ENTJ75 / ENTJ76 / ENTJ77 / ENTJ78

SERVICEGUIDE

Revision History

Please refer to the table below for the updates made on the ENTJ75 / ENTJ76 / ENTJ77 / ENTJ78 service guide.

Date	Chapter	Updates

Service guide files and updates are available on the ACER/CSD web. For more information, refer to http://csd.acer.com.tw

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System specifications

Preface

Conventions

The following conventions are used in this manual:

Warning
Indicates a potential for personal injury.

Caution
Indicates a potential loss of data or damage to equipment.

Important
Indicates information that is important to know for the proper completion of a procedure, choice of an option, or completing a task.

General information

Before using this information and the product it supports, read the following general information.

This service guide provides you with all technical information relating to the basic configuration decided for Acer's global product offering. To better fit local market requirements and enhance product competitiveness, your regional office may have decided to extend the functionality of a machine (such as add-on cards, modems, or extra memory capabilities). These localized features are not covered in this generic service guide. In such cases, contact your regional offices or the responsible personnel/channel to provide you with further technical details.

When ordering FRU parts: Check the most up-to-date information available on your regional web or channel. If, for whatever reason, a part number change is made, it may not be noted in this printed service guide.

Acer-authorized Service Providers: Your Acer office may have a different part number code to those given in the FRU list of this printed service guide. You must use the list provided by your regional Acer office to order FRU parts for repair and service of customer machines.

Features

Platform

- Processor
  - Intel Core i3 Processors: 330M (2.13 GHz), M620 (2.5 GHz), 350M (2.26 GHz)
  - Intel Core i5 Processors: 430M (2.26 GHz), 520M (2.4 GHz), 540M (2.53 GHz)
  - Intel Core i7 Processors: 620M (2.66 GHz)
- Core logic: Mobile Intel HM55 Express Chipset
- Wireless: Intel WiFi Link 5300/5100, Atheros b/g/n

System memory

- DDR3 SO-DIMM
- Data rate supported: 800/1066/1333 MT/s
- Maximum memory: 4 GB (using two SO-DIMM modules)

Display and graphics

- 15.6" WXGA TFT LCD display panel
- VGA controller:
  - Discrete model: ATI Madison Pro / Park XT with DDR3-800 1 GB VRAM
  - UMA model: Integrated in the Mobile Intel HM55 Express Chipset
- Dual independent display support
- 16.7 million colors
- MPEG-2/DVD hardware-assisted capability (acceleration)
- MPEG-2/DVD decoding (for selected models)
- WMV9 (VC-1) support (acceleration)
- WMV9 (VC-1) and H.264 (AVC) decoding (for selected models)
- HDMI™ (High-Definition Multimedia Interface) with HDCP (High-bandwidth Digital Content Protection) support

Storage subsystem

- Industry standard 2.5” 160–640 GB hard disk drive
- Optical drive options:
  - Blu-ray Disc™/DVD-Super Multi double-layer drive
  - DVD-Super Multi double-layer drive
- 5-in-1 card reader, supporting Secure Digital™ (SD), MultiMediaCard (MMC), Memory Stick® (MS), Memory Stick PRO™ (MS PRO), xD-Picture Card™ (xD)

Input devices

- 99-, 100-, or 103-key keyboard, 2.5 mm (minimum) key travel
- Twelve function keys, four cursor keys, two Windows® keys
- Touchpad pointing device
- Capacitive touch keys

Audio

- Two built-in stereo speakers
- Built-in microphone on webcam
- Realtek ALC272 codec
- Supports Dolby Advanced Audio technology
- MS-Sound compatible

Communication

- Integrated webcam
- WLAN: Intel® WiFi Link 5300/5100 a/b/g/n, Atheros b/g/n
- WPAN: Bluetooth® 2.0+EDR (Enhanced Data Rate)
- LAN: 10/100/1000 Ethernet

I/O ports

- USB (four)
- External display (VGA) port
- Ethernet (RJ45)
- Modem (RJ11)
- Headphone/SPDIF Audio Out
- Microphone in
- DC in jack for AC adapter
- 5-in-1 card reader (SD™, MMC, MS, MS PRO, xD)
- HDMI™ port with HDCP support

Security

- Kensington lock slot
- BIOS-based user, supervisor, and HDD passwords

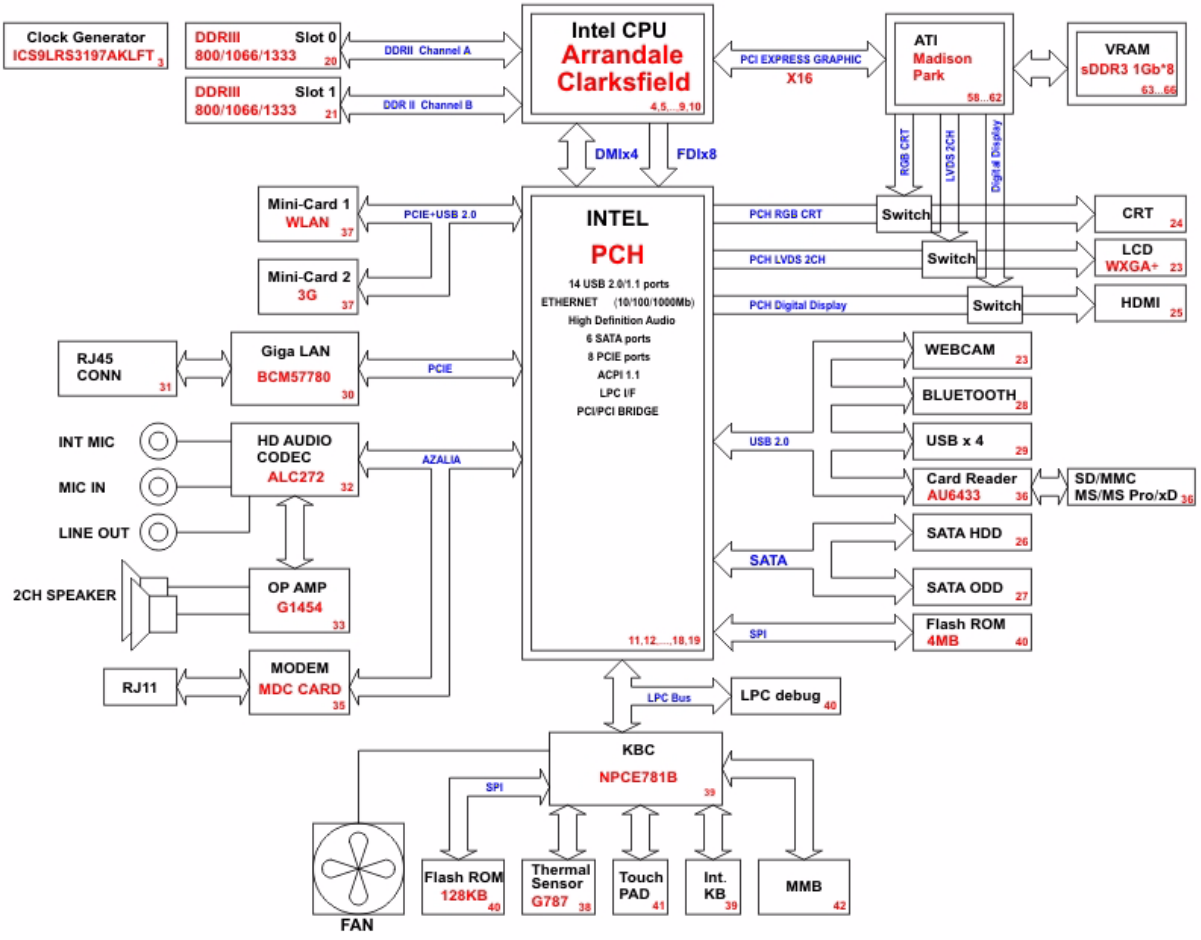
Physical specifications

- Dimensions: 372 × 259 × 26 / 37 mm (14.65 × 10.2 × 1.02 / 1.46 in)
- Weight: 3.1 kg (6.83 lb)

Environmental specifications

- Temperature
  - Operating: 32 °F to 90 °F (0 °C to 35 °C)
  - Non-operating: -4 °F to 140 °F (-20 °C to 60 °C)
- Humidity (non-condensing)
  - Operating: 10% to 90%
  - Non-operating: 5% to 95%

System block diagram



Hardware specifications and configurations

CPU

Item	Specification
CPU type	▫ Intel Core i3 Processors: 330M (2.13 GHz), M620 (2.5 GHz), 350M (2.26 GHz) ▫ Intel Core i5 Processors: 430M (2.26 GHz), 520M (2.4 GHz), 540M (2.53 GHz) ▫ Intel Core i7 Processors: 620M (2.66 GHz)
Core logic	Mobile Intel HM55 Express Chipset
Socket type	LGA 1156 (Socket H)

Controllers

Item	Controller
Core logic	Mobile Intel HM55 Express Chipset
VGA	▫ Discrete model: ATI Madison Pro / Park XT with DDR3-800 1 GB VRAM ▫ UMA model: Integrated in the Mobile Intel HM55 Express Chipset
LAN	Broadcom BCM57780
USB 2.0	Mobile Intel HM55 Express Chipset
Bluetooth	Broadcom BCM2046
Wireless 802.11	▫ Intel WiFi Link 5100 ▫ Intel WiFi Link 5300 ▫ Atheros AR5B91/HB93 b/g/n ▫ Atheros XB63 b/g
Memory card reader	Alcor AU6433
Audio codec	Realtek ALC272

BIOS

Item	Specification
BIOS vendor	Phoenix
BIOS version	v1.06

Item	Specification
Supported protocols	▫ ACPI 1.0b/2.0/3.0 compliance ▫ PCI 2.2 ▫ System/HDD password ▫ Security Control ▫ INT 13H Extensions ▫ PnP BIOS 1.0a SMBIOS 2.4 ▫ BIOS Boot Specification ▫ Simple Boot Flag 1.0 ▫ Boot block ▫ PCI Bus Power Management Interface Specification ▫ USB Specification 1.1/2.0 ▫ IEEE 1394 1.0 ▫ USB/1394 CD-ROM Boot Up support ▫ PC Card Standard 1995 (PCMCIA 3.0 Compliant Device) ▫ IrDA 1.0 ▫ Intel AC97 CNR Specification ▫ WfM 2.0 ▫ PXE 2.1 ▫ Boot Integrity Service Application Program Interface (BIS) 1.0 ▫ PC99a and Mobile PC2001 Compliant
BIOS password control	Manually set

Memory

Item	Specification
Memory controller	Built-in
Memory size	0 MB (no on-board memory)
SO-DIMM socket number	2 sockets
Supports maximum memory size	4 GB
Supports SO-DIMM type	DDR3
Supports data rate	800/1066/1333 MT/s
Supports SO-DIMM package	204-pin SO-DIMM
Memory module combinations	You can install memory modules in any combination as long as they match the above specifications.

Hard disk drive

Item					
Models	Seagate ST9160314AS Toshiba MK1655GSX HGST HTS545016B9A 300 WD WD1600BEVT- 22ZCTO	Seagate ST9250315AS Toshiba MK2555GSX HGST HTS545025B9A 300 WD WD2500BEVT-22Z CT0	Seagate ST9320325AS Toshiba MK3263GSX HGST HTS545032B9A 300 WD WD3200BEVT-22Z CT0	Seagate ST9500325AS Toshiba MK5055GSX HGST HTS545050B9A 300 WD WD5000BEVT-22Z AT0	WD WD6400BEVT-22A 0RT0
Capacity (MB)	160000	250000	320000	500000	640000
Bytes per sector	512	512	512	512	
Data heads	3/4	4	4	4	
Drive Format					
Disks	2	2	2	2	
Spindle speed (RPM)	5400 RPM	5400 RPM	5400 RPM	5400 RPM	5400 RPM
Performance Specifications					
Buffer size	8 MB	8 MB	8 MB	8 MB	8 MB
Interface	SATA	SATA	SATA	SATA	SATA
Max. media transfer rate (disk-buffer, Mbytes/s)	540	540	850	3.0 GB/s (Max.) Buffer to Host	3.0 GB/s
DC Power Requirements					
Voltage tolerance	5V (DC) +/- 5%	5V (DC) +/- 5%	5V (DC) +/- 5%	5V (DC) +/- 5%	5V (DC) +/- 5%

Optical drive

Item	Specification	
Models	HLDS Super-Multi Drive GT30N PLDS Super-Multi Drive DS-8A4SH Sony Super-Multi Drive AD-7585H Toshiba Super-Multi Drive TS-L633C	HLDS BD Combo 1CT21N PLDS BD Combo DS-4E1S Pioneer BD Combo BDC-TD01RS Sony BD Combo 4X BC-5500H
Performance Specification		
Transfer rate (KB/sec)	Sustained: ▫ with CD: Max 3.6Mbytes/sec ▫ with DVD: Max 10.08Mbytes/sec	Sustained: ▫ with CD: Max 3.6Mbytes/sec ▫ with DVD: Max 10.8Mbytes/sec ▫ with BD: Max 11Mbytes/sec
Buffer Memory	2MB	▫ for CD/DVD: 2MB ▫ for BD: 4.5MB
Interface	SATA	

Item	Specification	
Applicable disc format	CD: CD-DA, CD-ROM, CD-ROM XA, Photo CD (multi-session), Video CD, Cd-Extra (CD+), CD-text DVD: DVD-VIDEO, DVD-ROM, DVD-R (3.9GB, 4.7GB) DVD-R DL, DVD-RW, DVD-RAM, DVD+R, DVD+R DL, DVD+RW CD: CD-DA (Red Book) - Standard Audio CD & CD-TEXT CD-ROM (Yellow Book Mode1 & 2) - Standard Data CD-ROM XA (Mode2 Form1 & 2) - Photo CD, Multi-Session CD-I (Green Book, Mode2 Form1 & 2, Ready, Bridge) CD-Extra/ CD-Plus (Blue Book) - Audio & Text/Video Video-CD (White Book) - MPEG1 Video CD-R (Orange Book Part) CD-RW & HSRW (Orange Book Part Volume1 & Volume 2 Super Audio CD (SACD) Hybrid type US & US+ RW DVD: DVD-ROM (Book 1.02), DVD-Dual DVD-Video (Book 1.1) DVD-R (Book 1.0, 3.9G) DVD-R (Book 2.0, 4.7G) - General & Authoring DVD+R (Version 1.0) DVD+RW DVD-RW (Non CPRM & CPRM) DVD°”R Dual	
		Blu-Ray: BD-R, BD-R DL, BD-RE, BD-RE DL
Loading mechanism	Load: Manual Release: (a) Electrical (Release Button), (b) ATAPI command, (c) Emergency	
Power Requirement		
Input Voltage	5 V +/- 5% (Operating)	5 V +/- 5% (Operating)

LCD

Item	Specification
Vendor	▫ AUO ▫ CMO ▫ Innolux ▫ LG ▫ Samsung
Screen diagonal (mm)	15.6 inches
Resolution support (pixels)	▫ 800×600 ▫ 1024×768 ▫ 1280×720 ▫ 1280*768 ▫ 1360×768 ▫ 1366×768
Pixel pitch	0.204 x 0.204
Pixel arrangement	R.G.B. Vertical Stripe
Display mode	Normally white
Typical white luminance (brightness)	200 or 220 nits
Luminance uniformity	1.25 max.
Contrast ratio	400:1, 500:1 or 650:1

Item	Specification
Response time (msec)	8
Nominal input voltage VDD	+3.3V
Viewing angle (degree) Horizontal: Right/Left Vertical: Upper/Lower	 45/45 15/35
Temperature range(° C) Operating Storage (shipping)	 0 to +50 -40 to +60

Keyboard

Item	Specification
Keyboard controller	Winbond WPC773
Total number of keypads	99/100/103-key
Windows logo key	Yes
Internal & external keyboard work simultaneously	Plug USB keyboard to the USB port directly

Pointing device

Item	Specification
Type	▫ Synaptics TM00540-001 Touchpad ▫ ALPS KGDFF0031A Touchpad
Buttons	Left/Right

Memory card reader

Item	Specification
Controller	Alcor AU6433
Cards supported	Support 5-in-1 card reader (MMC, MS, MS-pro, SD, and xD)
Compliancy	▫ Complies to SDIO Host Interface Specification Rev 1.0 ▫ Supports MMC, MMCplus, SD Memory, and SDIO cards ▫ SDIO Version 1.10 compliant with High-Speed Mode ▫ SD Host Interface Specification v1.0 ▫ SD Host Interface Specification v2.0 ▫ SD HC (High Capacity SD memory card) ▫ Supports SD memory card, with CPRM security ▫ Complies to MultiMediaCard™ Version 4.0 ▫ Supports Memory Stick™ and MS PRO media cards ▫ Supports xD-Picture™ card and SmartMedia™ cards

Audio

Item	Specification
Audio codec	Realtek ALC272
Audio onboard or optional	Built-in
Mono or stereo	Stereo
Resolution	24-bit DAC and ADC
Compatibility	HD Audio
Sampling rate	192 kHz maximum sample rate
Internal microphone	With webcam
Internal speaker/quantity	2 speakers

Wired LAN

Item	Specification
LAN chipset	Broadcom BCM57780
Supports LAN protocol	10/100/1000 Mbps
LAN connector type	RJ45
LAN connector location	Left side
Features	▫ Integrated 10/10/1000 BASE-T transceiver ▫ PCI v2.2 compliant ▫ Wake on LAN support meeting ACPI requirements

Bluetooth

Item	Specification
Chipset	Broadcom BCM2046
Data throughput	2.1 Mbit/s
Protocol	Bluetooth 2.1
Interface	USB (board level)
Connector type	Wireless via Bluetooth protocols

Wireless LAN

Item	Specification
Chipset	▫ Intel WiFi Link 5100 ▫ Intel WiFi Link 5300 ▫ Atheros AR5B91/HB93 b/g/n ▫ Atheros XB63 b/g ▫ WNC WiMAX
Data throughput	11~54 Mbps, up to 270 Mbps for Draft-N
Protocol	▫ IEEE 802.11a ▫ IEEE 802.11b ▫ IEEE 802.11g ▫ IEEE 802.11 Draft-N ▫ IEEE 802.16e
Interface	PCI bus (mini PCI socket for wireless module)

USB

Item	Specification
Chipset	Mobile Intel HM55 Express Chipset
USB compliancy level	2.0
OHCI	USB 1.1 and USB 2.0 host controller
Number of USB ports	4
Location	▫ Two on the left side ▫ Two on the right side

Buttons/Indicators/Ports

Item	Specification
Buttons	▫ Power button ▫ Capacitive touch keys
Indicators	▫ Bluetooth ▫ Hard drive ▫ Num lock ▫ Caps lock ▫ Battery charge ▫ Power
Ports	▫ USB (four) ▫ External display (VGA) port ▫ Ethernet (RJ45) ▫ Modem (RJ11) ▫ Headphone/SPDIF Audio Out ▫ Microphone in ▫ DC in jack for AC adapter ▫ 5-in-1 card reader (SD™, MMC, MS, MS PRO, xD) ▫ HDMI™ port with HDCP support

Camera

Item	Specification
Model	Chicony 0.3M DV Calla / Camellia
Interface	USB 2.0
Resolution	0.3 M pixels (640x480)
Signal to noise ratio	42 dB
Sensor	CMOS 1/4
Power	5 V
Built-in microphone	Yes
LED	No

Fans

CPU temperature (° C)	Fan speed (rpm)	Acoustic level (dBA)
45-50	0-3000	29
55-66	0-3300	33
68-74	3300-3800	38
78-83	3800-4100	40
86-91	4100-4800	40

Throttling 50%: % is controlled by operating system. Temperature point is 95 °C. OS shut down at 100 °C; H/W shut down at 105 °C

Battery

Item	Specification
Vendor	▫ Panasonic ▫ Samsung ▫ Sanyo ▫ Sony ▫ Simplo
type	Li-ion
Pack capacity	4400mAH–5800mAH
Number of battery cell	6
Package configuration	3 cells in series, 2 series in parallel
Normal voltage	11.1V
Charge voltage	12.6V (max)

Power supply

Item	Specification
Vendor	▫ Delta ▫ Liteon ▫ Hipro
Input rating	90V AC to 264V AC, 47Hz to 63Hz
Maximum input AC current	1.7A (max)
Output rating	19V DC, 3.42A, 65W

Power savings

ACPI mode	Power Management
Mech. Off (G3)	All devices in the notebook are turned off completely.
Soft Off (G2/S5)	OS initiated shutdown. All devices in the notebook are turned off completely.
Working (G0/S0)	Individual devices such as the CPU and hard disc may be power managed in this state.
Suspend to RAM (S3)	▫ CPU set power down ▫ VGA suspend ▫ PCMCIA suspend ▫ Audio power down ▫ Hard drive power down ▫ Optical drive power down ▫ Super I/O low power mode
Save to Disk (S4)	Also called Hibernation mode. System saves all system states and data onto the disc prior to powering off the whole system.

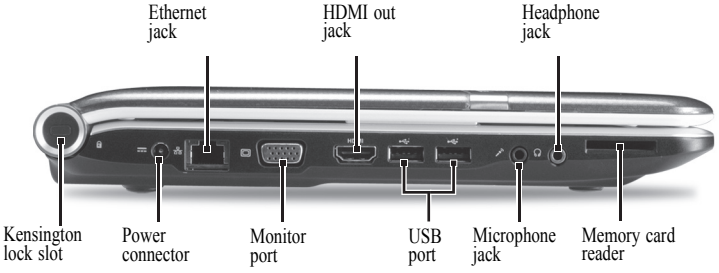
Notebook product tour

Important
Case color may vary from that shown in the pictures.

Front View

Component	Icon	Description
Ventilation fan		Helps cool internal components. Warning: Do not work with the notebook resting on your lap. If the air vents are blocked, the notebook may become hot enough to harm your skin. Caution: Do not block or insert objects into these slots. If these slots are blocked, your notebook may overheat resulting in unexpected shutdown or permanent damage to the notebook. Caution: Provide adequate space around your notebook so air vents are not obstructed. Do not use the notebook on a bed, sofa, rug, or other similar surface.

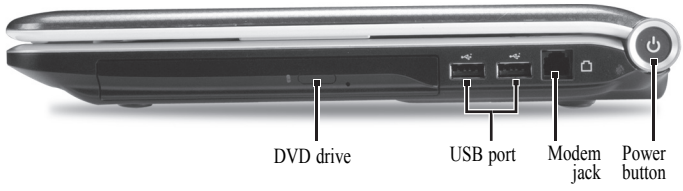
Left View



Component	Icon	Description
Kensington™ lock slot		Secure your notebook to an object by connecting a Kensington cable lock to this slot.
Power connector		Plug the AC adapter cable into this connector.
Ethernet jack		Plug an Ethernet network cable into this jack. Plug the other end of the cable into a cable modem, DSL modem, or an Ethernet network jack.
Monitor port		Plug an analog VGA monitor or projector into this port.
HDMI out jack		Plug an HDMI device, such as a high definition television, into this optional jack.

Component	Icon	Description
USB port		Plug USB devices (such as a diskette drive, flash drive, printer, scanner, camera, keyboard, or mouse) into these ports.
Microphone jack		Plug a microphone into this jack.
Headphone jack		Plug amplified speakers or headphones into this jack. The built-in speakers are turned off when speakers or headphones are plugged into this jack. Headphone with SPDIF support
Memory card reader		Insert a memory card from a digital camera, MP3 player, PDA, or cellular telephone into the memory card reader. The memory card reader supports Memory Stick®, Memory Stick Pro®, MultiMediaCard™, Secure Digital™, and xD-Picture Card™cards.

Right View

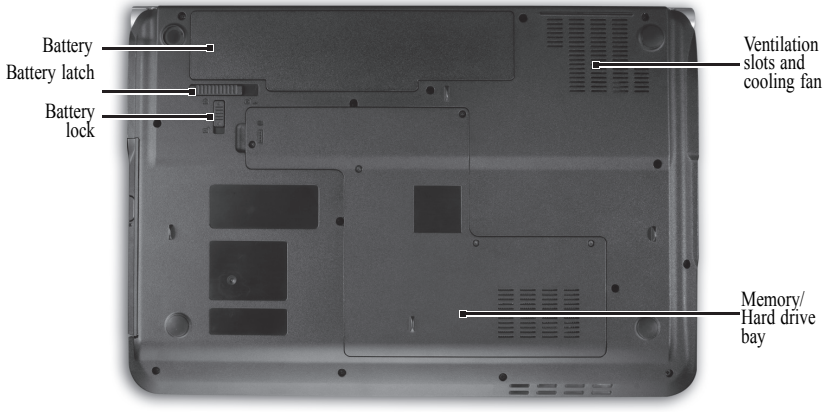


Component	Icon	Description
USB port		Plug a USB device (such as a diskette drive, flash drive, printer, scanner, camera, keyboard, or mouse) into this port.
DVD drive		Insert CDs or DVDs into this drive.
Modem jack		Plug a dial-up modem cable into this optional jack.
Power button		Press to turn the power on or off. You can also configure the power button for Sleep/Resume mode.

Rear View

Component	Icon	Description
Ventilation fan		Helps cool internal components. Warning: Do not work with the notebook resting on your lap. If the air vents are blocked, the notebook may become hot enough to harm your skin. Caution: Do not block or insert objects into these slots. If these slots are blocked, your notebook may overheat resulting in unexpected shutdown or permanent damage to the notebook. Caution: Provide adequate space around your notebook so air vents are not obstructed. Do not use the notebook on a bed, sofa, rug, or other similar surface.

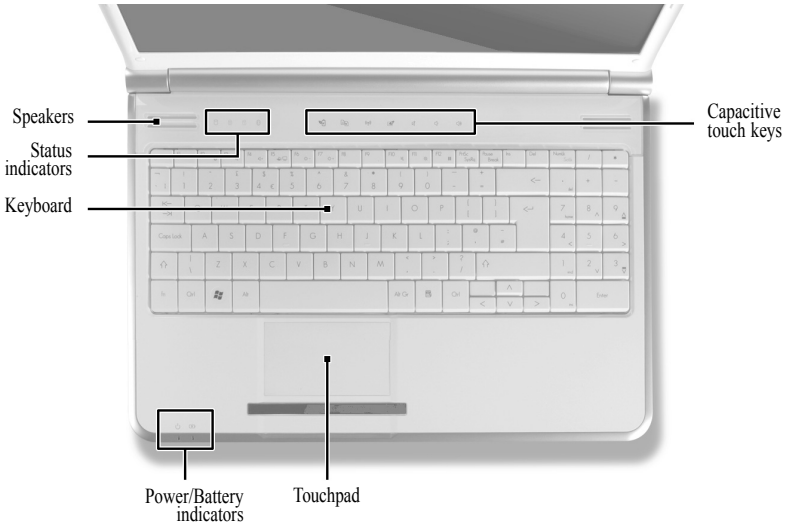
Bottom View



Component	Icon	Description
Battery		Provides power when the notebook is not plugged into AC power.
Battery lock		Slide to unlock the battery.
Battery latch		Slide to release the battery.
Memory bay		Memory modules are located in this bay.

Component	Icon	Description
Hard drive bay		The hard drive is located in this bay.
Ventilation slots and cooling fan		Helps cool internal components. Warning: Do not work with the notebook resting on your lap. If the air vents are blocked, the notebook may become hot enough to harm your skin. Caution: Do not block or insert objects into these slots. If these slots are blocked, your notebook may overheat resulting in unexpected shutdown or permanent damage to the notebook. Caution: Provide adequate space around your notebook so air vents are not obstructed. Do not use the notebook on a bed, sofa, rug, or other similar surface.

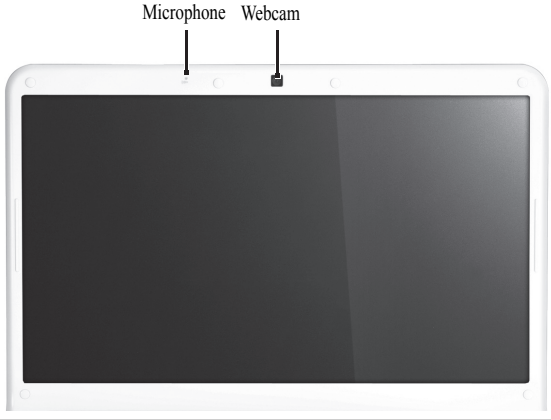
Keyboard area



Component	Icon	Description
Speakers		Left and right speakers deliver stereo audio output.
Capacitive hotkeys / status indicators		Inform you when there is media activity or when a button has been pressed that affects how the keyboard is used. When a function is enabled, the touch key is lit up. For more information, see “Using the status indicators” on page 21 and “Using the capacitive touch keys” on page 24.
Keyboard		Provides all the features of a full-sized, computer keyboard. For more information, see “Using the keyboard” on page 21.
Power indicator		▫ LED on - Notebook is on. ▫ LED blinking - Notebook is in Sleep or Hybrid Sleep mode. ▫ LED off - Notebook is off.
Battery charge indicator		▫ LED orange - Battery is fully charged. ▫ LED blinking orange - Battery is charging. ▫ LED blinking red - Battery charge is very low. ▫ LED solid red - Battery is malfunctioning. Important: This LED only lights up when your notebook is connected to AC power or the battery charge is very low.

Component	Icon	Description
Touchpad		Provides all the functionality of a mouse. For more information, see “Using the touchpad” on page 25.
Capacitive touch keys		Press to access capacitive touch key function. For more information, see “Using the capacitive touch keys” on page 24.

LCD panel

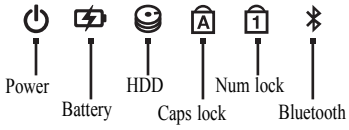


Component	Icon	Description
Webcam		Use to let others see who they are communicating with when making VoIP calls. For more information, see “Using the webcam” on page 26.
Microphone		Use to talk through when making Voice over Internet Protocol (VoIP) calls.

Using the status indicators

Important
If none of the indicators are on, you may need to press FN+F1 to toggle the status indicators on.

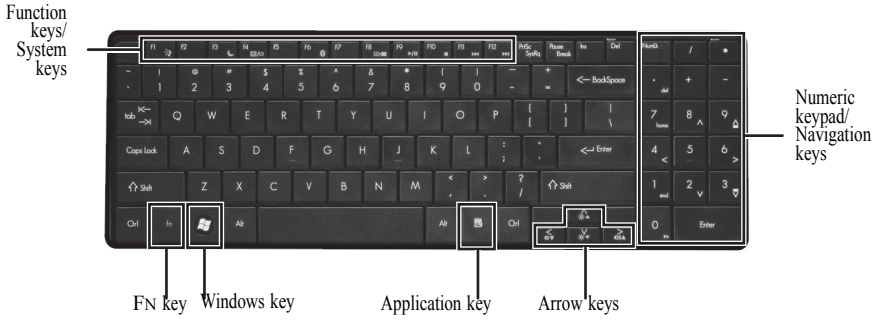
Status indicators inform you when a drive is being used or when a button has been pressed that affects how the keyboard is used. The status indicators are located below the screen.



Indicator	Icon	Description
Power indicator		▪ LED on - Notebook is on. ▪ LED blinking - Notebook is in Sleep or Hybrid Sleep mode. ▪ LED off - Notebook is off.
Battery charge indicator		▪ LED blue - Battery is fully charged. ▪ LED red - Battery is charging. Important: This LED only lights up when your notebook is connected to AC power.
Caps lock		▪ LED on - Caps lock is turned on. ▪ LED off - Caps lock is turned off.
Num lock		▪ LED on - Num lock is turned on. ▪ LED off - Num lock is turned off.
Hard drive		▪ LED blinking - The drive is being accessed. ▪ LED off - The drive is not being accessed.
Bluetooth		▪ LED on - Bluetooth communication is turned on. ▪ LED off - Bluetooth communication is turned off.

Using the keyboard

Your notebook features a full-size keyboard that functions the same as a desktop computer keyboard. Many of the keys have been assigned alternate functions, including shortcut keys for Windows and function keys for specific system operations.



Key types

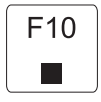
The keyboard has several different types of keys. Some keys perform specific actions when pressed alone and other actions when pressed in combination with another key.

Key type	Icon	Description
Function keys		Press these keys labeled F1 to F12 to perform actions in programs. For example, pressing F1 may open help. Each program uses different function keys for different purposes. See the program documentation to find out more about the function key actions.
System keys		Press these colored keys in combination with the Fn key to perform specific actions. For more information, see "System key combinations" on page 22.
Navigation keys		Press these keys to move the cursor to the beginning of a line, to the end of a line, up the page, down the page, to the beginning of a document, or to the end of a document.
Fn key		Press the Fn key in combination with a colored system key to perform a specific action.
Windows key		Press this key to open the Windows Start menu. This key can also be used in combination with other keys to open utilities like F (Search utility), R (Run utility), and E (Computer window).
Application key		Press this key for quick access to shortcut menus and help assistants in Windows.
Arrow keys		Press these keys to move the cursor up, down, right, or left.

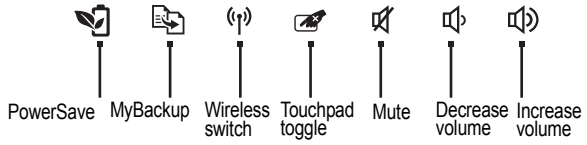
System key combinations

When you press the Fn key and a system key at the same time, your notebook performs the action identified by the text or icon on the key.

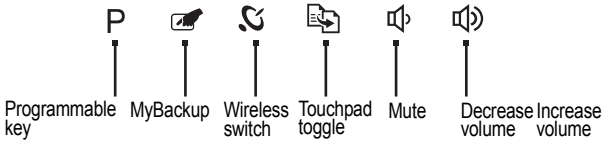
Press and hold Fn, then press this system key...	To...
	Turn the capacitive touch key LEDs on or off. For more information, see "Using the status indicators" on page 21.
	Enter Sleep mode or Hybrid Sleep mode. Press the power button to leave Sleep mode.
	Toggle the notebook display in the following order: ▫ The LCD ▫ An external monitor or projector (a monitor or projector must be plugged into the monitor port or HDMI port on your notebook) ▫ Both displays at the same time

Press and hold Fn, then press this system key...	To...
	Turn the optional Bluetooth radio on or off. Warning: Radio frequency wireless communication can interfere with equipment on commercial aircraft. Current aviation regulations require wireless devices to be turned off while traveling in an airplane. Bluetooth communication devices are examples of devices that provide wireless communication. Important: The wireless network switch must be in the ON position for this button to work. For more information, see “Left View” on page 16.
	Mute the sound. Press the key combination again to restore the sound.
	Turns the display screen backlight off to save power. Press any key to return.
	Play/ Pause—Plays or pauses the CD or DVD.
	Stop—Stops playing the CD or DVD.
	Previous—Skips back one CD track or DVD chapter.
	Next—Skips ahead one CD track or DVD chapter.

Using the capacitive touch keys



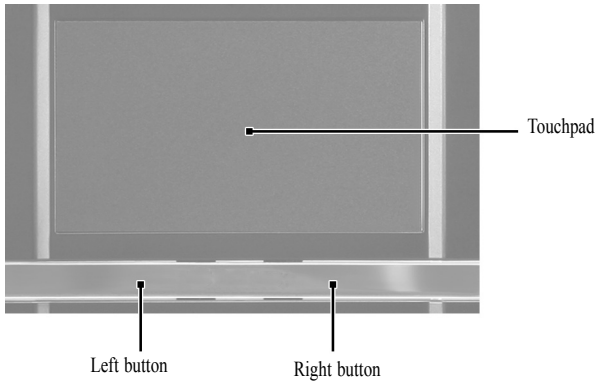
(only for certain models)



(only for certain models)

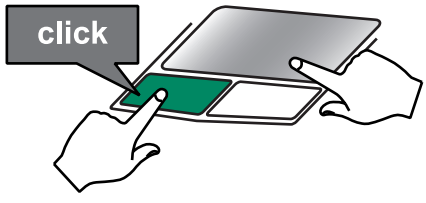
Button	Description
	PowerSave key—Press to put the notebook into power-saving mode. The button lights up red when this happens. Press this key again to return to your previous settings.
P	Programmable key—The programmable key will run the Launch Manager, you can assign an application as your needed. (only for certain models)
	MyBackup key—Press to create a data backup in three easy steps: select source, select destination, and backup schedule (manual or automatic). The button lights up red during the backup process.
	Wireless switch—Turn the optional IEEE 802.11 wireless network radio on or off. For more information, see “Wireless Ethernet Networking” in your online *User Guide*. Warning: Radio frequency wireless communication can interfere with equipment on commercial aircraft. Current aviation regulations require wireless devices to be turned off while traveling in an airplane. IEEE 802.11 communication devices are examples of devices that provide wireless communication.
	Touchpad toggle—turn the internal touchpad on and off.
	Mute—mutes the sound. Press again to restore the sound.
	Decrease volume—press to decrease volume.
	Increase volume—press to increase volume.

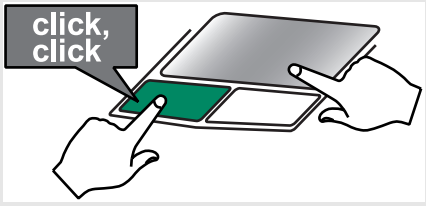
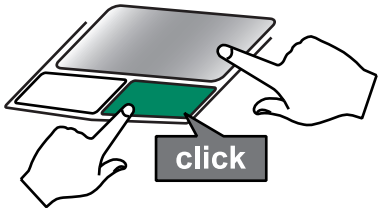
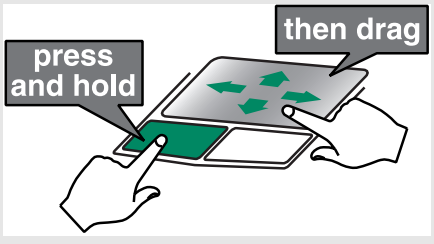
Using the touchpad



When you move your finger on the touchpad, the *pointer* (arrow) on the screen moves in the same direction. You can use the scroll zone to scroll through documents. Use of the scroll zone may vary from program to program.

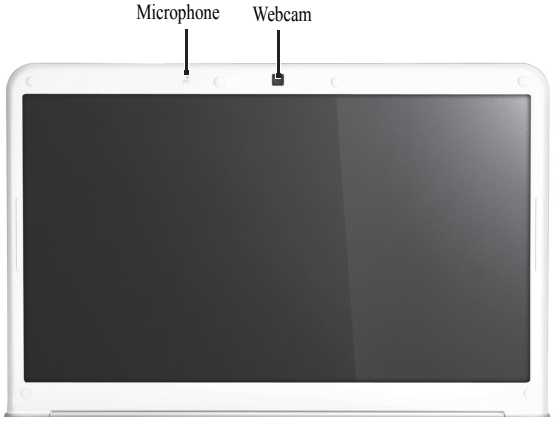
You can use the *left* and *right buttons* below the touchpad to select objects.

To...	Do this...	
Move the pointer on the screen.		Move your finger around on the touchpad. If you run out of space and need to move the pointer farther, lift your finger, move it to the middle of the touchpad, then continue moving your finger.
Select an object on the screen.		Position the pointer over the object. Quickly press and release the left button once. This action is called *clicking*.

To...	Do this...	
Start a program or open a file or folder.		Position the pointer over the object. Press the left button twice in rapid succession. This action is called *double-clicking*.
Access a shortcut menu or find more information about an object on the screen.		Position the pointer over the object. Quickly press and release the right button once. This action is called *right-clicking*.
Move an object on the screen.		Position the pointer over the object. Press the left button and hold it down, then use the touchpad to move (drag) the object to the appropriate part of the screen. Release the button to drop the object where you want it.

Using the webcam

You can use the optional webcam with many of the available Internet chat programs to add video and audio to your chat session. In addition, by using the software included with the webcam, you can take pictures or create video clips.



CHAPTER 2
System utilities

- BIOS setup utility
- BIOS recovery
- Clearing a BIOS password
- Unlocking the hard drive

BIOS setup utility

The BIOS setup utility is a hardware configuration program built into the notebook's BIOS (Basic Input/Output System). The notebook was shipped already properly configured and optimized. However, if the user encounters configuration problems, you may need to run Setup.

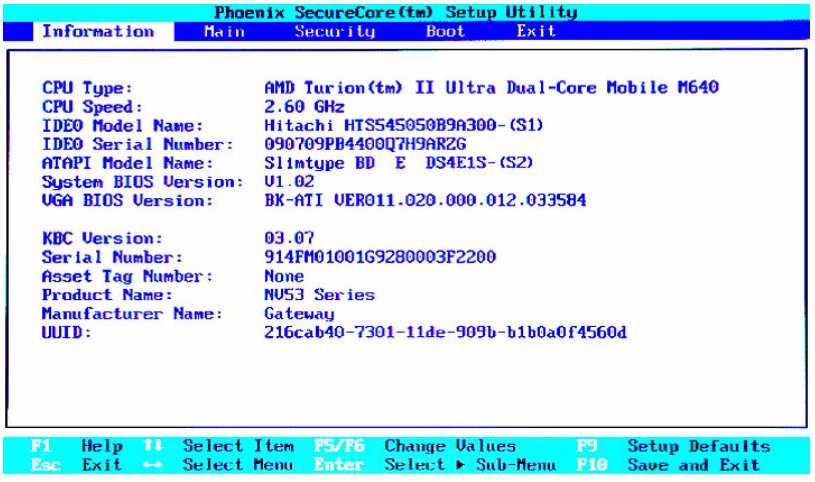
▶ To run the BIOS Setup Utility:

1. Turn on the notebook.

   If the computer is already turned on, save your data and close all open applications, then restart the computer.

2. Press F2 when the **Press <F2> to enter Setup** prompt appears on the bottom of the screen.

   Use the left and right arrow keys to move between selections on the menu bar.



Navigating the BIOS setup utility

Use the keys listed in the legend bar on the bottom of the Setup screen to work your way through the various menu and submenu screens.

▶ To use the BIOS setup utility:

- To choose a menu, use the left ← and right → arrow keys.
- To choose an item, use the up ↑ and down ↓ arrow keys.
- To change the value of a parameter, press F5 or F6.
- A plus sign (+) indicates the item has sub-items. Press ENTER to expand this item.
- To load default settings, press F9.
- To save changes made and close the utility, press F10.

1 Press ESC while you are in any of the menu screen to display the Exit menu.

Important

- You can change the value of a parameter if it is enclosed in square brackets.
- Navigation keys for a particular menu are shown on the bottom of the screen. Help for parameters are found in the Item Specific Help part of the screen. Read this information carefully when making changes to parameter values.
- The screenshots used in this section are for illustration only. The values displayed may not be the same as those in your computer.

■

BIOS setup utility menus

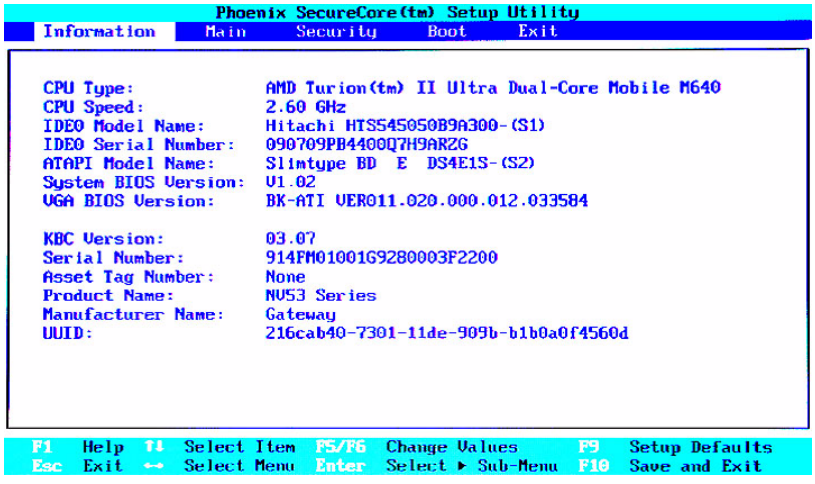
The Setup utility has five menus for configuring the various system functions. These include: Information, Main, Security, Boot, and Exit.

Important

- The screenshots used in this section are for illustration only. The values displayed may not be the same as those in your computer. Actual screen information varies by model, installed features, and location.
- In the descriptive table following each of the screenshot, settings in **boldface** are the default settings.

Information

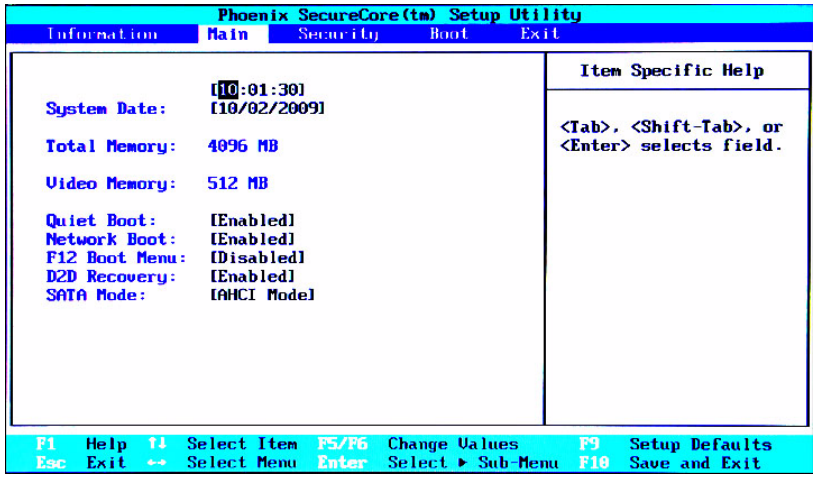
The Information menu displays a summary of your computer hardware information. These information are necessary for troubleshooting and may be required when asking for technical support.



Parameter	Description
CPU Type	Displays the processor model and speed.
CPU Speed	Displays the processor speed.
IDE0 Model Name	Displays the model name of the hard drive installed on the primary IDE master.
IDE0 Serial Number	Displays the serial number of the hard drive installed on the primary IDE master.
ATAPI Model Name	Displays the model name of the installed optical drive.
System BIOS Version	Displays system BIOS version.
VGA BIOS Version	Displays the VGA firmware version.
KBC Version	Displays the keyboard controller version.
Serial Number	Displays the system serial number.
Asset Tag Number	Displays the system asset tag number
Product Name	Displays the official model name of the computer.
Manufacturer Name	Displays the name of the computer manufacturer.
UUID Number	Displays the computer's UUID (universally unique identifier). UUID is an identifier standard used in software construction, standardized by the Open Software Foundation (OSF) as part of the Distributed Computing Environment (DCE).

Main

Use the Main menu to set the system time and date, and other basic options.

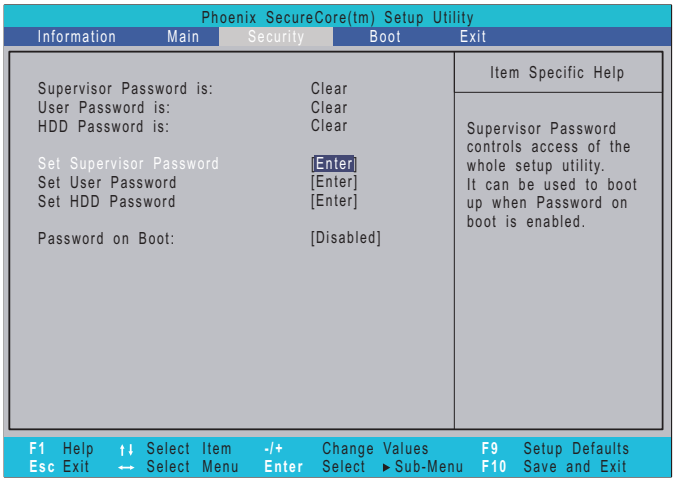


Parameter	Description	Format/Options
System Time	Displays the system time. The time is expressed in a 24-hour format.	HH:MM:SS (hour:minute:second)
System Date	Displays the system date.	MM/DD/YYYY (month/day/year)
Total Memory	Displays the size of system memory detected during boot-up.	
Video Memory	Displays the size of video memory detected during boot-up.	
Quiet Boot	Enables or disables the Quiet Boot function. When enabled, BIOS setup is in graphical mode and displays only the computer brand logo during POST and while booting. When disabled, BIOS setup is in conventional text mode and displays the system Summary Screen.	Disabled **Enabled**
Network Boot	When enabled, a remote host with appropriate boot image can boot this computer. (only works with an Ethernet device.)	Disabled **Enabled**
F12 Boot Menu	Enables or disables the Boot menu during POST.	**Disabled** Enabled

Parameter	Description	Format/Options
D2D Recovery	Enables or disables the D2D Recovery function. This function allows the user to create a hidden partition on the hard drive to store the operation system. User can then use this partition to restore the system to factory defaults by pressing the Alt+F10 keys during system boot-up.	Disabled **Enabled**
SATA Mode	Select the SATA controller operating mode. When set to AHCI (Advanced Host Controller Interface), the SATA controller enables its AHCI and RAID features when the computer boots up. When set to IDE, the SATA controller disables its AHCI and RAID functions when the computer boots up. **Note:** If you do not intend to use the AHCI or RAID features set this parameter to IDE to speed up the boot-up time.	AHCI IDE

Security

Use the Security menu option to set system passwords to protect your computer from unauthorized use.



Parameter	Description	Option
Supervisor Password Is	Displays the supervisor password status.	Clear Set
User Password Is	Displays the user password status.	Clear Set
HDD Password Is	Displays the hard drive password status.	Clear Set

Parameter	Description	Option
Set Supervisor Password	Press Enter to set a supervisor password. When set, this password will allow the user to access and change all settings in the Setup Utility.	
Set User Password	Press Enter to set a user password. When set, this password will restrict a user's access to the Setup menus. Only the following menus will be accessible: • System Time and System Date • All Exit menu options excluding Load Setup Defaults **Note:** A supervisor password must first be set before creating a user password. If Password on Boot is enabled, the user must enter the user password each time the notebook is turned on or wakes from Sleep.	
Set HDD Password	Press Enter to set password for accessing the hard disk drive (HDD) password. It will be required during boot-up or when waking from hibernation mode.	
Password on Boot	Referred to as the power-on password. When enabled, the user or supervisor password will be required to boot up the system. **Note:** A supervisor password must first be set before creating a user password.	**Disabled** Enabled

Caution

When you are prompted to enter a password, you have three tries before the system halts. Don't forget your password.

Setting a password

Note the following reminders before you define a system password:

- The maximum length of password contains 8 alphanumeric characters.
- System passwords are case-insensitive.
- When typing the password, only shaded blocks representing each typed character are visible.

▶ To set a supervisor password:

1 Press ↑ or ↓ to highlight Set Supervisor Password, then press Enter.

The *Set Supervisor Password* box opens.

2 Type a password, then press Enter.

3 Retype the password to verify the first entry, then press Enter.

You will be prompted to save the new password.

4 Press Enter.

5 Press F10 to save the password and close the Setup Utility or you can proceed to setting a user password.

■

▶ To set a user password:

1 Press ↑ or ↓ to highlight Set User Password, then press Enter.

The *Set User Password* box opens.

2 Type a password, then press Enter.

3 Retype the password to verify the first entry, then press Enter.

You will be prompted to save the new password.

4 Press Enter.

5 Press F10 to save the password and close the Setup Utility.

■

Changing a password

▶ To change a password:

1 Press ↑ or ↓ to highlight the Set Supervisor Password or Set User Password field, then press Enter.

The *Set Supervisor Password* or *Set User Password* box opens.

2 Type the current password, then press Enter.

3 Type a new password, then press Enter.

4 Retype the new password to verify the first entry, then press Enter.

You will be prompted to save the new password.

5 Press Enter.

6 Press F10 to save the password and close the Setup Utility or you can proceed to setting a user password.

■

Removing a password

▶ To remove a password:

1 Press ↑ or ↓ to highlight the Set Supervisor Password or Set User Password field, then press Enter.

The *Set Supervisor Password* or *Set User Password* box opens.

2 Type the current password, then press Enter.

3 Press Enter twice without entering anything in the new and confirm password fields.

You will be prompted to confirm the password removal.

4 Press Enter.

5 Press F10 to save the password and close the Setup Utility or you can proceed to setting a user password.

■

Resetting a password

If you have forgotten the user password, the computer will continue to function normally but you will have limited access to the Setup utility.

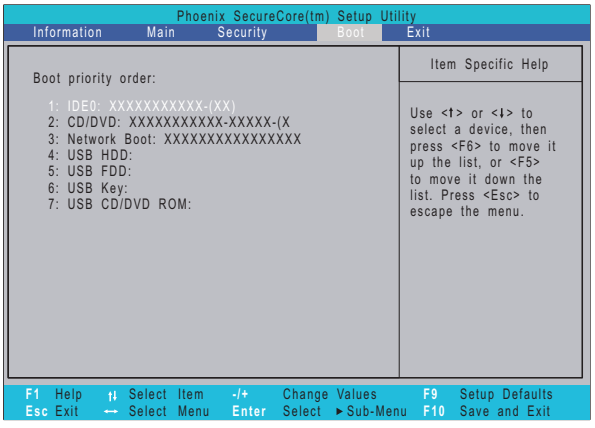
If you have enabled the Password on Boot field and you forget the supervisor password, you will not be able to boot up the computer. The same thing applies if you forget the HDD password.

To clear a lost BIOS password (user or supervisor password) you need to short the clear password hardware gap located on the system board. Go to page 40 for instructions.

To regain access to your computer if you lose the HDD password, you need to generate a master password and unlock your hard drive. Go to page 41 for instructions.

Boot

Use the Boot menu to set the preferred drive sequence in which the Setup utility attempts to boot the operating system.



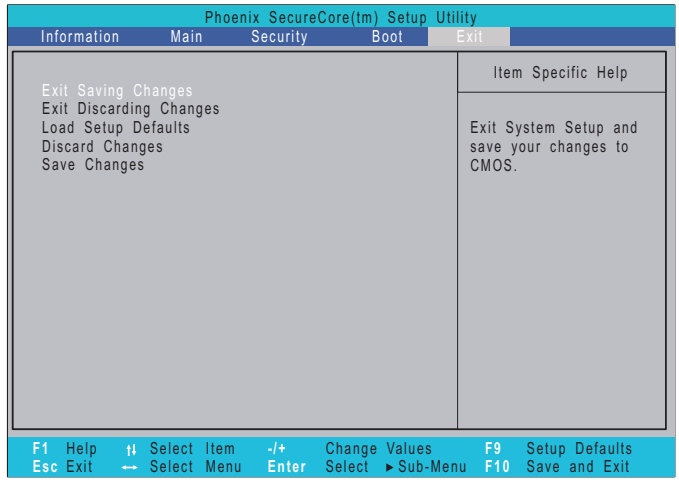
▸ To set boot drive sequence:

1. Press ↑ or ↓ to highlight a bootable device.
2. Press F5 or F6 to move the selected device up or down the boot sequence.
3. Press F10 to save the changes you made and close the Setup utility.

■

Exit

The Exit menu screen lists options for quitting from the Setup Utility.



Option	Description
Exit Saving Changes	Saves changes made and closes the Setup utility. Keyboard shortcut: F10
Exit Discarding Changes	Discards changes made and closes the Setup utility.
Load Setup Default	Loads the factory-default settings for all Setup parameters. Keyboard shortcut: F9
Discard Changes	Discards all changes made to the Setup utility and loads previous configuration settings.
Save Changes	Saves all changes made to the Setup utility.

BIOS recovery

An interruption during a BIOS flash procedure (e.g. a power outage) can corrupt the BIOS code, which will cause the system to go into an unbootable state. You need to access and execute the boot block program to reboot the computer and recover the regular BIOS code.

Caution

Observe the following when performing a BIOS recovery:

- Make sure the battery pack is installed to the system and that the computer is connected to a UPS unit during the BIOS recovery and BIOS flash procedures.
- The BIOS crisis recovery disk should be prepared in a computer running the Windows XP or Windows Vista OS.

Creating the Crisis Recovery disk

▸ To create the Crisis Recovery disk:

1. Prepare a removable USB storage device with a capacity size greater than 10 MB.

   Note that all data on the USB storage device will be cleared during the creation of the crisis disk.
2. Set up a computer running the Windows XP or Windows Vista OS and plug in the USB storage device into an available USB port.
3. Decompress the Crisis Package Source.
4. Select WINCRIS.exe and then select Run as administrator.
5. Keep the default settings and then click Start button.
6. When the pop-up warning dialog box appears, click OK to create the crisis disk.
7. Click No if you do not want to create another crisis disk.
8. Eject and reconnect the USB removable storage device, and make sure it contains the BIOS.wph, MINIDOS.sys, and PHLASH16.exe files.

■

Performing a BIOS recovery

▸ To perform a BIOS recovery:

1. Shut down the BIOS failed-computer.
2. Connect the USB storage device containing the Crisis Recovery disk files to the failed computer.
3. Press and hold the Fn+Esc keys (this is the BIOS recovery hotkey), then press the power button.

   The BIOS recovery process begins. When the process is complete the computer will automatically reboot.
4. Disconnect the USB storage device from the computer.
5. Perform a BIOS flash procedure to update the BIOS firmware.

■

Running the Flash utility:

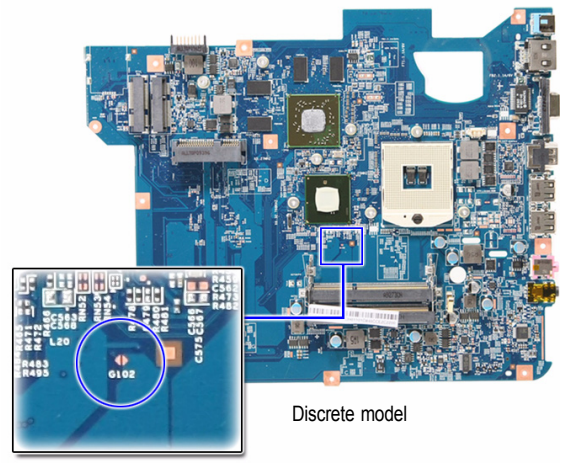
To run the Flash utility:

1. Rename the BIOS file as “XXXXXXX.FD”.
2. Copy the “XXXXXXX.FD” file to a bootable USB device containing the Crisis Recovery disk files.
3. Turn off the computer.
4. Insert the USB device containing the renamed BIOS file and the Crisis Recovery disk files to any USB port.
5. Press and hold the Fn+Esc keys (this is the BIOS recovery hotkey), then press the power button.
6. Release the Fn+Esc keys after POST.

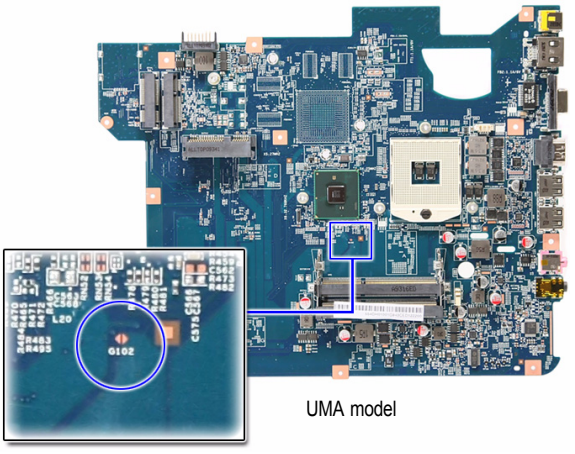
■

Clearing a BIOS password

To clear a lost BIOS password (user or supervisor password) you need to short the clear password hardware gap (G102) located on the system board.



Discrete model



UMA model

Gap	Default setting	Function
G102	Open (normal)	Short to clear the user and supervisor passwords.

▶ To clear a BIOS password:

1. Turn off the notebook and unplug all the peripherals connected to it.
2. Complete the steps in “Removing the battery” on page 48.
3. Complete the steps in “Removing the bay cover” on page 49.
4. Remove the memory module(s) and locate the G102 gap.
5. Use an electrical conductivity tool to short the two contacts on the hardware gap together.
6. While resting the tool on the two contacts, plug one end of the AC adapter into the DC power jack and plug one end to an electrical outlet.
7. Press the power button to turn on the system.
8. After the POST, remove the tool from the hardware gap.
9. Reinstall the memory module(s), battery pack, and the bay cover.
10. Turn on the notebook and press F2 during bootup to access the Setup utility.
11. Press F9 to load the system defaults.
12. Press F10 to save the changes you made and close the setup Utility.

■

Unlocking the hard drive

To regain access to your computer if you lose the HDD password, you need to generate a master password and unlock the hard drive.

▶ To unlock a hard drive:

1. Open the computer in a DOS environment.
2. Type the following command:

   A\> unlock6 XXXXX 00
3. Press Enter to display the command options.
4. Select option 2 (upper case ASCII code), then press Enter.
5. Write down the generated master password.
6. Reboot the computer.
7. In the HDD password prompt, type the master password generated in step 5, then press Enter.

■

CHAPTER 3
Replacing notebook components

Preventing static electricity discharge

Warning

To avoid exposure to dangerous electrical voltages and moving parts, turn off your notebook, remove the battery, and unplug the power cord and network cable before opening the case.

Warning

To prevent risk of electric shock, do not insert any object into the vent holes of the notebook.

Important

Before performing maintenance on the notebook, you should read and understand the information in this section.

The components inside your notebook are extremely sensitive to static electricity, also known as *electrostatic discharge* (ESD).

Before performing maintenance on the notebook, follow these guidelines:

- Avoid static-causing surfaces such as carpeted floors, plastic, and packing foam.
- Remove components from their antistatic bags only when you are ready to use them. Do not lay components on the outside of antistatic bags because only the inside of the bags provide electrostatic protection.
- Always hold components by their edges. Avoid touching the edge connectors. Never slide components over any surface.
- Wear a grounding wrist strap (available at most electronics stores) and attach it to a bare metal part of your workbench or other grounded connection.
- Touch a bare metal surface on your workbench or other grounded object.

Tape

Some of the procedures in this guide involve removing tape that secures cables or components. Two types of tape are used in this notebook:

- Mylar, non-conductive tape is typically transparent, with a red or brown tint.
- Conductive tape is typically grey or silver in color.

If the existing tape cannot be reused, replace it with the same type. Make sure the replacement tape is of the non-ESD generating kind. Do not use cellophane tape.

Preparing the work space

Before performing maintenance on the notebook, make sure that your work space and the notebook are correctly prepared.

- Wear a grounding (ESD) wrist strap, and use a grounded or dissipative work mat.
- Use a sturdy table. Make sure that the table top is wide enough to hold each component as you remove it.
- Ensure that clear lighting condition is available to make part identification easier.
- Keep your work surface free from clutter and debris that may damage components.
- Use a magnetized screwdriver for removing screws.
- When removing components that are attached to the notebook by a cable, unplug the cable before removing the screws, when possible, to avoid damaging the cable.
- As you remove components and screws, lay them toward the rear of your work surface (behind the notebook) or far enough to the side that your arms will not accidentally brush them onto the floor.
- To help keep track of screws, try the following:
  - Place each component's screws in their own section of a parts sorter.
  - Place each component's screws next to the component on your work surface.
  - Print the first page of each task, then place the page toward the rear of your work surface. As you remove screws, place the screws in their respective section on the page.
  - After loosening screws that are deeply recessed in a hole (for example, on the bottom of the base assembly), you can leave the screws in the holes if you place small pieces of masking tape over the hole openings. When reassembling the component, just remove the tape and tighten the screws.
  - When you place flat-headed screws on the work surface, stand them on their heads to prevent the screws from rolling off the table.

Required tools

To disassemble the notebook, you need the following tools:

- Wrist grounding strap (for ESD prevention)

- Conductive mat (for ESD prevention)
- Flat screwdriver

- Phillips screwdriver

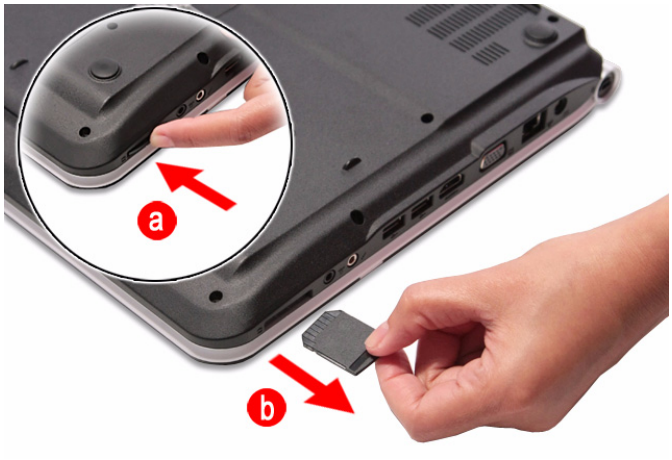
- Non-marring plastic scribe

Preparing the notebook

To prepare the notebook for maintenance:

1. Make sure that the optical disc drive is empty.
2. Turn off the notebook.
3. Close the LCD panel.
4. Disconnect the AC adapter.

5. Disconnect the network cable and all peripheral devices connected to the notebook.
6. Make sure there is no memory card on the card reader slot. To remove a memory card:
   a. Push against the card, as if you were pushing it further into the slot, letting the card spring out
   b. Pull the memory card out of its slot.



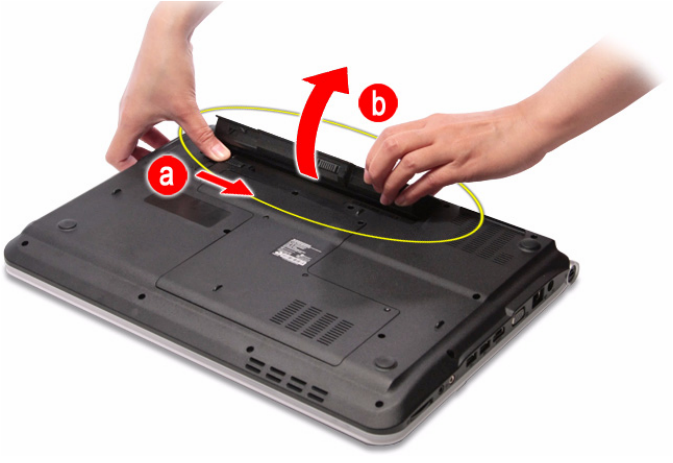
■

Removing the battery

▶ To remove the battery:

1. Turn the notebook over so the base is facing up.
2. Slide the battery lock to the unlocked position.

3. Slide the battery release latch **(a)**, then remove the battery out of the notebook **(b)**.



Note

The battery is highlighted with a yellow circle in the above image. Follow local regulations for battery disposal.

■

Removing the bay cover

To remove or replace components located on the lower bay, you need to remove the bay cover first.

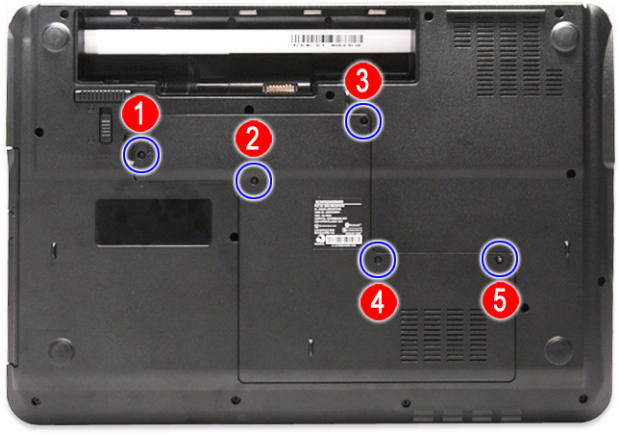
Tools you need to complete this task:

Phillips #0 screwdriver

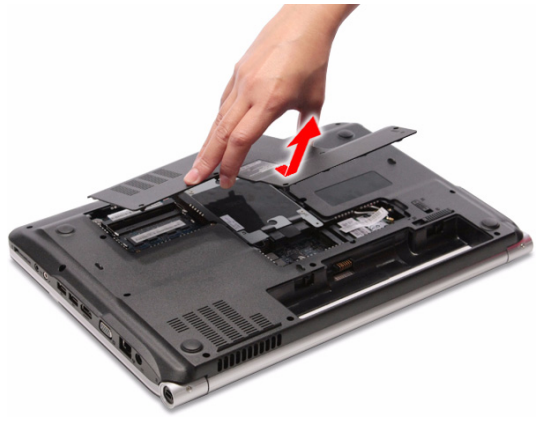
Non-marring plastic scribe

▶ To remove the bay cover:

1. Complete the steps in “Preparing the notebook” on page 47.
2. Turn the notebook over so the base is facing up.
3. Loosen the bay cover screws (these screws cannot be removed).



4. Insert a non-marring plastic scribe on the cover’s notch to release the cover from the computer, and then remove the cover.



■

Adding or replacing memory modules

Important
Use only memory modules designed for this Packard Bell notebook.

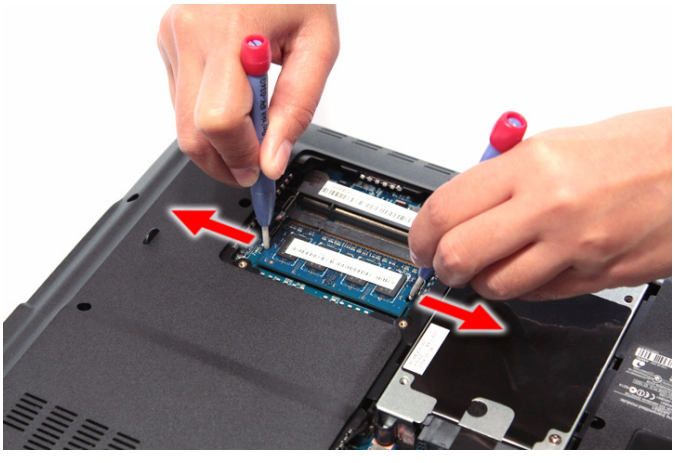
Tools you need to complete this task:


Phillips #0 screwdriver

Non-marring plastic scribe

▶ To add or replace memory modules:

1. Complete the steps in “Preparing the notebook” on page 47.
2. Complete the steps in “Removing the bay cover” on page 49.
3. If you are replacing a memory module, go to step 4.
   If you installing an additional memory module, go to step 6.
4. Use a non-marring plastic scribe to push out the latches on both sides of the memory slot until the module tilts upward.



5. Remove the memory module from its slot.

6 Insert the new memory module at a 30° angle into an empty memory slot, and then press it down until it clicks into place.

The module is keyed so it can only be inserted in one direction. If the module does not fit, make sure that the notch in the module lines up with the tab in the memory slot.

7 Reinstall the bay cover.

■

Replacing the wireless card

Tools you need to complete this task:

Phillips #0 screwdriver

Non-marring plastic scribe

Screws removed during this task:

- 1 black M2×5 (wireless card)

▶ To replace the wireless card:

1. Complete the steps in “Preparing the notebook” on page 47.
2. Complete the steps in “Removing the bay cover” on page 49.
3. Detach the bar code sticker covering the antenna cables.
4. Unplug the antenna cables. Note which color cable corresponds to each of the connectors.

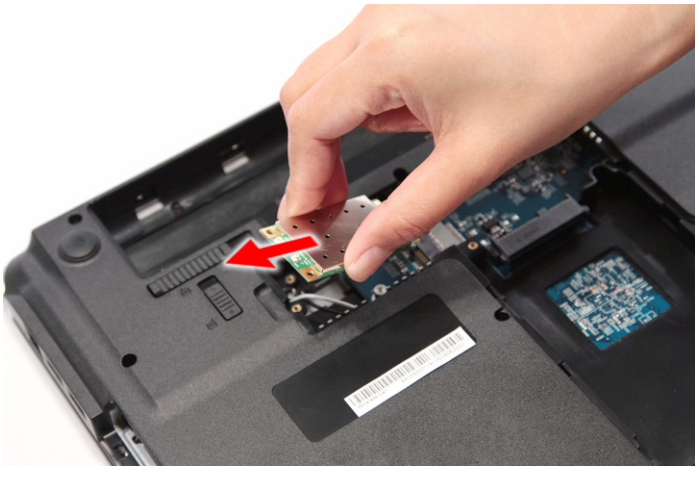
Important

The number of antenna cables varies depending on the type of wireless card installed on the notebook. IEEE 802.11n cards typically have three antenna cables. Other types of wireless cards usually have only two antenna cables.

5. Move the antenna cables away from the wireless card screw.

6 Remove the screw securing the wireless card.

7 Pull the card out of the slot.



8 Insert the new wireless card at a 30° angle into the empty Mini Card slot.

The card is keyed so it can only be inserted in one direction. If the card does not fit, make sure that the notch in the card lines up with the tab in the card slot.

9 Secure the new wireless card with the screw removed in step 6.

10 Reconnect the antenna cables to the connectors.

11 Reinstall the bay cover.

■

Replacing the hard drive

Tools you need to complete this task:

Phillips #0 screwdriver

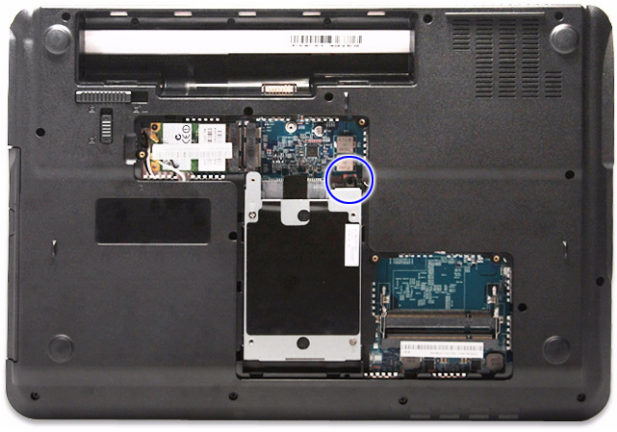
Non-marring plastic scribe

Screws removed during this task:

- 1 black M2×5 (hard drive)
- 2 chrome M3×3 (hard drive bracket)

▶ To replace the hard drive:

1. Complete the steps in “Preparing the notebook” on page 47.
2. Complete the steps in “Removing the bay cover” on page 49.
3. Remove the hard drive screw.

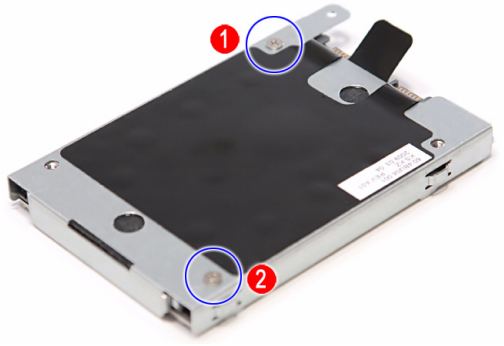


4. Grasp the black mylar tab and use it to disengage the hard drive from its connector, and then remove the drive from its compartment.

5 If your new hard drive already includes the hard drive bracket, go to step 8.

If you need to use the bracket from the old hard drive, go to step 6.

6 Remove the screws that secure the hard drive bracket, and then detach the bracket from the drive.



7 Place the bracket on the new drive and secure it with the two screws removed in step 6.

8 Slide the new hard drive into the hard drive compartment and make sure it's properly engaged to the SATA1 connector.

9 Secure the new drive to the system board with the screw removed in step 6.

10 Reinstall the bay cover.

■

Replacing the optical drive

Tools you need to complete this task:

Phillips #0 screwdriver

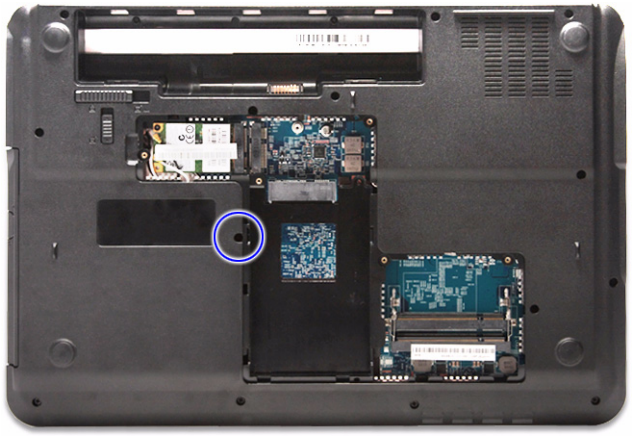
Non-marring plastic scribe

Screws removed during this task:

- 1 black M2.5×6 (optical drive)
- 1 chrome M2×3 (optical drive bracket)

▶ To replace the optical drive:

1. Complete the steps in “Preparing the notebook” on page 47.
2. Complete the steps in “Removing the bay cover” on page 49.
3. Remove the optical drive screw.



4. Use the non-marring plastic scribe to carefully push the optical drive out of the drive bay, and then slide the drive out.

5 If your new optical drive already has it's own bracket and bezel, go to step 10.

If you need to use the bracket and bezel from the old optical drive, perform steps 6–9 as necessary.

6 Detach the bezel from the old optical drive.

7 Remove the screws that secure the optical drive bracket, and then detach the bracket from the drive.

8 Attach the bezel to the new optical drive.

9 Attach the bracket to the new optical drive and secure it with the screw removed in step 7.

10 Slide the new optical drive into the drive bay and make sure it's properly engaged to the ODD1 connector.

11 Secure the new drive to the system board with the screw removed in step 3.

12 Reinstall the bay cover.

■

Replacing the keyboard cover

Tools you need to complete this task:

Phillips #0 screwdriver

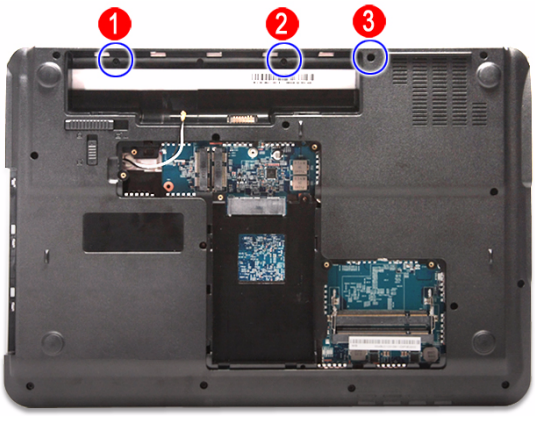
Flat screwdriver or Non-marring plastic scribe

Screws removed during this task:

- 3 black M2.5×6 (keyboard cover)

▶ To replace the keyboard cover:

1. Complete the steps in “Preparing the notebook” on page 47.
2. Complete the steps in “Removing the battery” on page 48.
3. Remove the screws securing the keyboard cover.



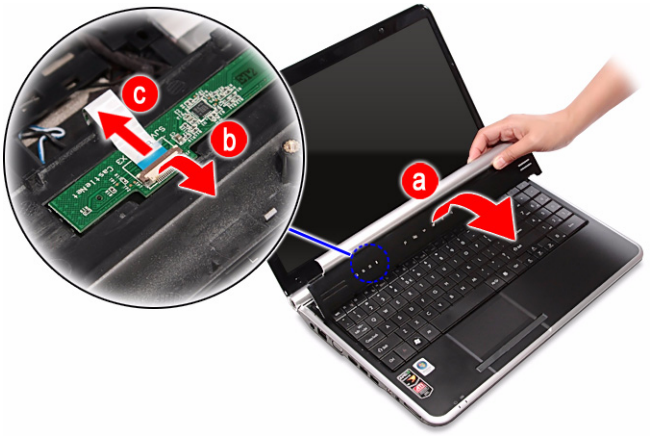
4. Turn the notebook over and open the LCD panel to its fully extended position.
5. Insert a small flat-blade screwdriver or non-marring scribe between the LCD hinge side and the keyboard cover, and carefully pry the cover up.

Caution

The keyboard cover is connected to the notebook through the multimedia board cable. Disconnect this cable first before pulling the cover away from the palm rest assembly.

6 Detach the keyboard cover from the palm rest assembly and turn it over the keyboard to access its underside **(a)**.

Open the multimedia board cable connector **(b)** and disconnect the cable **(c)**.



7 If you will be using the multimedia board from the old keyboard cover, remove it by performing steps 3 and 4 of the "Replacing the multimedia board" procedure on page 60.

8 Secure the multimedia board, with the connector facing up, on the new keyboard cover.

9 Insert the multimedia cable to its connector on the multimedia board, then close the clip to lock the cable in place.

10 Insert the tabs on the front side of the keyboard cover into the slots located on the top corners of the palm rest assembly, then press down on the back part.

11 Press down on the cover until it clicks in place.

The keyboard cover is correctly mounted when you can run you finger along the sides of the cover and find no gaps.

12 Close the LCD panel and turn the notebook over so the base is facing up.

13 Secure the keyboard cover with the screws removed in step 3.

Caution

If the cover is not correctly installed, your notebook could be damaged when you try to close the LCD panel.

14 Reinstall the battery.

■

Replacing the multimedia board

Tools you need to complete this task:

Phillips #0 screwdriver

Flat screwdriver or Non-marring plastic scribe

Screws removed during this task:

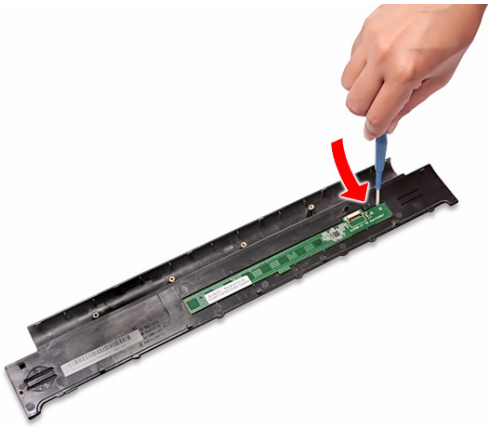
- 3 black M2.5×6 (keyboard cover)

▸ To replace the multimedia board:

1. Complete the steps in “Preparing the notebook” on page 47.
2. Remove the keyboard cover by performing steps 2–6 of the “Replacing the keyboard cover” procedure on page 58.

Caution
The multimedia board is glued to the keyboard cover. Remove this board only if it is defective.

3. Insert a small flat-blade screwdriver or non-marring scribe between the multimedia board and the keyboard cover’s underside, and carefully pry the board loose.



4. Remove the multimedia board from the keyboard cover.

Note
A circuit board that is >10 cm^2 has been highlighted with a yellow rectangle as shown in the above image. Follow the local regulations for disposing this type of circuit board.

5 Secure the new multimedia board, with the connector facing up, on the keyboard cover.

6 Insert the multimedia cable to its connector on the multimedia board, then close the clip to lock the cable in place.

7 Insert the tabs on the front side of the keyboard cover into the slots located on the top corners of the palm rest assembly, then press down on the back part.

8 Press down on the cover until it clicks in place.

The keyboard cover is correctly mounted when you can run you finger along the sides of the cover and find no gaps.

9 Close the LCD panel and turn the notebook over so the base is facing up.

10 Secure the keyboard cover with the screws removed in step 3 of the "Replacing the keyboard cover" procedure on page 58.

Caution

If the cover is not correctly installed, your notebook could be damaged when you try to close the LCD panel.

11 Reinstall the battery.

■

Replacing the keyboard

Tools you need to complete this task:

Phillips #0 screwdriver

Flat screwdriver or Non-marring plastic scribe

Screws removed during this task:

- 3 black M2.5×6 (keyboard cover)

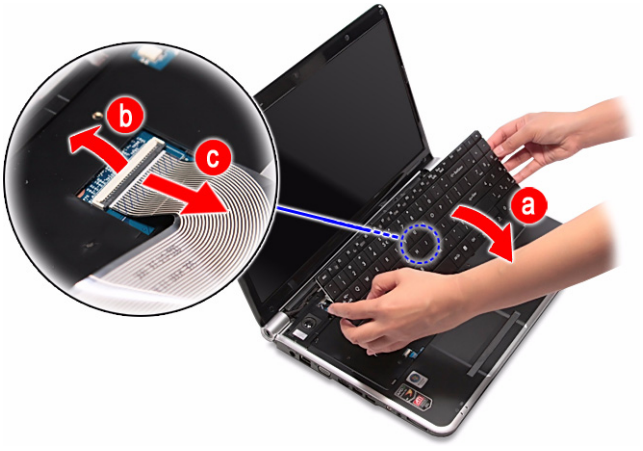
▸ To replace the keyboard:

1. Complete the steps in “Preparing the notebook” on page 47.
2. Remove the keyboard cover by performing steps 2–6 of the “Replacing the keyboard cover” procedure on page 58.

> **Caution**
> The keyboard is connected to the notebook through the keyboard cable. Disconnect this cable first before pulling the keyboard away from the palm rest.

3. Lift the back edge of the keyboard slightly, then carefully slide it toward the LCD panel to release the keyboard retaining tabs from the palm rest.
4. Flip the keyboard over onto the touchpad area to access to the keyboard cable **(a)**.

   Open the keyboard cable connector **(b)** and disconnect the cable **(c)**.



5 Insert the retaining tabs of the new keyboard into the slots located on the top side of the touchpad area.

6 Reach underneath the keyboard and insert the keyboard cable to its system board connector, then close the clip to lock the cable in place.

Important
The keyboard cable is correctly oriented if it is not twisted.

7 Gently press the keyboard down until it is flat all the way across.

8 Reinstall the keyboard cover by performing steps 9–13 of the "Replacing the keyboard cover" procedure on page 58.

9 Reinstall the battery.

■

Replacing the LCD panel assembly

Tools you need to complete this task:

Phillips #0 screwdriver

Flat screwdriver or Non-marring plastic scribe

Screws removed during this task:

- 3 black M2.5×6 (keyboard cover)
- 2 black M2.5×6 (LCD panel hinges - bottom)
- 2 black M2.5×6+Nylok (LCD panel hinges - top)

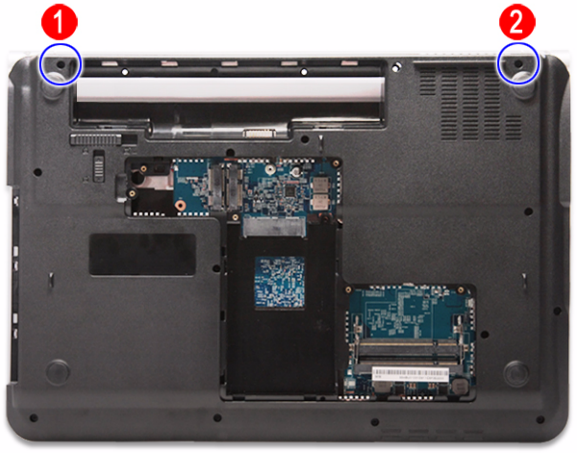
▶ To replace the LCD panel assembly:

1. Complete the steps in “Preparing the notebook” on page 47.
2. If the notebook has a wireless card installed, complete the steps in “Removing the bay cover” on page 49, and then unplug the antenna cables.

   If there’s no wireless card installed, proceed to step 5.
3. Remove the keyboard by performing steps 2–4 of the “Replacing the keyboard” procedure on page 62.

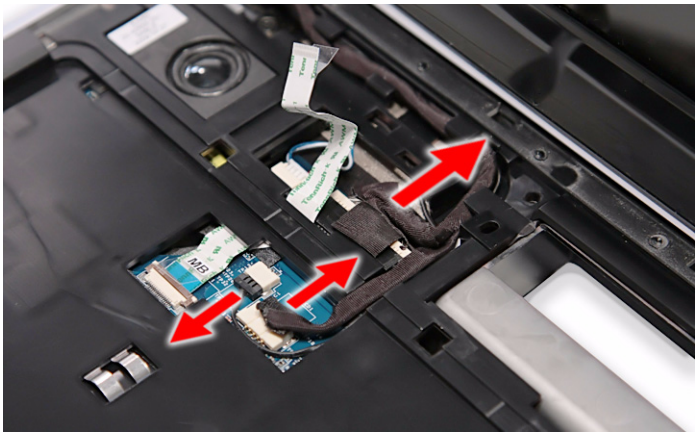
> **Caution**
> The keyboard is connected to the notebook through a keyboard cable. Disconnect this cable first before pulling the keyboard away from the palm rest assembly.

4. Turn the notebook over so the base is facing up.
5. Remove the base screws that secure the LCD panel hinges.

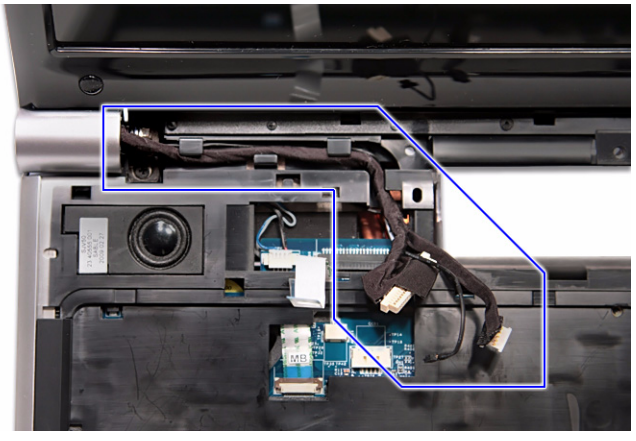


6 Turn the notebook over again so the palm rest is facing up.

7 Disconnect the LCD, webcam, and microphone cables from their system board connectors.



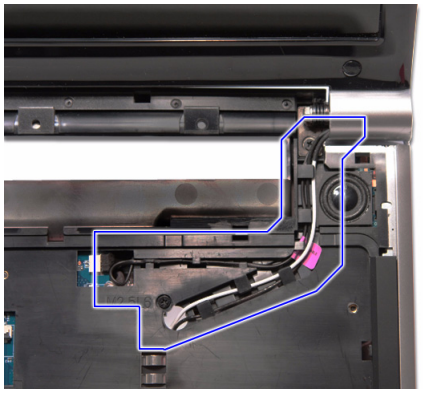
8 Release the LCD, webcam, and microphone cables from their latches.



9 If the notebook has a wireless card installed, note the antenna cable routing for later reference and then perform step 10 to release the antenna cables from the palm rest.

If there's no wireless card installed, proceed to step 11 to disconnect the power button board cable.

10 Release the antenna cables from their palm rest latches, and then pull them out from underneath the computer.

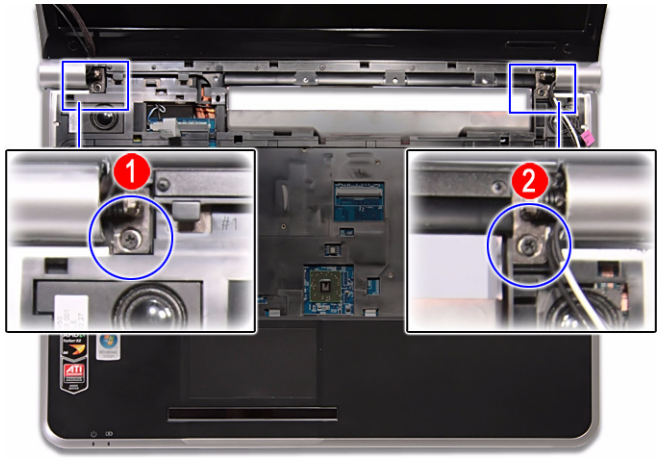


11 Disconnect the power button board cable from its system board connector, and then release it from its palm rest latches.

12 Carefully open the LCD panel to its fully extended position.

13 Move the LCD, webcam, and microphone cables away from the top hinge screws.

14 Remove the top hinge screws securing the LCD assembly.



15 Lift the LCD panel assembly up and away from the notebook.

16 Position the new LCD panel assembly on the notebook, and then secure it with the hinge screws removed in step 14.

17 If the notebook has a wireless card installed, proceed to step 18 to arrange the antenna cables.

If there's no wireless card installed, proceed to step 19 to reconnect the power button board cable.

18 Refer to the antenna cable routing note made on step 9 and secure the antenna cables to the palm rest before pulling the ends downward to the wireless card compartment.

19 Arrange the power button cable on the palm rest and reconnect it to its system board connector.

20 Arrange the LCD, webcam, and microphone cables on the palm rest and reconnect them to their system board connectors.

21 Close the LCD panel and turn the notebook over so the base is facing up.

22 If the notebook has a wireless card installed, reconnect the antenna cables and then reinstall the bay cover.

23 Return the base hinge screws removed in step 5.

24 Turn the notebook over so the palm rest is facing up.

25 Reinstall the keyboard and the keyboard cover by performing steps 5–8 of the "Replacing the keyboard" procedure on page 62.

26 Reinstall the battery.

■

Replacing the palm rest

Tools you need to complete this task:

Phillips #0 screwdriver

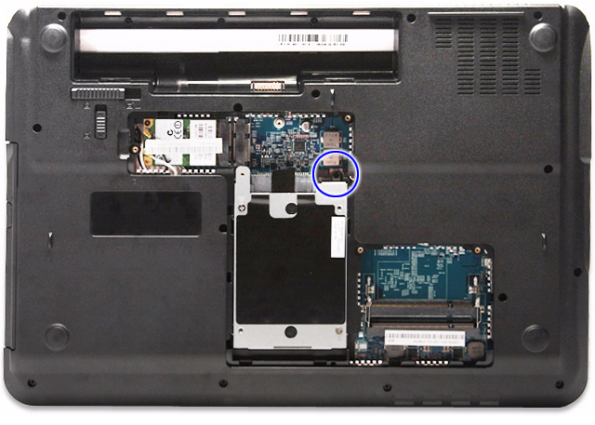
Flat screwdriver or Non-marring plastic scribe

Screws removed during this task:

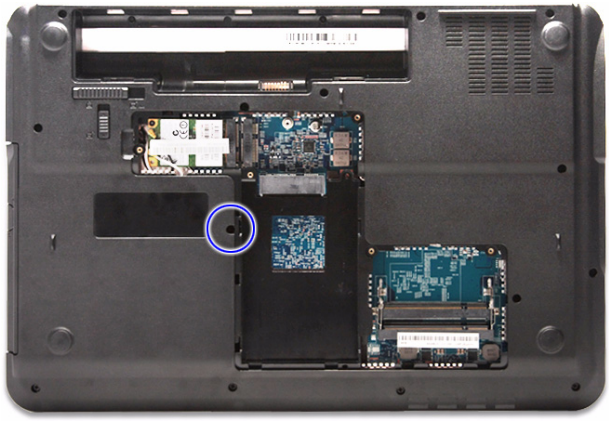
- 1 black M2×5 (hard drive)
- 1 black M2.5×6 (optical drive)
- 3 black M2.5×6 (keyboard cover)
- 2 black M2.5×6 (LCD panel hinges - bottom)
- 2 black M2.5×6+Nylok (LCD panel hinges - top)
- 10 M2.5×6 black (palm rest - base side)
- 3 M2.5×6 black (palm rest - top side)

▶ To replace the palm rest:

1. Complete the steps in “Preparing the notebook” on page 47.
2. Complete the steps in “Removing the bay cover” on page 49.
3. If the notebook has a wireless card installed, unplug the antenna cables.
4. Remove the hard drive screw, and then remove the hard drive from its compartment.



5 Remove the optical drive screw.

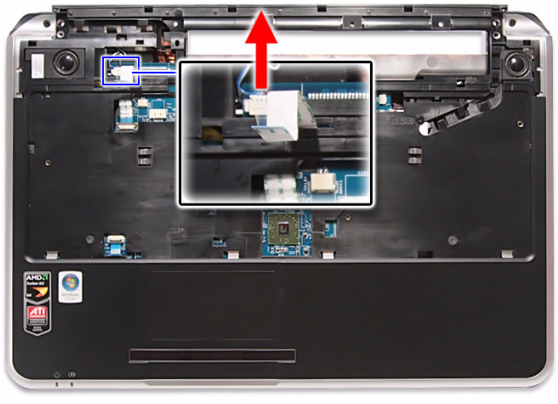


6 Remove the keyboard cover by performing steps 2–6 of the “Replacing the keyboard cover” procedure on page 58.

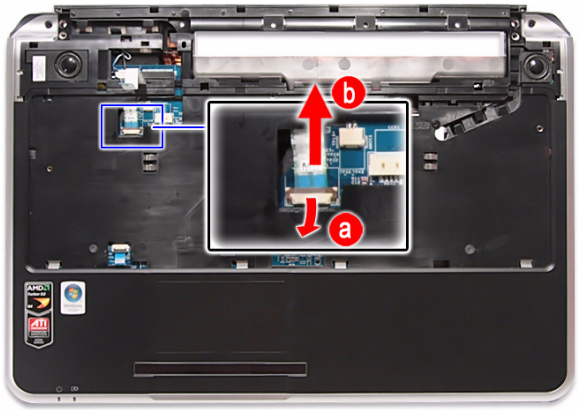
7 Remove the keyboard by performing steps 3 and 4 of the “Replacing the keyboard” procedure on page 62.

8 Remove the LCD panel assembly by performing steps 5–15 of the “Replacing the LCD panel assembly” procedure on page 64.

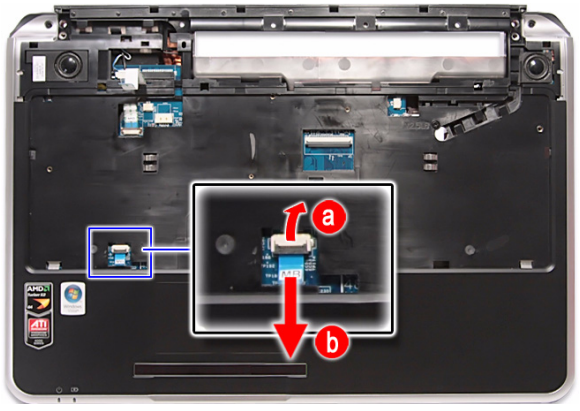
9 Disconnect the speaker cable from the system board.



10 Open the multimedia cable connector **(a)** and disconnect the cable **(b)**.

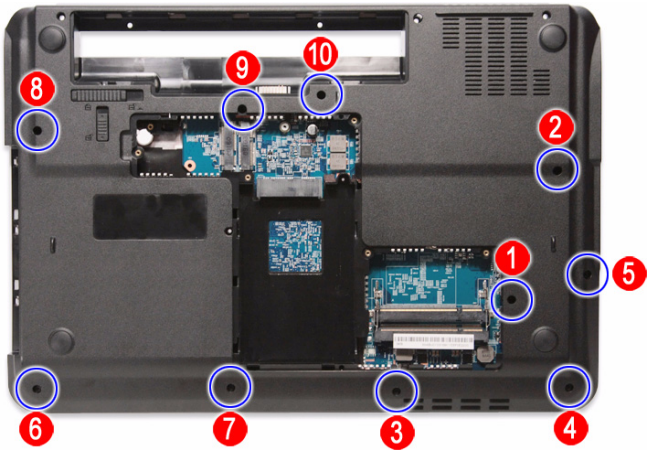


11 Open the touchpad cable connector **(a)** and disconnect the cable from the system board **(b)**.



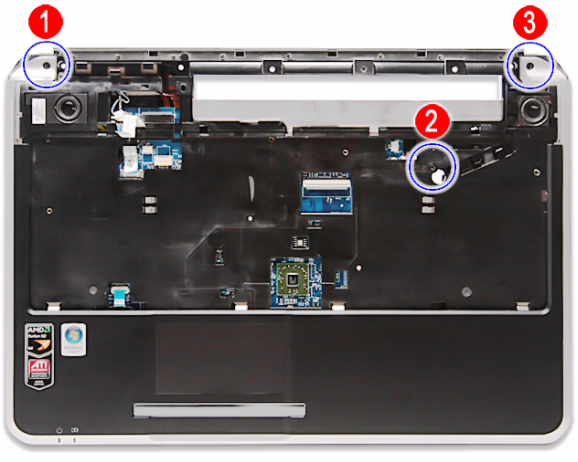
12 Turn the notebook over so the base is facing up.

13 Remove the screws securing the palm rest on the base side.



14 Turn the notebook over again so the palm rest is facing up.

15 Remove the screws securing the palm rest on the top side.



16 Locate the small gaps on the top side of the palm rest and insert a small flat-blade screwdriver or non-marring scribe into each gap to separate the palm rest from the base enclosure.

17 Once the top side is separated, pry loose the left and right sides of the palm rest, and finally the bottom side until all the palm rest retaining tabs have been released.

18 Lift the palm rest assembly from the base enclosure.

19 Place the new palm rest assembly on top of the base enclosure and press it down on all sides until it snaps into place.

20 Reconnect the speaker, multimedia, and touchpad cables to their respective system board connectors.

21 Secure the palm rest assembly with the screws removed in steps 13 and 15.

22 Reinstall the LCD panel assembly by performing steps 16–23 of the "Replacing the LCD panel assembly" procedure on page 64.

23 Reinstall the keyboard and the keyboard cover by performing steps 5–8 of the "Replacing the keyboard" procedure on page 62.

24 Return the optical screw drive in its place.

25 Reinstall the hard drive by performing steps 8 and 9 of the "Replacing the hard drive" procedure on page 54.

26 If you have disconnected any wireless antennas, reconnect them now.

27 Reinstall the bay cover.

■

Replacing the speakers

Tools you need to complete this task:

Phillips #0 screwdriver

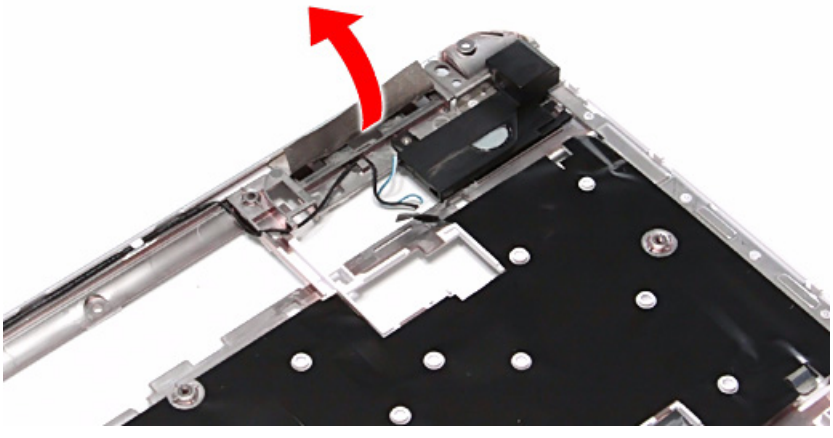
Flat screwdriver or Non-marring plastic scribe

Screws removed during this task:

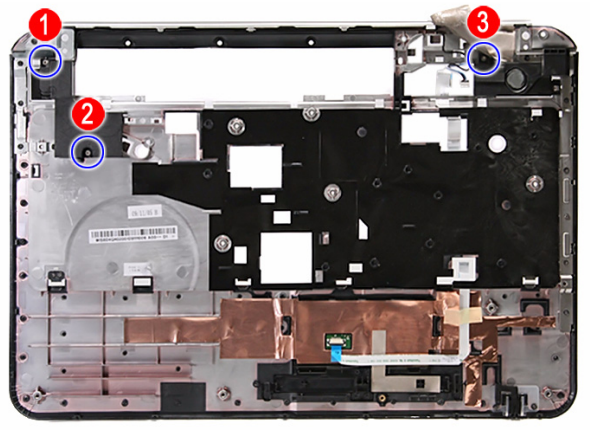
- 1 black M2×5 (hard drive)
- 1 black M2.5×6 (optical drive)
- 3 black M2.5×6 (keyboard cover)
- 2 black M2.5×6 (LCD panel hinges - bottom)
- 2 black M2.5×6+Nylok (LCD panel hinges - top)
- 10 M2.5×6 black (palm rest - base side)
- 3 M2.5×6 black (palm rest - top side)
- 2 chrome M2×3 (speakers)

▶ To replace the speakers:

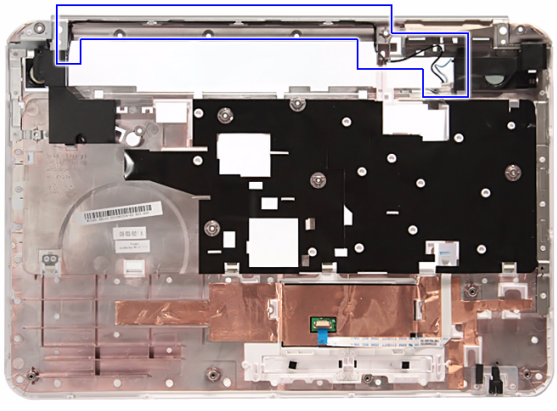
1. Complete the steps in “Preparing the notebook” on page 47.
2. Remove the palm rest by performing steps 2–18 of the “Replacing the palm rest” procedure on page 68.
3. Turn the palm rest over so that its underside is facing up.
4. Peel off the tape covering the left speaker screw.

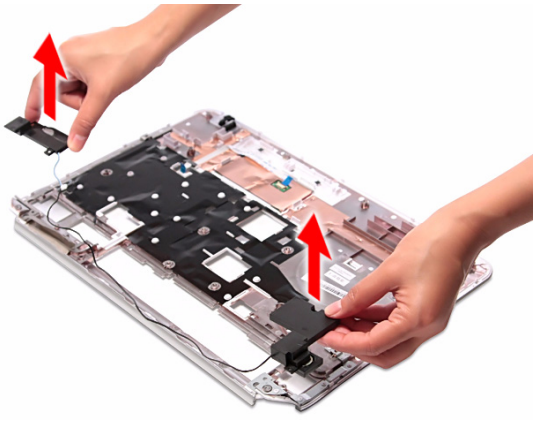


5 Remove the speaker screws.



6 Release the speaker cable from the palm rest, and then remove the speakers.





7 Position the new speakers on the palm rest.

8 Secure the speakers with the screws removed in step 5 and cover it with the tape that was detached in step 4.

9 Secure the speaker cable on the palm rest latches

10 Reinstall the palm rest by performing steps 19–21 of the “Replacing the palm rest” procedure on page 68.

11 Reinstall the LCD panel assembly by performing steps 16–23 of the “Replacing the LCD panel assembly” procedure on page 64.

12 Reinstall the keyboard and the keyboard cover by performing steps 5–8 of the “Replacing the keyboard” procedure on page 62.

13 Return the optical screw drive in its place.

14 Reinstall the hard drive by performing steps 8 and 9 of the “Replacing the hard drive” procedure on page 54.

15 If you have disconnected any wireless antennas, reconnect them now.

16 Reinstall the bay cover.

■

Replacing the touchpad board

Tools you need to complete this task:

Phillips #0 screwdriver

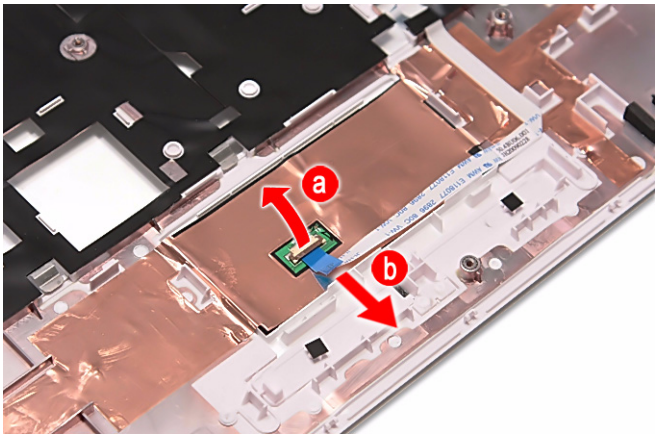
Flat screwdriver or Non-marring plastic scribe

Screws removed during this task:

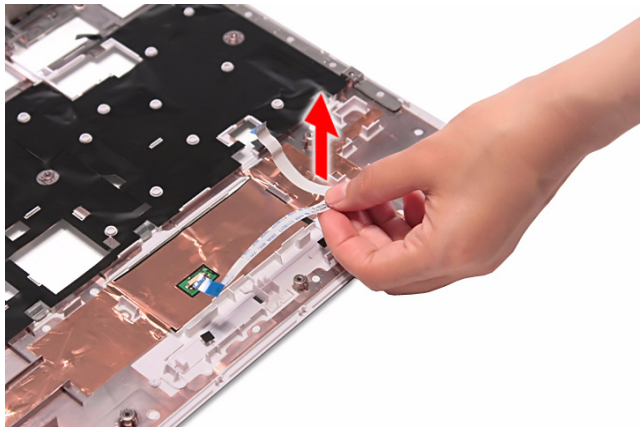
- 1 black M2×5 (hard drive)
- 1 black M2.5×6 (optical drive)
- 3 black M2.5×6 (keyboard cover)
- 2 black M2.5×6 (LCD panel hinge - bottom)
- 2 black M2.5×6+Nylok (LCD panel hinge - top)
- 10 M2.5×6 black (palm rest - base side)
- 3 M2.5×6 black (palm rest - top side)

▶ To replace the touchpad board:

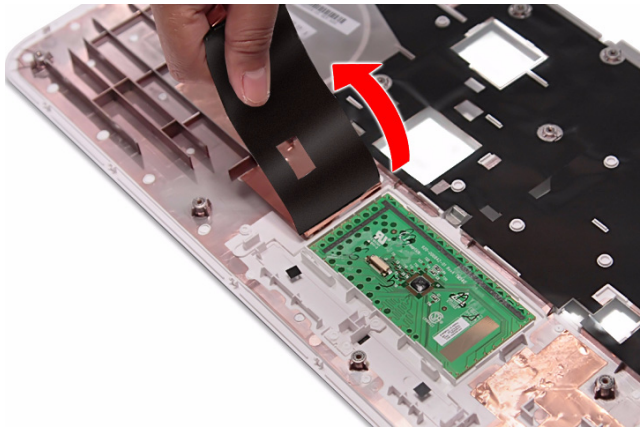
1. Complete the steps in “Preparing the notebook” on page 47.
2. Remove the palm rest by performing steps 2–18 of the “Replacing the palm rest” procedure on page 68.
3. Turn the palm rest over so that its underside is facing up.
4. Open the touchpad board cable connector **(a)** and disconnect the cable **(b)**.



5 Remove the touchpad cable from the palm rest.

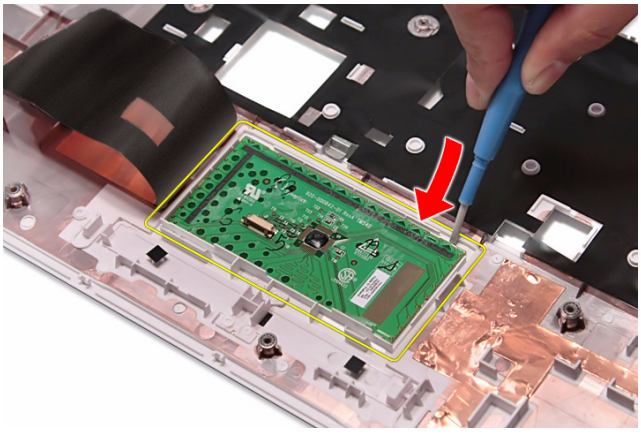


6 Peel off the tape protecting the touchpad board.



7 Note the orientation of the touchpad board for later reference in installing the new touchpad board.

8 Insert a small flat-blade screwdriver or non-marring scribe between the touchpad board and the palm rest's underside, and carefully pry the board loose.



9 Remove the touchpad board from the palm rest.

Note
A circuit board that is >10 cm^2 has been highlighted with a yellow rectangle as shown in the above image. Follow the local regulations for disposing this type of circuit board.

10 Observing the same orientation as the old touchpad board, secure the new board on the palm rest.

11 Cover the new touchpad board with the tape removed in step 6.

12 Insert the touchpad cable to the touchpad board cable connector, and then close the clip to lock the cable in place.

13 Reinstall the palm rest by performing steps 19–21 of the "Replacing the palm rest" procedure on page 68.

14 Reinstall the LCD panel assembly by performing steps 16–23 of the "Replacing the LCD panel assembly" procedure on page 64.

15 Reinstall the keyboard and the keyboard cover by performing steps 5–8 of the "Replacing the keyboard" procedure on page 62.

16 Return the optical screw drive in its place.

17 Reinstall the hard drive by performing steps 8 and 9 of the "Replacing the hard drive" procedure on page 54.

18 If you have disconnected any wireless antennas, reconnect them now.

19 Reinstall the bay cover.

■

Replacing the modem board

Tools you need to complete this task:

Phillips #0 screwdriver

Flat screwdriver or Non-marring plastic scribe

Screws removed during this task:

- 1 black M2×5 (hard drive)
- 1 black M2.5×6 (optical drive)
- 3 black M2.5×6 (keyboard cover)
- 2 black M2.5×6 (LCD panel hinge - bottom)
- 2 black M2.5×6+Nylok (LCD panel hinge - top)
- 10 M2.5×6 black (palm rest - base side)
- 3 M2.5×6 black (palm rest - top side)
- 1 black M2×4 (modem board)

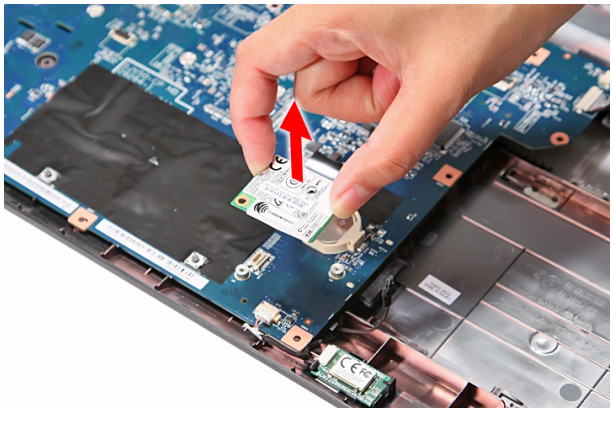
▶ To replace the system board:

1. Complete the steps in “Preparing the notebook” on page 47.
2. Complete the steps in “Removing the battery” on page 48.
3. Remove the memory from the old system board and install it on the new system board by following the instructions in the “Adding or replacing memory modules” section on page 50.
4. If the notebook has a wireless card installed, remove the card from the old system board and install it on the new system board by following the instructions in the “Replacing the wireless card” section on page 52.
5. Remove the hard drive by performing steps 3 and 4 of the “Replacing the hard drive” procedure on page 54.
6. Remove the optical drive by performing steps 3 and 4 of the “Replacing the optical drive” procedure on page 56.
7. Remove the palm rest by following steps 6–18 of the “Replacing the palm rest” procedure on page 68.

8 Disconnect the modem cable from the modem board.

9 Remove the modem board screw.

10 Remove the old modem board from the system board.



11 Connect the modem cable to the new modem board, and then attach to board to its system board connector.

12 Secure the new modem board with the screw removed in step 9.

13 Reinstall the palm rest by performing steps 19–21 of the “Replacing the palm rest” procedure on page 68.

14 Reinstall the LCD panel assembly by following the steps 16–23 of the “Replacing the LCD panel assembly” procedure on page 64.

15 Reinstall the keyboard and the keyboard cover by performing steps 5–8 of the “Replacing the keyboard” procedure on page 62.

16 Close the LCD panel and turn the notebook over so the base is facing up.

17 Reinstall the optical drive by performing steps 10 and 11 of the “Replacing the optical drive” procedure on page 56.

18 Reinstall the hard drive by performing steps 8 and 9 of the “Replacing the hard drive” procedure on page 54.

19 If you have disconnected any wireless antennas, reconnect them now.

20 Reinstall the bay cover.

21 Reinstall the battery.

■

Replacing the USB board

Tools you need to complete this task:

Phillips #0 screwdriver

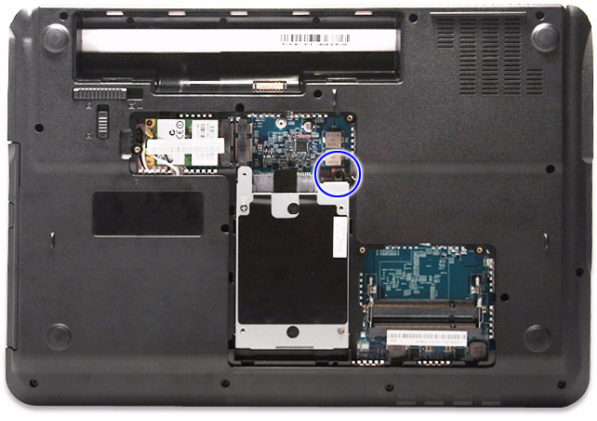
Flat screwdriver or Non-marring plastic scribe

Screws removed during this task:

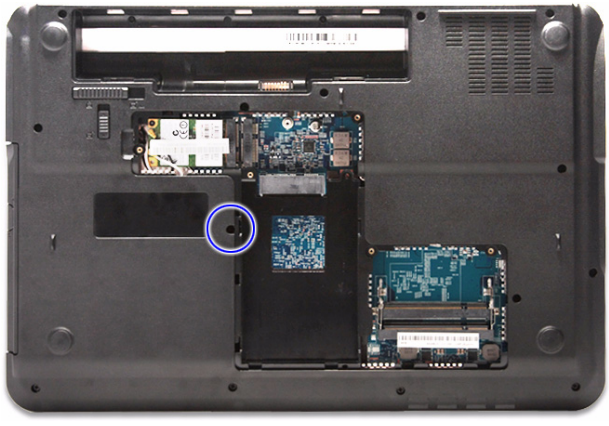
- 1 black M2×5 (hard drive)
- 1 black M2.5×6 (optical drive)
- 3 black M2.5×6 (keyboard cover)
- 2 black M2.5×6 (LCD panel hinge - bottom)
- 2 black M2.5×6+Nylok (LCD panel hinge - top)
- 10 M2.5×6 black (palm rest - base side)
- 3 M2.5×6 black (palm rest - top side)

▶ To replace the USB board:

1. Complete the steps in “Preparing the notebook” on page 47.
2. Complete the steps in “Removing the battery” on page 48.
3. Complete the steps in “Removing the bay cover” on page 49.
4. If the notebook has a wireless card installed, unplug the antenna cables.
5. Remove the hard drive screw, and then remove the hard drive from its compartment.

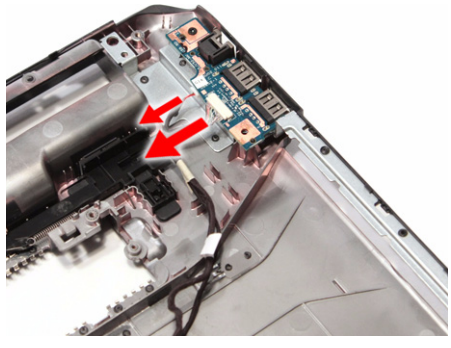


6 Remove the optical drive screw.

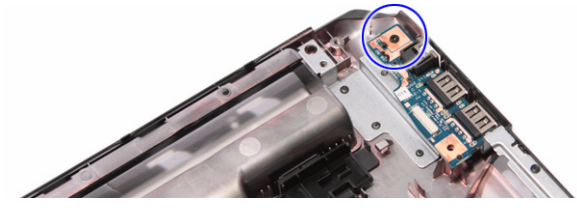


7 Remove the palm rest by performing steps 6–18 of the “Replacing the palm rest” procedure on page 68.

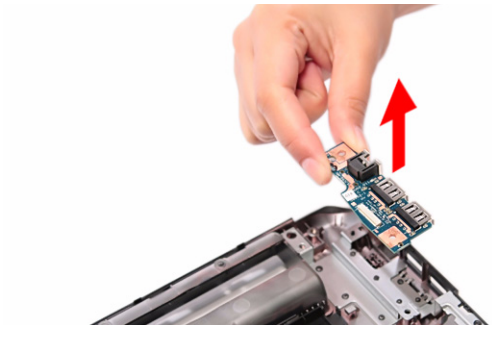
8 Disconnect the USB board and modem board cables from the USB board.



9 Remove the USB board screw.



10 Remove the USB board from the base enclosure.



11 Place the new USB board in the base enclosure and secure it with the screw removed in step 9.

12 Connect the USB board and modem board cables to the new USB board.

13 Reinstall the palm rest by performing steps 19–21 of the "Replacing the palm rest" procedure on page 68.

14 Reinstall the LCD panel assembly by performing steps 16–23 of the "Replacing the LCD panel assembly" procedure on page 64.

15 Reinstall the keyboard and the keyboard cover by performing steps 5–8 of the "Replacing the keyboard" procedure on page 62.

16 Close the LCD panel and turn the notebook over so the base is facing up.

17 Return the optical screw drive in its place.

18 Reinstall the hard drive by performing steps 8 and 9 of the "Replacing the hard drive" procedure on page 54.

19 If you have disconnected any wireless antennas, reconnect them now.

20 Reinstall the bay cover.

21 Reinstall the battery.

■

Replacing the Bluetooth module

Tools you need to complete this task:

Phillips #0 screwdriver

Flat screwdriver or

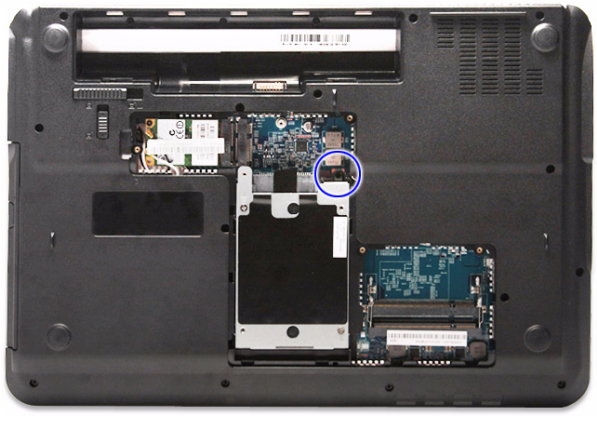
Non-marring plastic scribe

Screws removed during this task:

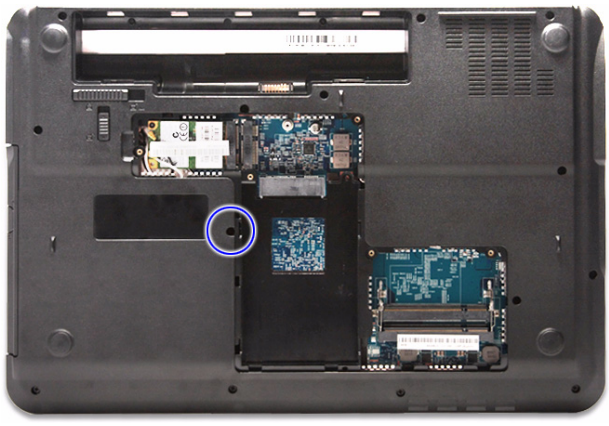
- 1 black M2×5 (hard drive)
- 1 black M2.5×6 (optical drive)
- 3 black M2.5×6 (keyboard cover)
- 2 black M2.5×6 (LCD panel hinge - bottom)
- 2 black M2.5×6+Nylok (LCD panel hinge - top)
- 10 M2.5×6 black (palm rest - base side)
- 3 M2.5×6 black (palm rest - top side)

▶ To replace the Bluetooth module:

1. Complete the steps in “Preparing the notebook” on page 47.
2. Complete the steps in “Removing the battery” on page 48.
3. Complete the steps in “Removing the bay cover” on page 49.
4. If the notebook has a wireless card installed, unplug the antenna cables.
5. Remove the hard drive screw, and then remove the hard drive from its compartment.

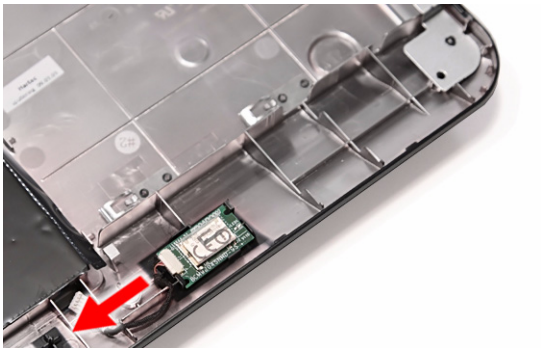


6 Remove the optical drive screw.

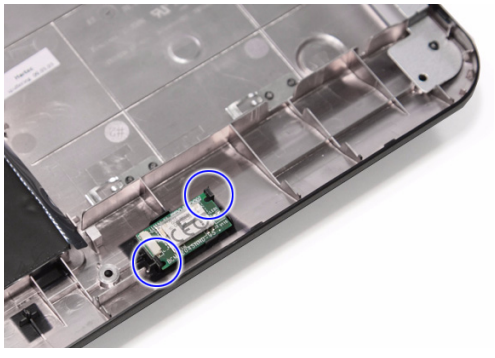


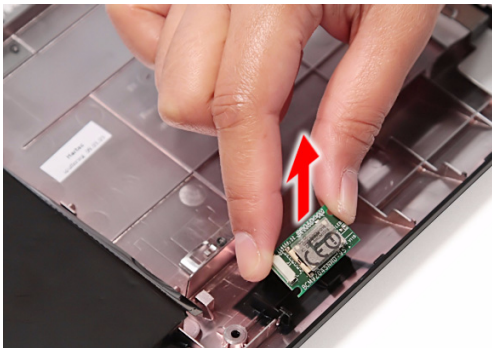
7 Remove the palm rest by performing steps 6–18 of the "Replacing the palm rest" procedure on page 68.

8 Disconnect the Bluetooth cable from the Bluetooth module.



9 Release the Bluetooth module from the tabs securing it.





10 Secure the new Bluetooth module on the base enclosure and connect the Bluetooth cable to it.

11 Reinstall the palm rest by performing steps 19–21 of the "Replacing the palm rest" procedure on page 68.

12 Reinstall the LCD panel assembly by performing steps 16–23 of the "Replacing the LCD panel assembly" procedure on page 64.

13 Reinstall the keyboard and the keyboard cover by performing steps 5–8 of the "Replacing the keyboard" procedure on page 62.

14 Close the LCD panel and turn the notebook over so the base is facing up.

15 Return the optical screw drive in its place.

16 Reinstall the hard drive by performing steps 8 and 9 of the "Replacing the hard drive" procedure on page 54.

17 If you have disconnected any wireless antennas, reconnect them now.

18 Reinstall the bay cover.

19 Reinstall the battery.

■

Replacing the system board

Tools you need to complete this task:


Phillips #0 screwdriver


Flat screwdriver

or

Non-marring plastic scribe

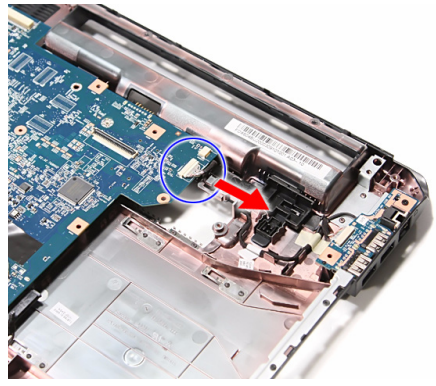
Screws removed during this task:

- 1 black M2×5 (hard drive)
- 1 black M2.5×6 (optical drive)
- 3 black M2.5×6 (keyboard cover)
- 2 black M2.5×6 (LCD panel hinge - bottom)
- 2 black M2.5×6+Nylok (LCD panel hinge - top)
- 10 M2.5×6 black (palm rest - base side)
- 3 M2.5×6 black (palm rest - top side)
- 1 black M2×4 (system board)

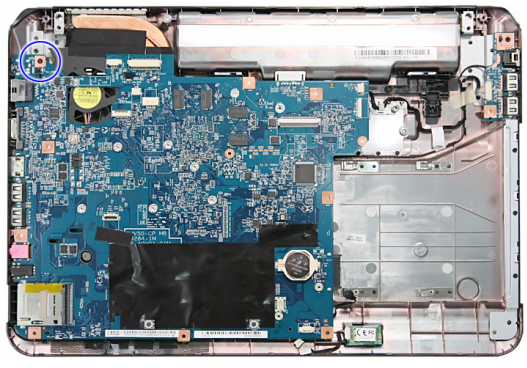
▶ To replace the system board:

1. Complete the steps in “Preparing the notebook” on page 47.
2. Complete the steps in “Removing the battery” on page 48.
3. Remove the memory from the old system board and install it on the new system board by following the instructions in the “Adding or replacing memory modules” section on page 50.
4. If the notebook has a wireless card installed, remove the card from the old system board and install it on the new system board by following the instructions in the “Replacing the wireless card” section on page 52.
5. Remove the hard drive by performing steps 3 and 4 of the “Replacing the hard drive” procedure on page 54.
6. Remove the optical drive by performing steps 3 and 4 of the “Replacing the optical drive” procedure on page 56.
7. Remove the palm rest by following steps 6–18 of the “Replacing the palm rest” procedure on page 68.
8. Remove the modem board by following steps 8–10 of the “Replacing the modem board” procedure on page 77, then disconnect the Bluetooth module cable from its system board connector.

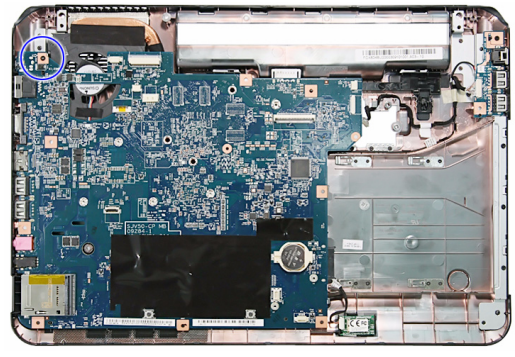
9 Disconnect the USB board cable from its system board connector.



10 Remove the system board screw.



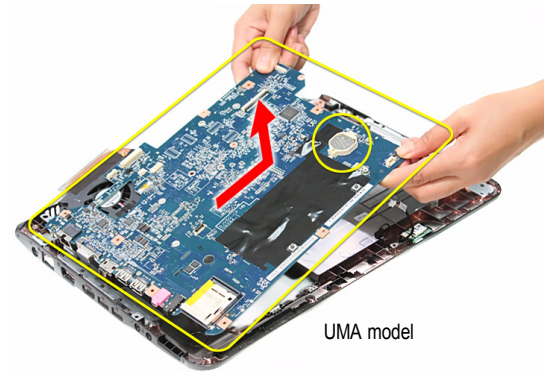
Discrete model



UMA model

11 Carefully remove the system board from the base enclosure.

Discrete model



UMA model

Note

A circuit board that is >10 cm^2 has been highlighted with a yellow rectangle as shown in the previous image. Follow the local regulations for disposing this type of circuit board.

The RTC battery has been highlighted with a yellow circle in the previous image. Detach the RTC battery and follow the local regulations for disposing it.

12 Turn the system board over and remove the cooling assembly by performing steps 4–7 of the "Replacing the cooling assembly" procedure on page 89.

13 If your new system board does not include a processor, remove the processor from the old system board and install it on the new system board by performing steps 4–7 in the "Replacing the processor" section on page 92.

14 Reinstall the cooling assembly by performing steps 9–12 of the "Replacing the cooling assembly" procedure on page 89.

15 Place the new system board in the base enclosure and secure it with the screw removed in step 9.

16 Reconnect the USB board and Bluetooth module cables to their system board connectors.

17 Reinstall the modem module by performing steps 11–12 of the "Replacing the modem board" procedure on page 77.

18 Reinstall the palm rest by performing steps 19–21 of the "Replacing the palm rest" procedure on page 68.

19 Reinstall the LCD panel assembly by following the steps 16–23 of the "Replacing the LCD panel assembly" procedure on page 64.

20 Reinstall the keyboard and the keyboard cover by performing steps 5–8 of the "Replacing the keyboard" procedure on page 62.

21 Close the LCD panel and turn the notebook over so the base is facing up.

22 Reinstall the optical drive by performing steps 10 and 11 of the "Replacing the optical drive" procedure on page 56.

23 Reinstall the hard drive by performing steps 8 and 9 of the "Replacing the hard drive" procedure on page 54.

24 If you have disconnected any wireless antennas, reconnect them now.

25 Reinstall the bay cover.

26 Reinstall the battery.

■

Replacing the cooling assembly

Tools you need to complete this task:

Phillips #0 screwdriver

Flat screwdriver or Non-marring plastic scribe

Additional materials you need to complete this task:

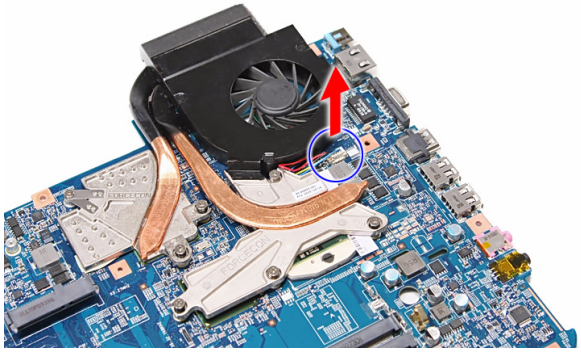
- Soft cloth and isopropyl alcohol; or alcohol pad
- Thermal grease

Screws removed during this task:

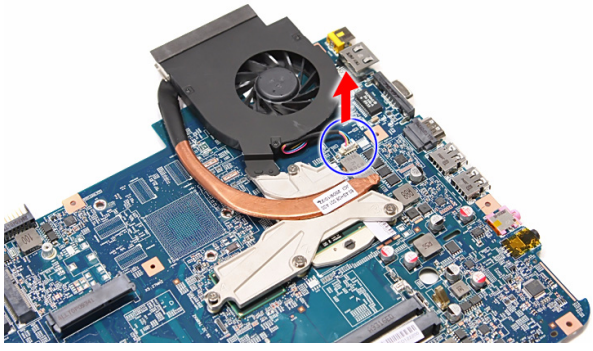
- 1 black M2×5 (hard drive)
- 1 black M2.5×6 (optical drive)
- 3 black M2.5×6 (keyboard cover)
- 2 black M2.5×6 (LCD panel hinge - bottom)
- 2 black M2.5×6+Nylok (LCD panel hinge - top)
- 10 M2.5×6 black (palm rest - base side)
- 3 M2.5×6 black (palm rest - top side)
- 1 black M2×4 (system board)

▶ To replace the cooling assembly:

1. Complete the steps in “Preparing the notebook” on page 47.
2. Remove the system board by performing steps 2–11 of the “Replacing the system board” procedure on page 86.
3. Turn the system board over to access the cooling fan cable.
4. Disconnect the cooling fan cable from its system board connector.

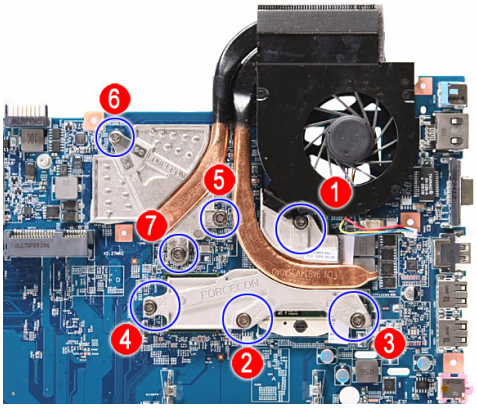


Discrete model

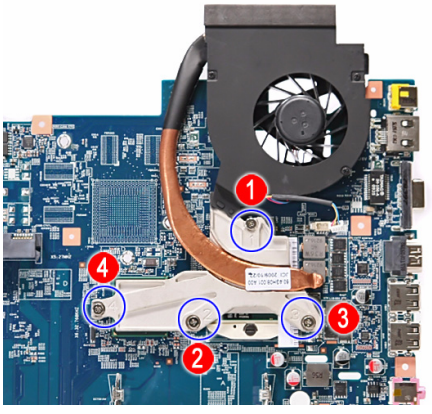


UMA model

5 Loosen the spring-loaded captive screws securing the cooling assembly. Follow the screw sequence indicated on the below images.



Discrete model



UMA model

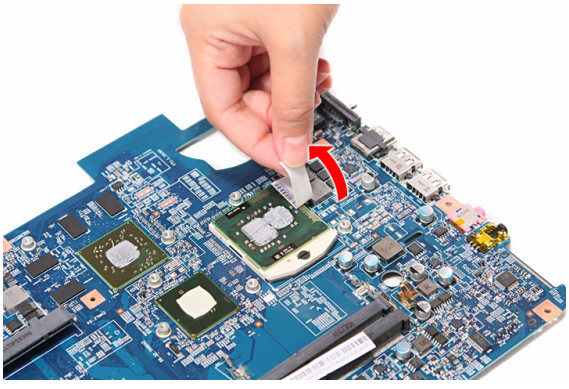
6 Remove the cooling assembly from the system board.

Discrete model

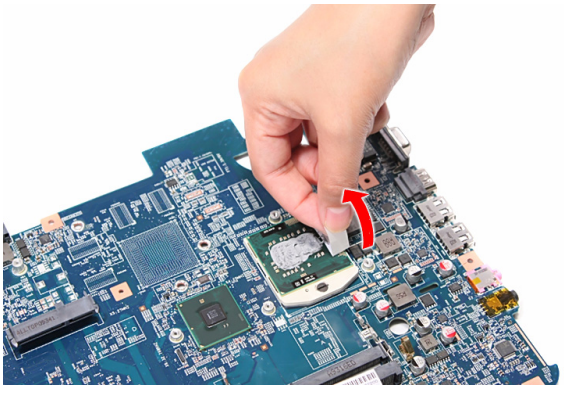
UMA model

7 Lay the cooling assembly down in an upright position to avoid tainting your work space with thermal grease.

8 Remove the barcode sticker on top of the processor.



Discrete model



UMA model

9 Moisten a soft cloth with isopropyl alcohol and clean the processor die to remove any thermal grease residue. Wipe the die surface several times to make sure that no particles or dust contaminants are evident. Allow the alcohol to evaporate before continuing.

Caution

Do not touch the contact surface of the new cooling assembly nor the processor dire as this may leave dead skin cells or oils from your finger that can result in poor thermal grease performance.

10 Apply just enough thermal grease to evenly coat the surface of the processor die.

11 Place the new cooling assembly on the system board and tighten its captive screws to secure it in place. Follow the sequence of the number beside each screw when securing the cooling assembly.

12 Reconnect the cooling fan cable to its system board connector.

13 Reinstall the system board by performing steps 15 and 16 of the "Replacing the system board" procedure on page 86.

14 Reinstall the palm rest by performing steps 19–21 of the "Replacing the palm rest" procedure on page 68.

15 Reinstall the LCD panel assembly by performing steps 16–23 of the "Replacing the LCD panel assembly" procedure on page 64.

16 Reinstall the keyboard and the keyboard cover by performing steps 5–8 of the "Replacing the keyboard" procedure on page 62.

17 Close the LCD panel and turn the notebook over so the base is facing up.

18 Reinstall the optical drive by performing steps 10 and 11 of the "Replacing the optical drive" procedure on page 56.

19 Reinstall the hard drive by performing steps 8 and 9 of the "Replacing the hard drive" procedure on page 54.

20 If you have disconnected any wireless antennas, reconnect them now.

21 Reinstall the bay cover.

22 Reinstall the battery.

■

Replacing the processor

Tools you need to complete this task:

Phillips #0 screwdriver

Flat screwdriver

Non-marring plastic scribe

Additional materials you need to complete this task:

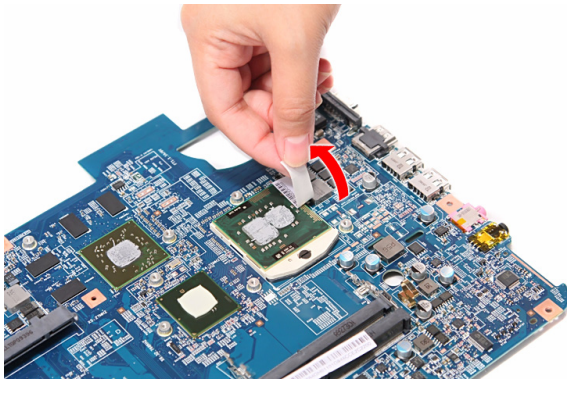
- Soft cloth and isopropyl alcohol; or alcohol pad
- Thermal grease

Screws removed during this task:

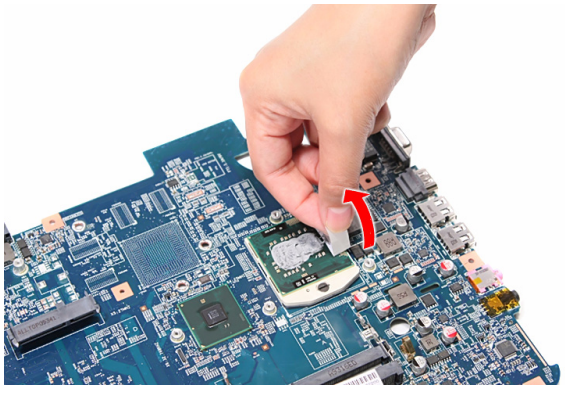
- 1 black M2×5 (hard drive)
- 1 black M2.5×6 (optical drive)
- 3 black M2.5×6 (keyboard cover)
- 2 black M2.5×6 (LCD panel hinge - bottom)
- 2 black M2.5×6+Nylok (LCD panel hinge - top)
- 10 M2.5×6 black (palm rest - base side)
- 3 M2.5×6 black (palm rest - top side)
- 1 black M2×4 (system board)

▸ To replace the processor:

1. Complete the steps in “Preparing the notebook” on page 47.
2. Remove the cooling assembly by performing steps 2–7 of the “Replacing the cooling assembly” procedure on page 89.
3. Remove the barcode sticker on top of the processor.

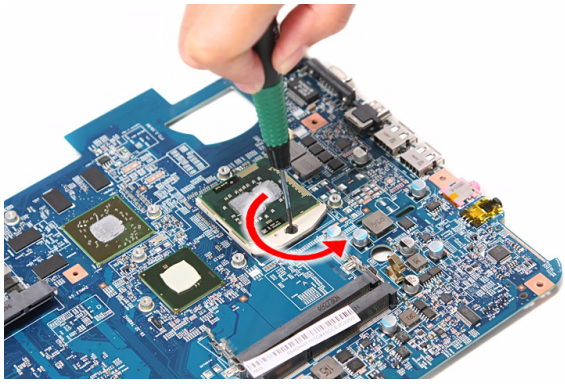


Discrete model

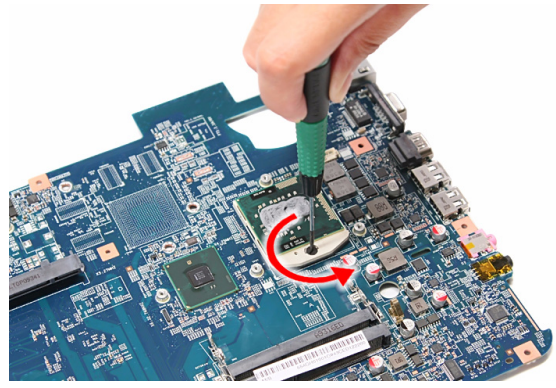


UMA model

4 Use a flat-blade screwdriver to turn the processor lock screw counter-clockwise.

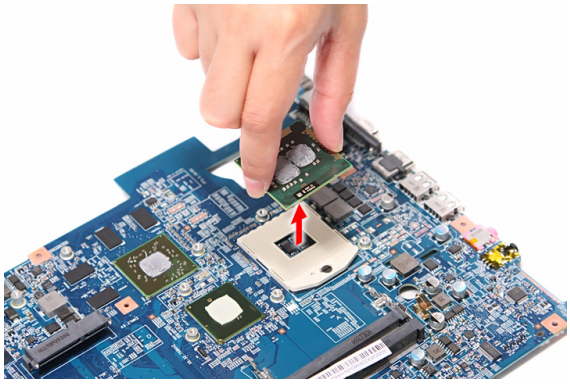


Discrete model

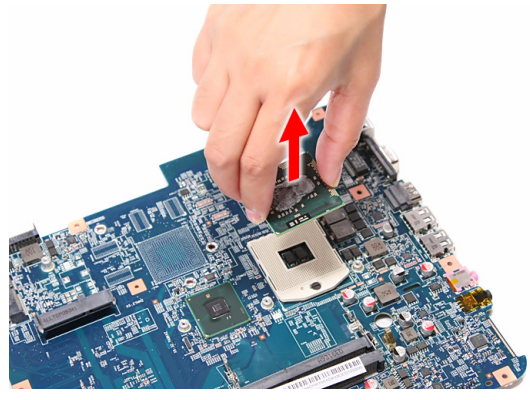


UMA model

5 Remove the old processor from the system board.



Discrete model



UMA model

6 Align pin 1 of the new processor (indicated by the gold arrow on the corner of the processor) with the beveled corner of the processor socket.

The processor will easily fit into the socket if you oriented it properly.

7 Use a flat-blade screwdriver to turn the lock screw 180° clockwise to secure the processor in place.

8 Apply just enough thermal grease to evenly coat the surface of the processor die.

9 Reinstall the cooling assembly by performing steps 9–12 of the "Replacing the cooling assembly" procedure on page 89.

10 Reinstall the system board by performing steps 15 and 16 of the "Replacing the system board" procedure on page 86.

11 Reinstall the palm rest by performing steps 19–21 of the "Replacing the palm rest" procedure on page 68.

12 Reinstall the LCD panel assembly by performing steps 16–23 of the "Replacing the LCD panel assembly" procedure on page 64.

13 Reinstall the keyboard and the keyboard cover by performing steps 5–8 of the "Replacing the keyboard" procedure on page 62.

14 Close the LCD panel and turn the notebook over so the base is facing up.

15 Reinstall the optical drive by performing steps 10 and 11 of the "Replacing the optical drive" procedure on page 56.

16 Reinstall the hard drive by performing steps 8 and 9 of the "Replacing the hard drive" procedure on page 54.

17 If you have disconnected any wireless antennas, reconnect them now.

18 Reinstall the bay cover.

19 Reinstall the battery.

■

Replacing the LCD front panel

Tools you need to complete this task:

Phillips #0 screwdriver

Flat screwdriver or

Non-marring plastic scribe

Screws removed during this task:

- 1 black M2×5 (hard drive)
- 1 black M2.5×6 (optical drive)
- 3 black M2.5×6 (keyboard cover)
- 2 black M2.5×6 (LCD panel hinges - bottom)
- 2 black M2.5×6+Nylok (LCD panel hinges - top)
- 4 black M2.5×6+Nylok (LCD front panel)
- 2 chrome M2×4 (LCD hinge covers)

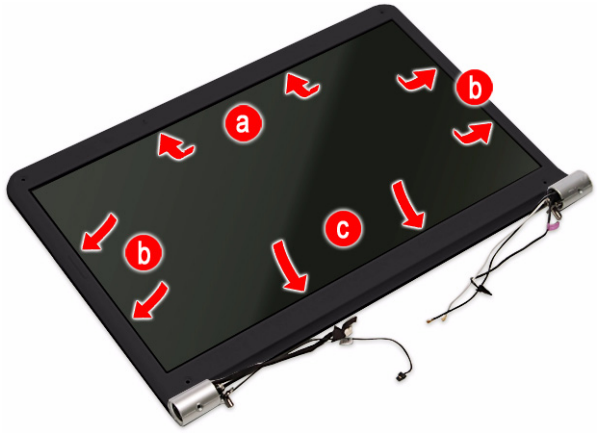
▶ To replace the LCD front panel:

1. Complete the steps in “Preparing the notebook” on page 47.
2. Remove the LCD panel assembly by performing steps 2–15 of the “Replacing the LCD panel assembly” procedure on page 64.
3. Remove the rubber inserts from the corners of the LCD front panel.

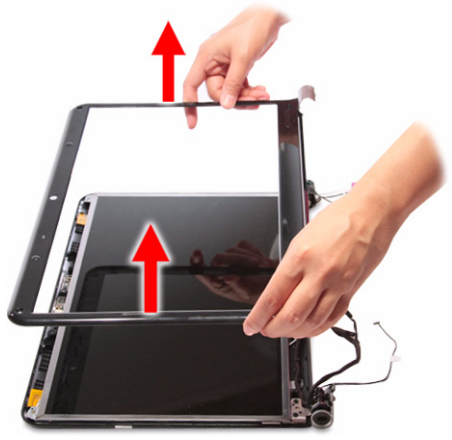
4 Remove the LCD front panel screws.

5 Remove the LCD hinge cover screws.

6 Carefully pry loose the front panel from the LCD assembly lid. Start on the top side **(a)**, continue to the left and right sides **(b)**, and finally the bottom side **(c)**.



7 Remove the front panel.



8 Place the new front panel on top of the LCD assembly lid.

Make sure that the LCD, webcam, microphone, antenna, and power button cables are properly routed on the hinge sides.

9 Press the front panel on all sides until it snaps into place.

Make sure that there is no gap the between the front panel and the LCD assembly lid.

10 Secure the front panel with screws removed in steps 4 and 5.

11 Return the LCD front panel rubber inserts to their places.

12 Reinstall the LCD panel assembly by performing steps 16–23 of the "Replacing the LCD panel assembly" procedure on page 64.

13 Turn the notebook over so the palm rest is facing up.

14 Reinstall the keyboard and the keyboard cover by performing steps 5–8 of the "Replacing the keyboard" procedure on page 62.

15 Reinstall the battery.

■

Replacing the webcam

Tools you need to complete this task:

Phillips #0 screwdriver

Flat screwdriver or Non-marring plastic scribe

Screws removed during this task:

- 1 black M2×5 (hard drive)
- 1 black M2.5×6 (optical drive)
- 3 black M2.5×6 (keyboard cover)
- 2 black M2.5×6 (LCD panel hinges - bottom)
- 2 black M2.5×6+Nylok (LCD panel hinges - top)
- 4 black M2.5×6+Nylok (LCD front panel)
- 2 chrome M2×4 (LCD hinge covers)
- 4 black M2.5×6+Nylok (LCD front panel)

▶ To replace the webcam:

1. Complete the steps in “Preparing the notebook” on page 47.
2. Remove the LCD panel assembly by performing steps 2–15 of the “Replacing the LCD panel assembly” procedure on page 64.
3. Remove the LCD front panel by performing steps 3–7 of the “Replacing the LCD front panel” procedure on page 95.
4. Disconnect the webcam board cable.

5 Place the new webcam on the top side of the LCD assembly lid.

6 Reinstall the LCD front panel by performing steps 8–11 of the "Replacing the LCD front panel" procedure on page 95.

Make sure the webcam lens is aligned with camera peephole on the LCD front panel before you secure the panel in place.

7 Reinstall the LCD panel assembly by performing steps 16–23 of the "Replacing the LCD panel assembly" procedure on page 64.

8 Turn the notebook over so the palm rest is facing up.

9 Reinstall the keyboard and the keyboard cover by performing steps 5–8 of the "Replacing the keyboard" procedure on page 62.

10 Reinstall the battery.

■

Replacing the LCD

Tools you need to complete this task:

Phillips #0 screwdriver

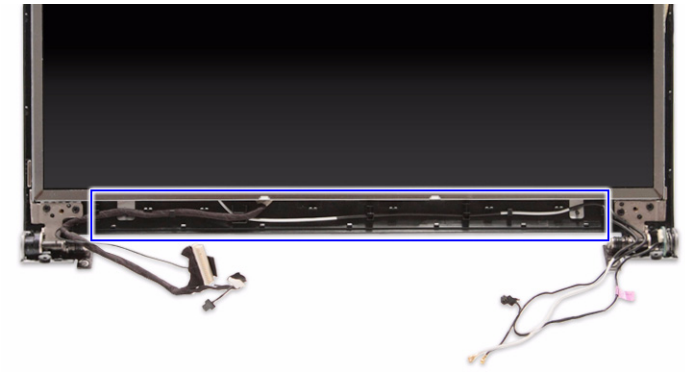
Flat screwdriver or Non-marring plastic scribe

Screws removed during this task:

- 1 black M2×5 (hard drive)
- 1 black M2.5×6 (optical drive)
- 3 black M2.5×6 (keyboard cover)
- 2 black M2.5×6 (LCD panel hinges - bottom)
- 2 black M2.5×6+Nylok (LCD panel hinges - top)
- 4 black M2.5×6+Nylok (LCD front panel)
- 2 chrome M2×4 (LCD hinge covers)
- 4 black M2.5×6+Nylok (LCD front panel)
- 4 black M2.5×5 (LCD panel hinges)
- 4 chrome M2×3 (LCD panel brackets)

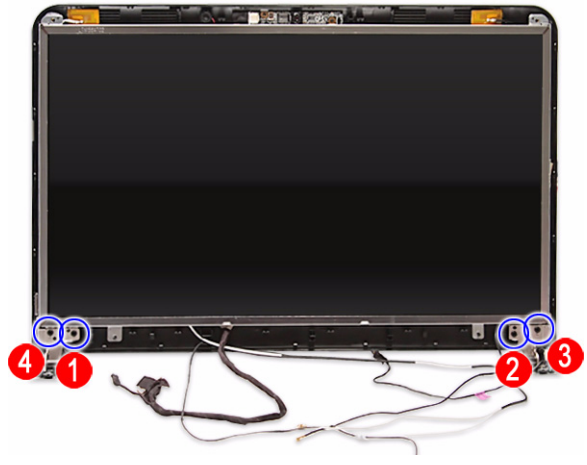
▸ To replace the LCD:

1. Complete the steps in “Preparing the notebook” on page 47.
2. Remove the LCD panel assembly by performing steps 2–15 of the “Replacing the LCD panel assembly” procedure on page 64.
3. Remove the LCD front panel by performing steps 3–7 of the “Replacing the LCD front panel” procedure on page 95.
4. Release the LCD, webcam, microphone, antenna, and power button from their LCD assembly lid latches.



5 Disconnect the webcam cable from the webcam board.

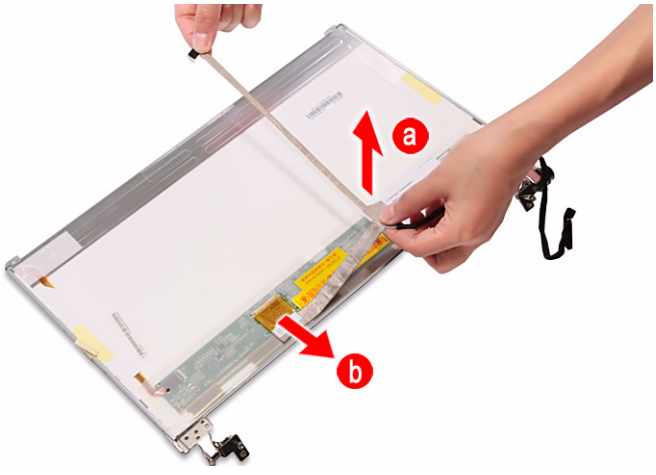
6 Remove the LCD hinge screws.



7 Remove the LCD from the LCD assembly lid.

8 Lay the LCD on its front to access the LCD-webcam cable.

9 Detach the LCD-webcam from the LCD's underside **(a)** and disconnect it from the LCD PCB **(b)**.



10 Remove the screws securing the LCD panel brackets.

11 Attach the LCD panel brackets and the LCD cable to the new LCD.

12 Place the new LCD on the LCD assembly lid and secure it with the screws removed in step .

13 Reinstall the LCD front panel by performing steps 8–11 of the "Replacing the LCD front panel" procedure on page 95.

14 Reinstall the LCD panel assembly by performing steps 16–23 of the "Replacing the LCD panel assembly" procedure on page 64.

15 Turn the notebook over so the palm rest is facing up.

16 Reinstall the keyboard and the keyboard cover by performing steps 5–8 of the "Replacing the keyboard" procedure on page 62.

17 Reinstall the battery.

■

Replacing the LCD panel hinge brackets

Tools you need to complete this task:

Phillips #0 screwdriver

Flat screwdriver or Non-marring plastic scribe

Screws removed during this task:

- 1 black M2×5 (hard drive)
- 1 black M2.5×6 (optical drive)
- 3 black M2.5×6 (keyboard cover)
- 2 black M2.5×6 (LCD panel hinges - bottom)
- 2 black M2.5×6+Nylok (LCD panel hinges - top)
- 4 black M2.5×6+Nylok (LCD front panel)
- 2 chrome M2×4 (LCD hinge covers)
- 4 black M2.5×6+Nylok (LCD front panel)
- 4 black M2.5×5 (LCD panel hinges)
- 4 chrome M2×3 (LCD panel brackets)

▶ To replace the LCD:

1. Complete the steps in “Preparing the notebook” on page 47.
2. Remove the LCD panel assembly by performing steps 2–15 of the “Replacing the LCD panel assembly” procedure on page 64.
3. Remove the LCD front panel by performing steps 3–7 of the “Replacing the LCD front panel” procedure on page 95.
4. Remove the LCD by performing steps 4–7 of the “Replacing the LCD” procedure on page 100.
5. Remove the screws securing the LCD panel brackets.

6 Attach the new LCD panel brackets to the LCD.

7 Place the LCD on the LCD assembly lid and secure it with the screws removed in step .

8 Reinstall the LCD front panel by performing steps 8–11 of the "Replacing the LCD front panel" procedure on page 95.

9 Reinstall the LCD panel assembly by performing steps 16–23 of the "Replacing the LCD panel assembly" procedure on page 64.

10 Turn the notebook over so the palm rest is facing up.

11 Reinstall the keyboard and the keyboard cover by performing steps 5–8 of the "Replacing the keyboard" procedure on page 62.

12 Reinstall the battery.

■

Replacing the power button board

Tools you need to complete this task:

Phillips #0 screwdriver

Flat screwdriver or Non-marring plastic scribe

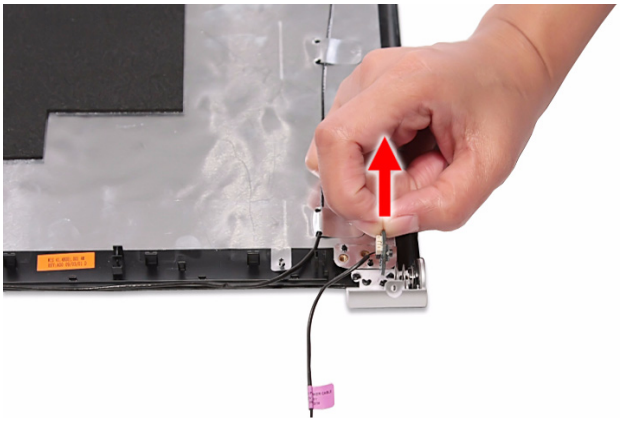
Screws removed during this task:

- 1 black M2×5 (hard drive)
- 1 black M2.5×6 (optical drive)
- 3 black M2.5×6 (keyboard cover)
- 2 black M2.5×6 (LCD panel hinges - bottom)
- 2 black M2.5×6+Nylok (LCD panel hinges - top)
- 4 black M2.5×6+Nylok (LCD front panel)
- 2 chrome M2×4 (LCD hinge covers)
- 4 black M2.5×6+Nylok (LCD front panel)
- 4 black M2.5×5 (LCD panel hinges)

▶ To replace the power button board:

1. Complete the steps in “Preparing the notebook” on page 47.
2. Remove the LCD panel assembly by performing steps 2–15 of the “Replacing the LCD panel assembly” procedure on page 64.
3. Remove the LCD front panel by performing steps 3–7 of the “Replacing the LCD front panel” procedure on page 95.
4. Remove the LCD by performing steps 4–7 of the “Replacing the LCD” procedure on page 100.

5 Note the orientation of the power button board for later reference and then remove the board from the LCD assembly lid.



6 Disconnect the power button cable from the board.

7 Connect the power button cable to the new power button board.

8 Position the new power button board on the LCD assembly lid making sure it is in the same orientation noted on step 5.

The board should fit snugly against the spring to ensure proper contact when pressing the power button.

9 Place the LCD back on the LCD assembly lid.

10 Return the hinge screws to their places.

11 Reinstall the LCD front panel by performing steps 8–11 of the "Replacing the LCD front panel" procedure on page 95.

12 Reinstall the LCD panel assembly by performing steps 16–23 of the "Replacing the LCD panel assembly" procedure on page 64.

13 Turn the notebook over so the palm rest is facing up.

14 Reinstall the keyboard and the keyboard cover by performing steps 5–8 of the "Replacing the keyboard" procedure on page 62.

15 Reinstall the battery.

■

Replacing the Kensington lock cap

Tools you need to complete this task:

Phillips #0 screwdriver

Flat screwdriver or

Non-marring plastic scribe

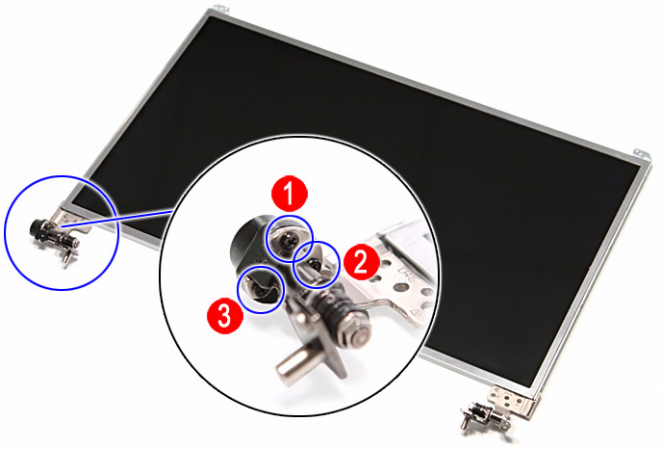
Screws removed during this task:

- 1 black M2×5 (hard drive)
- 1 black M2.5×6 (optical drive)
- 3 black M2.5×6 (keyboard cover)
- 2 black M2.5×6 (LCD panel hinges - bottom)
- 2 black M2.5×6+Nylok (LCD panel hinges - top)
- 4 black M2.5×6+Nylok (LCD front panel)
- 2 chrome M2×4 (LCD hinge covers)
- 4 black M2.5×6+Nylok (LCD front panel)
- 3 black (Kensington lock cap)

▶ To replace the Kensington lock cap:

1. Complete the steps in “Preparing the notebook” on page 47.
2. Remove the LCD panel assembly by performing steps 2–15 of the “Replacing the LCD panel assembly” procedure on page 64.
3. Remove the LCD front panel by performing steps 3–7 of the “Replacing the LCD front panel” procedure on page 95.
4. Move the LCD, webcam, microphone, and antenna cables away from the Kensington lock cap screws.

5 Note the orientation of the Kensington lock cap for later reference and then remove the screws securing it.



6 Detach the Kensington lock cap from the left hinge.

7 Position the new Kensington lock cap on the left hinge making sure it is in the same orientation noted on step 5.

8 Secure the cap with the screws removed in step 5.

9 Reinstall the LCD front panel by performing steps 8–11 of the "Replacing the LCD front panel" procedure on page 95.

10 Reinstall the LCD panel assembly by performing steps 16–23 of the "Replacing the LCD panel assembly" procedure on page 64.

11 Turn the notebook over so the palm rest is facing up.

12 Reinstall the keyboard and the keyboard cover by performing steps 5–8 of the "Replacing the keyboard" procedure on page 62.

13 Reinstall the battery.

■

Replacing the microphone

Tools you need to complete this task:

Phillips #0 screwdriver

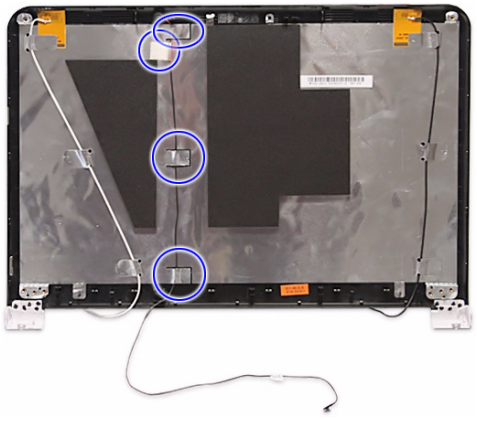
Flat screwdriver or Non-marring plastic scribe

Screws removed during this task:

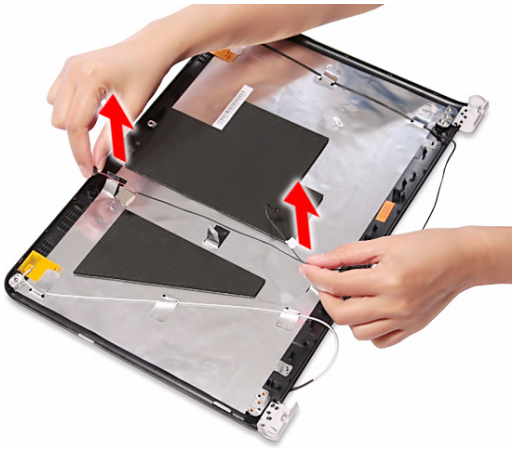
- 1 black M2×5 (hard drive)
- 1 black M2.5×6 (optical drive)
- 3 black M2.5×6 (keyboard cover)
- 2 black M2.5×6 (LCD panel hinges - bottom)
- 2 black M2.5×6+Nylok (LCD panel hinges - top)
- 4 black M2.5×6+Nylok (LCD front panel)
- 2 chrome M2×4 (LCD hinge covers)
- 4 black M2.5×6+Nylok (LCD front panel)
- 4 black M2.5×5 (LCD panel hinges)

▶ To replace the microphone:

1. Complete the steps in “Preparing the notebook” on page 47.
2. Remove the LCD panel assembly by performing steps 2–15 of the “Replacing the LCD panel assembly” procedure on page 64.
3. Remove the LCD front panel by performing steps 3–7 of the “Replacing the LCD front panel” procedure on page 95.
4. Remove the LCD by performing steps 4–7 of the “Replacing the LCD” procedure on page 100.
5. Release the microphone cable from the adhesive tabs securing it.



6 Remove the microphone from the LCD assembly lid.



7 Place the new microphone on the LCD assembly lid and secure its cable on the adhesive tabs.

8 Place the LCD back on the LCD assembly lid.

9 Return the hinge screws to their places.

10 Reinstall the LCD front panel by performing steps 8–11 of the "Replacing the LCD front panel" procedure on page 95.

11 Reinstall the LCD panel assembly by performing steps 16–23 of the "Replacing the LCD panel assembly" procedure on page 64.

12 Turn the notebook over so the palm rest is facing up.

13 Reinstall the keyboard and the keyboard cover by performing steps 5–8 of the "Replacing the keyboard" procedure on page 62.

14 Reinstall the battery.

■

Replacing the antennas

Tools you need to complete this task:

Phillips #0 screwdriver

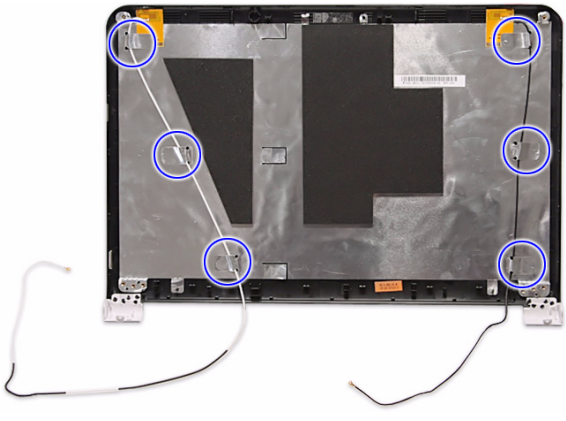
Flat screwdriver or Non-marring plastic scribe

Screws removed during this task:

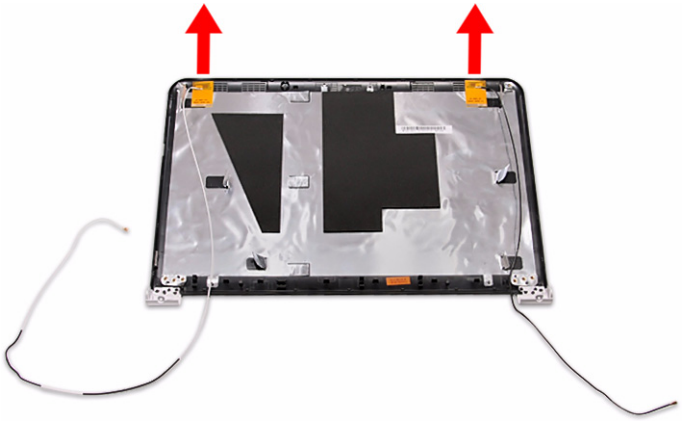
- 1 black M2×5 (hard drive)
- 1 black M2.5×6 (optical drive)
- 3 black M2.5×6 (keyboard cover)
- 2 black M2.5×6 (LCD panel hinges - bottom)
- 2 black M2.5×6+Nylok (LCD panel hinges - top)
- 4 black M2.5×6+Nylok (LCD front panel)
- 2 chrome M2×4 (LCD hinge covers)
- 4 black M2.5×6+Nylok (LCD front panel)
- 4 black M2.5×5 (LCD panel hinges)

▶ To replace the antennas:

1. Complete the steps in “Preparing the notebook” on page 47.
2. Remove the LCD panel assembly by performing steps 2–15 of the “Replacing the LCD panel assembly” procedure on page 64.
3. Remove the LCD front panel by performing steps 3–7 of the “Replacing the LCD front panel” procedure on page 95.
4. Remove the LCD by performing steps 4–7 of the “Replacing the LCD” procedure on page 100.
5. Release the antenna cables from the adhesive tabs securing them.



6 Carefully pry the antenna boards loose from the LCD assembly lid to remove the antennas.



7 Secure the new antenna on the LCD assembly lid and route their cables underneath the adhesive tabs.

8 Place the LCD back on the LCD assembly lid.

9 Return the hinge screws to their places.

10 Reinstall the LCD front panel by performing steps 8–11 of the "Replacing the LCD front panel" procedure on page 95.

11 Reinstall the LCD panel assembly by performing steps 16–23 of the "Replacing the LCD panel assembly" procedure on page 64.

12 Turn the notebook over so the palm rest is facing up.

13 Reinstall the keyboard and the keyboard cover by performing steps 5–8 of the "Replacing the keyboard" procedure on page 62.

14 Reinstall the battery.

■

Replacing the LCD assembly lid

Tools you need to complete this task:

Phillips #0 screwdriver

Flat screwdriver or Non-marring plastic scribe

Screws removed during this task:

- 1 black M2×5 (hard drive)
- 1 black M2.5×6 (optical drive)
- 3 black M2.5×6 (keyboard cover)
- 2 black M2.5×6 (LCD panel hinges - bottom)
- 2 black M2.5×6+Nylok (LCD panel hinges - top)
- 4 black M2.5×6+Nylok (LCD front panel)
- 2 chrome M2×4 (LCD hinge covers)
- 4 black M2.5×6+Nylok (LCD front panel)
- 4 black M2.5×5 (LCD panel hinges)

▶ To replace the antennas:

1. Complete the steps in “Preparing the notebook” on page 47.
2. Remove the LCD panel assembly by performing steps 2–15 of the “Replacing the LCD panel assembly” procedure on page 64.
3. Remove the LCD front panel by performing steps 3–7 of the “Replacing the LCD front panel” procedure on page 95.
4. Remove the LCD by performing steps 4–7 of the “Replacing the LCD” procedure on page 100.
5. If you are going to use the same Kensington lock cap, power button assembly, webcam, microphone and wireless antennas, remove these items from the old LCD assembly lid and attach them to the new one. Refer to the related replacement procedure on previous pages for instructions.
6. Place the LCD on the new LCD assembly lid.
7. Return the hinge screws to their places.

8 Reinstall the LCD front panel by performing steps 8–11 of the "Replacing the LCD front panel" procedure on page 95.

9 Reinstall the LCD panel assembly by performing steps 16–23 of the "Replacing the LCD panel assembly" procedure on page 64.

10 Turn the notebook over so the palm rest is facing up.

11 Reinstall the keyboard and the keyboard cover by performing steps 5–8 of the "Replacing the keyboard" procedure on page 62.

12 Reinstall the battery.

■

CHAPTER4
Troubleshooting

Diagnosing problems

Use the following procedure as a guide for diagnosing notebook problems.

Important
The diagnostic tests are intended to test only Acer products. Non-Acer products, prototype cards, or modified options can give false errors and invalid system responses.

1. Obtain the failing symptoms in as much detail as possible.
2. Verify the symptoms by attempting to re-create the failure by running the diagnostic test or by repeating the same operation.
3. Use the following table with the verified symptom to determine which page to go to.

Symptoms (Verified)	Go To
Power failure. (The power indicator does not go on or stay on.)	"Testing the power system" on page 118
POST does not complete. No beep or error codes are indicated.	"Power-On Self-Test (POST) error message" on page 120 "Undetermined problems" on page 133
POST detects an error and displayed messages on screen.	"Index of error messages" on page 121
Other symptoms (LCD display problems or others).	"Power-On Self-Test (POST) error message" on page 120
Symptoms cannot be re-created (intermittent problems).	Use the customer-reported symptoms and go to "Power-On Self-Test (POST) error message" on page 120 "Intermittent problems" on page 132 "Undetermined problems" on page 133

System test procedures

Testing the optical drive

Use the following procedure to isolate a problem in an optical drive controller, driver, or drive.

Important
Make sure that the CD-ROM does not have any label attached to it. The label can cause damage to the drive or can cause the drive to fail.

▶ To test the optical drive:

1. Boot from the diagnostics diskette and start the diagnostics program.
2. Run the CD-ROM Test and see if the test completes successfully.
3. Follow the instructions in the message window.

   If an error occurs, reconnect the connector on the system board.

   If the error still remains:
4. Reconnect the external optical drive to a USB jack.
5. Replace the external optical drive.
6. Replace the system board.

■

Testing the keyboard or auxiliary input device

If the internal keyboard does not work or an unexpected character appears, make sure that the flexible cable extending from the keyboard is correctly seated in the connector on the system board. If the keyboard cable is connected correctly, run the Keyboard Test.

Important
Disconnect any external keyboards before testing the built-in keyboard.

If the tests detect a keyboard problem, do the following one at a time.

▶ To correct the problem:

1. Reconnect the keyboard cable to the system board.
2. Replace the keyboard.
3. Replace the system board.

■

Important
Do not replace a non-defective FRU.

The following auxiliary input devices are supported by this notebook:

- Numeric keypad
- External keyboard

If any of these devices do not work, reconnect the cable connector and repeat the failing operation.

Testing the memory

Memory errors can stop your programs, show error messages on the screen, or hang the system.

▶ To test the memory:

1. Boot from the diagnostics diskette and start the diagnostics program.
2. Run the Memory Test and see if the test completes successfully.
3. Press F2 in the test items.
4. Follow the instructions in the message window.

> **Important**
> Make sure that each memory card is fully installed into the connector. A loose connection can cause an error.

■

Testing the power system

▶ To test for a power problem:

- Turn on the notebook using each of the following power sources:
  - Remove the battery pack, connect the power adapter, then make sure that the notebook turns on using AC power.
  - Disconnect the power adapter, install a charged battery pack, then make sure that power is supplied by the battery pack.

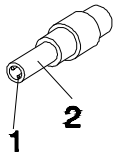
■

If you suspect a power problem, complete the appropriate power supply check:

- “Check the power adapter” on page 118
- “Check the battery pack” on page 119

Check the power adapter

Unplug the power adapter cable from the notebook and measure the output voltage at the power adapter cable plug. See the following figure.



Pin 1: +19 to +20.5V
Pin 2: 0V, Ground

- If the voltage is not correct, replace the power adapter.
- If the voltage is within the range, do the following:
  - Replace the system board.
  - If the problem is not corrected, see “Undetermined problems” on page 133.
  - If the power-on indicator does not light up, check the power adapter’s power cord for correct continuity and installation.
  - If the operational charge does not work, see “Check the battery pack” on page 119.

> **Important**
> An audible noise from the power adapter does not always indicate a defect.

Check the battery pack

▶ To check the battery pack using software:

1. Open Power Management in the Windows Control Panel.
2. In Power Meter, make sure that the parameters shown for Current Power Source and Total Battery Power Remaining are correct.
3. Repeat the steps 1 and 2, for both battery and adapter. This helps you identify first the problem is on recharging or discharging.

■

▶ To check the battery pack using hardware:

1. Turn off the notebook.
2. Remove the battery pack and measure the voltage between battery terminals 1 (+) and 6 (ground).
3. If the voltage is still less than 7.5 Vdc after recharging, replace the battery.

■

Important
To check the battery charge operation, use a discharged battery pack or a battery pack that has less than 50% of the total power remaining when installed in the notebook.

If the battery status indicator does not light up, remove the battery pack and let it return to room temperature. Re-install the battery pack.

If the charge indicator still does not light up, replace the battery pack. If the charge indicator still does not light up, replace the DC/DC charger board.

Testing the touchpad

If the touchpad doesn't work, do the following actions one at a time to correct the problem.

▶ To test the touchpad:

1. Reconnect the touchpad cables.
2. Replace the touchpad.
3. Replace the system board.

■

Important
Do not replace a non-defective FRU.

After you use the touchpad, the pointer may drift on the screen for a short time. This self-acting pointer movement can occur when a slight, steady pressure is applied to the touchpad pointer. This symptom is not a hardware problem. No service actions are necessary if the pointer movement stops in a short period of time.

Power-On Self-Test (POST) error message

The POST error message index lists the error message and their possible causes. The most likely cause is listed first.

Important
Perform the FRU replacement or actions in the sequence shown in the FRU/Action column. If the FRU replacement does not solve the problem, put the original part back in the notebook. Do not replace a non-defective FRU.

This index can also help you determine the next possible FRU to be replaced when servicing a notebook.

If the symptom is not listed, see “Undetermined problems” on page 133.

The following lists the error messages that the BIOS displays on the screen and the error symptoms classified by function.

Important
Most of the error messages occur during POST. Some of them display information about a hardware device, such as the amount of memory installed. Others may indicate a problem with a device, such as the way it has been configured.

Important
If the system fails after you make changes in the BIOS Setup Utility menus, reset the notebook, enter Setup, and install Setup defaults or correct the error.

Index of error messages

Error codes

Error Codes	Error Messages
006	Equipment Configuration Error Causes: 1. CPU BIOS Update Code Mismatch 2. IDE Primary Channel Master Drive Error (The causes are shown before “Equipment Configuration Error”)
010	Memory Error at xxxx:xxxx:xxxxh (R:xxxxh, W:xxxxh)
070	Real Time Clock Error
071	CMOS Battery Bad
072	CMOS Checksum Error
110	System is disabled. An incorrect password was entered.
<No error code>	Battery is critically low. In this situation BIOS issues four short beeps, then shuts the system down. No message is displayed.
<No error code>	Temperature is critically high. In this situation BIOS shuts the system down. No message is displayed.

Error messages

Error Messages	FRU/Action Sequence
Failure Fixed Disk	▫ Reconnect the hard disk drive connector. ▫ Run “Load Setup Defaults” using the BIOS Setup Utility, then reboot the notebook. ▫ Test or replace the hard disk drive. ▫ Test or replace the system board.
Stuck Key	See “Testing the keyboard or auxiliary input device” on page 117.
Keyboard error	See “Testing the keyboard or auxiliary input device” on page 117.
Keyboard Controller Failed	See “Testing the keyboard or auxiliary input device” on page 117.
Keyboard locked - Unlock key switch	Unlock the external keyboard.
Monitor type does not match CMOS - Run Setup	Run “Load Setup Defaults” using the BIOS Setup Utility, then reboot the notebook.
Shadow RAM Failed at offset: nnnn	▫ Test or replace the BIOS ROM. ▫ Test or replace the system board.
System RAM Failed at offset: nnnn	▫ Test or replace the SO-DIMM. ▫ Test or replace the system board.
Extended RAM Failed at offset: nnnn	▫ Test or replace the SO-DIMM. ▫ Test or replace the system board.
System battery is dead - Replace and run Setup	Test or replace the CMOS battery, run the BIOS Setup Utility to reconfigure system time, then reboot the system.
System CMOS checksum bad - Default configuration used	Test or replace the CMOS battery, run the BIOS Setup Utility to reconfigure system time, then reboot the system.

Error Messages	FRU/Action Sequence
System timer error	▪ Test or replace the CMOS battery, run the BIOS Setup Utility to reconfigure system time, then reboot the system. ▪ Test or replace the system board.
Real time clock error	▪ Test or replace the CMOS battery, run the BIOS Setup Utility to reconfigure system time, then reboot the system. ▪ Test or replace the system board.
Previous boot incomplete - Default configuration used	▪ Run “Load Setup Defaults” using the BIOS Setup Utility, then reboot the notebook. ▪ Test or replace the CMOS battery, run the BIOS Setup Utility to reconfigure system time, then reboot the system. ▪ Test or replace the system board.
Memory size found by POST differed from CMOS	▪ Run “Load Setup Defaults” using the BIOS Setup Utility, then reboot the notebook. ▪ Test or replace the SO-DIMM. ▪ Test or replace the system board.
Diskette drive A error	▪ Make sure that the drive is defined with the proper diskette type in the BIOS Setup Utility.
Incorrect Drive A type - run SETUP	Make sure that the drive is defined with the proper diskette type in the BIOS Setup Utility
System cache error - Cache disabled	Test or replace the system board.
CPU ID:	Test or replace the system board.
DMA Test Failed	▪ Test or replace the SO-DIMM. ▪ Test or replace the system board.
Software NMI Failed	▪ Test or replace the SO-DIMM. ▪ Test or replace the system board.
Fail-Safe Timer NMI Failed	▪ Test or replace the SO-DIMM. ▪ Test or replace the system board.
Device Address Conflict	▪ Run “Load Setup Defaults” using the BIOS Setup Utility, then reboot the notebook. ▪ Test or replace the CMOS battery, run the BIOS Setup Utility to reconfigure system time, then reboot the system. ▪ Test or replace the system board.
Allocation Error for device	▪ Run “Load Setup Defaults” using the BIOS Setup Utility, then reboot the notebook. ▪ Test or replace the CMOS battery, run the BIOS Setup Utility to reconfigure system time, then reboot the system. ▪ Test or replace the system board.
Failing Bits: nnnn	▪ Test or replace the SO-DIMM. ▪ Test or replace the BIOS ROM. ▪ Test or replace the system board.
Fixed Disk n	None
Invalid System Configuration Data	▪ Test or replace the BIOS ROM. ▪ Test or replace the system board.

Error Messages	FRU/Action Sequence
I/O device IRQ conflict	▫ Run “Load Setup Defaults” using the BIOS Setup Utility, then reboot the notebook. ▫ Test or replace the CMOS battery, run the BIOS Setup Utility to reconfigure system time, then reboot the system. ▫ Test or replace the system board.
Operating system not found	▫ Run the BIOS Setup Utility and see if fixed disk and drive A: are properly identified. ▫ Test or replace the diskette drive ▫ Test or replace the hard disk drive ▫ Test or replace the system board

No-beep error messages

No-beep Error Messages	FRU/Action in Sequence
No beep, power-on indicator turns off and LCD is blank.	▫ Test the power source (battery pack and power adapter). See “Testing the power system” on page 118. ▫ Make sure that every connector is connected tightly and correctly. ▫ Reconnect the SO-DIMM. ▫ Test or replace the LED board. ▫ Test or replace the system board.
No beep, power-on indicator turns on and LCD is blank.	▫ Test the power source (battery pack and power adapter). See “Testing the power system” on page 118. ▫ Reconnect the LCD connector ▫ Check the hard disk drive. ▫ Check the LCD inverter ID. ▫ Check the LCD cable. ▫ Test or replace the LCD inverter. ▫ Test or replace the LCD. ▫ Test or replace the system board.
No beep, power-on indicator turns on and LCD is blank. But you can see POST on an external CRT.	▫ Reconnect the LCD connectors. ▫ Check the LCD inverter ID. ▫ Check the LCD cable. ▫ Test or replace the LCD inverter. ▫ Test or replace the LCD. ▫ Test or replace the system board.
No beep, power-on indicator turns on and a blinking cursor shown on LCD during POST.	▫ Make sure that every connector is connected tightly and correctly. ▫ Test or replace the system board.
No beep during POST but system runs correctly.	▫ Test or replace the speaker. ▫ Test or replace the system board.

Phoenix BIOS beep codes

Code	Beeps	POST Routine Description
02h		Verify Real Mode
03h		Disable Non-Maskable Interrupt (NMI)
04h		Get CPU type
06h		Initialize system hardware
08h		Initialize chipset with initial POST values
09h		Set IN POST flag
0Ah		Initialize CPU registers
0Bh		Enable CPU cache
0Ch		Initialize caches to initial POST values
0Eh		Initialize I/O component
0Fh		Initialize the local bus IDE
10h		Initialize Power Management
11h		Load alternate registers with initial POST values
12h		Restore CPU control word during warm boot
13h		Initialize PCI Bus Mastering devices
14h		Initialize keyboard controller
16h	1-2-2-3	BIOS ROM checksum
17h		Initialize cache before memory autosize
18h		8254 timer initialization
1Ah		8237 DMA controller initialization
1Ch		Reset Programmable Interrupt Controller
20h	1-3-1-1	Test DRAM refresh
22h	1-3-1-3	Test 8742 Keyboard Controller
24h		Set ES segment register to 4 GB
26h		Enable A20 line
28h		Autosize DRAM
29h		Initialize POST Memory Manager
2Ah		Clear 215 KB base RAM
2Ch	1-3-4-1	RAM failure on address line xxxx
2Eh	1-3-4-3	RAM failure on data bits xxxx of low byte of memory bus
2Fh		Enable cache before system BIOS shadow

Code	Beeps	POST Routine Description
30h	1-4-1-1	RAM failure on data bits xxxx of high byte of memory bus
32h		Test CPU bus-clock frequency
33h		Initialize Phoenix Dispatch Manager
36h		Warm start shut down
38h		Shadow system BIOS ROM
3Ah		Autosize cache
3Ch		Advanced configuration of chipset registers
3Dh		Load alternate registers with CMOS values
42h		Initialize interrupt vectors
45h		POST device initialization
46h	2-1-2-3	Check ROM copyright notice
48h		Check video configuration against CMOS
49h		Initialize PCI bus and devices
4Ah		Initialize all video adapters in system
4Bh		QuietBoot start (optional)
4Ch		Shadow video BIOS ROM
4Eh		Display BIOS copyright notice
50h		Display CPU type and speed
51h		Initialize EISA board
52h		Test keyboard
54h		Set key click if enabled
58h	2-2-3-1	Test for unexpected interrupts
59h		Initialize POST display service
5Ah		Display prompt “Press F2 to enter SETUP”
5Bh		Disable CPU cache
5Ch		Test RAM between 512 and 640 KB
60h		Test extended memory
62h		Test extended memory address lines
64h		Jump to User Patch1
66h		Configure advanced cache registers
67h		Initialize Multi Processor APIC
68h		Enable external and CPU caches
69h		Setup System Management Mode (SMM) area

Code	Beeps	POST Routine Description
6Ah		Display external L2 cache size
6Bh		Load custom defaults (optional)
6Ch		Display shadow-area message
6Eh		Display possible high address for UMB recovery
70h		Display error messages
72h		Check for configuration errors
76h		Check for keyboard errors
7Ch		Set up hardware interrupt vectors
7Eh		Initialize coprocessor if present
80h		Disable onboard Super I/O ports and IRQs
81h		Late POST device initialization
82h		Detect and install external RS232 ports
83h		Configure non-MCD IDE controllers
84h		Detect and install external parallel ports
85h		Initialize PC-compatible PnP ISA devices
86h		Re-initialize onboard I/O ports
87h		Configure Motherboard Configurable Devices (optional)
88h		Initialize BIOS Area
89h		Enable Non-Maskable Interrupts (NMIs)
8Ah		Initialize Extended BIOS Data Area
8Bh		Test and initialize PS/2 mouse
8Ch		Initialize floppy controller
8Fh		Determine number of ATA drives (optional)
90h		Initialize hard-disk controllers
91h		Initialize local-bus hard-disk controllers
92h		Jump to UserPatch2
93h		Build MPTABLE for multi-processor boards
95h		Install CD ROM for boot
96h		Clear huge ES segment register
97h		Fixup Multi Processor table
98h	1-2	Search for option ROMs. One long, two short beeps on checksum failure.
99h		Check for SMART drive (optional)
9Ah		Shadow option ROMs

Code	Beeps	POST Routine Description
9Ch		Set up Power Management
9Dh		Initialize security engine (optional)
9Eh		Enable hardware interrupts
9Fh		Determine number of ATA and SCSI drives
A0h		Set time of day
A2h		Check key lock
A4h		Initialize Typematic rate
A8h		Erase F2 prompt
AAh		Scan for F2 key stroke
ACh		Enter SETUP
AEh		Clear Boot flag
B0h		Check for errors
B2h		POST done- prepare to boot operating system
B4h	1	One short beep before boot
B5h		Terminate QuietBoot (optional)
B6h		Check password (optional)
B9h		Prepare Boot
BAh		Initialize DMI parameters
BBh		Initialize PnP Option ROMs
BCh		Clear parity checkers
BDh		Display MultiBoot menu
BEh		Clear screen (optional)
BFh		Check virus and backup reminders
C0h		Try to boot with INT 19
C1h		Initialize POST Error Manager (PEM)
C2h		Initialize error logging
C3h		Initialize error display function
C4h		Initialize system error handler
C5h		PnPnd dual CMOS (optional)
C6h		Initialize notebook docking (optional)
C7h		Initialize notebook docking late
C8h		Force check (optional)
C9h		Extended checksum (optional)

Code	Beeps	POST Routine Description
D2h		Unknown interrupt
E0h		Initialize the chipset
E1h		Initialize the bridge
E2h		Initialize the CPU
E3h		Initialize the system timer
E4h		Initialize system I/O
E5h		Check force recovery boot
E6h		Checksum BIOS ROM
E7h		Go to BIOS
E8h		Set Huge Segment
E9h		Initialize Multi Processor
EAh		Initialize OEM special code
EBh		Initialize PIC and DMA
ECh		Initialize Memory type
EDh		Initialize Memory size
EEh		Shadow Boot Block
EFh		System memory test
F0h		Initialize interrupt vectors
F1h		Initialize Run Time Clock
F2h		Initialize video
F3h		Initialize System Management Mode
F4h	1	Output one beep before boot
F5h		Boot to Mini DOS
F6h		Clear Huge Segment
F7h		Boot to Full DOS

Symptom-to-FRU error messages

LCD

Symptom / Error	Action in Sequence
▫ The LCD backlight doesn't work. ▫ The LCD is too dark. ▫ The LCD brightness cannot be adjusted. ▫ The LCD contrast cannot be adjusted.	▫ Run “Load Setup Defaults” using the BIOS Setup Utility, then reboot the notebook. ▫ Reconnect the LCD connectors. ▫ Test or replace the keyboard (if contrast and brightness function key doesn't work). ▫ Check the LCD inverter ID. ▫ Test or replace the LCD cable. ▫ Test or replace the LCD inverter. ▫ Test or replace the LCD. ▫ Test or replace the system board.
▫ The LCD screen is unreadable. ▫ Missing pels in characters. ▫ The screen appears abnormal. ▫ The wrong color is displayed.	▫ Reconnect the LCD connector. ▫ Check the LCD inverter ID. ▫ Test or replace the LCD cable. ▫ Test or replace the LCD inverter. ▫ Test or replace the LCD. ▫ Test or replace the system board.
The LCD is displaying extra horizontal or vertical lines.	▫ Check the LCD inverter ID. ▫ Test or replace the LCD cable. ▫ Test or replace the LCD inverter. ▫ Test or replace the LCD. ▫ Test or replace the system board.

Power

Symptom / Error	Action in Sequence
The notebook shuts down during operation.	▫ Test the power source (battery pack and power adapter). See “Testing the power system” on page 118. ▫ Test or replace the battery pack. ▫ Test or replace the power adapter. ▫ Test or replace the system board.
The notebook doesn’t turn on.	▫ Test the power source (battery pack and power adapter). See “Testing the power system” on page 118. ▫ Test or replace the battery pack. ▫ Test or replace the power adapter. ▫ Test or replace the system board.
The notebook doesn’t turn off.	▫ Test the power source (battery pack and power adapter). See “Testing the power system” on page 118. ▫ Press and hold the power button for more than four seconds. ▫ Test or replace the system board.
The battery can’t be charged.	▫ Test the battery pack. See “Check the battery pack” on page 119. ▫ Test or replace the battery pack. ▫ Test or replace the system board.

Memory

Symptom / Error	Action in Sequence
Memory count (size) appears different from actual size.	▫ Run “Load Setup Defaults” using the BIOS Setup Utility, then reboot the notebook. ▫ Test or replace the SO-DIMM. ▫ Test or replace the system board.

Sound

Symptom / Error	Action in Sequence
No sound comes from the notebook when running Windows multimedia programs.	▫ Reinstall the audio driver. ▫ Test or replace the speakers. ▫ Test or replace the system board.
The internal speakers make noise or emit no sound.	▫ Test or replace the speakers. ▫ Test or replace the system board.

Power management

Symptom / Error	Action in Sequence
The notebook will not hibernate.	▫ Test or replace the keyboard (if control is from the keyboard). ▫ Test or replace the hard disk drive. ▫ Test or replace the system board.
The system doesn't hibernate and emits four short beeps every minute.	▫ Press Fn+O and see if the notebook enters hibernation mode. ▫ Test or replace the touchpad. ▫ Test or replace the keyboard. ▫ Check the hard disk connection to the system board. ▫ Test or replace the hard disk drive. ▫ Test or replace the system board.
The notebook doesn’t enter standby mode after closing the LCD.	▫ Make sure that the magnet is in the magnet holder. For more information, see “Replacing the LCD” on page 100. ▫ Test or replace the system board.
The system doesn't resume from hibernation mode.	▫ Check the hard disk connection to the system board. ▫ Test or replace the hard disk drive. ▫ Test or replace the system board.
The system doesn't resume from standby mode after opening the LCD.	▫ Make sure that the magnet is in the magnet holder. For more information, see “Replacing the LCD” on page 100. ▫ Test or replace the system board.
The battery fuel gauge in Windows doesn’t go higher than 90%.	▫ Remove the battery pack and let it cool for two hours. ▫ Refresh the battery (use only battery power until the notebook turns off, then charge the battery). ▫ Test or replace the battery pack. ▫ Test or replace the system board.
The system hangs intermittently.	▫ Reconnect the hard disk drive and optical drive. ▫ Check the hard disk connection to the system board. ▫ Test or replace the system board.

Devices

Symptom / Error	Action in Sequence
System configuration does not match the installed devices.	▫ Run “Load Setup Defaults” using the BIOS Setup Utility, then reboot the notebook. ▫ Reconnect the hard disk drive and optical drive.
The external display does not work correctly.	▫ Press Fn+F4 repeatedly to switch between LCD, external display, and both displays. ▫ Test or replace the system board.
USB does not work correctly.	▫ Test or replace the USB board. ▫ Test or replace the system board.
Printer problems.	▫ Run the printer self-test. ▫ Reinstall the printer driver. ▫ Test or replace the printer cable. ▫ Test or replace the printer. ▫ Test or replace the system board.

Keyboard and touchpad

Symptom / Error	Action in Sequence
The keyboard (one or more keys) does not work.	▫ Reconnect the keyboard cable. ▫ Test or replace the keyboard. ▫ Test or replace the system board.
The touchpad does not work.	▫ Reconnect the touchpad cable. ▫ Test or replace the touchpad board. ▫ Test or replace the system board.

Important
If you cannot find a symptom or an error in this list and the problem remains, see “Undetermined problems” on page 133.

Intermittent problems

Intermittent system hang problems can be caused by a variety of reasons that have nothing to do with a hardware defect. These reasons include: cosmic radiation, electrostatic discharge, or software errors. FRU replacement should be considered only when a recurring problem exists.

▶ To analyze an intermittent problem:

1. Run the advanced diagnostic test for the system board in loop mode at least ten times.
   - If any error is detected, replace the FRU.
   - If no error is detected, do not replace any FRU.
2. Rerun the test to verify that there are no more errors.

■

Undetermined problems

If the diagnostic test may not identify which adapter or device failed, which installed devices are incorrect, whether a short circuit is suspected, or whether the system is inoperative. Use these procedures to isolate the failing FRU (do not isolate a non-defective FRU).

Important
Verify that all attached devices are supported by the notebook.

Important
Verify that the power supply being used at the time of the failure is operating correctly. (See "Testing the power system" on page 118.)

▶ To isolate a failing FRU:

1. Turn off the notebook.
2. Visually check FRU parts for damage. If you identify any damage, replace the FRU.
3. Remove or disconnect all of the following devices:
   - Non-Acer devices
   - Printer, mouse, and other external devices
   - Battery pack
   - Hard disk drive(s)
   - SO-DIMM
   - Optical drive
4. Turn on the notebook.
5. Determine if the problem has changed.
   - If the problem does not recur, reconnect the removed devices one at a time until you find the failing FRU.
   - If the problem does recur, replace the following FRUs one at a time:
     - System board
     - LCD assembly

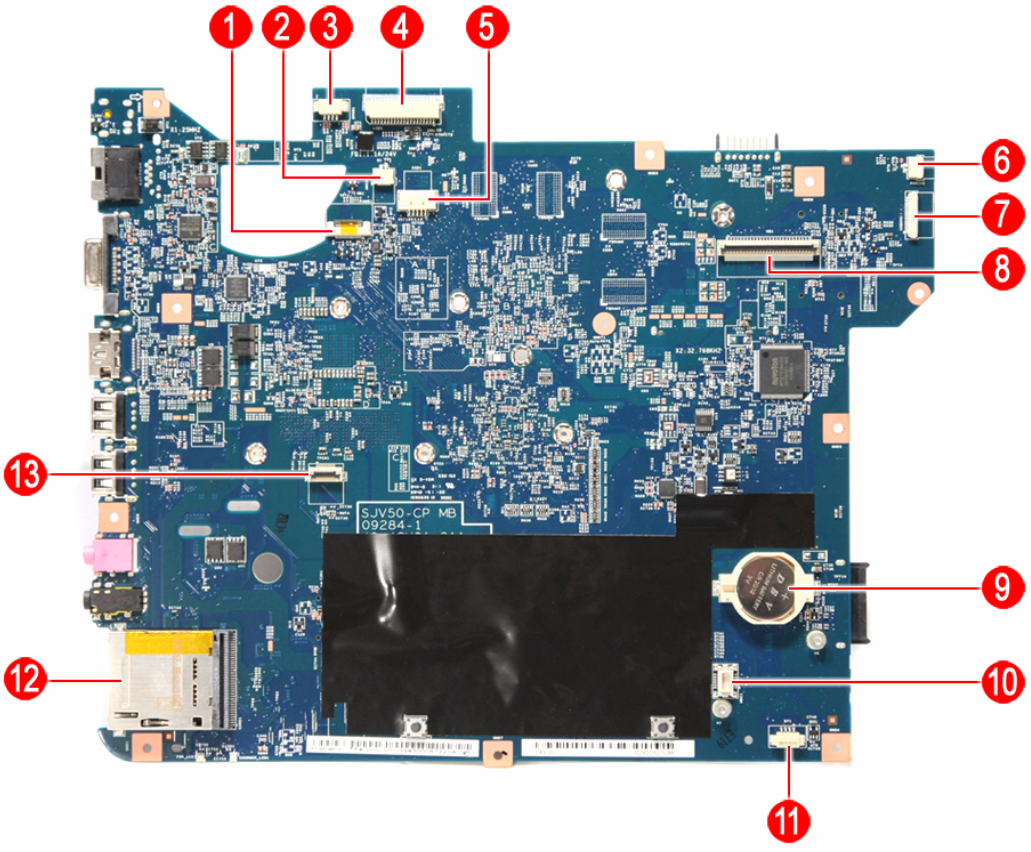
■

Important
Do not replace a non-defective FRU.

5
Connector locations

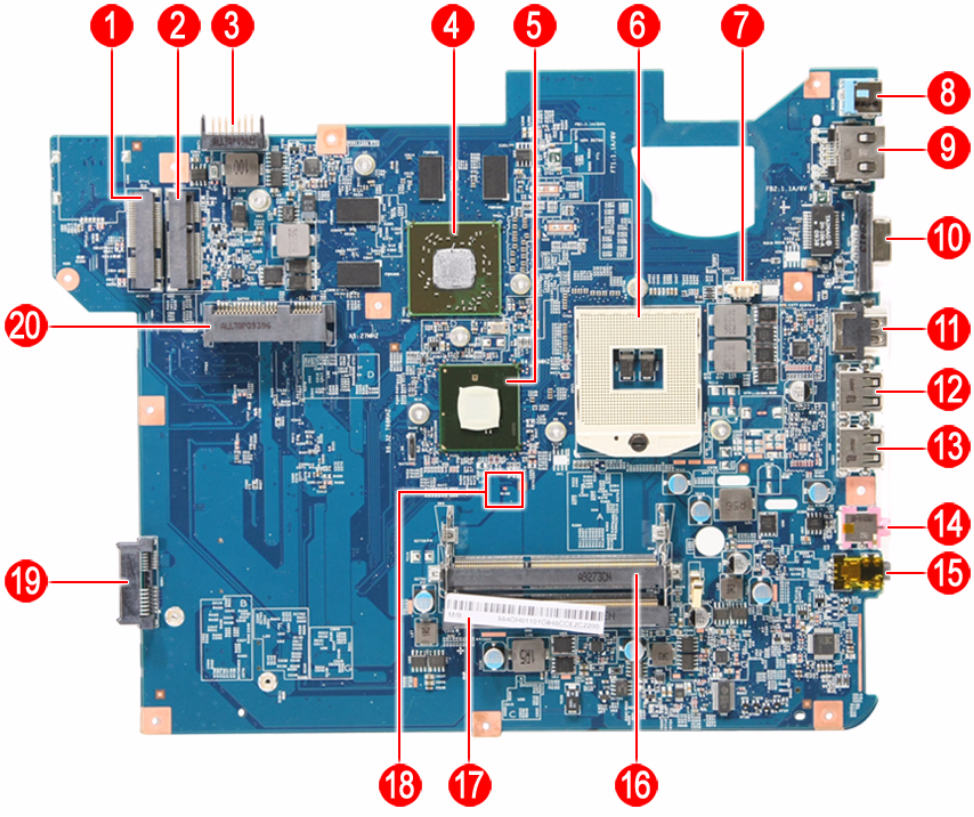
System board layout

Top view



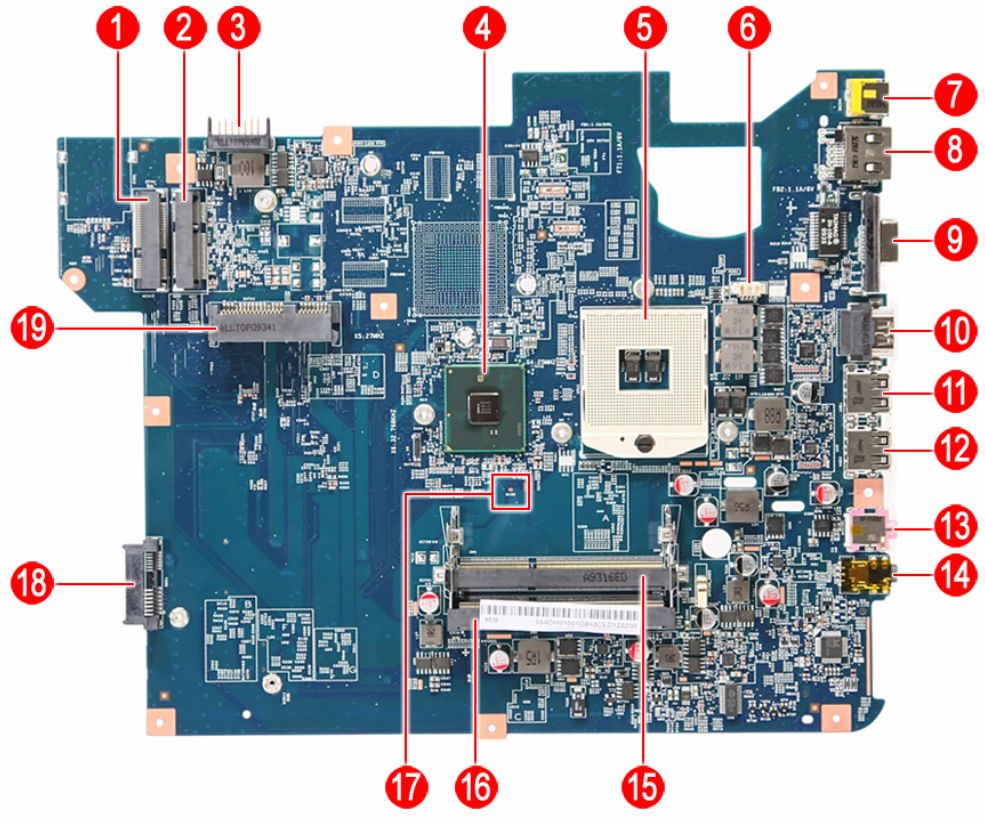
Item	Code	Component	Item	Code	Component
1	MMB1	Multimedia board cable connector	8	KB1	Keyboard cable connector
2	MIC1	Microphone cable connector	9	RTC1	RTC battery
3	SPKR1	Speaker cable connector	10	MDC1	Modem card cable connector
4	LCD1	LCD cable connector	11	BT1	Bluetooth module cable connector
5	CCD1	Webcam board cable connector	12	CARD1	Memory card reader
6	PWRCN1	Power button board cable connector	13	TPCN1	Touchpad / fingerprint reader board cable connector
7	USBCN1	USB board cable connector			

Bottom view – Discrete model



Item	Code	Component	Item	Code	Component
1	MINI2	3G module slot	11	HDMI1	HDMI out port
2	MINI1	WLAN module slot	12	USB1	USB port
3	BAT1	Battery connector	13	USB2	USB port
4	VGA1	AMD graphics controller	14	MICIN1	Microphone jack
5			15	LOUT1	Headphone jack
6	CPU1	Processor socket	16	DM1	Memory slot 1
7	FAN1	Cooling fan cable connector	17	DM2	Memory slot 2
8	DCIN1	DC power jack	18	G102	Clear password hardware gap
9	RJ45	Ethernet jack	19	ODD1	SATA optical drive connector
10	CRT1	Monitor port	20	SATA1	SATA hard drive connector

Bottom view – UMA model



Item	Code	Component	Item	Code	Component
1	MINI2	3G module slot	11	USB1	USB port
2	MINI1	WLAN module slot	12	USB2	USB port
3	BAT1	Battery connector	13	MICIN1	Microphone jack
4	PCH1	Intel PCH	14	LOUT1	Headphone jack
5	CPU1	Processor socket	15	DM1	Memory slot 1
6	FAN1	Cooling fan cable connector	16	DM2	Memory slot 2
7	DCIN1	DC power jack	17	G102	Clear password hardware gap
8	RJ45	Ethernet jack	18	ODD1	SATA optical drive connector
9	CRT1	Monitor port	19	SATA1	SATA hard drive connector
10	HDMI1	HDMI out port			

CHAPTER6
FRU (Field-Replaceable Unit) list

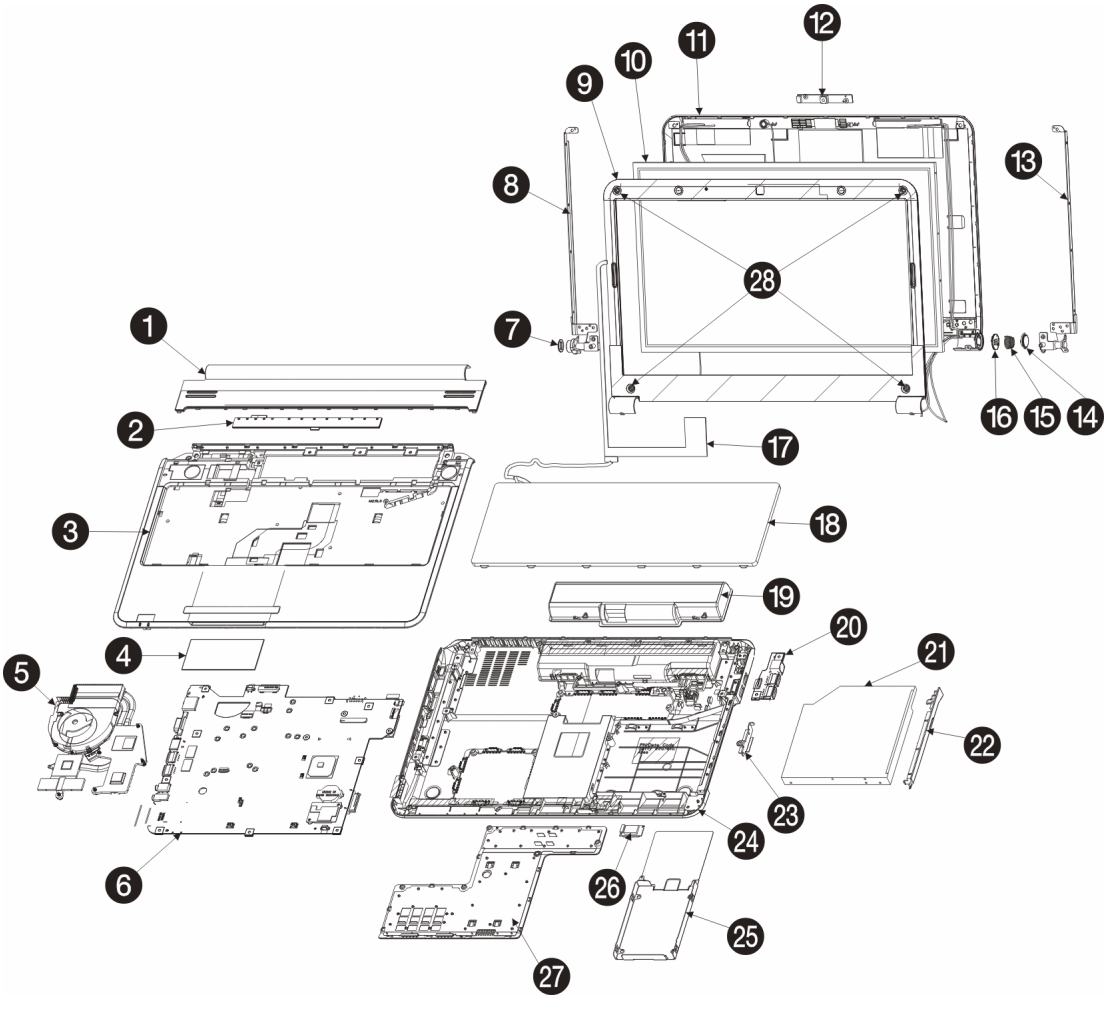
Introduction

This chapter gives you the FRU (field-replaceable-unit) listing in global configurations of this model. Refer to this chapter whenever ordering for parts to repair or for RMA (Return Merchandise Authorization).

Please note that WHEN ORDERING FRU PARTS, you should check the most up-to-date information available on your regional web or channel. For whatever reasons a part number change is made, it will not be noted on the printed Service Guide. For ACER AUTHORIZED SERVICE PROVIDERS, your Acer office may have a DIFFERENT part number code from those given in the FRU list of this printed Service Guide. You MUST use the local FRU list provided by your regional Acer office to order FRU parts for repair and service of customer machines.

Important
To scrap or to return the defective parts, you should follow the local government ordinance or regulations on how to dispose it properly, or follow the rules set by your regional Acer office on how to return it.

Exploded diagram



Item	Component
1	Keyboard cover
2	Multimedia board
3	Palm rest
4	Touchpad board
5	Cooling assembly
6	System board
7	Kensington lock cap
8	Left LCD panel hinge bracket
9	Front panel
10	LCD panel
11	LCD assembly lid
12	Webcam board (optional)
13	Right LCD panel hinge bracket
14	Power button board cap
15	Power button board spring
16	Power button board
17	LCD cable / LCD-webcam coaxial cable
18	Keyboard
19	Battery
20	USB board / USB-modem port board (optional)
21	Optical drive
22	Optical drive bezel
23	Optical drive bracket
24	Base enclosure
25	Hard drive
26	Bluetooth module
27	Bay cover

FRU list

Category	Description	Part No.
Adapter	Adapter DELTA 65W 19V 1.7x5.5x11 Yellow ADP-65JH DB A, LV5 LED LF	AP.06501.026
	Adapter LITE-ON 65W 19V 1.7x5.5x11 Yellow PA-1650-22AC LV5 LED LF	AP.06503.024
	Adapter HIPRO 65W 19V 1.7x5.5x11 Yellow (HP-A0653R3B 1LF), LV5 Timeline LF	AP.0650A.013
	Adapter DELTA 90W 19V 1.7x5.5x11 Blue ADP-90CD DB A, LV5 LED LF	AP.09001.027
	Adapter LITE-ON 90W 19V 1.7x5.5x11 Blue PA-1900-34AR, LV5 LED LF	AP.09003.021
	Adapter HIPRO 90W 19V 1.7x5.5x11 Blue HP-A0904A3 B1LF, LV5 LED LF	AP.0900A.005
Battery	Battery SANYO AS-2009A Li-Ion 3S2P SANYO 6 cell 4400mAh Main COMMON 2.2Ah(A)	BT.00603.076
	Battery SONY AS-2009A Li-Ion 3S2P SONY 6 cell 4400mAh Main COMMON 2.2Ah(G6F)	BT.00604.030
	Battery PANASONIC AS-2009A Li-Ion 3S2P PANASONIC 6 cell 4400mAh Main COMMON 2.2Ah(CG)	BT.00605.036
	Battery SAMSUNG AS-2009A Li-Ion 3S2P SAMSUNG 6 cell 4400mAh Main COMMON 2.2Ah(F)	BT.00606.002
	Battery SIMPLO AS-2009A Li-Ion 3S2P PANASONIC 6 cell 4400mAh Main COMMON Panasonic 2.2Ah (CG)	BT.00607.066
	Battery SIMPLO AS-2009A Li-Ion 3S2P LGC 6 cell 4400mAh Main COMMON LGC 2.2Ah(S3)	BT.00607.067
	Battery SIMPLO AS-2009A Li-Ion 3S2P SAMSUNG 6 cell 4400mAh Main COMMON SDI 2.2Ah(F)	BT.00607.068
	Battery SANYO AS-2009A Li-Ion 3S2P SANYO 6 cell 5600mAh Main COMMON 2.8Ah	BT.00603.077
	Battery SIMPLO AS-2009A Li-Ion 3S2P SAMSUNG 6 cell 5600mAh Main COMMON SDI 2.8Ah	BT.00607.069
	Battery PANASONIC AS-2009A Li-Ion 3S2P PANASONIC 6 cell 5800mAh Main COMMON 2.9Ah (NNP)	BT.00605.037
Hard disk drive	HDD SEAGATE 2.5" 5400rpm 160GB ST9160314AS Wyatt SATA LF F/W:0001SDM1	KH.16001.042
	HDD TOSHIBA 2.5" 5400rpm 160GB MK1655GSX Libra SATA LF F/W: FG011J	KH.16004.006
	HDD HGST 2.5" 5400rpm 160GB HTS545016B9A300 Panther B SATA LF F/W:C60F	KH.16007.024
	HDD WD 2.5" 5400rpm 160GB WD1600BEVT-22ZCTO ML160 SATA LF F/W:11.01A11	KH.16008.022
	HDD SEAGATE 2.5" 5400rpm 250GB ST9250315AS Wyatt SATA LF F/W:0001SDM1	KH.25001.016
	HDD TOSHIBA 2.5" 5400rpm 250GB MK2555GSX Libra SATA LF F/W:FG001J	KH.25004.003
	HDD HGST 2.5" 5400rpm 250GB HTS545025B9A300 Panther B SATA LF F/W:C60F	KH.25007.015

Hard disk drive *(continuation)*	HDD WD 2.5" 5400rpm 250GB WD2500BEVT-22ZCT0 ML160 SATA LF F/W:11.01A11	KH.25008.021
	HDD SEAGATE 2.5" 5400rpm 320GB ST9320325AS Wyatt SATA LF F/W:0001SDM1	KH.32001.017
	HDD TOSHIBA 2.5" 5400rpm 320GB MK3263GSX SATA 8MB 68P LF F/W:FG020J	KH.32004.003
	HDD HGST 2.5" 5400rpm 320GB HTS545032B9A300 Panther B SATA LF F/W: C60F	KH.32007.007
	HDD WD 2.5" 5400rpm 320GB WD3200BEVT-22ZCT0 ML160 SATA LF F/W:11.01A11	KH.32008.013
	HDD SEAGATE 2.5" 5400rpm 500GB ST9500325AS Wyatt SATA LF F/W:0001SDM1	KH.50001.011
	HDD TOSHIBA 2.5" 5400rpm 500GB MK5055GSX Libra SATA LF F/W:FG001J	KH.50004.001
	HDD HGST 2.5" 5400rpm 500GB HTS545050B9A300 Panther B SATA LF F/W:C60F	KH.50007.009
	HDD WD 2.5" 5400rpm 500GB WD5000BEVT-22ZAT0 ML250 SATA LF F/W:01.01A01	KH.50008.013
	HDD WD 2.5" 5400rpm 640GB WD6400BEVT-22A0RT0, ML320 SATA 8MB LF F/W:01.01A01	KH.64008.004
Optical disc drive	ODD HLDS BD COMBO 12.7mm Tray DL 4X CT21N LF W/O bezel 1.00 SATA (HF + Windows 7)	KO.0040D.004
	ODD PLDS BD COMBO 12.7mm Tray DL 4X DS-4E1S LF W/O bezel SATA (Windows 7)	KO.0040F.003
	ODD PIONEER BD COMBO 12.7mm Tray DL 4X BDC-TD01RS LF W/O bezel SATA (Windows 7)	KO.00405.003
	ODD SONY BD COMBO 12.7mm Tray DL 4X BC-5500H LF W/O bezel SATA (HF + Windows 7)	KO.0040E.003
	ODD HLDS Super-Multi DRIVE 12.7mm Tray DL 8X GT30N LF W/O bezel SATA (HF + Windows 7)	KU.0080D.048
	ODD PLDS Super-Multi DRIVE 12.7mm Tray DL 8X DS-8A4SH LF W/O bezel SATA (HF + Windows 7)	KU.0080F.006
	ODD SONY Super-Multi DRIVE 12.7mm Tray DL 8X AD-7585H LF W/O bezel SATA (HF + Windows 7)	KU.0080E.027
	ODD TOSHIBA Super-Multi DRIVE 12.7mm Tray DL 8X TS-L633C LF W/O bezel SATA (HF + Windows 7)	KU.00801.035
LCD	LED LCD AUO 15.6"W WXGA Glare B156XW02 V2 LF 200nit 8ms 500:1 (power saving)	LK.15605.010
	LED LCD CMO 15.6"W WXGA Glare N156B6-L06 LF 220nit 8ms 500:1	LK.1560D.007
	LED LCD CMO 15.6"W WXGA Glare N156B6-L0B LF 220nit 8ms 650:1	LK.1560D.010
	LED LCD INNOLUX 15.6"W WXGA Glare BT156GW01 V2 LF 220nit 8ms 600:1	LK.1560N.001
	LED LCD LPL 15.6"W WXGA Glare LP156WH2-TLE1 LF 220nit 8ms 400:1	LK.15608.002
	LED LCD SAMSUNG 15.6"W WXGA Glare LTN156AT02-A02 LF 220nit 8ms 500:1	LK.15606.005
	LED LCD SAMSUNG 15.6"W WXGA Glare LTN156AT02-A04 LF 220nit 8ms 500:1	LK.15606.009

Processor	CPU Intel Core i3 330M PGA 2.13G 35W Arrandale, TJ90, VT, 3M L3	KC.33001.DMP
	CPU Intel Core i3 350M PGA 2.26G 35W Arrandale, TJ90, VT, 3M L3	KC.35001.DMP
	CPU Intel Core i5 430M PGA 2.26G ARD, up to SC 2.53G, 3M L3	KC.43001.DMP
	CPU Intel Core i5 520M 2.4G 3M	KC.52001.DMP
	CPU Intel Core i5 540M 2.53G 3M	KC.54001.DMP
	CPU Intel Core i7 620M PGA 2.66G 4M	KC.62001.DMP
Memory	Memory ELPIDA SO-DIMM DDRIII 1066 1GB EBJ10UE8BDS0-AE-F LF 128*8 0.065um	KN.1GB09.012
	Memory HYNIX SO-DIMM DDRIII 1066 1GB HMT112S6BFR6C-G7 N0 LF 64*16 0.055um	KN.1GB0G.025
	Memory MICRON SO-DIMM DDRIII 1066 1GB MT8JSF12864HZ-1G1F1 LF 128*8 0.065um	KN.1GB04.015
	Memory SAMSUNG SO-DIMM DDRIII 1066 1GB M471B2873EH1-CF8 LF 64*16 0.055um	KN.1GB0B.028
	Memory ELPIDA SO-DIMM DDRIII 1066 2GB EBJ21UE8BDS0-AE-F LF 128*8 0.065um	KN.2GB09.006
	Memory HYNIX SO-DIMM DDRIII 1066 2GB HMT125S6BFR8C-G7 N0 LF 128*8 0.055um	KN.2GB0G.014
	Memory MICRON SO-DIMM DDRIII 1066 2GB MT16JSF25664HZ-1G1F1 LF 128*8 0.065um	KN.2GB04.015
	Memory SAMSUNG SO-DIMM DDRIII 1066 2GB M471B5673EH1-CF8 LF 128*8 0.055um	KN.2GB0B.012
	Memory NONE SO-DIMM DDRIII 1066 4GB dummy P/N LF	KN.4GB00.001
	Memory ELPIDA SO-DIMM DDRIII 1333 4GB EBJ41UF8BAS0-DJ-F LF 256*8 0.055um	KN.4GB09.001
VGA chip	AMD MADISON_PRO 40nm 29mm*29mm M2 package	KI.23200.169
	AMD PARK_XT 40nm 29mm*29mm M2 package	KI.23200.162
	UMA (Intel)	KI.23200.038
	NVIDIA N11MGE1 40nm 29mm*29mm GB1-128 package	KI.23200.160
VRAM	VRAM SAMSUNG Graphic DDRIII 800 1Gb K4W1G1646E-HC12 LF	VR.1GB0B.006
	VRAM HYNIX Graphic DDRIII 800 1Gb H5TQ1G63BFR-12C LF	VR.1GB0G.004
	1G-DDR3 64*16*8	KI.23300.018
	512M-DDR3 64*16*4	KI.23300.019
	VRAM ATI Graphic DDRIII 800 1Gb 23EY2387MA12-SZ LF+HF	VR.1GB0T.002
Core logic	NB Chipset Intel CS BD82HM55	KI.G5501.002
LAN chipset	Broadcom BCM57780	NI.22400.047
Audio codec	Realtek Audio Codec ALC272X	LZ.21000.045
WLAN module	Foxconn Wireless LAN Atheros HB93 2x2 BGN (HM)	NI.23600.062
	Liteon Wireless LAN Atheris HB93 2x2 BGN (HM) WN6602AH	NI.23600.063

WLAN module *(continuation)*	Liteon Wireless LAN Realtek 8192SE BGN WN6603LH(2x2 BGN)	NI.23600.065
	Foxconn Wirelss LAN Atheros HB95 1x1 BG (HM)	NI.23600.047
	Liteon Wireless LAN Atheros HB95 BG (HM) WN6601AH	NI.23600.052
	Lan Intel WLAN 112BN.HMWG MM#903341	KI.CPH01.001
	Lan Intel WLAN 622AN.HMWG	KI.PPH01.002
Bluetooth module	Foxconn Bluetooth BRM 2046 BT2.1 (T60H928.33) f/w:861	BH.21100.004
Modem	Lite-On Conexant -Unizion 1.5_3.3v AUS RD02-D330	FX.22500.021
Keyboard	Keyboard GATEWAY GP-7T Black SJM80 Internal 17 Standard Black NONE Texture	KB.I170G.002
	Keyboard GATEWAY GP-7T white SJV 50/70 Internal 17 Standard White NONE texture	KB.I170G.003
Camera	Chicony 0.3M DV Calla_2G	AM.21400.046
	Chicony 0.3M DV Calla_2GA (CNF8046)	AM.21400.060
	Suyin 0.3M DV Camellia_2G	AM.21400.045
Card reader	5 in 1-Build in MS, MS Pro, SD, SC, XD	CR.21500.013
WiFi antenna	PIFA	LZ.23500.006
A cover	Black IMR	LZ.21000.044
A cover	Blue IMR	LZ.21000.041
A cover	Brown IMR	LZ.21000.042
A cover	Red IMR	LZ.21000.056
B cover	Normal w/Camera	LZ.21000.011
Software	Antivirus application NIS	SR.23900.002

APPENDIX A
Test compatible components

Introduction

This notebook's compatibility is tested and verified by Acer's internal testing department. Refer to the following lists for components, adapter cards, and peripherals which have passed these tests.

Microsoft® Windows 7® Compatibility Test

Item	Device name
I/O Peripheral Compatibility Test	
TV	Westinghouse W37G (HDMI) Panasonic TC-37MPK (VGA/HDMI)
LCD monitor	Acer AL1916W 19" LCD Monitor Acer P244W 24" LCD Monitor Dell SP2208WFP 22" LCD Monitor Dell UltraSharp 3008WFP 30" LCD Monitor Dell 2407FPW 24" LCD Monitor Dell 1905FP 19" LCD Monitor Dell UltraSharp E2408WFP HP LP2065 20" LCD Monitor
Projector	Dell 3300MP Projector
USB keyboard/mouse	Logitech First Wheel Mouse Dell IR Keyboard & Mouse set
Headset	Hawk Stereo Headset 933 Dolby headphone (5.1 channel)
Speaker	Dell USB Speaker
Camera	Canon Digital IXUS 860
USB hard drive	Transcend 2.5" Portable 80 GB Hard Disk
USB optical drive	Plextor DVD+R/RW
USB flash drive	SanDisk USB 2GB Cruzer Micro Skin USB 2.0 Flash Drive A-Data PD16 Vista 16 GB Transcend JetFlash USB 2.0 Flash Drive V10 16 GB Memory Key
USB card reader	PQI 6-in-1 Flash Card Reader/Writer
USB 3G card	Huawei Mobile Connect E220 USB Modem 3G (E220: HSDPA/UMTS/EDGE/GPRS/GSM)
USB hub	Huawei Mobile Connect E220 USB Modem 3G PowerSync USB2.0 4-Port Mini Hub (HU151W) Techworks 4-Port USB2.0 Mini Hub (OW4PTUSBHB)
Access point	Buffalo Air Station Wireless NFINITI (WZR-G144N) Buffalo Air Station NFINITI (WZR2-G300N]
Wireless printer	HP Photosmart C309(CC35A) HP Photosmart C4580

Item	Device name
Wireless USB hub/adapter	IOGEAR Wireless USB Hub & Adapter Kit (GUWH104KIT)
Bluetooth access point	X-Bridge Bluetooth Access Point (BT300)
Bluetooth device	AmbiCom Bluetooth Wireless CompactFlash Card with PC Card Adapter Sony Ericsson Stereo Bluetooth Headset HBH-DS970
Memory Card Test	
MMC	RS-MMC 128 MB Memory Card Transcend MMC Plus 4 GB Card
SD card	RiDATA 4 GB SD Pro Memory Card Transcend SDHC Class 6 Memory Card 4 GB SanDisk microSDHC 4 GB Card with Adapter Kingston SDHC SD4 32 GB Card
MS	Sony Memory stick Pro 512 MB Lexar High Speed 1 GB Memory Stick Pro Duo Sony MS Pro Dou 2 GB High Speed SanDisk Memory Stick Micro (M2) 8 GB Card
xD card	Olympus xD-Picture Card M+ 2 GB Speed Card Fuji Film xD-Picture Card Type M 2 GB
Software Compatibility Test	
Utilities and applications	PowerDVD Oberon Game Zone Metaboli Google Toolbar Packard Bell Edition Google Setup Norton Internet Security 2009 Packard Bell Edition Nero 9 Essentials Packard Bell Edition
Games	World of WarCraft - Wrath of the Lich King Lineage II Dragon Ball Online S.T.A.L.K.E.R.: Call of Pripyat BattleForge HALF-LIFE 2 - EPISODE ONE Warcraft III: The Frozen Throne Facebook-Bowling Buddies Ragnarok Canaan

APPENDIXB
Online support information

This section describes online technical support services available to help you repair your Packard Bell notebook.

If you are a distributor, dealer, ASP, or TPM, please refer your technical queries to your local Acer branch office. Acer branch offices and Regional Business Units may access our website. However some information sources will require a user id and password. These can be obtained directly from Acer CSD Taiwan.

Acer's website offers you convenient and valuable support resources whenever you need them. In the Technical Information section you can download information on all of Acer's Notebook, Desktop and Server models including:

- Service guides for all models
- User's manuals
- Training materials
- BIOS updates
- Software utilities
- Spare parts lists
- TABs (Technical Announcement Bulletin)

For these purposes, we have included an Acrobat File to facilitate the problem-free downloading of our technical material. Also contained on this website are:

- Detailed information on Acer's International Traveller’s Warranty (ITW)
- Returned material authorization procedures
- An overview of all the support services we offer, accompanied by a list of telephone, fax and email contacts for all your technical queries.

We are always looking for ways to optimize and improve our services, so if you have any suggestions or comments, please do not hesitate to communicate these to us.

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