

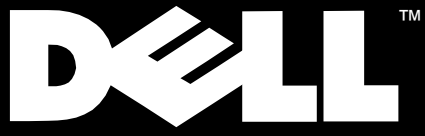


Dell™ Latitude™ CPiA

**SERVICE MANUAL**







Dell™ Latitude™ CPiA

**SERVICE MANUAL**

---

**Information in this document is subject to change without notice.  
© 1999 Dell Computer Corporation. All rights reserved.**

Reproduction in any manner whatsoever without the written permission of Dell Computer Corporation is strictly forbidden.

Trademarks used in this text: *Dell*, the *DELL* logo, and *Latitude* are trademarks of Dell Computer Corporation; *IBM* is a registered trademark of International Business Machines Corporation.

Other trademarks and trade names may be used in this document to refer to either the entities claiming the marks and names or their products. Dell Computer Corporation disclaims any proprietary interest in trademarks and trade names other than its own.

February 1999 P/N 0813P



# Contents

Recommended Tools . . . . .	2
Preparing to Work Inside Your Computer . . . . .	2
Screw Identification and Tightening . . . . .	3
ZIF Connectors . . . . .	4
Field-Replaceable Parts and Assemblies . . . . .	5
Removing Field-Replaceable Parts and Assemblies . . . . .	12
Hard-Disk Drive Assembly . . . . .	13
Memory Module Cover . . . . .	14
Memory Modules . . . . .	15
Keyboard Assembly . . . . .	16
Back Cover Assembly . . . . .	18
Palmrest Assembly . . . . .	19
Touch-Pad Interface Module . . . . .	20
Power Button . . . . .	21
Display Assembly . . . . .	21
Display Assembly Bezel . . . . .	23
Display Assembly Latch . . . . .	23
LCD Panel . . . . .	24
12.1-Inch LCD Displays . . . . .	24
13.3-Inch LCD Displays . . . . .	26
LCD Display Hinge . . . . .	28
Display-Assembly Top Cover . . . . .	28
Bottom Case Assembly . . . . .	28
Modular Bay Devices (Diskette Drive, CD-ROM Drive, Battery, or Travel Module) . . . . .	30
Audio Shield . . . . .	30
Audio Board . . . . .	31

Bottom Case Bracket . . . . .	32
Module Latch Assemblies . . . . .	33
Speakers . . . . .	34
System Board Assembly . . . . .	35
Exhaust Fan . . . . .	38
I/R Board . . . . .	39
Reserve Battery . . . . .	40

## **Index**

### **Figures**

Figure 1.	Computer Orientation . . . . .	1
Figure 2.	Main Battery Assembly Removal . . . . .	3
Figure 3.	Screw Identification . . . . .	3
Figure 4.	Disconnecting an Interface Cable . . . . .	4
Figure 5.	Exploded View—Computer. . . . .	12
Figure 6.	Hard-Disk Drive Assembly Removal . . . . .	13
Figure 7.	Memory Module Cover Removal . . . . .	14
Figure 8.	Memory Module Removal . . . . .	15
Figure 9.	Removing the Keyboard Assembly Screws . . . . .	16
Figure 10.	Keyboard Assembly Removal . . . . .	17
Figure 11.	Back Cover Assembly Removal . . . . .	18
Figure 12.	Palmrest Assembly Removal . . . . .	19
Figure 13.	Touch-Pad Interface Module Removal . . . . .	21
Figure 14.	Display Assembly Removal. . . . .	23
Figure 15.	Display Assembly Bezel Removal (12.1-Inch Display Shown) . . . . .	25
Figure 16.	LCD Panel Removal (12.1-Inch Display) . . . . .	27
Figure 17.	Cable Layout for the 12.1-Inch LCD Panel . . . . .	28
Figure 18.	LCD Panel Removal (13.3-Inch Display) . . . . .	29
Figure 19.	Two-Piece Cable Layout for the 13.3-Inch LCD Panel . . . . .	30
Figure 20.	Bottom Case Assembly . . . . .	34
Figure 21.	Modular Bay Device Removal. . . . .	35
Figure 22.	Audio Board Removal . . . . .	37
Figure 23.	Bottom Case Bracket Removal . . . . .	38
Figure 24.	Module Latch Assemblies Removal . . . . .	40
Figure 25.	Left Slider . . . . .	41
Figure 26.	System Board Assembly Removal . . . . .	42

Figure 27.	Processor Module . . . . .	44
Figure 28.	Exhaust Fan Removal . . . . .	45
Figure 29.	I/R Board Removal. . . . .	46
Figure 30.	Reserve Battery Installation . . . . .	47

**Tables**

Table 1.	Parts and Assemblies . . . . .	5
----------	--------------------------------	---

## **Read This First**

A prerequisite for using this manual to service Dell computer systems is a basic knowledge of IBM-compatible PCs and prior training in IBM-compatible PC troubleshooting techniques. In addition to information provided in this manual, Dell provides the *System Users Guide* for troubleshooting procedures and instructions on using the Dell Diagnostics to test the computer system.

## **Notes, Cautions, and Warnings**

Throughout this guide, blocks of text may be accompanied by an icon and printed in bold type or in italic type. These blocks are notes, cautions, and warnings, and they are used as follows:



*NOTE: A NOTE indicates important information that helps you make better use of your computer system.*



**CAUTION: A CAUTION indicates either potential damage to hardware or loss of data and tells you how to avoid the problem.**



**WARNING: A WARNING indicates the potential for bodily harm and tells you how to avoid the problem.**



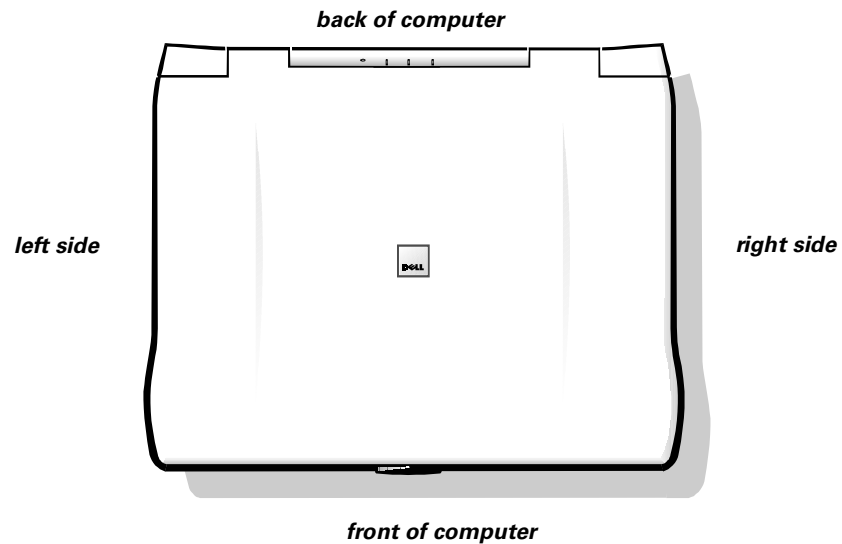


# **Dell™ Latitude™ CPiA Service Manual**

This manual provides instructions for removing and replacing field-replaceable components, assemblies, and subassemblies in your Dell Latitude portable computer. Unless otherwise noted, each procedure in this chapter assumes the following:

- The computer and any attached peripherals are turned off, and the peripherals are disconnected from the input/output (I/O) panel on the back of the computer.
- A part can be replaced by performing the removal procedure in reverse order.

When the display assembly is open nearly 180 degrees, use a book or something similar to support it. The angle of the display assembly with respect to the bottom case should never be allowed to exceed 180 degrees. Also, when performing the procedures in this manual, the locations or directions relative to the computer are as shown in Figure 1 unless otherwise specified.



**Figure 1. Computer Orientation**

## Recommended Tools

Most of the procedures in this manual require the use of one or more of the following tools:

- Number 0 and number 1 magnetized Phillips-head screwdrivers
- Small flat-blade screwdriver
- Small plastic scribe
- Processor extractor

## Preparing to Work Inside Your Computer

Before you start to work on the computer, perform the following steps:

1. Save any work in progress and close all open applications.
2. Turn off the computer and any attached peripherals.



*NOTE: Make sure the computer is turned off and not in suspend-to-disk mode. If you cannot shut down the computer using the computer's operating system, press the power button for 4 seconds.*

3. If the computer is docked in a C/Dock Expansion Station or C/Port Advanced Port Replicator (APR), undock the computer.
4. Disconnect the computer and any attached peripherals from AC power sources to reduce the potential for personal injury or shock. Also disconnect any telephone or telecommunications lines from the computer.
5. Remove the power cord.
6. Disconnect all other external cables from the computer.
7. Remove any installed PC Cards.



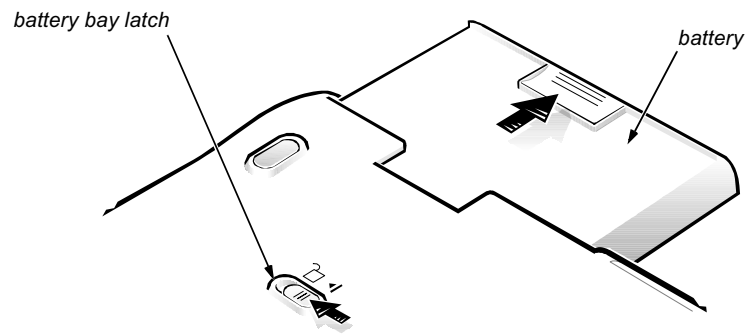
**CAUTION: Make sure the work surface is clean to prevent scratching the computer cover.**

8. Remove the main battery assembly from the battery bay.

Slide the battery bay latch away from the center of the computer. Then slide the battery out of the battery bay (see Figure 2).



**CAUTION:** To avoid damaging the system board, the battery must be removed before you service the computer.



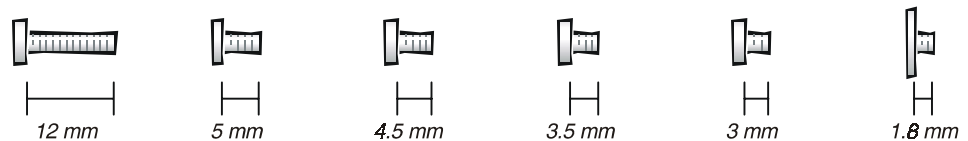
**Figure 2. Main Battery Assembly Removal**

9. Ground yourself by touching the unpainted metal surface of the I/O panel on the back of the computer.

While you work, periodically touch the I/O panel to dissipate any static electricity that might harm components.

## **Screw Identification and Tightening**

The illustrations in the following removal procedures provide the correct screw length as part of the screw's label. A graphic for that length screw is also included in the illustration. Examples are shown in Figure 3. Match the actual screw to the graphic in the illustration to check for correct length.



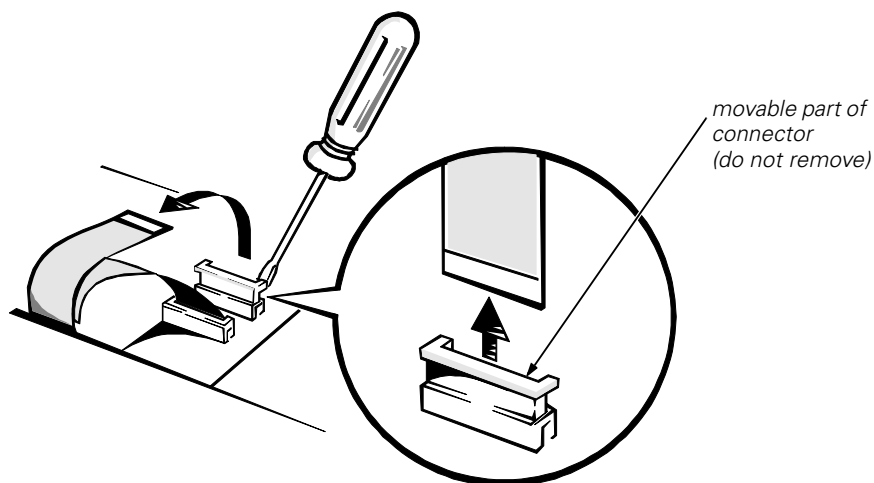
**Figure 3. Screw Identification**



**CAUTION:** When reinstalling a screw, you must use a screw of the correct length. Otherwise, hardware damage could result. Make sure that the screw is properly aligned with its corresponding hole, and avoid overtightening.

## ZIF Connectors

Some of the computer's interface connectors are zero insertion force (ZIF) connectors. These connectors are not removable, but they must be released to disconnect a cable from them (see Figure 4).



**Figure 4. Disconnecting an Interface Cable**



**CAUTION: The ZIF connectors are fragile. To avoid damage, do not apply too much pressure to the movable part of the connector.**

To disconnect an interface cable from a ZIF connector, perform the following steps:

1. Insert a small flat-blade screwdriver under the movable part of the connector.
2. Pull gently upward on the movable part of the connector until it releases the interface cable.
3. Grasp the interface cable and pull it out of the connector.

To reconnect an interface cable to a ZIF connector, perform the following steps:

1. Use a small flat-blade screwdriver to open the movable part of the ZIF connector.
2. Orient the end of the interface cable with the ZIF connector, and insert the end of the cable into the connector.
3. While holding the cable in place, close the ZIF connector.

To ensure a firm connection, make sure the ZIF connector is completely closed.

## Field-Replaceable Parts and Assemblies

Table 1 lists the parts and assemblies available for the computer. Some parts may only be available as part of a service kit or assembly and are provided for reference only. The subsections that follow Table 1 provide instructions for removing and replacing these parts and assemblies.

**Table 1. Parts and Assemblies**

Part or Assembly Name	Order Name	Figure
<b>AC Adapter and Power Cords</b>		
Customer kit, AC adapter	CUS,ADPT,AC,EXT,20V,70W, NBK,CPIA	
AC adapter	ADPT,AC,EXT,20V,70W,3WIRE, CPIA	
Power cable, U.S.	CORD,PWR,110V,6F,AC,3W3P,US	
<b>Audio Board</b>		
Service kit, audio board	SVC,PWA,AUDIO,CPIA	22
<b>Audio Shield</b>		
Audio shield	SHLD,W/SPR,AUDIO CRD	22
<b>Back Cover Assembly</b>		
Service kit, back cover assembly	SVC,SUBASSY, BK CVR/DOOR,I/O,CPIA	11
Back cover assembly	ASSY,BK PLT/DOOR,I/O,CPIA	
Docking bar	BAR,DOOR,DCKG,MET	
Docking door	DOOR,DCKG,PLSTC,I/O	
<b>Battery (Main)</b>		
Customer kit, main battery	CUS,BTRY,MN,14.4V,8CELL, LITH	2
Main battery	BTRY,MN,14.4V,8CELL,LITH	
<b>Battery (Reserve)</b>		
Service kit, reserve battery	SVC,BTRY,RSRV,7.2V,30MAH,6, NIHD	29
Reserve battery	BTRY,RSRV,7.2V,30MAH,6, NIHD	
Reserve battery sponge pad	PAD,FOAM,BRTY,RSRV,CPIA	
<b>Bottom Case Assembly</b>		
Bottom case assembly	ASSY,CVR,BTM,PLSTC, BASE,CPIA	5, 26

**Table 1. Parts and Assemblies** (continued)

<b>Part or Assembly Name</b>	<b>Order Name</b>	<b>Figure</b>
<b>Bottom Case Bracket</b>		
Bottom case bracket assembly	ASSY,BRKT,CASE,BTM	20, 23
<b>CD-ROM Drive Subassembly</b>		
Service kit, CD-ROM drive	SVC,SUBASSY,CD,24X,NBK	21
CD-ROM drive bezel	BZL,CD	
24X CD-ROM drive	CD,680M,INT,NBK	
CD-ROM drive interface board	PWA,CD/FDD INTERCONN,SE	
Bottom CD-ROM drive cover	CVR,BTM,PLSTC,CD,CPIA	
Top CD-ROM drive cover	CVR,TOP,PLSTC,CD,CPIA	
CD-ROM drive shield	SHLD,CD,CPIA	
CD-ROM drive label	LBL,REG,CD,24X	
<b>Diskette Drive Subassembly</b>		
Diskette drive service kit	SVC,SUBASSY,FD,F3,INT/EXT,CPIA	21
Diskette drive subassembly	SUBASSY,FD,F3,INT/EXT,CPIA	
Diskette drive	FD,F3,CPIA	
Diskette drive assembly bottom cover	CVR,BTM,PLSTC,FD,F3,CPIA	
Diskette drive assembly top cover	CVR,TOP,PLSTC,FD,F3,CPIA	
Diskette drive assembly interface board	PWA,INTFC,FD,F3,CPIA	
Diskette drive assembly interface cable	CBL,FPC,FD,F3,CPIA	
Diskette drive assembly shield	SHLD,FD,F3,CPIA	
<b>Exhaust Fan</b>		
Service kit, exhaust fan	SVC,FAN,25X25X10,CPIA	27

**Table 1. Parts and Assemblies** (continued)

Part or Assembly Name	Order Name	Figure
<b>Hard-Disk Drive Assemblies</b>		
Hard-disk drive, subassembly	SUBASSY,HD,xxxxx,l,yyMM,CPiA *	6
Hard-disk drive	HD,xxxxx,l,yyMM,NBK,zzz*	
Hard-disk drive interface board	PWA,INTERCONN,HD,CPiA	
Hard-disk drive bracket	BRKT,HD,CPiA	
<b>Hard-Disk Drive Bracket/Door Assembly</b>		
Hard-disk drive carrier bracket/door assembly service kit	SVC,ASSY,BRKT/DOOR,HD,CPiA	6
Hard-disk drive carrier door	DOOR,HD,12.5MM,CPiA	
Hard-disk drive carrier bracket	BRKT,HD,12.5MM,CPiA	
Hard-disk drive carrier insulator	INSUL,HD,CPiA	
Hard-disk drive carrier screws	SCR,M3X3,PHH,LP,ZPS	
<b>I/R Board</b>		
Service kit, I/R board	SVC,PWA,FAST IR,CPiA	28
<b>Keyboards</b>		
Keyboard, Belgian	KYBD,88,BEL,CPiA	10
Keyboard, Chinese	KYBD,87,CHI,CPiA	
Keyboard, Danish	KYBD,88,DEN,CPiA	
Keyboard, French	KYBD,88,FR,CPiA	
Keyboard, French/Canadian	KYBD,87,FR CAN,CPiA	
Keyboard, German	KYBD,88,GER,CPiA	
Keyboard, Italian	KYBD,88,ITALIAN,CPiA	
Keyboard, Japanese	KYBD,90,JPN,CPiA	
Keyboard, Korean	KYBD,87,KOR,CPiA	
Keyboard, Latin American	KYBD,88,LAC,CPiA	
Keyboard, Norwegian	KYBD,88,NOR,CPiA	
Keyboard, Portuguese	KYBD,88,PORTUGEUSE,CPiA	

\* Substitute the drive capacity for xxxxx, the drive height for yy, and the manufacturer for zzz.

**Table 1. Parts and Assemblies** (continued)

Part or Assembly Name	Order Name	Figure
<b>Keyboards</b> (continued)		
Keyboard, Russian	KYBD,87,RUS,CPIA	
Keyboard, Spanish	KYBD,88,SPN,CPIA	
Keyboard, Swedish/Finnish	KYBD,88,SWE,CPIA	
Keyboard, Swiss	KYBD,88,SWI,CPIA	
Keyboard, Thai	KYBD,87,THAI,CPIA	
Keyboard, English (U.K.)	KYBD,88,UK,CPIA	
Keyboard, English (U.S.)	KYBD,87,DOM,CPIA	
<b>Display Back Cover</b>		
Display top-cover service kit, 13.3/12.1-inch display	SVC,ASSY,CVR,TOP,LCD,CPIA	
Display top cover	CVR,TOP,LCD,TFT,CPIA	
Display top-cover EMI shield	SHLD,EMI,DIS,TFT,CPIA	
<b>LCD Assemblies, 12.1-Inch Display</b>		
12.1-inch LCD/Cable service kit, including LCD, brackets, cable, and inverter	SVC,LCD/CBL/INV,TFT,zzz,12.1"; CPIA *	18
Bezel service kit, 12.1-inch display	SVC,BZL,LCD,12.1";CPIA	14, 17
Display assembly bezel	BZL,LCD,TFT,12.1";CPIA	
Bezel retaining screw covers, upper corners, 12.1-inch display	CVR,SCR,TOP,RND,ADH	
Bezel retaining screw covers, lower	CVR,SCR,BTM,OVAL,ADH	
Display-assembly-bezel retaining screw covers, latch, 12.1-inch display	CVR,SCR,TOPOVAL,SM,ADH,12.1	
<b>LCD Assemblies, 13.3-Inch XGA Display</b>		
13.3-inch LCD/Cable service kit, including LCD, brackets, cable, inverter, and bezel	SVC,LCD/CBL/INV,TFT,zzz,13.3"; CPIA *	15, 17
<b>LCD Latch Assembly</b>		
Latch service kit	SVC,LATCH,DIS,BZL,CPIA	14, 15

\* Substitute the drive capacity for xxxxx, the drive height for yy, and the manufacturer for zzz.



**Table 1. Parts and Assemblies** (continued)

<b>Part or Assembly Name</b>	<b>Order Name</b>	<b>Figure</b>
<b>LCD Parts, Miscellaneous</b>		
13.3/12.1-inch display		
Right hinge	HNG,RT,LCD,TFT	14, 15
Left hinge	HNG,LF,LCD,TFT	14, 15
<b>Memory</b>		
Customer kit, memory module, 32-MB	32MB,DIMM,SDRAM,LAT CPIA,FACT	
Customer kit, memory module, 64-MB	64MB,DIMM,SDRAM,LAT CPIA,FACT	
Customer kit, memory module, 128-MB	128MB,DIMM,SDRAM,LAT CPIA,FACT	
<b>Memory Door</b>		
Service kit, memory door assembly	SVC,SUBASSY,DOOR, MEM/BIOS,CPIA	7
Memory/BIOS door subassembly	SUBASSY,DOOR, MEM/BIOS,NB,CPIA	
<b>Miscellaneous Parts</b>		
Touch-pad bracket	BRCKT,TPAD,CPIA	13
Air flow duct	GDE,INTK,AIR,FAN,PLSTC,CPIA	26
<b>Palmrest Assembly</b>		
Service kit, palmrest assembly	SVC,SUBASSY,PLMRST,CPIA	12
Palmrest assembly	ASSY,PLMRST,GRY,CPIA	
Power button	SWT,PWR SW, CPIA	
Power button spring	SPR,PWR SW,CPIA	

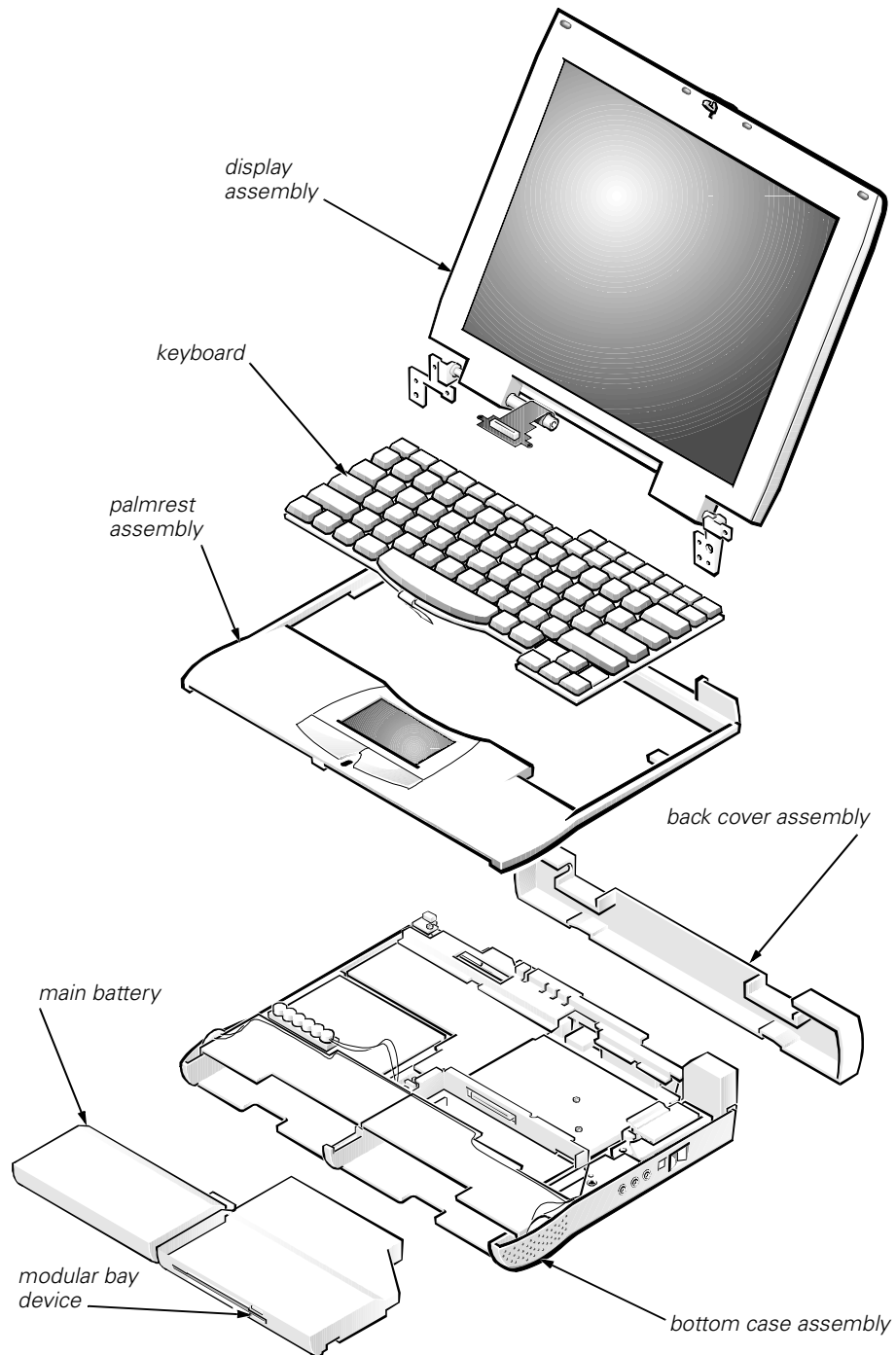
**Table 1. Parts and Assemblies** (continued)

<b>Part or Assembly Name</b>	<b>Order Name</b>	<b>Figure</b>
<b>Screws</b>		
LCD panel	SCR,M2X4.5,PHH,LP,ZPS	18, 19
LCD hinge	SCR,M3X5,PHH,LP,ZPS	16
LCD bezel	SCR,M2X4.5,PHH,LP,ZPS	17
Keyboard	SCR,M2.6X12,PHH,LP,ZPS	9
Thermal cooling assembly	SCR,M2X3.5,PHH,LP,ZPS	26
Touch pad	SCR,M2.6X1.8,PHH,XLP,ZPS	13
Palmrest, front edge	SCR,M2.6X12,PHH,LP,ZPS	12
Palmrest, hard-disk drive area	SCR,M2.6X5,PHH,LP,ZPS	12
I/R board	SCR,M2.6X5,PHH,LP,ZPS	28
Back cover	SCR,M2.6X5,PHH,LP,ZPS	11
Audio board	SCR,M2.6X5,PHH,LP,ZPS	22
Bottom-case bracket	SCR,M2.6X5,PHH,LP,ZPS	23
Exhaust fan	SCR,M2.6X12,PHH,LP,ZPS	27
<b>Speakers</b>		
Left speaker assembly	SUBASSY,SPKR,LF,W/WIRES	
Right speaker assembly	SUBASSY,SPKR,RT,W/WIRES	
<b>System Board Assembly</b>		
System board assembly, CPiA, service kit	SVC,ASSY,PRM/ PWA,ENGINE,CPiA	26
System board assembly, CPiA, service kit	SVC,ASSY,PRM/ PWA,ENGINE,CPiA	
Service tag installation diskette	DSK,BIOS,FLDSVC,F3,US,CP	
BIOS flash diskette	KIT,BIOS,FLASH,UPG,F3,CP	
Diagnostic diskette	KIT,DSK,DIAG,F3,CPiA,WW	
System board assembly	ASSY,PRM/PWA,ENGINE, CPiA	

**Table 1. Parts and Assemblies** (continued)

<b>Part or Assembly Name</b>	<b>Order Name</b>	<b>Figure</b>
<b>System Board Assembly</b> (continued)		
System board assembly (366 MHz processor with 13.3-in display; 300 MHz processor with 12.1-in display)	ASSY,PRM/PWA,ENGINE,CPIA	
System-board engine subassembly	SUBASSY,PWA/ENGINE,CPIA	
I/R board	PWA,FAST IR,CPIA	
Microphone boot	GRMT,RBR,BOOT,MCPHN	
Main system board	PWA,PLN,0M,NB,CPIA	
Video/PC Card board	PWA,DTRBD,VID/PCMCIA,CPIA	
LED board	PWA,LED,CPIA	
Exhaust fan and cable	FAN,25X25X10,CPIA	
Microphone	MCPHN,CPIA	
Reserve battery	BTRY,RSRV,7.2,30MAH,6,NIHD	
Foam pad	PAD,FOAM,BTRY,RSRV,CPIA	
<b>Thermal Cooling Assembly</b>		
Service kit, thermal cooling subassembly	SVC,SUBASSY,HTSNK,CPU,HYB,CPIA	26
<b>Touch Pad</b>		
Touch-pad service kit	SVC,TPAD,SQ,INTFC,CPIA	13
Touch-pad subassembly	TPA,INTFC,CPIA	

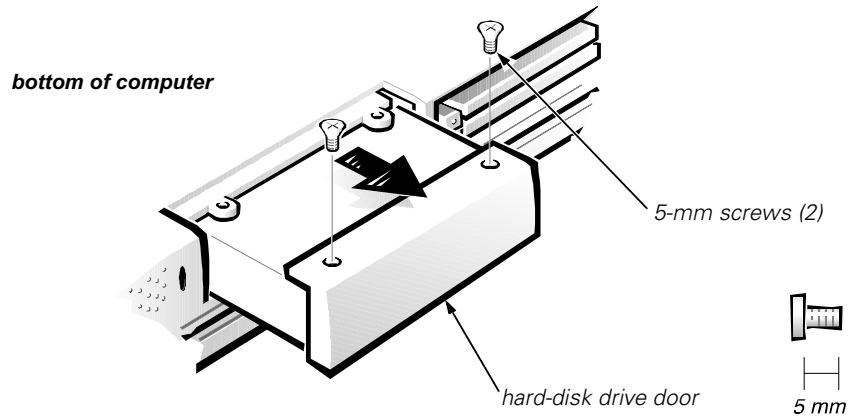
# Removing Field-Replaceable Parts and Assemblies



**Figure 5. Exploded View—Computer**

The following subsections provide instructions for removing and replacing field-replaceable parts and assemblies.

## Hard-Disk Drive Assembly



**Figure 6. Hard-Disk Drive Assembly Removal**



**CAUTION:** The hard-disk drive is very sensitive to shock. Handle the assembly by its edges (do not squeeze the top of the hard-disk drive case), and avoid dropping it.



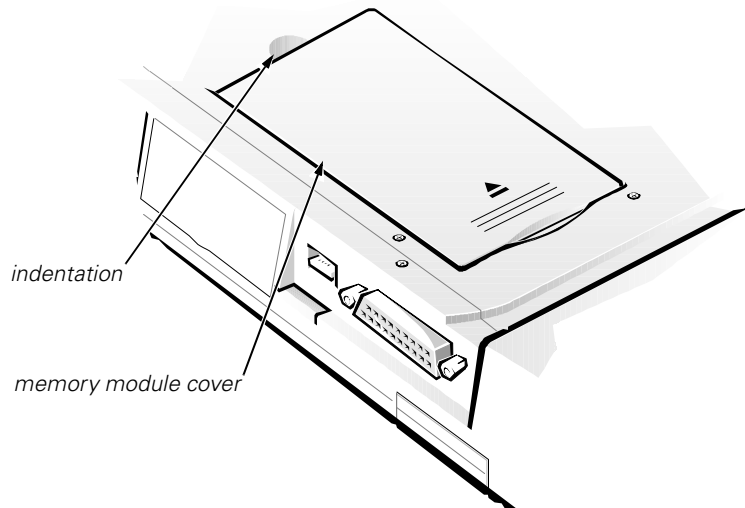
**CAUTION:** Make sure the work surface is clean to prevent scratching the computer cover.

1. Turn the computer over, and remove the two 5-mm screws from the hard-disk drive door.

The drive is on the left side of the computer.

2. Grasp the drive door and pull the drive out of the computer.

## Memory Module Cover



**Figure 7. Memory Module Cover Removal**

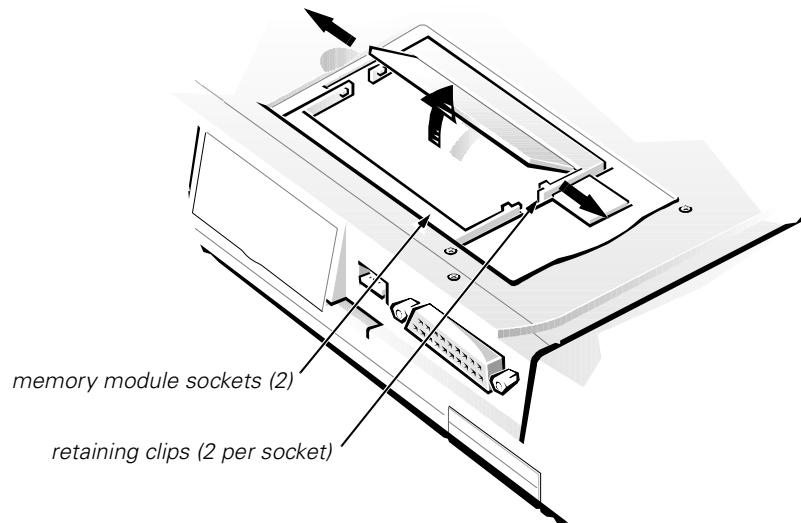


**CAUTION: Make sure the work surface is clean to prevent scratching the computer cover.**

1. Close the display, and turn the computer upside down on a flat work surface.
2. Release the memory module cover.

Insert a fingertip in the indentation in the bottom case assembly and lift the cover slightly; then slide the cover in the direction indicated by the arrow on the cover.

## Memory Modules



**Figure 8. Memory Module Removal**

1. Remove the memory module cover.
2. To avoid possible damage to the memory module from electrostatic discharge (ESD), ground yourself by touching the unpainted metal surface of an I/O connector on the computer's back panel.
3. To release a memory module from its socket, gently push outward on each of the memory module's two metal retaining clips.

The memory module rotates upward out of its retaining clips.

4. Lift the memory module out of its socket.

You can install memory modules only one way. Do not attempt to force the memory module into the socket. Align the notch near the center of the memory module with the corresponding key in the memory module socket.

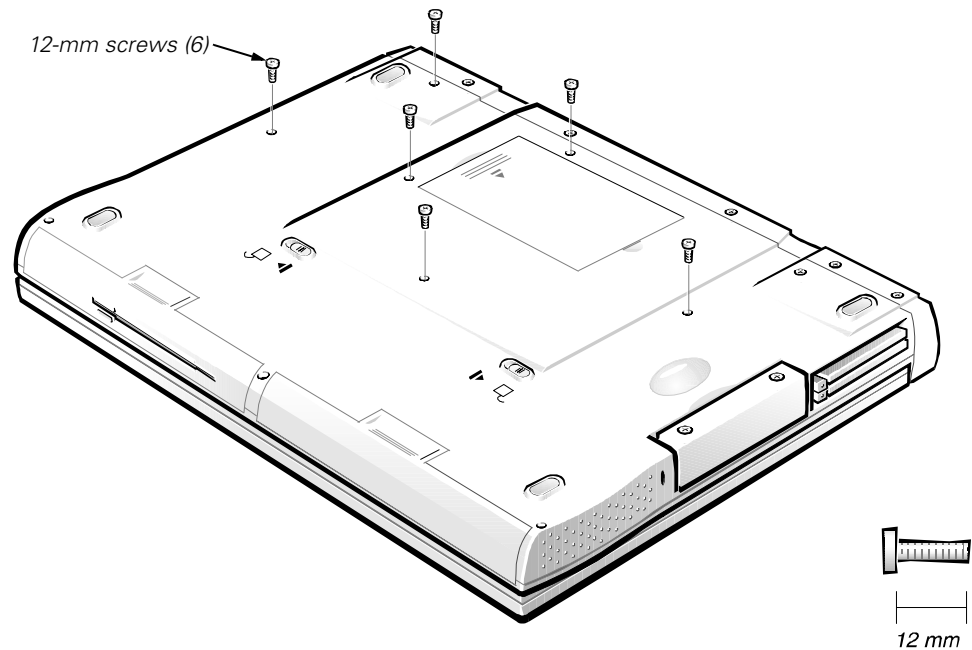
## Keyboard Assembly

To remove the keyboard assembly, perform the following steps.



**CAUTION: Make sure the work surface is clean to prevent scratching the computer cover.**

1. Close the display assembly, and turn the computer upside down on a flat work surface (see Figure 9).



**Figure 9. Removing the Keyboard Assembly Screws**

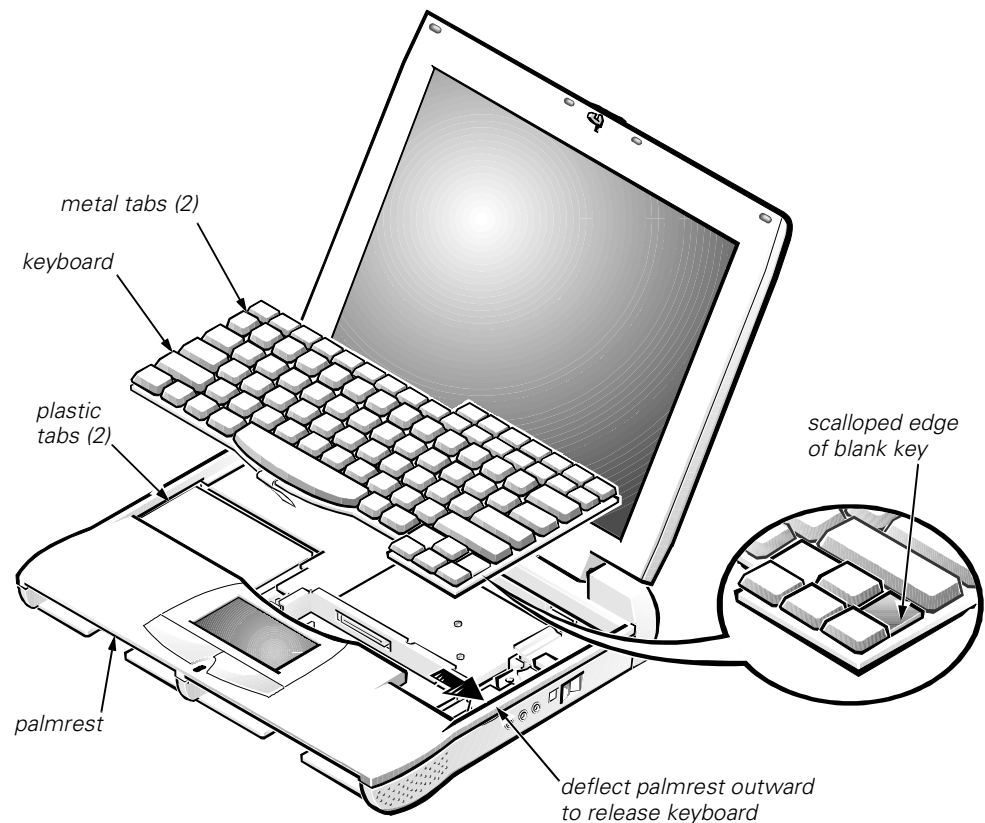
2. Remove the six 12-mm screws securing the keyboard to the computer.
3. Turn the computer right-side up and open the display.



**CAUTION: The keycaps on the keyboard are fragile, easily dislodged, and time-consuming to replace. Be careful when removing and handling the keyboard.**

4. Release the keyboard from the palmrest assembly:
  - a. Carefully deflect the palmrest (next to the blank key below the <Shift> key; see Figure 10) away from the center of the keyboard, until the tab on the palmrest's inner edge disengages from the keyboard. The keyboard should raise up slightly.
  - b. Insert a fingernail or a small flat-bladed screwdriver under the scalloped edge of the blank key (see Figure 10), and lift the right edge of the keyboard.





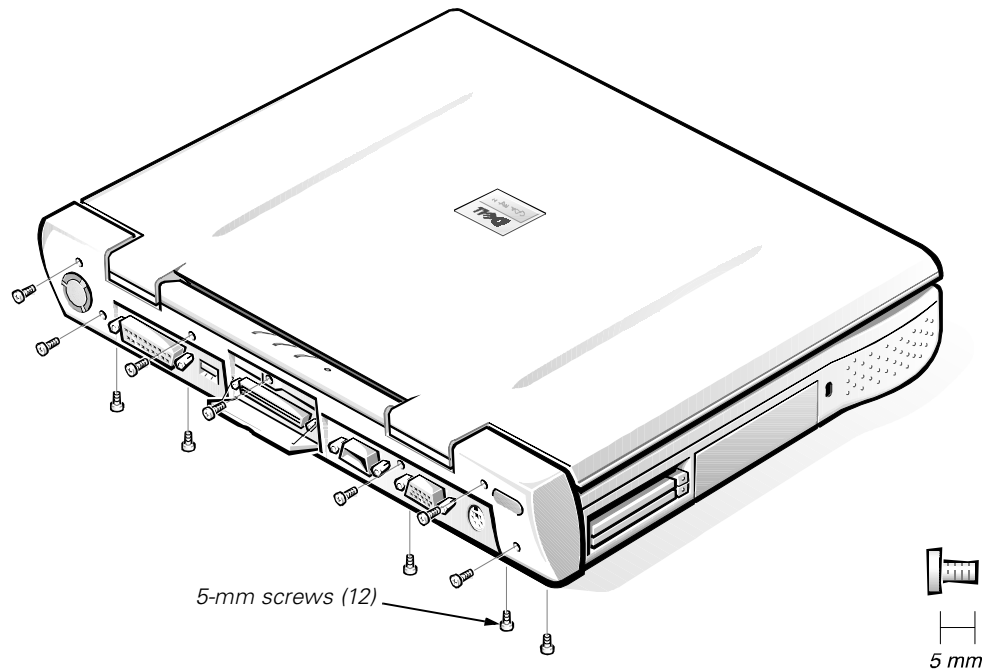
**Figure 10. Keyboard Assembly Removal**

5. Once the keyboard is fully released from the palmrest, place the keyboard upside down over the touch pad.
6. Disconnect the keyboard cable from connector KB1 on the system board.
7. Remove the keyboard assembly.

Perform the following steps when you replace the keyboard assembly:

1. Connect the keyboard cable to connector KB1 on the system board.
2. Fit the left edge of the keyboard into place, making sure the two small metal tabs on the keyboard fit under the corresponding plastic tabs on the palmrest's inner edge.
3. Lower the right edge of the keyboard into place, and press on the blank key below the <Shift> key until the tab on the palmrest's inner edge engages the keyboard with an audible "click."
4. Check that the keyboard is correctly installed. The keys should be flush with the left and right surfaces of the palmrest.
5. Reinstall the six 12-mm screws.

## Back Cover Assembly



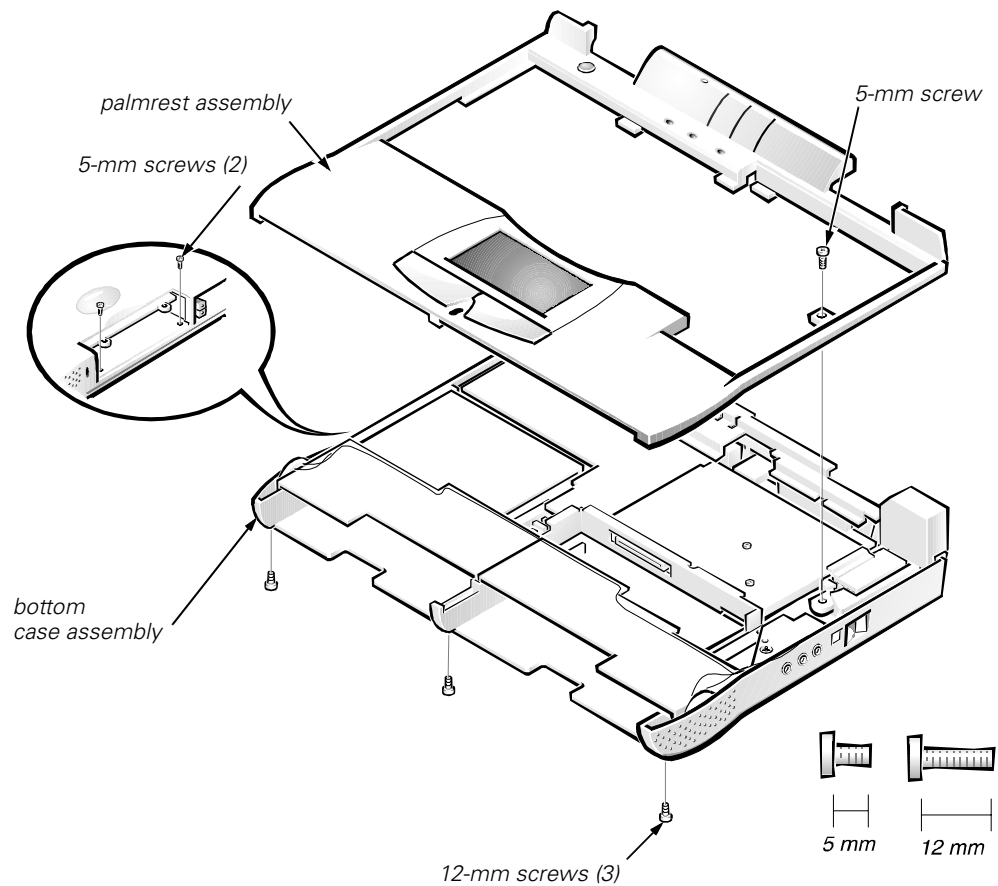
**Figure 11. Back Cover Assembly Removal**

1. Close the display.
2. Remove the twelve 5-mm screws securing the back cover:
  - Five screws on the underside of the back cover
  - One screw behind the docking connector door
  - Six screws on the face of the back cover
3. Close the docking connector door.
4. Remove the back cover assembly.

Grasp the right end of the back cover assembly firmly, and unsnap it from the computer. Then disengage the left end of the back cover assembly.

## Palmrest Assembly

The palmrest assembly consists of the touch pad and the palmrest.



**Figure 12. Palmrest Assembly Removal**

1. Remove the keyboard.
2. Disconnect the touch-pad cable from ZIF connector JP2 on the system board.
3. Remove the back cover assembly.
4. Remove the following screws securing the palmrest to the computer:
  - One 5-mm screw inside the computer, adjacent to the thermal cooling assembly.
  - Two 5-mm screws inside the upper edge of the hard-disk drive bay. (You must remove the hard-disk drive to access these screws.)
  - Three 12-mm screws underneath the front edge of the computer.

- Turn the computer right-side up on the work surface, and open the display assembly 180 degrees.



*NOTE: Support the display assembly with a book or similar object so that the display assembly does not open beyond 180 degrees.*

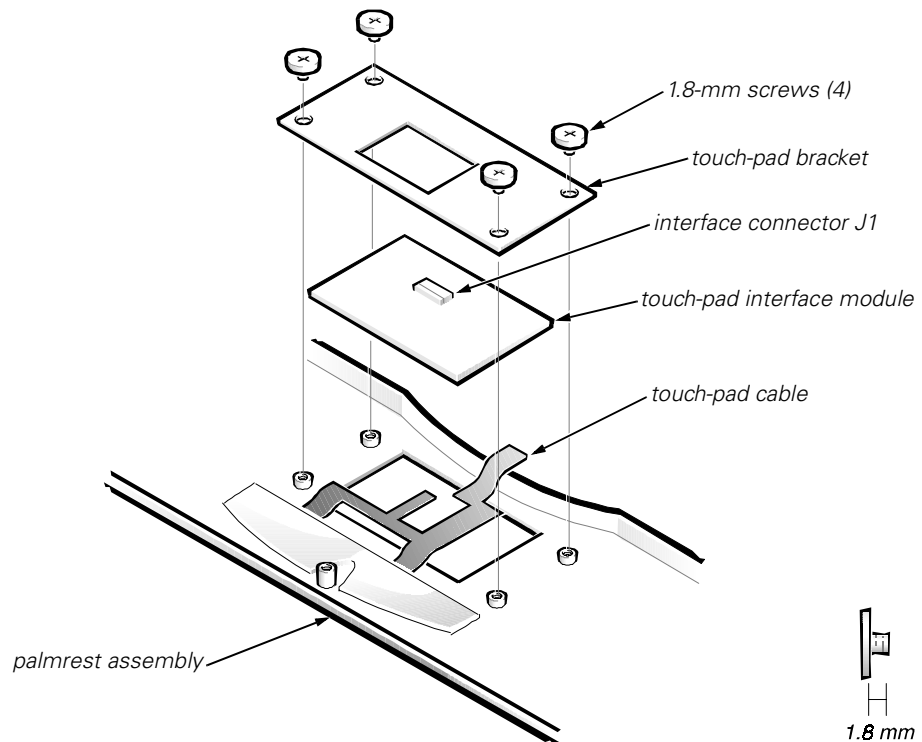
- Carefully remove the palmrest assembly from the bottom case assembly.

The palmrest assembly is secured in the bottom case assembly by four snaps and tabs on the right and left ends of the palmrest. Take care not to damage the snaps when removing the palmrest.



*NOTE: When you replace the palmrest, ensure that the vertical tab at the back of the palmrest fits on the **outside** of the system board assembly, near the parallel port connector. Also, check that the microphone boot is properly located in its slot on the top electromagnetic interference (EMI) shield and is fitted within the palmrest assembly.*

## Touch-Pad Interface Module



**Figure 13. Touch-Pad Interface Module Removal**

- Remove the palmrest assembly.
- Turn the palmrest assembly upside down on a flat work surface.
- Remove the four 1.8-mm screws securing the touch-pad bracket.

- Carefully disconnect the touch-pad cable from ZIF connector J1 on the touch-pad interface module.

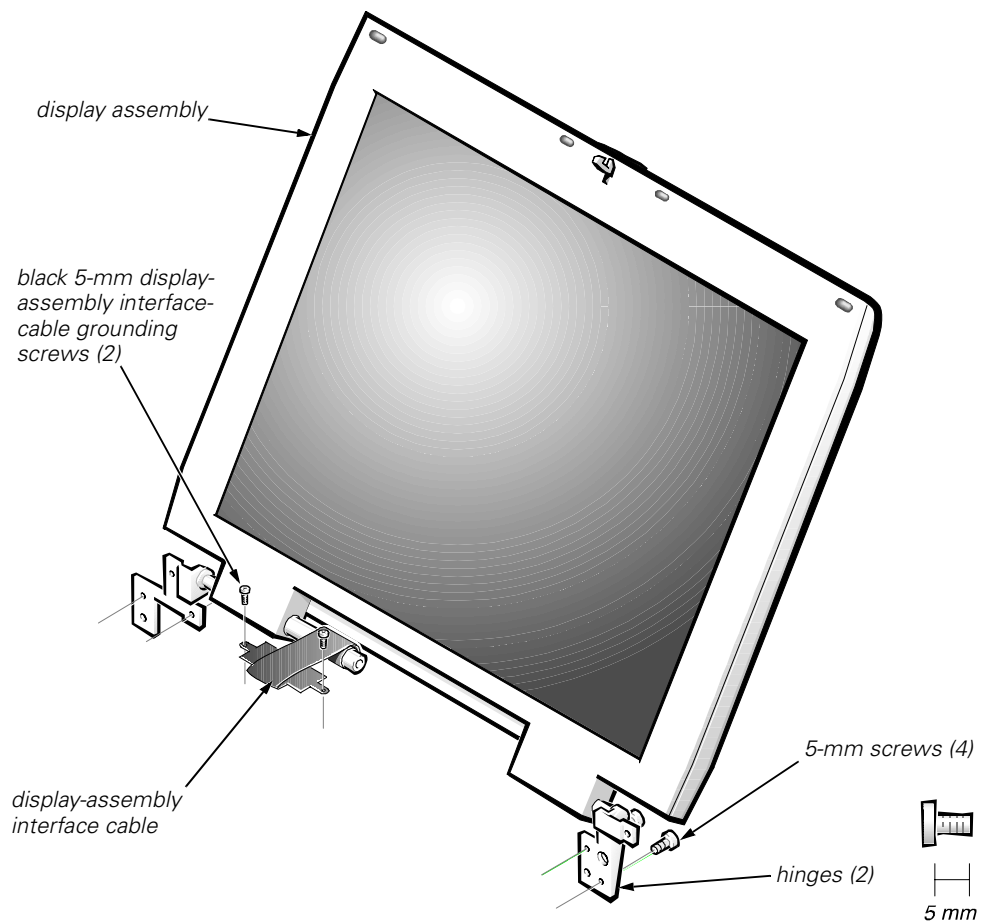
To release the ZIF connector latch, use a fingernail to lift up the central portion of the black plastic latch.

- Remove the touch-pad interface module from the palmrest.

## **Power Button**

- Remove the palmrest assembly.
- Turn the palmrest assembly upside down on a flat work surface.
- Compress the two catches securing the power button, and remove the power button and spring from the palmrest assembly.

## **Display Assembly**



**Figure 14. Display Assembly Removal**

1. Remove the back cover assembly.
2. Remove the keyboard.
3. Remove the palmrest assembly.
4. Remove the two black 5-mm interface-cable grounding screws and the interface cable bracket.
5. Disconnect the display-assembly interface cable from connector JP1 on the system board.

Grasp the grounding tabs and pull the connector straight up from the system board.

6. Close the display, being careful not to damage the display-assembly interface cable.
7. Remove the four silver 5-mm screws securing each of the two hinge brackets to the bottom case assembly.
8. Lift the display assembly from the bottom case assembly.

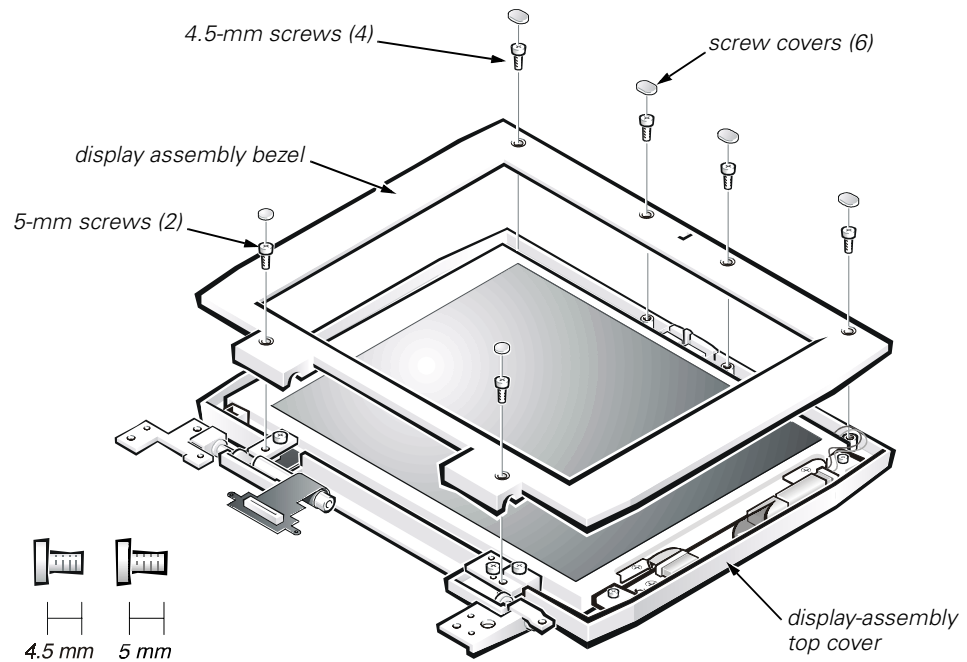


*NOTE: When you reinstall the display assembly, install the four screws securing the hinges at the locations marked by arrows on the face of each hinge.*



**CAUTION: When you reinstall the display-assembly interface cable, be very careful not to insert it into the connector at an angle. Position the cable end over the connector and push the cable end straight down to prevent bending the connector pins.**

## Display Assembly Bezel



**Figure 15. Display Assembly Bezel Removal (12.1-Inch Display Shown)**

1. Use a scribe to carefully pry the screw covers out of the six screw holes in the bezel.
2. Remove the six screws from the bezel.

The four upper screws are 4.5-mm screws, while the two lower screws are 5-mm in length.

3. Separate the bezel from the display-assembly top cover.

The bezel is secured by snaps around all four of its edges. Insert your fingertips between the bezel and the LCD panel, and lift upward on the bezel to release the hidden snaps. Avoid pressing on the surface of the LCD panel.

## Display Assembly Latch



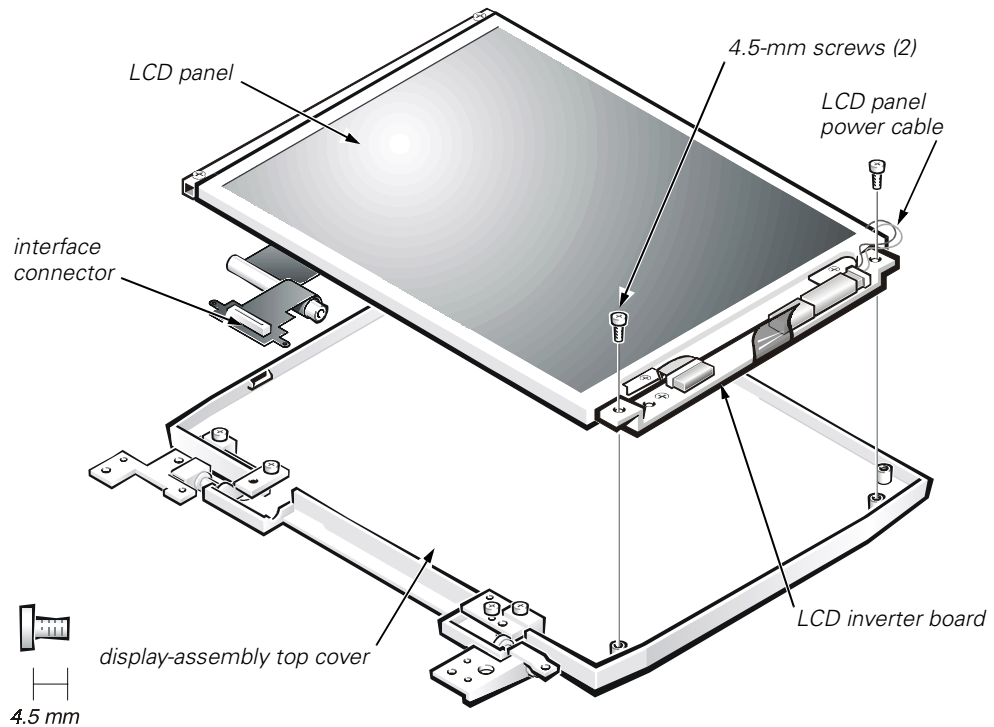
*NOTE: On a 13.3-inch display, you must remove the LCD panel before you can remove the display assembly latch.*

1. Remove the display assembly bezel.
2. Remove the display assembly latch by unsnapping the latch and captive spring from the inside of the display assembly top-cover assembly.

## LCD Panel

The following subsections describe how to remove an LCD panel.

### 12.1-Inch LCD Displays

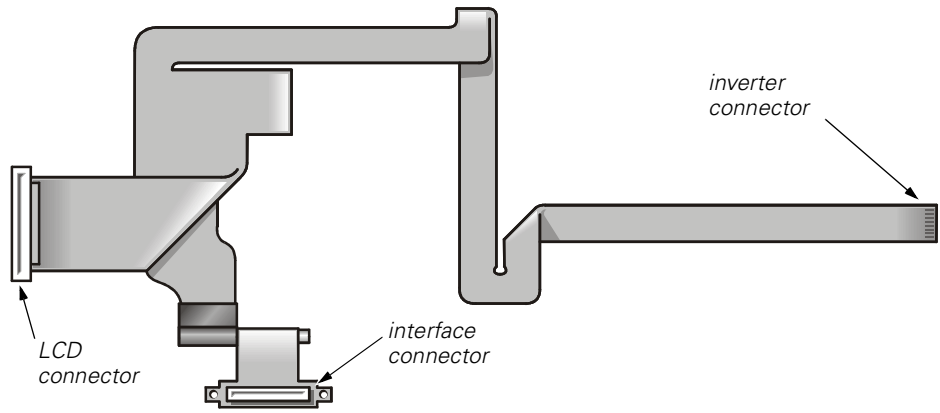


**Figure 16. LCD Panel Removal (12.1-Inch Display)**

1. Remove the back cover assembly.
2. Remove the keyboard.
3. Remove the palmrest.
4. Remove the display assembly bezel.
5. Remove the two 4.5-mm screws at the right corners of the LCD panel.
6. Remove the two screws holding the interface connector.
7. Disconnect the interface connector.

Figure 17 shows the cable layout for a 12.1-inch LCD panel.





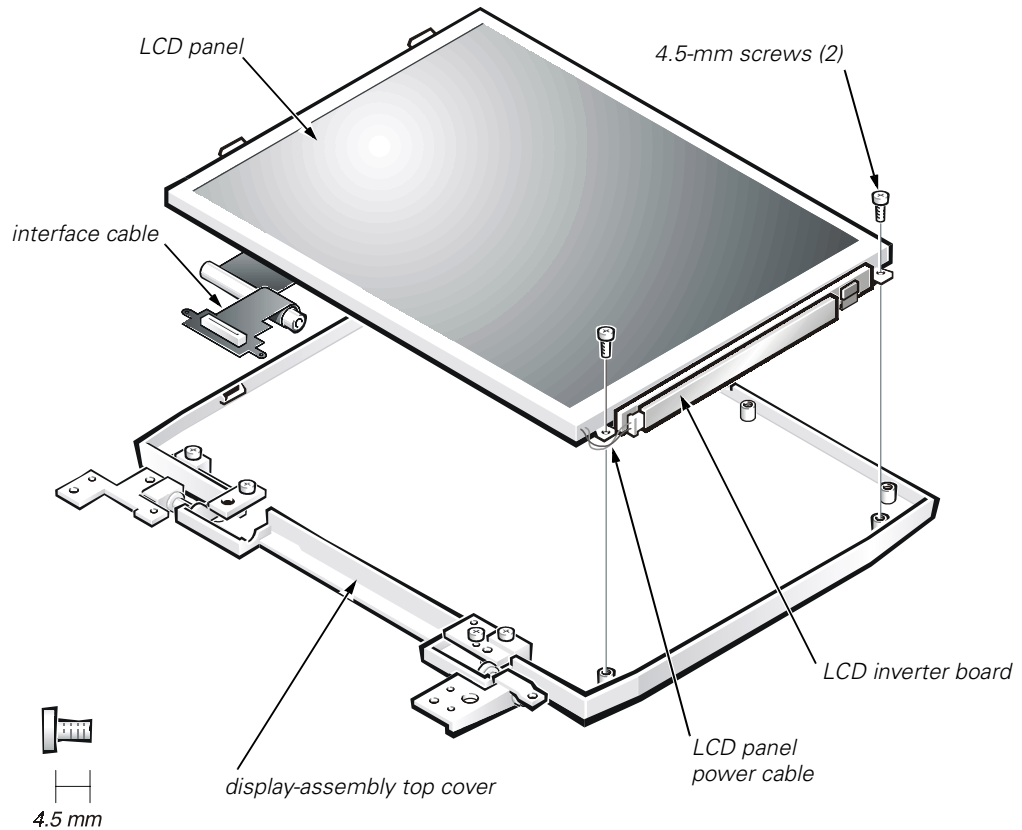
**Figure 17. Cable Layout for the 12.1-Inch LCD Panel**

8. Use the yellow tab to lift the right side of the LCD panel, slide the LCD panel to the right, and then lift the LCD panel out of the top cover.



*NOTE: Remove and replace the LCD as a whole assembly.*

## 13.3-Inch LCD Displays



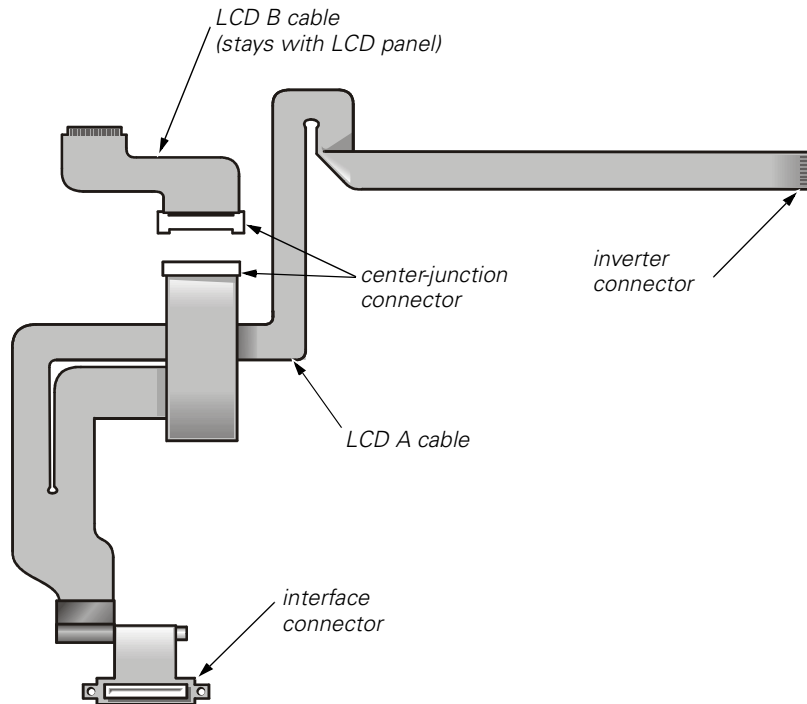
**Figure 18. LCD Panel Removal (13.3-Inch Display)**

1. Remove the display assembly bezel.
2. Remove the two 4.5-mm screws at the right corners of the LCD panel.
3. Use the yellow tab to lift the right side of the LCD panel, slide the LCD panel to the right, and then pivot the panel up.
4. Disconnect the interface cable at the center-junction connector on the back of the LCD panel.



**CAUTION: Carefully press down on the locking tabs and then pull the connector apart.**

Figure 19 shows the two-piece (A and B) cable layout for a 13.3-inch LCD panel.



**Figure 19. Two-Piece Cable Layout for the 13.3-Inch LCD Panel**

5. Disconnect the display-assembly interface cable from the ZIF connector on the inverter that is located on the right side of the LCD panel.

To disconnect the cable, carefully work the cable connector free from the ZIF connector on the LCD panel. Do *not* pull on the LCD interface cable itself.



*NOTES: When you replace the 13.3-inch LCD display, always replace the display assembly bezel with the new one that comes with the LCD display.*

*If you need to replace the bottom LCD cable on the 13.3-inch display, use one bend to route the new cable to the inverter board connector.*

*If you need to replace the bottom LCD cable on the 12.1-inch display, use two bends to route the new cable to the inverter board connector.*

## **LCD Display Hinge**

1. Remove the LCD display assembly from the computer.
2. Remove the display assembly bezel.
3. Remove the four silver 5-mm screws securing the two hinge brackets to the display-assembly top cover.



*NOTE: To aid in reinstalling the hinges and display assembly, the right and left hinges are marked by an "R" and an "L," respectively. Install the four screws securing the hinges at the locations marked by arrows on the face of each hinge.*

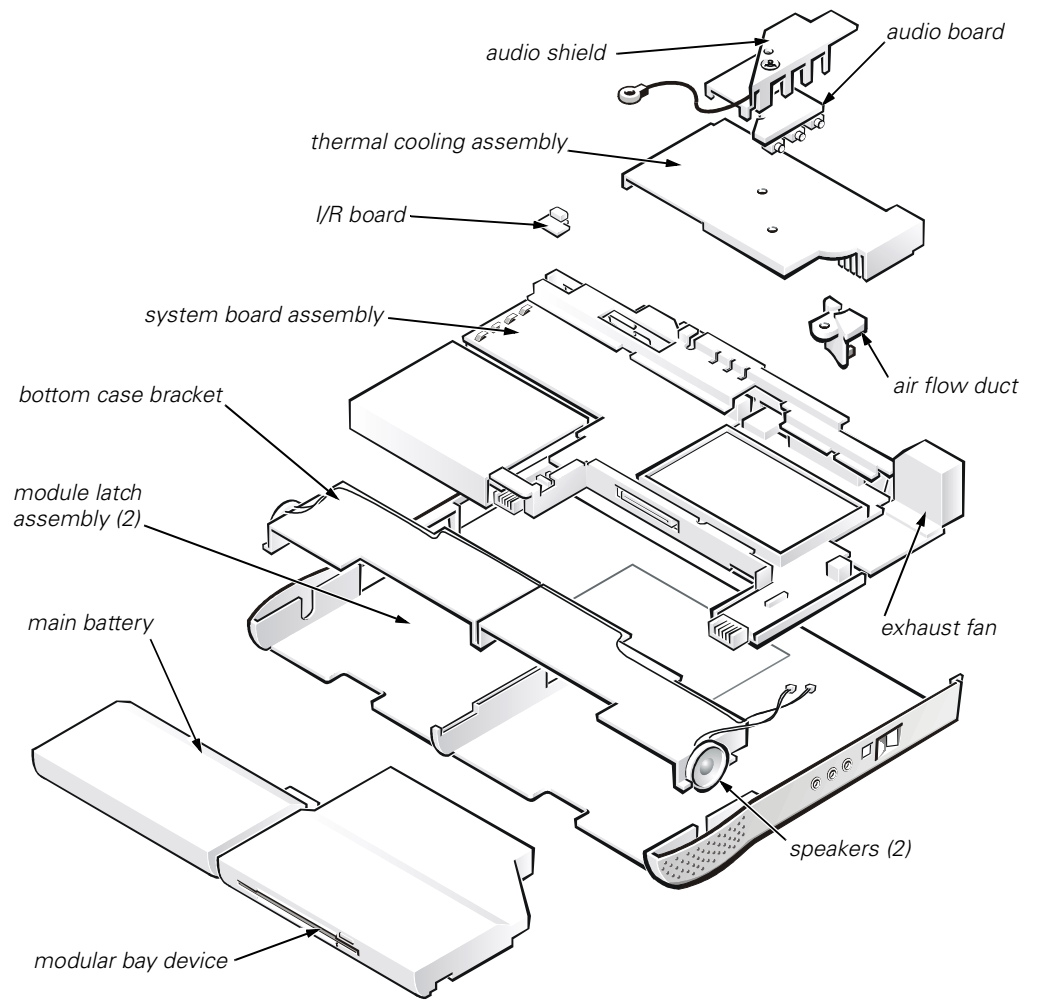
## **Display-Assembly Top Cover**

1. Remove the display assembly.
2. Remove the display assembly bezel.
3. Remove the LCD panel.
4. Remove the display assembly latch.
5. Remove the left and right hinges.
6. Remove the display-assembly interface cable.

## **Bottom Case Assembly**

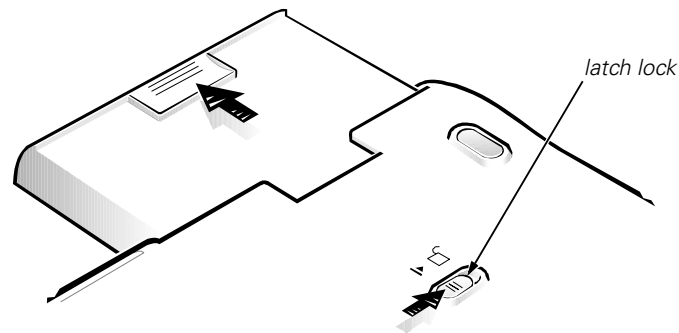
The bottom case assembly consists of the following field-replaceable components:

- Modular bay device (diskette drive assembly, CD-ROM drive assembly, or travel module)
- Back cover assembly
- Audio shield
- Audio board
- Bottom case bracket
- Module latch assemblies
- Speakers
- System board assembly
- Thermal cooling assembly
- Air flow duct
- Exhaust fan
- Infrared (I/R) board
- Reserve battery



**Figure 20. Bottom Case Assembly**

## Modular Bay Devices (Diskette Drive, CD-ROM Drive, Battery, or Travel Module)



**Figure 21. Modular Bay Device Removal**



*NOTE: You do not need to remove the main battery or hard-disk drive prior to this procedure.*



**CAUTION: Make sure the work surface is clean to prevent scratching the computer cover.**

1. Close the display and turn the computer over.
2. Remove the device from the modular bay.

Push the modular bay latch away from the center of the computer. Keep holding the latch open while pulling the device out of the modular bay with the other hand.

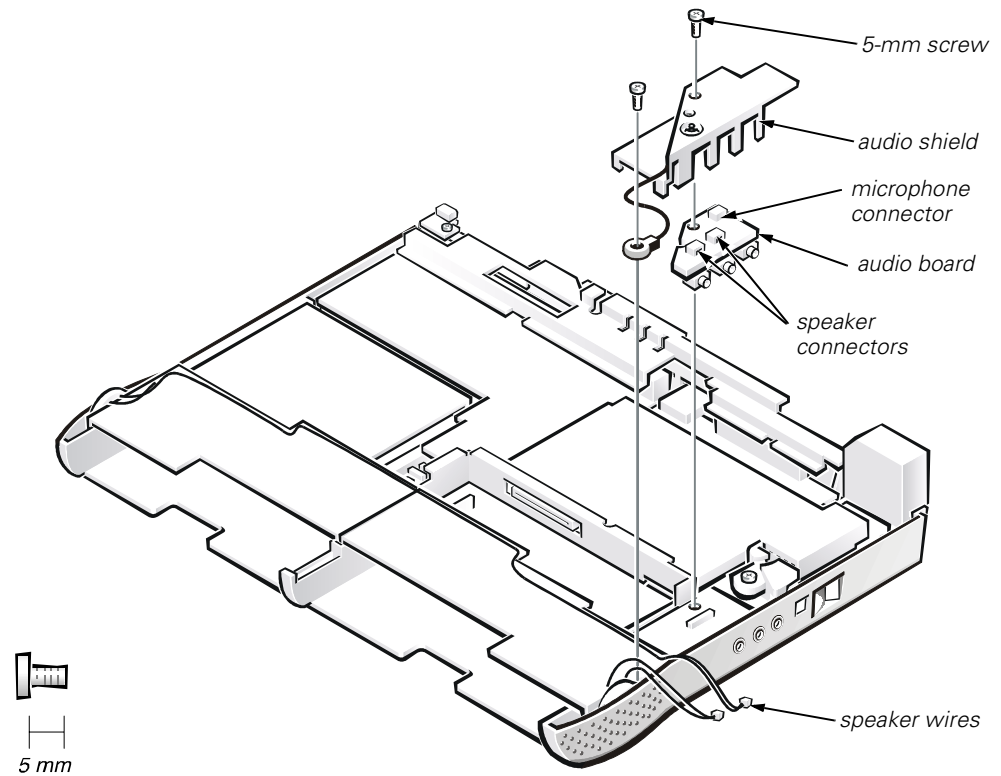
### Audio Shield

1. Remove the back cover assembly.
2. Remove the keyboard assembly.
3. Remove the palmrest assembly.
4. Remove the 5-mm screw securing the audio shield (see Figure 22).
5. Remove the 5-mm screw securing the EMI drain wire.
6. Remove the audio shield.



*NOTE: When you replace the audio shield, ensure that the audio shield is properly seated to prevent it from cutting into the speaker wires or interfering with devices installed in the modular bay. (You can check this by temporarily installing a device in the modular bay prior to reinstalling the palmrest assembly.)*

## Audio Board



**Figure 22. Audio Board Removal**

1. Remove the back cover assembly.
2. Remove the keyboard assembly.
3. Remove the palmrest assembly.
4. Remove the 5-mm screw securing the audio shield.
5. Remove the 5-mm screw securing the EMI drain wire.
6. Remove the audio shield.
7. Disconnect the speaker wires and microphone wire from their connectors on the audio board.

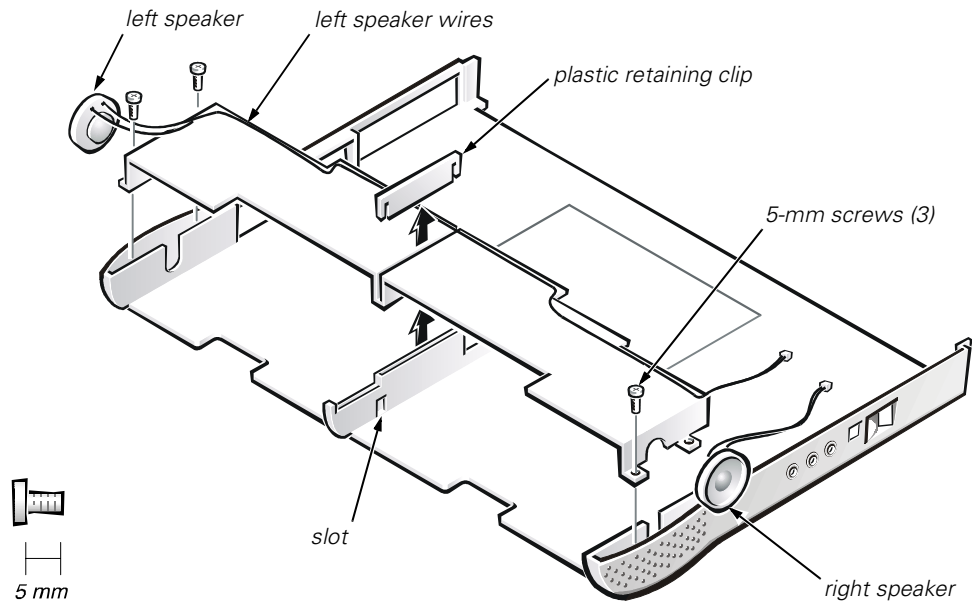
The connectors are fragile—do not pull on the wires to disconnect them.

8. Remove the audio board from the bottom case.



**NOTE:** When you replace the audio shield, ensure that the audio shield is properly seated to prevent it from cutting into the speaker wires or interfering with devices installed in the modular bay. (You can check this by temporarily installing a device in the modular bay prior to reinstalling the palmrest assembly.)

## Bottom Case Bracket



**Figure 23. Bottom Case Bracket Removal**

1. Remove the back cover assembly.
2. Remove the keyboard assembly.
3. Remove the palmrest assembly.
4. Remove the 5-mm screw securing the audio shield and the 5-mm screw securing the EMI drain wire.
5. Remove the audio board shield.
6. Disconnect the speaker wires from connectors JP1 and JP2 on the audio board.

The connectors are fragile—do not pull on the speaker wires to disconnect them.

7. Remove the two 5-mm screws on the left side and one 5-mm screw on the right side of the bottom case bracket.
8. Insert the end of a small flat-blade screwdriver into the slot in the vertical support in the center of the bottom case, and disengage the plastic retaining clip.
9. Lift the bottom case bracket from the computer.

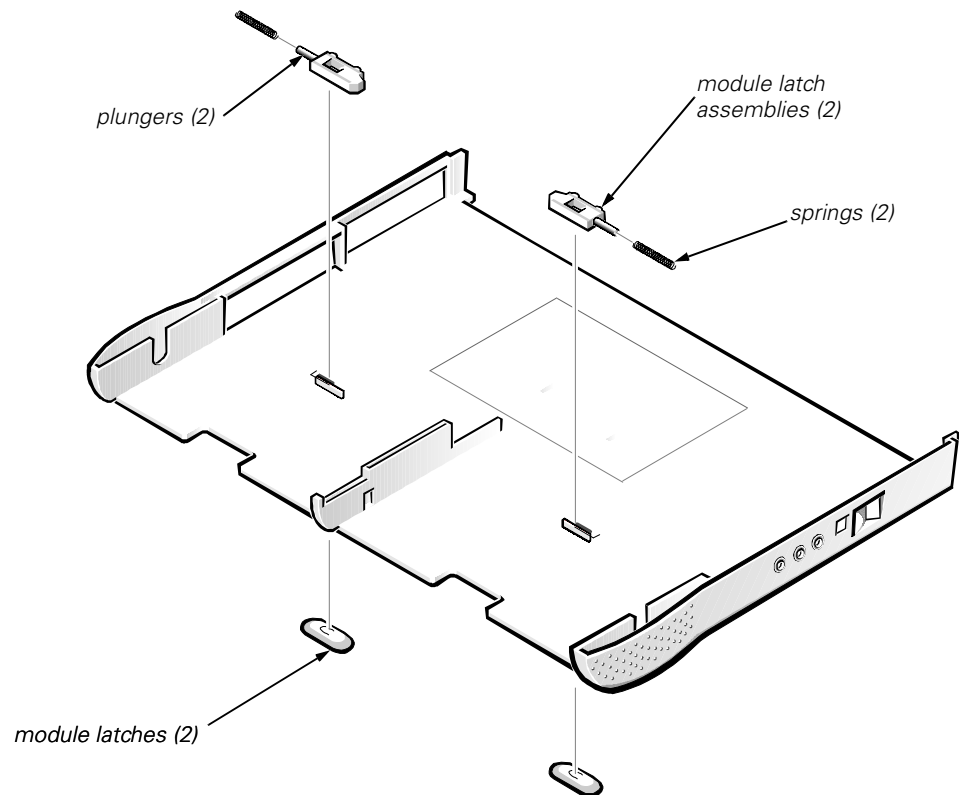




**NOTE:** When you replace the bottom case bracket, follow these guidelines to prevent damage to the speaker wires:

- Orient each speaker in the bottom case so that its wires are facing upwards.
- Route the speaker wires under their respective retaining clips on the bottom case bracket.

## Module Latch Assemblies



**Figure 24. Module Latch Assemblies Removal**

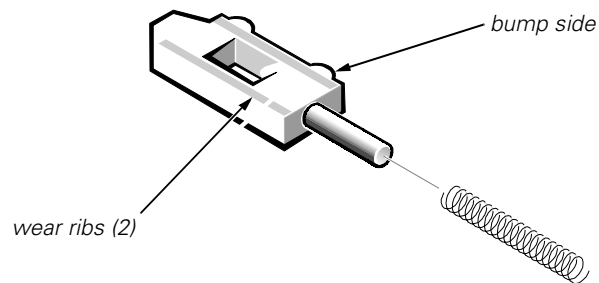
1. Remove the bottom case bracket.
2. Remove the left latch from the outside of the bottom case by unsnapping the slider-spring assembly.

Keep pressure applied to the slider-spring assembly while unsnapping the latch to prevent the slider-spring assembly from coming loose from the case. If the slider-spring assembly does come loose from the case:

- a. Carefully reinsert the spring onto the plunger on the slider, and reinstall the slider-spring assembly into the holding features on the inside of the case.

- b. Ensure that the plunger is inserted in its respective hole, that the side of the slider with the two bumps is facing the rear of the case, and that the surface with the wear ribs is facing the bottom of the case (see Figure 25).
3. Snap in the new latch from the bottom of the base, making certain its snap features are fully engaged in the slider.
4. Ensure that the newly installed latch moves smoothly and freely when pushed and released.
5. Repeat steps 1 through 4 for the latch on the right side.
6. On the base plastic, find the molded label "P.N. ASSY 89501"; then use a permanent marker to write "A01" to the right of "89501."

This revision mark indicates that the latch rework is complete.



**Figure 25. Left Slider**

## Speakers

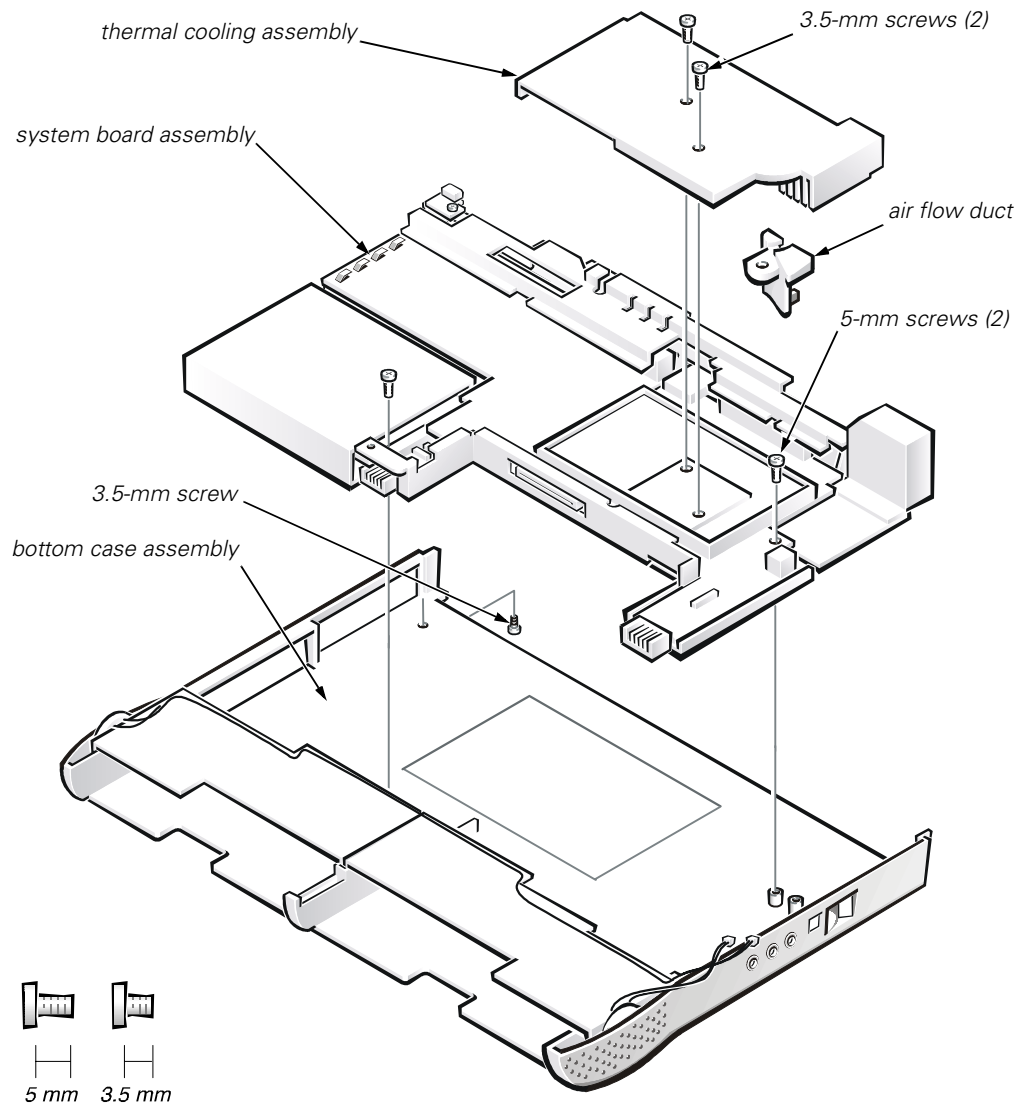
1. Remove the bottom case bracket.
2. If you are replacing the left speaker, carefully remove the speaker wires from the retaining clips along the bracket's edges.
3. Remove the speaker from the bottom case bracket.



*NOTE: When you replace the speaker, follow these guidelines to prevent damage to the speaker wires:*

- *Orient the speaker in the bottom case so that the speaker wires are facing upwards.*
- *Route the speaker wires under their retaining clips on the bottom case bracket.*

## System Board Assembly



**Figure 26. System Board Assembly Removal**

The system board's basic input/output system (BIOS) chip contains the system service tag number, which is also visible on a bar-code label on the bottom of the computer. The replacement kit for the system board assembly includes a diskette that provides a utility for transferring the service tag number to the replacement system board assembly.

1. Remove the back cover assembly.
2. Remove the keyboard assembly.
3. Remove the palmrest assembly.



**CAUTION: To ensure maximum cooling for the microprocessor, do not touch the heat transfer areas on the thermal cooling assembly (TCA). The oils in your skin reduce the heat transfer capability of the thermal pads.**

4. Remove the two 3.5-mm screws securing the TCA to the microprocessor module.
5. Remove the TCA from the microprocessor module.
6. Remove the three screws that secure the processor module to the system board.
7. Use a processor extractor tool to remove the processor module.

The tool fits on the left side of the module, in the notches.



**CAUTION: Pull the module straight up. Do not move the tool from side to side to extract the processor module.**

8. Remove the audio shield and audio board.
9. Remove the airflow duct.
10. Remove the bottom case bracket.
11. Turn the assembly over and remove the two 3.5-mm screws from the bottom case assembly, located in the rubber feet.
12. Turn the assembly over and remove the two 5-mm screws that secure the system board to the bottom case assembly.

The screws are located in the back rubber feet.

13. Lift the system board assembly out of the bottom case assembly.

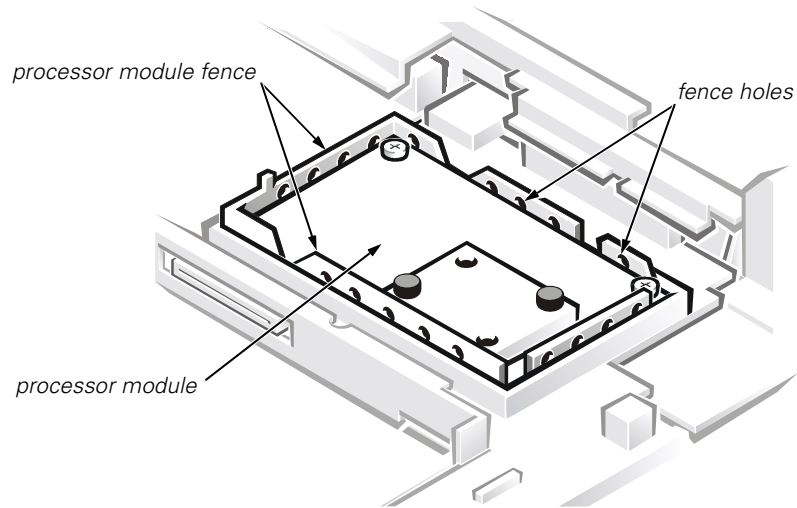


**CAUTION: When you handle the system board, be careful not to bend or break the EMI clips that are located at the upper-left corner of the board.**

Be sure to transfer the memory module(s) to the replacement system board assembly. If you are replacing the thermal cooling assembly with a new one, remove any lining present on the thermal pad before installing the new thermal cooling assembly.

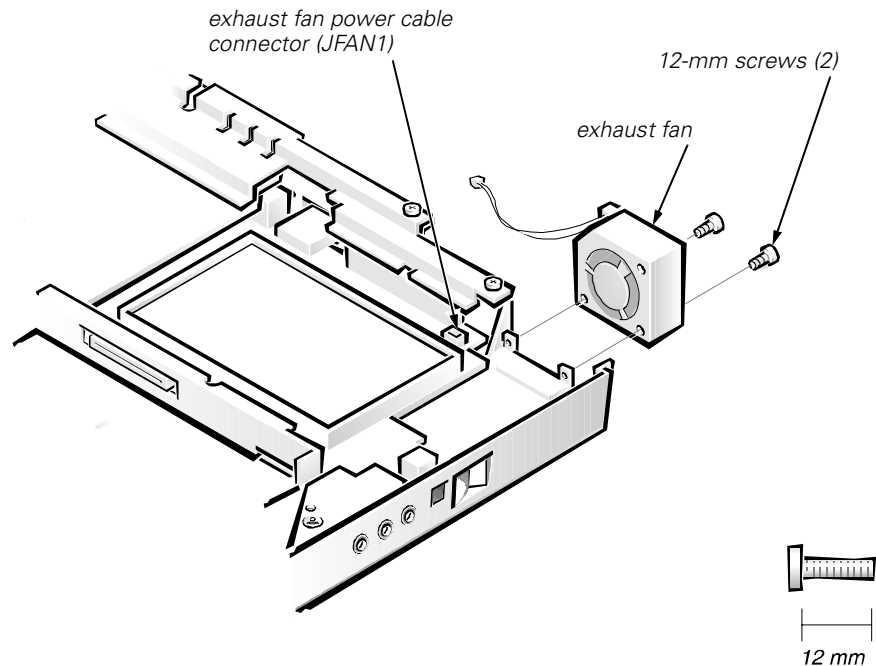
After you replace the system board assembly, be sure to enter the system's service tag number into the BIOS of the replacement system board assembly. Insert the diskette that accompanied the replacement system board assembly into the diskette drive, and turn on the computer. Follow the instructions on the display screen.

When you reinstall the processor module in the system board, make sure you press down evenly at all four corners of the module. When the processor module is seated, all four corners must be at the same height. If one or more corners of the module are higher than the others, the module is not seated correctly. To ensure the processor module is seated correctly, look at the holes on the processor module fence. You should see no less than the top half of the holes all the way around the processor module (see Figure 27).



**Figure 27. Processor Module**

## Exhaust Fan



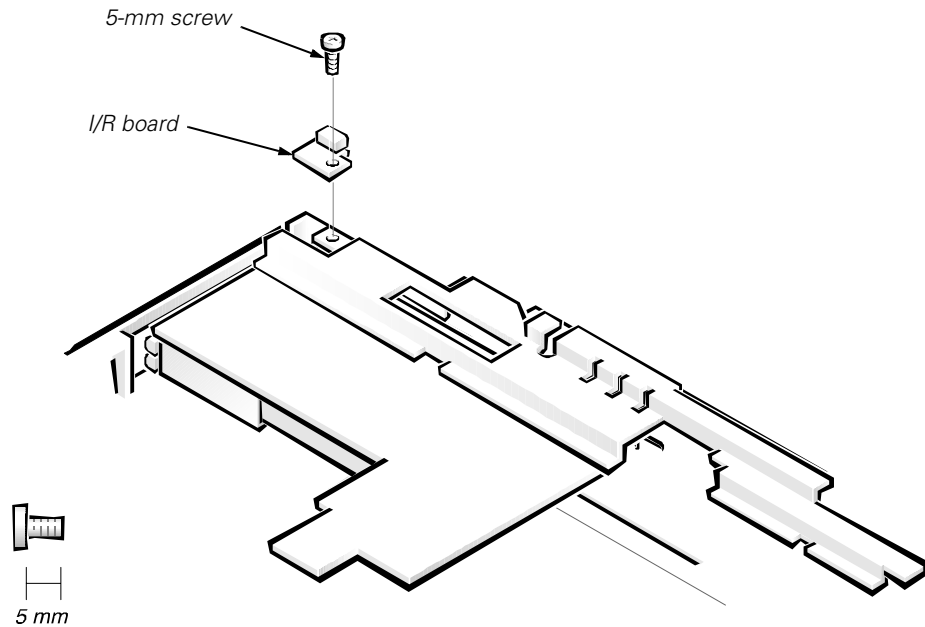
**Figure 28. Exhaust Fan Removal**

1. Remove the back cover assembly.
2. Remove the keyboard assembly.
3. Remove the palmrest assembly.
4. Disconnect the exhaust fan power cable from connector J10 on the system board.
5. Remove the two 12-mm screws securing the exhaust fan, and then remove the exhaust fan.



*NOTE: When you replace the exhaust fan, orient the fan so that the fan label faces outward and the power cable is at the upper-right corner of the fan (when viewed from the back of the computer). (This prevents the fan wires from being pinched when you reassemble the computer.) Make sure that the wires are routed under the upper EMI shield.*

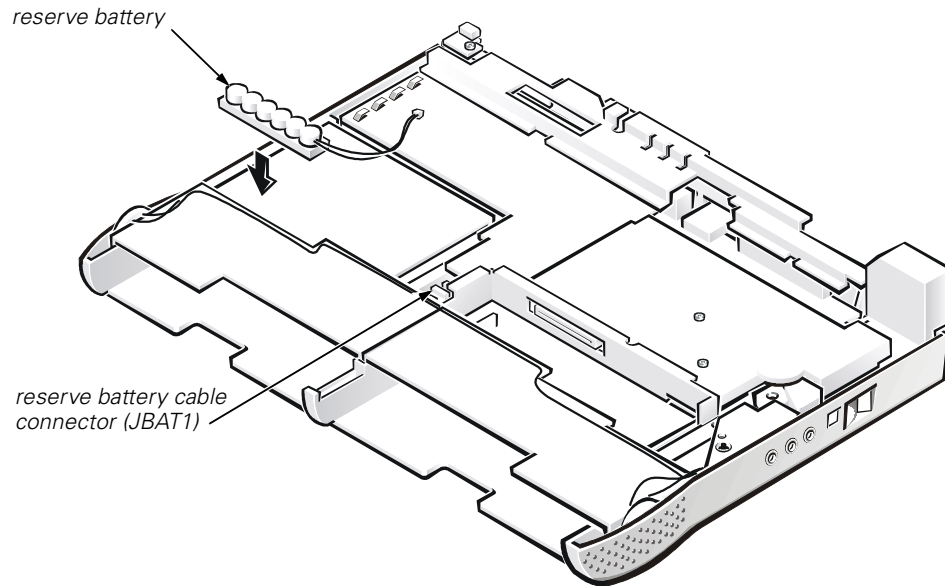
## I/R Board



**Figure 29. I/R Board Removal**

1. Remove the palmrest assembly.
2. Remove the 5-mm screw securing the I/R board to the system board assembly.
3. Lift the I/R board straight up from the system board assembly.

## Reserve Battery



**Figure 30. Reserve Battery Installation**



**CAUTION:** The reserve battery provides power to the computer's real-time clock (RTC) and nonvolatile random-access memory (NVRAM) when the computer is turned off. Removing the battery causes the computer to lose its date and time information as well as all user-settable parameters in NVRAM. If possible, make a copy of this information before you remove the reserve battery.

To remove the reserve battery, perform the following steps:

1. Remove the back cover assembly.
2. Remove the keyboard assembly.
3. Remove the palmrest assembly.
4. Disconnect the reserve battery cable from connector JRBAT1 on the system board.
5. Remove the reserve battery from the bottom case bracket.
  - a. Tear the reserve battery free from the foam pad.
  - b. Remove the remnants of the foam pad from the system board assembly.



**NOTE:** When you replace the reserve battery, first connect the reserve battery cable to the system board. Then position the reserve battery on the hard-disk drive bay so that there is minimal slack in the cable.





# Index

## A

audio board  
removal, 31

audio shield  
removal, 30

## B

back cover assembly  
removal, 18

battery (in modular bay)  
removal, 30

bottom case assembly  
components, 28  
illustrated, 29

bottom case bracket  
removal, 32

## C

CD-ROM drive  
removal, 30

## D

diskette drive  
removal, 30

display assembly  
bezel, removal, 23  
removal, 21  
top cover, removal, 28

## E

ESD, 2

exhaust fan  
removal, 38

## F

field-replaceable parts and  
assemblies  
illustrated, 12  
list of, 5

## H

hard-disk drive assembly  
removal, 13

## I

I/R board  
removal, 39

## **K**

keyboard assembly  
removal, 16

## **L**

LCD display hinge  
removal, 28  
LCD panel  
removal, 24, 26

## **M**

main battery assembly  
removal, 2  
memory module  
removal, 15  
memory module cover  
removal, 14  
modular bay devices  
removal, 30  
module latch assemblies  
removal, 33  
module latch assemblies removal, 33

## **P**

palmrest assembly  
removal, 19  
power button  
removal, 21  
preparing to work, 2

## **R**

reserve battery  
removal, 40

## **S**

screw identification and tightening, 3  
sockets  
memory module, 15  
speakers  
removal, 34  
system board assembly  
removal, 35

## **T**

tools, 2  
touch-pad interface module  
removal, 20  
travel module  
removal, 30

## **Z**

ZIF connectors, 4