Acer TravelMate 4520 Notebook Computer Service Guide

Service guide files and updates are available on the Acer CSD web site at http://csd.acer.com.tw

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Revision History

Refer to the table below for the updates made on this version of the TravelMate 4520 Notebook Computer Service Guide.

Date	Chapter	Updates

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Conventions

The following textual conventions are used in this service guide.

SCREEN MESSAGES	Denotes actual messages that appear on screen.
NOTE	Gives additional information related to the current topic.
WARNING	Alerts you to any physical risk or system damage that might result from doing or not doing specific actions.
CAUTION	Gives precautionary measures to avoid possible hardware or software problems.
IMPORTANT	Reminds you to do specific actions relevant to the accomplishment of procedures.

Service Guide Coverage

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 (e.g. add-on card, modem, or extra memory capability). These LOCALIZED FEATURES will NOT be covered in this generic Service Guide. In such cases, please contact your regional offices or the responsible personnel/channel to provide you with further technical details.

FRU Information

Please note WHEN ORDERING FRU PARTS, that you should 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 will not be noted in the printed Service Guide. For 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.

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System Tour

Features

Your TravelMate 4520 is part of the Acer ProFile line of notebook computers. It provides superior computing performance and flexible usability in a classic matte black magnesium alloy casing.

NOTE: The features listed in this section is for your reference only. The exact configuration of your TravelMate computer depends on the model purchased.

Computing platform

AMD Better by Design solution with the following features:

- Processor options
  - AMD Turion™ 64 X2 Dual-Core Mobile Technology (TL-50, TL-52, TL-56, TL-60, or TL-66 models)
  - Mobile AMD Sempron™ Processor (3400+, 3500+, or 3600+ models)
- Processor technologies
  - Dual-Core Technology
  - AMD64 Technology
  - Enhanced Virus Protection (EVP) [1]
  - HyperTransport™ Technology (1600 MHz)
  - AMD PowerNow!™ Technology
- Core logic: ATI M690G chipset
- Mobile technology: Acer InviLink™ 802.11b/g Wi-Fi CERTIFIED solution supporting the Acer SignalUp™ wireless technology

Memory

- Two DIMM slots supporting DDR2 533/667 MHz memory modules
- Maximum 4 GB system memory using two 2 GB soDIMM modules
- Supports dual-channel (interleaving) memory mode
- 1 MB flash BIOS and shadow RAM support

Storage subsystem

- Hard disk drive (HDD)
  - SATA hard disk drives in 80–,120–, and 160 GB capacities (higher HDD capacity supported)
  - Acer DASP (Disk Anti-Shock Protection)
- Optical disc drive (ODD) options
  - DVD-Super Multi double-layer drive
  - DVD/CD-RW combo drive
- 5-in-1 card reader slot supports Secure Digital (SD), MultiMediaCard (MMC), Memory Stick® (MS), Memory Stick Pro™ (MS Pro), and xD-Picture Card™ (xD) formats

[1] EVP is only supported by certain operating systems including the current versions of Microsoft Windows, Linux, Solaris and BSD Unix. Consult your OS documentation for information on enabling EVP.

Display and graphics

- 14.1" WXGA TFT LCD (1280 x 800 pixel resolution, 16.7 million colors)
- Graphics controller: ATI Radeon™ X1250
  - 896 MB of HyperMemory™
  - 256 MB of dedicated DDR2 VRAM
  - 640 MB of shared system memory
  - Microsoft® DirectX® 9 compliance
- Acer GridVista™ for simultaneous multi-window viewing
- Supports the following video capabilities:
  - Dual independent display
  - MPEG-2/DVD hardware-assisted function
  - WMV9 (VC-1) and H.264 (AVC)
  - S-video/TV-out (NTSC/PAL)

Audio

- Two built-in Acer 3DSonic stereo speakers
- One built-in stereo microphone
- Intel High Definition Audio support
- MS-Sound compatible

Communications

- Multiple network connection options
  - WLAN via Acer InviLink 802.11b/g Wi-Fi CERTIFIED solution; Acer SignalUp compatible
  - WPAN via Bluetooth® 2.0+EDR (Enhanced Data Rate) interface
  - LAN via a Gigabit Ethernet port (Wake-on-LAN ready)
  - 56K ITU V.92 MDC 1.5 modem (PTT approved, Wake-on-Ring ready)
- Acer Video Conference solution for advanced Voice and Video over Internet Protocol (VVoIP)
  - Built-in Acer Crystal Eye webcam supporting the Acer PrimaLite™ technology
  - Optional Acer Bluetooth® VoIP phone
- WLAN controller options
  - Intel PRO/Wireless 3945ABG Network Connection (tri-mode 802.11a/b/g)
  - Intel Wireless Wi-Fi Link 4965AGN
  - Intel PRO/Wireless 2200BG Network Connection (dual mode 802.11b/g)
- Broadcom NetLink™ BCM5787 Gigabit Ethernet Controller with PCI Express

Keyboard and special keys

- Acer FineTouch™ keyboard with
  - 88-/89-key models with 5° curve for better typing comfort
  - Embedded numeric keypad
  - Inverted "T" cursor keys, 12 function keys, Windows® key, independent US and Euro dollar sign keys, and hotkey controls
  - Seamless touchpad pointing device with 4-way scroll button
  - 2.5 mm (minimum) key travel
  - International language support
- Productivity keys: Lock, Presentation, and Sync keys
- Easy-launch keys: Acer Empowering, Internet, email, and a blank **P** (programmable) keys
- Front-access communication switches: Bluetooth and WLAN

I/O interface

- Front panel
  - IEEE 1394
  - Infrared (IR)
  - USB 2.0 (1x)
  - UAA (Universal Audio Architecture)[2] ready audio jacks: line-in, microphone-in, and headphone
- Rear panel: Modem (RJ-11)
- Left panel
  - Kensington lock
  - USB 2.0 (1x)
  - 5-in-1 card reader slot
- Right panel
  - PC Card slot (Type II)
  - USB 2.0 (2x)
  - S-video/TV-out
  - Ethernet (RJ-45)
  - VGA (external monitor)
  - DC-in jack
- Acer Bio-Protection fingerprint solution with FingerLaunch, FingerNav and PBA (Pre-Boot Authentication) support provides enhanced security

Status indicators

- Left edge: HDD activity, Num Lock, and Caps Lock
- Front edge: power status, battery charge; Bluetooth, and WLAN functions
- Ethernet and modem ports: link and activity indicators

Power subsystem

- 44W 4000 mAh Li-ion battery pack (6-cell)
- 3-pin 65W AC adapter
- Acer QuicCharge™ battery technology
- ACPI (Advanced Configuration and Power Interface) 3.0 power management standard (supports standby and hibernation modes)

System security and compliance features

- Physical security
  - Acer DASP absorbs shocks and insulates the hard drive.
  - Kensington lock notch deters theft by letting you secure the notebook to a permanent object.
  - Magnesium-alloy casing for a light-weight and reliable safeguard against physical damage.
- Data security
  - Acer Bio-Protection solution provides network and data security by verifying an individual's true identity.
  - Acer Empowering Technology (particularly the eDataSecurity and eLock features)
- Industry standard compliance
  - Wi-Fi
  - ACPI 3.0
  - Mobile PC 2002
  - DMI 2.0 (Desktop Management Interface)

[2] UAA refers to a class driver architecture for PC audio solutions supported in Microsoft Windows Vista .

Software

- Operating system options
  - Windows Vista™ Business
  - Windows Vista Home Premium
  - Windows Vista Home Basic
- System tools and utilities
  - Acer Empowering Technology (eNet, ePower, eAudio , ePresentation, eDataSecurity, eLock, eRecovery, and eSettings Management)
  - Acer Crystal Eye
  - Acer Video Conference Manager
  - Acer GridVista
  - Acer Launch Manager
  - Microsoft Office Ready 2007
  - NTI Shadow
  - Adobe®Reader®
  - CyberLink® PowerProducer®
  - NTI CD-Maker™
  - Norton Internet Security™

Physical specifications

- Dimensions (width x depth x height): 331 x 248 x 29.7/41.08 mm (13.03 x 9.76 x 1.17/1.62 in)
- Weight (with 6-cell battery pack): 2.4 kg (5.29 lbs)
- Two-spindle design for portability
- Streamlined ProFile chassis for professional style and optimized portability

Environmental specifications

- Temperature:
  - Operating: 5° C to 35° C
  - Non-operating: -20° C to 65° C
- Humidity (non-condensing):
  - Operating: 20% to 80%
  - Non-operating: 20% to 80%

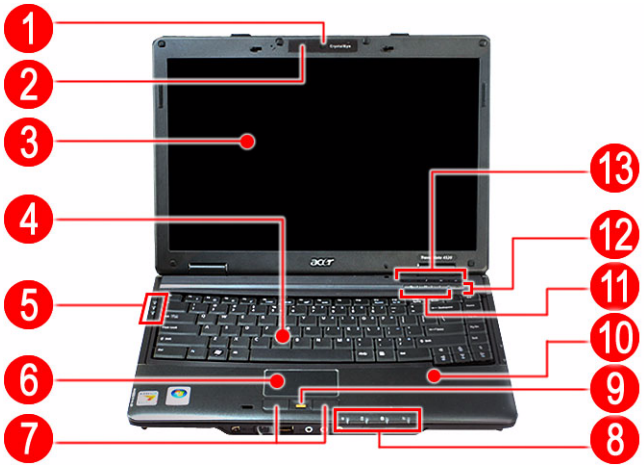
Accessories

- Acer Bluetooth VoIP phone with the Acer Video Conference Manager
- 512 MB, 1 or 2GB DDR2 667 MHz soDIMM modules
- 9-cell 4800 mAh Li-ion battery pack
- 3-pin 65 W AC adapter
- External USB floppy disk drive

TravelMate Tour

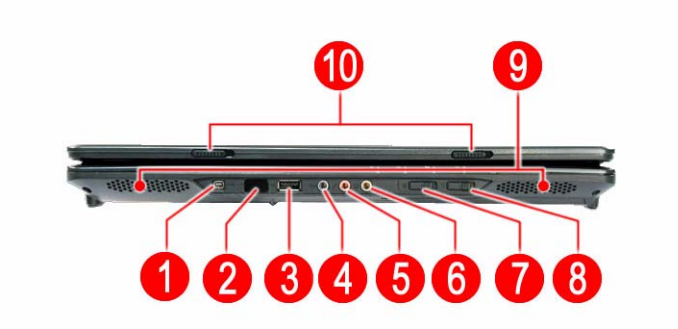
This section is a virtual tour of your TravelMate notebook's interior and exterior components.

Open Front View



Number	Icon	Item	Description
1		Acer OrbiCam camera	Conduct video communication. (for selected models)
2		Internal microphone	Create sound recording and conduct voice communication.
3		LCD panel	Displays computer output.
4		Keyboard	For entering data into your computer.
5		Status indicators	Light-Emitting Diodes (LEDs) for monitoring the hard drive activity, as well as the Num Lock and Caps Lock functions. Go to page 10 for more information.
6		Touchpad	Touch-sensitive pointing device which functions like a computer mouse.
7		Click buttons	The left and right buttons function like the left and right mouse buttons.
8		Status indicators	LEDs for monitoring the power status and battery charge level, as well as the Bluetooth and WLAN functions. Go to page 10 for more information.
9			Function may vary base on actual notebook model. It can either be a 4-way scroll button or an Acer Bio-Protection fingerprint reader.
10		Palmrest	Comfortable support area for your hands when you use the keyboard.
11		Easy-launch buttons	Press to launch frequently used programs/functions. Go to page 11 for more information.
12		Power button	Turns the computer on and off.
13		Productivity keys	Press to access TravelMate's protection and manageability features. Go to page 12 for more information.

Close Front View



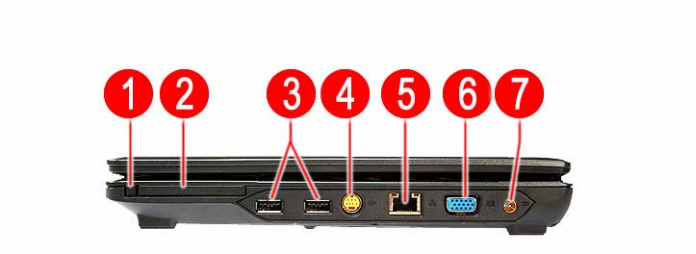
Number	Icon	Item	Description
1	1394	IEEE 1394 ports	Connects to a IEEE 1394 devices.
2		IR port	Interfaces with IR-aware (e.g. infrared printer, IR-aware computers and mobile phone). Your computer can transfer data at speeds of up to 4 Mbps at a distance of up to one meter.
3		Front USB 2.0 port	Connects to USB 2.0 devices (e.g. USB mouse, USB camera).
4		Line-in jack	Accepts audio line-in devices (e.g., audio CD player, stereo walkman).
5		Microphone-in jack	Accepts an external microphone.
6		Headphone jack	Accepts headphones or external speakers.
7		Bluetooth switch	Toggles the Bluetooth function on and off.
8		WLAN switch	Toggles the WLAN function on and off.
9		Speakers	Delivers High Definition (HD) audio output.
10		Lid latch	Locks and releases the notebook lid.

Left View

Number	Icon	Item	Description
1		Kensington lock notch	Accepts a Kensington-compatible computer security lock.
2		Optical disc drive (ODD)	Accepts CDs or DVDs (drive type maybe slot-load or tray-load depending on model).
3		ODD access indicator *	Lights up when a the optical drive is active .
4		ODD eject button *	Ejects the optical disc from the drive.
5		Emergency eject hole *	Ejects the ODD tray when the computer is turned off.
6		USB 2.0 port	Connects to USB 2.0 devices.
7		5-in-1 card reader slot	Accepts MS, MS PRO, MMC, SD, and xD formats memory cards.

* Item location varies depending on the drive model.

Right View

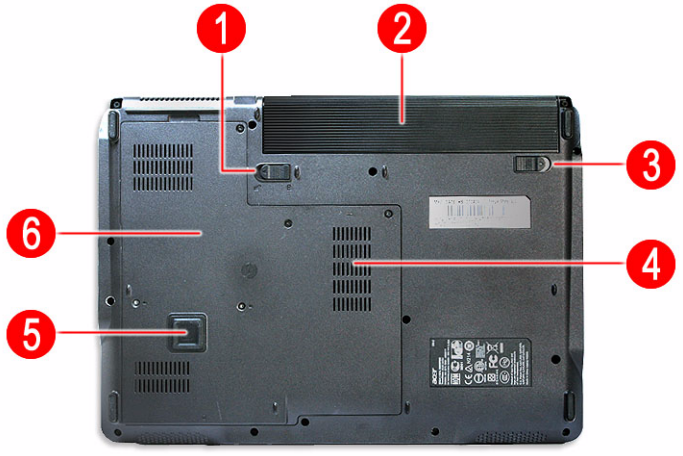


Number	Icon	Item	Description
1		PC Card slot eject button	Ejects the PC Card from the slot.
2		PC Card slot	Accepts one Type II PC Card.
3		USB 2.0 ports	Connects to USB 2.0 devices.
4		S-Video/TV-out port	Connects to a television or display device with an S-video input. Supports both NTSC and PAL standards.
5		Ethernet port (RJ-45)	Connects to an Ethernet 10/100/1000-based network (selected models).
6		VGA port	Connects to an external display device (e.g., external monitor, LCD projector).
7		DC-in jack	Connects to an AC adapter.

Rear View

Number	Icon	Item	Description
1		Ventilation slots	Enable the computer to stay cool, even after prolonged use.
2		Modem port (RJ-11)	Connects to a phone line.

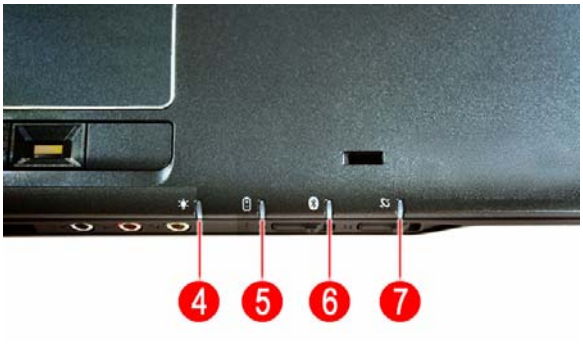
Base View



Number	Icon	Item	Description
1		Battery lock	Secures the battery pack in position.
2		Battery pack	Provides power to the computer.
3		Battery release latch	Releases the battery pack for removal.
4		Ventilation slots	Enable the computer to stay cool, even after prolonged use. **Note:** Do not cover or obstruct the opening of the fan.
5		Acer DASP pad	Provides anti-shock/bump protection to the hard drive.
6		Lower case cover	Protects the external modules located on the system lower case.

Status Indicators

The computer has several status indicators for monitoring various system components and functions.

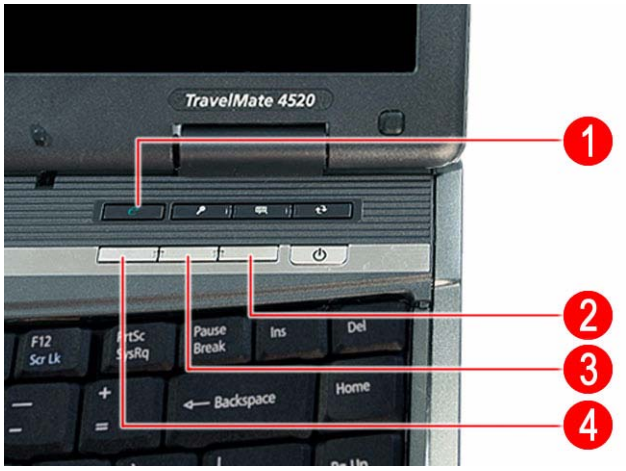


Number	Icon	Indicator	Description
1		Hard drive activity	Flashes green when there is hard drive activity.
2		Num Lock	Lights up green when the Num Lock function is activated.
3		Caps Lock	Lights up green when the Caps Lock function is activated.
4		Power *	Indicates the computer's power state. It lights up: ❑ Green when the computer is powered on. ❑ Amber when the computer is in standby or hibernation mode.
5		Battery charge *	Indicates the battery charging state. It lights up: ❑ Amber when the computer is charging. ❑ Green when battery charging is complete.
6		Bluetooth *	Indicates the Bluetooth status. It lights up: ❑ Green when there's an active Bluetooth connection ❑ Amber when there's no Bluetooth connection.
7		WLAN *	Indicates the WLAN status. It lights up: ❑ Green when there is an active WLAN connection ❑ Amber when there is no WLAN connection.

* These indicators remain visible when the computer lid is closed.

Easy-launch Keys

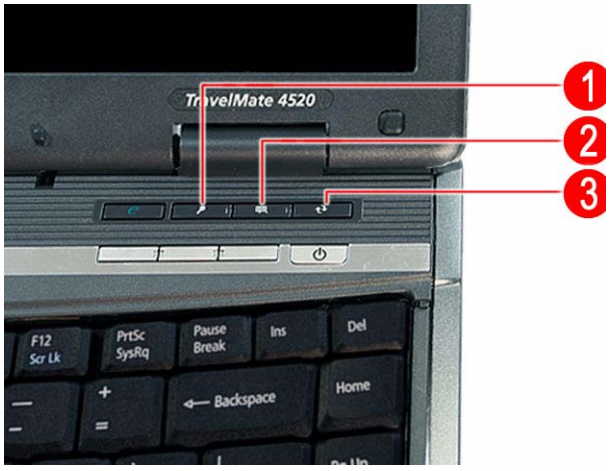
On the upper right side of the keyboard are special keys for launching commonly-used programs. Use Launch Manager to customize the function assigned to any of these keys. Go to page 25 for instructions.



Number	Icon	Indicator	Description
1	e	Acer Empowering key *	Press to launch the Acer Empowering Technology widgets.
2		Web browser *	Press to launch the preferred Internet browser.
3	✉	Mail *	Press to launch the preset E-mail application.
1	P	Programmable key	Press to launch a customized program or function.

Productivity Keys

The productivity keys on the upper right side of the keyboard provides one-touch manageability for a more secure and smarter work mode.



Number	Icon	Indicator	Description
1		Lock	Press to launch the Windows Lock window. This enable users to protect the system from unauthorized access. If your computer is equipped with an Acer Bio-Protection fingerprint reader, you only need to swipe your finger to log into Windows again.
2		Presentation	Press to enable professional presentations without screen saver interruptions or system notifications.
3		Sync	Press to launch the NTI Shadow program. This allows users to perform real-time backups to any designated storage device.

System Utilities

Phoenix TrustedCore Setup Utility

Phoenix TrustedCore Setup Utility is a hardware configuration program built into your system's Basic Input/ Output System (BIOS). Since most systems are already properly configured and optimized, there is normally no need to run this utility.

You will need to run this utility under the following conditions:

- When changing the system configuration including:
  - Setting the system time and date
  - Configuring the hard drives
  - Specifying the boot device sequence
  - Configuring the power management modes
  - Setting up system passwords or making other changes to the security setup
- When a configuration error is detected by the system and you are prompted ("Run Setup" message) to make changes to the BIOS settings.

IMPORTANT: If you repeatedly receive "Run Setup" messages, the RTC battery located on the system board (RTC1) may be defective. In this case, the system cannot retain configuration values in CMOS. Replace the RTC battery with a new one.

NOTE: For ease of reading, Phoenix TrustedCore Setup Utility will be simply referred to as "Setup" or "Setup Utility" in this Service Guide.

The screenshots used in this guide display default system values. These values may not be the same as those in your computer.

In the descriptive tables following each of the menu screen illustrations, settings in **boldface** are the default and suggested parameter settings.

The Setup Utility loads the configuration values in a battery-backed nonvolatile memory called CMOS RAM. This memory area is not part of the system RAM, which allows configuration data to be retained when power is turned off. The values take effect when the system is booted. Power-On Self Test (POST) uses these values to configure the hardware. If the values and the actual hardware do not agree, POST generates an error message. You must run this utility to change the BIOS settings from the default or current configuration.

Accessing the Setup Utility

1. Turn on the computer.

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

2. During POST, press **F2**.

   If you fail to press **F2** before POST is completed, you will need to restart the computer.

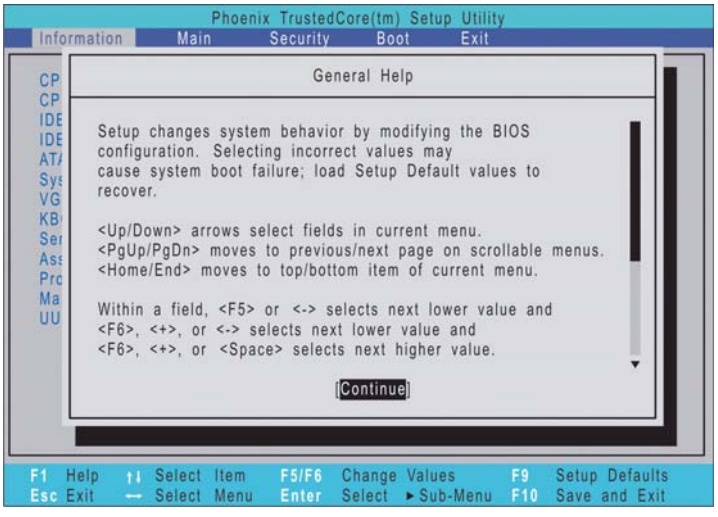
The first page to be displayed will be the Information menu. Use the left (←) and right (→) arrow keys to move between selections on the menu bar.

Navigating Through the 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 of the Setup Utility. The table below lists these legend keys and their respective functions.

Key	Function
← and →	To move between selections on the menu bar.
↑ and ↓	To move the cursor to the field you want.The currently selected field will be highlighted. The right side of each menu screen displays a field help panel—Item Specific Help panel. This panel displays the help text for the currently selected field. It updates as you move the cursor to each field. You can also use these keys to navigate through the multipage General Help window.
F5 or (-) F6, (+), or Space	To select a value for the currently selected field (only if it is user-configurable). Press **F5** or (-) to select the next lower value; **F6**, (+), or Space to select the next higher value. A parameter that is enclosed in square brackets [ ] is user-configurable. Parameters are not user-configurable for one of the following reasons: ❑ The field value is auto-configured or auto-detected.· ❑ The field value is informational only. ❑ The field is password-protected.
Enter	To select a field value.
Esc or Alt-X	If you press this key: ❑ On one of the menu screens, the Exit menu displays. ❑ On a General Help window, closes the window.
F1 or Alt-H	To bring up the General Help window. This window lists other Setup navigation keys that are not displayed on the legend bar.
F9	Press to load default system values.
F10	Press to save changes and close the Setup Utility.

Additional help information is available on the General Help window. Just press **F1** on any screen.



Setup Utility Menus

The *Phoenix*BIOS Setup Utility has five menus for configuring the various system functions. These include:

- Information
- Main
- Security
- Boot
- Exit

Information

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

Field	Description
CPU Type	Displays the processor name, sequence number, and clock speed.
CPU Speed	Displays the CPU speed.
IDEO Model Name	Displays the hard disk drive model.
IDEO Serial Number	Displays the hard disk drive serial number.
ATAPI Model Name	Displays the optical disc drive model.
System BIOS Version	Displays the current system BIOS version.
VGA BIOS Version	Displays the current VGA firmware version.
KBC Version	Displays the current 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 product.
Manufacturer Name	Displays the manufacturer of the computer.
UUID	Displays the universally unique identifier of your computer. This will only be visible when an internal LAN device is presenting.

Main

The Main menu screen allows you to configure the basic system settings and view the memory allocations.

Field	Description	Value
System Time	Set the system time.	HH:MM:SS (hour:minute:second)
System Date	Set the system date.	MM/DD/YYYY (month/day/year)
System Memory	Displays the size of system memory detected during boot-up. Memory size is fixed at 640 MB.	
Extended Memory	Displays the size of extended memory detected during boot-up. Extended memory size is equal to total memory size less 1 MB.	
Video Memory	Displays the size of video memory detected during boot-up.	**128 MB** 256 MB
Quiet Boot	When enabled, the Acer logo screen appears during boot-up	Disabled **Enabled**
Network Boot	When enabled, remote host with appropriate boot image can boot this computer. (Only works with an Ethernet device.)	Disabled **Enabled**
F12 Boot Menu	When enabled, the “Press F12 to enter Multi-Boot Menu” message is displayed during POST.	**Disabled** Enabled
D2D Recovery	When enabled, pressing Alt-F10 during POST will activate the Acer disc-to-disc recovery function. The function allows the user to create a hidden partition on the hard drive to store a copy of the OS and restore the system to its default factory settings.	Disabled **Enabled**

Security

The Security menu screen displays system passwords options to help safeguard and protect your computer from unauthorized use.

Field	Description	Value
Supervisor Password Is	Indicates whether a supervisor password is in use (Set) or not (Clear).	
User Password Is	Indicates whether a user password is in use (Set) or not (Clear).	
HDD Password Is	Indicates whether an HDD password is in use (HDD Password Set) or not (Clear).	
Set Supervisor Password	When set, this password will allow the user to access and change all settings in the Setup Utility. Press **Enter** to configure.	
Set 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 ❑ System Date ❑ Boot menu options ❑ All Exit menu options excluding Load Setup Defaults A supervisor password must first be set before creating a user password.	
Set HDD Password	When set, this password will restrict a user's access to the internal hard disk drive. It will be required during boot-up or when resuming from S4 mode (hibernation). **Note:** If this password is the same as the power-on password, it will not be required anymore at boot-up.	
Password on Boot	Referred to as power-on password. When set, the user or supervisor password will be required to boot up the system or when resuming from S4 mode. A supervisor password must first be set before creating this password.	**Disabled** Enabled

Setting a system password

Note the following before you define a system password:

- The maximum length of password contains eight alphanumeric characters—A - Z, 0 - 9, and ‘;’ (for a French keyboard).
- System passwords are case-insensitive.
- Password re-try is limited to three times. If user failed to enter the correct password, the system will hang up.

To set a system password:

1. Press ↑ or ↓ to highlight a set password field, then press **Enter**.

   The password box appears.

2. Type a password then press **Enter**.

IMPORTANT: Be very careful when typing your password because the characters do not appear on the screen. Only shaded blocks representing each typed character are visible.

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

   You will be prompted to save the new password.

4. Press **Enter**.

   The corresponding password status field displays **Set** to indicate that a password has been enabled.

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

To change a system password:

1. Press ↑ or ↓ to highlight an enabled password field, then press **Enter**.

   The password box appears.

2. Type the original 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.

To remove a system password:

1. Press ↑ or ↓ to highlight a password parameter, then press **Enter**.

   The password box appears.
2. Type the original 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**.

   The corresponding password status field displays **Clear** to indicate that the password has been disabled.
5. Press **F10** to save the changes you made and close the Setup Utility.

To clear a lost 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.

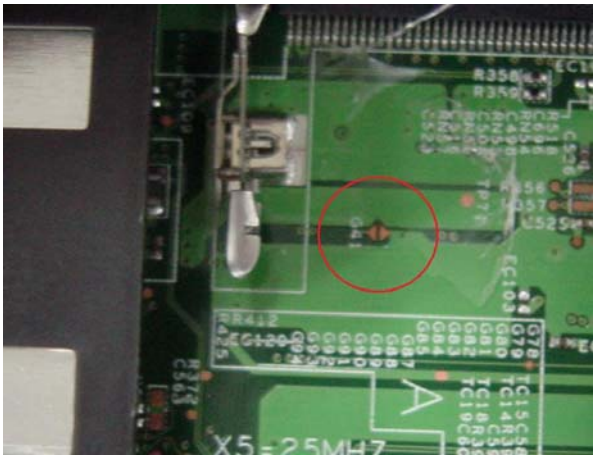
If you have enabled the Password on Boot field and you forget the supervisor password, you will not be able to boot up the computer. The same thing applies if you forget an HDD password.

You will need short the G41 pin located near the DIMM slot (DM1) to clear the supervisor password.

To clear the supervisor password:

1. Turn off the computer and unplug all the peripherals connected to it.
2. Unplug the power cord from the computer.
3. Remove the lower case cover according to the instructions described on page 32.
4. Remove the memory modules according to the instructions described on page 32.

5. Peel off the black tape near the DIMM slot to expose the SW1 dip switch.
6. Locate the G41 pin.



7. Short the G41 pin to clear all system passwords.
8. Reinstall the memory modules and the lower case cover.
9. Turn on the computer and press **F2** during bootup to access the Setup Utility.
10. Press **F9** to load the system defaults.
11. Press **F10** to save the changes you made and close the Setup Utility.

To clear a lost HDD password:

It uses on dos environment. To decode HDD password error code for unlock hard disk.

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 4, then press **Enter**.

Boot

The Boot menu screen allows users to set the drive sequence in which Setup attempts to boot the operating system. By default, Setup searches for boot devices in the order shown in the screen below.

To set the boot drive sequence:

1. Press ↑ or ↓ to select a bootable device.
2. Press **F6** to move the device up the list, or **F5** to move it down the list.
3. Press **F10** to save the changes you made and close the Setup Utility.

Exit

The Exit menu displays the several options on how to quit from the Setup Utility. Select any of the exit options then press **Enter**.

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 Defaults	Loads the factory-default settings for all Setup fields. Keyboard shortcut: F9
Discard Changes	Discards all changes made to the Setup Utility and loads the previous configuration settings.
Save Changes	Saves all changes made to the Setup Utility.

BIOS Flash Utility

The BIOS flash memory update is required under the following conditions:

- ❑ When there are new versions of system programs
- ❑ When new hardware options are installed
- ❑ When the BIOS has been corrupted and you need to restore it

BIOS Flash Precautions

- ❑ If you do not have a crisis recovery diskette at hand, create a **Crisis Recovery Diskette** in Windows XP of Vista before you use the flash utility.
- ❑ Do not install memory-related drivers (XMS, EMS, DPMI) when you use the flash utility.
- ❑ Place the computer in AC mode during the BIOS flash procedure. If the battery pack does not contain enough power to finish the BIOS flash, you may not able to boot the system because the BIOS is not completely loaded.

To flash the BIOS:

1. Prepare a bootable diskette.
2. Copy the flash utilities to the bootable diskette.
3. Boot the system from the bootable diskette.

   The flash utility will automatically be executed.
4. Follow the on-screen instructions to finish the flashing of the BIOS.

BIOS Recovery

If a BIOS flash procedure fails to complete, perform a BIOS recovery procedure by using the **Crisis Recovery Diskette**. During this procedure, the system will force the BIOS to enter a special BIOS block, called boot block, to boot up the system with minimum BIOS initialization.

To perform BIOS recovery:

1. Make sure the power cord is connected to the computer.
1. Attached a USB floppy drive to the computer.
2. Insert the **Crisis Recovery Diskette** into the floppy drive.
3. Press and hold the **Fn**+**Esc** keys, then press the power button ⏻.

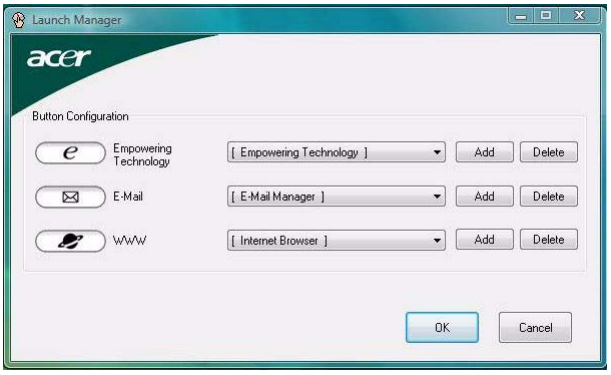
   This initialize the BIOS recovery process. The boot block BIOS will start to restore the failed BIOS code. Short beeps should be heard during this process. Once the process is completed, a long beep should be heard.
4. Turn off the computer once the process is complete.
5. Turn on the computer again and flash the BIOS. Refer to the previous instructions.

Launch Manager

Launch Manager allows users to configure three of the easy-launch keys—Acer Empowering, Web browser, and Mail.

To configure an easy-launch key:

1. Select **Start** | **All Programs** | **Launch Manager**.



2. Select which key to configure, then click the **Add** button opposite it.

3. You can set the key to open a particular file or program, or display a Web site address. Select the corresponding radio button, then type or browse for your selection.
4. If you've entered a Web site address, key in a descriptive label for the new easy-launch key function.
5. Click **OK**.
6. Click **OK** to save the new settings.

System Disassembly

This chapter provides step-by-step instructions on how to disassemble the notebook computer for maintenance and troubleshooting purposes.

Disassembly Tools

In performing the disassembly process, you will need the following tools:

- ❑ Wrist-grounding strap and conductive mat for preventing electrostatic discharge
- ❑ Philips screwdriver
- ❑ Flat screwdriver
- ❑ Hex screwdriver
- ❑ Flat plastic screwdriver
- ❑ Plastic tweezers

Stages of the Disassembly Process

The disassembly process is divided into three stages:

1. External modules disassembly
2. Main unit disassembly
   a. Upper case disassembly
   b. Lower case disassembly
3. LDC module disassembly

IMPORTANT: The disassembly procedure described in this chapter is a gradual process, as illustrated in the flowcharts preceding each disassembly stage section. This means that users need to observe the instructions in a step-by step manner. To illustrate, removing the HDD assembly will require that you first remove the battery pack and the stylus. Failure to observe the gradual flow of the process may result in component damage.

NOTE: To reinstall the system components and assemble the unit, perform the disassembly procedures in reverse.

Equivalent Torque Values

Torque values indicated in this chapter are expressed in kgf-cm (kilogram force-centimetre). For equivalent values in in-lb (inch-pound force) and Nmm (milli Newton meter), refer to the table below.

Torque Units	kgf-cm	in-lb	Nmm
Torque values	1.6	1.39	156.91
	3	2.60	294.21
	4	3.47	392.28

System Screw List

Listed below are the screw types used in this system, plus their corresponding part numbers.

NOTE: The screws for the different components vary in size. During the disassembly process, group the screws with their corresponding components to avoid mismatches when putting back the components.

Screw	Type	Color	Part Number
A	M2 x L8 BZN+NYLOK	Black	86.00D75.220
B	M2 x L4 BZN	Black	86.00A02.140
C	M2.5 x L8 BZN+NYLOK	Black	86.00E34.738
D	M2 x L4 BZN+NYLOK	Black	86.00E13.524
E	M3 x L4	Silver	86.9A554.4R0
F	M2 x L3 BZN+NYLOK	Black	86.00E25.723
G	M2 x L2.5 BZN+NYLOK	Black	86.00D72.620
H	M2.5 x L12 BZN+NYLOK	Silver	86.00E67.63C
I	M2.5 x L4 BZN+NYLOK	Black	86.00D30.630
J	M2.5 x L6 BZN+NYLOK	Black	86.00E33.736
K	M2 X L2 NI	Silver	86.00D77.320
L	M2.5 x L5 BZN+NYLOK	Black	86.00F19.735
M	M2.5 x L3 BZN+NYLOK	Black	86.00D52.630

Pre-disassembly Procedure

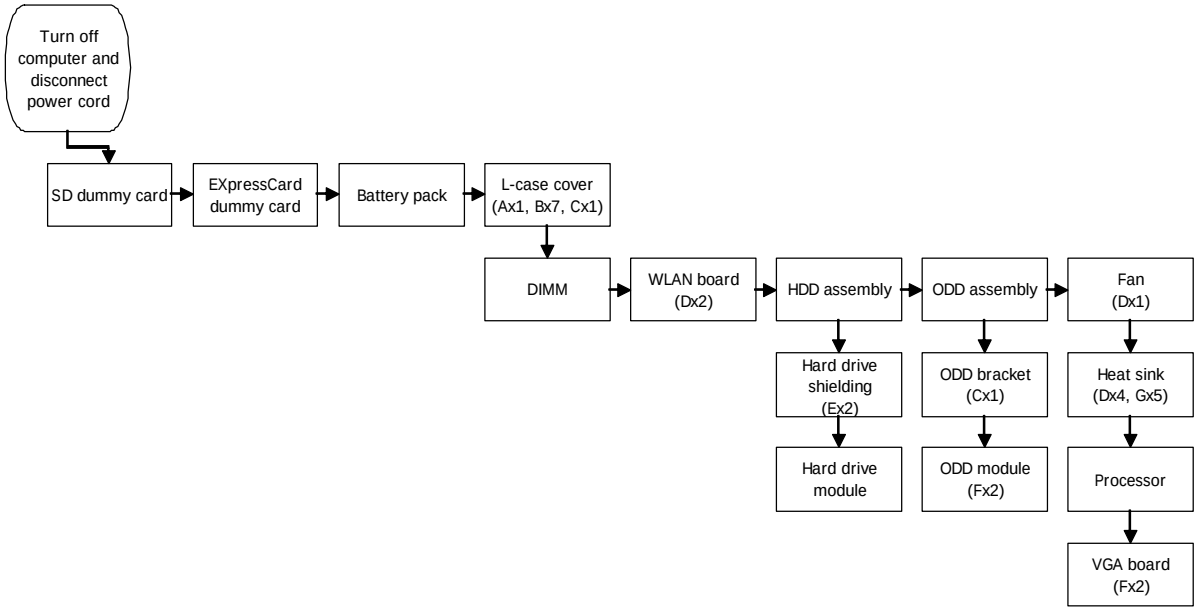
Before proceeding with the disassembly procedure, perform the steps listed below:

1. Turn off the power to the computer and all peripherals.
2. Unplug the power cord from the computer.

3. Unplug all peripheral cables from the computer.
4. Close the notebook lid and place the computer on a flat, steady surface.

External Modules Disassembly

External Modules Disassembly Flowchart



Screw	Type	Part Number
A	M2 x L8 BZN+NYLOK	86.00D75.220
B	M2 x L4 BZN	86.00A02.140
C	M2.5 x L8 BZN+NYLOK	86.00E34.738
D	M2 x L4 BZN+NYLOK	86.00E13.524
E	M3 x L4	86.9A554.4R0
F	M2 x L3 BZN+NYLOK	86.00E25.723
G	M2 x L2.5 BZN+NYLOK	86.00D72.620

Removing the SD Dummy Card

1. Push against the card, as if you were pushing it further into the slot, letting the card spring out.

2. Pull the SD dummy card out of its slot.

Removing the PC Card Dummy Card

1. Press the PC card slot eject button to pop it out, then press it again to eject the dummy card.

2. Pull the PC Card dummy card out of its slot.

Removing the Battery Pack

1. Turn the unit over with the base facing upward.
2. Slide the battery lock to the unlock position.

3. Slide and hold the battery release latch, then remove the battery pack from its bay.

Removing the Lower Case Cover

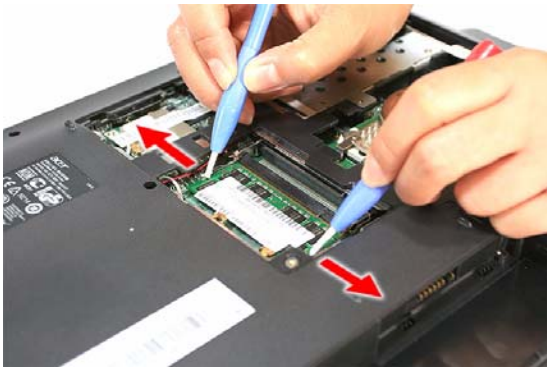
1. Remove the screws securing the lower case cover.

Step	Type	Quantity	Color	Torque
1	M2 x L8 BZN+NYLOK	1	Black	1.6 kgf-cm +/-15%
	M2 x L4 BZN	4	Black	1.6 kgf-cm +/-15%

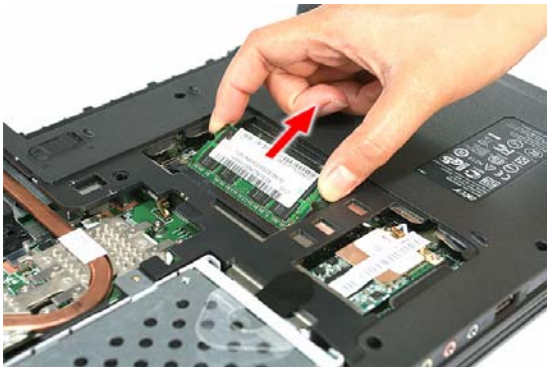
2. Pry the lower case cover from the main unit, then remove it.

Removing the Memory Modules

1. Push out the latches on both sides of the exterior DIMM slot (DM1).



2. Remove the memory module from its slot.



3. Repeat steps 1 and 2 to remove the second memory module.

Removing the WLAN Board

1. Peel off the end of the bar code tape securing the WLAN antennas.

2. Disconnect the antennas from the WLAN board, then move them away from the board.

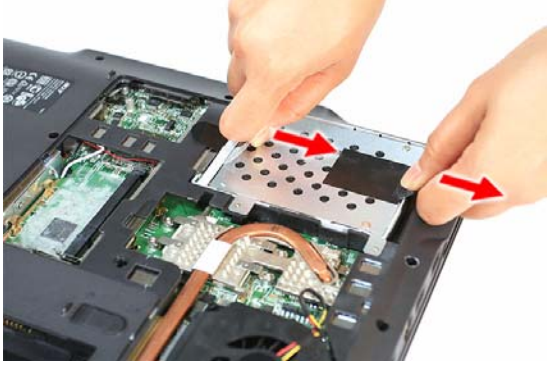
3. Remove the screws securing the WLAN board.

Step	Type	Quantity	Color	Torque
3	M2 x L4 BZN+NYLOK	2	Silver	1.6 kgf-cm +/-15%

4. Remove the WLAN board from its slot (MINIC1).

Removing and Dismantling the HDD Assembly

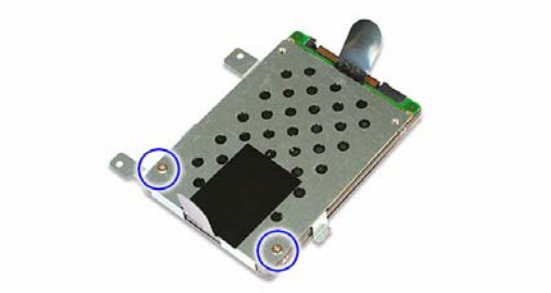
1. Use the clear plastic tab and the black mylar tape to disconnect the HDD assembly from its connector (SATA).



2. Remove the HDD assembly from the main unit.

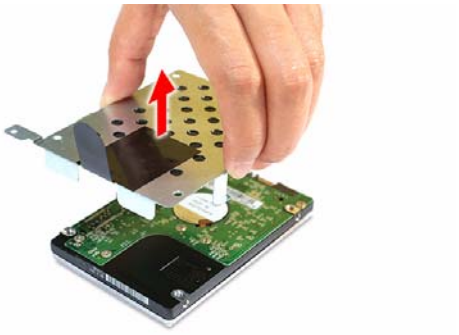
3. Remove the HDD rubber enclosure from the assembly.

4. Remove the screws on the HDD module shielding.



Step	Type	Quantity	Color	Torque
4	M3 x L4	2	Silver	3 kgf-cm +/-15%

5. Remove the shielding from the HDD module.



Removing and Dismantling the ODD Assembly

1. Remove the screw securing the ODD assembly to the main unit.

Step	Type	Quantity	Color	Torque
1	M2.5 x L8	1	Black	3 kgf-cm +/-15%

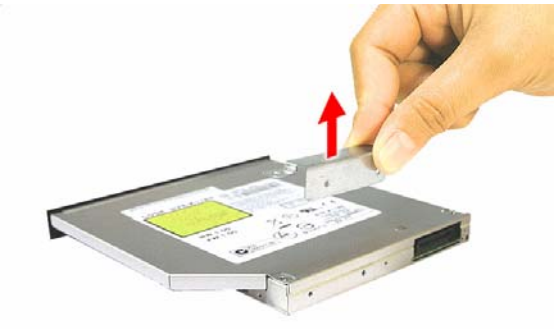
2. Use a plastic flat screwdriver to push the ODD assembly out of the main unit.

3. Pull the ODD assembly out of its bay.

4. Remove the screws securing the ODD bracket.

Step	Type	Quantity	Color	Torque
4	M3 x L4	2	Silver	3 kgf-cm +/-15%

5. Detach the ODD bracket from the module.



Removing the Processor Cooling Fan

1. Disconnect the fan cable from its system board connector (FAN1).

2. Remove the screws securing the cooling fan.

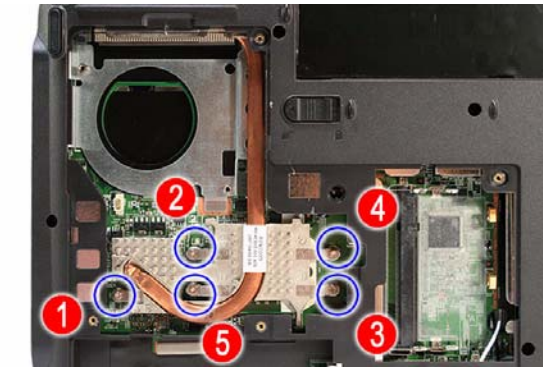
Step	Type	Quantity	Color	Torque
2	M2 x L4 BZN+NYLOK	2	Black	1.6 kgf-cm +/-15%

3. Peel off the aluminum tape on the top edge of the cooling fan.

4. Remove the cooling fan from the main unit.

Removing the Heat Sink

1. Remove the screws securing the heat sink.



Step	Type	Quantity	Color	Torque
1	M2 x L2.5 BZN+NYLOK	5	Silver	1.6 kgf-cm +/-15%

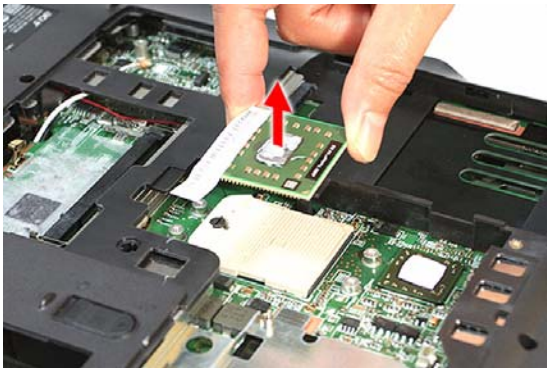
2. Carefully pull the heat sink from the unit base, then remove it from the system board.

Removing the Processor

1. Use a flat screwdriver to turn the processor socket lock to the counter-clockwise to the unlock position (note the unlock icon).

   Torque value: 3 kgf-cm +/-15%

2. Hold the processor by its edges and remove it from its socket (U52).

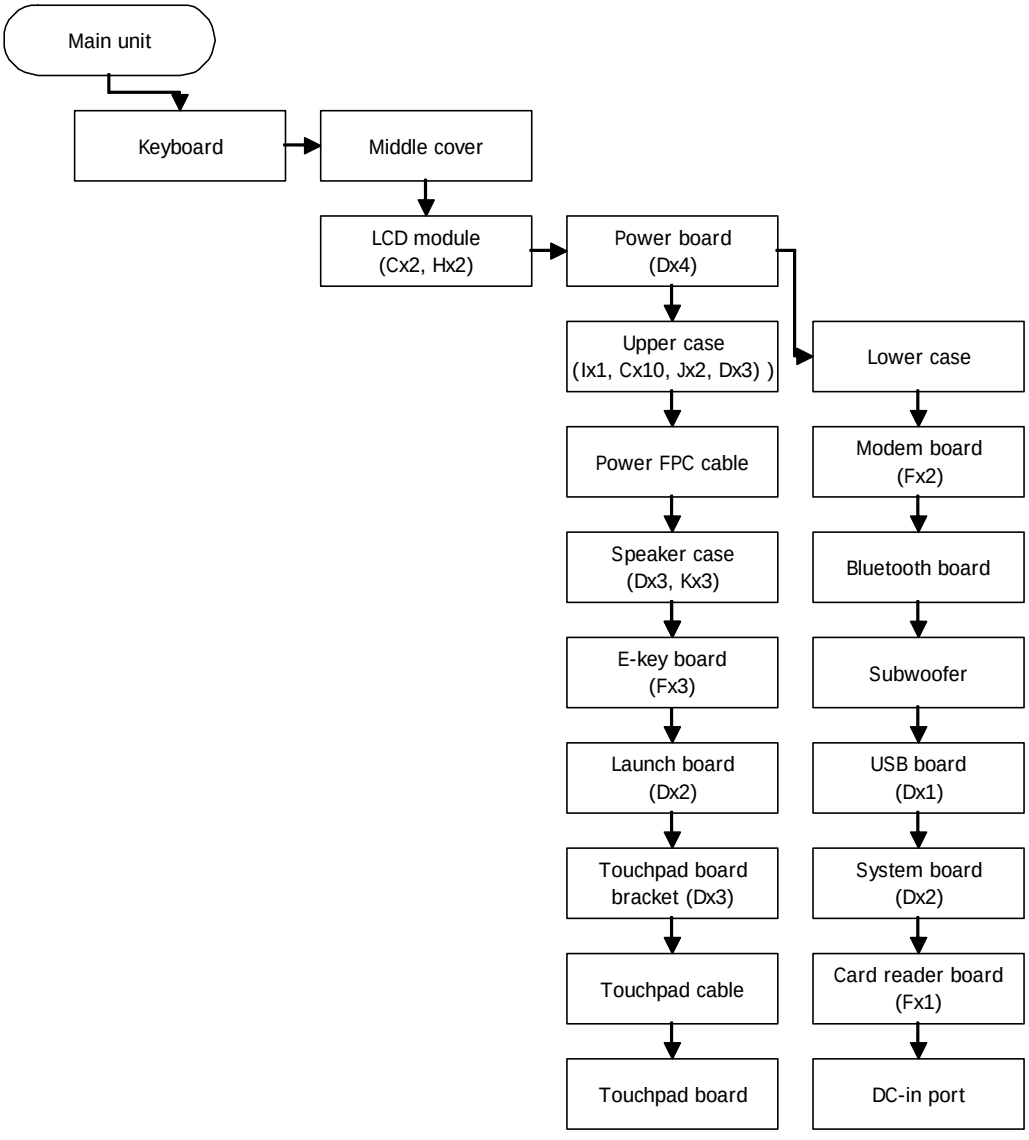


IMPORTANT: When installing a processor, note the golden arrow on the corner to make sure the processor is properly oriented over the socket. Refer to the figure above.

Main Unit Disassembly

IMPORTANT: To prevent from scratching or damaging the LCD panel, cover it with a protective film before disassembling the main unit.

Main Unit Disassembly Flowchart



Screw	Type	Part Number
C	M2.5 x L8 BZN+NYLOK	86.00E34.738
D	M2 x L4 BZN+NYLOK	86.00E13.524
F	M2 x L3 BZN+NYLOK	86.00E25.723
H	M2.5 x L12 BZN+NYLOK	86.00E67.63C
I	M2.5 x L4 BZN+NYLOK	86.00D30.630
J	M2.5 x L6 BZN+NYLOK	86.00E33.736
K	M2 X L2 NI	86.00D77.320

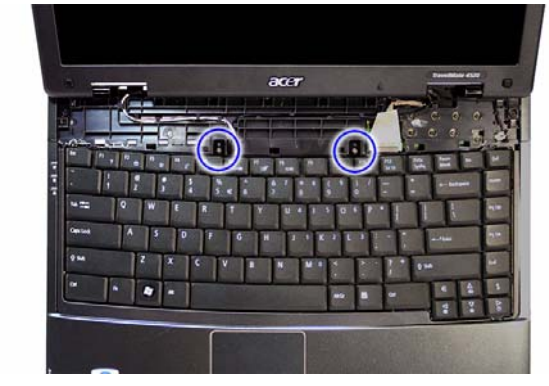
Removing the Middle Cover

1. Open the LCD panel completely to facilitate the easy removal of the middle cover.
2. Use a plastic flat screwdriver to pry open the outer edge of the cover, then continue prying on the hinge sides until the cover is released from the U-case.

3. Remove the middle cover from the main unit.

Removing the Keyboard

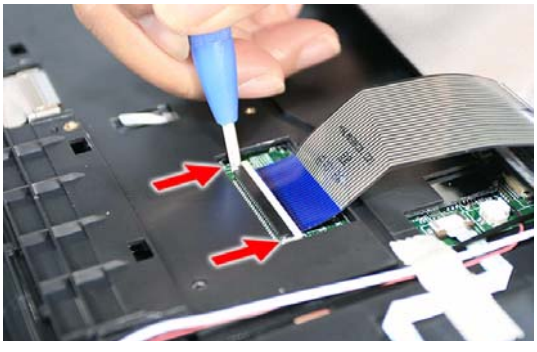
1. Remove the screws securing the keyboard.

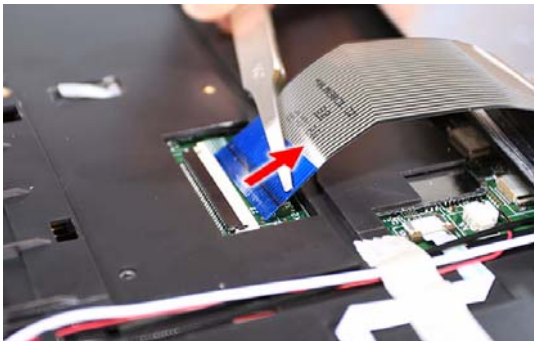


Step	Type	Quantity	Color	Torque
1	M2 x L2.5 BZN+NYLOK	2	Silver	1.6 kgf-cm +/-15%

2. Detach the top edge keyboard from the upper case, then turn it over the palmrest to gain access to the keyboard cable.

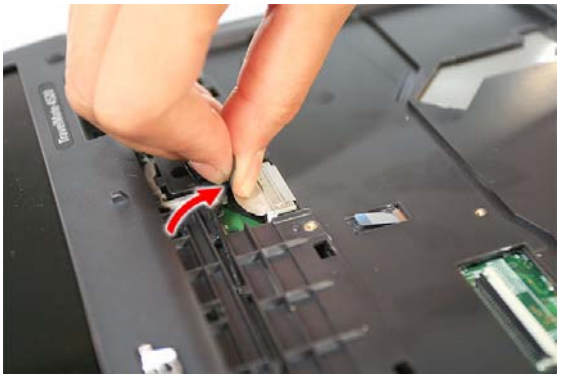
3. Disconnect the keyboard cable from its system board connector (KB1) to completely detach the keyboard from the main unit.





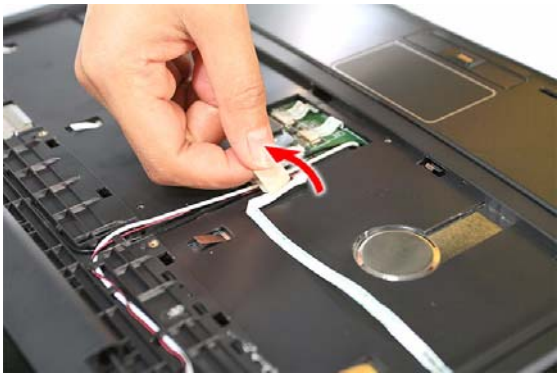
Removing the LCD Module

1. Peel off the silver acetic tape protecting the LCD cable.



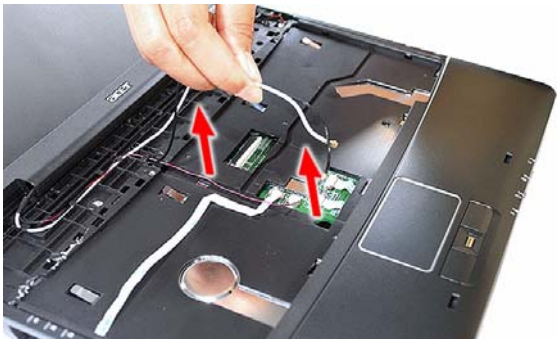
2. Disconnect the LCD cable from its system board connector (LCD1).

3. Peel off the masking tape securing the WLAN and internal microphone cables to the U-case.

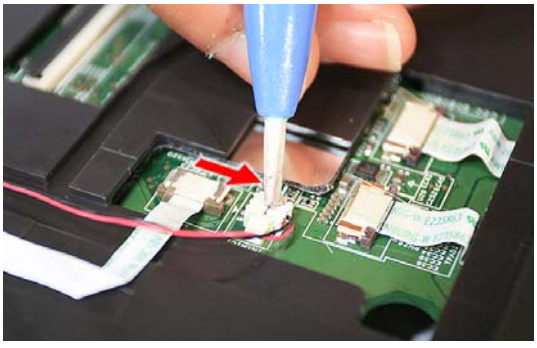


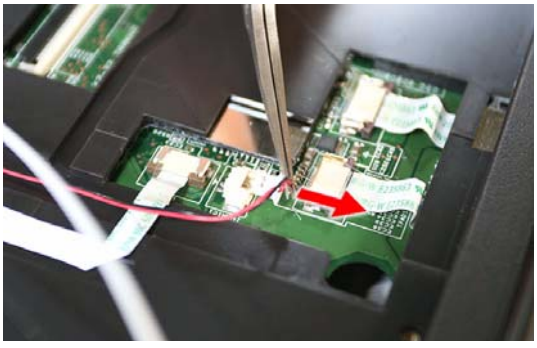
4. Disconnect the LCD cable from its system board connector (LCD1).

5. Pull out the WLAN antennas from underneath the computer base, and then release them from their U-case latches.

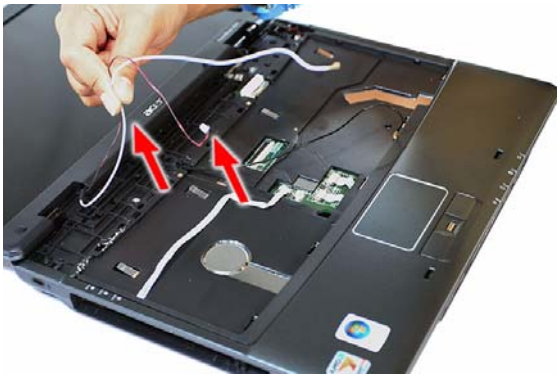


6. Disconnect the internal microphone cable from its system board connector (INTMIC1).





7. Release the internal microphone cable and the <main or aux??> WLAN antenna (white) from their U-case latches.



8. Release the <main or aux??> WLAN antenna (black) from their U-case latches.

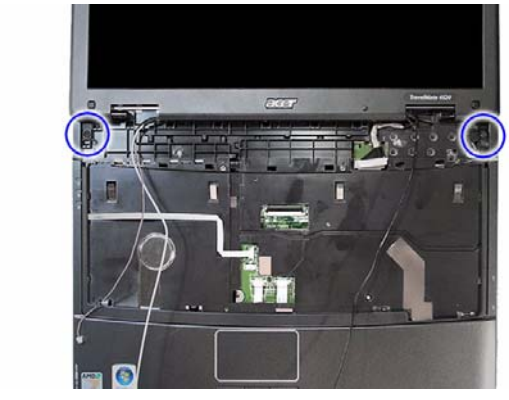
9. Close the computer lid and turn the unit over to the base side.

10. Remove the lower case screws securing the LCD module.

Step	Type	Quantity	Color	Torque
10	M2.5 x L8 BZN+NYLOK	2	Black	3 kgf-cm +/-15%

11. Turn the unit right side up and open the notebook lid again.

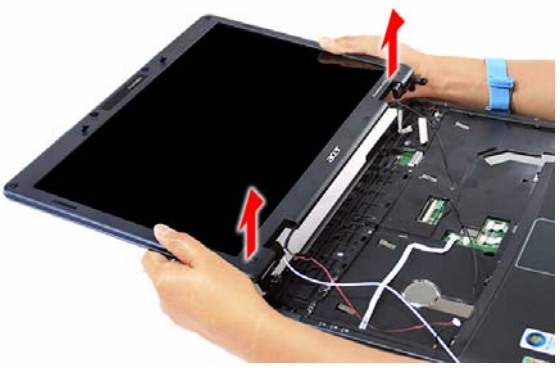
12. Remove the hinge screws securing the LCD module.



Step	Type	Quantity	Color	Torque
12	M2.5 x L12 BZN+NYLOK	2	Silver	4 kgf-cm +/-15%

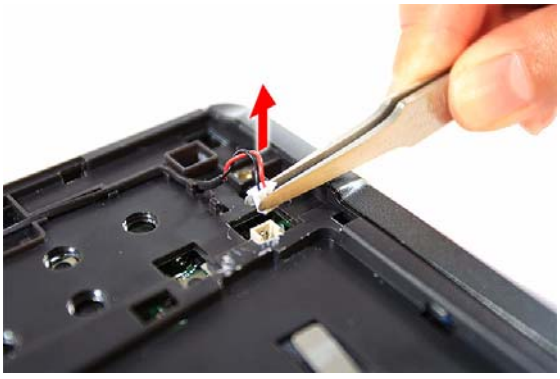
13. Detach the LCD module from the main unit.

Proceed to page 57 for instructions on how to disassemble the LCD module.



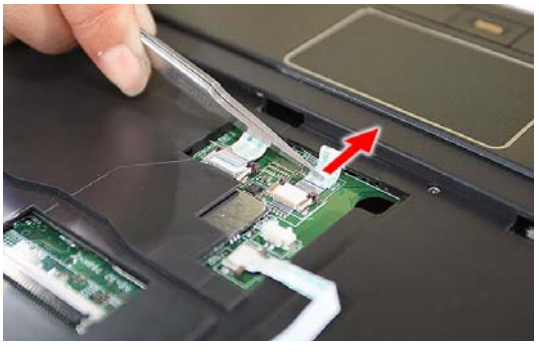
Removing the Upper Case

1. Disconnect the following system cables from their board connectors.
   - Notebook lid cable (LID1)

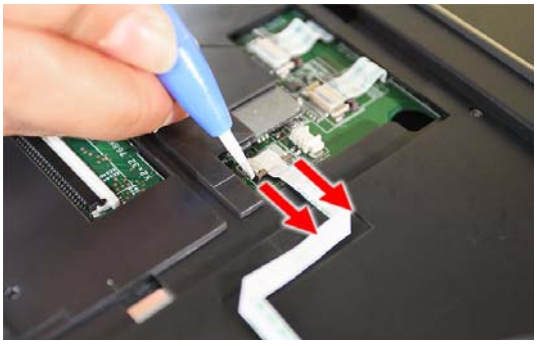


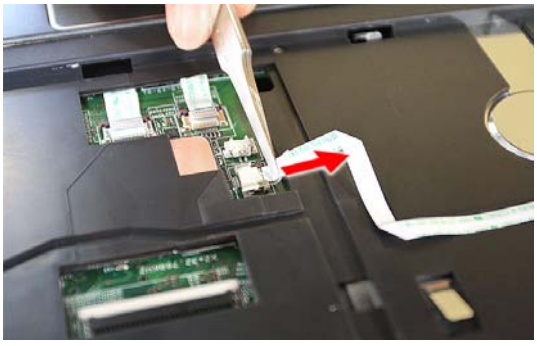
   - Fingerprint board cable (FP1)

   - Touchpad board cable (TPAD1)



- LED board cable (LEDB1)

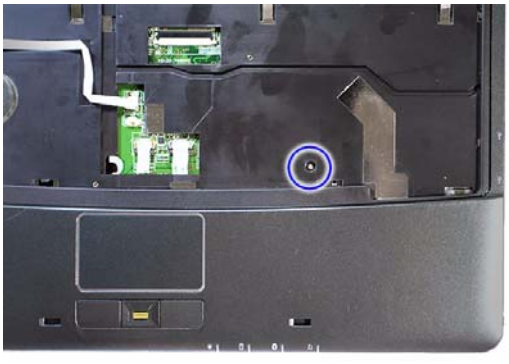




2. Turn the unit over to the base side.
3. Remove the lower case screws securing the upper case.

Step	Type	Quantity	Color	Torque
3	M2.5 x L4 BZN+NYLOK	11	Black	3 kgf-cm +/-15%

4. Turn the unit over again and remove the single top upper case screw.



Step	Type	Quantity	Color	Torque
4	M2.5 x L4 BZN+NYLOK	1	Silver	3 kgf-cm +/-15%

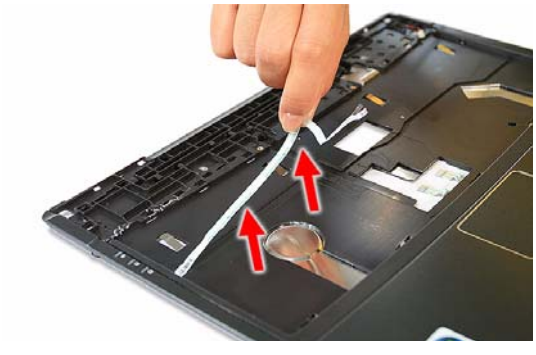
5. Detach the upper case from the lower case.

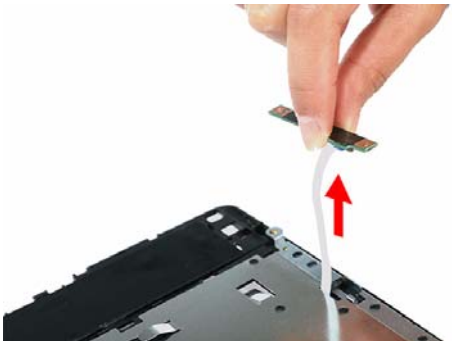
Removing the LED Board

1. Locate the LED board on the upper case underside.
2. Remove the screw securing the LED board.

Step	Type	Quantity	Color	Torque
2	M2 x L3 BZN+NYLOK	1	Silver	1.6 kgf-cm +/-15%

3. Peel off the LED board cable from the upper case, then grasp the LED board and pull the cable through its upper case opening.

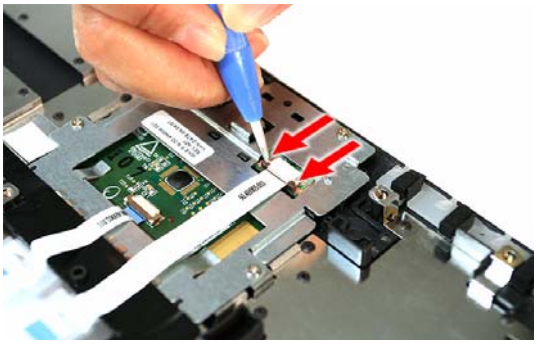




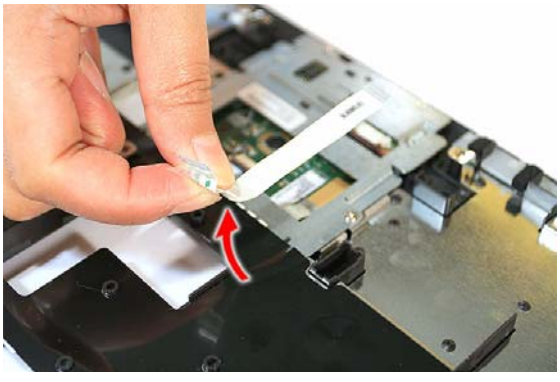
4. Disconnect the LED board cable from its board connector.

Removing the Fingerprint and Touchpad Boards

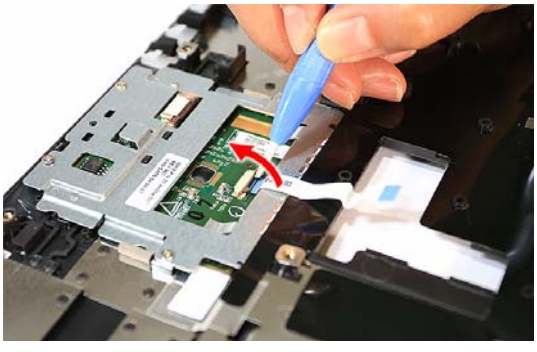
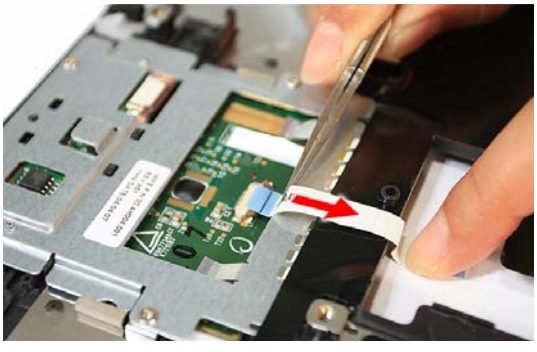
1. Disconnect the fingerprint board cable.




2. Detach the fingerprint board cable from the upper case.

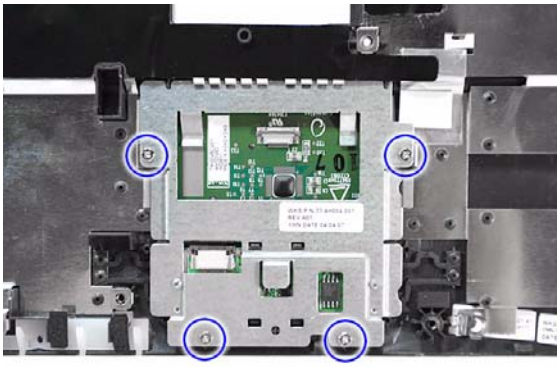


3. Disconnect the touchpad board cable.

4. Detach the fingerprint board cable from the upper case.

5. Remove the screws securing the fingerprint board bracket.



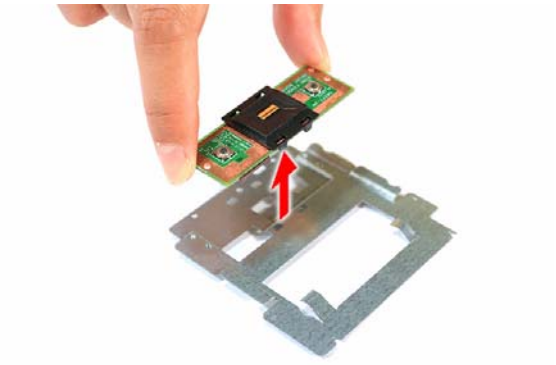
Step	Type	Quantity	Color	Torque
5	M2 x L4 BZN+NYLOK	4	Silver	1.6 kgf-cm +/-15%

6. Detach the fingerprint board bracket from the upper case.

7. Remove the screws securing the fingerprint board.

Step	Type	Quantity	Color	Torque
7	M2 x L4 BZN+NYLOK	2	Silver	1.6 kgf-cm +/-15%

8. Detach the fingerprint board from its bracket.

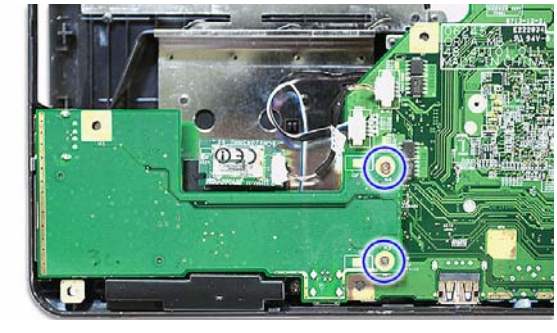


9. Carefully pry loose the touchpad board from the upper case to detach it.

CAUTION: The touchpad board is glued to the upper case. Remove the touchpad board only if it is defective.

Removing the Card Reader Board

1. Remove the screws securing the card reader board to the system board.

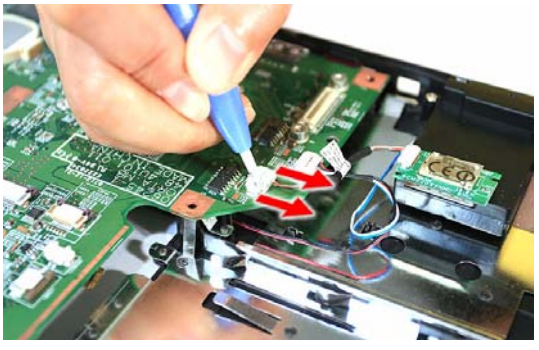


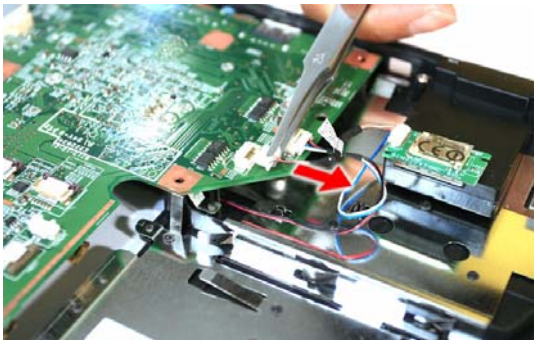
Step	Type	Quantity	Color	Torque
1	M2 x L3 BZN+NYLOK	2	Silver	1.6 kgf-cm +/-15%

2. Detach the card reader board from its connector (CRB1).

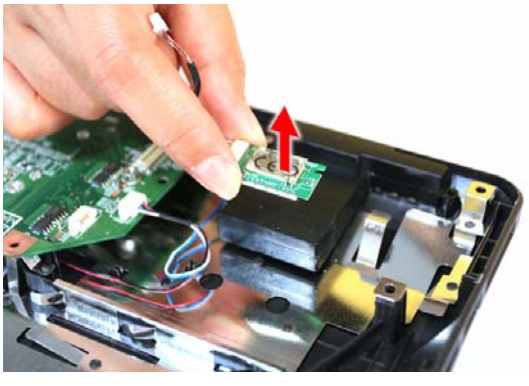
Removing the Bluetooth Board

1. Disconnect the Bluetooth board cable from its system board connector (BLUE1).



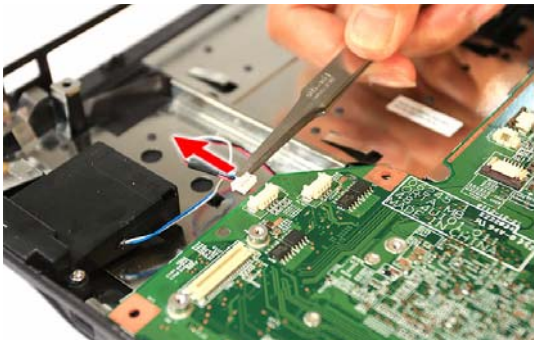


2. Detach the Bluetooth board from the left speaker.

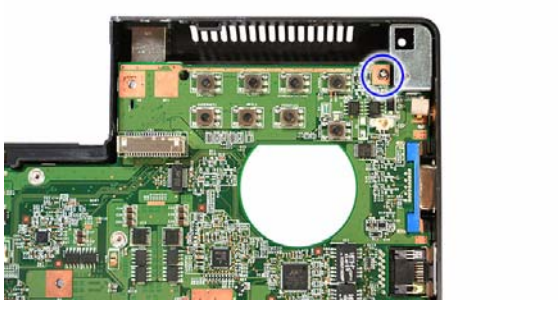


Removing the System Board

1. Disconnect the speaker cable from its system board connector (SPKR1).



2. Remove the single screw securing the system board to the lower case.



Step	Type	Quantity	Color	Torque
2	M2 x L4 BZN+NYLOK	1	Silver	1.6 kgf-cm +/-15%

3. Detach the system board from the upper case, then turn it over to gain access to the modem board.

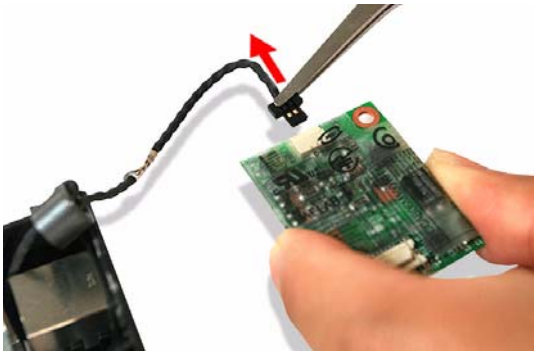
   Proceed to the next section for instructions on how to remove the modem board.

Removing the Modem Board

1. Remove the screws securing the modem board.

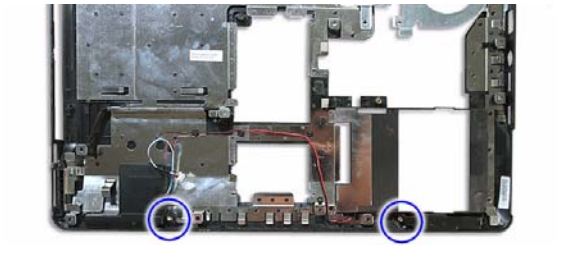
Step	Type	Quantity	Color	Torque
1	M2 x L3 BZN+NYLOK	2	Silver	1.6 kgf-cm +/-15%

2. Remove the modem board from its system board connector (MDC1), then disconnect the modem cable from the board.



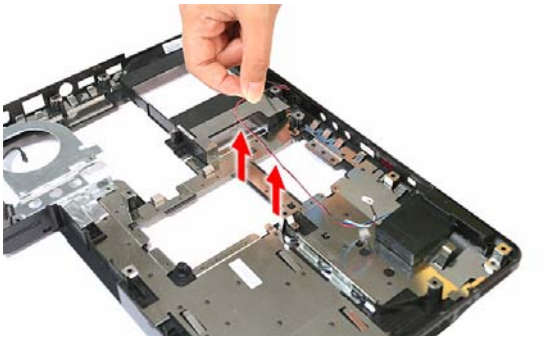
Removing the Speakers

1. Remove the screws securing the speakers.

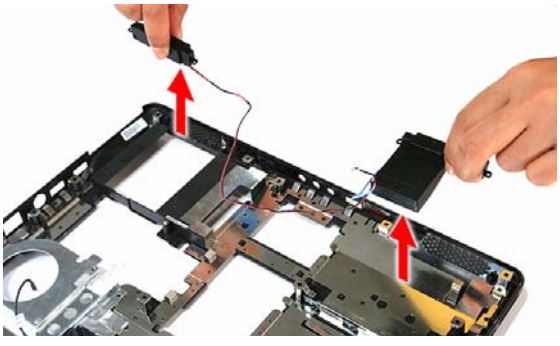


Step	Type	Quantity	Color	Torque
1	M2 X L2 NI	2	Silver	1.6 kgf-cm +/-15%

2. Release the speaker cable from its lower case latches.

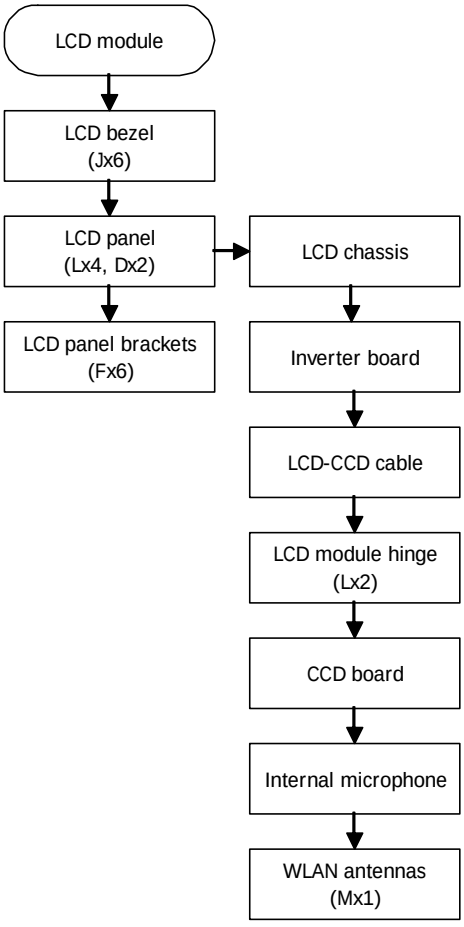


3. Remove the speakers from the lower case.



LCD Module Disassembly

LCD Module Disassembly Flowchart



Screw	Type	Part Number
D	M2 x L4 BZN+NYLOK	86.00E13.524
F	M2 x L3 BZN+NYLOK	86.00E25.723
J	M2.5 x L6 BZN+NYLOK	86.00E33.736
L	M2.5 x L5 BZN+NYLOK	86.00F19.735
M	M2.5 x L3 BZN+NYLOK	86.00D52.630

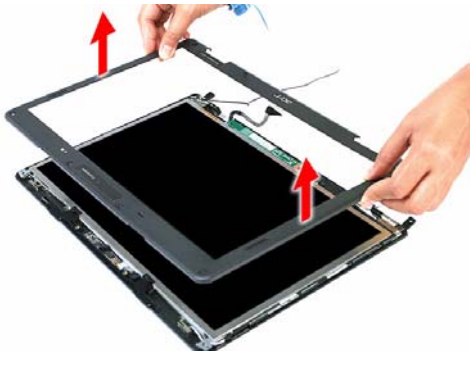
Removing the LCD Bezel

1. Remove the rubber pads securing the LCD bezel screws.

2. Remove the screws securing the LCD bezel.

Step	Type	Quantity	Color	Torque
2	M2.5 x L6 BZN+NYLOK	6	Black	3 kgf-cm +/-15%

3. Carefully pry the LCD bezel open and remove it from the LCD module.



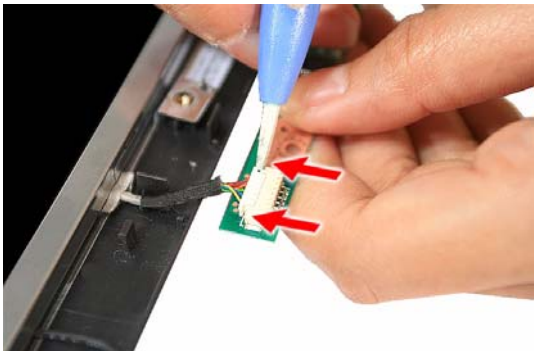
Removing the Inverter Board

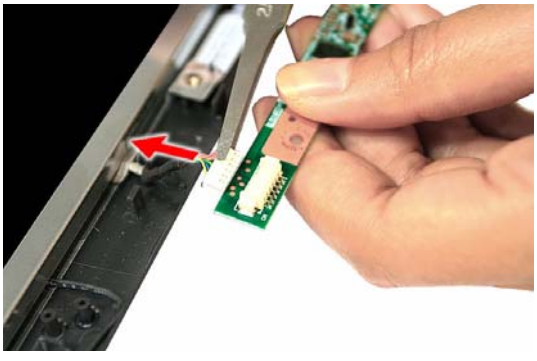
1. Remove the screws on the lower edge of the LCD panel.

Step	Type	Quantity	Color	Torque
1	M2 x L3 BZN+NYLOK	3	Black	1.6 kgf-cm +/-15%

2. Turn the board over and disconnect the 2P cable.

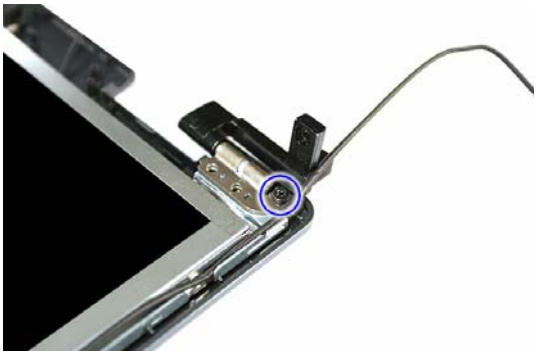
3. Disconnect the inverter cable from the board.





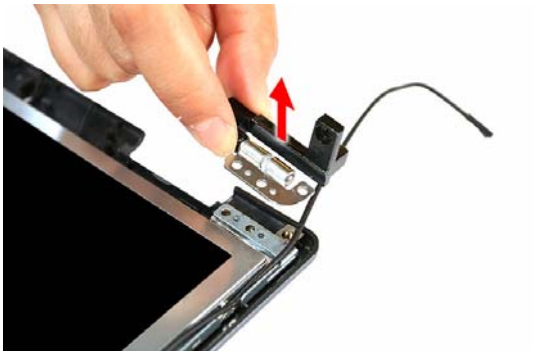
Removing the LCD Module Hinges

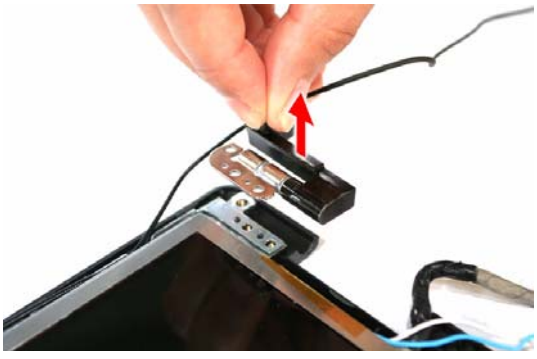
1. Remove the screws securing the LCD module hinges.



Step	Type	Quantity	Color	Torque
1	M2.5 x L5 BZN+NYLOK	2	Black	3 kgf-cm +/-15%

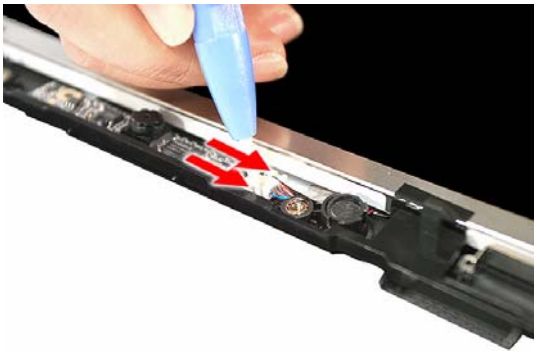
2. Remove the LCD module hinges from the LCD chassis.

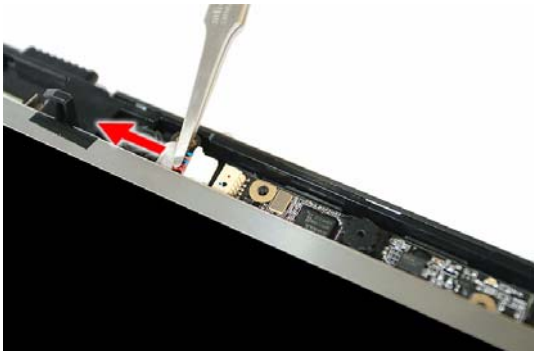




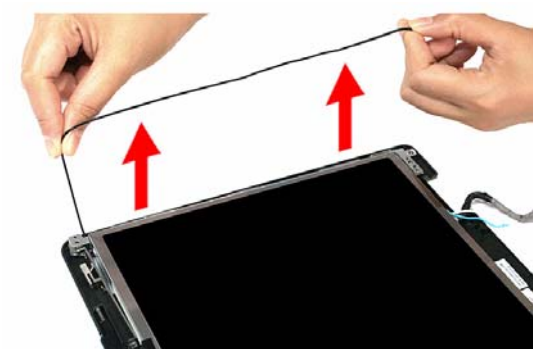
Removing the LCD Panel

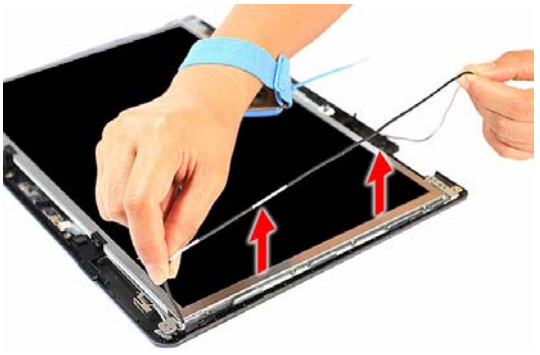
1. Disconnect the CCD board cable.





2. Release the WLAN antennas from the left and right LCD brackets.

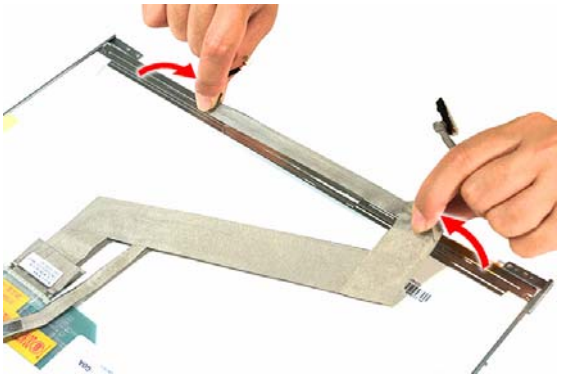




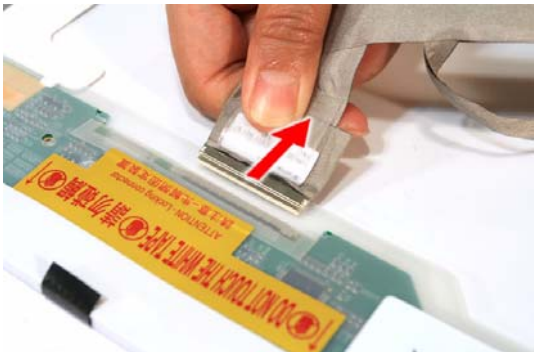
3. Remove the LCD panel from its chassis.

Removing the LCD-CCD Cable

1. Peel off the LCD-CCD cable from the bottom edge of the LCD panel.



2. Detach the adhesive tab on the cables's LCD connector, then disconnect the cable from the LCD panel PCB.



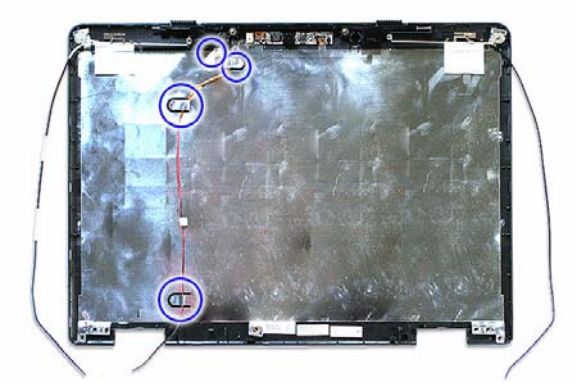
Removing the LCD Panel Brackets

- ❑ Remove the screws securing the LCD panel brackets.

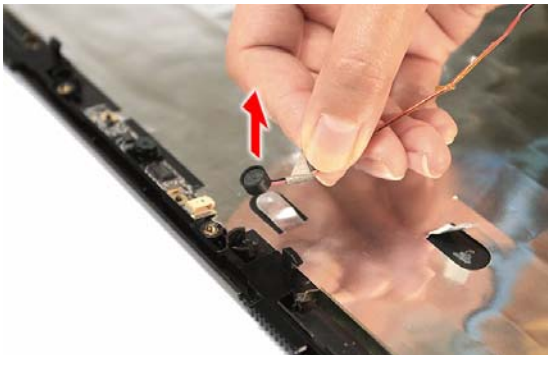
Step	Part Number and Type	Quantity	Color	Torque
*	M2 x L3 BZN+NYLOK	8	Silver	1.6 kgf-cm +/-15%

Removing the Internal Microphone and the CCD Board

1. Peel off the aluminum foil tabs and acetic tape securing the microphone cable.



2. Carefully remove the internal microphone from the LCD chassis.

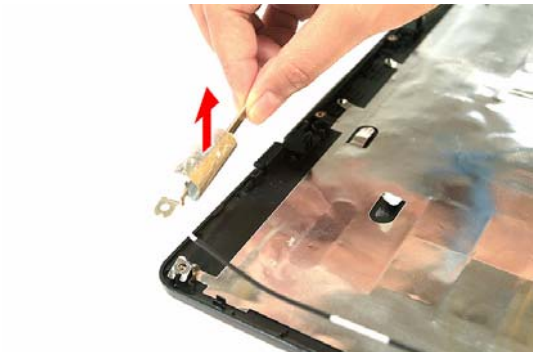


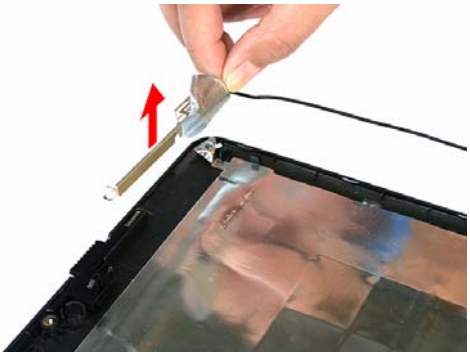
3. Remove the CCD board from the LCD chassis.

Removing the WLAN Antennas

1. Peel off the aluminum foil tabs securing the WLAN antennas.

2. Carefully detach the WLAN antenna from the LCD chassis.





System Troubleshooting

This chapter provides instructions on how to troubleshoot system hardware problems. If the problem can't be resolved using the procedures described here, information for getting online technical assistance is also provided.

Hardware Diagnostic Procedure

IMPORTANT: The diagnostic tests described in this chapter are only intended to test Acer products. Non-Acer products, prototype cards, or modified options can give false errors and invalid system responses.

1. Obtain as much detail as possible about the presented failure symptoms.
2. Verify the symptoms by attempting to re-create the failure through diagnostic tests or by repeating the same condition that precedes the symptoms.
3. Refer the table below to determine which corrective action to perform.

Problem	Symptom	Section to Refer to
Power failure	The power indicator does light up or stay lit.	"Power System Check" on page 67
POST failure	POST does not complete. No beep or error codes issued.	"POST Error Message" on page 69 "Undetermined Problems"
	POST detects an error and displayed messages on screen.	"POST Error Message" on page 69
Specific component failure	Dysfunctional component symptoms (e.g. blurred LCD display).	"POST Error Message" on page 69
Intermittent failure	Symptoms cannot be re-created	Use the customer-reported symptoms and go to the "POST Error Message" section on page 69. "Intermittent Problems" on page 80

System Check Procedures

External Diskette Drive Check

Do the following to isolate the problem to a controller, driver, or diskette. A write-enabled, diagnostic diskette is required.

IMPORTANT: Make sure that the diskette does not have more than one label attached to it. Multiple labels can damage to the drive.

1. Boot from the diagnostics diskette and start the diagnostics program.
2. Check if the FDD Test is successful (pass).
3. Follow the instructions in the message window.

If an error occurs with the internal diskette drive, reconnect the diskette connector on the system board.

If the error still remains:

1. Reconnect the external diskette drive.
2. Replace the external diskette drive.
3. Replace the system board.

External CD-ROM Drive Check

Do the following to isolate the problem to a controller, drive, or CD-ROM.

IMPORTANT: Make sure that the CD-ROM does not have any label attached to it. The label can damage the drive.

1. Boot from the diagnostics diskette and start the diagnostics program.
2. Check if the CD-ROM Test is successful (pass).
3. Follow the instructions in the message window.

If an error occurs, reconnect the CD-ROM drive connector on the system board.

If the error still remains:

1. Reconnect the CD-ROM module.
2. Replace the CD-ROM module.
3. Replace the system board.

Keyboard or Auxiliary Input Device Check

Remove the external keyboard if the internal keyboard is to be tested.

If the internal keyboard does not work or an unexpected character appears, make sure that the flexible cable extending from the keyboard is properly connected to its system board connector (KB1).

If the keyboard cable connection is correct, run the Keyboard Test.

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

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

The following auxiliary input devices are supported by this computer:

- ❑ Numeric keypad
- ❑ External keyboard

If any of these devices do not work, reconnect the device cable and check if that corrects the device failure.

Memory Check

Memory errors might stop system operations, display error messages, or cause the system to hang up.

Make sure that the DIMM is properly installed in its slot. A loose connection can cause an error.

If the DIMM connection is correct, run the Doagmpstotics Test.

1. Boot from the diagnostics diskette and start the Doagmpstotics program.
2. Go to the diagnostic memory in the test items.
3. Press **F2** in the test items.
4. Follow the instructions in the message window.

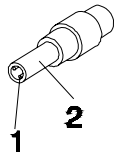
Power System Check

To verify the cause of the power problem, power on the computer using the AC adapter, and then the battery pack.

1. Remove the battery pack.
2. Connect the AC adapter and check if power is supplied.
3. Disconnect the AC adapter and install a fully-charged battery pack, and then check if power is supplied.
   - If the failure is cause by a defective AC adapter, refer to the “Check the AC Adapter” section.
   - If the failure is cause by a defective battery pack, refer to the “Check the Battery Pack” section.

Check the AC Adapter

Unplug the AC adapter cable from the computer and measure the output voltage at the plug of the AC adapter cable. Refer the figure below.



Pin 1: + 19 to +20.5V
Pin 2: OV, ground

1. If the voltage is not correct, replace the power adapter.
2. If the voltage is within the range, do the following:
   a. Replace the system board.
   b. If the problem is not corrected, see the section “Undetermined Problems” on page 81.
   c. If the voltage is still not corrected, proceed to the next step.

NOTE: An audible noise from the power adapter does not always indicate a defect.

3. If the power indicator does not light up, check the power cord of the AC adapter for correct continuity and installation.
4. If the operational charge does not work, see the “Check the Battery Pack” section on the next page.

Check the Battery Pack

Check the battery pack via the OS control and by checking the actual battery pack.

Using the OS control:

1. Open the **Power Management** setting in the Windows Control Panel screen.
2. On the Power Meter tab, confirm that the **Current Power Source** and **Total Battery Power Remaining** parameters are correct.
3. Repeat steps 1 and 2 using both the battery pack and the AC adapter as the power source.

   This will help you identify if the problem is on recharging or discharging.

Checking the battery pack voltage:

1. Power off the computer.
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.

Checking the battery charge function:

1. Use a discharged battery pack or a battery pack that has less than 50% of the total power remaining when installed in the computer.
2. If the battery charge indicator does not light up, remove the battery pack and allow it to return to room temperature, then reinstall the battery pack.
3. If the charge indicator still does not light up, replace the battery pack.

Touchpad Check

If the touchpad doesn't work, do the following actions one at a time to correct the problem. Do not replace a non-defective FRU:

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

After you use the touchpad, the pointer drifts 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.

POST Error Indicators

When POST detects a system failure, it either displays a POST error message, or emits a series of beep codes.

POST Error Message

Whenever a non-fatal error occurs during POST, an error message describing the problem appears onscreen. These text messages are displayed in normal video (white text on black background). It shows the details of the error.

The POST error message index in this section lists the error messages and their possible causes. The most likely cause is listed first. The listed error symptoms classified by function.

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

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

If the symptom is not listed, see “Undetermined Problems” on page 81.

NOTE: Most of the error messages occur during POST. Some of them display information about a hardware device, e.g., 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 Setup Utility menus, reboot the computer, enter Setup, then press **F9** to load the Setup defaults to correct the error.

Error Code List

Error Code	Error Message
006	Equipment Configuration Error Causes: 1. CPU BIOS Update Code Mismatch 2. IDE Primary Channel Master Drive Error (The causes will be shown before the `Equipment Configuration Error` message)
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 disabled. Incorrect password is specified.
<No error code>	Battery Critical Low In this situation BIOS will issue four short beeps, then shut down the system, no message will show.
<No error code>	Thermal Critical High In this situation BIOS will shut down the system, no message will show.

Error Message List

Error Message	FRU/Action in Sequence
Failure Fixed Disk	Reconnect the hard disk drive to its connector. Run the Setup Utility, then press **F9** to load the system defaults. Hard disk drive System board
Stuck Key	Refer to the “Keyboard or Auxiliary Input Device Check” section on page 66.
Keyboard Error	Refer to the “Keyboard or Auxiliary Input Device Check” section on page 66.
Keyboard Controller Failed	Refer to the “Keyboard or Auxiliary Input Device Check” section on page 66.
Keyboard locked - Unlock key switch	Unlock external keyboard
Monitor type does not match CMOS - Run Setup	Run the Setup Utility, then press **F9** to load the system defaults.
Shadow RAM Failed at offset: nnnn	BIOS ROM System board
System RAM Failed at offset: nnnn	DIMM System board
Extended RAM Failed at offset: nnnn	DIMM System board
System battery is dead - Replace and run Setup	Replace the RTC battery, then access the Setup Utility to reconfigure the system time setttings.
System CMOS checksum bad - Default configuration used	RTC battery Run the Setup Utility to reconfigure the system time settings.
System timer error	RTC battery Run the Setup Utility to reconfigure the system time settings. System board
Real time clock error	RTC battery Run the Setup Utility to reconfigure the system time settings. System board
Previous boot incomplete - Default configuration used	Run the Setup Utility, then press **F9** to load the system defaults. RTC battery System board
Memory size found by POST differed from CMOS	Run the Setup Utility, then press **F9** to load the system defaults. DIMM System board
Diskette drive A error	Check if the drive matches the diskette type set in the Setup Utility. Refer to the “External Diskette Drive Check” section on page 66.
Incorrect Drive A type - run SETUP	Check if the drive matches the diskette type set in the Setup Utility.
System cache error - Cache disabled	System board
CPU ID:	System board

Error Message	FRU/Action in Sequence
DMA Test Failed	DIMM System board
Software NMI Failed	DIMM System board
Fail-Safe Timer NMI Failed	DIMM System board
Device Address Conflict	Run the Setup Utility, then press **F9** to load the system defaults. RTC battery System board
Allocation Error for device	Run the Setup Utility, then press **F9** to load the system defaults. RTC battery System board
Failing Bits: nnnn	DIMM BIOS ROM System board
Fixed Disk n	None
Invalid System Configuration Data	BIOS ROM System board
I/O device IRQ conflict	Run the Setup Utility, then press **F9** to load the system defaults. RTC battery System board
Operating system not found	Run the Setup Utility and see if fixed disk and drive A: are properly identified. Diskette drive Hard disk drive System board

System Error – No Beep

Error Message	FRU/Action in Sequence
No beep, power indicator turns off and the LCD screen is blank.	Power source (battery pack and power adapter). Refer to the “Power System Check” section on page 67. Ensure every internal cables are properly and securely connected. Reinstall the memory module. System board.
No beep, power indicator turns on but the LCD screen is blank.	Power source (battery pack and power adapter). Refer to the “Power System Check” section on page 67. Reconnect the LCD-CCD cable. Hard disk drive LCD-CCD cable Inverter board LCD panel System board

Error Message	FRU/Action in Sequence
No beep, power indicator turns on, the LCD screen is blank, but you can view POST when connected to an external CRT.	Reconnect the LCD-CCD cable. LCD-CCD cable Inverter board LCD panel System board
No beep, power indicator turns on and a blinking cursor appears on screen during POST.	Ensure every internal cables are properly and securely connected. System board
No beep during POST but system runs correctly.	Speaker System board

POST 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

Code	Beeps	POST Routine Description
2Eh	1-3-4-3	RAM failure on data bits xxxx of low byte of memory bus
2Fh		Enable cache before system BIOS shadow
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
6Ah		Display external L2 cache size
6Bh		Load custom defaults (optional)
6Ch		Display shadow-area message

Code	Beeps	POST Routine Description
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
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

Code	Beeps	POST Routine Description
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)
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

Code	Beeps	POST Routine Description
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

Index of Symptom-to-FRU Error Message

NOTE: If the symptom or error for your problem condition is not listed in this section, refer to the "Undetermined Problems" section on page 81.

LCD-related Symptoms

Symptom/Error	Action in Sequence
LCD backlight doesn't work LCD is too dark LCD brightness cannot be adjusted LCD contrast cannot be adjusted	Run the Setup Utility, then press **F9** to load the system defaults. Reconnect the LCD-CCD cable. Keyboard (if contrast and brightness function key doesn't work). LCD-CCD cable Inverter board LCD panel System board
Unreadable LCD screen Missing pels in characters Abnormal screen Wrong color displayed	Reconnect the LCD-CCD cable. LCD cable Inverter board LCD panel System board
LCD has extra horizontal or vertical lines displayed.	Inverter board LCD-CCD cable LCD panel System board

Power-related Symptoms

Symptom/Error	Action in Sequence
Power shuts down during operation	Power source (battery pack and power adapter). Refer to the "Power System Check" section on page 67. Battery pack Power adapter System board
The system won't power on.	Power source (battery pack and power adapter). Refer to the "Power System Check" section on page 67. Battery pack Power adapter System board
The system won't power off.	Power source (battery pack and power adapter). Refer to the "Power System Check" section on page 67. Hold and press the power button for more than four seconds. System board
Battery won't charged	Refer to the "Check the Battery Pack" section on page 67. Battery pack System board

Memory-related Symptom

Symptom / Error	Action in Sequence
Memory count (size) appears different from actual size.	Run the Setup Utility, then press **F9** to load the system defaults. DIMM System board

Audio-related Symptoms

Symptom / Error	Action in Sequence
In Windows multimedia programs, no sound comes from the computer.	Audio driver Speaker System board
Internal speakers emit noise or emit no sound.	Speaker System board

Power Management-related Symptoms

Symptom / Error	Action in Sequence
The system will not enter hibernation mode.	Check the system hibernation settings. Press the e key, then select **ePower Management** from the Empowering Technology interface. Keyboard (if control is from the keyboard) Hard disk drive System board
The system will not enter hibernation mode and emits four short beeps every minute.	Press **Fn**+**0** and see if the computer enters hibernation mode. Check the system hibernation settings. Press the e key, then select **ePower Management** from the Empowering Technology interface. Touchpad Keyboard Hard disk drive System board
The system does not enter standby mode after closing the notebook lid.	Check the system hibernation settings. Press the e key, then select **ePower Management** from the Empowering Technology interface. System board
The system will not leave hibernation mode.	Hard disk drive System board
The system doesn't resume from standby mode after opening the LCD.	System board
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 pack (continue battery usage until power is depleted, then recharge the battery). Battery pack System board
System hangs intermittently.	Reinstall the system drives (HDD/ODD). System board

I/O-related Symptoms

Symptom / Error	Action in Sequence
System configuration values does not match the installed devices.	Run the Setup Utility, then press **F9** to load the system defaults. Reconnect hard disk/CD-ROM/diskette drives.
External display does not work correctly.	Press **Fn**+**F5**, LCD/CRT/both display switching System board
USB does not work correctly	System board
Print problems	Run printer self-test. Printer driver Printer cable Printer System board
Keyboard (one or more keys) does not work.	Reconnect the keyboard cable. Keyboard System board
Touchpad does not work.	Reconnect the touchpad cable. Touchpad board System board
Internal modem does not work correctly.	Modem port Modem board System board

Intermittent Problems

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

When analyzing an intermittent problem, do the following:

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

Undetermined Problems

Undetermined problems are those for which diagnostic tests cannot identify the cause. This may be a failure to detemine which adapter or device failed, which installed device is malfunctioning, a short circuit is suspected, or when the system is inoperative.

IMPORTANT: Verify that all attached devices are supported by the computer, and that power supply to the computer is good.

Follow these procedures to isolate the failing FRU (do not isolate non-defective FRU).

1. Shut down the computer.
2. Visually check the failing FRU for damage. If any problems are found, replace the FRU.
3. Remove or disconnect all the following devices:
   - Non-Acer devices
   - Printer, mouse, and other external devices
   - Battery pack
   - Hard disk drive
   - DIMM
   - Optical drive/diskette drive
   - Cards in the ExpressCard/54 and card reader slots
4. Power on the computer.
5. Determine if the problem has changed.
6. If the problem does not recur, reconnect the removed devices one at a time until you find the failing FRU.
7. If the problem remains, replace the following FRU one at a time. Do not replace a non-defective FRU:
   - System board
   - LCD module assembly

Online Support Information

This section describes online technical support services available to help you repair your TravelMate 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 at http://global.acer.com/support/index. 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 Support & Downloads tab you can download information materials for all of Acer notebook, desktop and server models including:

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

For these purposes, we have included an Acrobat File to facilitate a hassle-free downloading of our technical materials.

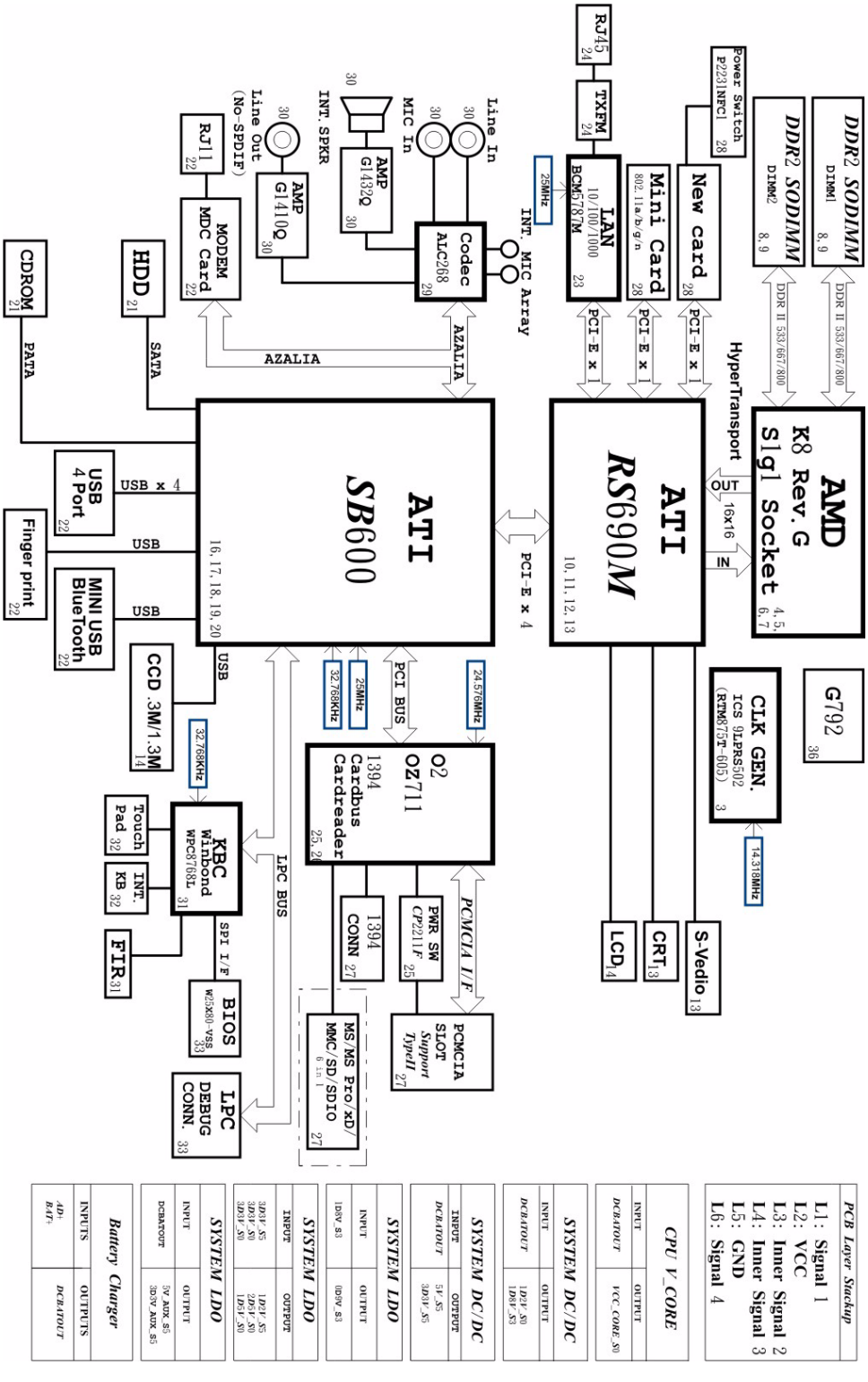
The following are also available in the Support & Downloads tab:

- Detailed information on Acer's International Traveler'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.

System Block Diagram and Board Layout

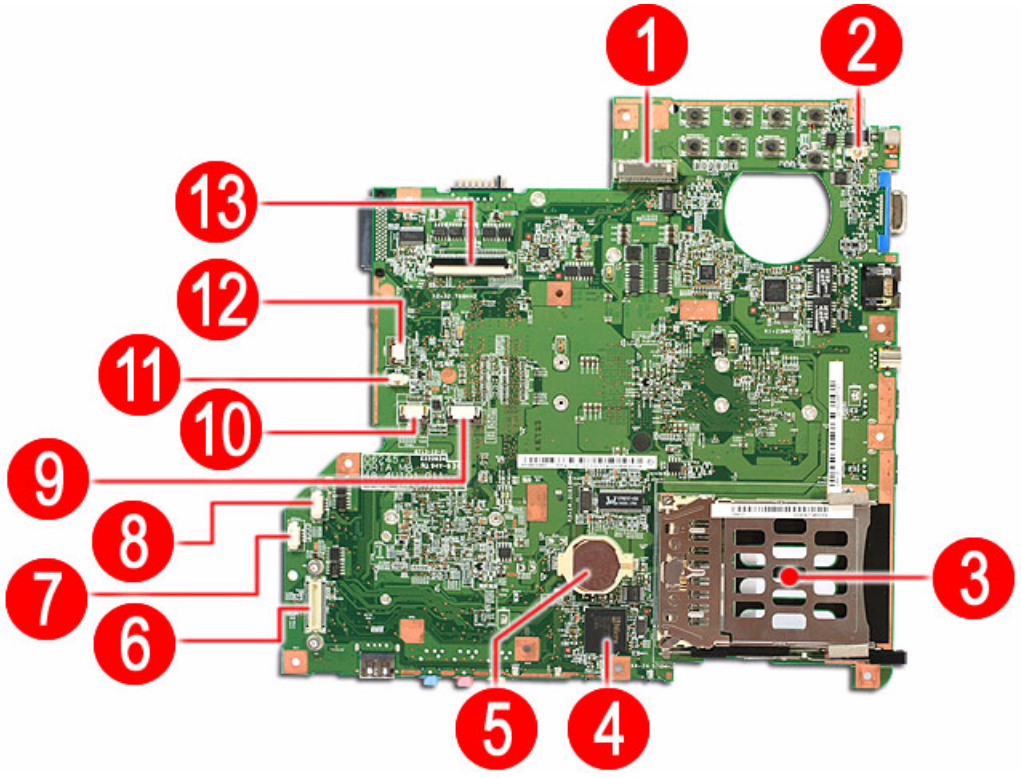
System Block Diagram



System Board Layout

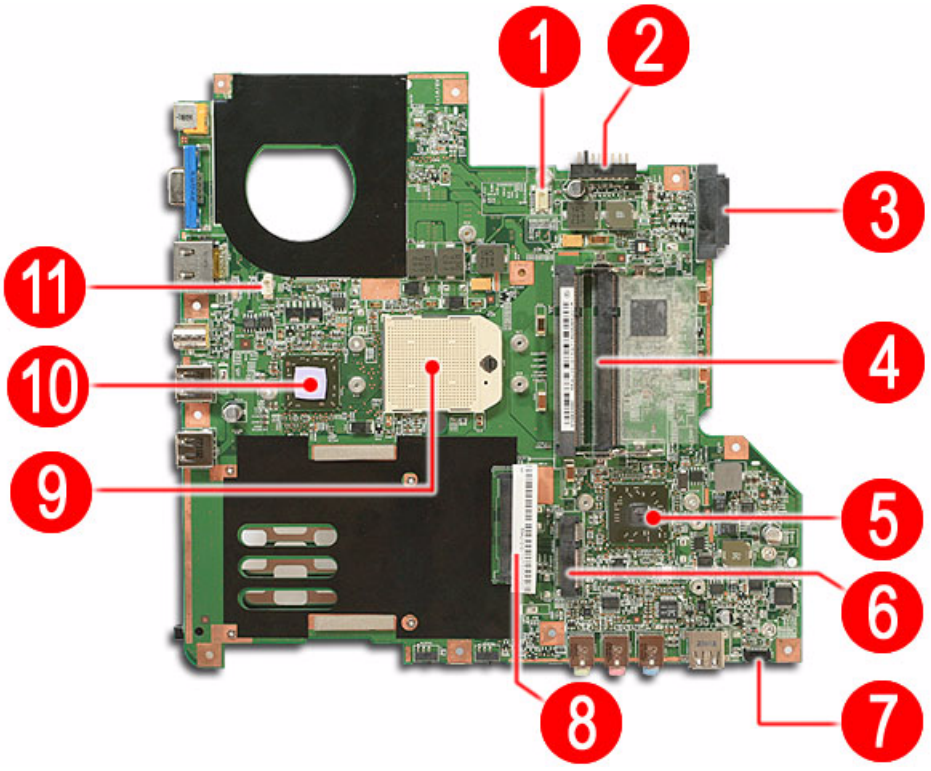
This section shows the top and bottom layout of the TravelMate 4520 system board.

Top View



Item	Code	Description
1	LCD1	LCD-CCD cable connector
2	LID1	Notebook lid connector
3	CN1	PC card slot
4	U40	???
5	RTC1	CMOS battery (RTC battery)
6	CRB1	Card reader board connector
7	SPKR1	Speaker cable connector
8	BLUE1	Bluetooth board cable connector
9	FP1	Fingerprint board cable connector
10	TPAD1	Touchpad board cable connector
11	INTMIC1	Internal microphone cable connector
12	LEDB1	LED board cable connector
13	KB1	Keyboard cable connector

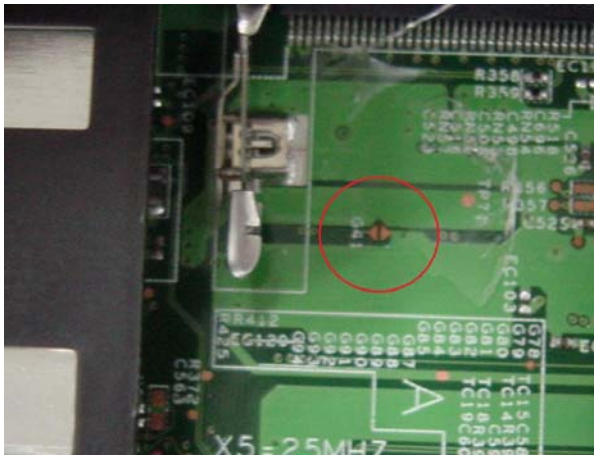
Bottom View



Item	Code	Description
1	MDC1	Modem board connector
2	BAT1	Battery pack connector
3	ODD1	Optical drive connector
4	DMI	soDIMM slots
5	U57	ATI M690G chipset
6	MINIC1	WLAN board slot
7	U72	???
8	SATA1	Hard drive connector
9	U52	Processor socket
10	U53	???
11	FAN1	Fan cable connector

System Switch

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. Your TravelMate notebook has a hardware pin (G41) for clearing a lost supervisor password. Go to page 20 for related instructions.



FRU (Field Replaceable Unit) List

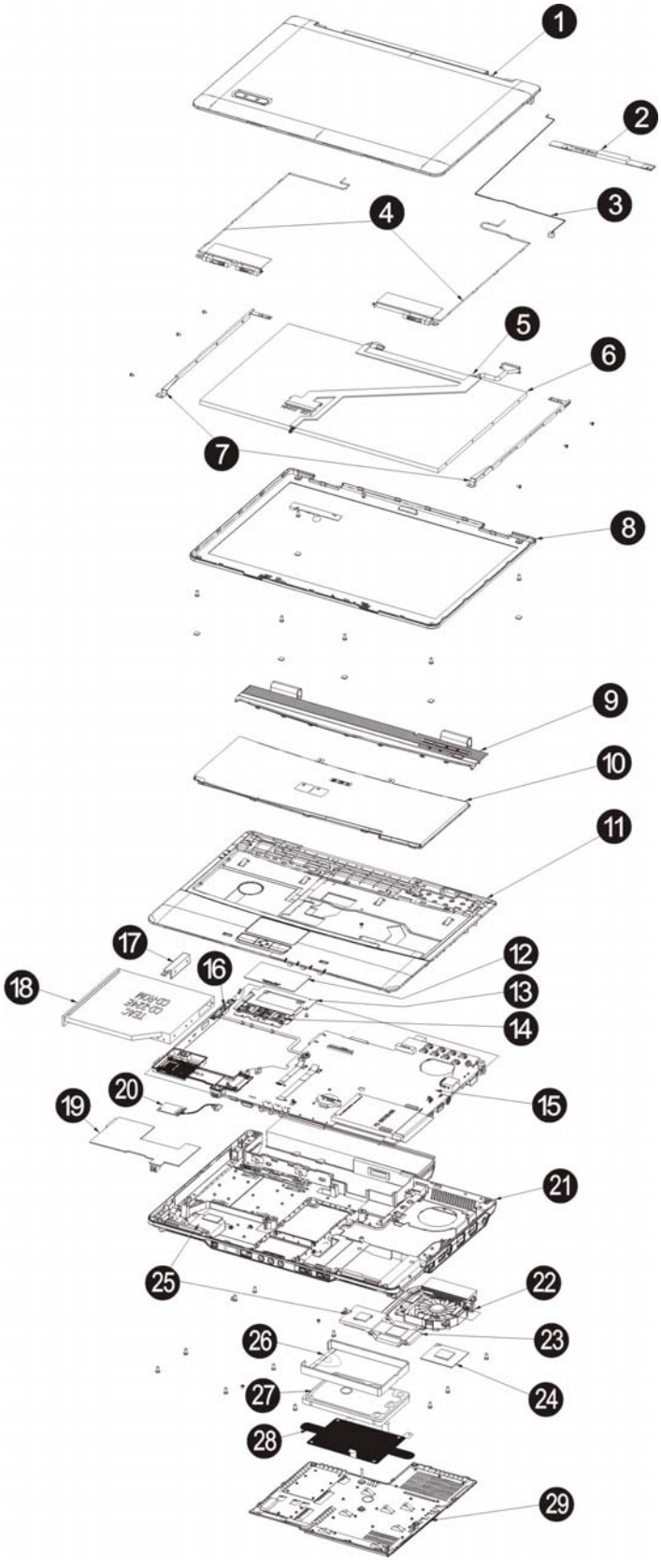
This chapter gives you the FRU (Field Replaceable Unit) listing in global configurations of Aspire 5910. Refer to this chapter whenever ordering for parts to repair or for RMA (Return Merchandise Authorization).

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.

NOTE: 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.

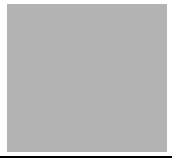
<all FRU description and PNs are not yet final. waiting for final FRU list>

Aspire 5910 Exploded Diagram



TravelMate 4520 FRU List

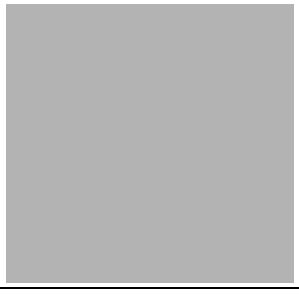
Category	No.	Part Name and Description	Acer Part No.
Audio-related			
			
			
			
Boards			
			
			
			
			
			
			

Category	No.	Part Name and Description	Acer Part No.
			
			
			
			
			
			
			
Cables			
			
			

Category	No.	Part Name and Description	Acer Part No.
			
			
			
			
			
Fan			
			
Hard Disk Drive			
			

Category	No.	Part Name and Description	Acer Part No.
Keyboard			
			

Category	No.	Part Name and Description	Acer Part No.
Keyboard (TM)			
LCD Panel			
			

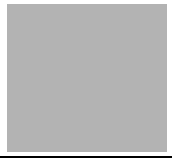
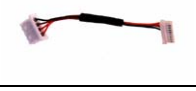
Category	No.	Part Name and Description	Acer Part No.
Mechanical parts			
			
			
			
			

Category	No.	Part Name and Description	Acer Part No.
			
			
			
			
			
			
Memory			
			
Optical Disc Drive			

Category	No.	Part Name and Description	Acer Part No.
Power-related			
			
Processor			

Category	No.	Part Name and Description	Acer Part No.
			
Screws			
Miscellaneous			

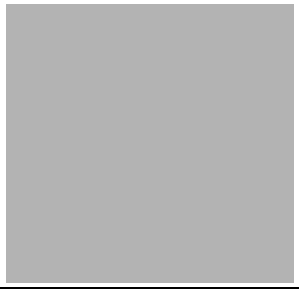
Category	No.	Part Name and Description	Acer Part No.
Audio-related			
			
			
			
Boards			
			
			
			
			
			
			

Category	No.	Part Name and Description	Acer Part No.
			
			
			
			
			
			
			
Cables			
			
			

Category	No.	Part Name and Description	Acer Part No.
			
			
			
Fan			
Hard Disk Drive			

Category	No.	Part Name and Description	Acer Part No.
Keyboard			
			

Category	No.	Part Name and Description	Acer Part No.
Keyboard (TM)			
LCD Panel			
			

Category	No.	Part Name and Description	Acer Part No.
Mechanical parts			
			
			
			
			

Category	No.	Part Name and Description	Acer Part No.
			
			
			
			
			
			
Memory			
			
Optical Disc Drive			

Category	No.	Part Name and Description	Acer Part No.
Power-related			
			
Processor			

Category	No.	Part Name and Description	Acer Part No.
			
Screws			
Miscellaneous			

TravelMate 4520 Series Model Configurations

This chapter provides features summary for each of the four TravelMate 4520 Series computer model configurations.

Model A (TravelMate 4220)

System Internal Part Number: 91.4U101.001G

System Board Internal Part Number: 55.4U101.001G/55.4U101.M01G

Component	Description	Part Number	Provider
Processor	Sempron 64 3600+ 25W F	KC.S3602.25F	AMD
North bridge	ATI RS690M	71.RS690.M05	ATI
South bridge	ATI SB600	71.SB600.M03	ATI
LCD module	AUO 14.1" WXGA non-glare	LK.14105.019	AUO
Memory	2x Samsung DDRII 667 512MB*2	KN.5120B.023	Samsung
Hard disk drive (SATA)	Seagate 2.5" 5400 rpm 80GB ST980811	KH.08001.030	Seagate
Optical disc drive	Panasonic Super-Multi drive 12.7mm Tray DL 8X UJ-850	KU.00807.055	Panasonic
Modem board	Lite-On Agere	54.09027.091	Lite-On
LAN controller	Marvell 8071 B0	—	Marvell
Bluetooth board	T60H928.01(Bluetooth)	56.25020.003	—
Wireless module	Fox BRM 4311 Minicard BG	54.03320.001	Fox
Camera module	Suyin Camellia CN0314-OV03	56.18012.041	Suyin
Fingerprint reader/ scroll key	scroll key	—	—
Inverter board	Foxconn 17" T62I240.00	19.21030.M45	Foxconn
Keyboard	US-International	9J.N8882.K1D	—
Touchpad board	Synaptics TM00450-001	56.17022.001	Synaptics
Battery pack	Simplo 6 cell, 2.0AHR	BT.00607.003	Simplo
Power cord	3-pin	27.01518.781	—
AC adapter	Delta 65W 1.7x5.5x11 SADP-65KB DFA LF	AP.06501.013	Delta

Model B (TravelMate 4520)

System Internal Part Number: 91.4U101.002G

System Board Internal Part Number: 55.4U101.001G/55.4U101.M01G

Component	Description	Part Number	Provider
Processor	Turion 64 X2 TL56 rev.G	KC.TTL02.56G	AMD
North bridge	ATI RS690M	71.RS690.M05	ATI
South bridge	ATI SB600	71.SB600.M03	ATI
LCD module	AUO 14.1" WXGA non-glare	LK.14105.019	AUO
Memory	Nanya DDRII 667 512MB*2 NT512T64UH8B0FN-3C	KN.51203.032	Nanya
Hard disk drive (SATA)	WD 2.5" 5400rpm 80GB WD800BEVS-22RST0	KH.08008.033	WD
Optical disc drive	Sony Super-Multi drive 12.7mm Tray DL 8X AD-7530A	KU.0080E.002	Sony
Modem board	Lite-On Agere	54.09027.091	Lite-On
LAN controller	Marvell 8071 B0	—	Marvell
Bluetooth board	T60H928.01(Bluetooth)	56.25020.003	—
Wireless module	Fox BRM 4311 Minicard BG	54.03320.001	Fox
Camera module	Bison Lotus BN30V4O714300	56.18011.041	Bison Lotus
Fingerprint reader/ scroll key	scroll key	—	—
Inverter board	Foxconn 17" T62I240.00	19.21030.M45	Foxconn
Keyboard	US-International	9J.N8882.K1D	—
Touchpad board	Synaptics TM00450-001	56.17022.001	Synaptics
Battery pack	Panasonic pack 2.0	BT.00605.006	Panasonic
Power cord	3-pin	27.01518.781	—
AC adapter	Lite-On 65W 1.7x5.5x11 PA-1650-02AC LF	AP.06503.016	Lite-On

Model C (TravelMate 4520)

System Internal Part Number: 91.4U101.003G

System Board Internal Part Number: 55.4U101.011G/55.4U101.M02G

Component	Description	Part Number	Provider
Processor	Turion 64 X2 TL64 rev.G	KC.TTL02.64G	AMD
North bridge	ATI RS690M	71.RS690.M05	ATI
South bridge	ATI SB600	71.SB600.M03	ATI
LCD module	Samsung 14.1” WXGA LTN141W3-L01-G GLARE 16MS, 200NITS	LK.14106.011	Samsung
Memory	Hynix DDRII 667 1GB HYMP512S64CP8-Y5	KN.1GB0G.006	Hynix
Hard disk drive (SATA)	WD 2.5" 5400rpm 160GB	KH.16008.019	WD
Optical disc drive	Pioneer Super-Multi drive 12.7mm Tray DL 8X DVR-K17RS	KU.00805.038	Pioneer
Modem board	Foxconn Conexant 3.3V	54.09018.051	Foxconn
LAN controller	Marvell 8071 B0	—	Marvell
Bluetooth board	T60H928.01(Bluetooth)	56.25020.003	—
Wireless module	Fox BRM 4311 Minicard BG	54.03320.001	Fox
Camera module	Suyin Camellia CN0314-OV03	56.18012.041	Suyin
Fingerprint reader/ scroll key	fingerprint reader	71.A1610.B0U	AuthenTec
Inverter board	17" RoHs VK.21189.406	19.21066.034	—
Keyboard	US-International	9J.N8882.K1D	—
Touchpad board	Synaptics TM00450-001	56.17022.001	Synaptics
Battery pack	Panasonic 6 cell, 2.4AHR	BT.00605.007	Panasonic
Power cord	3-pin	27.01518.781	—
AC adapter	Delta 65W 1.7x5.5x11 SADP-65KB DFA LF	AP.06501.013	Delta

Model D (TravelMate 4520)

System Internal Part Number: 91.4U101.004G

System Board Internal Part Number: 55.4U101.011G/55.4U101.M02G

Component	Description	Part Number	Provider
Processor	Turion 64 X2 TL66 rev.G	KC.TTL02.66G	AMD
North bridge	ATI RS690M	71.RS690.M05	ATI
South bridge	ATI SB600	71.SB600.M03	ATI
LCD module	Samsung 14.1” WXGA LTN141W3-L01-G GLARE 16MS, 200NITS	LK.14106.011	Samsung
Memory	Samsung DDRII 667 1GB*2 M470T2953EZ3-CE	KN.1GB0B.011	Samsung
Hard disk drive (SATA)	HGST 160 GB 2.5" 5400RPM SATA HTS541616J9SA00	KH.16007.011	HGST
Optical disc drive	Sony Super-Multi drive 12.7mm Tray DL 8X AD-7530A	KU.0080E.002	Sony
Modem board	Foxconn Conexant 3.3V	54.09018.051	Foxconn
LAN controller	Marvell 8071 B0	—	Marvell
Bluetooth board	T60H928.01(Bluetooth)	56.25020.003	—
Wireless module	Fox BRM 4321 Minicard ABGN	54.0309F.001	Fox
Camera module	Bison Lotus BN30V4O714300	56.18011.041	Bison Lotus
Fingerprint reader/ scroll key	fingerprint reader	71.A1610.B0U	AuthenTec
Inverter board	YEC 17" YNV-W06	19.21072.013	YEC
Keyboard	US-International	9J.N8882.K1D	—
Touchpad board	Synaptics TM00450-001	56.17022.001	Synaptics
Battery pack	Sanyo 6 cell 2.4AHR	BT.00603.040	Sanyo
Power cord	3-pin	27.01518.781	—
AC adapter	Lite-On 65W 1.7x5.5x11 PA-1650-02AC LF	AP.06503.016	Lite-On

Model E (TravelMate 4520)

System Internal Part Number: S2.TLD0Z.001

System Board Internal Part Number: 55.4U101.001G/55.4U101.M01G

Component	Description	Part Number	Provider
Processor	Turion 64 X2 TL64 rev.G	KC.TTL02.64G	AMD
North bridge	ATI RS690M	71.RS690.M05	ATI
South bridge	ATI SB600	71.SB600.M03	ATI
LCD module	AUO 14.1" WXGA non-glare	LK.14105.019	AUO
Memory	Samsung DDRII 667 1GB*2 M470T2953EZ3-CE	KN.1GB0B.011	Samsung
Hard disk drive (SATA)	HGST 160 GB 2.5" 5400RPM SATA HTS541616J9SA00	KH.16007.011	HGST
Optical disc drive	Sony Super-Multi drive 12.7mm Tray DL 8X AD-7530A	KU.0080E.002	Sony
Modem board	Lite-On Agere	54.09027.091	Lite-On
LAN controller	Marvell 8071 B0	—	Marvell
Bluetooth board	T60H928.01(Bluetooth)	56.25020.003	—
Wireless module	Fox BRM 4321 Minicard ABGN	54.0309F.001	Fox
Camera module	Bison Lotus BN30V4O714300	56.18011.041	Bison Lotus
Fingerprint reader/ scroll key	scroll key	—	—
Inverter board	17" RoHs VK.21189.406	19.21066.034	—
Keyboard	US-International	9J.N8882.K1D	—
Touchpad board	Synaptics TM00450-001	56.17022.001	Synaptics
Battery pack	Sanyo 6 cell 2.4AHR	BT.00603.040	Sanyo
Power cord	3-pin	27.01518.781	—
AC adapter	Lite-On 65W 1.7x5.5x11 PA-1650-02AC LF	AP.06503.016	Lite-On

Test Compatible Components

This computer's compatibility is tested and verified by Acer's internal testing department. All of its system functions are tested for the Business, Home Basic, and and Home Premium editions of Microsoft's latest operating system Windows Vista.

Refer to the following lists for components, adapter cards, and peripherals which have passed these tests. Regarding configuration, combination and test procedures, please refer to the TravelMate 4520 series Compatibility Test Report released by the Acer Mobile System Testing Department.

Hardware Compatibility Tests

Item	Specification
VGA/DVD-D/S-Video Port Test	
CRT monitor	Acer 211c 21" ViewSonic G220F ViewSonic PF790 19" Sony TV Trinitron (S-Video)
LCD monitor	Acer FP751 17" TFT LCD Acer AL1521 15" LCD monitor (DVI) Acer AL1721 17" LCD monitor (DVI) ViewSonic VD201b 20" LCD (DVI-I, DVI-D, D-sub) Westinghouse W37G (HDMI) HP LP2065 20" TFT monitor (DVI Port) HP S9500 19" monitor (DVI Port)
Projector	Dell 3300MP projector
USB Port Test	
USB mouse	Logicool USB mouse (OWCM-USB) Logitech USB Wheel Mouse Logitech First Wheel Mouse Dell by logitech HP USB Optical Austin Mouse Belkin MiniGlow optical USB mouse HP USB optical mouse (RB129AA)
USB keyboard	Microsoft Natural Keyboard Pro Dell USB keyboard Dell Internet Navigator Keyboard Dell Smart Card Keyboard
USB joystick	Logitech WingMan RumblePad (G-UA3)
USB speaker	Aiwa Multimedia Digital Speaker (SC-UC78) Peripheral Dolby headphone (5.1 channel) Panasonic USB Speaker (EAB-MPC57USB) JS iFun USB speaker
USB web camera	Intel Easy PC Camera (A20953-001) Orange Micro USB 2.0 Web Cam
USB scanner	Canon Scanner D1250 (JP OS only) HP 2400 Scanjet (USB 1.1)
USB printer	HP 450wbt Deskjet Printer (USB/Bluetooth)

Hardware Compatibility Tests

Item	Specification
USB hub	ATEN UH-204 4 -port USB hub IOGEAR 4-port USB hub Corega WLAN USB Stick-11 (CG-WLUSBST11)
USB card reader	PQI 6-in-1 Flash Card Reader/Writer
USB Zip drive	Iomega USB Zip 250 MB
USB hard drive	Fujitsu DynaMO-1300 1.3G Transcend 80G HDD (with IEEE1394) Galileo Mass Storage 2.5 Travel Kit (with IEEE 1394) Transcend 2.5" Portable 80 GB HDD **Note**: Place computer in AC power mode when transferring large amount of data.
USB optical drive	Plextor DVD+R/RW LG DVD+R/RW 16X (with IEEE1394) Sony DVD+R/RW 16X (with IEEE1394) Logitec CD-RW+ DVD-ROM combo drive
USB flash drive	Sony 128 MB Memory Key Sony 5 GB Micro Vault Pro USB Flash Drive IBM 128 MB USB Memory Key IBM 512 MB Memory Key Apacer 256 MB Handy Drive
IR Port Test	
IR printer	HP LaserJet 2200 HP 450wbt Deskjet
Mobile phone	Sony Ericsson T610 Motorola V600 Nokia 6820
IEEE 1394 Port Test	
1394 storage device	LG DVD+R/RW 16X SONY DVD+R/RW 16X Transcend 2.5" Portable 80 GB HDD
1394 camera	Sony DV
1394 hub	ATEN FH-600 Firewire 6-port expansion hub
WLAN Access Point Test	
Access point 802.11b	Cisco Aironet 350 Cisco Aironet 1230
Access point 802.11a	Intel Pro/Wireless 5000 Netgear HE102
Access point 802.11g	D-Link Wireless 108G gaming router
Access point 802.11n	D-Link WiFi 802.11n Rangebooster N 650 BUFFALO WZR-G144N AirStation Wireless IEEE 802.11n/g/b Belkin N1MIMO wireless router
Bluetooth Access Point Test	X Bridge Bluetooth Access Point BT300
Bluetooth Device Test	Sony Ericsson Wireless Headset Sony Ericsson T610 X Bridge BT300 Bluetooth Access Point EPSON Bluetooth Print Adapter HP Deskiet 450wbt AmbiCom Bluetooth Wireless CompactFlash Card with PC Card Adapter

Hardware Compatibility Tests

Item	Specification
PC Card Test	
LAN/modem card	CardBus Ethernet 10/100 32Bit(CBE-10/100BTX)
Storage card	IOmega Click! 40 MB Hitachi Microdrive 4 GB
USB 2.0 card	IBM EtherJet CardBus Adapter 10/100 Adaptec USB2 Connect IOGEAR Cardbus Card USB 2.0
1394 card	Buffalo 1394 Interface Cardbus (4 pin) (IFC-ILCB/DV) I-O Data 1394 Interface Cardbus (6 pin) (CB1394/DVC)
GPRS card	Vodafone QL1ACC-21581 3G/GPRS card Sony Ericsson GC83 GPRS card Sony EricssonGC89 GPRS card
Memory Card Test (SD/MS/MMC/CF/xD)	
Secure Digital (SD)	Apacer 128/256 MB SD card Transcend 256 MB SD card SanDisk 256 MB SD card Apacer 2 GB SD card (150x Hi-Speed) Kingmax 1GB SD card (66x Hi-Speed) SanDisk I GB SD card RIDATA 4 GB SD PRO Memory Card
Memory Stick (MS)	I-O DATA 64 MB Memory Stick Apacer 128 MB Memory Stick Sony 512 MB Memory Stick Pro Lexar High-speed 512 MB Memory Stick Pro Duo Lexar High-speed 1 GB Memory Stick Pro Duo SanDisk 1GB Memory Stick Pro Sony High-speed 2 GB Memory Stick Pro Dou Sony 2 GB Memory Stick Pro
MultiMedia Card (MMC)	SanDisk 32MB MMC Apacer 128 MB MMC Transcend 64/128 MB MMC Transcend 128 MB MMC Transcend 256 MB MMC SanDisk 128 MB RS-MMC PQI 256 MB RS-MMC Mobile\ Transcend 512 MB MMC A-DATA Turbo 200X 2 GB MMC
CompactFlash	Apacer 256/512 MB Compact Flash Card SanDisk 2 GB Compact Flash Card
extreme Digital	Olympus 512 MB xD-Picture Card

Games and Software Compatibility Tests

Item	Specification
Games	Blizzard q WarCraft III (CD-04-062) q WarCraft III - Frozen Throne Expansion Pack (CD-04-157) + (DX8.1, Patch 1.18 or later) Atari q Neverwinter Nights + Patch v1.62 (CD-04-220 / WKS) q Unreal Tournament 2004 (CD-04-140) ID Software q Quake III Arena (CD-04-057) q Quake IIII (CD-04-197) Activision q Call of Duty 2 (CD-04-203) q Star Wars Jedi Knight: Jedi Academy (CD-04-192) q Doom 3 (CD-04-194) + Doom 3 (DX9.0b) Electronic Arts q A Battlefield 1942 (CD-04-107/WKS) q Battlefield 2 (CD-04-207) + (DX 9.0c, Patch 1.01) q Command & Conquer Generals (CD-04-222 / WKS) q Madden NFL 2006 (CD-04-216) q Nascar Thunder 2004 (CD-04-113) q Nascar SimRacing (CD-04-228) q NBA LIVE 2006 (CD-04-214 / WKS) q Tiger Woods PGA Tour 2006 (CD-04-199) q Medal of Honor Allied Assault Spearhead Expansion Pack (CD-04-122-1) q FIFA World Cup GERMANY 2006 (CD-04-234) q Sports FIFA 2006 Soccer (CD-04-236) q Need for Speed - Under Ground II (DX9) Microsoft q Flight Simulator 2004 A Century of Flight (CD-04-074) q Halo (CD-04-078) q Rise of Nations 1.0 (CD-04-079 / WKS) Sierra Half-Life 2 (CD-04-237) Crytek Far Cry (CD-04-154) Interwise Silent Hunter III (CD-04-226) Ubisoft Tom Clancy's Splinter Cell: Chaos Theory (CD-04-230) FIFA Soccer 06 2006 FIFA World Cup 仙境傳說 (2D)
System utilities and applications	PowerDVD Windows DVD Maker NTI-CD Maker Acrobat Reader Microsoft Office Norton Internet Security Acer Launch Manager Wireless AP Bluetooth AP

Technical Specifications

This section provides technical specifications for the system hardware components.

Processor

Item	Intel Core 2 Duo Processor Number				
	T7600	T7400	T7200	T5600	T5500
CPU speed	2.33 GHz	2.16 GHz	2 GHz	1.83 GHz	1.66 GHz
Bus speed	667 MHz	667 MHz	667 MHz	667 MHz	667 MHz
Bus/core ratio	14	13	12	11	10
L2 cache size	4 MB	4 MB	4 MB	2 MB	2 MB
L2 cache speed	2.33 GHz	2.16 GHz	2 GHz	1.83 GHz	1.66 GHz
Manufacturing technology	65 nm				
Core stepping	B2				
CPUID string	0X6F6				
Thermal design power	34W				
Thermal specification	100° C				
Core voltage	1.0375 - 1.30V				
Socket type	LGA775				
Core logic	Mobile Intel 945PM Express Chipset ❑ North bridge: 82945PM (MCH) ❑ South bridge: 82801GBM/GHM (ICH7-M)				
Technologies	❑ Intel Virtualization Technology (T5500 does not support this technology) ❑ Enhanced Intel SpeedStep ❑ Intel 64-bit architecture ❑ Execute Disable Bit				

System Controllers

Item	Specification
Storage controller	Intel ICH7-M
Memory controller	Intel 82945PM
Graphics controller	ATI Mobility Radeon X2300 HD
Audio controller	Realtek ALC883 Azalia HD Audio Codec
USB controller	Integrated in the Intel ICH7-M
Keyboard/touchpad controller	Winbond WPC8768L
LAN controller	Broadcom NetLink BCM5787 Gigabit Ethernet Controller with PCI Express

System Controllers

Item	Specification
WLAN controller	Options include: ❑ Intel PRO/Wireless 3945ABG Network Connection ❑ Intel Wireless Wi-Fi Link 4965AGN ❑ Intel PRO/Wireless 2200BG Network Connection

Memory

Item	Specification		
Memory controller	Intel 82945PM		
DIMM slot number	2		
Maximum memory size per socket	2048 MB		
Maximum memory	4 GB (2 GB soDIMM installed in both DIMM slots)		
DIMM type	DDR II synchronous DRAM		
Provider	Hynix		Nanya
Model	HYMP564S64C P6-Y5 AB	HYMP512S64C P8-Y5 AB	NT512T64UH8B0FN-3C
DIMM size	512 MB	1 GB	512 MB
DIMM speed	667 MHz		

Memory Population Options

The following table lists possible system memory configurations. You may combine DIMMs of various capacities to form other combinations. The configuration for slot 1 and slot 2 could be reversed.

Slot 1	Slot 2	Total Memory
0 MB	256 MB	256 MB
0 MB	512 MB	512 MB
0 MB	1024 MB	1024 MB
0 MB	2048 MB	2048 MB
256 MB	256 MB	512 MB
256 MB	512 MB	768 MB
256 MB	1024 MB	1280 MB
256 MB	2048 MB	2304 MB
512 MB	256 MB	768 MB
512 MB	512 MB	1024 MB
512 MB	1024 MB	1536 MB
512 MB	2048 MB	2560 MB
1024 MB	0 MB	1024 MB
1024 MB	256 MB	1280 MB
1024 MB	512 MB	1536 MB
1024 MB	1024 MB	2048 MB
1024 MB	2048 MB	3072 MB
2048 MB	0 MB	2048 MB
2048 MB	256 MB	2304 MB
2048 MB	512 MB	2560 MB
2048 MB	1024 MB	3072 MB
2048 MB	2048 MB	409 6MB

Video Interface

Item	Specification
Graphics controller	ATI Mobility Radeon X2300 HD
Package	Micro-FCBGA 465-pin
Video memory	256 MB
Memory bus width	128-bit
Memory type	Graphics Double Data Rate 3 (GDDR3)
Compatibility	❑ Microsoft DirectX 9.0c ❑ PowerPlay 6.0

Audio Interface

Item	Specification
Audio controller	Realtek ALC883 Azalia
Amplifier	G1431, G1412, and G1442
Internal speakers	❑ One speaker grill with 2W L/R stereo speakers ❑ One 2.5W subwoofer
Internal microphone	Two built-in stereo microphones
Supported audio technologies	❑ Intel HD Audio (integrated in the Intel ICH7-M) ❑ Dolby SurroundSound ❑ Dolby Home Theater ❑ S/PDIF ❑ MS-Sound

USB Interface

Item	Specification
USB controller	Integrated in the Intel ICH7-M
USB specification	2.0
Number of USB port	4 (two each on the left and right sides)

Keyboard

Item	Specification
Keyboard controller	Winbond WPC8768L
Keyboard layout	88-/89-/93-key keyboard with international language support
Features	❑ Embedded numeric keypad ❑ Inverted "T" cursor keys, 12 function keys, Windows® key, independent US and Euro dollar sign keys, and hotkey controls ❑ Acer MediaTouch keys: play/pause, stop, previous, next, and record keys ❑ Easy-launch keys: WLAN, Internet, email, Bluetooth, Acer Empowering, and Acer Arcade
Simultaneously support for internal and external keyboard	Yes

LAN Controller

Item	Specification
LAN controller	Broadcom NetLink BCM5787 Gigabit Ethernet Controller with PCI Express
Data link protocols	❑ Ethernet ❑ Fast Ethernet ❑ Gigabit Ethernet
Remote management protocol	DMI 2.0
Interface type	PCI Express x1
LAN connector type	RJ-45
LAN connector location	Left side
Features	❑ Wake on LAN (WOL) ❑ ACPI 2.0

WLAN Controller

Specification	WLAN Module	
	Intel PRO/Wireless 3945ABG	Intel Wireless Wi-Fi Link 4965AGN
Dimensions (H x W x D)	2.00 x 1.18 x 0.18 in (50.95 x 30 x 4.5 mm)	2.00 x 1.18 x 0.13 in (50.95 x 30 x 3.30 mm)
Weight	6g	7.2g
Diversity	On-board dual diversity switching support for systems designed with two antennas	On-board diversity support for systems designed with two or three antennas
Radio ON/OFF control	Supported in both hardware and software	
Connector interface	Mini Card form factor, based on PCIe electrical interface	
LEDs Output	Link, Activity	Single LED
Operating temperature	0 to +80° C	
Humidity Non-operating	50% to 92% RH non-condensing (at temperatures of 25° C to 80° C)	50% to 90% RH non-condensing (at temperatures of 25° C to 35° C)
Operating system	Microsoft Windows XP (Professional, Home, Tablet), 2000	Microsoft Windows 2000, XP (32/64-bit), and Vista (32/64-bit)
Wi-Fi Alliance	Wi-Fi CERTIFIED for 2.4 GHz and 5 GHZ band, WMM, WPA and WPA2	Wi-Fi Certified for 802.11a, 802.11b, 802.11g, WMM, WPA, and WPA2 (Wi-Fi Alliance Draft-N and 802.11n certifications expected when available)
Microsoft WHQL	Yes	
IEEE WLAN standard	IEEE 802.11a, IEEE 802.11g and IEEE 802.11b	IEEE 802.11a, IEEE 802.11b, IEEE 802.11g, (targeting IEEE 802.11n when available)
Architecture	Infrastructure or ad hoc (peer-to-peer)	
Data rate	Up to 54 Mbps data rates	Up to 300 Mbps Draft-N data rates
Encryption	64-bit and 128-bit WEP, AES-CCMP, CKIP, TKIP	CKIP, TKIP, 64-bit and 128-bit WEP (for 802.11a/b/g), AES-CCMP (for 802.11a/b/g/n)

Modem

Item	Specification
Data modem data baud rate (bps)	56K
Supports modem protocol	V.90/V.92 WWDAA
Modem connector type	RJ-11
Modem connector location	Right side

Bluetooth Interface

Item	Specification
Chipset	Foxconn Broadcom 2045
Data throughput	723 bps (full speed data rate)
Protocol	Bluetooth 1.1 (Upgradeable to Bluetooth 1.2 when SIG specification is ratified).
Interface	USB 1.1
Connector type	USB

Battery Pack

Item	Specification							
Type	Lithium-ion (Li-ion)							
Vendor	Panasonic		Sanyo		Sony		Simplo	
Number of cells	6	8	6	8	6	8	6	8
Capacity (mAh)	4000	4800	4000	4800	4000	4800	4000	4800

AC Adapter

Item	Specification		Specification	
Vendor	Delta		Lite-On	
Model Name	SADP-65KB DBE	ADP-90SB BBEA LF	PA-1650-02WR	PA-1900-24AR
DC output power	65W	90W	65W	90W
AC input voltage	100V	100-240V	100V	100-240V
DC output voltage	19 VDC			
AC input frequency	50-60 Hz			

Hard Disk Drive

Specification	Capacity		
	80 GB	120 GB	160
Provider	Seagate	Toshiba	Seagate
Model			
Part number	ST980811AS	MK1237GSX	ST9160821AS
Formatted capacity		120 GB	
Number of disks		2	
Number of data heads		4	
Interface		ATA7/Serial ATA 1.0a	
Seek time (average)		12ms	
Rotational speed		5,400 (±0.1%) rpm	
Data transfer rate Internal Buffer to Host		 335 to 613 Mb/s 300 MB/s	
Buffer		8 MB	
Dimensions (mm) Height Width Depth		 9.5 69.85 100.0	
Weight		102g (max)	
Allowable voltage		5V ±5%	
Temperature Operating Non-operating		 5 to 55° C -40 to 60° C	
Humidity (non-condensing)		8–90%R.H.	
Vibration Operating Non-operating		 9.8m/s2 (1G) 49m/s2 (5G)	

Optical Disc Drive

Item	Specification		
Provider	HLDS	Sony	Pioneer
Model	GSA-T20N	AD-7560A	DVR-K17RS
Drive type			Internal Slim DVD/CD writer
Data transfer rate			Write: • CD-R: 24X • CD-RW: 24X • DVD-RW: 6X • DVD-R/+R/+RW: 8X Write • DVD-RAM: 5x
Interface			Enhanced IDE(ATAPI) compatible
Supported disc formats			DVD-RAM, DVD-R/RW, DVD+R (SL, DL)/RW, CD-R/RW, DVD-ROM, DVD-RAM, DVD-R, DVD-RW, DVD+R (SL, DL), DVD+RW; CD-R, CD-RW, CD-ROM, CD-ROM XA, CD-DA, CD-I, CD-Extra, CD-Text, Photo CD, Video CD
Buffer memory			2 MB
Power supply			5V DC

LCD Panel

Specification	Provider		
	CMO	AUO	Samsung
Model name	N154I2	B154EW02 V1	LTN154AT01-001 G <can't locate this model>
Screen size	15.4" (wide)	15.4" (wide)	
Resolution (H x V)	1280x800 WXGA	1280x800 WXGA	
Color support	262K	262K	
Brightness (nits)	200	200	
Contrast ratio	400:1	400:1	
Viewing angle	20/45/45/45 (U/D/R/L))	80/40 (H/V)	
Power consumption (without inv)	5.2 W	6.5 W	
Outlines (W x H x D, mm)	344x 222x6.2	344.0 x 222.0 x 5.8	
Weight	540 g	500 g	
Response time	16 ms	16 ms	
Electrical interface	LVDS	1ch LVDS	

LCD Inverter

Item	Specification
Vendor & model name	Darfon/V189-301GP
Brightness conditions	N/A
Input voltage (V)	9~21
Input current (mA)	2.56 (max)
Output voltage (V, rms)	780V (2000V for kick off)
Output current (mA, rms)	6.5 (max)
Output voltage frequency (k Hz)	65K Hz (max)

System BIOS

Item	Specification
BIOS vendor	Phoenix
BIOS version	v0.14
BIOS ROM	Winbond W25X80 spiFlash Memory
BIOS ROM size	1M byte fLASH ROM SST
BIOS package	8-pin SOIC 208mil
Supported industry standards	❑ PCI 2.2 or later ❑ System/HDD Password Security Control ❑ INT 13h Extensions ❑ PnP BIOS 1.0a ❑ SMBIOS 2.4 or later ❑ BIOS Boot Specification (Compal, Phoenix, Intel). ❑ 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 ❑ Support Intel HD Audio ❑ WfM 2.0 ❑ Preboot Execution Environment (PXE) 2.1 ❑ Boot Integrity Service Application Program Interface (BIS) 1.0 ❑ PC2002/2005 compliant ❑ Intel Enhanced SpeedStep Technology ❑ AHCI support
BIOS password control	Via Setup Utility's Security menu (Set Supervisor Password)

Power Management

Item	Specification
Power management standard	ACPI 1.0b/2.0/3.0

System power management states	❑ Mechanical Off (G3) – All system devices are turned off completely.
	❑ Soft Off (G2/S5) – OS initiated shutdown. All devices in the system are turned off completely.
	❑ Working (G0/S0) – Individual devices such as the processor and hard disk may be power managed in this state.
	❑ S3 Sleeping State
	  ❑ CPU set power down
	  ❑ VGA suspend
	  ❑ Audio power down
	  ❑ Hard disk power down
	  ❑ Optical drive power down
	  ❑ Card reader function suspend
	❑ S4 Sleeping State (hibernation mode) – All system states and data are saved onto disk before power shutdown. The same session is restored the next time the system is powered on.

Processor power management states	To further conserve power in a Working state, the processor enters a low-power state when the OS is idle. ❑ C1 state – CPU halt instruction ❑ C2 state – CPU stop grant state ❑ C3 state – CPU stop clock state

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