Multimedia Notebook Computer

User's Manual

NOTICE

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Federal Communications Commission (FCC) Statement

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Warning

Use only shielded cables to connect I/O devices to this equipment.

You are cautioned that changes or modifications not expressly approved by the manufacturer for compliance with the above standards could void your authority to operate the equipment.

IMPORTANT SAFETY INSTRUCTIONS

The notebook computer is quite rugged, but it can be damaged. To ensure that does not happen, follow these suggestions:

1. Don't drop it. **Make sure it's on a stable surface. If the computer falls, the case and other components could be damaged.**
2. Don't overheat it. **Keep the computer and power supply away from any kind of heating element. Keep the computer out of direct sunlight.**
3. Avoid interference. **Keep the computer away from high capacity transformers, electric motors, and other strong magnetic fields. These can hinder proper performance and damage your data.**
4. Keep it dry**. This is an electrical appliance. If water or any other liquid gets into it, the computer could be badly damaged.**
5. Be careful with power. **The computer has specific power requirements.**
   - Only use a power adapter approved for use with this computer.
   - Your AC adapter may be designed for international travel but it still requires a steady, uninterrupted power supply. If you are unsure of your local power specifications, consult your dealer or local power company.
   - The power adapter may have either a 2-prong or a 3-prong grounded plug. The third prong is an important safety feature; do not defeat its purpose. If you do not have access to a compatible outlet, have a qualified electrician install one.
   - When you want to unplug the power cord, be sure to disconnect it by the plug head, not by its wire.
   - Make sure the socket and any extension cord(s) you use can support the total current load of all the connected devices.
   - Before cleaning the computer, make sure it is disconnected from any external power supplies (i.e. AC adapter or car adapter).

BATTERY PRECAUTIONS

Only use batteries designed for this computer. ***The wrong battery type may explode, leak or damage the computer.***

Recharge the batteries using the notebook's system. ***Incorrect recharging may make the battery explode.***

Do not try to repair a battery pack. **Refer any battery pack repair or replacement to your dealer or qualified service personnel.**

Keep children away **from, and promptly dispose of a damaged battery.**

Always dispose of batteries carefully. ***Batteries may explode or leak if exposed to fire, or improperly handled or discarded.***

Warning

The product that you have purchased contains a rechargeable battery. The battery is recyclable. At the end of its useful life, under various state and local laws, it may be illegal to dispose of this battery into the municipal waste stream. Check with your local solid waste officials for details in your area for recycling options or proper disposal.

Your battery pack is labeled with the type and manufacturer.

UL® Mainboard Battery Note

CAUTION: Danger of explosion if battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the manufacturer. Discard used battery according to the manufacturer's instructions.

CLEANING

Do not apply cleaner directly to the computer, use a soft clean cloth.

Do not use volatile (petroleum distillates) or abrasive cleaners on any part of the computer.

SERVICING

Do not attempt to service the computer yourself. **Doing so may violate your warranty and expose you and the computer to electric shock. Refer all servicing to authorized service personnel.**

Unplug the computer from the power supply. **Then refer servicing to qualified service personnel under any of the following conditions:**

- When the power cord or AC/DC adapter is damaged or frayed.
- If the computer has been exposed to rain or other liquids.
- If the computer does not work normally when you follow the operating instructions.
- If the computer has been dropped or damaged.

CONVENTIONS

This manual uses the following typesetting conventions:

	Example
commonly used terms (capitals):	FDD, HDD, AC, DC
features on the notebook (icons):	
keyboard keys (bold, as printed):	**Y, N, Enter**
programs, operating systems (italics):	*Setup, Windows 95*
files (all capitals):	AUTOEXEC.BAT
program groups (bold):	**Control Panel**
sequences (arrows)**:**	**My Computer > Control Panel**
icons/user interface switches (bold):	**Continue, Yes**
menu items (initial capitals):	Boot High Speed
variables (quotes):	“Enabled”
text the user must enter (bold):	a:**>\setup**
keys to press while in DOS (brackets, bold):	[**Enter**]
command switches (bold):	**format /s**
space:	~

TABLE OF CONTENTS

Chapter 1: Introduction

Chapter 2: System

Chapter 3: Firmware

Chapter 4: Power

Chapter 5: Extras

Appendix A: Specifications
Appendix B: Troubleshooting
Glossary

ADVANCED USER GUIDES

WARNINGS

List of Figures

List of Tables

1 Introduction

This manual explains the hardware and essential software you need to operate your notebook computer. Information about "non-essential" or "enhancement" software is also included, but in a separate section. Depending on how your system is configured, some or all of the features described may already be set up.

If you're an "advanced" user, you may want to skip over most of this manual. However, you should still look at the Quick Start guide on page 1-3 of this chapter. Also look at *Chapter 4: Power*. Information that might be of particular interest to you is indicated by the "✵" symbol and is found in the margins of each chapter.

If you are new to the wonders of notebook computers, or just feel like a beginner, you should still look over all of the documentation. Don't worry if you don't understand everything the first time around. Just keep this manual near your computer, and learn as you go.

Advanced Notes

Advanced users should check the sidebars which look like this. You'll find tips and more detailed information about the notebook's various features. "Beginners" are welcome too. As you get used to your computer, you may be surprised at how much of this stuff you can understand.

No matter what your level, please pay careful attention to warning and safety information indicated by the "" symbol. Also, pay careful attention to the safety information in the *Preface*.

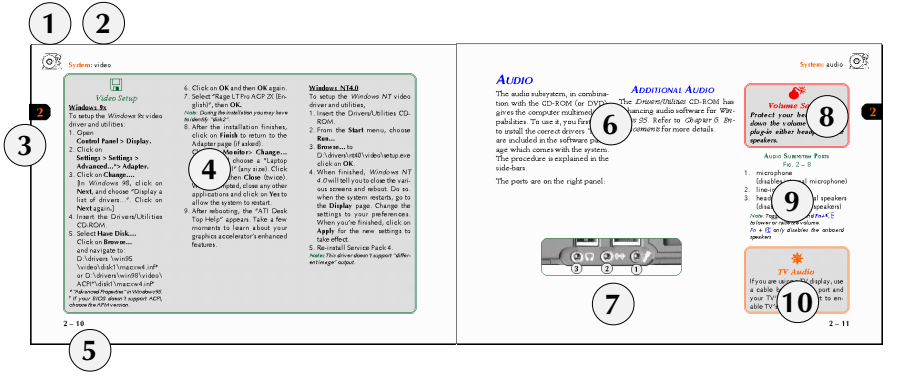
NOT HERE

Operating systems (i.e. *Windows 9x*, *Windows NT 4.0*, *OS/2 Warp*, *UNIX*, etc.) have their own manuals as do application software (e.g. word processing and database programs). If you have questions about those programs, you should consult those manuals.

MANUAL LAYOUT KEY

FIG. 1–1

1. chapter icon
2. chapter topic & quick key
3. chapter tab
4. setup text
5. page #
6. general/beginner text
7. graphic
8. warning text
9. graphic key
10. advanced user text



PACKING

Keep the packing materials in a safe place in case you need them for shipping or long-term storage.

QUICK START GUIDE

This quick start guide assumes that you're already familiar with notebook computers and can tell at a glance what and where all the key components are.

If you're not that comfortable with this sort of device, take a look at the following pages for an overview of the system.

You should review these steps, *before* you take any action. If you aren't sure about one of the procedures, check the relevant chapter before continuing.

1. Follow the safety instructions on page *iv*, especially the instructions on placement.
2. Remove all packing materials, CD-ROMs, floppy disks and any PC Cards.
3. Secure the main battery pack in its compartment. (Ch. 4)
4. Securely attach any peripherals you want to use with the notebook (i.e. mouse or keyboard) to their ports. (Ch. 1)
5. Attach the AC adapter to the port on the left side of the computer. (Ch. 4)
6. Plug the AC power cord into an outlet.
7. Connect the AC power cord to the AC adapter.
8. Raise the lid/LCD to a comfortable viewing angle. (Preface)
9. Push the ⏻ button (On/Off button) to turn "on".

Battery Charging

When you get your system, the battery(ies) may not be fully charged. Follow the procedure in *Chapter 4: Power, First-Time Use and Storage* (page 4-4), to charge the battery.

Save to Disk Considerations

If you're setting up your system and plan to use the *Save to Disk* partition option in the future, make sure your hard disk has enough *unpartitioned* and *unformatted* space left to accommodate the size of the file or partition you expect to have. Refer to *Chapter 4: Power* for details.

System Maps

The notebook has a lot of built-in features. The operating system automatically enables most of them. Further explanations (if necessary) of the various subsystems are covered in the chapters or pages indicated.

Front View

Latch — To open the notebook cover, slide this latch to the right.

LCD — Refer to *Chapter 2: System* for a description of the video system.

LEDs — Page 1–6 has a quick guide of their definitions.

Keyboard — Page 1–7 has a quick guide to the "hot keys". *Chapter 2: System* has more on how to use the keyboard itself.

TouchPad — *Chapter 2: System* covers basic functions, and *Chapter 5: Extras* has supplemental driver information.

13.3″ maximum design

14.1″ maximum design

Front View

Fig. 1– 2

1. LCD (2–6)
2. microphone (2–11)
3. speakers (2–11)
4. On/Off button
5. status LEDs
6. function LEDs
7. keyboard (2–2)
8. TouchPad & buttons (2–4)
9. vent

Note: *Detailed battery status is reported by the Operating System's power management utility.*

Design Note: *To accommodate different LCD panel sizes, this notebook series has two principal designs.*

— Except for some elements seen from this view, the placement and performance of the components is virtually identical.

LEDs

The system uses 8 LEDs to tell you about itself:

Icon	Variable	Meaning	Notes
		On/Off switch	
	flashing	Suspend mode activated	
	solid	Power-On mode	
	flashing	charging (AC-in)	
	solid	fully charged*	Unless the adapter stays plugged in, this doesn't last long.
	(no light)	no battery problems*	System is drawing power from the adapter, or battery condition is "OK".
	flashing (accompanied by warning "beeps")	Low Power (less than 8% left)	**Auto-Shutdown Imminent:** Connect the AC power supply immediately or shut down.
		CD-ROM / DVD or FDD in use	* Battery charge status is more completely reported by APM or ACPI compliant operating systems (e.g. Windows 98).
		HDD in use	
		NumLock activated	
		CapsLock activated	
		ScrollLock activated	

Table 1–1
LED Indicators

Hot Key Controls

Some of the system's features are managed by Fn + Key combinations:

Keys	Control	Comment
Fn +	freeze	activates "Save to Disk" if the Save to Disk partition/ file is available otherwise activates "Suspend" (to RAM)
F2	enter *Setup*	If pressed immediately after boot-up, this starts the Setup utility
Fn +	Standby/Suspend	activates "Suspend" (to RAM)
Fn +	LCD/monitor	toggles between display devices: monitor, LCD and combinations (refer to video setup information)
Fn +	speaker mute	toggles the on-board speakers on/off (does not affect phones)
Fn +	volume up	increases audio volume
Fn +	volume down	reduces audio volume
Fn +	brightness up	increases LCD brightness
Fn +	brightness down	reduces LCD brightness
Fn +	contrast up	increases LCD image contrast (DSTN display only)
Fn +	contrast down	reduces LCD image contrast (DSTN display only)
(**any key**)	resume	ends power-saving modes, including "Suspend" (to RAM), but not "Save to Disk"

Key Combinations

Whenever you use a key combination, start pressing them in the order they are listed. Don't release any of the keys in a sequence until you've pressed the last one.

TABLE 1–2
HOT KEY CONTROLS

Contrast Controls

Active matrix (TFT) screens have excellent contrast ratios, so the contrast control is not needed.

Drive Warning

Don't try to remove the hard disk (HDD) while the system is on. This could result in data loss or damage.

Don't try to remove a floppy or Super disk while the system is accessing it. This may cause the system to "crash".

Left View: Drives

[adapter] Refer to *Chapter 4: Power* and *Appendix A: Specifications* for details about the power system.

[CD-ROM/DVD] Refer to *Chapter 2: System* for more on how to setup this drive.

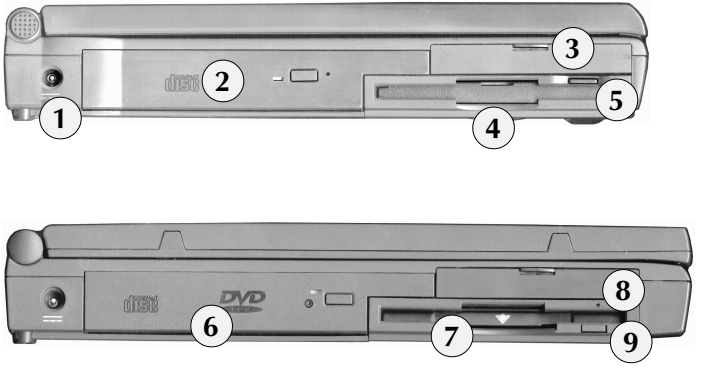
[HDD Module] Refer to *Chapter 4: Power* and *Chapter 5: Extras* for more on how to setup or replace an HDD.

[FDD /LS-120] Depending on your model, this can be a standard 1.44MB Floppy drive or, an *LS-120 Super Drive.*

Left View

Fig. 1– 3

1. adapter port (4-3)
2. CD-ROM (2-13)
3. HDD module (3-6, 5-3)
4. FDD (option)
5. FDD eject button
6. DVD (option replaces CD-ROM) (2-13)
7. LS-120 (option replaces FDD)
8. emergency eject button
9. power eject button



Inserting/Removing Disks

Gently insert the disk (with its label side up) into the drive until the disk "clicks" into place.
Press the button on the right of the slot to eject the disk.

FDD and LS-120 Care

Following are a few tips on the proper handling of floppies and super-disks:

- Store disks away from magnetic fields and extreme temperatures. These conditions can damage your data. It's also a good idea to make backup copies of software and data.
- If a disk label is already on the disk, use a soft-tipped pen to write on the label. This prevents damage to the disk. Don't use a pencil - its carbon particles can rub off inside the drive.
- Do not remove any disk from the drive when the LED is flashing (in-use).
- Do not try to clean, bend, or throw disks.
- Do not touch or scratch any exposed portion of the disk medium. Don't pull open the protective door either - this lets dust get inside.

Right View

(**Fax/Modem**) RJ-11 modem/phone line (*Chapter 2: System*).

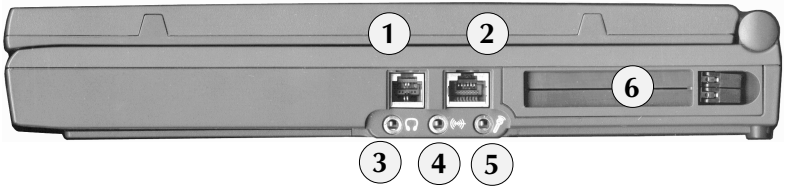
(**LAN**) RJ-45 LAN Ethernet (*Chapter 2: System*).

(**Audio**) Setup for this subsystem is covered in *Chapter 2: System* (p. 2-12).

(**PC Card**) Your computer uses newer technologies than the drivers included in *Windows 95*. Refer to the setup procedure detailed in *Chapter 2: System* (p. 2-19).

Right View

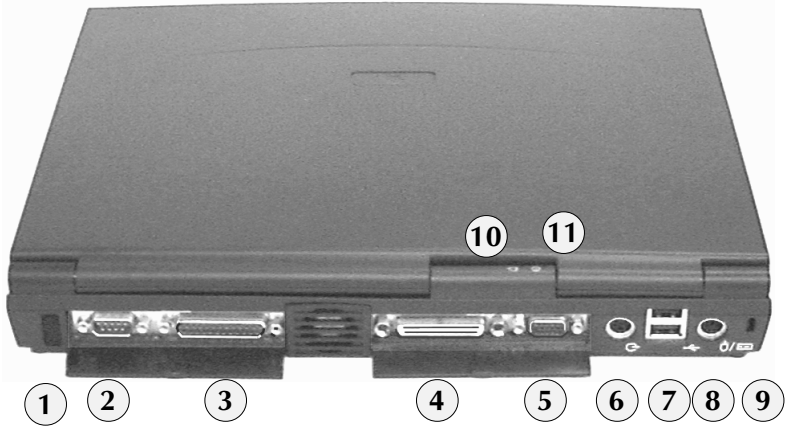
Fig. 1– 4



1. Fax/Modem (2-21)
2. LAN (2-23)
3. phones (2-11)
   using this port disables the speakers.
4. audio line-in (2-11)
5. mic (2-11)
6. PC Card slots (2-17)

Rear View

The principal peripherals plug in on this panel. To be safe, turn off both the system and peripherals *before* connecting them. Turn the peripherals on *first*, *before* you turn on the system.



Rear View
Fig. 1– 5

1. IrDA port
2. COM port
3. parallel/printer port
4. expansion port
5. external monitor port (2-8)
6. S-video TV-out port (2-8)
7. USB ports (2-24)
8. PS/2 port (2-3)
9. Kensington lock port
10. AC-in/charging indicator
11. Suspend/Power-on indicator

Printer Types

Your operating system may include drivers for many printer models. Consult your printer dealer for the most recent driver for your model, as this can greatly affect the performance of the printer.

Fan Warning

Do not block the fan. Overheating may cause the system to become unstable.

IrDA This port uses (serial) COM2 resources. The infrared connection supports the SIR, FIR and ASK standards. Its most common use is for a printer, modem or LAN.

Note: Newer versions of *Windows 9x* have an IrDA driver built-in. For older versions, support is available from Microsoft Corp. For other operating systems and IrDA standards, consult your system vendor. Also consult the user's guides for the device this port is going to work with.

[**COM1** (serial)] Use this with any 9-pin serial device (e.g. a mouse, serial printer or modem).
Consult the user's guides for the device this port is going to work with.
For pointing devices, refer to *Chapter 2: System*, "TouchPad".

[**Parallel/Printer**] This port supports several standards:

Output only
Bidirectional
EPP
ECP (Extended Capabilities)

Most printers use the ECP mode. The *Setup*'s "Help" bar (refer to *Chapter 3: Firmware*) explains how to adjust this setting. Your peripheral's manual explains how to configure the device.

[Fan]

[**Expansion**] With the other doors closed, open and then slide this panel into the computer's body.

[**External Monitor**] Use this port with any standard color VGA monitor. For details, refer to *Chapter 2: System*.

[**TV**] TV-out usage is covered in *Chapter 2: System* (p.2-8).

[**USB**] *Windows 98* automatically enables this port. *Windows 95* users should refer to *Chapter 2: System* for setup instructions (p.2-24). *Windows NT4* doesn't support this port.

[**PS/2**] Use this with any standard PS/2 external keyboard or mouse. For details, refer to *Chapter 2: System*, "TouchPad".

[Kensington Lock] This is a standard security port.

Parallel to USB Adapters

If you plan to use one of these adapters, make sure a USB driver is available for your device.
Consult the device's manufacturer for the latest driver options.
– You can usually do this on the Internet.

Bottom View

There are three compartments on the notebook's bottom none of which you should have to use frequently:

[**FDD/LS-120 bay**] This bay contains a standard FDD or an LS-120 Super Disk drive.

Do not remove this module.

If you are upgrading your system from FDD to LS-120, ask your authorized service provider to switch modules.

[**Battery**] This is part of the power system covered in *Chapter 4: Power*.

[**RAM**] This contains the system memory covered in *Chapter 5: Extras*.

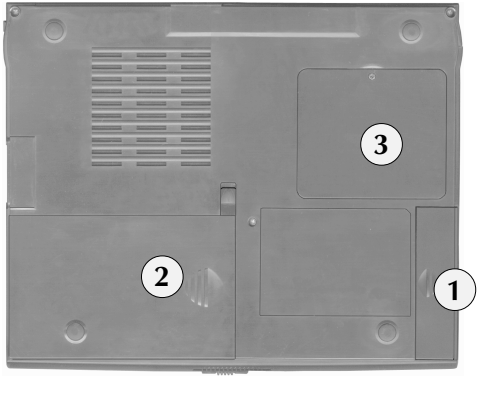
Upgrade Warning

Carefully review all the instructions about upgrading the system memory. Also check with your dealer to be sure that opening a compartment does not violate your warranty.

Bottom View

Fig. 1–6

1. FDD/LS-120 bay
2. Battery bay
3. RAM bay



2 System

This chapter is about computer's main subsystems

Input: Keyboard, TouchPad

Output: Video and Audio, and CD-ROM/DVD

Communications: PC Card, Fax/Modem, LAN and USB

Software Notes

This chapter only covers essential setup instructions in *Windows 9x*, and *NT4* operating systems. Enhanced utilities and software are covered in *Chapter 5: Extras*. For other operating systems (e.g. *Windows NT3.5x*), check the "readme.txt" file in the appropriate driver folder on the accompanying *Drivers/Utilities* CD-ROM.

Assumptions

In our explanations, we assume your system is configured so the CD-ROM is "drive D:". If the driver is located somewhere else, just substitute that source in the configuration.

For driver installations, we also assume your system is setup to view all files and file extentions.

Service Packs, Versions & Updates

Our descriptions are based on:
Windows 95 ver. 4.00.950B*
Windows 98 ver. 4.10.1998*
Windows NT4 (Build 1381: Service Pack 4)†
In most cases earlier versions are very similar.
Click on **Control Panel>**System** (**General** tab) to check your version number.*
†appears in the startup screen.

Networking Note

Make sure you've downloaded the driver from the network source to your hard drive before you begin any installation. In some cases, the operating system must reboot as part of the installation process and reconnecting to the network may not be practical.

KEYBOARDS

Your computer's keyboard has all the functions of a full-sized AT-compatible keyboard plus a few extras:

Type These keys are like those on a typewriter.

Function Many operating systems (and applications) use these keys to access special features, so you should consult those manuals.

Hot Keys These keys (and combinations) control some of the hardware. Refer to page 1-7.

Special Characters

Some software applications allow the number-keys to be used with **Alt** to produce special characters. These special characters can only be produced by using number keys on the embedded numeric keypad. Regular number keys won't work.

TYPE KEYS

FIG. 2 – 1

Press **NumLock** to turn on the embedded numeric keypad (outlined) – the LED will light.

FUNCTION KEYS

FIG. 2 – 2

External Keyboards

You can attach an external keyboard to the (PS/2) port. If you don't have a 6-pin keyboard connector, use a 5-to-6 pin adapter cable. The system automatically detects and enables the external keyboard as well as the notebook's. However, for those functions requiring the **Fn** key, you will still need to use the notebook's keyboard.

This port can only accept one type of device configuration per system session. For example, if you connect a PS/2 mouse to this port, you cannot connect a keyboard to the port during the same system session. Doing so will cause a system conflict. If you already have a mouse attached, and want to use a keyboard instead, you must shut down and restart the system. However, you can detach and reconnect the same device during a system session.

PS/2 Port
Fig. 2 – 3

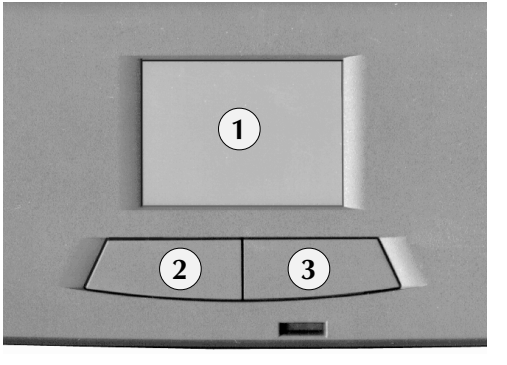
TouchPad

The system automatically enables the built-in TouchPad. If you're using any version of *Windows* or *OS/2*, you don't have to install a driver for it.

If you want to use the TouchPad's advanced features, refer to the driver information in *Chapter 5: Extras*.

Configuring the TouchPad

The TouchPad is a factory enabled PS/2 device. It can use the "Microsoft, or IBM PS/2" mouse driver available with most operating systems. Optimized TouchPad software for various operating systems is in the *Drivers/Utilities* CD-ROM which came with the system and is covered in *Chapter 5: Extras*.



The TouchPad
Fig. 2 – 4

1. sensor pad
2. left "mouse" button
3. right "mouse" button

Note for left-handers: Most operating systems allow you to reverse the mouse-button settings.

TouchPad & Serial Device

If you want to use a serial device as well as the TouchPad, you must make sure the device's driver can "see" it on COM1(serial port A). In some operating systems, you can only use one pointing device driver at a time, either serial or PS/2. To use a serial device, first enable it by attaching it to the port (while the system is OFF) and then start up and configure it with a suitable driver.

TouchPad & PS/2 Device

If you haven't installed any specialized mouse drivers, you can also use a mouse connected to the (PS/2) port. Just make the connection, and the system automatically detects an attached mouse, enabling it as well as the TouchPad using the same driver.

Note: The PS/2 port only accepts one type of device per system session. If you want to switch to an external keyboard on this port, you must shut down and restart the system. However, you can detach and reconnect the *same* device during a system session.

TouchPad & Serial Device

Windows 9x/Windows NT 4.0

1. Attach the serial device when the system is off.
2. Turn on the system and allow the operating system to detect and configure the device on the serial port (COM1). Insert the manufacturer's driver disk(s) if required.
3. Both devices are enabled.

Return to TouchPad (exclusively):

1. Exit the operating system (i.e. *Windows 9x* family or *Windows NT 4.0*).
2. Detach the serial device.
3. Start the operating system. It will automatically enable the available pointing device, in this case the TouchPad.

To find out how to change mouse settings for other operating systems, consult the manuals for those operating systems.

Protect the LCD

Do not allow any foreign objects (i.e. paper or plastic) to get between the lid/LCD and the work panel. They could damage or scratch the LCD and/or accidentally activate the close-cover switch.

VIDEO

There are three display options:

- the notebook's LCD
- an external monitor (CRT)
- a TV.

Select between the LCD and CRT with the **Fn** + toggle or the controls embedded in the video driver interface. The interface also lets you select a TV output, or change the screen resolution and color output to whatever is most comfortable/efficient for you.

As you examine the video driver (see below for setup information), you'll notice that some displays have more flexibility than others. This is a matter of hardware, video memory and the driver for your operating system. The driver interface shows the available options.

THE LCD CONTROLS

FIG. 2 – 5

1. Display toggle (LCD/CRT)
2. Brightness controls
3. Contrast controls (not active with TFT LCDs)

LCD

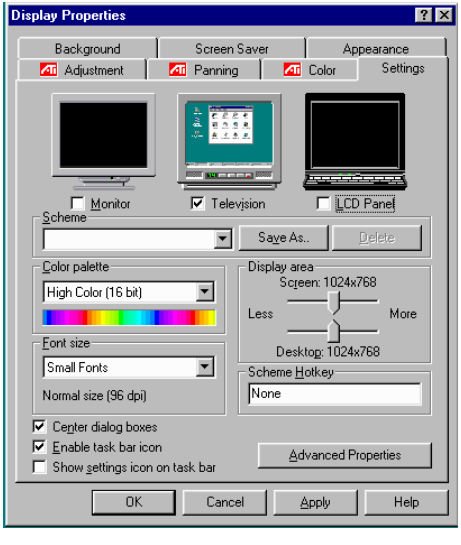
As you open the lid, adjust it so you can look at the screen straight-on, without any glare. If necessary, adjust the brightness and contrast controls.

Note: TFT LCD screens don't need contrast controls.

VIDEO DRIVER CONTROLS

The Rage LT Pro 3D driver adds three additional pages to the "Advanced" button in "Setting" tab of **Display Properties** to support the new enhanced display features. The new added pages allow you to select output devices (**Display** page), to adjust the position and size of your screen (**Adjustment** page), as well as to correct color tone differences between real color values and the way your monitor or flat panel displays them (**Color** page).

Note: For *Windows 95*, the **Display** option is embedded in **Settings** page (see the example). It also adds an additional **Panning** page to **Display Properties** for setting hotkeys to control panning when the desktop's display area is larger than the screen resolution.



WINDOWS 95
DISPLAY PROPERTIES CONTROL
FIG. 2 – 6

Attaching a Monitor

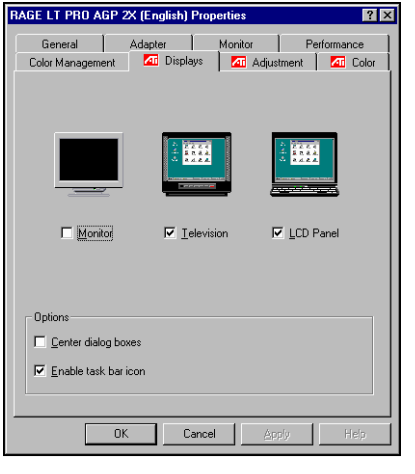
If you prefer to use an external monitor, connect it to the VGA port on the rear panel.

Note: *The vertical refresh rate of your monitor is very important. If it's too low and/or you're using fluorescent lighting, the screen will appear to flicker. To reduce flickering on an external monitor, use faster refresh rates (we recommend a refresh rate of 72Hz or more). But first check your monitor's documentation to make sure it can support the rates listed by the video driver. The default refresh rate for VGA monitors (without drivers) is 60Hz. For NTSC and PAL TVs, it's fixed at 60Hz and 50Hz, respectively.*

Power Warning

Both the monitor & computer should be OFF before you connect them.

Windows 98
Display Panel Settings
Fig. 2 – 7



TV Type

Both the TV & computer should be OFF before you connect them.

Be sure the NTSC/PAL setting in the BIOS *Setup* is correct. The wrong setting could damage your TV. (See *Chapter 3: Firmware* on how to use the Setup utility to configure your TV port setting in the BIOS.)

TV

To use a TV display instead of the LCD and/or monitor, connect the TV-adapter's "S" plug to the ⇨ port. The other end connects to your TV's "S" input.

Note: *The default refresh rate for NTSC and PAL TVs is fixed at 60Hz and 50Hz, respectively. And if you want to enable TV's speakers, you must use a cable between the computer's headphones port and your TV's audio-in port.*

SWITCHING

You can switch to the CRT display using the video driver control panel or by toggling **Fn +** . The toggle sequence is:

TV Standard	Monitor Resolution	Toggle Sequence	Comment
NTSC	VGA 640 x 480	LCD > monitor > LCD + monitor	TV output, controlled from the video driver interface, is supported in any color depth supported by the CRT (monitor) without panning.
	SVGA 800 x 600		
	XGA 1024x768		
	SXGA 1280x1024	LCD > monitor > LCD + monitor	TV output is not supported.
PAL	VGA 640 x 480	LCD > monitor > LCD + monitor	TV output, controlled from the video driver interface, is supported in any color depth supported by the CRT (monitor) without panning.
	SVGA 800 x 600		
	XGA 1024x768		
	SXGA 1280x1024	LCD > monitor > LCD + monitor	TV output is not supported.

TABLE 2 – 1
VIDEO OUTPUT
KEY COMBINATION SEQUENCE

2

Video Setup

Windows 9x & NT4.0

To setup the *Windows 9x* and *Windows NT4.0* video driver and utilities:

1. Open
   Control Panel > **Display.**
2. Click on
   Settings > **Advanced...***> **Adapter.**
   ** "Advanced Properties" in Windows 95.*
3. Click on **Change....**
   [In *Windows 98 and NT4.0*, click on **Next,** and choose "Display a list of drivers...". Click on **Next** again.**]**
4. Insert the Drivers/Utilities CD-ROM.
5. Select **Have Disk....**
   Click on **Browse...**
   and navigate to:
   D:\drivers \win95\video\disk1\macxw4.inf* (*Windows 95*)
   D:\drivers\win98\video\ ACPI†\disk1\macxw4.inf† (*Windows 98*)
   D:\drivers\winNT40\video\atirage.inf (*Windows NT4*)

   † If your BIOS doesn't support ACPI, choose the APM version.

6. Click on **OK** and then **OK** again.
7. Select "Rage LT Pro AGP 2X (English)", then **OK.**

Note: *During the installation you may have to identify "disk2".*

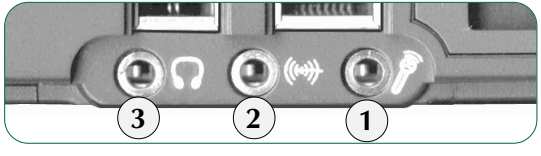
8. After the installation finishes, click on **Finish** to return to the Adapter page (if asked).
   Click on **Monitor**> **Change...** (button) and choose a "Laptop Display Panel" (any size). Click on **OK** and then **Close** (twice). When prompted, close any other applications and click on **Yes** to allow the system to re-start.
9. If you're using *Windows NT4.0*, re-install Service Pack 4.
10. After rebooting, the "ATI Desk Top Help" appears. Take a few moments to learn about your graphics accelerator's enhanced features.

Note: *This driver doesn't support "different image" output.*

AUDIO

The audio subsystem, in combination with the CD-ROM (or DVD), gives the computer multimedia capabilities. To use it, you first have to install the correct drivers. These are included in the software package which comes with the system. The procedure is explained on the next page.

The ports are on the right panel:



ADDITIONAL AUDIO

The *Drivers/Utilities* CD-ROM has enhancing audio software for *Windows 9x*. Refer to *Chapter 5: Extras* for more details.

Volume Safety

Protect your hearing! Turn down the volume before you plug-in either headphones or speakers.

AUDIO SUBSYSTEM PORTS

FIG. 2 – 8

1. microphone
   (disables internal microphone)
2. line-in
3. headphones/external speakers
   (disables on-board speakers)

Note: *Toggle* ***Fn+*** *and* ***Fn+*** *to lower or raise the volume.*
Fn + only disables the onboard speakers

TV Audio

If you are using a TV display, use a cable between this port and your TV's audio-in port to enable TV's speakers.

2

Audio Setup

Windows 9x

The *ESS AudioDrive* system takes advantage of technical improvements since *Windows 9x*'s release. Before installing these drivers for *Windows 95*, you should install the USB & related Chipset drivers (refer to page 2-24 of this chapter).

To install the audio drivers:

1. Press ⊞+**Break***> **Device Manager** (tab) .
2. Highlight **!PCI Multimedia Device** then click on the **Remove** button to delete it.
3. Click on the **Refresh** button.
4. Click on the **OK** button to get out of **System,** then allow the computer to reboot.
   If the driver hasn't been installed, the first time the operating system detects the audio hardware (soon after bootup) the *Update Device Driver Wizard* appears asking for a "PCI Multimedia Audio Device"
   Click on **Next>**
   Insert the Drivers/Utilities CD-ROM, then click on **OK** then on **Browse...** and navigate to D:\drivers\win98\audio or D:\drivers\win95\audio.
   Click **OK** (twice) to allow the wizard to complete the installation.

*⊞+Break = Start > Control Panel > System

Windows NT4.0

To install the audio driver after you're into the system, insert the *Drivers/Utilities* CD-ROM. Then,

1. Open **Control Panel** >**Multimedia** >**Devices** (tab) and click on the **Add** button.
2. Double-click on "Unlisted or Updated Driver". Then click **Browse...** and navigate to: D:\drivers\nt40\audio.
3. Click on **OK** when "ESS AudioDrive..." appears. Choose **OK** to confirm the settings. Then restart the system to activate the driver.
4. When the system restarts, double-click on the speaker icon in the task bar on the lower right to open the sound control panel.
5. Re-install Service Pack 4.

Note: *Windows NT4.0* does not support PnP function. For this reason, you must choose "other" for the "Installed O/S" in the BIOS *Setup* (see page 3-19) ***before*** this setup.

CD-ROM

Data Storage

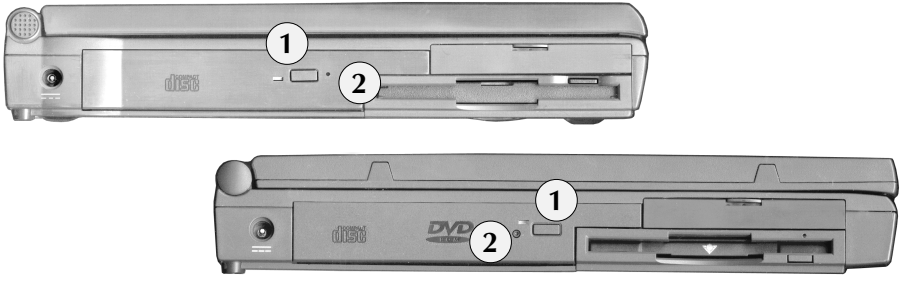
As a data storage device, the CD-ROM works like the other drives in the **My Computer** window (or **File Manager** in older versions of Windows).

Multimedia

If you're using the CD-ROM (or DVD) as a multimedia playback device, you'll need to use various utilities. *Windows 9x* and *NT 4.0* automatically include basic controls in their "Entertainment" packages (**Start** > **Programs** > **Accessories** > **Multimedia** or **Entertainment**).

DVD

DVD functions need more specialized support which is covered in the setup instructions on the next page.



DVD Limits

DVD functions are not available in the *DOS, Windows 3.1x & Windows NT* environments. They can only "see" your built-in DVD as an ordinary CD-ROM.

CD-ROM Drive

Fig. 2 – 9

1. CD-ROM eject button
2. CD-ROM emergency eject button. This requires a probe (e.g. a straightened paper clip)

Audio CD

If you want to use the CD-ROM to play an audio CD, make sure your operating system has the necessary drivers installed.

Multimedia CD's: MPEG

The ATI video driver automatically supports MPEG decoding, so you don't have to install any special hardware or software to play Video CDs.

Inserting & Removing a CD-ROM

To insert a CD-ROM:

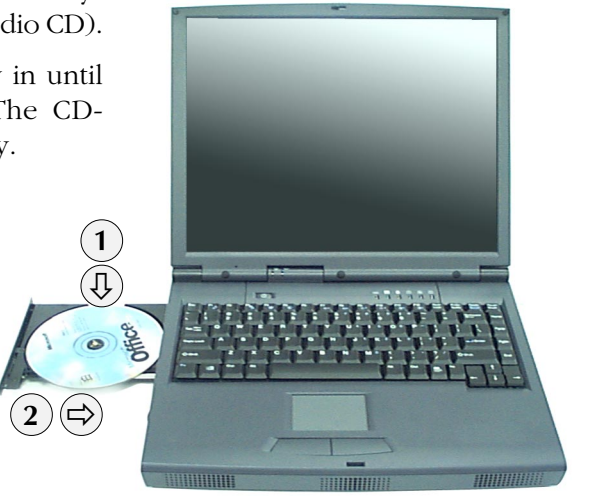
1. With the notebook turned On, press the button on the front of the module to release the spring-loaded tray.
2. Gently pull the tray out to its fullest extension.
3. Insert your CD-ROM shiny-side down (like an audio CD).
4. Gently push the tray in until it clicks in place. The CD-ROM is ready to play.

To remove the CD-ROM, press the same button to release the tray. If the system is Off, you can open the tray by inserting a probe (e.g. a straightened paper clip) into the small hole next to the eject button.

Using a CD-ROM

Fig. 2 – 10

1. Insert the disk face down.
2. Push the tray in until it clicks in place.



CD-ROM Drivers

DOS

These instructions assume you've already installed some version of DOS including the MSCDEX file.

1. If you do not have a floppy disk with the CD-ROM driver on it, your only other source is the CD-ROM which accompanies the system. Using a CD-ROM drive on another computer, navigate to the d:\drivers\other directory. Copy the cd-rom folder onto a 1.44MB floppy.
2. Insert the floppy containing CD-ROM driver into the FDD. Switch to drive A:\ and open its driver directory, and type:
   SETUP.EXE
3. As each page appears, press **Y** or **Enter** to confirm the settings. If you don't want to install the driver in the default directory (C:\ATADVD), when the "Specify the directory..." dialog box appears, use **Backspace** to delete the current name, then type in your preference. Remember to start the directory name with **C:**.
   When you get to the "Specify the parameter..." page, make sure the **( )/D [MSCD000]** switch has an asterisk (*). Then press **Enter**.
4. When the installation is complete, remove the floppy disk and reboot your computer.

Windows 9x
Windows NT4

These operating systems automatically detect and configure the CD-ROM drive. The start-up floppy which comes with them should also be able to configure the CD-ROM.

It they can't, install a version of DOS and the CD-ROM driver as described above. Then follow the installation utilities for the operating system you plan to use. As the installation progresses, the operating system will replace, or modify our CD-ROM driver.

DVD-ROM Setup (Windows 9x only)

If you don't install drivers and application software, the system "sees" the DVD as an ordinary CD-ROM. To make your DVD work,

1. Make sure the following drivers are installed:
   USB (page 2-24)
   Video (page 2-10)
   Audio (page 2-12)
   (***Windows 98*: skip steps 2 & 4**)
2. Download ***DirectX 5.0*** from the Microsoft web site or talk to your dealer. Then click on **Start** in *Windows 95*. Select **Run...** and type **C:\DX5ENG.exe***. Click on **OK** to install (If prompted, restart the system.)

** This assumes your DirectX 5.0 is English version and is stored in drive "C:".*

3. Insert the *DVD Drivers/Utilities* CD-ROM.
4. Click on **Start** > **Run...** > **Browse...** and navigate to: **D:\utilities\DVD\DXMEDIA\Win95 \installmedia52b.exe***.
   Click on **Open** and then **OK** to install ***DirectShow***. This will take a moment to install. Please wait for "The operation completed successfully" prompt to appear, click on **OK**.
5. Click on **Start** > **Run...** > **Browse...** again and navigate to: **D:\utilities\DVD\setup.exe***. Click on **Open**, then **OK** .
6. Follow the on-screen instructions to install ***DVD Express*** to your system. Unless you choose otherwise, the utility will create a "DVDExpress" sub-folder within a "\Program Files\ Media-matics" sub-folder. When prompted, select the region for your system* (Refer to the table). When the installation is done, click on **Finish**.

DVD Regional Coding	
Region	**Where**
1	USA, Canada & US Territories
2	Europe, Japan, South Africa, Middle East (including Egypt)
3	South East Asia, East Asia (but not China)
4	Australia, New Zealand, Mexico, Central & South America, Caribbean and Pacific Islands
5	Former Soviet Union, Indian Subcontinent, Africa, North Korea, and Mongolia
6	China (but not Hong Kong)

* ***Windows 98* does not allow region changes**. *So, be careful when choosing your region code. To change your region, you must* ***reinstall*** Windows 98, *then redo the entire setup again.*

Note: We also recommend installing the PC Card (PCMCIA) driver before this setup.

PC Cards

The notebook has two PC Card expansion sockets:

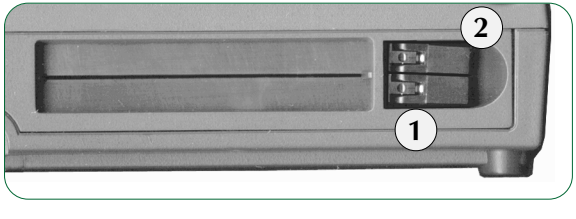
socket 0 (lower), is Type III
socket 1 (upper), is Type II

Both sockets are backward-compatible. For example, a Type III socket can handle a Type I, II, or III card. They also support PCMCIA (rev. 2) and CardBus (PCI bus to PCMCIA socket).

Both sockets are always “hot”.

Both sockets also support Zoomed Video (ZV) cards. This is a direct connection between the PC Card and the notebook’s video and audio subsystems. As such, it works directly with the CD-ROM module to support multimedia features.

Refer to the documentation which comes with your ZV card for more information about its capabilities and how to use its features.



PC Card Sockets
Fig. 2 – 11
1. socket 0 (lower) eject button
2. socket 1 (upper) eject button

PC Card Changes

Do not add, remove or change cards while the system is in Save to Disk mode. This may cause a conflict with the stored system configuration information.

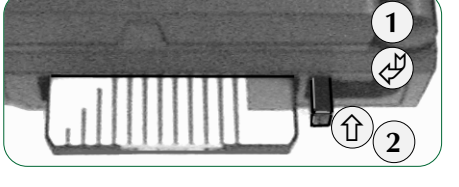
I/O PC Cards

Some operating systems may experience difficulties if an I/O card (e.g. a LAN) is present in the socket when you restart the computer. Depending on your operating system, the COM ports (I/O) for PC Card devices are reassigned. *Plug 'n Play operating systems (e.g. Windows 95 & Windows 98) don't have this limitation.*

Inserting a PC Card

If you want to use PC Cards, there are two levels of software to consider. The first is the driver for the PC Card sockets themselves. This is covered in the instructions on the next page.

The second level is for the PC Card itself. Plug 'n play operating systems (e.g. *Windows 9x*) can recognize most PC Cards and automatically install the right driver(s). If the operating system doesn't have the driver, it will ask you to supply it from a disk provided by the PC Card's manufacturer. Non-plug 'n play OSs won't prompt you for driver information, but need it nonetheless - check your operating system and PC Card documentation.



PC Card

Fig. 2 – 12

1. Flip the button out.
2. Push the button in to eject.

Once the driver is installed, *Windows* allows you to "hot" insert and remove the PC Card - within limits. You should refer to your operating system manual for more on this.

When you insert a card correctly, the system beeps once. If the PC Card is not detected, check whether the correct drivers are loaded.

Removing a PC Card

In general, you should always "mount" and "dismount" the PC Card using the PC Card socket utility.

When the utility tells you it's safe, push the appropriate eject button to remove the card. The system will beep twice when the card is disconnected.

PC Card Setup

Windows 95

The PC Card socket uses technologies which are newer than *Windows 95*. If you need to use these sockets in the *Windows 95* environment, please consult your dealer for technical support.
However, before installing these drivers for *Windows 95*, you should install the USB & related Chipset drivers (refer to page 2-24 of this chapter).

Windows 98

The PC Card system uses newer technologies than *Windows 98*. To upgrade the PC Card driver:

1. Navigate to:
   d:\drivers\win98\pcmcia
   copy PCMCIA.INF
   to c:\windows\inf.
   (This will overwrite the existing file of the same name.)
2. Press ⊞+**Break*** >**Device Manager** (tab).
3. Click on **PCMCIA socket**, and remove the "*Generic CardBus Controller*" listings. When both lines are removed, the **PCMCIA socket** heading will disappear.
4. Click on **Refresh**. The system will start rebuilding its driver base. Click on **Next >**.
5. Choose "Search for the best driver for your device", then **Next >**.
   Don't specify a location (no boxes checked).
6. Click **Next >** (several times), then **Finish**.
   During the installation, you may be asked to instert the *Windows 98* disk.
7. When the installation finishes, allow the system to restart.

***⊞+Break = Start > Control Panel > System**

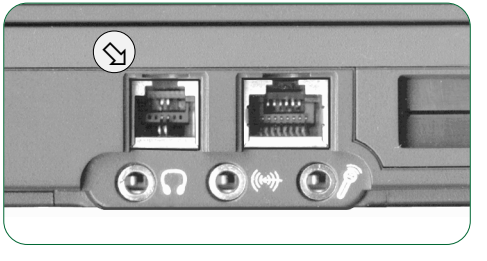
Windows NT 4.0

The operating system automatically installs the PC Card socket drivers. However, it is only PCMCIA (rev. 2) compliant, so you can install or remove cards only when the system is turned off. In particular, any I/O PC Card (e.g. SCSI) must be present when you boot-up the system. CardBus and ZV support are not available.

FAX/MODEM (OPTION)

If your system includes the fax/modem module, both *Windows 9x* and *Windows NT 4.0* will detect it during setup. However, our module takes advantage of newer technologies so you will have to install our updated drivers to take advantage of its full speed.

FAX/MODEM PORT
FIG. 2 – 13



Fax/Modem Setup

Windows 9x

Windows 95 launches the Update Device Driver Wizard when it detects the "PCI Communication Device".

Windows 98 automatically detects the Windows LT Modem. To update the driver,

1. Press ⊞+**Break***> **Device Manager** .
2. Click on **Other devices**, and remove "*Windows LT Modem*".
3. Click on **Refresh**. When the *Add New Hardware Wizard* appears, insert the *Drivers/Utilities* CD-ROM, and click on **Next** .
   (In *Windows 98*, you need to choose "Search for the best driver for your device", then **Next**.)
4. Click on **Other Locations...** (in *Windows 95*),
   Choose "Specify a location" (In *Windows 98*),
   and navigate to: d:\drivers\options\modem\win95&98&nt4
5. Follow the program's dialog boxes. When asked for "Wave Device for Voice Modem" and/or *Add New Hardware Wizard* reappears, go to the same location found in step 4.
6. When the installation finishes, click the **Modems** icon in the **Control Panel** to continue the setup (the modem should be assigned to COM2).

Note: For Dial-up Internet access, you must be sure to have all the proper "protocols" installed (e.g. TCP/IP). Refer to your operating system manual for this and/or your Internet Service Provider's documentation.

***⊞+Break = Start > Control Panel > System**

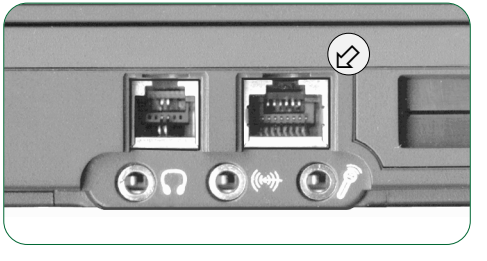
Windows NT 4.0

1. Insert the *Drivers/Utilities* CD-ROM. Navigate to: D:\drivers\options\modem\win95&98&nt40\setup.exe.
2. Follow the program's dialog boxes. When prompted, choose "Install new modem driver and components". Then click on **Finish**.
3. When the computer restarts, click **Modems** icon in the **Control Panel** to continue the setup (the modem should be assigned to COM2).

LAN *(OPTION)*

If your system includes the Local Area Network module, both *Windows 9x* and Windows *NT 4.0* will detect it during setup. However, our module takes advantage of newer technologies so you will have to install our updated drivers to take advantage of its full speed.

LAN PORT
FIG. 2 – 14



Setting up the LAN

Windows 98

Windows 98 automatically detects and installs the "AMD PCNET Family Ethernet Adapter (PCI-ISA)". However, your system uses even newer technologies.

To update your system,

1. Click on ⊞ + **Break** > **Device Manager** (tab)> **Network adapters**.
2. Highlight "AMD PCNET Family Ethernet Adapter".
3. Click on **Properties** > **Driver** (tab) > **Update Driver....**
4. Start the *Update Device Wizard* Choose **Next** > choose the "**Display a list**"... (button) **> Next> Have Disk....**
5. Insert the *Drivers/Utilities* CD-ROM and navigate to:

D:\Drivers\Win9x\lan\ndis30\netamd.inf

or

D:\Drivers\Win9x\lan\ndis40\netamd.inf

Click on **OK** (twice) to install it.

Note: *Consult your network administrator to find out which driver is compatible.*

5. After you've updated your drivers and rebooted, make sure the proper protocols are setup (refer to your operating system documentation for this).

Windows 95

To update the LAN driver,

1. Click on ⊞ + **Break** > **Device Manager** (tab)> **Network adapters**.
2. Highlight "Dial-Up adapter".
3. Click on **Properties** > **Driver** (tab) > **Update Driver**....
4. Start the *Update Device Wizard* Choose **No**...(button)> **Next** > **Have Disk....**
5. Insert the *Drivers/Utilities* CD-ROM and navigate to:

D:\Drivers\Win95\lan\netamd.inf

Click on OK **(twice).**

Highlight "AMD PCNET Family Ethernet Adapter(PCI)"

Note: *The installation may ask you for a *.sys file. This is also located in Win95\lan\ folder of your Drivers/Utilities CD-ROM.*

Windows NT 4.0

To update the LAN driver,

1. In the **Control Panel**, click on **Network**.
2. Choose **No** (You can install the network later, first get the adapter setup).
3. In the network dialog box, go to the **Adapters** tab.
4. Click **Add...> Have Disk....**
5. On the *Drivers/Utilities* CD-ROM, navigate to Drivers\options\NT40 \ndis3\oemsetup.inf or Drivers\options\NT40 \ndis4\oemsetup.inf. Choose the "AMD PCNET Family Ethernet Adapter".
6. Allow the "AutoSense" connection type.
7. Finish and close, then allow the system to reboot. When it resumes, you'll still have to install the rest of the Networking drivers and protocols. Follow the operating system for that part.

USB & Related Chipset Setup

The USB socket drivers were not available with the initial release of *Windows 95*. This installation will correct that defect.

Enabling the USB features is a two-stage process which must be followed in order:

Stage 1 USB setup:

Run the Usbsupp.exe utility from Microsoft. This may be included on the CD-ROM containing *Windows 95*. When the system restarts, continue to Stage 2.

Stage 2 Chipset setup

Run *Setup.exe* of the Intel 82371xb INF Update Installer ver. 3.0 . When this is installed, the system will go through a re-detection process, which may require several restarts of the system (just follow the on-screen instructions).

Windows 98

USB support is fully integrated.

Windows NT 4.0

USB support is not available.

3 Firmware

This chapter is about the notebook's built-in software:

Diagnostics: the *POST* (Power-On Self Test)

Configuration: the *Setup* utility

If your computer has never been set up, or you are making important changes to the system (e.g. power management features), then you should review this chapter first and note the original settings found in *Setup*. Even if you are a beginner, keep a record of the settings you find and any changes you make. This information could be useful if your system ever needs servicing.

There is one general rule: *Don't make any changes unless you are sure of what you are doing*. Many of the settings are required by the system, and changing them could cause it to become unstable or worse. If you have any doubts, consult your system dealer.

THE POWER-ON SELF TEST (POST)

Each time you turn on the computer, several things happen:

- BIOS information flashes on the screen.
- the system takes a few seconds to conduct a *POST*, including a quick test of the on-board RAM.

As the POST proceeds, the computer will tell you if there is anything wrong. If there is a problem which prevents the system from booting, it will tell you to run *Setup*. If there are no problems, the system will present a summary, and announce that it is starting the operating system. Once that message appears, you can no longer get into *Setup*.

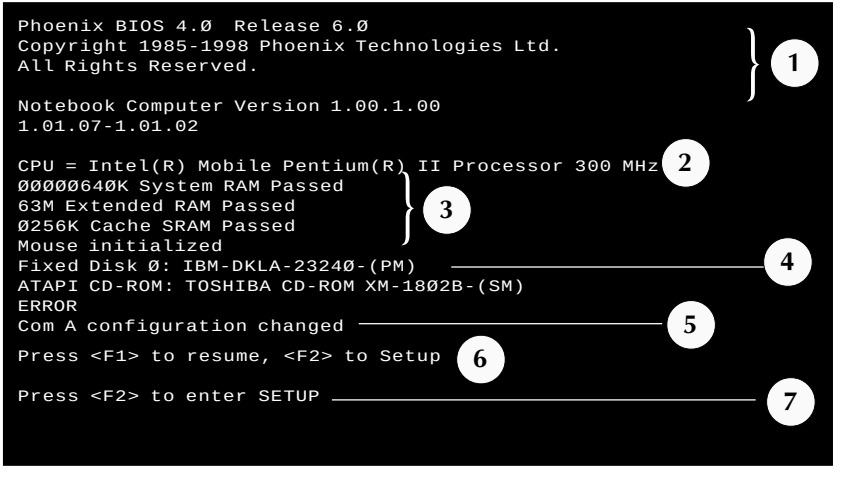
STARTUP SCREEN: THE POST

FIG. 3 – 1

If you choose the Quick Boot option in the Setup utility, you will only see an abbreviated version of this screen.

1. BIOS information
2. CPU type
3. memory status
4. HDD identification notice
5. error notice (example)
6. Enter *Setup* cue
   - appears if there is an error
7. Enter *Setup* cue
   - appears only during POST (#6 is *not* present)

Note: *your POST may identify different components (e.g. "Fixed Disk Ø").*



FAILING THE POST

Errors can be detected during the *POST*. There are two categories, “fatal” and “non-fatal”.

FATAL ERRORS

These stop the boot process and usually indicate there is something seriously wrong with your system. Take the computer to your dealer or authorized service center as soon as possible.

NON-FATAL ERRORS

This kind of error still allows you to boot. You will get a message identifying the problem (make a note of this message!) followed by the cue:

```
Press <F1> to resume,
<F2> to enter Setup
```

Press **F1** to see if the boot process can continue. It may work, without the correct configuration.

Press **F2** to run the *Setup* program and try to correct the problem. If you still get an error message after you change the setting, or if the “cure” seems even worse, call for help.

THE SETUP PROGRAM

The Phoenix *Setup* program tells the system how to configure itself and manage basic features and subsystems (e.g. port configuration and power management).

ENTERING SETUP

To enter *Setup*, turn on the computer and press **F2** during the *POST*. The prompt seen in Fig. 3 – 1 is usually present for a few seconds after you turn on the system. If you get a "Keyboard Error" (usually because you pressed **F2** too quickly) just press **F2** again.

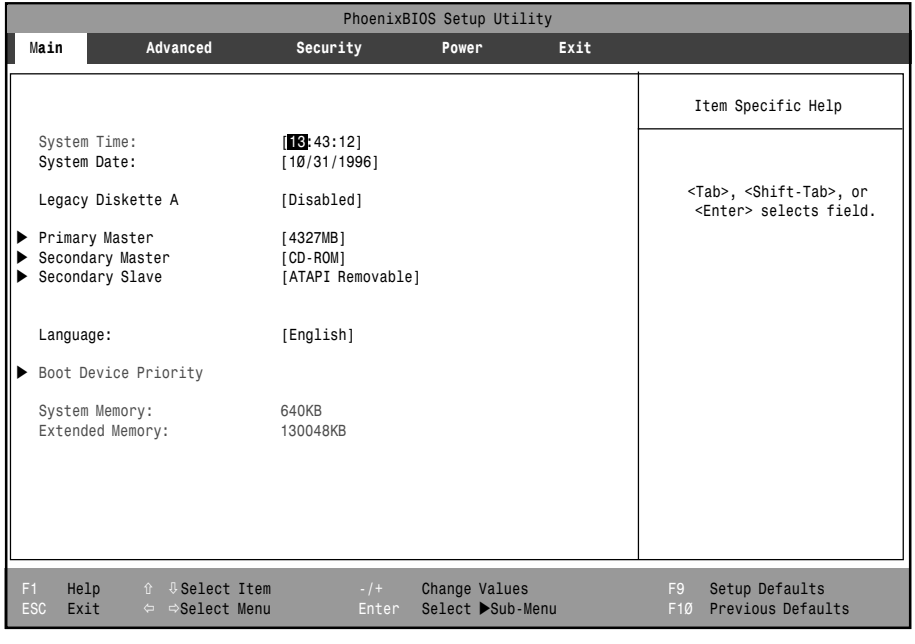
If the computer is already on, reboot using the **Ctrl** + **Alt** + **Delete** combination and then hold down **F2**. *Setup's* main menu will appear.

SETUP SCREENS

The *Setup* interface looks like a "windows" screen:

Along the top of the screen is a menu bar with five (5) menu headings. When you select a heading, a new screen appears. Scroll through the features listed on each screen to make changes to *Setup*.

Instructions on how to navigate each screen are in the box along the bottom of the screen. If these tools are confusing, press **F1** to call up a *General Help* screen. Then use the arrow keys to scroll up or down this page.



The "Item Specific Help" on the right side of each screen explains the highlighted item and has useful messages about its options.

If you see an arrow (" ▶ ") next to an item, press **Enter** to go to a sub-menu on that subject. The sub-menu screen which appears has a similar layout but the **Enter** key may execute a command.

Setup Main Menu

Fig. 3 – 2

The *Setup* menus shown in this section are for reference only. Your computer's menus will indicate the configuration appropriate for your model and options.

Switching Hard Disks

Every time you install a different hard disk in the notebook, it should be (re)configured, unless **Auto** is selected.

Auto Limitations

The **Auto** feature may provide a different set of parameters for the same hard disk at different times. However, it should be reconfigured with the same parameters you got the first time. If you use a different set of parameters, it may be impossible for you to read any data on the hard disk.

More on Setup

Following is additional advice on portions of the *Setup*, not covered in the Item Specific Help.

System Time & Date (Main Menu)

The hour setting uses the 24-hour system (i.e., ØØ = midnight; 13 = 1 pm). If you can change the date and time settings in your operating system, you will also change these settings. Some applications may also alter data files to reflect these changes.

Legacy Diskette A (Main Menu)

If you're using a standard FDD, choose "1.44/1.25MB 3½".
If you're using an LS-120 Super Drive, choose "Disabled" (it's on the Secondary Slave instead).

Primary Master (Main Menu)

Pressing **Enter** opens the submenu to configure the main IDE HDD which fits into the notebook's HDD bay. Refer to *Chapter 5: Extras* for more on this bay.

Type (Main Menu >Primary Master)

This setting has several options for choosing which method *Setup* will use to detect the hard disk:

Auto (*Default setting*) This is the easiest solution. It allows *Setup* to determine the hard disk's type and other information when you press **Enter**. It automatically loads the information into the *BIOS*.

None No hard disk is installed. With this option, the system will require a removable disk to supply the bootup information.

User This allows you to fill in the Cylinders, Heads and Sectors/Track fields. The size (MB) field is automatically calculated based on this information. The information for all these fields should be printed on the hard disk itself, or in its accompanying documentation.

Note: *For future use, and as a precaution, make a record the hard disk's original configuration.*

Multi-Sector Transfers

(Main Menu >Primary Master)

This determines the number of sectors in each block that can be transferred together. The "Auto" Type setting selects the optimum number.

LBA Mode Control

(Main Menu >Primary Master)

If your hard disk is larger than 528MB (unformatted capacity), enable this control. The "Auto" Type setting enables this setting if the disk is large enough.

32 Bit I/O *(Main Menu >Primary Master)*

Most new hard disks can support this higher rate. If yours can't, the "Enabled" setting may slow down the system.

Transfer Mode & Ultra DMA Mode

(Main Menu >Primary Master)

These settings allow you to choose among various modes used for data transfers. "Auto" Type setting selects the best modes for your HDD.

LBA Warning

If you enable LBA mode for a particular HDD, be sure to enable it each time you use the same hard disk. If you don't you may encounter read/write errors.

When to Use LBA

The "standard" or ATA mode of "seeing" HDDs is inadequate for drives larger than 528MB. LBA mode corrects this and allows for hard disks up to 128GB. ATA and LBA modes overlap. So if LBA mode is not activated when an HDD is first formatted, sections may not be readable under the LBA system. (This does not matter with 528 MB or smaller HDDs.)

If you're using an HDD not formatted using LBA mode, do not use the "Auto" setting.

SECONDARY MASTER (MAIN MENU)

Pressing **Enter** opens the sub-menu to configure the second IDE device, in this case, the CD-ROM/DVD. Don't change the default setting, "Auto".

Refer to page 2-15 for more on how to configure the CD-ROM or page 2-16 to configure the DVD.

SECONDARY SLAVE (MAIN MENU)

Pressing **Enter** opens the sub-menu to configure the third IDE device, in this case, the LS-120 Super Disk. Don't change the default setting, "Auto".

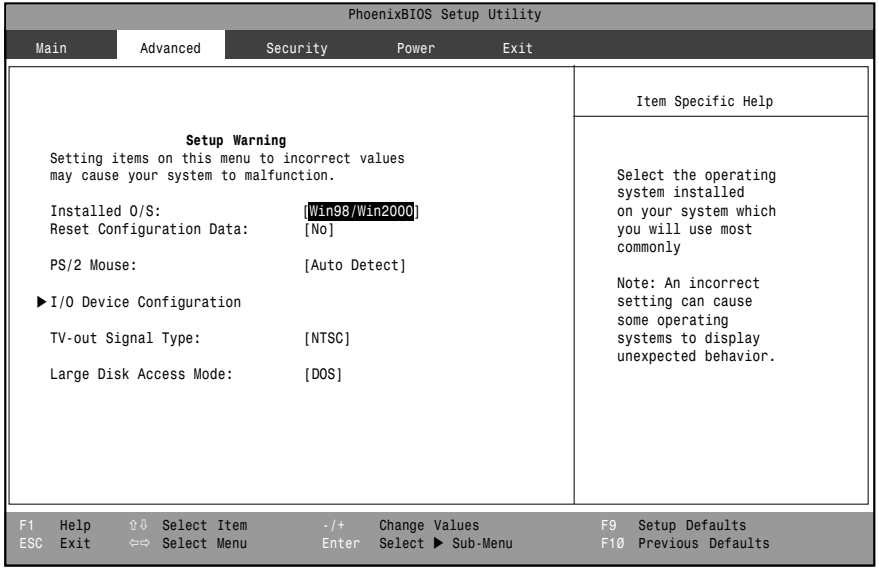
If you don't have one, the Type field will say "None". In this case, be sure to enable the "Legacy Diskette A" setting.

ADVANCED MENU

INSTALLED O/S (ADVANCED MENU)

This setting conforms to your OS's Plug 'n Play and power management capabilities:

Win98/Win2000	for Windows 98 and Windows 2000
Win95	for Windows 95 and OS/2 Warp ver. 4
Other	for Windows NT 4



ADVANCED MENU
FIG. 3 – 3

Reset Configuration Data (advanced Menu)

Do not change this setting, it is intended for service testing.

I/O Device Configuration

(advanced Menu)

Serial port A

(Advanced Menu >I/O Device Configuration)

If you don't plan to use this port, you can set this line to "Disabled" to save power. The default setting is "Enabled".

Serial port B

(Advanced Menu >I/O Device Configuration)

This assigns resources to the built-in IrDA port. If you don't plan to use this port, you can set this line to "Disabled" to save power. The default setting is "Enabled".

Mode

(Advanced Menu >I/O Device Configuration> Serial port B)

There are several modes available if you set the serial port B to "Enabled". Make sure the mode you choose is supported by the device with which you want to communicate. Fast IR (FIR), as the name implies, is the most powerful option followed by IrDA (standard) and then ASK.

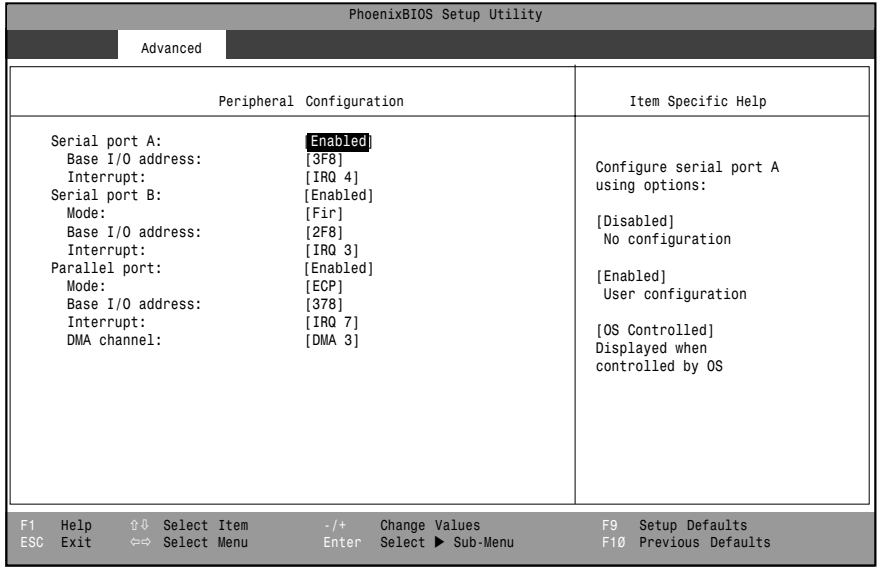
Parallel port

(Advanced Menu >Peripheral configuration)

If you don't plan to use this port, you can set this line to "Disabled" to save power. The default setting is "Enabled".

Serial Resources

If you are not planning to use these serial ports, you can disable them (by choosing "Disabled"). This way you can assign resources to another device, e.g. a PC Card device.



ADVANCED MENU,
I/O DEVICE CONFIGURATION
SUB-MENU
FIG. 3 – 4

MODE

(ADVANCED MENU > I/O DEVICE CONFIGURATION > PARALLEL PORT)

There are several modes available once you set this port to “Enabled”:

ECP (Extended)

EPP (Enhanced)

Output only

Bi-directional

You should check your parallel device’s documentation to see which one it can use.

Parallel Modes

Most newer printers recommend ECP or Bidirectional mode.

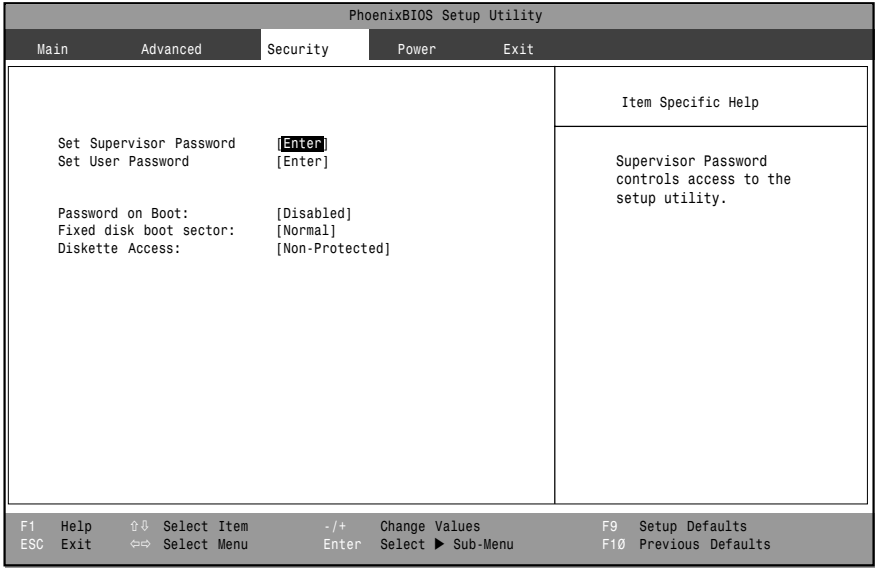
SECURITY MENU

SET SUPERVISOR PASSWORD & SET USER PASSWORD

(SECURITY MENU)

Passwords can be up to seven (7) characters and/or numbers (but not symbols). When creating a password it must be entered twice, the second time for confirmation.

If you forget or lose a password, consult your dealer or service center.



SECURITY MENU
FIG. 3 – 5

Set Supervisor Password

(Security Menu)

Supervisors have unrestricted access to the system and can assign a "User" password.

Only a supervisor can change a "Supervisor" password. If you leave the field empty, both the Supervisor and User passwords are disabled and erased.

Set User Password

(Security Menu)

To use this feature, a Supervisor password must be set first. Only the supervisor (using the Supervisor password) can set and change the User password. To disable the User password, enter the existing password first and leave the new password fields blank.

If you enter the system with the User password, you are denied access to:

- Advanced Menu:
  I/O Device Configuration
- Security menu:
  all except for user password
- Exit Menu:
  pre-loaded value options

Password on Boot

(Security Menu)

When this is "Enabled", the system will ask for a password each time you turn on the system or reboot. Type either password and then press **Enter**.

The system allows three attempts. If the wrong password is entered again, the system locks and must be restarted.

Fixed disk boot sector

(Security Menu)

If this feature is active, you will get a warning message,

Hard drive not installed
If operating system not found,
re-install hard drive.
Hit any key to exit.

whenever Boot Sector 0 is different from the one recorded. This includes re-partitioning or reformatting the hard disk. You must turn off the "Write Protect" feature to perform those functions or install a different hard disk.

If boot sector protection is not enabled, make sure that the new hard disk is not infected with viruses.

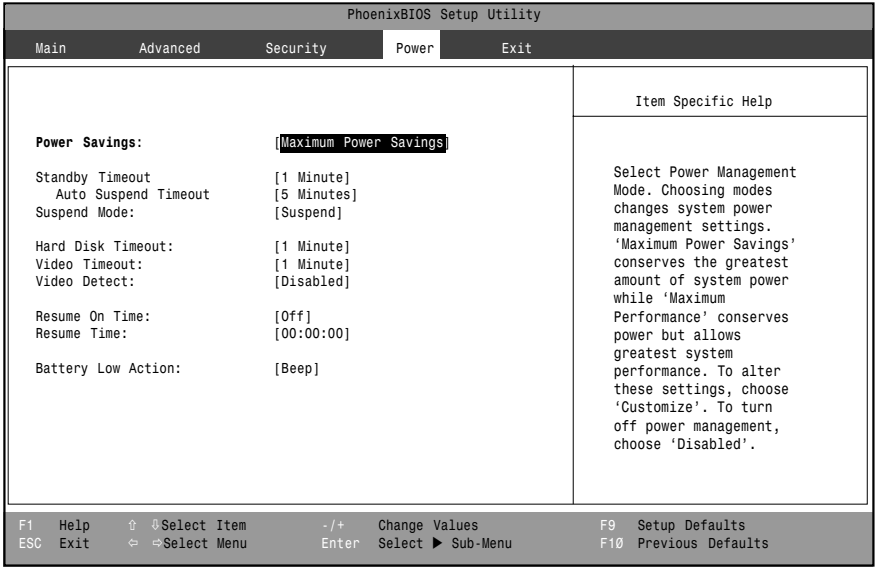
POWER MENU

In this menu, you can choose among three preset power saving schemes or customize your desired settings.

Before you adjust the settings in this menu, we suggest a review of the power management system in *Chapter 4: Power*.

Note: If you have prepared a "Save to Disk" partition or file, the **Fn** + combination activates *Save to Disk* mode.

If you don't have an appropriate partition or file, both the **Fn** + and **Fn**+ combinations activate *Suspend* mode *(Save to RAM)*.



POWER MENU
FIG. 3 – 6

Power Savings (Power Menu)

This is the "master switch" for the power savings system.

Suspend Mode (Power Menu)

Use this item to control the **Suspend** power management system. If you want to use the "Save to Disk" method, you must have set up a Save to Disk file or partition as described in *Chapter 4: Power*. If you haven't set up a file or partition for Save to Disk, the system defaults to the low-power suspend to RAM.

Resume On Time & Resume Time (Power Menu)

Use these items to control how the system will be reactivated from *Suspend (to RAM)* mode. This does not apply to *Save to Disk* mode.

Exit Menu

Choosing to "Load Setup Defaults" will wipe out any customized settings. "Exit Discarding Changes" will quit *Setup* without making any changes, though if there are customized settings from a previous session, they also won't be changed.

4 Power

This chapter is about the power system, both hardware and software:

Hardware AC adapter, battery pack(s)

Software *Setup* utility parameters, power & battery management utilities

The first part covers the battery and the AC adapter. To see where these fit into the system, review the system layout in *Chapter 1: Introduction*.

The second part is about the power usage and management - how to get the most out of your battery. Part of this involves settings in the *Setup* utility, so you should also refer to *Chapter 3: Firmware*.

Icons & Indicators

These LEDs describe the system's Power status:

Table 4 – 1
Power Indicators

Icon	Variable	Meaning	Notes
 Power	flashing	Suspend mode activated	
	solid	Power-On mode	
 Charge	flashing	charging (AC-in)	
	solid	fully charged*	Unless the adapter stays plugged in, this doesn't last long.
 Battery Status	(no light)	no battery problems*	System is drawing power from the adapter, or battery condition is "OK".
	flashing (accompanied by warning "beeps")	Low Power (less than 8% left)	**Auto-Shutdown Imminent:** Connect the AC power supply immediately or shut down.

* Battery charge status is more completely reported by APM or ACPI compliant operating systems.

Power Hardware

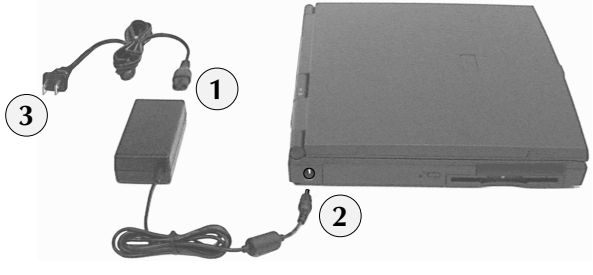
You can operate the notebook on either AC or battery power. The next two sections are about how to use these power sources and other AC/battery power related information.

AC Power

The notebook comes with an AC power cord and a universal, auto-switching power adapter. You can use the adapter anywhere the voltage is steady, between 100 and 240 volts.

When the adapter is connected to a power source and then to the computer, the ⇶ icon lights up to indicate the system is receiving AC power. To use the AC adapter:

1. Plug the power cord to the power adapter.
2. Plug the power adapter to the ⎓ socket on the computer's right panel.
3. Plug the power cord into a wall outlet.
4. Press the ⏻ (On/Off) switch for **one second** to turn the system on.



Connecting AC Adapter
Fig. 4 – 1

Adapter Warning

Only use an approved adapter. The wrong adapter could damage the computer.

Battery Power

The notebook comes with a standard-sized rechargeable battery. You can get a replacement battery from your dealer.

First-Time Use & Storage

If you don't use battery packs for a long time (about three weeks), they should be discharged completely and then recharged. The battery that came with your new computer may have been in storage or shipment for some time. So, we **strongly recommend** that you follow these steps when you receive this computer or if you have not used the battery for a long time. You should follow this procedure regardless of whether or not the AC power source is plugged in during the battery inactivity.

1. Install the battery in its compartment (if it's not already there).
2. Make sure that the AC power source is plugged in. Refer to the AC Power section for details. Turn on the system and press **F2** to enter *Setup*. (If you are not sure how to do this, refer to *Chapter 3: Firmware*.)
3. Open the Power menu and set the Power Savings to "Disabled".
4. Save the setting by choosing "Exit Saving Changes" in the Exit menu.

5. Make sure that your operating system does not activate Advanced Power Management (APM or ACPI). If you are using *Windows 9x*, reboot using "Command prompt only".

   Note: If your hard disk is not bootable, insert a bootable floppy disk in drive A: before rebooting.

6. After the system finishes booting, detach the AC power source. Discharge the battery completely by leaving the system on for about two (2) hours, until the system shuts itself down. Ignore any low power warnings.

7. Plug in the AC power source to recharge the battery. Leave the system off while charging. The battery status icon flashes during charging. When the battery is full, the LED remains solid. The approximate charge time is about two hours (system Off). Refer to the Using & Charging the Battery Pack section in this chapter for details.

8. Turn on the computer and press **F2** to enter *Setup*. Open the Power menu and reset your preference. Save the setting and reboot.

Installing & Removing a Battery Pack

First, use one of these methods to protect your work

- Use *Save to disk* mode.
- Save your work then shut down the system.

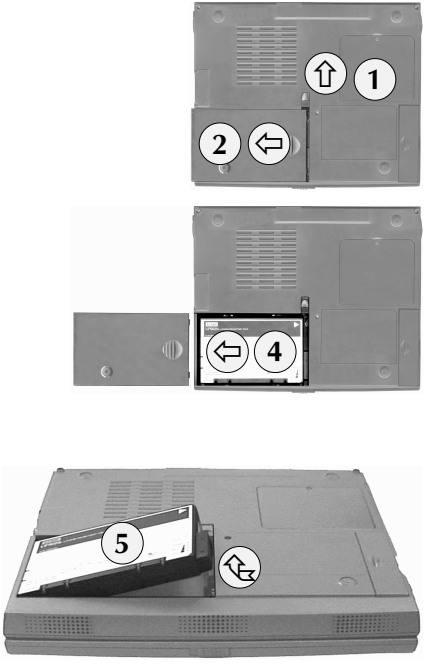
Packaging Note

The battery pack is packaged separately from the notebook.

Pull the Battery Out by the Tab

Fig. 4 – 2

1. Slide the battery-lock latch out.
2. Slide the battery-cover out.
3. Holding the outer edge, angle the battery-cover up and lift away.
4. Slide the battery towards the outer edge.
5. Pry the battery up from its inner edge.



Into the Power Bay

1. Remove the battery bay lid.
2. Remove the used battery (if present). Follow the instructions in the side-bar.
3. Remove the battery from its packaging.
4. Slide the fresh battery into the slot. If there is any resistance as you slide it in, check for and remove any foreign objects that may have gotten into the bay.

   Note: The battery's connector must be toward the front edge of the computer.
5. Replace the bay lid.

Using & Charging the Battery Pack

Refer to Table 4-1 on page 4-2 of this chapter. If a low battery warning occurs, *save your work immediately* and do one or more of the following:

- Plug in the AC adapter.
- Replace the battery pack while connected to the AC adapter.
- Go into Save to Disk or shut down until you can recharge.

When the system receives AC power, the power LED glows and the charge LED starts flashing. The battery status LED, stops flashing when the battery passes the low-power zone. When the battery is full, the charge LED becomes solid.

Battery Type Warning

If your system does not have a "smart battery" (e.g. a Molicel-ME202BB). The power monitoring utilities for Windows 9x do not work.

Power Management

Hardware (Battery Status & Warnings)

After the POST finishes, the battery status LED indicates the battery's charge level. When the battery is low, this icon flashes. Save your work immediately and follow the suggestions on page 4-7.

Low Battery & Suspend

When battery levels get too low (and you're not using the adapter), the computer reacts in one of two ways:

Without Save to Disk

If you don't "Enable" Save to Disk in *Setup* (Power menu), information is saved to the RAM and the system goes into Suspend (low power) mode.

With Save to Disk

If Save to Disk is "Enabled", the system records status information to a special file or partition on the HDD and then turns itself OFF. If a Save to Disk file or partition isn't available, the system goes into "Suspend" mode.

If either of these options starts, the battery should be considered "fully" depleted, though it maintains a small, safety, reserve. If the battery depletes the safety reserve, the system can't be turned on and anything not saved to disk is lost.

PC Card Warning

Do not remove or change the PC Cards while the system is in Save to Disk Mode. The slots are turned off and any change in the system configuration may cause problems when the computer comes back on.

FIRMWARE (SETUP CONTROLS)

The Power menu in *Setup* controls how Suspend (to RAM) or Save to Disk is activated. Refer to *Chapter 3: Firmware* on how to setup these modes.

SAVE TO DISK

This suspend method records system status information to a special file or partition on the HDD and then turns the system OFF.

Save to Disk can be activated by:

- Critically Low battery power
- Pressing **Fn+**
- Specified time-out after the *Suspend (to RAM)* mode

Once the function is activated, the system makes a starting beep. When system status information is saved into the specially-reserved hard disk area (partition or file), the system shuts down.

To resume work, press the ON/OFF button to turn the system back ON. The system will return to the state before it went into Save to Disk and turn on all devices.

Security Note: *If you setup a password in* Setup, *you will need it to resume from* Save to Disk.

Ring in Note: The system is OFF during this mode, so a Ring-in or Alarm Resume time will not wake up the system. If you want a ring-in from a fax-modem to wake the system, do not use this setting.

Partition Warning

If you haven't set up the system for Save to Disk, or if the space reserved for the Save to Disk partition isn't large enough, the system will default to Suspend (to RAM) mode and your unsaved data will be lost when power is turned off.

Save to Disk

DOS Save to Disk Setup

When the BIOS instructs the system to "Save to Disk", it makes use of a special **file** or **partition** on the HDD. This is created and managed by the PHDISK utility found on the same floppy as the CD-ROM driver. Another copy is on the Drivers/Utilities CD-ROM.

Space

Both partition and file methods occupy the same amount of space on your HDD. The size of this partition must be greater than the total size of the memory (DRAM) and the notebook's video RAM. A typical setup's space requirement might be:

memory type	**KB size**	**MB size**
system	65,536KB	64MB
video	4,096KB	4MB
total	69,632KB	68MB
recommended*	70,656KB	69MB

*The recommended space should always be about 1MB more than the total calculated. The extra MB is for data from other chip registers. (1MB = 1024KB)

Check the specifications for your system before you run the PHDISK utility.

The File Method
(for FAT16/FAT32 file system only)

This is the most flexible means of preparing your hard disk for the Save to Disk power saving system. However, it is not compatible with all file systems (e.g. NTFS). To setup this file you should,

1. Make sure your hard disk is defragmented (there are numerous utilities available for this).
2. Reboot the computer in the DOS mode.
3. Insert the PHDISK Utility floppy.
4. Run PHDISK.EXE
   type,
   a:>**PHDISK** [**Enter**]
   type
   2 [**Enter**], then
   • to use the default setting, press [**Enter**]
   • to make a partition the size you prefer (e.g. for a 69MB= 70,656KB partition),
   type
   "**70656**" then press [**Enter**]

5. When finished creating, choose "**3**", then press **any key** to reboot.

Note: When finished, the utility will save the file, **SAVE2DSK.BIN**, as a hidden, system, and read-only file in your root directory of drive "C:".

The Partition Method

Since this method requires you to configure your HDD, you must make sure you have enough **unpartitioned**, **unformatted** hard disk space to accommodate the size of the partition you expect to have **before** this setup. Follow these steps to prepare the partition:

1. Boot up the computer from a bootable disk.
2. Insert the PHDISK Utility floppy.
3. Run PHDISK.EXE at the DOS prompt,
   type
   a:>**PHDISK** [**Enter**],
   type
   1 [**Enter**], then
   - to use the default setting, press **Enter**
   - to make a partition the size you prefer (e.g. for a 37MB =37,888KB partition),

   type
   "**37888**" then press **Enter**
4. When finished formatting, choose "**3**", then press **any key** to reboot the system.

Note: When you run your operating system's partition utility (e.g. MS-DOS's **FDISK**), it will tell you that it has found a "Non-DOS" partition. Do not do anything to this partition, and be careful not to format the "Non-DOS" partition.

Other Controls

Reformatting (partition only)

If your Save to Disk partition becomes corrupted or develops too many "bad sectors", you should reformat it by typing,

a:>**PHDISK [ENTER]**,

then type **1** [**Enter**]

When finished reformatting, choose "**3**", then press **any key** to reboot the system.

Deleting (partition or file)

If you want to remove the partition or file contents, type

a:>**PHDISK** [**ENTER**]

then type **2** [**Enter**]

When finished deleting, choose "**3**", then press **any key** to reboot.

Note: If you created a partition, it will still exist as a separate partition. To make it DOS-usable, next use DOS's FORMAT utility.

Suspend (to RAM)

In this mode, the computer is powered down, but still supplies minimal power to the DRAM to preserve the system information stored there.

Depending on the option you selected in *Setup*, Suspend can be activated by:

- low battery power
- pressing **Fn+** 
- after the specified Standby time-out

Pressing any key reactivates the computer. However, each time this happens, you risk depleting the battery beyond its safety reserve and losing any data not saved to a disk.

Security Note: Passwords are not needed to resume from *Suspend*. If you want password protection, use the *Save to Disk* alternative.

Ring in Note: The system will wake if a ring-in is detected from a fax-modem or an activated serial (or other COM) port.

Software (Utilities)

Your system is designed to work with both APM and the newer (and more effective) ACPI power management systems.

If you are using an operating system which doesn't have either of these, (e.g. Windows NT 4.0) you should consult your dealer about a supplemental utility such as SystemSoft's *PowerProfiler*.

APM & ACPI

Developed by Microsoft and Intel, *Advanced Power Management* (*APM*) is embedded in the *Windows 95* operating system. Use the Power icon on *Windows 95*'s **Control Panel** to access *APM*. For best results, use the default settings.

If you're using *Windows 98*, the *Advanced Configuration and Power Interface* (*ACPI*) allows you to control more functions, including Suspend. However, the type of Suspend - either Suspend to RAM (low power) or the more powerful Save to Disk, is controlled from *Setup* (refer to *Chapter 3: Firmware*).

For more information about *APM* and *ACPI*, refer to your operating system documentation.

Additional Power Management

You can conserve power by reducing the amount of disk caching Windows 9x does. From the **Control Panel**, select **System**. From the **Performance** tab, select **File System**.... On the **Hard Disk** tab, select "Mobile or docking system" under "Typical role of this machine:". Your system performance may not be as fast, but the battery should last longer.

NOTES:

5 Extras

This chapter is about add-ons and extra features available with your system:

Hardware: Upgrading the HDD, memory (also refer to page A-3)

Software: improved TouchPad drivers (also see pages 2-4 & 2-5) and AudioRack32

If you plan on increasing your system memory, be sure to read the "Memory" section before you make any purchases.

If you use the TouchPad frequently, the enhanced driver allows you to make it even more user friendly. However, it doesn't have any effect if you're using an external pointing device.

OTHER EXTRAS

The *Drivers/Utilities* CD-ROM which comes with the system has a number of features for other operating systems which are not covered in this manual. If you have need of them, make sure to review any accompanying "README" files.

Windows NT 3.5x	• LAN drivers
Windows 95	• LS-120 drivers/utilities
Windows 98	• LS-120 drivers/utilities
Windows NT 4.0 (SP4)	• LS-120 drivers/utilities

If you need additional utilities or drivers, consult your system dealer and/or ask your operating system vendor about availability.

HDD

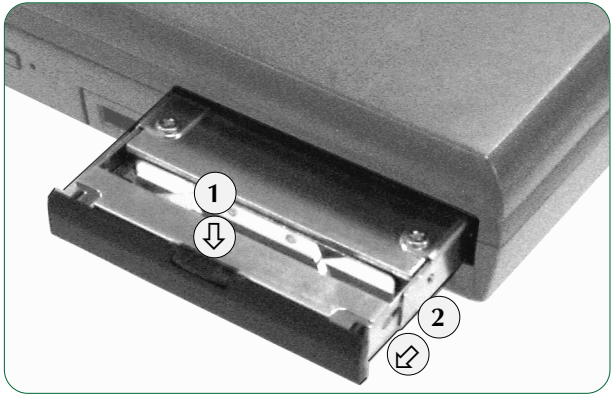
The HDD is in a removable metal frame.

Removing the HDD Module

If for some reason you must remove the HDD cartridge:

1. Make sure the computer is turned off.
2. Push down on the HDD release tab (1).
3. Pull the HDD module out by the handle formed when the HDD release tab pops out (2).

Note: The HDD is mounted upside-down within its module.



Removing the HDD

Fig. 5 – 1

Refer to the text in the accompanying instructions.

Removal Warning

Don't try to remove the hard disk (HDD) while the system is on. This will make the system "crash", resulting in data loss or damage.

Installing the HDD Module

To install the (new or upgraded) HDD module, carefully slide it back into the HDD bay. Be sure that the module handle's release tab snaps into place.

Replacing/Upgrading the Cartridge

You can replace your HDD with another 2.5", 9.5mm high IDE HDD.

If you're too harried or a bit of a techno-phobe, contact your dealer to purchase or replace your current HDD with an upgrade.

If you intend to do the work yourself, you will need the following:

- A clean, dry, and level work area.
- A small philips-head screwdriver.
- A very thin flat-head screwdriver.
- You should also wear an anti-static wrist-strap (available from most computer supply centers).

Warranty Warning

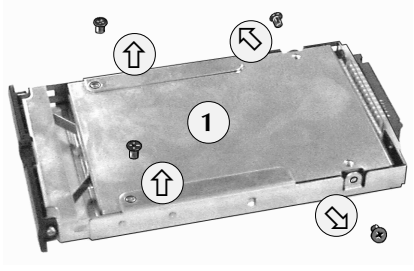
Check with your dealer or service center to make sure this procedure does not violate your warranty.

Taking it Apart

After you've removed the HDD module,

1. Remove the four (4) bracket screws, and set them aside.
2. Carefully tip the module over so that the FDD falls out slightly. (Do not shake it!)

   Note: You do not need to remove the mylar shield.
3. Grasp the HDD on its sides, and use the flat-head screwdriver as a wedge to gently pry the HDD away from its connector. As you separate them, use the wedge evenly along the connector's edge to avoid bending the HDD's pins. DO NOT PULL THEM APART.



Contamination Warning

Do not touch the HDD's connector pins or electronic components. Even the cleanest hands have oils which may attract corrosive particles.

HDD Module Disassembly

Fig. 5 – 2

1. remove the screws
2. tip the cartridge out
3. HDD (electronics face-down)
4. connector

For instructions, refer to the accompanying text.

HDD JumperWarning

Some (usually older) HDDs have a small jumper switch. It must be set to "master" or the system may not correctly recognize the drive. Check your drive's documentation.

HDD Module Disassembly

Fig. 5 – 3

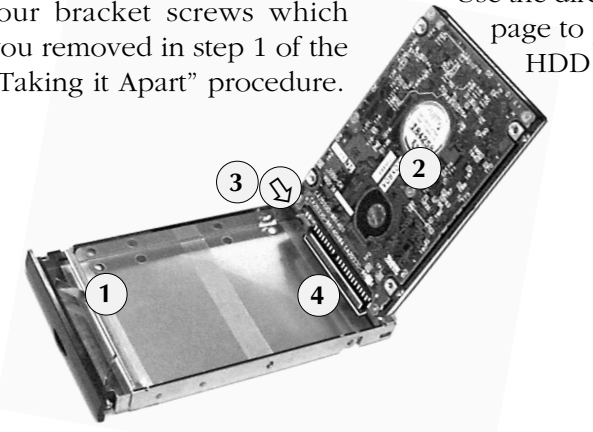
1. cartridge frame
2. HDD (electronics face-down)
3. master/slave jumper
4. connector

Refer to the text in the accompanying instructions.

HDD Module Assembly

When you're ready to install a new hard disk,

1. Hold the HDD by its edges and orient it so the electronic component side faces the interior of the cartridge.
2. Push the HDD down until its pins are fully inserted into the connector.
3. Gently tip the HDD into the module and secure it with the four bracket screws which you removed in step 1 of the "Taking it Apart" procedure.



Setting Up a New HDD for the First Time

Before you can use a new HDD for the first time, you have to do two things:

- tell the computer about the HDD (refer to *Chapter 3: Firmware*).
- prepare the HDD to accept data (refer to your operating system manual).

Use the directions on the next page to prepare your new HDD for use.

Setting Up the HDD

Hardware

After you replace or upgrade the HDD, turn the system on and configure it for the newly-installed HDD using *Setup*. Refer to *Chapter 3: Firmware*.

528MB or Larger HDDs & LBA Mode

The notebook automatically assumes any HDD 528MB or larger uses LBA Mode. If the HDD was formatted on an older system which did not use LBA mode, use the *Setup* utility (refer to *Chapter 3: Firmware*) to manually adjust the LBA setting for the Primary Master. If you don't, the system will not "see" it correctly.

The default, "Auto" type setting uses LBA mode. Use this if you're preparing a "fresh" HDD.

Software

A hard disk must be partitioned, and formatted before use.

Partitioning

To partition the HDD, use the utility from your operating system (e.g. Microsoft's **fdisk** command) to do this.

Note: *If you want to use the Save to Disk Partition feature, refer to* Chapter 4: Power *before you partition the HDD.*

Formatting

To format, use the utility from your operating system (e.g. Microsoft's **format/s** command). Consult your operating system's manual for more information on its partitioning and formatting utilities.

Save to Disk Warning

***Whenever you install a different hard disk that has a Save to Disk partition on it, make sure you follow the procedures detailed in* Chapter 3: Firmware *and* Chapter 4: Power.**

MEMORY

You can upgrade your notebook's memory to as much as 256MB. This involves opening the memory compartment and installing one or two DIMMs.

You can install these modules in either one socket or both sockets (in any order and any size combination).

Socket requirements:

- 16MB, 32MB, 64MB or 128MB modules
- 144-pin SO-DIMMs
- 3.3-volt
- TSOP package
- SDRAM DIMMs
  – rated at 10ns or faster

Make sure you put the correct type in each socket.

Warranty Warning

Check with your dealer to make sure installing RAM yourself doesn't violate your warranty.

Module Warning

Make sure each module meets all of the criteria for the socket it will be used in.

Installing DIMMs

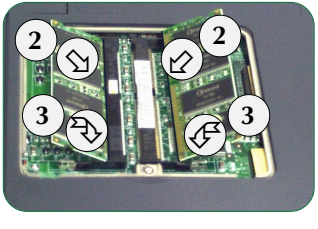
If you install additional memory by yourself,

1. Make sure the system is turned off, you are wearing an antistatic wrist strap (available from most computer supply dealers) and you are in a dust/smoke-free environment.
2. Place the computer up-side down on a clean, dry, level surface.
3. Using a Philips-head screwdriver, remove the anchor screw from the memory bay cover and set the cover aside (1).
4. Insert a DIMM in either slot at about a 20° angle (2). Grooves on the sides of the module allow you to insert it only one way. Make sure it is seated as far into the slot as it will go.
5. Gently push down on the module (3) until its lock-catches snap into place. **DO NOT FORCE IT**. The module should fit in without much pressure. If there is a lot of resistance, check to make sure the DIMM is properly seated.
6. Install the second module in the same way.
7. Replace the memory bay cover.
8. After changing the RAM configuration, run *Setup* so the new total can be registered in the CMOS (refer to Chapter 3: Firmware).

Contamination Warning

Do not touch the module's edge connectors. Even the cleanest hands can leave oils which may attract corrosive particles.

Removing the RAM Bay Cover
Fig. 5 – 4



Inserting the DIMM
Fig. 5 – 5

Modules can be inserted in any order.

TouchPad

If you want to take full advantage of the TouchPad's capabilities, you need to install the specialized drivers which come with your system. These are on the accompanying *Drivers/Utilities* CD-ROM.

Gestures

The software adds the following enhanced features to *Mouse Properties* to allow you to define your TouchPad "gestures" to your preference:

1. **Button Actions** allows you to customize the tap action in the corner tap zone regions.
2. **Scrolling** allows you to customize the Touchpad's capabilities to scroll documents without having to move the pointer away from your work.
3. **Touch** allows you to customize your TouchPad's tap sensitivity.
4. **Edge Motion** allows you to keep moving the pointer, even when you reach the edge of the TouchPad. Motion stops when you lift your finger.
5. **More Features** provides more better controls to your TouchPad.

For more details, refer to the "Help" button in *Mouse Properties*.

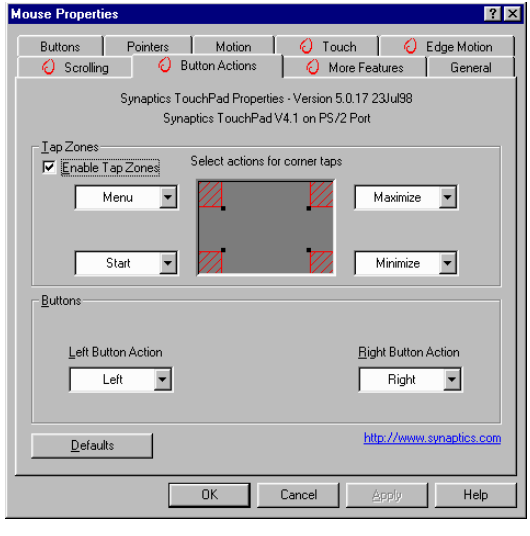
CUSTOMIZING GESTURES

WINDOW 9X & WINDOWS NT 4.0

To customize TouchPad gestures in *Window 9x*, use the **Button Actions** tab in the **Control Panel's** *Mouse Properties*:

1. From the **Start** menu, select **Settings** > **Control Panel**.
2. Double-click on the **Mouse** icon.

When the *Mouse Properties* page appears, use the on-line help (click the help button) to get information about each feature. To configure other features, click on other tabs.



DEFAULT TOUCHPAD GESTURES
FIG. 5 – 6

TouchPad Driver Installation

Windows 9x & NT 4.0

1. Insert the *Drivers/Utilities* CD-ROM.
2. Use the **Add/Remove Programs** utility in the **Control Panel**.
3. Click on **Install...** then **Next**.
   Click on **Browse...** and navigate to:
   D:\drivers\win95\touchpad\setup.exe
   or D:\drivers\win98\touchpad\setup.exe
   or D:\drivers\nt40\touchpad\setup.exe
   Click **Open**, then **Finish** to start the installation.
4. Follow the on-screen instructions. (For *Windows NT4.0*, it will ask to run the emergency repair disk before installing, do so if you have already created one.) The utilities will create a "*Synaptics*" sub-folder in the "*Program Files*" folder for itself on your C: drive unless you choose otherwise.
   If asked to "Insert Disk", return to the location found in step 3. When prompted, allow the system to restart.
5. After rebooting, information about your TouchPad dialog box appears. You should also see the **TouchPad** icon in your taskbar next to the clock.

*Note: For normal operations, click on the **Mouse** icon in the **Control Panel** or double-click the **TouchPad** icon in the task bar if you want to change the default settings.*

AUDIORACK32 *(OPTION)*

The system also comes with *AudioRack32*, a *Windows 9x* applet. This utility offers more convenient audio controls than the operating system's own utility.

Setup instructions follow this page.

AudioRack32 Setup

Windows 95/98

The *AudioRack32* utility supplements the *ESS Maestro 2E AudioDrive*. To install it,

1. Insert the *Drivers/Utilities* CD-ROM.
2. Open **Control Panel** > **Add/Remove Programs**.
3. Click on **Install** > **Next** > **Browse...** and navigate to
d:\drivers\win98\audrack\setup.exe
or
d:\drivers\win95\audrack\setup.exe
4. Click **Open** > **Finish** to start the installation.
5. Follow the program's dialog boxes. The utility will create an "AudioRack" sub-folder in the "Program Files" folder on your drive C:, unless you choose otherwise. If you want to use *AudioRack32* as your default CD player, say **Yes** when the utility asks.

When the installation is complete, it's ready to use (you don't have to reboot).

PORT REPLICATOR (OPTION)

The Port Replicator is designed to enable easy, and more permanent peripheral connections with your notebook computer.

These connections, except where noted, exactly replace similar connections on your notebook computer:

- Serial Port (COM1)
- USB Port (2 ports)
- S-Video
- AV(composite) video
- VGA Port
- PS/2 Port for a compatible pointing device
- PS/2 Port for a PS/2 compatible keyboard
- Parallel Port
- Power Socket: This serves as a pass-through connector to the notebook's own adapter port.

TROUBLESHOOTING

The monitor screen is blank or the video display dimensions are wrong.

solution:

- Make sure the monitor is turned ON and the notebook's video settings are set to recognize the attached monitor.
- Connect the monitor directly to the notebook's VGA port to make sure it's working. If it still doesn't work, there may be a problem with the monitor. If it does work when connected directly, contact your service provider.

Other peripheral devices attached to the Port Replicator are not functioning.

solution:

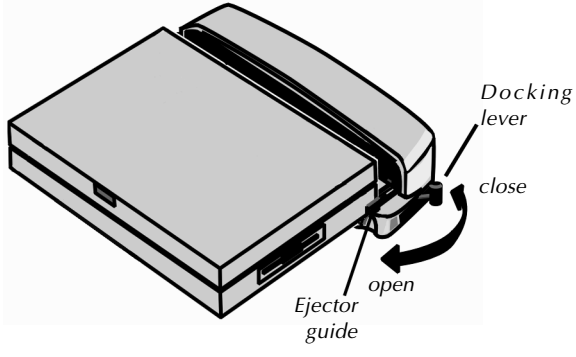
- Make sure the cable connections between the Port Replicator and the device(s) in question are undamaged and secured.
- Make sure the peripherals work when connected directly to the notebook computer.
- *Confirm the* Setup *settings for the ports.*
- Shut down the entire system. Disconnect all peripherals from the notebook. Disconnect all devices from their power supplies. Reestablish all connections. Turn on any peripheral with its own power supply. Lastly, turn on the computer.

Docking Procedures

Make sure the system is OFF before connecting or disconnecting the Port Replicator.

1. Connect your peripherals to the Port Replicator. The connections are marked with icons to help identify their functions.
2. Make sure the **Docking Lever** is all the way back in its open position.
3. Make sure the **expansion door** on the rear of the notebook is open.
4. Position the notebook between the **slide connection** and **ejector guides**.
5. Pull the **docking lever** forward to securely fasten the Port Replicator.
6. Turn on the computer.

Port Replicator Docking
Fig. 5 – 7



Undocking Procedure

1. Shut down your system or put it into Suspend mode.
2. Push the **docking lever** all the way back to the open position and lift the notebook straight up, off the Port Replicator.
3. Restart the notebook computer.

Regulatory Information

This device complies with Part 15 of the FCC Rules where operation is subject to the following conditions: (1) This device may not cause harmful interference; (2) this device must accept any interference received, including interference that may cause undesired operation.

Specifications

The information listed in this section is for reference only. It is subject to change at the manufacturer's discretion and without notice.

Unless otherwise indicated, none of the components and/or subsystems can be modified or upgraded.

CPU & Chipset

CPU

- Intel Pentium® II (Dixon-256) 266MHz~400MHz
- Intel Celeron®-128 266MHz~400MHz

Upgrade Warning

The CPU is not user-upgradable. Do not try to upgrade the CPU yourself as doing so will violate the warranty. Upgrading requires additional system adjustments. Any upgrade procedure must be performed by authorized service personnel only.

Chipset

Core Logic:	440BX AGPset
BIOS	Phoenix (512KB Flash ROM, APM 1.2, ACPI)

Voltage, Speed & Power Savings

Generally, higher voltage or faster CPUs use more power and run "hotter".

So of these options, an Intel Celeron®-128 running at 266MHz is the most energy efficient, though the slowest. However, actual power consumption also depends on the amount of "work" the CPU must perform.

Memory

cache

Integrated with CPU:	
Intel Celeron	128KB
Intel Pentium® II (Dixon)	256KB

RAM (base): 0MB

RAM (expansion)*: 256MB (max.) using one or both sockets

RAM Type: • EDO/SDRAM DIMM • 32MB, 64MB or 128MB modules • 3.3V • 144 pins • 3.3-volt • TSOP package • Small outline • Rated at 10ns or faster

* *User upgradable.*

VIDEO

VGA Controller

ATI Rage LT Pro 3D Graphic Hardware Accelerator
Supports 2X AGP; Built-in DVD motion compensation; Tri-view function; built-in LVDS I/F & TV-out (MacroVision support)

Display Memory

4MB/8MB SGRAM nonupgradable
100MHz

Video Bandwidth

128bit

LCD resolutions

12.1″TFT: SVGA
13.3″ TFT & 14.1″ TFT: XGA

Ports

CRT: 15pin VGA
TV-out: S connector (NTSC/PAL support)

VIDEO STANDARDS

Depending on the OS, the *ATI Rage LT Pro 3D Graphic Controller* supports these resolutions (in pixels).

Type	Pixels	Output
NTSC	640x400	NTSC TV
VGA	640x480	LCDs & monitors
SVGA	800x600	LCDs, monitors &PAL TVs
XGA	1024x768	LCDs& monitors
SXGA	1280x1024	monitors

Colors /Resolution*	VGA	SVGA	XGA	SXGA
Single Display				
256†	✓	✓	✓	✓
16 bit (HiColor)	✓	✓	✓	✓
24 bit (TruColor)	✓	✓	✓	
32 bit (TruColor)	✓	✓		
Dual Display (LCD+Monitor only)				
256†	✓	✓	✓	✓
16 bit (HiColor)	✓	✓	✓	
24 bit (TruColor)	✓	✓		
32 bit (TruColor)	✓			

TV & Monitor Output

The TV and Monitor outputs share chip resources. So if you are using them simultaneously, you may encounter some distortion on the monitor's display. Use the monitor's own hardware controls to adjust that image.

More on TV Output

If you are using a newer TV, it may be able to display higher resolutions. However the image quality won't be as clear - this has to do with the TV's pixel size.

A

AUDIO

Controller
ESS Maestro 2E (proprietary driver) PnP, 64-voice dual-audio engine, 20-bit ADC/DAC audio resolution

Compatibility
Sound Blaster Pro™, legacy audio, I²S/Zoomed video, MS Windows Sound System™

Built-in
2 speakers, microphone, 0.5watt stereo amp.

Ports
Line-in, Mic-in, Headphone/speakers-out

DRIVES

HDD Bay Module 2.5″, 9.5mm removable 3GB or larger

FDD Bay Modules
- 3.5″ 1.44MB FDD (3-mode)
- LS-120 drive (replacement option)

CD-ROM Modules
- CD-ROM module
- DVD module (replacement option)

I/O

USB (2 ports)	12MB/s bandwidth, 5V PCI-to-USB complies with Open HCI 1.0, USB 1.0 & PCI 2.1
Parallel	25-pin, ECP, EPP, output-only, bi-directional
Serial 1	9-pin, 16C550 compatible
Serial 2	IrDA v1.1 FIR, ASK
TV-out	S-video
PS/2	6-pin mini-din, mouse or keyboard
PC Card	2x Type II or 1x Type III PC Card (with ZV support)
Expansion	120-pin proprietary port replicator (option)

Other Features

TouchPad	built-in PS/2 pointing device by Synaptics (with proprietary supplemental drivers)
Kensington Lock	standard security interface

More on Battery Life

We can't be more specific because performance varies depending on many factors, including battery condition, capacity, environmental conditions, system usage habits, software requirements, and (not least), system configuration.
Our *very* artificial examples use the following configuration:

Battery:	*NiMH 4000mAH or Li-Ion 4500mAH*
CPU:	*Dixon 333MHz*
RAM:	*128MB RAM*
Video:	*4MB Video SGRAM, 14.1 TFT LCD*
Ports:	*All enabled, No devices attached*
Test package:	*ZD BatteryMark 2.0*
ambient temperature:	*25°C*

Your system's performance and configuration will be different, so it's possible for you to get much better results.

A

POWER (MINIMUM REQUIREMENTS)

AC Adapter output:
19VDC, 2.8A

AC Adapter input:
96~264VAC,
full range, autosensing

Battery (form) 36 (Ni-MH)
or 202 (Li-Ion)
"smart" battery

Battery Charging*
(system off) 2000mA ± 200mA/hr
(system on) 700mA ± 50mA/hr
"Trickle" <100mA/hr

**See the following section for an explanation of limitations.*

Estimated Battery Life†
with all power savings disabled:
1h 40m (NiMH)
2h (Li-Ion)

†These numbers are very rough guides for two Setup default configurations.

RECHARGE TIMING

To calculate how long it will take your battery to recharge, first check its capacity (e.g. 4000mA) then divide by the appropriate speed.

For example, a 4000mA Ni-MH* battery should take about 2 hours to fully recharge with the system off, and 5 hours with the system running. However, your time may be faster since under most conditions your battery is rarely completely empty (there's usually a small "reserve" charge left).

*NiMH batteries charge at a constant rate. Li-Ion batteries' charge rate slows for about the last 25%.

More on Charging

Your system doesn't require a proprietary battery, so to use the widest range of batteries on the market, and still be safe, we've taken a lot of factors into consideration:

Type

Different batteries accept charge at different rates. If the system charges faster than the battery can accept, it may damage the battery.

Environment

Removeable batteries' contacts can be contaminated (oils, smoke, etc.), inhibiting current flow.

Temperature

If the temperature gets too high, the system automatically slows the recharging process to reduce heat generation. Too much heat, and your battery could explode!

Condition

This is a huge catch-all, which includes the amount of charge already present and how worn your battery is.

ENVIRONMENT

Operating Temperature
5°C to 35°C
Storage Temperature
-20°C to 60°C
Operating Humidity
20% to 80% non-condensing
Storage Humidity
8% to 90% non-condensing

DIMENSIONS

max 14.1" LCD capable:

Height	42mm
Width	316mm
Depth	256mm
Weight	3.0KG with battery, FDD, HDD & CD-ROM

max 13.3" LCD capable:

Height	39.5mm
Width	312mm
Depth	242mm
Weight	2.9KG with battery, FDD, HDD & CD-ROM

ACCESSORIES & OPTIONS*

FDD module
LS-120 module
24X CD-ROM module
DVD-ROM module
56K Fax/Voice modem module†
LAN (on-board)†
Drivers/Utilities
Expansion DRAM module(s):
16MB,32MB
64MB, or 128MB
Battery pack: 36 (Ni-MH)
/202 (Li-Ion)
Port replicator
Car adapter
Carrying Bag

**Options may not be immediately available and/or may be standard accessories depending on your package.*

†This is a manufacturer option.

B Troubleshooting

This section is about what you should do if something goes wrong with your system. This can't anticipate every possible problem, but you should check here before you panic. If you don't find the answer in these pages, make sure you have followed the instructions carefully and observed the safety precautions in the preface. If all else fails, talk to your dealer. You should also make a record of what happened and what remedies you tried.

Of course, if something goes wrong, it will happen at the most inconvenient time possible, so you should preview this section just in case. If, after you've tried everything, and the system still won't cooperate, try turning it off for a few minutes and then rebooting. You will lose any unsaved data, but it may start working again. Then call your dealer or service representative.

GETTING STARTED

This first group of problems and solutions may seem obvious but you'd be surprised at how many "experienced" users have similar problems.

POWER

YOU TURNED THE POWER ON BUT IT DOESN'T WORK.

possible cause:	Battery missing / incorrectly installed
indicator:	If the power LED, ⏻ , doesn't light up, then the battery may be missing or incorrectly installed.
solution:	Check the power bay, make sure the battery is present and seated properly (the design of the battery only allows it to go in one way). Make sure there's nothing interfering with the battery contacts.
possible cause:	Low battery
indicator:	The battery status LED, 🔋, is flashing.
solution:	Plug in the AC power source. If the computer doesn't start up immediately, turn it off then on again.
possible cause:	The suspend key combination, **Fn**+ , has been toggled.
indicator:	The various LEDs light up, but no picture.

solution: Press any key on the keyboard (e.g. an "arrow" key). Wait a few moments before trying this control again. With the system off, plug in (and turn on) a CRT to the appropriate port. Reboot, and toggle the screen display key combination, Fn + .

YOU ARE LOSING BATTERY POWER TOO QUICKLY.

possible cause: The battery does not fully charge because of prolonged inactivity.
indicator: The battery life per charge is too short.
solution: Refer to *Chapter 4: Power*, First-Time Use & Storage.

possible cause: The battery is too hot.
indicator: The battery is warm to the touch.
solution: Allow the battery to cool. If this problem persists, make sure the vents aren't blocked and the computer isn't sitting on a thermal surface.
Make sure you're using the correct adapter.

possible cause: The system is using too much power.
solution: Go into *Setup* (see *Chapter 3: Firmware*), and adjust the controls available in the Power menu. If your operating system has a power management scheme (e.g. APM) check its settings. You may also be using a PC Card device which is drawing a lot of power (e.g. a Type III storage device).

THE NOTEBOOK FEELS TOO HOT.

possible cause: The system is using too much power.
indicator: The computer feels uncomfortably warm.
solution: Reduce the computer's power consumption (refer to *Chapter 3: Firmware* and *Chapter 4: Power*). Make sure the notebook is properly ventilated and the fan port is not blocked. If this doesn't cool it down, put the system into Suspend mode or turn it off for an hour.

DISPLAY

NOTHING APPEARS ON THE SCREEN.

possible cause: The system is in a power saving mode.
indicator: The Suspend LED, ⏻, is flashing.
solution: Press a key on the keyboard. Toggle the suspend key combination, **Fn**+ (see *Chapter 1: Introduction*, Hot Key Controls).

possible cause: The screen controls need to be adjusted.
solution: Toggle the screen control key combinations (see *Chapter 1: Introduction*, Hot Key Controls).

possible cause: The computer is set for a different display.
solution: Toggle the screen display key combination, Fn + (see *Chapter 1: Introduction*, Hot Key Controls). If this works, the next time you bootup you should go into Setup's Main menu, Boot Options sub-menu and change the "Display" setting (see *Chapter 3: Firmware*). If an external monitor is connected, turn it on.

THE SCREEN IS FLICKERING.

possible cause: The vertical refresh rate is insufficient.
solution: (1) Avoid using the Simultaneous display mode. Use LCD only or CRT only.
(2) Switch to a lower resolution and/or fewer colors.
(3) Adjust the refresh frequency in the display controls.

THE SCREEN IMAGES AREN'T CLEAR.

possible cause: The screen controls need to be adjusted.
solution: Toggle the screen control key combinations (see *Chapter 1: Introduction*, Hot Key Controls).
possible cause: The viewing angle of the LCD is bad.
indicator: The screen appears shiny or too dim.
solution: Adjust the position of the LCD. LCDs are designed to be viewed "straight on". If the angle is wrong, you may see glare from the screen's backlight.

possible cause: The screen is dirty.
indicator: The screen images are blurry.
solution: Clean the screen using a soft, clean dry cloth. Many cleaning solutions can damage the LCD surface so you should follow the precautions outlined in the Preface. Try to avoid touching the screen itself. Even the cleanest hands can leave oils which attract contaminants.

possible cause: The screen is suffering from burn-in.
indicator: The screen has ghost images, even when it's off.
solution: This problem is usually associated with monitors. Use power saving options (see *Chapter 3: Firmware* and *Chapter 4: Power*) to turn off the LCD. You can also use a screen-saver which can help protect an attached monitor.

OPERATION

THE SYSTEM GIVES YOU GARBAGE WHEN YOU TRY TO READ A HARD DISK FROM ANOTHER COMPUTER.

possible cause: The hard disk is not recognized.

indicator: The system cannot boot from the hard disk.

solution: The BIOS usually automatically detects the parameters of the hard disk. However, it may occasionally detect a different set of parameters. If the system cannot use the hard disk, check the parameters of the hard disk in *Setup*. Use the User option to manually adjust the parameters if they are not the same as the original settings.

solution: *Setup*'s Autotype assumes that any hard disk 528 MB or larger is formatted using "LBA" mode. Some older systems don't use LBA mode. If your hard disk wasn't formatted using LBA mode, you must enter *Setup*'s Primary Master section and manually adjust the LBA Mode Control switch to "Disabled". Since LBA mode is the preferred standard, you may want to consider reformatting your hard disk. - After you've saved your files on other media.

THE SYSTEM FREEZES.

possible cause: The system's power saving features have timed-out.

indicator: The screen goes dark.

solution: Use the AC adapter, press the **Fn**+ key combination, or press the On/Off switch if no LEDs are lit.

possible cause: A software conflict made the system "crash".
solution: Consult your operating system manual. As a last resort, since you will lose any unsaved data, try to reboot the system or if that doesn't work, turn the computer off and on again.

possible cause: The system cannot access the Save to Disk partition.
indicator: The system retrieves Save to Disk information very quickly during bootup and then freezes.
solution: This situation usually happens after one of the following occurs and you activate the Save to Disk process: (1) the hard disk has been changed; or (2) there has been a CMOS failure or a Checksum failure and the problem has not been corrected. If one of these occurs, you must run the PHDISK utility as soon as possible. Refer to *Chapter 4: Power*, Save to Disk.

The Save-to-Disk function does not work.

possible cause: The system can't access the Save to Disk partition.
indicator: When you press the Fn + key combination, normal Suspend is activated instead of Save to Disk.
solution: (1) Make sure you have enabled Save to Disk in the Power menu in *Setup*. Refer to *Chapter 3: Firmware*.

(2) Set up the Save to Disk partition if you haven't done so. Refer to *Chapter 4: Power*.
(3) Run the PHDISK utility if you installed a different hard disk with a Save to Disk partition on it, or there has been a CMOS or Checksum failure.

The system never goes into Suspend mode.

possible cause: Power management features are not enabled.
solution: Go to *Setup*'s Power menu and enable the features you prefer. Refer to the Power Management section of *Chapter 4: Power*.

The system does not go into Suspend or Save to Disk when the battery is low.

possible cause: Suspend Timeout is disabled.
solution: Use one of the Power Management presets or manually set the Suspend Timeout in the Power menu in *Setup*. See *Chapter 3: Firmware* and *Chapter 4: Power*.

The PC Card does not work.

possible cause: The drivers are not loaded.
indicator: The system cannot access the card after it is installed.
solution: Load the proper drivers.

POST Messages

Each time you boot up, the computer performs a self-diagnostic check.

Warning Messages

If there is an error during the self-diagnosis, a short message will display specifying the error. You can press F1 to try to continue the boot process, or press F2 to run *Setup*.

If the following messages occur, press F2 to run *Setup*.

message: **Diskette drive A error**
description: The floppy drive is present, but fails the BIOS POST.
solution: Check that the FDD is correctly defined in *Setup* (refer to *Chapter 3: Firmware*).

message: **Extended RAM failed at offset: nnn**
description: The extended memory is not working or not configured properly.
solution: 1. Make sure the expansion memory is seated properly in its socket(s) (refer to *Chapter 5: Extras*).
2. Run *Setup* to allow the system to recheck the amount of memory present, then save the Setup information and reboot (refer to *Chapter 3: Firmware*).

message: **Failing Bits: nnnn**
description: The hex number, nnnn, is a map of the bits at the RAM address that failed the memory test.

> ☑ ***Faster Repairs***
> Keep a record of any warning messages; it may help to reduce repair time.

solution: 1. Make sure the expansion memory is seated properly in its socket(s) (refer to *Chapter 5: Extras*).
2. Run *Setup* to allow the system to recheck the amount of memory present, then save the Setup information and reboot (refer to *Chapter 3: Firmware*).
3. Turn off the system and remove any DIMMs (refer to *Chapter 5: Extras*). Restart the system. If the problem persists, contact your service center. If the problem disappears, replace the DIMMs one at a time to identify the defective module. Replace any defective DIMMs.

message: **Fixed Disk x Failure or Fixed Disk Controller Failure**

description: The hard disk is not working or is not properly configured.

solution: 1. Check that the HDD is properly attached (refer to *Chapter 5: Extras*).
2. Run *Setup* to make sure the HDD is correctly configured (refer to *Chapter 3: Firmware*).
3. Make sure the HDD's jumper settings are correct - "master" (refer to *Chapter 5: Extras*).

message: **Incorrect Drive A: type - run *Setup***

description: The FDD is incorrectly identified in *Setup*.

solution: Run *Setup* and check the settings for the FDD, usually 1.44MB/3 1/2", (refer to *Chapter 3: Firmware*).

B

message:	**Keyboard controller error**
description:	The keyboard controller failed the POST.
solution:	1. Try restarting the system. 2. If you are using an external keyboard, remove it and make sure the onboard keyboard works correctly. If it does, you may have to replace the external keyboard. 3. If the problem persists, contact your service center.

message:	**Keyboard error**
description:	The POST doesn't see the keyboard.
solution:	1. Try restarting the system. 2. If you are using an external keyboard, remove it and make sure the onboard keyboard works correctly. If it does, you may have to replace the external keyboard. 3. If the problem persists, contact your service center.

message:	**Keyboard error nn**
description:	The BIOS discovered a stuck key and lists its scan code.
solution:	1. Press the keys on the keyboard to loosen the one with a problem. 2. If keys consistently fail to spring up, contact your service representative.

message:	**Monitor type does not match CMOS**
description:	The CMOS doesn't recognize your monitor (LCD).

solution: Run *Setup* then save and exit. The system will survey itself then update its record (refer to *Chapter 3: Firmware*).

message: **Operating system not found**
description: The operating system can't be found on either drive A: or drive C:.
solution:
1. Assuming there is an operating system to be found, enter *Setup* and make sure the FDD and/or Fixed Drive 1 are correctly identified (refer to *Chapter 3: Firmware*).
2. Make sure the HDD is properly installed.
3. If your HDD was set up with multiple partitions, make sure drive C: is active (boot up from drive A: and use FDISK.EXE).

message: **Parity check 1 nnnn** or **Parity check 2 nnnn**
description: The BIOS found a parity error in the system bus.
solution:
1. Reboot.
2. If the problem persists, contact your service representative.

message: **Press <F1> to resume, <F2> to Setup**
description: The POST discovered a recoverable error.
solution:
1. Press F1 to continue and boot up, hoping the system will function without further problem.
2. Press F2, enter *Setup*, correct the problem, save & exit.

message:	**Previous boot incomplete - Default configuration used**
description:	The last POST couldn't be completed so the POST loaded the defaults and gave you a chance to run *Setup*.
solution:	Run *Setup* and make sure all the settings are correct.
message:	**Real time clock error**
description:	The real-time clock failed the BIOS test.
solution:	Contact your service representative. The onboard battery may have to be replaced or this may indicate a deeper problem.
message:	**Shadow RAM failed at offset: nnnn**
description:	The shadow RAM in the 64K block failed at the "nnnn" address.
solution:	1. Reboot. 2. Contact your service representative.
message:	**System battery is dead - Replace and run Setup**
description:	The CMOS clock battery indicator shows the battery is dead.
solution:	Contact your service representative to replace the onboard battery. Then run *Setup* to reestablish the correct settings.

message: **System cache error - Cache disabled**
description: The RAM cache failed the BIOS test and was disabled.
solution:
1. Reboot.
2. Continue without the cache, though system performance will be degraded.
3. Contact your service representative.

message: **System CMOS checksum bad - run Setup**
description: The system CMOS has been corrupted or modified incorrectly.
solution: Run *Setup* and reconfigure the system.
Note: This may indicate the CMOS was targeted by a virus. Reboot from an anti-virus program on a write-protected floppy.

message: **System RAM failed at offset: nnnn**
description: The system failed at the "nnnn" address.
solution:
1. Reboot.
2. Contact your service representative.

message: **System timer error**
description: The timer test failed.
solution: Contact your service representative.

OTHER MESSAGES

If your hard disk is disconnected after the POST but before the operating system starts to initialize, you may get the following message:

Hard disk failed
Press 'H' to retry Hard Disk, any other key for floppy

You can press **H** to try again or press any other key to boot from a floppy. If you feel that the hard disk is improperly connected, turn off the system before reinserting the hard disk.

Glossary

A - B

ACPI

Advanced **C**onfiguration and **P**ower **I**nterface. A power management specification developed by Intel, Toshiba and Microsoft that makes hardware status information available to the operating system. It enables a PC to turn its peripherals on and off for improved power management.

Adapter

(1) A device that allows compatibility between different equipment.

(2) A printed circuit board that connects a system board to a peripheral I/O device (devices) or adds specialized functions to the system.

Address

An identification, such as a label, number, or name that designates a particular location in storage or any other data destination or source.

Application

A program such as a word processor, image editor or database.

ASCII

An acronym for **A**merican **S**tandard **C**ode for **I**nformation **I**nterchange. A 7-bit stan-

dard code adopted to facilitate the interchange of data among various types of data processing and data communications equipment.

AT

Advanced **T**echnology. IBM's first 286-based PC, introduced in 1984. It was the most advanced machine in the PC line and featured a new keyboard, 1.2MB floppy and 16-bit data bus. AT-class machines run considerably faster than XTs (8088-based PCs).

ATAPI

AT Attachment **P**acket **I**nterface. The specification for IDE tape drives and CD-ROMs. See **IDE**.

Backlight

The rear illumination of an LCD screen.

BIOS

Basic **I**nput/**O**utput **S**ystem. The program that customizes a computer.

Boot

Derives from "bootstrap". To start or restart a computer system by reading instructions from a storage device into the computer's memory. If the computer is already turned on, it's a "warm boot", if not, it's a "cold boot".

C - D

Cache memory

A small high-speed memory for the temporary storage of information, usually used between a slower large memory and a fast central processing unit.

CD-ROM

Compact **D**isk **R**ead **O**nly **M**emory. This refers to both

the disk type and the drive. The disk can hold over 600 MB of data, text, graphics, sound and video information. Although the form is similar to the audio CD, its formatting is different.

CMOS

Complementary **M**etal-**O**xide **S**emiconductor. This chip keeps track of setup information. The BIOS is located on this chip. The *Setup* utility is used to change it.

Configure

To assemble a selection of hardware or software into a system and to adjust each of the parts so that they all work together.

Configuration

An assembly of machines that are interconnected and are programmed to operate as a system. The layout or design of elements in a hardware or information processing system.

CPU

Central **P**rocessing **U**nit. The component of a computer system with the circuitry to control the interpretation and execution of instructions. This computer has a "Pentium".

Crash

The system suddenly stops working. This usually requires a system reboot.

Disk drive

A device that reads data from a magnetic disk and copies it into the computer's memory so that it can be used by the computer, and that writes data from the computer's memory onto a disk so that it can be stored.

DOS

From **D**isk **O**perating **S**ystem. A specialized, disk-oriented program that provides an easy-to-use link between the user and a computer's disk drive.

DRAM

Dynamic **RAM**. Storage that the computer must refresh at frequent intervals.

Driver

A series of instructions the computer follows to reformat data for transfer to and from a particular peripheral device. The electrical and mechanical requirements are different from one kind of device to another, so software drivers are used to standardize the format of data between them and the central processor.

DVD

From "**D**igital **V**ideo**D**isc", later "**D**igital **V**ersatile **D**isc", now the acronym is the name.

A family of double-sided optical discs the same size as CDs, but with greater capacities.

DVD-Video uses MPEG-2 compression for about 133 minutes of LaserDisc-quality video per side. It supports Dolby Digital surround sound, with five channels of CD-quality audio plus a subwoofer (5.1 channel).

DVD-ROM is for audio, video, data storage, and interactive material. It can also play DVD-Video movies.

E - F

ECP

Enhanced **C**apabilities **P**ort. A parallel standard. This mode is designed for printers. It uses DMA channels, which reduces CPU overhead, and also provides a buffer. The peripheral driver determines which mode to use. See **Parallel printer**.

EPP

Enhanced **P**arallel **P**ort. A parallel standard. This mode increases bi-directional transfer from the Centronics port 150 Kbytes/sec to between 600 Kbytes/sec and 1.5 Mbytes/sec. See **Parallel printer**.

External option

An device attached to the outside of the system unit which extends and enhances its operation. e.g. printer or mouse.

FireWire (IEEE 1394)

A high-speed serial bus developed by Apple and Texas Instruments that allows for the connection of up to 63 devices. Original spec calls for 100, 200 and 400 Mbits/sec transfer rates. IEEE 1394b provides 800, 1600 and 3200 Mbps. FireWire supports hot swapping, multiple speeds on the same bus and isochronous data transfer, which guarantees bandwidth for multimedia operations.

Flash memory

By Toshiba from “in a flash”. A memory chip that holds its content without power. Derived from EEPROM chip technology, which can be erased in place, flash memory is less expensive and more dense. Flash memory must be

erased and written in fixed blocks, typically ranging from 512 bytes up to 256KB.

Flash chips are used for updatable BIOSs (like this system's). They are also used as solid state disks in palmtops, digital cameras and other consumer products.

Font

A set of type characters of a particular typeface design and size. Usually, it is available in four variations: normal weight, bold, italic and bold italic. Thus, for bitmapped fonts, which are fully generated ahead of time, four fonts would be required for each point size used in each typeface. For scalable fonts, which are generated in any point size on the fly, only four fonts would be required for each typeface.

bitmapped font – A set of pre-generated dot patterns for each letter and digit in a particular typeface for specified type size (10 points, 12 points, etc.). Bitmapped fonts take up disk space for each point size.

scalable font – The dot patterns (bitmaps) are generated as needed for display or printing from a set of outline fonts, or base fonts, which contain a mathematical representation of the typeface. The two major scalable fonts are Adobe's Type 1 PostScript and Apple/Microsoft's TrueType. Although a bitmapped font always look the best, scalable fonts save a lot of disk space. In most cases, only the trained eye can tell the difference.

G - H

Hot

(i.e. a socket/port is hot.) A port is always ready to accept a connection.

Hot Swap

Hot Swappable devices can safely be attached or removed from the computer without turning it off. This procedure may also include special commands. The operating system, PnP BIOS, hardware and power subsystems, are coordinated to detect the device's presence and status and stop the system from "crashing" during a swap.

I - J

IDE

An abbreviation for **I**ntegrated **D**rive **E**lectronics (or **I**ntelligent **D**evice **E**lectronics). Among IBM-compatible computers, this is the most common type of internally-mounted hard disk controller. External devices usually use SCSI controllers.

Internal option

A part installed inside the system unit cover which enhances operation of the system, such as an adapter and a memory chip.

Interrupt

A signal that, when activated, causes the hardware to transfer the program control to some specific location in main storage, thus breaking the normal flow of the program being executed.

IrDA

(**I**nfrared **D**ata **A**ssociation) IrDA ports allow a laptop or PDA to exchange data with a desktop computer or use a

printer without a cable connection. IrDA requires line-of-sight transmission like a TV remote control.

K - L

KB

(Kilobyte) 1024 bytes.

LBA Mode

Logical **B**lock **A**ddress Mode. This is another way for the BIOS to interpret a hard disk's cylinder, head and sector information. Before LBA mode, the BIOS could not properly support IDE hard disks larger than 528 MB. This system allows BIOS support for IDE hard disks up to 128 GB.

LCD

Liquid **C**rystal **D**isplay. A way to make images appear by reflecting light on a special crystalline substance. It has high visibility in high illumination levels but no visibility in low illumination levels.

Load

In programming, enter data into storage or working registers.

M - N

MB

(Megabyte) 1,048,576 bytes, 1024KB

Memory

The storage facilities of the computer, capable of storing vast amounts of data.

Microprocessor

The basic arithmetic, logic, and control elements required for processing (generally contained on one integrated circuit chip).

Mode

A method or condition of operation.

Modem

MOdulator-**DEM**odulator. A device that adapts a terminal or computer to a telephone line. It converts the computer's digital pulses into audio frequencies (analog) for the telephone system and converts the frequencies back into pulses at the receiving side. The modem also dials the line, answers the call and controls transmission speed.

Monitor

A video display which comprises a CRT (Cathode Ray Tube) and associated circuitry.

Mouse

A device for moving a cursor or other objects around on the display screen. A typical mouse has one or more buttons on the top of a small box that can be moved around on a flat surface. The mouse's main advantage is that it can move a cursor around on the screen with great precision.

MPEG

Moving **P**icture **E**xperts **G**roup. A video and audio compression standard which allows decompression at 1.2 MB to 1.5 MB/second so CD players can replay color movies at a realistic 30 frames/second.

NTSC

National **T**elevision **S**tandards **C**ommittee. A video broadcast standard of 525 scan lines every 1/30 second. This is accomplished in 2 passes of 1/60 second each (60 Hz). This system is used mostly in North America and East Asia.

Nonvolatile memory

The contents of the memory storage unit are not lost when power is turned off (e.g. floppy, hard disk).

Notebook computer

A small portable computer that uses a flat panel liquid crystal display. It is about the size of a large book.

O - P

PAL/SECAM

Phase **A**lternate **L**ine and **Se**quential **C**olor **a**nd **M**emory. Two video broadcast standards of 625 scan lines every 1/25 second. This is accomplished in 2 passes of 1/50 second each (50 Hz). These systems are used mostly in Europe, Australia and parts of Africa.

Parallel printer

A printer that receives information from the computer one character (letter, number, etc.) at a time through eight wires. Additional wires are needed to exchange control signals.

Parameter

An arbitrary constant. A variable in an algebraic expression that temporarily assumes the properties of a constant.

Partition

A reserved part of disk or memory that is set aside for some purpose. New hard disks must be partitioned before they can be formatted for the operating system, and the Fdisk utility is used for this task. It can make one partition, creating one drive letter for the entire disk, or it

can make several partitions sized to your requirements. For example, drives C:, D: and E: could be the same physical disk, but they would act like three separate drives to the operating system and user.

PC Card

This term has largely replaced the term PCMCIA. See PCMCIA.

PCI

Peripheral **C**omponent **I**nterface. A 32/64-bit local bus architecture widely used in Pentium-based PCs. Developed by DEC, IBM, Intel, and others, a PCI bus provides a high-bandwidth data channel between system-board components such as the CPU and devices such as hard disks and video adapters. The other widely adopted local-bus standard, the VL-Bus, is primarily used in 486 PCs.

PCMCIA

Personal **C**omputer **M**emory **C**ard **I**nternational **A**ssociation. A consortium of computer manufacturers that devised the standard for the credit card-size adapter cards used in many notebook computers. PCMCIA defines three card types: Type I cards can be up to 3.3 mm thick and are generally used for RAM and ROM expansion cards; Type II cards can be as thick as 5.5 mm and typically house modems and fax modems; Type III cards are the largest (up to 10.5 mm thick) and are mostly used for miniature hard disks. Windows 95's Plug and Play architecture provides PCMCIA support, which automatically recog-

nizes when PCMCIA devices are inserted and removed. The simpler term PC Card has largely replaced this acronym to refer to these cards.

PnP

Plug a**n**d **P**lay. The technology that makes Windows 95 automatically detect and configure most of the adapters and peripherals connected to a PC. A fully PnP-enabled PC requires three PnP components: a PnP BIOS, PnP adapters and peripherals, and a PnP operating system. When adding a PnP-compliant device to a PnP PC, the operating system, in conjunction with PnP logic present in the BIOS and in the device itself, handles the IRQ settings, I/O addresses, and other technical aspects of the installation to ensure that the device doesn't conflict with other installed devices.

POST

Power-**O**n-**S**elf-**T**est. A sequence of self-tests automatically run by the computer whenever it is turned on or is reset.

PostScript

A page description language (PDL) from Adobe that is used extensively on all computer platforms. It is the de facto standard in commercial typesetting and printing houses. Most all accept and may even require PostScript files as electronic input.

PostScript commands are language statements in ASCII text that are translated into the printer's machine language by a PostScript interpreter built into the printer. Fonts are scaled to size by

the interpreter, thus eliminating the need to store a variety of font sizes on disk. PostScript Level 2, adds data compression and enhancements, especially for color printing. Level 3 adds more enhancements and native fonts and the ability to directly support more formats, including HTML, PDF, GIF and JPEG.

Encapsulated PostScript (EPS) is a subset of PostScript used to exchange a single graphic image in the PostScript format.

PPP

Point-to-**P**oint **P**rotocol. A protocol that allows a computer to connect to the Internet through a dial-in connection and enjoy most of the benefits of a direct connection, including the ability to run graphical front ends such as Microsoft's *Internet Explorer*, *Mosaic* and Netscape's *Communicator*. PPP is generally considered to be superior to SLIP, because it features error detection, data compression, and other elements of modern communications protocols that SLIP lacks.

PS/2 connector

A 6-pin mini DIN plug and socket used to connect a keyboard and mouse to a computer. This port was originally used on IBM's PS/2 models and later adapted to all laptops and then desktop PCs.

Q - R

RAM

Random **A**ccess **M**emory. Memory into which the user can enter information and

instructions (write), and from which the user can call up data (read). RAM is the "working memory" of the computer, into which application programs can be loaded from a storage device and then executed.

ROM

An acronym for **R**ead-**O**nly **M**emory. Generally, a solid state storage chip that is programmed at the time of its manufacture and that cannot be reprogrammed by the computer user.

Routine

A short set of program codes that perform a specific task.

S - T

SCSI

An abbreviation for **S**mall **C**omputer **S**ystem **I**nterface. This is a standard for connecting external devices (e.g. scanners and storage devices) to computers.

Serial port

An input/output port in a computer through which data is transmitted and received one bit at a time.

Setup

(1) A utility program which modifies the BIOS.

(2) Assembly and adjustment of a computer's components.

(3) The preparation of the system for normal operation.

S-video

(**S**uper-**video**) A higher standard video technology. 5-pin connectors have separate channels for luminance (Y) and color information (C) as well as Red, Green and Blue.

TCP/IP

Transmission **C**ontrol **P**rotocol/**I**nternet **P**rotocol. A set

of communication protocols developed by the U.S. Department of Defense that allows dissimilar computers to share information over a network. TCP/IP is the glue that binds the Internet.

TrueType Font

Each font contains its own algorithms for converting the outline into bitmaps. The lower-level language embedded within the TrueType font allows unlimited flexibility in the design.

Type 1 (PostScript) Font

Type 1 fonts are distributed by Adobe as two files: outlines (PFB), and metrics (AFM), which includes character widths and heights and kerning values and are converted to PFM (Printer Font Metric) files on the hard disk. These fonts are encrypted, and compressed. They also allow for hints, which improve the appearance of text at 300 dpi and lower resolutions. Adobe Type Manager is needed with non-PostScript printers.

Type 3 fonts do not use encryption or hints, but can use the entire PostScript language to create complex designs. They can also be bitmaps. Type 3 fonts are not widely used.

U - V

USB

(**U**niversal **S**erial **B**us) A hardware interface for low-speed peripherals such as the keyboard, mouse, joystick, scanner, printer and telephony devices. It supports MPEG-1 and MPEG-2 digital video. It has a maximum bandwidth of

1.5 Mbytes/sec, and support up to 127 devices. USB peripherals are "hot" swappable.

Utility

A program that helps the user run, enhance, create, or analyze other programs, programming languages, operating systems, and equipment. Utilities are designed to facilitate or aid the operation and use of the computer for a number of different applications and uses.

V.90

An ITU standard for a modem that communicates at 56 Kbps downstream and 33.6 Kbps upstream.

VGA

Video **G**raphics **A**dapter. Video system that allows simultaneous display of 256 colors at 640 x 480 graphics resolution and 720 x 400 text resolution.

This standard has been superceded by SVGA (800 x 600 resolution), XVGA (1024 x 768 resolution) and SXVGA (1280 x 1024 resolution)

Volatile memory

The contents of the memory storage unit are lost when the machine is turned off (e.g. cache or RAM).

W - Z

Zoomed Video (ZV) Port

The ZV Port is an enhanced PC Card port which has a direct connection between the PC Card and the notebook's AV subsystems. It allows for a dedicated data path to handle multimedia features.