Using the Battery

Your computer uses a smart rechargeable Lithium-ion (Li-ion) battery pack for power when the AC adapter is not attached to an electrical outlet. The smart battery gives a accurate measurement of the current battery capacity which helps extend operating time by enabling effective power management in operating systems that take advantage of the accurate information supplied by the battery.

Charging the Battery

Your computer's battery starts charging automatically when you connect the power to the computer and to an electrical outlet. If the computer is off, the battery charges faster than if the computer's power is on.

Approximate charging times for the Li-Ion battery are

- 3 hours with the computer off.
- 6 hours with the computer on.

While the battery is charging normally, the battery charge light on the computer is red. When the battery is fully charged, the light changes to green.

When you use a new battery pack for the first time or use a battery after a long period of storage, the initial battery life is shorter than normal. Normal battery life resumes after a few discharge-recharge cycles.

Follow these rules for charging your battery:

- A battery normally discharges power when not used for long periods of time. Be sure to recharge the battery every two months when it is not in use.
- Make it a practice to discharge your battery fully before recharging the battery. This can help extend the life of the battery.
- Do not attempt to charge the battery in temperatures of under 5°C or over 35°C

All batteries eventually wear out and lose the ability to hold a charge. You may need to replace your battery pack after a year of average usage.

Safely Using the Battery

Follow these guidelines to safely use the battery:

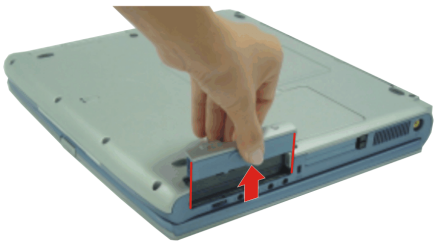
- Turn off your computer and unplug it if you accidentally:
  - Expose the equipment to liquid.
  - Drop, jar, or damage the computer.
- Use only approved battery chargers.
- Do not disassemble the battery, heat it above 100°C, or burn it. The battery used in this computer may cause a fire or chemical burn if mistreated.
- Your computer's rechargeable battery may be considered hazardous waste. If you replace your battery with a new one:
  - Keep the old battery out of the reach of children.
  - Dispose of the old battery promptly.
  - Make sure that you follow all local requirements when you dispose of the old battery.

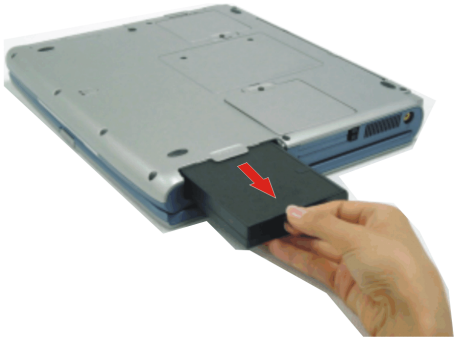
Removing the Battery

Your computer comes with the battery pack inserted in the computer.

To remove the battery from the computer:

1. Turn the computer's power off.
2. Close the LCD panel, and turn the computer over so that the bottom of the unit faces up.
3. Slide the battery compartment cover straight up and off the computer.





4. Grasp the tab on the battery and pull the battery out of the compartment.

Installing the Battery

To install the battery pack:

1. With the computer's power off, close the LCD panel and turn the computer over so the bottom of the unit faces up.
2. Slide the battery compartment cover straight up and off the computer.

Insert the battery into the battery compartment, ensuring the correct orientation so that the battery fits in its slot properly.

3. Slide the battery pack into the compartment. Make sure the battery is fully inserted into the compartment.
4. Align the tabs on the battery compartment cover with the slots on the battery compartment.
5. Push the cover straight down until it snaps into place.

Monitoring the Battery Charge

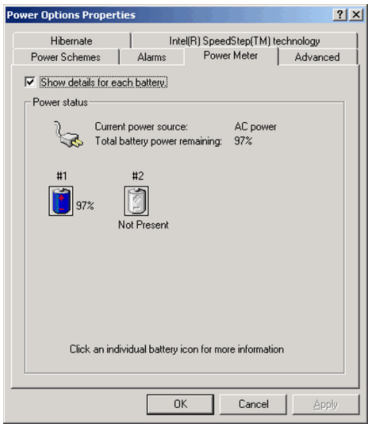
Battery life is affected by factors such as the power-management settings in System Setup, the applications you use, and the brightness settings of the LCD. Under normal usage, the battery charge lasts approximately 3 hours.

Battery life estimates are subject to variation. The actual life of your battery may be less than the estimates given in the manual.

You can monitor the charge of the battery pack installed in your computer by using the Power Meter or Battery Gauge.

Power Meter

The Power Meter displays the charge of the batteries and the current source of computer power, AC or batteries. You may monitor the battery charge or usage by using the “Power Meter”. To access the power meter click  icon on the task bar or click **Start** > **Settings > Control Panel** > **Power Options** > **Power Meter** Tab.



The Power Status icons shown below are displayed during Battery Charging Operations


At ~15% and 10% remaining battery power the current power source and the battery Icons respectively change to the icon shown below and you should follow the instructions in “Battery Warnings” section below

You may also check battery charge by moving the cursor to the  icon, a small dialog box will display the % of charge.

Battery Gauge

You may display the battery gauge while you are in any program by pressing <Fn+F6>. While the battery gauge is being displayed, all keys except <Esc> are disabled. The battery gauge is only displayed for a few seconds.

Power Source:

- Indicates that the computer is powered by the AC adapter.

- Indicates that the computer is powered by the battery.

Battery Level:

- The top/right section indicates the approximate amount of the primary battery charge remaining.

Battery Warnings

If the battery charge is low (about 10%) you have approximately 5–10 minutes of battery life left. **You should:**

- Save your work and,
- Connect the power cord to the computer or turn off the computer and install a fully charged battery.

You can adjust the battery alarm features by using the operating systems power management program (**Start** > **Settings > Control Panel** > **Power Options** > **Alarm** Tab in Windows).

If you cannot run your computer from the battery and the battery will not charge when you attach the power cord, **the problem may be that:**

- The battery temperature is below 10°C or over 32°C. If you think the battery temperature is too hot or too cold, turn off the computer, remove the battery, and let the battery reach room temperature. Then try charging the battery again.
- The battery is defective. Replace the battery with a new battery.

Battery Calibration

Calibrating your battery once a month is one of the recommended methods of increasing your computer's battery life. To calibrate the battery complete the following steps:

Calibration Notes:
You should start the battery calibration process with a fully charged battery, battery status LED is green. The power meter may not show 100%.

Before you commence the battery calibration process you should fully charge, then fully discharge and finally fully recharge the battery again.

1. Disconnect the AC power adapter after turning off the system.
2. Restart your computer and press **<F2>** to enter BIOS setup.
3. Using the arrow keys, highlight **Battery Calibration** in the **Power** menu.
4. Press **Enter** to start calibration process. The calibration usually takes 2 to 3 hours depending on the current battery charge.
5. When the calibration process is complete, recharge the battery fully.

Using System Setup

The System Setup program enables you to configure your computer hardware and set security and power-savings options. The settings you choose are stored in battery-maintained CMOS memory that saves the information even when the computer's power is turned off. When your computer is turned back on, it is configured with the values found in this memory.

Run System Setup if you get a message prompting you to run the program. You may also want to run System Setup, particularly the first time you use your computer, to set the time and date, use security or power-management features, or alter the settings of other features.

Your computer's version of System Setup may not include all the fields listed here or may include additional fields. Field names and order of appearance can vary according to the version of the BIOS (basic input/output system) on your computer.

Starting System Setup

To start System Setup, turn on your computer and then press <F2> when prompted. The System Setup screen appears.

The top of the System Setup screen has a menu bar with the selections listed in Table 5.

Table 5. System Setup Menus

Menu	Function
Main	Changes the basic system configuration.
Advanced	Configures advanced features on your computer.
Security	Enables security features, including passwords and backup and virus-check reminders.
Power	Configures power-management features.
Boot	Specifies the order of boot devices and configures boot features.
Exit	Specifies how to exit System Setup.

To open a menu, use the left or right arrow keys to select the menu name and then press <Enter>.

Table 6. System Setup Navigation Keys

Navigation Key	Alternate Key	Function
<F1>	<Alt+H>	Displays the General Help window.
<Esc>		Exits the current menu.
<Left Arrow> and <Right Arrow> keys	Keypad arrow keys	Select a different menu. Pressing <ESC> at the Main menu brings you to the Exit menu.
<Up Arrow> and <Down Arrow> keys	Keypad arrow keys	Move the cursor up and down between fields.
<Tab>		Moves the cursor forward through the cells for a highlighted field.
<Tab+Shift>		Moves the cursor backward through the cells for a highlighted field.
<Home>	<PgUp>	Moves the cursor to the field at the top of the window.
<End>	<PgDn>	Moves the cursor to the field at the bottom of the window.
<F5>	<->	Scrolls backwards through the options for the highlighted field.
<F6>	<+> or <Space>	Scrolls forward through the options for the highlighted field.
<F9>		Sets the parameters for the current menu to their default values.
<F10>		Sets the parameters for the current menu to their previous values.
<Enter>		Executes commands or opens a submenu.

Changing Booting Priority

The Boot menu in System Setup enables you to select the booting device and to set booting options.

Boot Device Priority field enables:
You to select the order in which the computer attempts to boot from different devices. The field has three (3) options: **CD-ROM Drive, Removable Devices and Hard Drive**.

To change the booting device priority, choose the device positions by completing the following:

1. At startup, press <F2> to open **System Setup**
2. Use <Right Arrow> or <Left Arrow> to select the **Boot** menu.
3. Press <Enter> in the **Boot Device Priority** field.
4. Highlight the option with the <PgUp> or <PgDn> keys.
5. Use <-> or <+> keys to move the boot device up or down in the list of options.
6. Press <Esc> to return to the Boot menu.
7. Press <Esc> to go to the exit menu.
8. Select Exit Save Changes, press <Enter>.
9. Press <Enter> again to restart the computer.

If you want to start the system using a bootable CD, change the CD-ROM Drive to be the first priority and make sure that Auto is set in the Type field of the Secondary Master Submenu at Main page.

Using System Security

This section describes your computer security programs. The first is the standard BIOS security which is standard on almost all computers. The second is a advanced factory option *Biometric* security system that uses your fingerprint(s) to control access to your computer and individual files if necessary. You no longer have to worry about passwords being lost, stolen or forgotten.

Bios Security

The BIOS security operations are explained below:

System Passwords

The computer provides two levels of password security: administrative-level (supervisor) and user-level (user). Either password prevents unauthorized access to the computer. The supervisor password enables full access to all System Setup fields. The user password enables full access to only the *Set User Password* and *Password on boot* security fields and read access to all other System Setup fields.

If multiple users have access to the computer (such as in a network environment), a supervisor password can prevent unauthorized access to certain security options.

Choose the type of password security that is appropriate for your work. If you want to set a user password, you must set a supervisor password first.

If You Forget Your Password

It is very important that you do not forget your password. If you do, you cannot access your system. Write your password down and keep it in a safe place. If you do forget and cannot find the written note, please contact the Samsung Helpline. Please have your receipts available to verify the type and model of your computer. You may be charged for password removal.

Creating a Password

To create a password:

1. At startup, press <F2> to open System Setup.
2. Use the <Right Arrow> key to select the Security menu.
3. Use the <Down Arrow> key to select *Set Supervisor Password* or *Set User Password.*
4. Press <Enter>. The Set Password dialog box appears.

5. Type a password of up to seven characters. You can enter letters or numbers, but you cannot use the function keys, such as <Shift>. Your computer does not distinguish between capitalized and lowercase letters in your password. As you type the password, the cursor moves but your password does not appear on the screen.
6. Press <Enter> after you have typed your password. The computer prompts you to reenter your password for verification.
7. Type your password again and press <Enter>. A message appears telling you that the changes have been saved. Press <Enter> again to return to the Security menu.
8. Press <Esc> to go to the Exit menu.
9. Select *Exit Saving Changes*, press <Enter>, and press <Enter> again to restart the computer.

Deleting a Password

To delete the password:

1. At startup, press <F2> to open System Setup.
2. Type your password when prompted and press <Enter>.
3. Use the <Right Arrow> key to select the Security menu.
4. Use the <Down Arrow> key to select *Set Supervisor Password* or *Set User Password.*
5. Press <Enter>. The computer prompts you to enter the current password.
6. Press <Enter>. The computer prompts you to enter a password. Do not type anything.
7. Press <Enter>. The computer prompts you to re-enter the password. Do not type anything.
8. Press <Enter>. A message appears telling you that the changes have been saved. Press <Enter> again to return to the Security menu.
9. Press <Esc> to go to the Exit menu.
10. Select *Exit Saving Changes*, press <Enter>, and press <Enter> again to restart the computer.

Requiring a Boot Password

After you create a supervisor or user password, you can enable the computer to prompt for a password each time it starts.

To enable the prompt, select the option *Enabled* in the *Password on boot* field in System Setup. For more information about the *Password on boot* field.

Biometric Security

The factory optional fingerprint sensor provides unique security access to your computer. You will no longer have to worry about losing or forgetting your password. Since every person has a unique set of fingerprints, only a biometrically enrolled person may have access to your computer.

Advantages of Biometric Security are:

- Very high level of security
- No password to remember, lose or have stolen.
- Streamlined logon process.
- Single fingerprint will access many programs, eliminating passwords.

If you purchased the Biometric Security option, please refer to the manual provided for installation and use.

Using Power Management Options

Your computer includes **Power Management** options that can help the battery charge last longer and extend the life of the battery. Power-management options will slow down or shut off system components when the components are not being used.

Power management may slow down system performance. Your computer runs fastest with the power cord attached, when power management is disabled.

In the next sections, basic and advanced methods of power management will be discussed.

Intel® SpeedStep™

Intel® SpeedStep™ will control the CPU speed on your system according to the kind of power supply as part of power saving management.

To use this function, your system must meet the conditions below:

- Intel SpeedStep Applet Support
- BIOS and OS Support

Basic Power Management Schemes

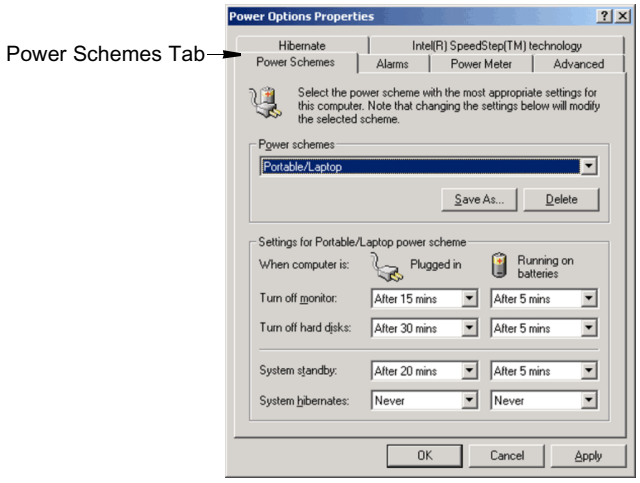
This section discusses the basic schemes of power management when the computer is operating on battery power or using AC power.

Standby vs. Hibernation
Standby unlike hibernation mode does not store unsaved information on your hard disk; it's stored only in the computer memory. If there is an interruption in power, the information is lost. So before putting your computer on standby, you should save your files.

Changing Devices:
Do not change PC Cards while in standby or hibernate modes.

To enter the power management window complete the following:

1. Click **Start** > **Settings > Control Panel**.
2. Click **Power Options** icon to display the **Power Options Properties** window.
3. Click the **Power Schemes** tab to display the basic power management options.



4. Select the time that you wish each of the following actions to occur in **Battery** and **AC power** mode.
   - Turn off monitor:
   - Turn off hard disks:
   - System standby:
   - System hibernates:

Turning off the monitor and HDDs will save a substantial battery power, therefore when in battery only mode select the shortest time practical.

- **Hibernate Mode** (*Power Management or Manual Method*)

  When hibernation is used, your computer turns off and when you power up again, everything is restored exactly as you left it—including programs and documents you may not have saved or closed. Everything in memory gets saved to the HDD, and the monitor and hard disk get turned off.

Frequent Interruptions:
If you experience frequent interruptions, you might also consider putting your computer into automatic hibernation after a specified number of minutes using the power management options.

- **Standby Mode** (*Power Management or Manual Method*)

Standby is used mainly for conserving battery power in your notebook computer. It also gives you the benefit of getting right back to your work without waiting for the computer to restart. Standby turns off your monitor and hard disks, placing your entire system in a low-power state. When you return to your computer, restores your desktop exactly as you left it. It is recommended that you do not enter standby mode with less than 20% battery power.

5. Click **OK** to set your power management options and close the window.

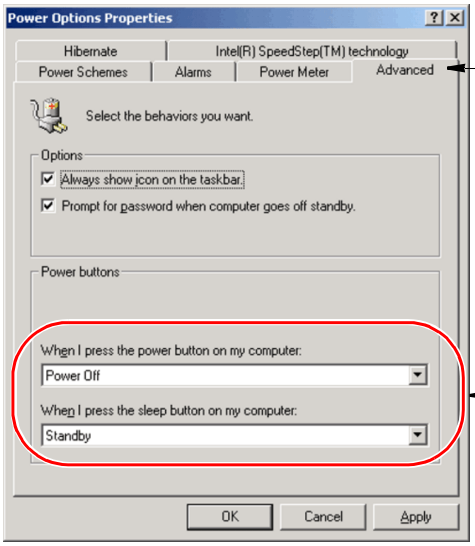
Rest Key:
The manual <Fn + F11> key combination will not activate Standby or Hibernate modes whilst you are playing a multimedia program or have an active USB device connected.

Advanced Power Management Schemes

This section discusses the advanced power management schemes. There are two buttons that you can use to manually conserve power.

To enter the power management window complete the following:

1. Click **Start** > **Settings > Control Panel**.
2. Click **Power Options** icon to display the **Power Options Properties** window.
3. Click the **Advanced** tab to display the advanced power management options.



Advanced Tab

Power & Sleep Button Programming Windows

4. Select the mode (**Standby/Hibernate/Power Off**) assigned to the Power button and/or Rest <F11> key.

The "Rest" key is assigned to the <Fn+F11> key combination.

See "Basic Power Management Schemes" on page 47 for meaning of Standby and Hibernate modes.

5. Click **OK** to set your power management options and close the window.

You can return to normal operation after you have used one of the "Power Management" buttons by quickly pushing and releasing the **Power** button.

Using the Hard Drive

Your computer includes a removable IDE (integrated drive electronics) hard drive. The IDE hard drive can store the data and programs your computer uses. The drive plugs into a connector on the system board.

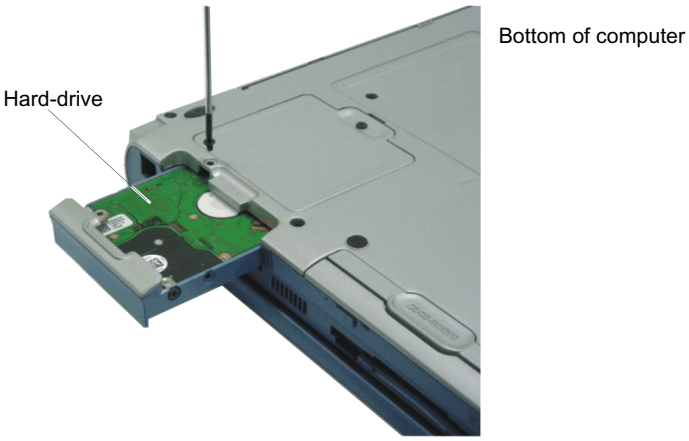
The hard drive that comes with your computer has already been formatted. Do not format the hard drive. Doing so destroys all data contained on the drive. If you need to format a new drive, or want to erase all data on your existing hard drive, refer to the manual for your operating system.

Removing the Hard Drive

To prevent loss of data and damage to the disk, do not remove the hard drive while the computer's power is on and do not drop or jar the hard drive.

To remove the hard drive from the computer:

1. If you are installing a new hard drive, backup the application and data files on the old hard drive before removing it from the computer.
2. Turn the computer's power off.
3. Close the LCD panel, and turn the computer over so that the bottom of the unit faces up.
4. Remove the screw that holds the hard drive in place.



5. Pull the hard drive out of the computer.

Installing a Hard Drive

To install a hard drive:

1. Remove the old hard drive from the computer as described in the previous section.
2. Slide the new drive into the hard drive compartment. Make sure the drive is pushed back as far as it will go.
3. Install the screw that holds the hard drive in place.
4. If required install windows and appropriate device drivers according to the instructions below.

(Re)Installing Windows and Device Drivers

Use System Recovery CD to (re)install OS and System Software CD to (re)install device' drivers.

The System Recovery CD is used to (re)install the OS and System Software to a new HDD or recover from a system crash.

Notebook computers that ship from the factory include System Recover CD-ROM and System Software CD-ROM, which contains a copy of the applications and drivers needed for computer's operating system.

In the unlikely event that programs on the computer hard drive become corrupted or are erased, you can use the System Recovery CD-ROM to reinstall your operating system and then System Software CD-ROM to reinstall your original applications and drivers.

Video Features and Configuration

Your computer includes a TFT LCD or active-matrix display. The capabilities of the screen plus the video drivers installed on the computer determine the quality of the image your LCD can display.

The following sections describe the display capabilities of your computer.

Resolution and Colour Depth

The resolution of the LCD is the sharpness of the image it can display. Resolution is measured by the number of pixels (individual dots) displayed on the entire screen. In general, the more pixels the LCD can display, the better the image.

Your LCD screen is SXGA. In SXGA, the screen has a maximum display of 1400x1050, about 1,470,000 pixels.

The number of colours the LCD can display is measured by how many bits the LCD uses to represent each pixel:

- 16-bit colour can support 64 K (65,536) colours.
- 32-bit colour can support 16 M (16.8 million) colours.

All these video modes can be displayed on an external monitor. However, if you disconnect an external monitor that was attached to your computer and then start the computer, the LCD may revert to a different resolution than the one you chose for the external monitor.

Configuring Display Features

The following sections describe how to configure the display settings on your computer.

Display Resolution Notes:
When Windows 2000 is initially installed it will automatically adjust the resolution to maximum available.

Changing Colour Depth and Resolution

To change the colour depth and resolution of your LCD or external monitor:

1. Click **Start** > **Settings > Control Panel**.
2. Click **Display** icon . The Display Properties window appears.
3. Click the **Settings** tab. The Settings screen appears.
4. To change the colour depth, click the arrow next to the **Colour quality** palette and select the available colour depth you want.
5. To change the resolution, click and drag the slider under the **Screen resolution** until you select the available resolution you want.
6. Click **OK**.
7. Follow the prompts that appear on the screen.

Using the TV-Out Port

Using the TV-out port, a compatible TV or other compatible display device can be connected and an image displayed. No Audio is transmitted through the TV-Out port. To check if and how your TV displays the TV-out signal see the documentation included with your TV. You must also insure that (TV/Video) is changed to Video mode using the TV remote controller or the buttons on the TV set.

To enable TV-out:

1. Connect the TV to the TV-Out port using an appropriate cable.
2. Click **Start** > **Settings > Control Panel**.
3. Click **Display** > **Settings**
4. Click **Advanced** > **Display**.
5. Click the check box to the left of the text “TV”.
6. Follow the screen prompts and the LCD screen display will be duplicated on the television.

If the TV symbol is grayed out then the system has not detected a TV, check that the TV standard in the System Setup is set correctly and that the TV is turned on and connected properly. You can not use TV-out port in DOS mode.

7. Click **Apply** or **OK**.

Using Options

You can order the following options for your Notebook computer from your authorised reseller:

- An extra AC adapter.
- An auto adapter that enables you to charge the computer's battery and operate the computer while in an automobile.
- An extra battery pack.
- An upgraded hard drive. Optional hard drives are available to fit in the hard drive compartment or the Flex-Bay.
- 64, 128, 256 and 512 MB SDRAM memory modules that enable you to upgrade your computer's memory to a maximum of 1 GB.
- A CD-ROM drive module (CD Only or CD R/W).
- DVD/CD-RW Combo drive:
- A DVD-ROM drive module.
- A Superdisk LS-120 drive.
- Docking options that enable you to use your computer like a desktop computer.
- Wireless LAN

The options that are available may change periodically. Contact your reseller for updated information on current and new options.

AC Adapter

The optional AC adapter operates in the same way as the adapter that came with your computer does. See "Attaching the AC Adapter" on page 7 for information about the AC adapter.

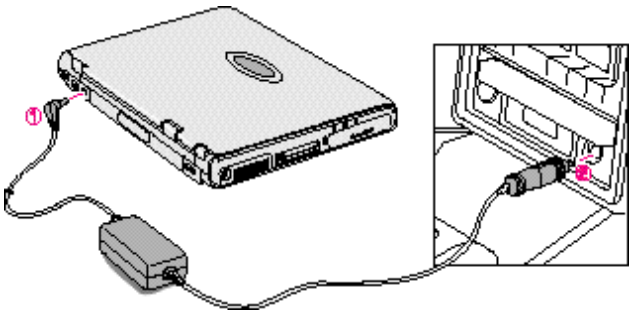
Auto Adapter

The auto adapter enables you to power your computer and charge the computer battery.

- In an automobile, through the +12 volt cigarette lighter socket.

To use the adapter:

1. Plug the adapter cable into the AC adapter connector on the computer.
2. Connect the adapter to the cigarette lighter socket.



The light on the adapter is green when the adapter is working properly. The light may be red for a few seconds when you first plug in the adapter or while you use the adapter. This is normal. If the light remains red, check to make sure the adapter is connected correctly.

If the adapter is plugged in and the adapter light does not turn on:

- Check the adapter connections.
- If you are in an automobile, turn on the automobile's ignition to supply power to the adapter. In some vehicles, power to the cigarette lighter socket is always on and you do not need to turn on the ignition.
- If the previous procedures do not activate the adapter, you may need to change the fuse in the adapter. To remove the fuse from the adapter, unscrew the adapter cap with a pair of pliers and remove the cap. Replace the fuse with an 8 amp fuse. In an automobile, you may need to replace the fuse in the cigarette lighter socket.

When you connect the adapter to the cigarette lighter, the computer's battery starts charging immediately.

To prevent loss of data and possible damage to the computer, unplug the auto adapter when starting and stopping the automobile engine.

Battery Pack

You can order another smart lithium-ion battery pack for your computer. See "Using Power Management Options" on page 46 for information on the battery.

Hard Drives

You can order optional hard drives for your system. A hard drive can be installed in the hard-drive compartment to replace your existing hard drive or you can order a hard drive that fits in the Flex-Bay. See "Installing a Hard Drive" on page 51 for information on installing a new drive in the hard-drive compartment. See "Using the Flex-Bay" on page 25 for information on installing a device in the Flex-Bay.

Memory Modules

You can increase system memory by installing optional memory modules. You can install a 64, 128 256 or 512 MB modules.

To avoid possible system problems, use only approved memory modules in your computer.

Before You Install Memory

To prevent personal injury and damage to the equipment, follow the precautions listed here before installing a memory module.

Take the following precautions when installing a memory module:

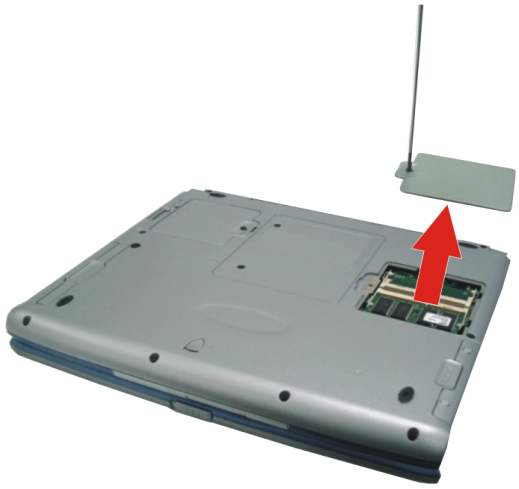
- Before you remove the memory module compartment door, turn off the computer, unplug the power cord, and remove the battery. Also, disconnect any peripheral devices.
- Before handling a memory module, discharge any static electricity by touching a grounded surface or using a grounding wrist strap.
- Do not insert objects with conductive material, such as metal screwdrivers or graphite pencils, into the memory-module compartment.
- Be careful in handling the metal plate of the memory door.

Installing a Memory Module

Handle a memory module carefully. Hold them only by the edges.

To install a memory module:

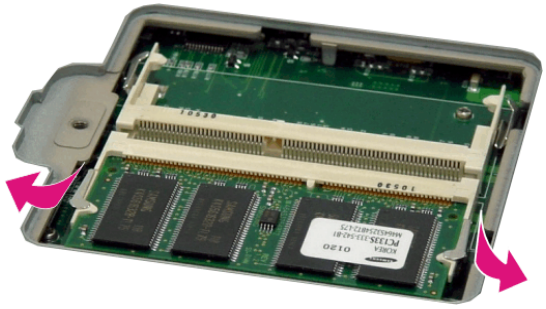
1. Turn the computer over so that the bottom faces up.
2. Using a screwdriver, remove the screw that holds the memory-module compartment door in place.



3. Grasp the edge of the door and pull the door off the chassis.
4. Remove installed modules if necessary:

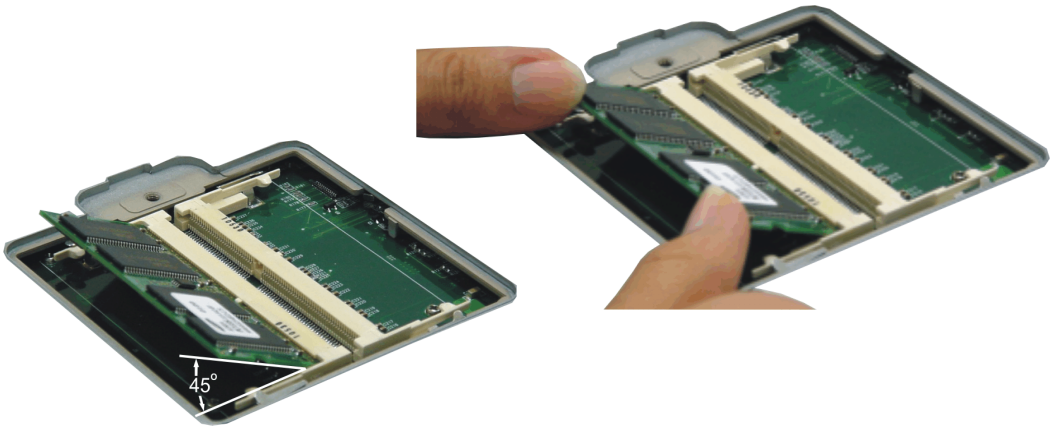
Memory Module Precautions:
When removing the module, pull on the plastic portion of the connector slots tabs only. Do not pull on the metal part of the tabs, this may damage the tabs.

a. Pull the tabs on the connector slot outward slightly, until the edge of the memory module pops up.



b. Hold the memory module by the edges and pull it forward out of the compartment.

5. Align the connector on the memory module with the connector of the slot.
6. Push the memory module into the slot at a slight angle until the connectors are fully engaged.



7. Push down on the edge of the memory module until the module snaps into place.
8. Align the memory module compartment door with the compartment and push the door down until it snaps into place.
9. Reinstall the screw you removed in step 2.
10. Turn on the computer and perform a complete POST to check the memory integrity.

CD-ROM Drive (CD Only or CD R/W)

If your system did not ship with a CD-ROM drive included, you can order a drive. See “Using the CD/DVD-ROM Drive” on page 29 for directions on installing the CD-ROM drive.

DVD/CD-RW Combo Drive Module

If your system did not ship with a DVD/CD-RW Combo drive included, you can order a drive. The DVD/CD-RW Combo drive module can be inserted into your computer exactly as you would insert a CD-ROM. See “Using the CD/DVD-ROM Drive” on page 29 for directions on installing and using the RW-Combo drive. There is DVD and CD writing software included with the drive that will enable you to play DVD movies from the DVD-ROM drive.

DVD-ROM Drive Module

If your system did not ship with a DVD-ROM drive included, you can order a drive. The DVD-ROM drive module can be inserted into your computer exactly as you would insert a CD-ROM. See “Using the CD/DVD-ROM Drive” on page 29 for directions on installing and using the CD-ROM drive. There is DVD software included with the drive that will enable you to play DVD movies from the DVD-ROM drive.

Superdisk LS-120 Drive

The LS-120 drive enables you to store 120 MB of data on a single, 3.5-inch LS-120 diskette. It is backward compatible with standard HD 1.44MB 3.5-inch diskettes and it can read and write to them up to three times faster. The LS-120 drive fits in the Flex-Bay, see “Using the Flex-Bay” on page 25

If you want to boot from LS-120, you have to disable "Diskette A:" in BIOS setup Boot menu.

Docking Options

Contact your reseller for a list of docking options available for your Notebook computer. User’s manuals are included with the docking options.

Wireless LAN

The wireless LAN option allows easy connection to large or small office networks while also providing freedom from the constraints of cables and sockets.

To setup and use the Wireless LAN, Please refer to the user manual provided with the option at the time of purchase.

Troubleshooting

If you ever have difficulty running your computer, follow these steps:

1. Consult the following sections for advice on how to handle system problems.
2. Refer to warnings, cautions and notes within applicable portion of this manual.
3. Refer to “Windows” and other “Program” manuals as applicable.
4. If steps 1 to 3 do not resolve the problem, contact the Samsung Helpline.

Operating Problems

This section answers most of the frequently asked questions associated with simple problems you may encounter while using your computer. This covers the most common problems and give the best solution to that problem. However, if you experience a problem not discussed here, please contact the Samsung Helpline.

Problem	Action
The computer does nothing when you turn it on.	Has the battery run down? Connect the power cord to the computer and recharge the battery. Try turning on the computer again.
Some of the letter keys type numbers instead of the indicated letters.	Is the Num Lock light on? If so, the numeric keypad on the keyboard is active. To return the keypad keys to typing letters, press <Num Lock>.
Battery power seems to run out faster than expected.	If you are running the computer from the battery rather than the power cord, make sure that you set the Idle Mode field in System Setup to On. This setting enables the microprocessor and the hard drive to slow down when the computer is not busy.
Certain software programs “hang” during operations when there is no interaction with the keyboard or peripheral devices.	Your computer may be in Suspend or Rest mode. Tap the touchpad to resume from Suspend or press the power button to resume from rest.
PC Card does not work correctly.	Make sure that the PC Card is inserted left side up in the PC Card slot. Check that the card is inserted fully into the slot. If you are using a PC Card modem, check the modem cable connections.

Problem	Action
Your ATA or Compact Flashcard do not work.	A patch is provided for these cards on the Recovery CD
The System Setup settings are not retained when you turn off the computer.	The CMOS battery inside the computer may need to be replaced. The CMOS battery provides power to save the system BIOS information when the computer is turned off. Normally, the CMOS battery lasts for several years. Do not attempt to open the chassis and replace this battery yourself or your warranty is void. Have an authorized the manufacturer's service center replace the CMOS battery.
No sound.	Verify if the mute check box is checked or the volume is not turned down in the pop up menu by clicking the speaker icon of the task bar.
System/BIOS behaves erratically	If you caused an abnormal power interruption (i.e.. removing battery while on battery power), you may cause BIOS data corruption.

Video Problems

Problem	Action
Nothing appears on the LCD panel when you turn on the computer.	Adjust the brightness on a TFT LCD. Are you using an external monitor? If so, press <Fn+F5> to return to the LCD panel.
Error Message when entering Power Management while in Multimonitor mode.	If the secondary monitor is set to 256 colours, this error message could appear. Change the colour of the secondary monitor to 'high colour (16 bit)'.
Nothing appears on the external monitor when you switch the display to it.	Is the monitor properly connected to the computer? Is the monitor's power cord connected to an AC wall outlet? Check the brightness and contrast controls on the monitor. Does the program appear on the LCD panel instead of the external monitor? If so, press <Fn+F5> to switch to the monitor. Try turning the monitor off and on again.
Only the LCD Display works when system returns from Power management mode while in Multimonitor mode.	The system resets to the original BIOS setup when the system returns from the power management mode. If the Display mode, in the Advanced menu of BIOS setup is set to LCD, then only the LCD will be turned on when the system wakes up. Set the Display mode in the BIOS to Both to turn on the LCD & CRT on wakeup.
The external monitor displays flashes or waves.	Check the cables between the monitor and the computer. Are they properly installed?
Cannot toggle between CRT and LCD while playing the 3D game.	If you are using the Multimonitor mode, you can not use the <Fn+F5> key combination and also you cannot use this function in 3D games using Direct-X.
There is LCD or CRT has noise (speckles, lines or raged edges) on the picture when playing a MPEG file with the Media player/ DVD software or using the USB camera.	Adjust the resolution and the colour to 1400 x 1050 and 32 bit to display clearly, or avoid playing two programs at the same time.
In DOS mode the CRT/LCD button does not work.	The LCD only mode is not supported using this Key combination.

Problem	Action
If the connected CRT monitor display is not steady.	If the refresh rate is not optimal for the connected CRT, then this problem may occur. **To correct this problem do the following:** **1.** Click **Start** > **Settings** > **Control Panel.** **2.** Double Click the **Display** icon to open the **Display properties**. **3.** Select **Settings** **4.** Click the **Advanced** button. **5.** Click the Adapter tab **6.** Adjust the Refresh rate to optimal or other selections until you see the CRT clearly.

Modem Problems

Problem	Action
My modem doesn't connect to services or disconnects during communication	If your modem has difficulty in connecting to on-line services and sustaining communications, first check if other devices are connected and remove them. Also remove any extension leads. Interference from certain devices or poor line power conditions may degrade the quality of your connection. Under these conditions gradually reduce the communication speed of your modem until a reliable connection is achieved. Check with your on-line service provider.
When using a PBX phone system I can't dial on my modem.	If you use a PBX phone system you may need to press a number i.e. '9' to connect to an external line, you should enter the following command before trying the connection and check modem initialization. (***ATX3&W***) And add "9," as the external line prefix (example) of the phone number when using the dial command "***ATDT9, 123-4567***".
Screen displays random or garbage characters during communications.	After your modem has connected to the on-line service, your screen may display garbage characters or after-images in screen transitions. This problem is caused by a mismatch of the terminal modes between communications service and communications programs. You need to match the terminal modes to each other. Refer to the user's guide of the communications program you're using.
Reports error message that insufficient Hard Disk space is available.	Delete the unnecessary messages or data you received by Modem or Fax every one to three months as required. If you're using the internet, many picture and data files can get downloaded to your HARD DISK every time you visit a home page, which will consume a lot of your HARD DISK space. For more detailed information about the method of deleting, refer to the help of the Web browser you've been using or your user's guide.

FAX Problems:
Depending on telephone line status, or types of Fax machines/programs that send/receive the Fax, Fax transmission/reception may not work correctly. In that case, please try other Fax programs. (e.g. Win Fax)

Windows & Device Drivers

If for some reason your system crashes you may corrupt your HDD, Windows Operating system and/or some of your device drivers. If this is the case, use **System Recovery CD** to reinstall **OS** and **System Software CD** to reinstall the corrupt device drivers.

Samsung may, from time to time, issue updated drivers. These are posted on the Samsung Support website at www.samsungpc.com

When updating drivers, please select the “Supported” driver with the *highest* revision number.

Driver Problems / Driver (Re)Installation

This section will discuss driver problems due to system crashes, accidental file deletion, etc. Generally you will simply reinstall the driver. More detail is provided in the sections below.

Modem Driver (Re)Installation

Before you (re)install the modem drivers, check if the *PCI Serial Controller* under *Other devices of Device Manager tab* of Control Panel on Windows exists. If it exists, remove it first.

After that, (re)install the modem driver according to the instruction below.

You can also install the modem driver by specifying the directory location of the modem driver file. When Windows 2000 *automatically* detects the modem and starts the *Add New Hardware Wizard dialog* box you may follow the instructions in the wizard or click on the cancel button. (However, It is easier to not use the wizard)

1. Insert the CD or floppy diskette that contains the modem driver.
2. Click **Start**.
3. Click **Run**. Locate the directory that contain the modem driver.
4. Run **setup.exe** (ex D:\Win2000\Drivers\Modem\Setup.exe).
5. Click the **OK** button in the confirmation dialog box.
6. The setup program will copy the driver files into the correct system locations.
7. Restart the system by clicking **OK**.

Selecting a Country

You have to check if the country is selected correctly before you use the modem.

1. Click **Start** > **Settings** > **Control Panel**.
2. Double-Click  icon.
3. Select **Edit** in the Dialing Rules tab.
4. Select the country you are dialing from in the General tab.
5. Click **OK**. The new country setting is activated the next time the application is started. Or, if the application is already running, once the modem has gone off-hook and then back on-hook again.

Incorrect Country Selection:

If the country is not selected correctly at the "I am in this country/region" of the "Dialing Properties" dialog, the modem may not work properly. So, you must check if the country you're calling from is selected appropriately and then use the modem. If your modem only supports "Domestic", you must select the country where you bought your computer. And, if you use the modem in other countries, your modem may not work properly. If your modem supports "Worldwide", please check with your local distributor which countries can be supported by the SENS modem.

Confirming Installation of the Modem Driver

After the modem driver is installed, you can check if the modem driver is installed properly.

1. Click **Start** > **Settings** > **Control Panel**.
2. Double-Click  icon.
3. Select SENS LT56ADW Modem in the Modems tab and then click Properties button.
4. Click Query Modem button in the Diagnostics tab. The modem is properly installed if the contents of Command and Response appear.

LAN Driver (Re)Installation

Before you begin verify that the “Intel(R) PRO/100 VE Network Connection” is installed otherwise you will have to install it.

Windows 2000 has its own PCI Ethernet Adapter driver, simply install the LAN driver according to the instructions below.

1. **Start** > **Settings** > **Control Panel.**
2. Double-click **System** icon.
3. Click the **Hardware** tab **> Device Manager** button.
4. Double-click **Network Adapters** in the list area.
5. Click **Update Driver** in the **Driver tab**.
6. Click **Next**.
7. Select **Display a list of the known drivers in a specific location, so that I can choose a specific driver.**
8. Click **Next**.
9. Click **Have Disk**. (Insert the System Software CD in the CD Drive)
10. Click **Browse**
11. Type “D:\Win2000\Drivers\LAN\” in the “Copy manufacturer’s files from:”
12. Select the “Intel(R) PRO/100 VE Network Connection”
13. Click **OK**.
14. Verify the “Intel(R) PRO/100 VE Network Connection” is displayed on the device wizard.
15. Click **Next**.
16. Click **Finish**. (Windows has finished (re)installing an updated driver for your hardware device).

Sound Driver (Re)Installation

When you add a new sound device Windows 2000 will recognize the addition of *PCI Multimedia Audio Device* and start the driver (re)installation process automatically. This also applies to reinstallation if problems occur.

When Windows 2000 automatically detects a 'PCI Multimedia Audio Device', click **Next** and **Finish**.

1. Insert the **System Software** CD-ROM.
2. Click **Start** > **Settings** > **Control Panel**.
3. Double-Click **System** icon.
4. Choose **Hardware** tab > **Device Manager** button.
5. Select **Sound**, **Video** and **Game controller** and Right click **ESS Maestro3 PCI Audio (WDM)**.
6. Click **Properties**.
7. Click **Driver** tab > **Update Driver** button.
8. Click **Next**.
9. Click **Next**.
10. Check **Specify a location** and type (ex D:\Win2000\Drivers\Audio).
11. Click **Next**.
12. Click **Next** when the dialog appears saying that Windows is now ready to (re)install the driver.
13. Click **OK** when the dialog appears saying that Windows has finished installing.
14. Restart the system to update your files.

Video Driver (Re)Installation

If your system crashes and you have to reinstall Windows 2000 you will have to reinstall the Mobility Radeon Video Driver.

To reinstall the driver complete the following steps.

1. Insert **System Software CD-ROM** to CD-ROM drive.
2. Click **Start** > **Settings** > **Control Panel**.
3. Double-Click  icon.
4. Click **Settings** >**Advanced** in **Display Properties**.
5. Click **Adapter** tab > **Properties** button > Select **Driver** tab > Click **Update Driver** button.
6. Click **Next**
7. Click **Next**
8. Select **Specify a location** and input “(ex D:\Win2000\Drivers\Video)”.
9. Click **Next**
10. Click **Next**
11. Restart your system.

Specifications

Dimension	
* LCD viewing area	
LCD viewing area (15” TFT)	304.8 x 228.6 mm
Width	32.4 cm
Depth	27.2 cm
Height	4.1 cm
Weight (with integrated floppy drive, Li-Ion battery & 14.1” TFT LCD & weight saver)	3221 g
Environment	
Ambient temperature, operating	10^{o}–32^{o}C
Ambient temperature, storage	-5^{o}–40^{o} C
Relative humidity (noncondensing), operating	20–80%
Relative humidity (noncondensing), storage	5–90%
Altitude, operating	0 to 2,348 m
Altitude, storage	0 to 12,192 m
Shock, operating	10 G for 11 ms half sine
Shock, nonoperating	60 G for 11 ms half sine
Lithium-Ion Smart Battery	
Normal Weight	500g
Nominal open circuit voltage	11.1 VDC
Capacity, typical	5880 mAhr, 65.3whr
Charging time, approximate, with computer turned off , typical	3.0 hr
Charging time, approximate, with computer turned on , typical	6.0 hr
Average battery life, with no power management enabled	4.0 hr
External AC Adapter	
Operating voltage	100-240 VAC
Line frequency	50-60 Hz
Input current	1.5 A 100 V ~ 0.8 A 240 V
Output current	3.15 A
Output voltage	19.0 VDC

Abbreviations

A . . . . . Amperes
AC . . . . . Alternating current
ACPI . . . . . Advanced Configuration and Power management Interface
APM . . . . . Advanced Power Management
ATA. . . . . AT attachment (refers to the hard-drive interface in an AT-compatible computer)
ATAPI. . . . . AT attachment packet interface
BBS . . . . . Bulletin board system
BIOS . . . . . Basic input/output system
C . . . . . Centigrade
CD . . . . . Compact disc
CD-ROM . . Compact disc read-only memory
cm . . . . . Centimeters
COM . . . . . Communication (as in communication port)
CMOS . . . . . Complementary metal-oxide semiconductor
DC . . . . . Direct current
DMA . . . . . Direct memory access
DPMS . . . . . Display power-management signaling
DRAM. . . . . Dynamic random access memory
DSTN . . . . . Double layer super twist nematic
ECP . . . . . Extended capabilities port
EPP . . . . . Enhanced parallel port
g . . . . . gram
G . . . . . Gravity
GB . . . . . Gigabytes
hr . . . . . hour
Hz . . . . . Hertz
IDE . . . . . Integrated drive electronics
I/O . . . . . Input/output
IRQ . . . . . Interrupt request line

ISA . . . . . Industry Standard Architecture
KB . . . . . Kilobytes
kg. . . . . Kilograms
LAN. . . . . Local-area network
lb.. . . . . Pounds
LBA. . . . . Logical block addressing
LCD. . . . . Liquid-crystal display
m . . . . . Meters
mA. . . . . Milliampere
mAhr. . . . . Milliampere hour
MB. . . . . Megabyte
mm . . . . . millimeter
MPEG . . . . . Motion Picture Experts Group
MPU . . . . . Microprocessor unit
ms . . . . . Millisecond
PDF . . . . . Portable document format
PC . . . . . Personal computer
PCI . . . . . Peripheral component interconnect
PCMCIA. . . Personal Computer Memory Card International Association
POST. . . . . Power-on self-test
PNP . . . . . Plug and play
PS/2 . . . . . Personal System/2
RAM . . . . . Random-access memory
ROM . . . . . Read-only memory
SVGA . . . . . Super video graphics array
TFT . . . . . Thin-film transistor
USB . . . . . Universal serial bus
V . . . . . Volt
VAC . . . . . Voltage alternating current
VCC . . . . . Voltage collector current
VDC . . . . . Voltage direct current
whr . . . . . Watt hour

Glossary

AC adapter

The AC (or alternating current) adapter regulates current coming into your computer from the wall outlet. The current at the wall outlet is alternating current and needs to be changed by the adapter to DC (direct current) before your computer can use it for power.

ACPI

ACPI (Advanced Configuration and Power Interface)- a method for describing hardware interfaces in terms abstract enough to allow flexible and innovative hardware implementations and concrete enough to allow shrink-wrap OS code to use such hardware interfaces.

BIOS

BIOS stands for basic input/output system. The BIOS is software (often called firmware) that is independent of any operating system. It enables the computer to communicate with the screen, keyboard, and other peripheral devices without using programs on the hard disk.

The BIOS on your computer is flash BIOS, which means that it has been recorded on a flash memory chip that can be updated if needed.

Boot

To start your computer. A cold boot resets the entire computer and runs through all computer self-tests. A warm boot clears out computer memory only.

Boot disk

A disk containing operating system programs required to start your computer. A boot disk can be a floppy disk, hard drive, or compact disc.

Byte

The basic unit of measure for computer memory. A character—such as a letter of the alphabet—uses one byte of memory. Computer memory is often measured in kilobytes (1,024 bytes) or megabytes (1,048,576 bytes).

Each byte is made up of eight bits. For more information on bytes and bits, see an introductory book on computers.

Cache memory

Cache is very fast, zero-wait-state memory located between the microprocessor and main memory. Cache reduces the average time required by the microprocessor to get the data it needs from the main memory by storing recently accessed data in the cache.

CardBus

CardBus technology enables the computer to use 32-bit PC Cards. Hardware in the computer and the Windows operating system provide support for the 32-bit cards. The voltage of 32-bit cards (3.3 volts) is lower than that of 16-bit cards (5 volts). The 32-bit cards can transmit more data at a time than the 16-bit cards, thus increasing their speed.

CMOS memory

CMOS (complementary metal oxide semiconductor) memory is powered by the CMOS battery. The System Setup settings and other parameters are maintained in CMOS memory. Even when you turn your computer off, the information in CMOS memory is saved.

COM port

COM stands for communication. COM ports are the serial ports in your computer.

Compact Disc

A compact disc (CD).

Conventional memory

The first 640 KB of system memory. Operating systems and application programs can directly access this memory without using memory-management software.

Disk

The device used by the computer to store and retrieve information. *Disk* can refer to a floppy disk, hard disk, or RAM disk.

Disk cache

A software device that accumulates copies of recently used disk sectors in RAM. The application program can then read these copies without accessing the disk. This, in turn, speeds up the performance of the application.

A cache is a buffer for transferring disk sectors in and out of RAM. Data stored in a disk cache is a copy of data already stored on the physical disk.

DMA (direct memory access)

A method of transferring data from a device to memory without having the data pass through the microprocessor. Using DMA can speed up system performance.

DPMS

Display Power Management Signalling. Displays or monitors that comply with this can be managed by the Power Management features found in the system setup.

Floppy disk

A removable disk, also called *floppy* or *diskette*.

Hard drive

Also called *fixed* disk. A hard drive is connected to the computer and can be installed or removed. Data written to a hard drive remains until it is overwritten or corrupted.

The 2.5-inch hard drive in your computer was designed for use in a notebook computer. Because hard drives in notebook computers are smaller than those in desktop computers, their maximum storage capacity may be less than that of desktop hard drives. However, because of their smaller size, the drives handle shock and vibration better than larger drives, which is important for a notebook computer.

I/O

Input/output. Refers to peripheral devices, such as printers, that are addressed through an I/O address.

I/O address

I/O stands for input/output. Peripheral devices, such as printers, are addressed through the I/O port address.

IRQ (interrupt request line)

The IRQ is a hardware line that a device uses to signal the microprocessor when the device needs the microprocessor's services. The number of IRQs is limited by industry standards.

LCD (liquid-crystal display)

The LCD screen on your computer differs from the display screen of a desktop monitor. Most desktop monitors use CRT (cathode-ray tube) displays, which work by moving an electron beam across phosphor dots on the back of the screen. The phosphor dots light up to show the image. LCDs use a liquid-crystal solution between two sheets of polarizing material. Electric current passing through the liquid aligns the crystals so that light can or cannot pass through them, creating an image.

MB (megabyte)

1,024 kilobytes.

Megabit

1,048,576 bits or about 128 kilobytes.

Operating system

A program that supervises the computer's operation, including handling I/O. Application programs and users can request operating-system services. A user might request operation-system services to copy files or format a disk. An application program might use the operating system to obtain keyboard input, write data to a file, or write data to a screen.

PC Card

PC Card stands for personal computer card. The Personal Computer Memory Card International Association (PCMCIA) defines the standards used to develop all PC Cards. PC Card types include: modems, Ethernet adapters, SCSI adapters, ATA cards, and memory cards.

PC slot

The PC slot is the hardware slot in the computer where the PC Card is placed.

Pixel

A pixel is an individual dot in a graphic displayed on your computer. The pixels are so close together that they look as though they are connected. An LCD screen displays thousands or millions of pixels.

Plug and Play

A plug and play operating system automatically configures computer components to work with your system. With this type of operating system, you normally do not need to set jumpers on devices or set memory addresses or IRQs.

RAM (random access memory)

The computer's system memory, including conventional and extended memory. You can write to and read from RAM. Information stored in RAM is temporary, and is erased when the system is turned off.

Refresh rate

The refresh rate is the rate at which the image on the LCD screen is rewritten to the screen. A fast refresh rate helps keep the image from flickering.

Resolution

The resolution is the sharpness or clarity of the image on your LCD screen. Resolution is measured by the number of pixels the computer’s screen can display. For example, a resolution of 800 x 600 means that the screen can display 800 pixels in row and can display 600 rows. The more pixels displayed, the higher the resolution and the better the image.

ROM (read-only memory)

Permanent computer memory dedicated to a particular function. For example, the instructions for starting the computer when you first turn on power are contained in ROM. You cannot write to ROM. (ROM is not the same as RAM).

Sector

Also known as *disk sector*. The portion of a track that is numbered and can hold a specified number of characters (usually 512 KB).

Shadow RAM

A write-protected area of RAM that contains a copy of the BIOS. As the computer boots, the BIOS is copied from its permanent location in ROM to RAM. The BIOS can be executed much faster in RAM than in ROM. The BIOS remains in shadow RAM until you turn off the computer.

TFT (thin film transistor) LCD

A TFT LCD uses a separate transistor circuit to control each pixel. This technology provides the best resolution for an LCD screen. A TFT LCD is also sometimes called an active matrix LCD.

Zoomed video

Zoomed video technology enables zoom video PC Card to transfer data directly from the card to video and audio systems without going through the microprocessor. This process improves video performance. Video conferencing and real-time multimedia devices, such as video cameras, are supported by zoom video.