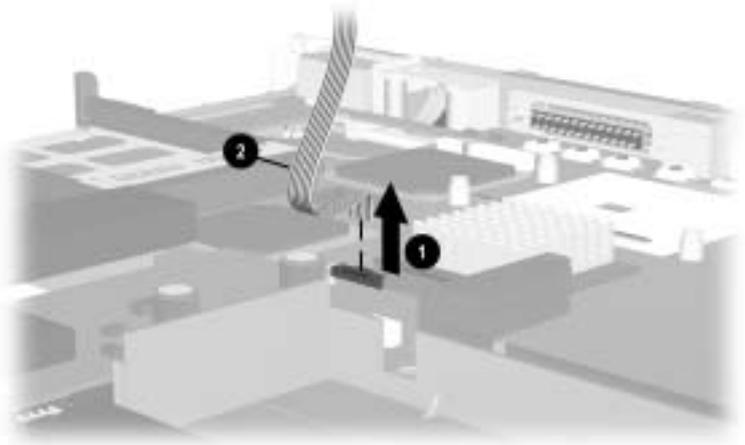
Figure 5-41. Removing the System Board-to-TouchButton Board Cable

Reverse the preceding procedures to install the top cover.

5.21 Fan

Fan **Spare Part Number Information**	
Fan	285543-001

1. Prepare the computer for disassembly (Section 5.3) and remove the following components:

   a. LED cover (Section 5.9)

   b. Keyboard (Section 5.10)

   c. Heat spreader (Section 5.11)

   d. Display (Section 5.13)

   e. Palm rest (Section 5.14)

   f. Top cover (Section 5.20)

2. Disconnect the fan cable ❶ from the system board (Figure 5-42).

3. Remove the fan ❷ from the base enclosure.
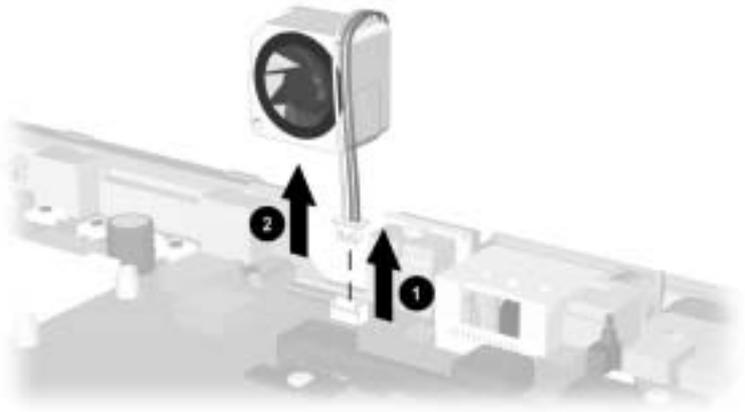
Figure 5-42. Removing the Fan

Reverse the preceding procedures to install the fan.

5.22 System Board

**System Board
Spare Part Number Information**

System board (does not contain memory)   285515-001

✎ When replacing the system board, ensure that the following
components are removed from the old system board and installed
on the new system board:

■ Memory expansion boards (Section 5.5)

■ Mini PCI communications board (Section 5.6)

■ Disk cell RTC battery (Section 5.7)

■ Processor (Section 5.12)

■ Modem cable (Section 5.23)

1. Prepare the computer for disassembly (Section 5.3) and
   remove the following components:

   a. LED cover (Section 5.9)

   b. Keyboard (Section 5.10)

   c. Heat spreader (Section 5.11)

   d. Display (Section 5.13)

   e. Palm rest (Section 5.14)

   f. Charger board and shield (Section 5.18)

   g. Speaker assembly (Section 5.19)

   h. Top cover, microphone, and TouchPad cable
      (Section 5.20)

   i. Fan (Section 5.21)

2. Remove the two TM2.5 × 5.0 screws ❶ that secure the optical drive front alignment rail to the base enclosure (Figure 5-43).

3. Remove the front alignment rail ❷ from the base enclosure.

4. Remove the two TM2.5 × 5.0 screws ❸ that secure the optical drive rear alignment rail to the base enclosure.

5. Remove the rear alignment rail ❹ from the base enclosure.
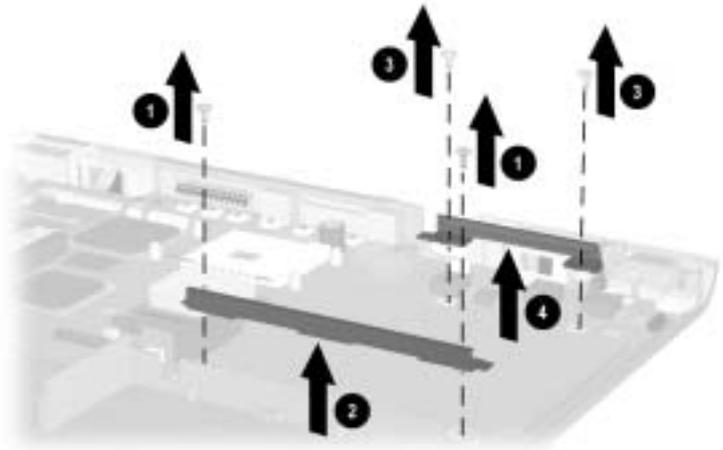
Figure 5-43. Removing the Optical Drive Alignment Rails

✎ The optical drive alignment rails are included in the Miscellaneous Plastics/Hardware Kit, spare part number 285541-001.

6. Remove the following screws:

❏ TM2.5 × 5.0 screw ❶ next to the PC Card assembly
(Figure 5-44)

❏ TM2.5 × 5.0 screw ❷ next to the RJ-11 and
RJ-45 connectors

❏ TM2.5 × 5.0 screw ❸ next to the audio connectors
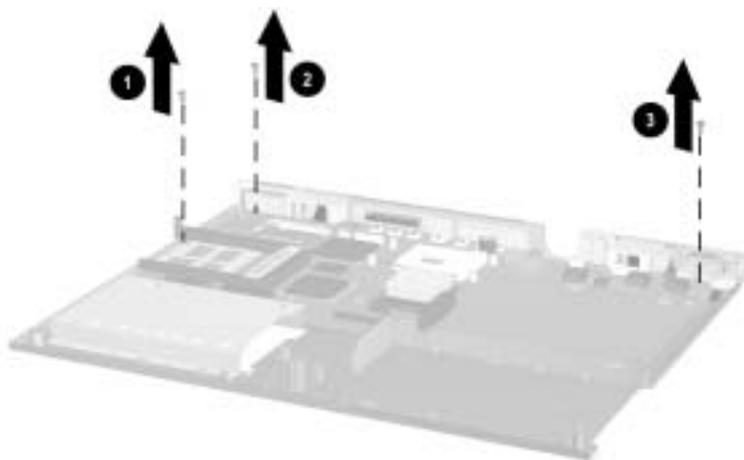
Figure 5-44. Removing the System Board Screws

7. Lift the front edge of the system board until it rests at an angle ❶ (Figure 5-45).

8. Slide the system board forward ❷ and remove it from the base enclosure.
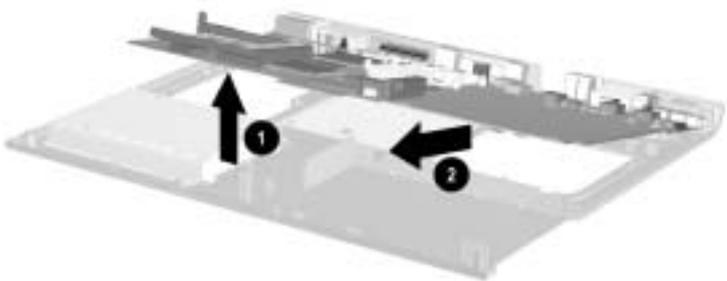
Figure 5-45. Removing the System Board

Reverse the preceding procedures to install the system board.

5.23 Modem Cable

✎ The modem cable is included in the Miscellaneous Cable Kit, spare part number 285540-001.

1. Prepare the computer for disassembly (Section 5.3) and remove the following components:

   a. LED cover (Section 5.9)

   b. Keyboard (Section 5.10)

   c. Heat spreader (Section 5.11)

   d. Display (Section 5.13)

   e. Palm rest (Section 5.14)

   f. Top cover (Section 5.20)

   g. Fan (Section 5.21)

   h. System board (Section 5.22)

2. Turn the system board bottom side up with the rear panel facing forward.

3. Remove the PM2.0 × 4.5 screw ❶ that secures the modem ground cable to the system board (Figure 5-46).

4. Disconnect the modem cable ❷ from the system board.

5. Remove the cable from the clips ❸ on the system board.
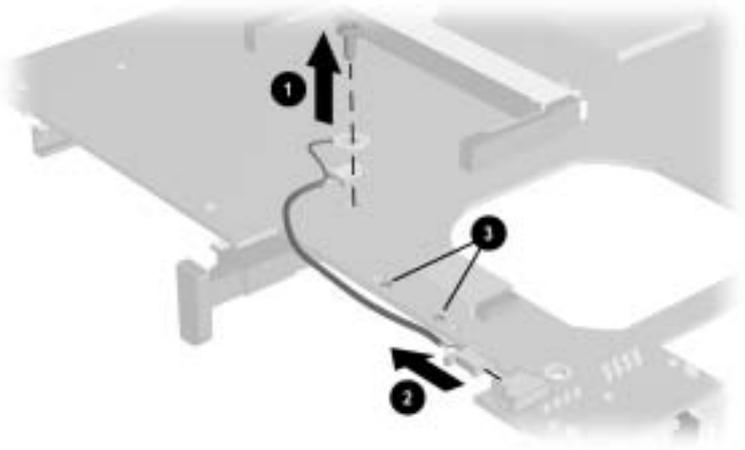
Figure 5-46. Removing the Modem Cable

Reverse the preceding procedures to install the modem cable.

6

Specifications

This chapter provides physical and performance specifications.

<table>
<tr><td colspan="3" align="center">**Table 6-1**
Notebook</td></tr>
<tr><td colspan="3">**Dimensions**</td></tr>
<tr><td>Height</td><td>3.94 cm</td><td>1.55 in</td></tr>
<tr><td>Width</td><td>32.74 cm</td><td>12.89 in</td></tr>
<tr><td>Depth</td><td>26.75 cm</td><td>10.53 in</td></tr>
<tr><td colspan="3">**Weight (varies by notebook configuration)**</td></tr>
<tr><td>with 15.1-inch display and Intel Pentium 4 processor</td><td>3.22 kg</td><td>7.09 lb</td></tr>
<tr><td>with 14.1-inch display and Intel Pentium 4 processor</td><td>3.09 kg</td><td>6.82 lb</td></tr>
<tr><td>with 15.1-inch display and Intel Celeron processor</td><td>3.12 kg</td><td>6.87 lb</td></tr>
<tr><td>with 15.1-inch display and Intel Celeron processor</td><td>2.99 kg</td><td>6.60 lb</td></tr>
</table>

Table 6-1
Notebook *(Continued)*

Stand-alone power requirements

Nominal operating voltage	14.4 V (8 cell)
Average operating power	29.7 W desktop
Peak operating power	80 W on AC, 55 W on DC
Power in Suspend mode	< 1000 mW
Power in Hibernation mode	< 100 mW

Temperature

Operating	10° to 35° C	50° to 95° F
Nonoperating	-10° to 60° C	14° to 140° F

Relative humidity (noncondensing)

Operating	10% to 90%
Nonoperating	5% to 90%, 38.7° C (101.6° F) maximum wet bulb temperature

Table 6-1
Notebook *(Continued)*

Altitude (unpressurized)

Operating	0 to 3,048 m	0 to 10,000 ft
Nonoperating	0 to 9,144 m	0 to 30,000 ft

Shock

Operating	10 G, 11 ms, half-sine
Nonoperating	60 G, 11 ms, half-sine

Vibration

Operating	0.5 G zero-to-peak, 10 to 500 Hz, 0.25 oct/min sweep rate
Nonoperating	1.0 G zero-to-peak, 10 to 500 Hz, 0.5 oct/min sweep rate

✎ Applicable product safety standards specify thermal limits for plastic surfaces. The computer operates well within this range of temperatures.

Table 6-2
15.0-inch SXGA+, TFT Display

Dimensions

Height	22.86 cm	9.00 in
Width	29.97 cm	11.80 in
Diagonal	38.10 cm	15.00 in

Number of colors	Up to 16.8 million

Contrast ratio	150:1

Brightness	150 nit typical

Pixel resolution

Pitch	0.264×0.264 mm
Format	1400×1050
Configuration	RGB stripe

Backlight	Edge lit

Character display	80×25

Total power consumption	5.75 W

Table 6-3
15.0-inch XGA, TFT Display

Dimensions

Height	22.86 cm	9.00 in
Width	29.97 cm	11.80 in
Diagonal	38.10 cm	15.00 in

Number of colors	Up to 16.8 million

Contrast ratio	150:1

Brightness	120+ nit typical

Pixel resolution

Pitch	0.297 × 0.297 mm
Format	1024 × 768
Configuration	RGB stripe

Backlight	Edge lit

Character display	80 × 25

Total power consumption	5.00 W

Table 6-4
14.1-inch XGA, TFT Display

Dimensions

Height	28.50 mm	11.22 in
Width	21.49 mm	8.46 in
Diagonal	35.81 mm	14.1 in

Number of colors	Up to 16.8 million
Contrast ratio	150:1
Brightness	120 nits typical

Pixel resolution

Pitch	0.264×0.264 mm
Format	1024×768
Configuration	RGB stripe

Backlight	Edge lit
Character display	80×25
Total power consumption	4.2 W

**Table 6-5
Hard Drives**

	40 GB	30 GB	20 GB
User capacity per drive[1]	40.0 GB	30.0 GB	20.0 GB
Drive height	9.5 mm	9.5 mm	9.5 mm
Drive width	70 mm	70 mm	70 mm
Interface type	ATA-5	ATA-5	ATA-5
Seek times (typical read, including setting)			
Single track	3 ms	3 ms	3 ms
Average	13 ms	13 ms	13 ms
Full stroke	24 ms	24 ms	24 ms
Logical blocks[3]	78,140,160	58,605,120	39,070,080
Logical configuration			
Cylinders	16,683	16,683	16,683
Heads	16	16	16
Sectors per track	63	63	63

[1] 1 GB = 1,073,741,824 bytes.

[3] Actual drive specifications may differ slightly.

Certain restrictions and exclusions apply. Consult the Compaq Customer Support Center for details.

Table 6-5
Hard Drives *(Continued)*

	40 GB	30 GB	20 GB
Physical configuration			
Cylinders[3]	22,784	25,800	22,784
Heads	4	2	4
Sectors per track[3]	293 to 560	398 to 731	293 to 560
Bytes per sector	512	512	512
Buffer size[3]	2 MB	512 KB	512 KB
Disk rotational speed	4200 rpm	4200 rpm	4200 rpm
Transfer rate			
Interface max (MB/s)[2]	66.6	100	66.6
Media (Mb/s)[3]	109 to 203	155 to 256	109 to 203

[2] System capability may differ.

[3] Actual drive specifications may differ slightly.

Certain restrictions and exclusions apply. Consult the Compaq Customer Support Center for details.

**Table 6-6
Diskette Drive**

Diskette size	3.5 inch
Activity indicator	On system
Height	12.7 mm (0.5 in)
Bytes per sector	512
Sectors per track	
High density	18 (1.44 MB)
Low density	9
Tracks per side	
High density	80
Low density	80
Read/write heads	2
Average seek times	
Track-to-track (high/low)	3 to 6 ms
Average (high/low)	95 to 174 ms
Settling time	15 ms
Latency average	100 ms

Table 6-7
DVD-ROM Drive

Applicable disk	DVD-5, DVD-9, DVD-10	
	CD-ROM (Mode 1 and 2)	
	CD Digital Audio	
	CD-XA ready (Mode 2, Form 1 and 2)	
	CD-I ready (Mode 2, Form 1 and 2)	
	CD-R (read only)	
	CD Plus	
	Photo CD (single/multisession)	
	CD-Bridge	
Center hole diameter	1.5 cm	.59 in
Disk diameter	12 cm, 8 cm	
Disk thickness	1.2 mm	.047 in
Track pitch	.74 µm	
Access time (typical reads, including setting)		
Random (DVD media)	< 125 ms	
Full stroke (DVD media)	< 225 ms	
Random (CD media)	< 100 ms	
Full stroke (CD media)	< 175 ms	
Audio output level	Line-out, 0.7 to 0.9 Vrms	
Cache buffer	512 KB	
Data transfer rate (typical, including setting)		
Max 24X CD	3600 KB/s (150 KB/s at 1X CD rate)	
Max 8X DVD	10,800 KB/s (1352 KB/s at 1X DVD rate)	
Startup time	< 12 seconds (typical)	
Stop time	< 3 seconds	

Table 6-8
DVD-RW Drive

Applicable disk	DVD-5, DVD-9, DVD-10	
	CD-ROM (Mode 1 and 2)	
	CD Digital Audio	
	CD-XA ready (Mode 2, Form 1 and 2)	
	CD-I ready (Mode 2, Form 1 and 2)	
	CD-R (read only)	
	CD Plus	
	Photo CD (single/multisession)	
	CD-Bridge	
Center hole diameter	1.5 cm	.59 in
Disk diameter	12 cm, 8 cm	
Disk thickness	1.2 mm	.047 in
Track pitch	1.60 µm	
Access time		
Random	< 120 ms	
Full stroke	< 175 ms	
Audio output level	Line-out, 0.7 to 0.9 Vrms	
Cache buffer	2 MB	
Data transfer rate		
CD-R (8X)	1200 KB/s (150 KB/s at 1X CD rate)	
CD-RW (8X)	1200 KB/s (150 KB/s at 1X CD rate)	
CD-ROM (24X)	3600 KB/s (150 KB/s at 1X CD rate)	
DVD (8X)	10,800 KB/s (1352 KB/s at 1X DVD rate)	
Normal PIO Mode 4 (single burst)	16.6 MB/s	
Startup time		
Single	< 7 seconds (typical)	
Multi-session	< 30 seconds (typical)	
Stop time	< 3 seconds	

**Table 6-9
CD-ROM Drive**

Applicable disk	CD-ROM (Mode 1, 2, and 3) CD-XA ready (Mode 2, Form 1 and 2) CD-I ready (Mode 2, Form 1 and 2) CD-R (read only) CD Plus Photo CD (single/multisession) CD-Extra Video CD CD-WO (fixed packets only) CD-Bridge	
Center hole diameter	1.5 cm	.59 in
Disk diameter	12 cm, 8 cm	
Disk thickness	1.2 mm	.047 in
Track pitch	1.6 µm	
Access time		
Random Full stroke	< 150 ms < 300 ms	
Cache buffer	128 KB	
Data transfer rate		
Sustained, 16X Variable Normal PIO Mode 4 (single burst)	150 KB/s at 1X 1500 to 3600 KB/s (10X to 24X) 16.66 KB/s	
Startup time	< 8 seconds	
Stop time	< 4 seconds	

Table 6-10
CD-RW Drive

Center hole diameter	1.5 cm	.59 in
Disk diameter	12 cm, 8 cm	
Disk thickness	1.2 mm	.047 in
Track pitch	.74 µm	
Access time		
Random	< 150 ms	
Full stroke	< 225 ms	
Audio output level	Line-out, 0.7 Vrms	
Cache buffer	128 KB	
Data transfer rate		
Sustained, 16X	150 KB/s	
Sustained, 4X CD-RW	5,520 KB/s	
Normal PIO Mode 4 (single burst)	16.6 MB/s	
Startup time	< 15 seconds	
Stop time	< 6 seconds	

Table 6-11
External AC Adapter

Weight	.85 lb	.39 kg

Power supply

Operating watts	90 W	
Operating voltage	110 to 240 VAC RMS	
Operating current	1.5 A RMS	
Operating frequency range	50 to 60 Hz AC	

Table 6-12
8-cell, Li ion Battery Pack

Dimensions

Length	12.57 cm	4.95 in
Width	8.79 cm	3.46 in
Depth	2.03 cm	0.80 in
Weight	.44 kg	0.96 lb

Energy

Voltage	14.8 V
Amp-hour capacity	minimum 3.7 Ah, typical 3.9 Ah
Watt-hour capacity	minimum 53.2 Ah, typical 56.1 Ah

Temperature

Operating	0 to 42° C	32 to 108° F
Nonoperating	0 to 60° C	32 to 140° F

Table 6-13
System DMA

Hardware DMA	System Function
DMA0	Available for audio
DMA1	Entertainment audio (default; alternate = DMA0, DMA3, none)
DMA2	Diskette drive
DMA3	ECP parallel port LPT1 (default; alternate = DMA0, none)
DMA4	DMA controller cascading (not available)
DMA5	Available for PC Card
DMA6	Not assigned
DMA7	Not assigned

✎ PC Card controller can use DMA 1, 2, or 5.

Table 6-14
System Interrupts

Hardware IRQ	System Function
IRQ0	System timer
IRQ1	Keyboard controller
IRQ2	Cascaded
IRQ3	COM2
IRQ4	COM1
IRQ5	Audio (default)*
IRQ6	Diskette drive
IRQ7	Parallel port
IRQ8	Real time clock (RTC)
IRQ9	Infrared
IRQ10	System use
IRQ11	System use
IRQ12	Internal point stick or external mouse
IRQ13	Coprocessor (not available to any peripheral)
IRQ14	IDE interface (hard drive and optical drive)
IRQ15	System use

✎ PC Cards may assert IRQ3, IRQ4, IRQ5, IRQ7, IRQ9, IRQ10, IRQ11, or IRQ15. Either the infrared or the serial port may assert IRQ3 or IRQ4.

*Default configuration; audio possible configurations are IRQ5, IRQ7, IRQ9, IRQ10, or none.

**Table 6-15
System I/O Addresses**

I/O Address (hex)	System Function (shipping configuration)
000 - 00F	DMA controller no. 1
010 - 01F	Unused
020 - 021	Interrupt controller no. 1
022 - 024	Opti chipset configuration registers
025 - 03F	Unused
02E - 02F	87334 "Super IO" configuration for CPU
040 - 05F	Counter/timer registers
044 - 05F	Unused
060	Keyboard controller
061	Port B
062 - 063	Unused
064	Keyboard controller
065 - 06F	Unused
070 - 071	NMI enable/real time clock
072 - 07F	Unused
080 - 08F	DMA page registers
090 - 091	Unused
092	Port A
093 - 09F	Unused
0A0 - 0A1	Interrupt controller no. 2

Table 6-15
System I/O Addresses *(Continued)*

I/O Address (hex)	System Function (shipping configuration)
0A2 - 0BF	Unused
0C0 - 0DF	DMA controller no. 2
0E0 - 0EF	Unused
0F0 - 0F1	Coprocessor busy clear/reset
0F2 - 0FF	Unused
100 - 16F	Unused
170 - 177	Secondary fixed disk controller
178 - 1EF	Unused
1F0 - 1F7	Primary fixed disk controller
1F8 - 200	Unused
201	Joystick (decoded in ESS1688)
202 - 21F	Unused
220 - 22F	Entertainment audio
230 - 26D	Unused
26E - 26	Unused
278 - 27F	Unused
280 - 2AB	Unused
2A0 - 2A7	Unused
2A8 - 2E7	Unused
2E8 - 2EF	Reserved serial port

Table 6-15
System I/O Addresses *(Continued)*

I/O Address (hex)	System Function (shipping configuration)
2F0 - 2F7	Unused
2F8 - 2FF	Infrared port
300 - 31F	Unused
320 - 36F	Unused
370 - 377	Secondary diskette drive controller
378 - 37F	Parallel port (LPT1/default)
380 - 387	Unused
388 - 38B	FM synthesizer - OPL3
38C - 3AF	Unused
3B0 - 3BB	VGA
3BC - 3BF	Reserved (parallel port/no EPP support)
3C0 - 3DF	VGA
3E0 - 3E1	PC Card controller in CPU
3E2 - 3E3	Unused
3E8 - 3EF	Internal modem
3F0 - 3F7	"A" diskette controller
3F8 - 3FF	Serial port (COM1/default)
CF8 - CFB	PCI configuration index register (PCIDIVO-1)
CFC - CFF	PCI configuration data register (PCIDIVO-1)

Table 6-16
System Memory Map

Size	Memory Address	System Function
640 KB	00000000 - 0009FFFF	Base memory
128 KB	000A0000 - 000BFFFF	Video memory
48 KB	000C0000 - 000CBFFF	Video BIOS
160 KB	000C8000 - 000E7FFF	Unused
64 KB	000E8000 - 000FFFFF	System BIOS
15 MB	00100000 - 00FFFFFF	Extended memory
58 MB	01000000 - 047FFFFF	Super extended memory
58 MB	04800000 - 07FFFFFF	Unused
2 MB	08000000 - 080FFFFF	Video memory (direct access)
4 GB	08200000 - FFFEFFFF	Unused
64 KB	FFFF0000 - FFFFFFFF	System BIOS

A

Connector Pin Assignments

Table A-1
RJ-45 Network Interface

```
1  3  5  7
 2  4  6  8
```
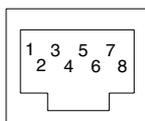
Pin	Signal	Pin	Signal
1	Transmit +	5	Unused
2	Transmit -	6	Receive -
3	Receive +	7	Unused
4	Unused	8	Unused

Table A-2
RJ-11 Modem
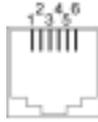
Pin	Signal	Pin	Signal
1	Unused	4	Unused
2	Tip	5	Unused
3	Ring	6	Unused

Table A-3
Universal Serial Bus

Pin	Signal	Pin	Signal
1	+5 VDC	3	Data +
2	Data -	4	Ground

Table A-4
S-Video

Pin	Signal	Pin	Signal
1	Ground (Y)	3	Y-Luminance (Intensity)
2	Ground (C)	4	C-Chrominance (Color)

Table A-5
External Keyboard/Mouse
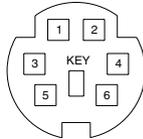
Pin	Signal	Pin	Signal
1	Keyboard/mouse DATA	4	+5 VDC
2	Keyboard/mouse DATA	5	Keyboard/mouse CLK
3	Ground	6	Keyboard/mouse CLK

Table A-6
Parallel
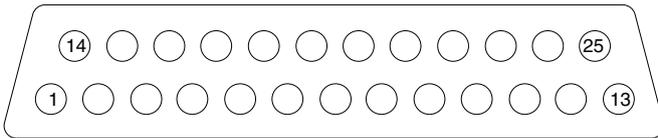
Pin	Signal	Pin	Signal
1	Strobe*	10	Acknowledge*
2	Data bit 0	11	Busy
3	Data bit 1	12	Paper out
4	Data bit 2	13	Select
5	Data bit 3	14	Auto line feed*
6	Data bit 4	15	Error*
7	Data bit 5	16	Initialize printer*
8	Data bit 6	17	Select in*
9	Data bit 7	18-25	Signal ground

*Signal is active low.

Table A-7
External Monitor
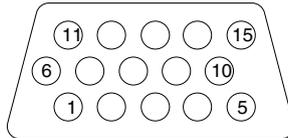
Pin	Signal	Pin	Signal
1	Red analog	9	+5 VDC
2	Green analog	10	Ground
3	Blue analog	11	Monitor detect
4	Not connected	12	DDC 2B data
5	Ground	13	Horizontal sync
6	Ground analog	14	Vertical sync
7	Ground analog	15	DDC 2B clock
8	Ground analog		

**Table A-8
Stereo Speaker/Headphone**

Pin	Signal		Pin	Signal
1	Audio out		2	Ground

**Table A-9
Microphone**

Pin	Signal		Pin	Signal
1	Audio in		2	Ground

B

Power Cord Set Requirements

3-Conductor Power Cord Set

The wide range input feature of the notebook permits it to operate from any line voltage from 100 to 120 or 220 to 240 volts AC.

The power cord set received with the computer meets the requirements for use in the country where the equipment is purchased.

Power cord sets for use in other countries must meet the requirements of the country where the computer is used. For more information on power cord set requirements, contact a Compaq authorized reseller or service provider.

General Requirements

The requirements listed below are applicable to all countries:

■ The length of the power cord set must be at least 1.5 m (5.00 feet) and no more than 2.0 m (6.50 feet).

■ All power cord sets must be approved by an acceptable accredited agency responsible for evaluation in the country where the power cord set will be used.

■ The power cord set must have a minimum current capacity of 10 amperes and a nominal voltage rating of 125 or 250 volts AC, as required by each country's power system.

■ The appliance coupler must meet the mechanical configuration of an EN 60 320/IEC 320 Standard Sheet C13 connector, for mating with the appliance inlet on the back of the computer.

Country-Specific Requirements

3-Conductor Power Cord Set Requirements

Country	Accredited Agency	Applicable Note Number
Australia	EANSW	1
Austria	OVE	1
Belgium	CEBC	1
Canada	CSA	2
Denmark	DEMKO	1
Finland	FIMKO	1
France	UTE	1
Germany	VDE	1
Italy	IMQ	1
Japan	METI	3
The Netherlands	KEMA	1
Norway	NEMKO	1
Sweden	SEMKO	1
Switzerland	SEV	1

3-Conductor Power Cord Set Requirements *(Continued)*

Country	Accredited Agency	Applicable Note Number
United Kingdom	BSI	1
United States	UL	2

Notes

1. The flexible cord must be <HAR> Type HO5VV-F, 3-conductor, 1.0 mm^2 conductor size. The power cord set fittings (appliance coupler and wall plug) must bear the certification mark of the agency responsible for evaluation in the country where they will be used.

2. The flexible cord must be Type SPT-3 or equivalent, No. 18 AWG, 3-conductor. The wall plug must be a two-pole grounding type with a NEMA 5-15P (15 A, 125 V) or NEMA 6-15P (15 A, 250 V) configuration.

3. The appliance coupler, flexible cord, and wall plug must bear a "T" mark and registration number in accordance with the Japanese Dentori Law. The flexible cord must be Type VCT or VCTF, 3-conductor, 1.00 mm^2 conductor size. The wall plug must be a two-pole grounding type with a Japanese Industrial Standard C8303 (7 A, 125 V) configuration.

C

Screw Listing

This appendix provides specification and reference information for the screws used in the computer. All screws listed in this appendix are available in the Miscellaneous Screw Kit, spare part number 285542-001.

Table C-1
Torx T8 Metric 2.5 × 5.0 Screw

	Color	Qty	Length	Thread	Head Width
	Silver	30	5.0 mm	2.5 mm	5.0 mm

Where used:

Two screws that secure the optical drive to the computer
(documented in Section 5.3)

Figure C-1. TM2.5 × 5.0 Screw Locations

Table C-1
Torx T8 Metric 2.5 × 5.0 Screw *(Continued)*

	Color	Qty	Length	Thread	Head Width
	Silver	30	5.0 mm	2.5 mm	5.0 mm

Where used:

Two screws that secure the connector cover to the base enclosure (documented in Section 5.8)
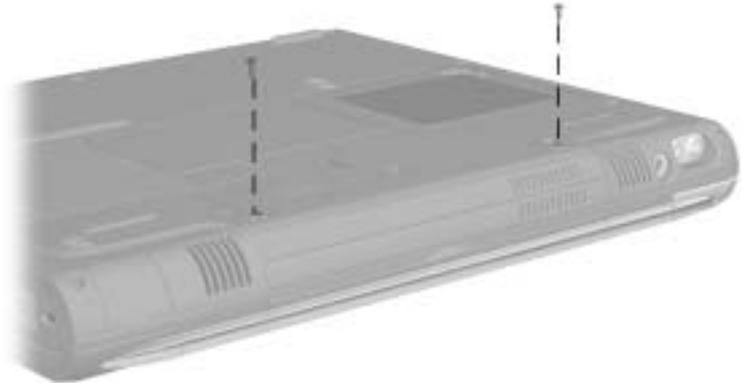
Figure C-2. TM2.5 × 5.0 Screw Locations

Table C-1
Torx T8 Metric 2.5 × 5.0 Screw *(Continued)*

	Color	Qty	Length	Thread	Head Width
	Silver	30	5.0 mm	2.5 mm	5.0 mm

Where used:

❶ One screw that secures the heat spreader to the base enclosure (documented in Section 5.11)

❷ One screw that secures the display video cable ground loop to the heat spreader (documented in Sections 5.11 and 5.13)
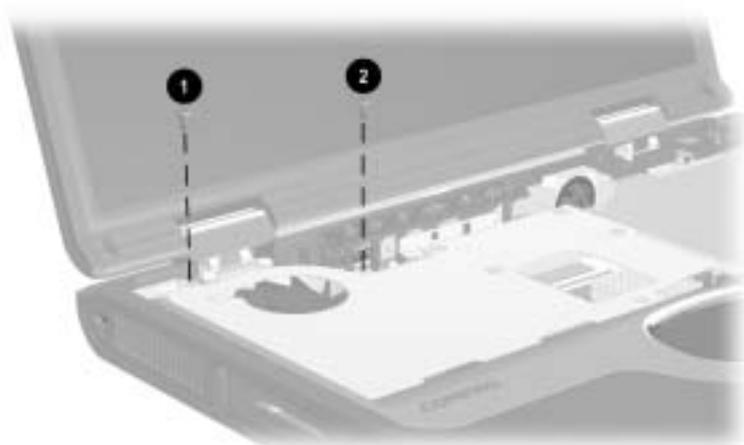
Figure C-3. TM2.5 × 5.0 Screw Locations

Table C-1
Torx T8 Metric 2.5 × 5.0 Screw *(Continued)*

	Color	Qty	Length	Thread	Head Width
	Silver	30	5.0 mm	2.5 mm	5.0 mm

Where used:

One screw that secures the display inverter cable ground loop to the heat spreader (documented in Section 5.13)
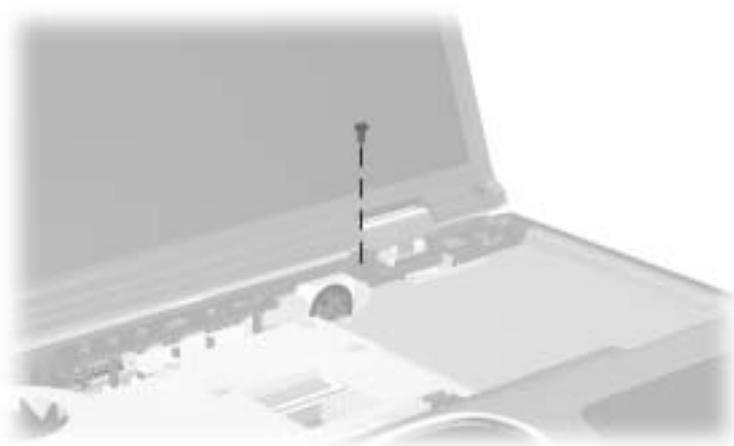
Figure C-4. TM2.5 × 5.0 Screw Locations

Table C-1
Torx T8 Metric 2.5 × 5.0 Screw *(Continued)*

	Color	Qty	Length	Thread	Head Width
	Silver	30	5.0 mm	2.5 mm	5.0 mm

Where used:

❶ Three screws that secure the diskette drive to the palm rest (documented in Section 5.15)

❷ **TouchPad only models**—Four screws that secure the TouchPad components to the palm rest (documented in Section 5.16)

❷ **Dual Stick models**—Five screws that secure the TouchPad components to the palm rest (documented in Section 5.16)

❸ Two screws that secure the display release assembly to the palm rest (documented in Section 5.17)
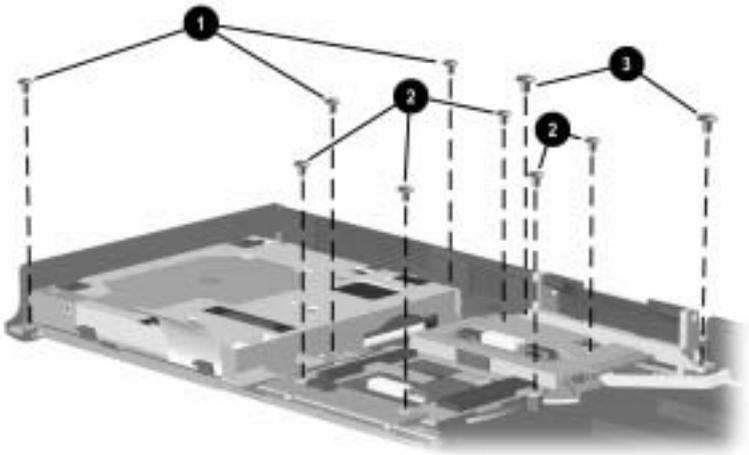
Figure C-5. TM2.5 × 5.0 Screw Locations

Table C-1
Torx T8 Metric 2.5 × 5.0 Screw *(Continued)*

	Color	Qty	Length	Thread	Head Width
	Silver	30	5.0 mm	2.5 mm	5.0 mm

Where used:

Three screws that secure the charger board and shield to the base enclosure (documented in Section 5.18)
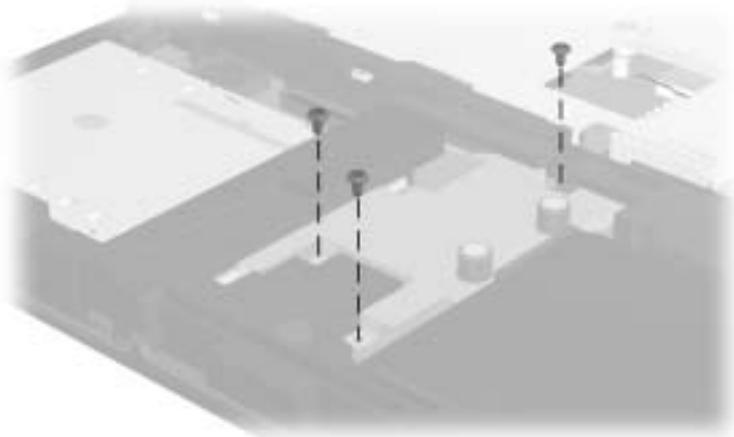
Figure C-6. TM2.5 × 5.0 Screw Locations

Table C-1
Torx T8 Metric 2.5 × 5.0 Screw *(Continued)*

	Color	**Qty**	**Length**	**Thread**	**Head Width**
	Silver	30	5.0 mm	2.5 mm	5.0 mm

Where used:

Three screws that secure the top cover to the base enclosure (documented in Section 5.20)
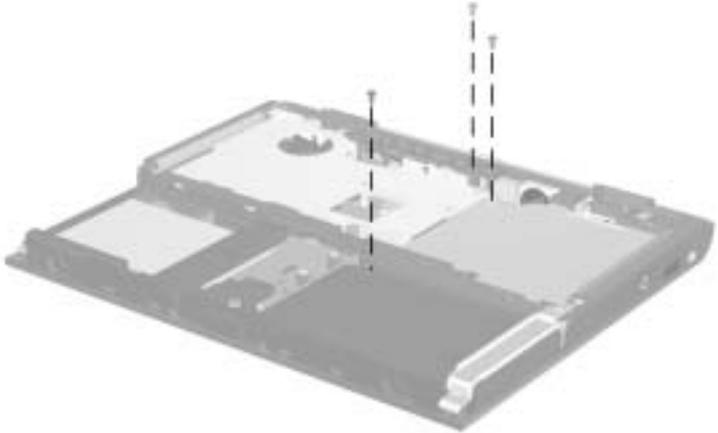
Figure C-7. TM2.5 × 5.0 Screw Locations

Table C-1
Torx T8 Metric 2.5 × 5.0 Screw *(Continued)*

	Color	Qty	Length	Thread	Head Width
	Silver	30	5.0 mm	2.5 mm	5.0 mm

Where used:

❶ Two screws that secure the optical drive front alignment rail to the base enclosure (documented in Section 5.22)

❷ Two screws that secure the optical drive rear alignment rail to the base enclosure (documented in Section 5.22)

❸ Three screws that secure the system board to the base enclosure (documented in Section 5.22)
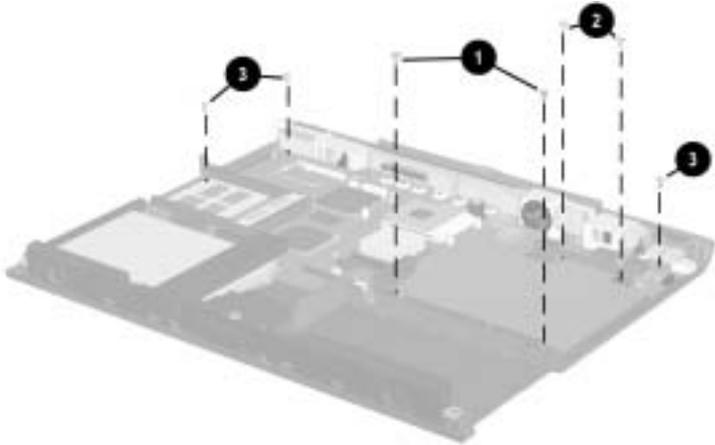
Figure C-8. TM2.5 × 5.0 Screw Locations

Table C-2
Torx T8 Metric 2.5 × 8.0 Screw

	Color	Qty	Length	Thread	Head Width
	Silver	11	8.0 mm	2.5 mm	4.0 mm

Where used:

❶ One screw that secures the hard drive to the base enclosure (documented in Section 5.3)

❷ Two screws that secure the LED cover to the base enclosure (documented in Section 5.9)

❸ Five screws that secure the palm rest to the base enclosure (documented in Section 5.14)

❹ Two screws that secure the top cover to the base enclosure (documented in Section 5.20)
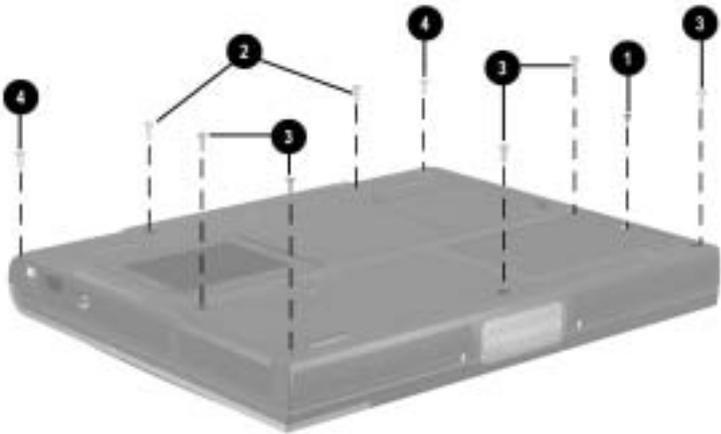
Figure C-9. TM2.5 × 8.0 Screw Locations

Table C-2
Torx T8 Metric 2.5 × 8.0 Screw *(Continued)*

✐	Color	Qty	Length	Thread	Head Width
	Silver	11	8.0 mm	2.5 mm	4.0 mm

Where used:

One screw that secures the heat spreader to the base enclosure (documented in Section 5.11)
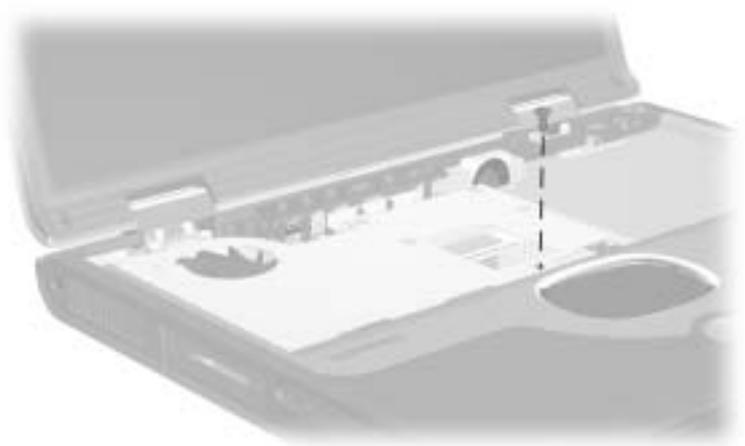
Figure C-10. TM2.5 × 8.0 Screw Locations

Table C-3
Phillips Metric 3.0 × 3.0 Screw

	Color	Qty	Length	Thread	Head Width
	Silver	4	3.0 mm	3.0 mm	5.0 mm

Where used:

Four screws that secure the hard drive to the hard drive bracket (documented in Section 5.3)

Figure C-11. PM3.0 × 3.0 Screw Locations

Table C-4
Phillips Metric 2.5 × 4.0 Screw

	Color	Qty	Length	Thread	Head Width
	Silver	2	4.0 mm	2.5 mm	5.0 mm

Where used:

❶ One screw that secures the memory expansion compartment cover to the base enclosure (documented in Section 5.5)

❷ One screw that secures the mini PCI compartment cover to the base enclosure (documented in Section 5.6)
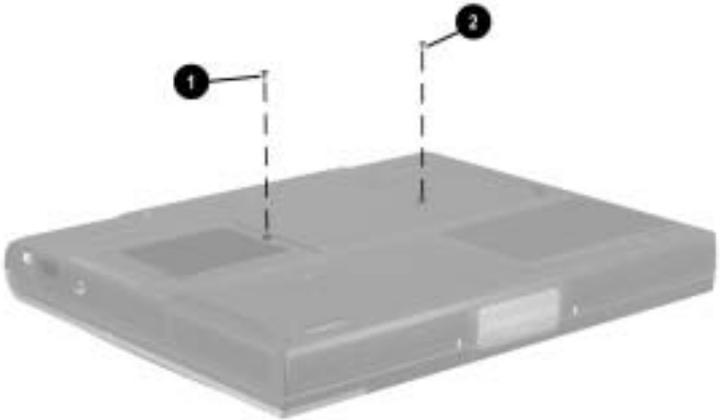
Figure C-12. PM2.5 × 4.0 Screw Locations

Table C-5
Torx T8 Metric 2.5 × 14.0 Shoulder Screw

	Color	Qty	Length	Thread	Head Width
	Silver	4	14.0 mm	2.0 mm	6.0 mm

Where used:

Four screws that secure the heat spreader to the base enclosure
(documented in Section 5.11)
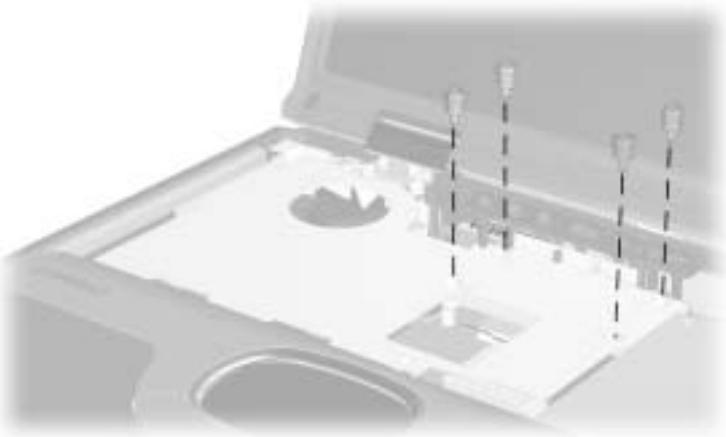
Figure C-13. TM2.5 × 14.0 Shoulder Screw Locations

Table C-6
Torx T8 Metric 2.5 × 9.0 Screw

	Color	Qty	Length	Thread	Head Width
	Silver	4	9.0 mm	2.5 mm	5.0 mm

Where used:

Four screws that secure the display assembly to the base enclosure
(documented in Section 5.13)

Figure C-14. TM2.5 × 9.0 Screw Locations

Table C-7
Phillips Metric 2.0 × 4.5 Screw

	Color	Qty	Length	Thread	Head Width
	Silver	1	4.5 mm	2.0 mm	4.0 mm

Where used:

One screw that secures the modem cable to the system board (documented in Section 5.23)
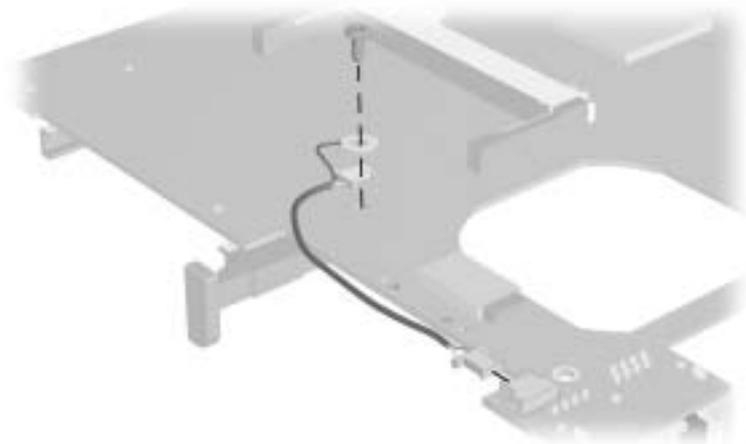
Figure C-15. PM2.0 × 4.5 Screw Locations

Index

1394 jack 1–19

A

AC adapter
    spare part numbers 3–22
    specifications 6–14
Advanced Port Replicator,
  spare part number 3–22
audio troubleshooting 2–25

B

base enclosure, spare part
  number 3–13
battery components
    bay 1–19, 1–27
    bezel
      illustrated 3–16
      removal 5–6
    light 1–19, 1–25
    pack
      removal 5–5
      spare part numbers
        3–15, 5–5
    release latch 1–27, 5–5
    specifications 6–14
battery, real time clock (RTC)
    removal 5–17
    spare part number 3–15,
      5–17
bottom components 1–26

C

cables
    power cords 3–22, B–1
    service considerations 4–2
caps lock light 1–25
CD-ROM drive
    OS loading problems 2–24
    spare part number 3–15,
      3–21, 5–7
    specifications 6–12
CD-RW drive
    spare part number 3–15,
      3–21, 5–7
    specifications 6–13
Certificate of Authenticity
  label 1–27
charger board
    removal 5–46
    spare part number 3–13,
      5–46
charger board shield 3–16
Common Port Replicator,
  spare part number 3–22
Compaq Diagnostics 2–1, 2–7