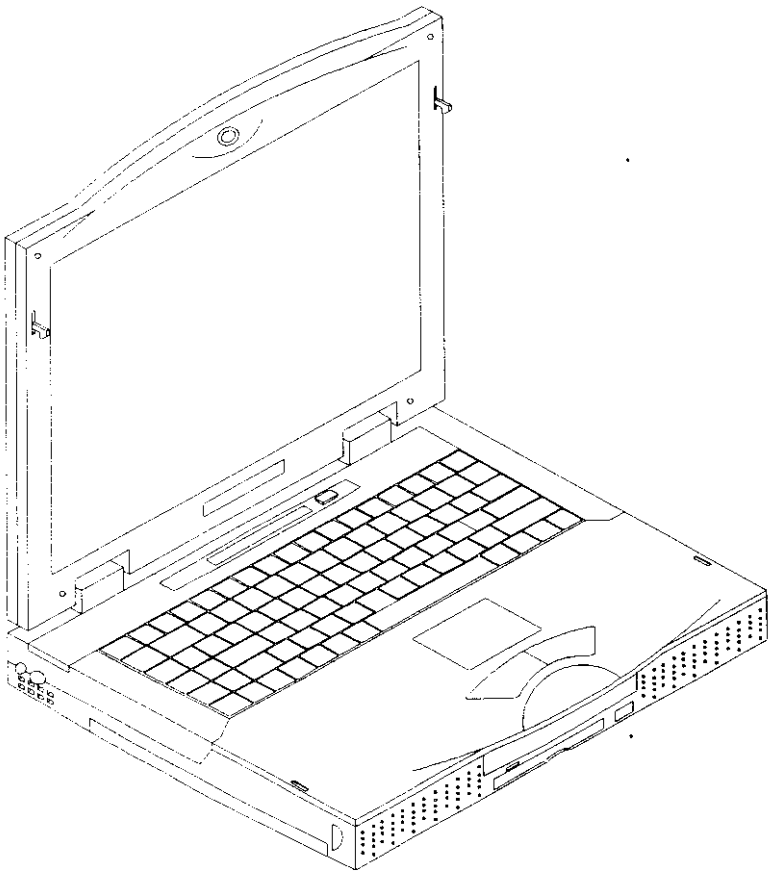
The MRA-2000

ALL-IN-ONE NOTEBOOK COMPUTER WITH A 15.0" LCD AND A BUILT-IN CCD CAMERA



USER'S GUIDE

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PRELIMINARY DRAFT

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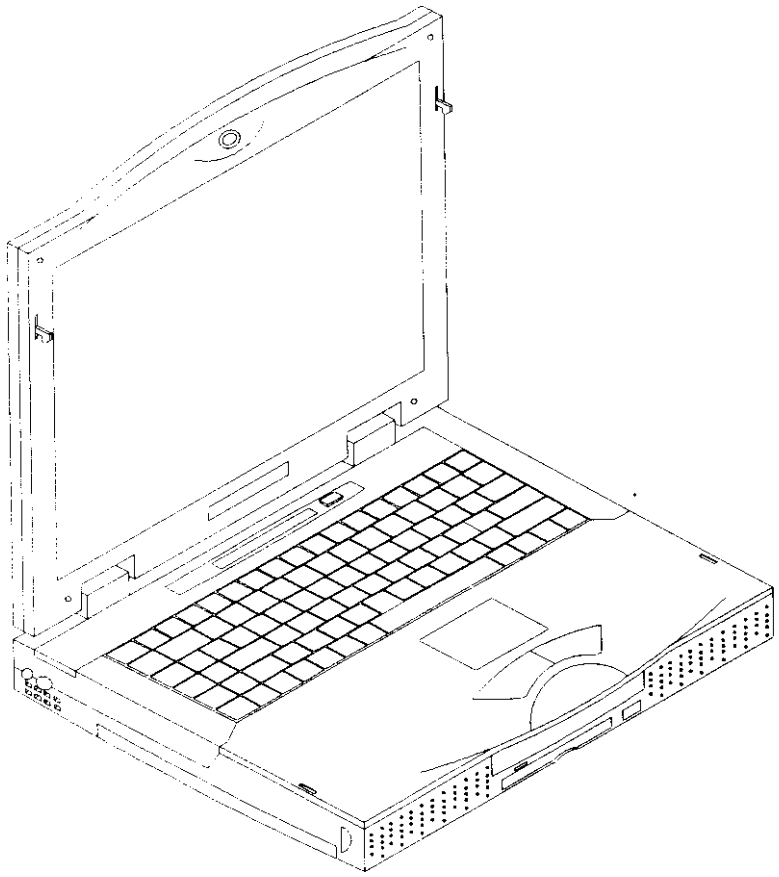

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About This Manual

This manual is designed to assist users in using their new Notebook computer. Information in this document has been carefully checked for accuracy; however, no guarantee is given as to the correctness of the contents. The information contained in this document is subject to change without notice.

Edition

Preliminary Edition, September 1998

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Regulations

- **EMI:** FCC/CE-Mark/VCCI/CNS
- **Safety:** TUV/UL/ULC/S-Mark
- **OS:** Windows 97 Logo

Federal Communications Commission 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 Federal Communications Commission (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.

If 產品，Label 上使用 VCCI Mark 如下：

If 產品，使用手冊中必須有下列文字敘述：

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取扱説明書に従って正しい取り扱いをして下さい。

CANADIAN DOC NOTICE

This digital apparatus does not exceed the Class B limits for radio noise emissions from digital apparatus as set out in the Radio Interference Regulation of the Canadian Department of Communications.

"Le présent appareil numérique n'èmet pas de bruits radioélectriques dépassant les limites applicables aux appareils numériques de la class B prescrites dans le Règlement sur le brouillage radioélectrique édicté par le ministère des Communications du Canada"

Warning

It is essential that only the supplied power cord be used.

You are cautioned that changes or modifications not expressly approved by the party responsible for compliance could void your authority to operate the equipment.

Maintenance

Follow these steps and you will increase the working lifetime of your Notebook. You will also reduce the chance of damage to your computer and personal injury to yourself.

1. Make sure the computer is turned off before unplugging it.
2. When possible, use a high-quality electrical surge protector when your computer is powered by the AC adapter. It is also a good idea to unplug your computer when it is not in use.
3. Do not use the computer in a dusty or dirty work area. Dust can cause contamination of the unit, which can result in malfunction or damage.

4. Ensure that your hands are clean when you use the Touchpad to prevent oil and dirt build-up, which can impair the Touchpad operation.
5. Clean your computer's exterior casing occasionally with a soft cloth. If you use a cleanser, make sure that it is only a mild detergent. Never use solvents like thinner or benzene, or abrasive cleansers because these may damage the cabinet. Make sure that the computer's power is off when you clean it. After cleaning, allow 30 minutes drying time.
6. Remember to clean your display at regular intervals. Spray window cleanser onto a soft cloth and then wipe the display. Do not spray the cleanser directly onto the display.
7. Clean your keyboard when needed. This can be done with a soft cloth as well as with a keyboard vacuum cleaner.

Safety Instructions

Computer

1. Follow all warnings and instructions marked on the Notebook.
2. Do not open the computer in a vertical position. Always use the computer in a horizontal position.
3. Do not operate your computer near a source of heat or in direct sunlight.
4. Do not use the computer in a potentially flammable work area.
5. Do not use your computer on an unstable working surface. This will prevent your computer from falling or being knocked over and damaged.
6. Do not store objects on the top of your computer. Do not exert pressure on the computer. It may damage the LCD display.

7. If you are traveling with your computer, remember to carry your computer as hand luggage. Do not check it in as baggage.
8. Do not use the Notebook near water or other liquids, or in rainy/moist situations. If liquid gets into your computer, turn it off and take it to your dealer for inspection.
9. Do not place the Notebook on an unstable cart, stand, or table. The Notebook may fall, causing serious damage to the computer.
10. Never push objects of any kind into the slots on the Notebook's cabinet as they may touch dangerous voltage points or short out parts that could result in a risk of fire or electric shock.
11. Unplug this product from the wall outlet before cleaning. Do not use liquid cleaners or aerosol cleaners. Use a damp cloth for cleaning.
12. Do not press on the LCD cover. Do not place any object on the cover when it is closed. Doing so may cause the LCD to break.
13. Do not attempt to service the Notebook yourself. Unplug this product from the wall outlet and refer servicing to the authorized dealer.
14. When replacement of components is required, be sure to replace only with components approved by the manufacturer or the authorized dealer. Unauthorized substitutions may result in safety hazards and/or violate the warranty.

Power

1. This electronic device should be operated from the type of power source indicated on the marking label. If you are not sure of the type of power available, consult your dealer or local power company.

2. This computer is shipped with its own AC adapter. Do not use the computer with a different adapter.
3. Do not allow anything to rest on the power cord. Do not place the Notebook where people will walk on the cord.
4. When you disconnect cords, remember to pull them by the plugs and not by the cords themselves. This will prevent damage to the cords, plugs, ports, and jacks.
5. If an extension cord is used with this Notebook, make sure that the total ampere ratings of the products plugged into the extension cord do not exceed the extension cord's ampere rating. Also, make sure that the total current of all products plugged into the wall outlet does not exceed 15 amperes.

The Battery

1. Do not disassemble the battery. The chemicals inside can damage skin and clothing.
2. Keep the battery pack away from fire.
3. Do not soak the battery pack in water or expose it to rain.
4. Replace only with the same or equivalent type of battery recommended by the manufacturer or the authorized dealer.
5. The battery will lose its charge when stored for a long time. Fully charge the battery before you use it again.

CAUTION!

Danger of explosion if battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the manufacturer. Discard used batteries according to the manufacturer's instructions. Do not place the battery contacts near metal objects.

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Chapter 1

NOTEBOOK INTRODUCTION

Congratulations on purchasing your Notebook! Your new Notebook is a compact personal computing station, featuring the most innovative advances in portable computing technology. Designed with SOHO (Small Office/Home Office) executives and high-tech engineers in mind, this mobile office station — equipped with a long-life 4-5 hour battery.

Your Notebook has a built-in CCD camera for video conferencing. An Image Sensor camera delivers clear, crisp images at 30 fps — *real continuous motion requires 24 fps (frames per second).* And a mammoth 15.0" display at a resolution of 1024x768 in True Color, allows for comfortable uncluttered viewing. Now if you can't be at that meeting in person, you can still make the deal.

The 16-bit 3D stereo sound audio system is fully compatible with Sound Blaster Pro and Microsoft Sound System for Windows. The two stereo speakers allow you to take full advantage of the multimedia capabilities of the Notebook.

The high-performance Mobile Intel Pentium II processor and enhanced IDE hard drive provide you with extra processing power for handling complex graphics and large sound files. Also featured is a built-in 3½" FDD or an optional LS-120 drive, allowing you to take advantage of the higher capacity of LS-120 drive diskettes. The is installed with a 24-speed CD-ROM drive or with a DVD-ROM drive. Other optional items include memory expansion cards, a 56K Fax/Modem module and a car adapter.

This User's Guide describes all features of the Notebook in an easy-to-read yet thorough manner. Refer to *Abbreviations and Glossary* in Appendix C, for an explanation of any unfamiliar terms you may encounter while reading this Guide. The primary goals of this chapter are to identify the external components of the Notebook and to provide a quick reference of the Notebook functions for experienced computer users.

Unpacking the Notebook

The Notebook comes securely packaged in a sturdy cardboard shipping carton. Upon receiving your Notebook, open the carton and carefully remove the contents. If anything is missing or damaged, please contact your Notebook dealer immediately. The shipping carton should contain the following items:

- The Notebook computer
- CD-ROM 24X (installed) or an optional 2X DVD-ROM
- Floppy Disk Drive (installed) or an optional LS-120 Disk Drive
- HDD (installed)
- CCD Camera (installed)
- An AC adapter
- An AC power cord
- Li-Ion Battery Pack
- Software Drivers and a CD-ROM Driver Diskette
- This User's Manual

Do not throw the packaging materials away. You may need them later to transport or ship the computer for repairs.

Note!

Using a computer for extended periods with a poor workstation set-up and incorrect work habits can cause health problems. The science of ergonomics studies the relationship between health and a suitable work environment. There is a section on ergonomics at the end of Chapter Two in this manual. For more information on ergonomics, contact your nearest computer bookstore, or local library. The Internet also has information on this and other subjects.

Opening and Closing the Notebook

At the sides of the Notebook you will find two retaining latches on the display panel which lock the display in a closed position when the Notebook is not in use. To raise the display panel follow these steps:

1. Slide the display panel latches forward until the display panel releases, and then raise the LCD screen.
2. Tilt the display to a comfortable viewing position.

To close the Notebook lower the LCD screen and press down gently; you will hear the retaining latch click shut.

> **CAUTION!**
> When closing the Notebook, be careful to lower the LCD screen gently. Slamming the LCD screen shut could damage the Notebook's circuitry.

Optional Devices

To further enhance the utility of your Notebook computer, there are several optional products available from your dealer.

- EDO RAM or SDRAM Modules
- 56Kbps Fax/Modem Module
- Additional Battery Packs
- Exchangeable IDE Hard Disk Drive
- DVD-ROM Drive (Manufacturer's Option)
- LS-120 Drive (Manufacturer's Option)

Overview of the Notebook's Hardware Features

This section provides an overview of the Notebook's features. For more detailed information see the specification section in Appendix A. The Notebook's hardware has the following features:

CPU

The central processing unit (CPU) is the Notebook's key hardware feature; it acts as the brain of the computer, performing all the computing functions and orchestrating the actions of the system.

External Cache	The Notebook supports an external 512KB L2 write back cache with Synchronous Pipeline Burst mode. The external cache enhances system performance, especially in the Windows environment.
Upgradeable System Memory	The Notebook has two 144-pin, 64-bit SO-DIMM Memory Module slots. Memory can be upgraded up to 256MB by using one or two 8, 16, 32, 64 or 128MB 144-pin, 3.3V, EDO/SDRAM SO-DIMM modules.
Power Management	The Notebook features sophisticated power management built into the BIOS Setup program. The *Integrated Smart Charger Circuit* is designed to conserve power and extend the life of the battery between charges.
Display	The LCD is a 15.0" XGA TFT display. The LCD assembly can be used simultaneously with an external monitor.
Ultra DMA 33	An enhanced version of the IDE interface that transfers data up to 33 Mbytes/sec
440 BX PCIset	Intel's trade name for its PCI-based chipsets. These chipsets provide the interfaces between all of the PC's subsystems.
VGA Graphics Accelerator	The video subsystem includes 2.5 or 4.5MB of video memory and a high performance 32-bit PCI Bus, 64-bit video memory bus VGA controller with support for simultaneous display and full power management. The video subsystem also supports a ZV (Zoomed Video) port.

Software MPEG-2

MPEG-2 is an ISO/ITU standard for decoding compressed motion video. MPEG, pronounced as "em-peg", stands for **M**oving **P**ictures **E**xperts **G**roup. MPEG-2 is a broadcast-quality standard that provides high-grade resolution and is used in DVD movies.

CCD Image Sensor Camera

Built into the LCD cover, this video conferencing camera provides you with image capture, motion video and adjustable focus, at a resolution of 704 x 480 at 30 fps (frames per second).

FDD Module

The Notebook comes with a built-in FDD (Floppy Disk Drive) module. The FDD can use either 720KB double density or 1.44MB high-density 3.5-inch floppy diskettes, with 3 mode 1.2MB format support for NEC PC compatibility.

Exchangeable HDD Module

The Notebook comes with a 2.5" (12.7mm maximum height) hard disk installed. The hard drive can easily be removed and replaced with a second hard drive for the purpose of data backup or expansion.

CD-ROM Drive

The Notebook comes with a 24-speed CD-ROM drive. It allows you to take advantage of a wide array of multimedia titles available.

DVD-ROM Drive

The Notebook comes with an optional 2-speed DVD-ROM drive (Manufacturer's Option). DVD-ROMs are the next-generation video CD and high-capacity CD-ROM.

The disc is the same diameter as a CD-ROM, but can be recorded on two layers, and on both sides. Each layer holds 4.7GB, equivalent to seven CD-ROMs (or 17GB, if both sides are used).

LS-120 Drive

The FDD can be exchanged with the optional LS-120 drive (Manufacturer's Option). The LS-120 drive uses 120MB diskettes housed in a redesigned 3.5" floppy disk cartridge. The LS-120 also reads and writes 1.44MB diskettes up to three times as fast as standard floppy drives.

Pointing Device

The Notebook comes with a Touchpad. The Touchpad is a pressure-sensitive pointing device, which allows you to move the cursor around the screen and make selections just as one would with a conventional mouse. You can use the Touchpad concurrently with an external PS/2 mouse.

Windows 95 Enhanced Keyboard

The Notebook keyboard uses a standard QWERTY layout with the addition of special function keys (e.g., "Hot-Keys" for LCD brightness & contrast) and an embedded numeric keypad for number intensive data entry. The Notebook's enhanced keyboard design emulates a full-size desktop keyboard and supports multiple language formats. Your keyboard supports Windows 95 by incorporating two Windows-specific keys. With the Windows 95 keys, you will be able to access and take advantage of many of the time-saving features of Windows 95 software. An optional 89-key OADG and Microsoft Windows compliant keyboard for Japanese language is also available.

PCMCIA Interface

Two PCMCIA expansion sockets provide an interface for two Type II cards, or one Type III card. The PCMCIA interface in your Notebook uses a PCI bus and supports two CardBus ports and one ZV port. PC cards accommodate a number of expansion options, including memory cards, modems, hard disks, and network adapters.

Serial Port

A standard 9-pin RS-232 serial port (16550 UART compatible)

Parallel Port

A 25-pin parallel port which is most commonly used to connect a printer or Pocket LAN to the computer. The parallel port supports EPP, ECP, and SPP capabilities.

USB Port

Dual Universal Serial Bus (USB) ports are available for you to connect a USB device. Contact your dealer for details

The USB has a maximum bandwidth of 1.5MB per second and at full capacity can accommodate up to 128 peripheral devices.

Infrared Port

The Notebook features two IrDA compatible Fast Infrared (FIR) and Serial Infrared (SIR) communication modules. The FIR module enables you to make wireless serial communication between the Notebook and other IR equipped devices such as a printer or another Notebook computer. The convenient-facing FIR modules allow communication with a compatible FIR device at the front or the rear of the Notebook.

3D Audio

The Notebook's audio system is based on a sophisticated ESS Audio Accelerator chipset. It includes a 64-voiced, Pipelined Wavetable Synthesizer, 3D audio sound effects with an integrated 3-D spatializer, an AudioDrive chipset with digital mixer and an AC '97 CODEC Compliant interface. The Notebook's sound system is generated through two built-in *Rare Earth* stereo speakers encased in mini speaker cabinets. Up to four audio power amplifiers are provided to greatly enhance the Notebook's sound quality. The Notebook also has an internal microphone and is Sound Blaster Pro compatible.

The Notebook's audio system supports software Wavetable Synthesis. Wavetable synthesis provides more realistic sound than the FM synthesis method, which generates the sound waves entirely via electronic circuits. Wavetable synthesis creates musical sounds by storing digitized samples of the actual instruments. The more notes sampled, the better the resulting sound recreation.

Audio Ports

The Notebook comes with four audio jacks: Line-out, Line-in, Mic-in, and a jack for connecting headphones.

TV-out Port

Connect a television set to one of the Notebook's two TV-out ports. This port (TV-out only) supports high quality S-Video and allows the TV to be used as an external monitor. The S-video cable is terminated at each end with a four-pin DIN connector and has two 75 ohm coaxial cables internally.

RCA Jack — Connect a television set via the Notebook's RCA jack to use the TV as an external monitor as well. This port (TV-out only) supports Composite Video. Composite video signals are connected between products with a single 75 ohm coaxial cable and usually with RCA connectors on both ends of the cable.

PS/2 Port — The Notebook has a 6-pin connector for connecting a full-size keyboard or a PS/2 mouse.

VGA Port — At the rear of the Notebook, there is a 15-pin VGA connector for connecting an external CRT monitor.

56K Rockwell Fax/Modem Module — Insert a standard phone line into this Rockwell 56K fast fax/modem jack for a speedy connection to the internet. Also included are three fax/modem status LEDs.

Popup Screens — The Notebook provides a number of hot key popup screens to let users quickly manage the LCD, battery, CCD camera and external CRT.

Keyboard Controls — The Notebook provides a host of hot key features that are a permanent part of the computer's operation. Some affect the LCD video display, while others control the sound volume.

Battery and AC Power System

The Notebook can operate on two power sources: an AC Adapter or the rechargeable battery module pack. The system will automatically recharge the battery pack in the Notebook by using the AC Adapter. By using the power management features described in Chapter Five, the Notebook can operate on battery power for 4 to 5 hours. Each battery pack takes approximately 4 hours to recharge when the computer is turned off and 6 hours when the computer is turned on. The Notebook has a number of battery indicators. A) A Fuel Gauge on the battery pack informs you of the current battery charge status. B) An LED on the top of the LCD lid informs you of charging status. C) A System Status icon also informs you of charging status. D) A function key informs you of battery charge status. E) And a System Status icon also informs you of battery charge status. For extended battery-powered operation, additional battery modules may be purchased.

Identifying External Components

Please refer to the text and diagrams below to identify all external components and accessories of the Notebook computer.

Top View

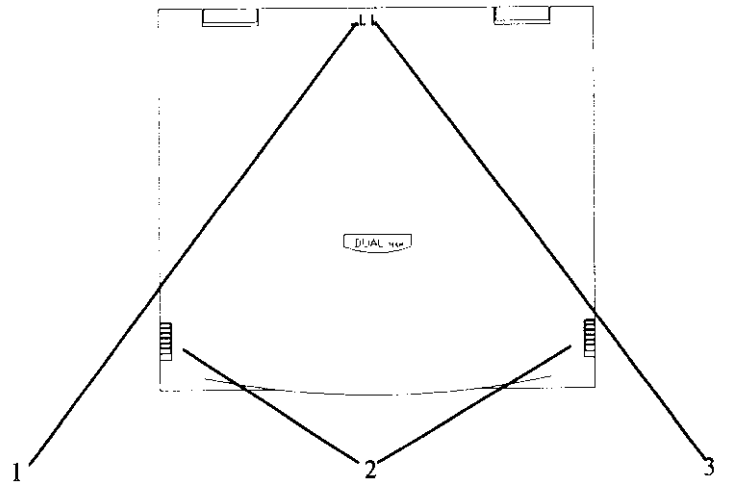


Figure 1-1: Top View of the Notebook

Located on the outside cover of the LCD panel, the Power Status Indicators show the current operating status of the Notebook. They are described below from left to right.

1. **Battery Charging/Power On**
   This LED has several functions. Firstly, when the machine is turned off and the battery is recharging, this LED turns red. When the battery is fully charged, the LED turns off. Secondly, when the notebook is turned on and the battery is recharging, this LED turns orange. When charging is complete it will turn to green. Lastly, when operating on AC power or battery power, this LED is green.

2. **Display Panel Latches**
   These latches are used to release the display panel from its locked or closed position.

3. **Standby Indicator**
   This LED flashes green indicating that the Notebook is in a Standby power-saving mode.

Front Left View

Please refer to ***Figure 1-2*** and the descriptions that follow to identify the components on the front and left side of the Notebook.

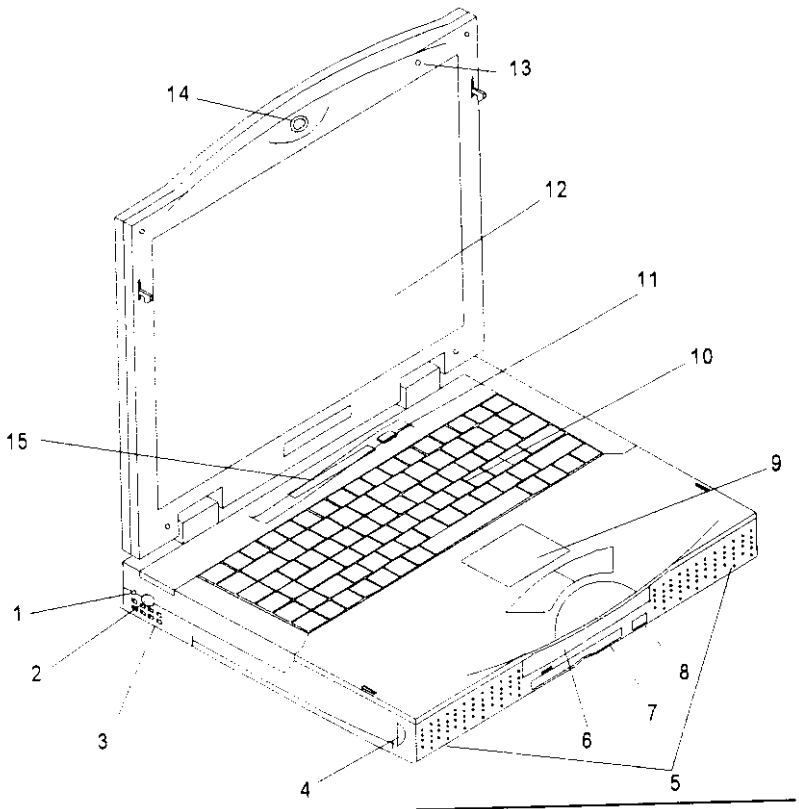


Figure 1-2: Front Left View of the Notebook

1. **AC-In Jack**
   Connect the AC Adapter power lead to this jack.

> **CAUTION!**
> Only use the AC adapter that came with the Notebook, or a dealer specified AC adapter. Never connect a non-dealer specified AC adapter to the Notebook. Using a non-dealer specified AC adapter could result in a fire.

2. **PS/2 Mouse or Keyboard Port**
   This port is for connecting an external PS/2 mouse or a keyboard to the Notebook.

3. **Ventilation Slots**
   These slots allow air to circulate throughout the CPU and other internal components. Keep these slots unobstructed to allow proper ventilation to the Notebook's internal components.

4. **Speaker Vents**
   For optimal sound keep the speaker vents (left and right panels) unobstructed.

5. **Built-in Stereo Speakers**
   The Notebook provides three audio-output choices: wearing headphones connected to the audio-out port for private listening; connecting external stereo speakers to the audio-out port for high quality sound; or for convenience, using the internal stereo speakers.

6. **Built-in CD-ROM Module or Optional DVD-ROM**
   The Notebook comes with a built-in CD-ROM module or an optional DVD-ROM module. There is a System Status icon that indicates when the CD-ROM/DVD-ROM is being accessed.

7. **Floppy Disk Drive or Optional LS-120 Disk Drive**
   The Notebook comes with a built-in 3.5-inch floppy disk drive (FDD) or an optional LS-120 disk drive. There is a System Status icon that indicates when the FDD/LS-120 is being accessed.

8. **IrDA V1.1 FIR/SIR Module**
   The FIR/SIR Module allows wireless communication between the Notebook and another IrDA compliant computer or device.

9. **Touchpad**
   The pressure sensitive Touchpad and two Touchpad buttons provide all the functions of a two-button mouse and can be used concurrently with an external PS/2 mouse.

10. **Keyboard**
    The low-profile keyboard emulates all the functions of a full-size keyboard including an embedded numeric keypad and a full array of special function keys. The keyboard also includes two Windows keys. The Notebook keyboard is available in several languages.

11. **Power Button/Suspend Resume**
    Press this button and hold it down for one full second to turn the computer on or off. Also press this button to resume normal operations after going into suspend mode.

12. **LCD Display**
    The 15.0-inch LCD display panel supports XGA and has standard resolutions of 1024x768 in True Color.

13. **Built-in Microphone**
    The built-in microphone allows you to record voice annotations, music, and other sound files.

14. **Image Sensor Camera**
    The built-in video conferencing camera features video capture and adjustable focus. Real continuous motion is simulated at 30 fps with a resolution of 704x480.

15. **System Status Indicators**
    These system status indicators inform you of the computer's current operating status at a glance. The different display indicators are Power on, AC in, Battery charging, Battery on, Suspend to RAM, CD-ROM/DVD-ROM, FDD/LS-120, HDD, PCMCIA activity, Scroll Lock, Caps Lock, and Number Lock.

> ***Note!***
>
> ***Your Notebook comes with a special on/off feature designed to protect your data from accidental shut-offs. In order to power on/off your Notebook, you must press this button for at least one full second.***

Right View

Please refer to ***Figure 1-3*** and the descriptions that follow to identify the components on the right side of the Notebook.

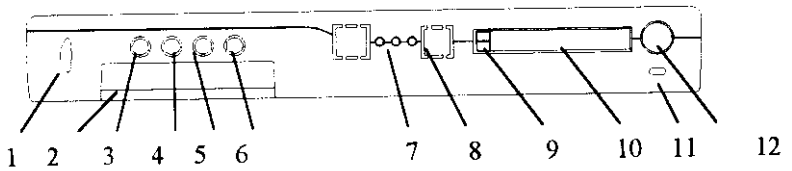


Figure 1-3: Right View of Notebook

1. **Speaker Vents**
   For optimal sound keep the speaker vents (left and right panels) unobstructed.
2. **Removable HDD**

Remove this cover to access the Notebook's hard disk drive.

3. **Headphones Jack**
   Connect headphones to this jack.

4. **Audio Line-out Jack**
   This stereo jack is used to connect external speakers or headphones.

5. **Audio Line-in Jack**
   Use this jack to connect an audio source, such as a CD player to your Notebook.

6. **MIC Jack**
   This mono microphone jack is used to connect an external microphone.

7. **Modem Status LEDs**
   The three Modem LEDs are from left to right (a) ringing, (b) connected, and (c) power on.

8. **RJ-11 Internal Modem Jack**
   Connect your phone line to this jack to use the Notebook's internal Modem.

9. **PCMCIA Eject Buttons**
   Press one of the PCMCIA eject buttons once to retract the button. Press it again to eject the card.

10. **PCMCIA Slots**
    Two PCMCIA Type II cards can be inserted into these slots. The lower slot also supports one Type III PCMCIA card. The PCMCIA has a built-in ZV Port (Zoomed Video Port) providing a high transfer rate for video applications. The ZV Port is activated by plugging in an MPEG PC Card that is ZV Port-compliant.

11. **Kensington Security Lock**
    You can use the Kensington Security Lock to lock your Notebook to a desk or other large stationary object to protect against theft.

12. **TV-out Port**
    This 5-pin S-video port allows you to view the Notebook's Video output on a television monitor.

> **Note!**
> ***Your Notebook is shipped with "dummy" protection cards inserted in the PCMCIA sockets to protect the bay from dust or other foreign objects. Remove the dummy card before inserting a PCMCIA card. Refer to Chapter Three, Inserting a PCMCIA Card for more information.***

Rear View

Please refer to ***Figure 1-4*** and the descriptions that follow to identify the components on the rear side of the Notebook.

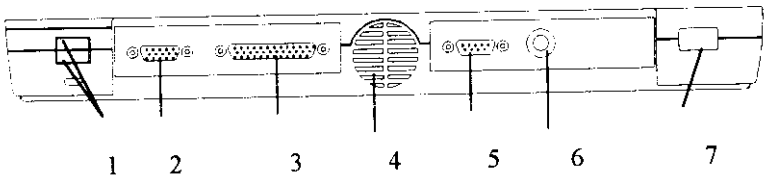


Figure 1-4: Rear View of Notebook

1. **USB Ports**
   These two ports were designed in full compliance with Universal Serial Bus specifications. Any USB supported peripheral device, i.e., joystick, digital camera, or printer, can be connected to these ports.
2. **VGA Display Port**

This port is used to connect an external monitor (CRT).

3. **Parallel (LPT1) Port**
   This port is normally used to connect a printer to the Notebook.
4. **Fan**
   Keep this fan unobstructed to allow air flow to the CPU and other internal components.
5. **Serial (COM1) Port**
   This port is used to connect RS-232 serial devices to the Notebook. Three types of serial devices are external mice, serial printers, and Fax/Modems.
6. **RCA Jack**
   This jack allows you to connect an external TV to the Notebook.
7. **IrDA FIR/SIR Module**
   The FIR/SIR Module allows wireless communication between the Notebook and another IrDA compliant computer or device.

The Bottom View

Please refer to ***Figure 1-5*** and the descriptions that follow to identify the components on the bottom of the Notebook.

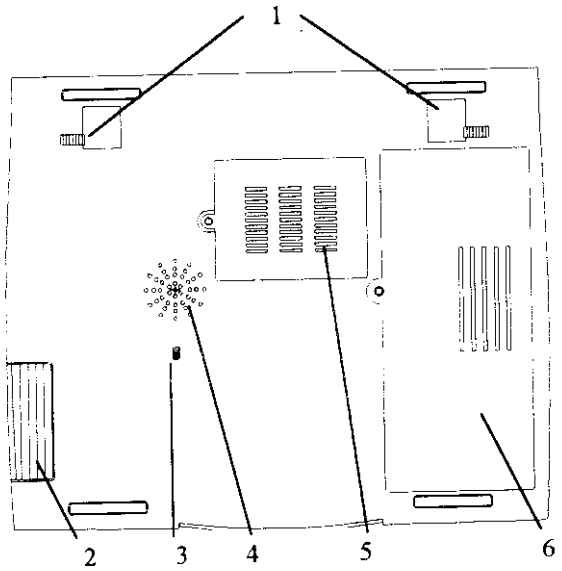


Figure 1-5: Bottom View of Notebook

1. **Extendable Footpads**
   These footpads can be extended to provide a more comfortable angle when typing.

2. **Hard Disk Drive Cover**
   Remove this cover to access the Notebook's hard disk drive.

3. **HDD Cover Lock**
   Open the HDD cover lock to remove the HDD cover.

4. **Air Vent**
   An air vent allows air to flow freely.

5. **RAM Module**
   Remove this cover when installing new RAM modules.

6. **Battery Bay Cover**
   Remove this cover to insert or replace the battery. Located beneath this cover is the Notebook's battery pack module. The battery is not installed when the Notebook is shipped. After the battery runs down, the module can be recharged or removed and replaced with a charged battery. Additional battery packs are optional.

   For instructions on installing the battery, see Chapter Five, Inserting the Battery Pack.

Preparing the Notebook for Transport

To prepare your Notebook for transport, you should first disconnect all peripheral devices. Make sure the computer is turned off before you do this. The Notebook's hard disk head is self-parking. This means that the Notebook can be directly turned off from the DOS prompt. Close the LCD panel and check that it is latched securely to the computer. Make sure the floppy drive does not contain a diskette. When a diskette is inserted in the floppy drive the eject button pops out. If you attempt to transport the Notebook with a diskette in the drive, you risk damaging the eject button.

To save battery power, whenever possible, you should operate the Notebook on AC power without the battery inserted, unless you are recharging the battery.

This concludes Chapter One. The next chapter provides important information for getting the Notebook up and running for the first time.

Chapter 2

GETTING STARTED

This chapter explains what you need to do after turning on your Notebook. Experienced computer users may need only read this chapter and Chapter One while using the rest of the manual merely as a reference.

Powering Up the Notebook for the First Time

To connect the Notebook to an AC power source, please refer to ***Figure 2-1*** and the following instructions:

1. Identify the two cables that come with the AC Adapter. One is the power cord. It connects the AC Adapter to a power source, such as an electrical outlet or UPS. The other cord connects the Notebook to the AC Adapter module.
2. Connect the female end of the AC power cord to the AC adapter.

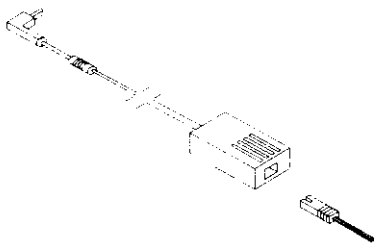


Figure 2-1: Connecting the AC Power Adapter

3. Connect the male end of the AC power cord to an electrical outlet.

4. Connect the AC adapter plug from the AC adapter to the DC-In jack on the left side of the Notebook.

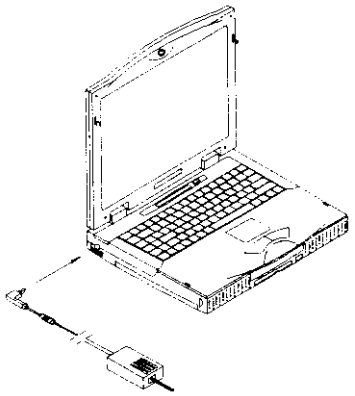


Figure 2-2: Connecting the AC Adapter to the Notebook

> CAUTION!
> Only use the AC adapter that came with the Notebook or a dealer specified AC adapter. Never connect a non-dealer specified AC adapter to the Notebook. Using a non-dealer specified AC adapter could result in a fire.

5. Open the Notebook and adjust the LCD screen to a comfortable viewing position

6. Press and hold down the power button for at least one second. You will hear a short beep. Then Notebook's sign-on message should appear on the screen, after which the Notebook will run through a series of software-controlled diagnostic tests called the Power On Self

Test (POST). You may need to adjust the brightness and LCD screen angle to attain a clear display. For instructions on how to adjust the brightness, please refer to the "Special Function Keys" description on page 38.

7. When you see the POST screen, you can press [F2] to enter the BIOS Setup program to set up or modify the system configuration. For more information about the BIOS Setup program, please refer to Chapter Six of this manual for detailed information on the BIOS Setup.

Note!

The best kind of AC power source to connect your Notebook to is a UPS (Uninterruptible Power Supply). If a UPS is not available, use a power strip with a built-in surge protector. Do not use inferior extension cords as this may result in damage to your Notebook.

The Notebook comes with its own AC adapter. Do not use the AC adapter to power other electrical devices.

When you connect the AC adapter to the Notebook and to an electrical outlet, the outlet supplies power to the Notebook and recharges the battery

Whenever possible, keep the AC adapter plugged into the Notebook and an electrical outlet to conserve battery power. Although it is not necessary, it is also a good idea to protect the display panel by always closing it when the Notebook is powered off.

CAUTION!

Never turn off or reset your Notebook while the hard disk or floppy disk is in use and the FDD and/or HDD status icon is lit; doing so can result in loss or destruction of your data. Always wait at least 5 seconds after turning off your Notebook before turning it back on; turning the power on and off in rapid succession can damage the Notebook's electrical circuitry.

The Power On Self Test (POST)

When you turn on the Notebook, it will first run through a series of software-controlled diagnostic tests called the Power On Self Test (POST). The software that controls the POST is installed as a permanent part of the Notebook's architecture. The POST includes a record of the Notebook's hardware, which is used to make a diagnostic check of the system. This record is created by using the BIOS Setup program. If the POST discovers a difference between the record and the existing hardware, it will display a message on the screen prompting you to correct the conflict by running the BIOS Setup program. Refer to Chapter Six for instructions on how to run the BIOS Setup program.

In most cases, the record should be correct when you receive the Notebook. If so, the POST will finish and the Notebook will look for a Disk Operating System to load into memory. The self test will run every time you turn on the computer.

When the test is finished, you should only get a message reporting that there is a non-system disk or disk error if the hard disk was not pre-loaded with an operating system. This indicates that the hard disk is ready to be prepared for use with the operating system you intend to use.

After you prepare the hard disk for use, you should not see this message again unless you try to start the Notebook with a non-system floppy diskette inserted in the floppy drive. In this case, you will see the following message:

```
Invalid system disk
Replace the disk, and then press any key
```

Remove the diskette and press the [Enter] key.

To enter the BIOS setup screen, press [F2] when the POST screen is displayed.

Installing a Disk Operating System

When starting the Notebook for the first time, please be aware that you must have a Disk Operating System (DOS) program installed on the hard drive. You might have Windows 95, Windows 98 or MS-DOS already installed on your Notebook. If your dealer did not install an operating system for you, please consult your Disk Operating Software manuals for instructions on how to install an operating system.

Resetting the System

After installing a software application package on your hard disk drive, you may be prompted to reset the system to load the changed operating environment. To reset the system, or "reboot," press the [Ctrl] + [Alt] + [Delete] keys simultaneously. This is known as a "warm boot." This key combination acts as a "software" reset switch when you encounter hardware or software problems, which lock up the Notebook.

If this key combination does not shut down the Notebook, you can reset the Notebook by using the Notebook's power-on button. Should the Notebook lock up for some reason, pressing this button resets and powers the Notebook off.

A Word about Ergonomics

Ergonomics is the study of how people with their different physical characteristics and ways of functioning relate to their working environment (the furnishings and machines they use). The goal of Ergonomics is to incorporate comfort, efficiency, and safety into the design of keyboards, computer desks, chairs, and other items in an effort to prevent physical discomfort and health problems in the working environment. Because more and more

people are spending large amounts of time in front of computer monitors, scientists from many fields including anatomy, psychology, and occupational safety are involved in the study of ergonomically sound work environments.

If your budget permits, buy ergonomically designed furniture such as chairs, shelves, and desks that fit your physical characteristics and work methods. Most furniture manufacturers have not considered the particular shape of your body when designing workstations. If you are going to be sitting for extended periods, an ergonomically designed chair may well be worth the extra expense.

You can, however, create an ergonomically improved workstation without spending much money. Listed below are a few tips to help you work effectively without a lot of physical discomfort:

- Place the Notebook's LCD screen so that it is a little *above* eye level to prevent neck strain.
- Try to place the Notebook so that there is little glare from the sun on the LCD screen.
- Use a thick book as a foot rest.
- Walk around the room every hour.
- Every half hour look away from the computer screen for a few minutes.
- Place everything that you need for work within easy reach.

Powering Off the Notebook

To power off the Notebook from the Windows 95/98 operating system, please refer to the following instructions:

1. Click on the **Start** button in the bottom left-hand corner of the screen to show the Start menu.
2. Click on the **Shut Down** button to display the following (or similar) Shut Down Windows dialog box.

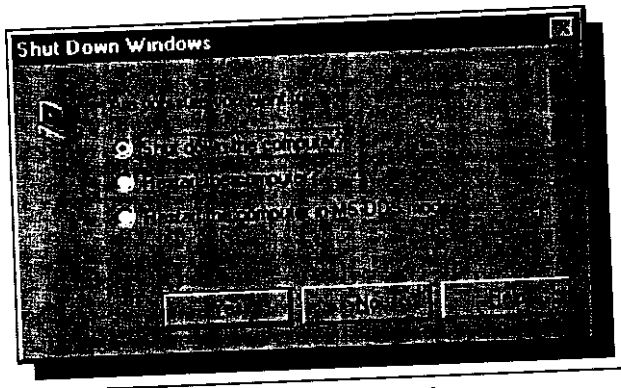


Figure 2-3: Shut Down Windows Dialog Box

3. Select **Shut down the computer?** and click on the **Yes** button. Your Notebook will shut down automatically.

This concludes Chapter Two. The next chapter provides a detailed description on operating the Notebook.

NOTES

Chapter 3

OPERATING THE NOTEBOOK

This chapter provides detailed information on how to use the Notebook's sophisticated hardware features. Most of the Notebook's hardware features can be described as input and output devices. An input device, as its name suggests, is a hardware device used to enter information to be processed by the computer. Examples of input devices are the keyboard and the Touchpad. An output device, such as an LCD display, monitor, or printer, receives data from the computer and displays the information in a human-readable format. Other hardware components such as the serial port, parallel port, and disk drives are both input and output devices, i.e., they can be used for transferring data to and from the computer.

The LCD Display

The Notebook comes with a Color LCD display panel that supports the following display options:

Display
15.0" TFT XGA

Note!

Models with a display resolution of 800 x 600 and 2.5MB or 4.5MB of video RAM, support a 16.7M color depth. Models with a display resolution of 1024 x 768 must have 4.5MB of video RAM to support a 16.7M color depth.

Adjusting the Display

The LCD screen can be adjusted or changed by implementing the following key combinations:

Key Combinations	Definitions
[Fn] + [F7]	**Increases display brightness**
[Fn] + [F8]	**Decreases display brightness**
[Fn] + [10]	**Switches between simultaneous display (Simulscan), external monitor, and LCD display**

LCD Care

LCD screens are delicate devices that need careful handling. Please pay attention to the following precautions:

- When you are not using the computer, keep the LCD screen closed to prevent dust from gathering on the keyboard and/or LCD display.
- If you need to clean your LCD screen, use a soft tissue to gently wipe the LCD surface.
- Do not put your fingers or sharp objects directly on the surface and never spray cleaner directly onto the display.
- Do not apply pressure to the cover when it is closed. Do

not store any objects on the cover when it is closed. Doing so may cause the LCD to break.

External CRT Display

You can attach an external monitor through the 15-pin VGA port located at the rear of the Notebook. Three configurations are available:

- LCD only
- CRT only
- Simultaneous display of the LCD screen and CRT monitor (Simulscan)

For information on connecting an external display, please refer to Chapter Four.

External TV Display

The Notebook has two TV-out connection ports. On the right side of the Notebook there is an S-video port (TV-out only). On the rear side is an RCA jack (TV-out only) for Composite video. Both of these TV connectors can change the computer's output signal into a TV's input signal. Both support the NTSC and PAL protocols. If you connect the system to a TV set via these connectors, you can use your Television as a display device. The Notebook does support simultaneous TV and LCD display under Windows 95 and 98. This feature is not supported in DOS. The Notebook's Video-in function is solely reserved for the CCD camera. The Notebook does not support Video-in, e.g., from TVs, camcorders or VCRs.

A Tour of the Notebook's Keyboard

The Notebook's keyboard uses a standard QWERTY layout with the addition of special function keys and an embedded numeric keypad for number intensive data entry. The enhanced keyboard

design of the Notebook emulates a full-size desktop keyboard. Your keyboard supports Windows by incorporating two Windows specific keys. With the two Windows keys, you will be able to access and take advantage of many of the time-saving features of Windows 95/98 software.

The QWERTY layout means the alphanumeric keys located on the keyboard are in the same position as those found on a standard typewriter. The usage of these keys is straightforward. There are some keys such as Scroll Lock, Print Screen, etc., whose functions may be unfamiliar to you. This chapter identifies these keys and discusses their functions when used with either the Disk Operating System Software or other application software, such as word processors, spread sheet applications, or database management programs.

This section covers the Notebook keyboard and identifies several keys, which you will commonly use when working with either the Disk Operating Software or other software. ***Figure 3-1*** shows the keyboard layout. A description of some of the keys is provided below.

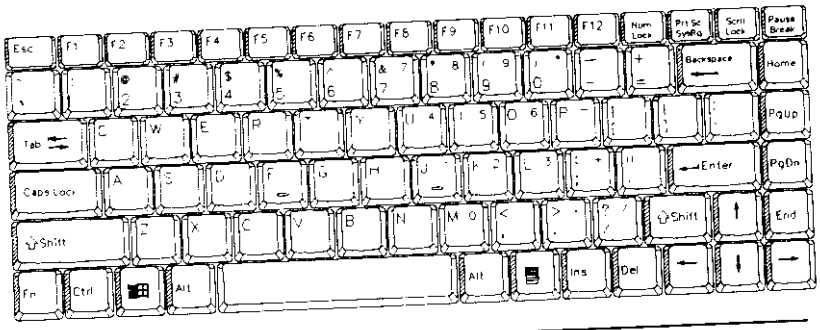


Figure 3-1: The Notebook Keyboard Layout

1. **[Esc]:** The Escape key allows you to cancel any specific command you may have just keyed in. For example, if you mistakenly hit the function key, [F1], in your word processor or spread sheet program, but want to "cancel" the command so that the computer will ignore the func-

tion key, just press [Esc].

2. **[NumLock]:** Pressing the [Fn] + [NumLock] keys together enables/disables the Notebook's numeric keypad. It also enables/disables a connected keyboard's keypad.

3. **[PrtSc/SysRq]:** Pressing this key will cause whatever is on the screen at the time to be printed. Note that in some software programs, this key may be used in conjunction with other keys for other specific functions. Consult your software user's manual for more information.

4. **[Scroll Lock]:** When Scroll Lock is engaged, pressing the cursor control keys moves the cursor by fields of text. Note that when Scroll Lock is engaged, the Scroll Lock Status indicator comes on.

5. **[Pause/Break]:** The Break key is used in conjunction with the Control key ([Ctrl] + [Pause/Break]) to cancel a command. The Pause key is most commonly used during boot-up, to pause the sign-on screen. Press the [Pause/Break] key when you want to stop the screen. Press the spacebar to commence boot sequence.

6. **[CapsLock]:** The Caps Lock key corresponds to a typewriter's Shift Lock key, but it only affects alphabet keys. The number keys and function keys are not affected. Even with the Caps Lock key engaged, if you want to generate the symbols and punctuation marks above the number keys, you must still use the Shift key. Press the [CapsLock] key to engage this mode, note the Caps Lock Status indicator comes on.

7. **[Shift]:** Similar to the typewriter's Shift key, this key allows you to type letters in "UPPER CASE."

8. **[Ctrl]:** Used by itself, the Control key has no effect carrying out commands. Like the [Alt] key, it is always used in combination with other keys. Its function depends mainly upon the type of software you are currently using. Refer to the user's manual of the software you are using for details on how to use this key.

9. **[Alt]:** Used by itself, the Alternate Key has no effect carrying out commands, but functions with the [Ctrl] and [Del] keys ([Alt] + [Ctrl] + [Del]) to reboot or restart your operating system program. Refer to the user's guide of the software you are using for more details on how to use this key.2

10. **[Ins]:** The Insert key toggles between *insert* or *overwrite* mode. When set to insert mode each new character typed in pushes existing characters to the right of the cursor to make room for the new character. When set to overwrite mode, each new character typed in replaces the existing character to the right of the cursor. With some software the insert key can be programmed to insert an object or text from the clipboard at the cursor position.

Windows Keys

There are two special Windows Keys on the keyboard. A brief description of each key is given below.

This Windows key activates the *Start* menu button on the bottom left of the screen. Press [Esc] to cancel.

This Windows Application key, which looks like a menu with a small arrow, activates the properties menu and is equivalent to pressing the right mouse button while pointing at any object on the Windows desktop. Press [Esc] to cancel.

Special Function Keys

Key Combinations	Definitions
[Fn] + [Esc]	Turns off battery *low warning beep*
[Fn] + [F1]	Displays Battery Fuel Gauge popup screen
[Fn] + [F2]	Powers on/off the CCD Image Sensor Camera after a CCD application is launched
[Fn] + [F3]	Suspends to DRAM. Press these keys again to resume (see Chapter Five *Suspend Mode*)
[Fn] + [F4]	Suspends to Hard Disk. Press the power button to resume (see Chapter Five *Suspend to Hard Disk Mode*)
[Fn] + [F7]	Increases display brightness
[Fn] + [F8]	Decreases display brightness
[Fn] + [F9]	Switches the display resolution between 800 x 600 and 1024 x 768 (nonexpand/expand)
[Fn] + [F10]	Switches between simultaneous display (Simulscan), external monitor, and LCD display
[Fn] + [F11]	Hold these keys to increase the audio volume output (avoid rapidly pressing the keys)
[Fn] + [F12]	Hold these keys to decrease the audio volume output (avoid rapidly pressing the keys)
[Fn] + [End]	Press these keys to mute the audio volume output

The Function Keys

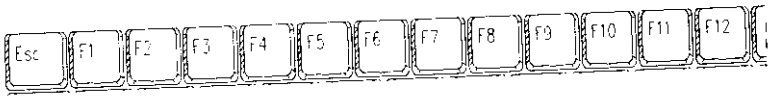


Figure 3-2: The Function Keys

Notice the twelve function keys in the top row of the keyboard. These keys appear in sequence ([F1], [F2], [F3], . . . [F11], [F12]) from left to right. The functions of these keys vary with respect to the operating system and software in use. Refer to the appropriate software user's manuals for more detailed information on function key definitions.

Embedded Numeric Keypad

The embedded numeric keypad consists of 15 keys that make number intensive input more convenient. Like the [Num Lock] key, these keys are labeled in blue on the keycaps. Numeric assignments are located at the upper right of each key as shown in ***Figure 3-3***. When the numeric keypad is engaged, the NumLock status indicator will come on. The numeric keypad can be used on your Notebook or on an external keyboard, but not in unison. Pressing the Notebook's [Fn] + [Num Lock] keys, or the external keyboard's [Num Lock] key, activates the keypad on the keyboard and deactivates the Notebook's.

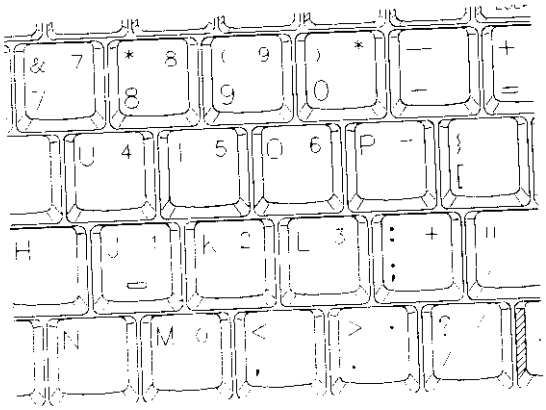


Figure 3-3: The Embedded Numeric Keypad

The System Status Indicators

Located above the keyboard, the System Status Indicators inform you of the Notebook's current operating status at a glance. If you are having trouble locating the system status icons, please see ***Figure 1-2***. Upon activating a certain function, an LED indicator corresponding to that function will light up and remain lit until you deactivate that feature.

Figure 3-4 shows the "System Status Indicators". A description of each of the icons is listed below.

Figure 3-4: The System Status Indicators

There are twelve indicators. The indicators are explained below from left to right.

Power On

This indicator lights when the Notebook is powered on.

AC Power

Indicates when AC power is being supplied to the Notebook.

Battery Charging

Indicates when the battery is being charged.

Battery Status

This indicator comes on when the battery is being used.

Suspend to RAM

Indicates when on that the system is suspending to RAM.

CD-ROM/DVD-ROM Activity

Indicates when on that the CD-ROM is being accessed.

FDD/LS-120 Activity

Indicates when on that the floppy disk drive is being accessed.

HDD Activity

Indicates when on that the hard disk is being accessed.

PCMCIA Activity

Indicates when on that the PCMCIA card is being accessed.

Scroll Lock

Upon pressing the [Scroll Lock] key, this status indicator comes on, indicating the scroll lock is engaged. Press the [Scroll Lock] key again to deactivate this feature and turn off the indicator.

Caps Lock

Upon pressing the [Caps Lock] key, this status indicator comes on, indicating that the Caps Lock feature is engaged. Press the [Caps Lock] key again to deactivate this feature and turn off the indicator.

Num Lock

Upon pressing the [Fn] + [Num Lock] keys, this status indicator comes on, indicating the embedded keypad's numeric feature is activated. Press the [Fn] + [Num Lock] keys again to deactivate this feature and turn off the icon.

Popup Screens

The Notebook's integrated BIOS software system has seven user-friendly popup screens to help you manage your system quickly and easily. These screens will appear for approximately three seconds and then automatically disappear.

Battery Low-Warning Mute on/off

[Fn] + [Esc]

The Notebook automatically beeps when the battery charge falls below 10%. To mute this beep, press [Fn] + [Esc], a "mute battery low-warning off" popup screen will appear. If you'd like to hear this beep, press the [Fn] + [Esc] keys again and an "on" popup screen will appear.

Battery Fuel Gauge [Fn] + [F1]

Upon pressing the [Fn] + [F1] keys, a battery fuel gauge popup screen will appear. Your battery power will be displayed as a percentage from 10%-100%.

CCD Camera on/off [Fn] + [F2]

Upon pressing the [Fn] + [F2] keys, a CCD camera popup screen will appear indicating that the CCD camera is on. Press the [Fn] + [F2] keys again to deactivate this feature and turn off the camera.

Brightness up [Fn] + [F7]

Upon pressing the [Fn] + [F7] keys, this popup screen comes on, indicating the brightness level of the LCD panel. Press the [Fn] + [F7] keys again to increase the brightness. Brightness is displayed as a percentage from 10%-100%.

Brightness down [Fn] + [F8]

Upon pressing the [Fn] + [F8] keys, this popup screen comes on, indicating the brightness level of the LCD panel. Press the [Fn] + [F8] keys again to decrease the brightness. Brightness is displayed as a percentage from 100%-10%.

Expand Screen [Fn] + [F9]

Press the [Fn] + [F9] keys to expand the display resolution to 1024 x 768. Press the [Fn] + [F9] keys again to reduce the display resolution to 800 x 600.

Switch Displays [Fn] + [F10]

Press the [Fn] + [F10] keys to switch from LCD display to CRT display. Press the keys again to switch from CRT display to simultaneous display (the popup screen will read "on"). And press the keys once more to return to LCD display mode.

The Touchpad

The Notebook's integrated Touchpad is compatible with a PS/2 mouse. A device driver is not required for working with application software that supports PS/2 mouse operation.

Using the Touchpad

The Touchpad is an electrostatic pressure sensitive pointing device that provides all the features of a two-button mouse. Its primary function is to move the cursor around the screen. The instructions listed below describe how to use the Touchpad.

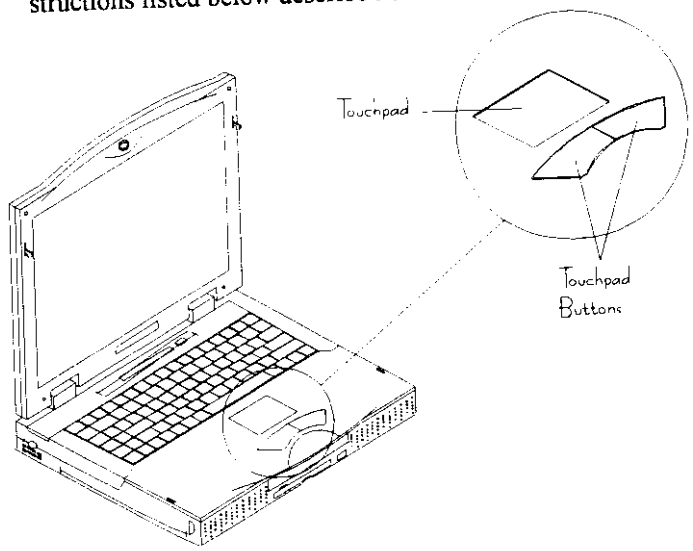


Figure 3-5: The Touchpad Pointing Device

1. First, place your fingers on the keyboard in a normal typing position. The Touchpad is easily accessible by moving either your left or right thumb (or you may be more comfortable using your index finger) off the space bar and onto the Touchpad.

2. Gently move your thumb across the pressure-sensitive Touchpad in the direction you want the cursor to move. The pad detects the change in pressure and moves the cursor in the corresponding direction.

3. With a conventional mouse, selections are usually made by double-clicking the mouse's left button. The Touchpad also supports this feature. It is described in more detail below.

4. *Double-clicking* is a common technique for selecting objects or launching programs from icons. Once you have moved the cursor over the object you wish to select, rapidly press the left button two times. This action is commonly referred to as "double-clicking on an object."

5. The Touchpad offers another method of making selections in a software program. It is called *double-tapping*. This function corresponds to double-clicking with a mouse. Once the cursor has been moved to the object you want to select, *lightly and rapidly* double-tap the pressure sensitive Touchpad itself. This action will select the desired item and prompt the software to perform the related operation.

6. Tapping the Touchpad three times is equivalent to a right mouse-button click. When you tap three times in Windows 95, you will launch the Windows 95 object submenus.

7. The buttons located below the Touchpad are essentially the same in function as those found on a two-button mouse. Clicking these buttons makes selections, drags objects, or performs a variety of other functions depending on the software.

8. To highlight an object, first move the cursor over the object, and then press the left button one time. To highlight text, move the cursor to the text you want to highlight. Now, click and hold the left button down, move the cursor over the text to highlight it, and then

release the left button.

9. To drag an object, move the cursor over the object. Now, click and hold the left button down. Drag the object to a new location and release the left button. This technique is useful when moving files from one folder to another, or moving text in a document. To move text in a document you must first highlight it. Then, with the left button, click and hold on the highlighted text and drag it to the new location.

10. The Touchpad is equipped with the Smart Edges feature. If your finger reaches the edge of the Touchpad surface the cursor on the screen will continue moving until you pull your finger away from the edge.

> **Note!**
>
> ***As with a conventional mouse, operating the Touchpad may be difficult at first. With some practice, you will soon be as comfortable with the Touchpad as with a mouse!***

TP3 Standard Touchpad Special Functions

Your Notebook is equipped with the *Logitech patented* TP3 Standard Touchpad. The TP3 Standard Touchpad supports the *Windows 97 Office* standard and has a number of functions to make using the Touchpad as convenient as possible. The following tables will explain these functions and the equivalent conventional mouse functions.

The following conventions are used to describe the various Touchpad actions:

Slide
The finger moves across the surface of the Touchpad and the cursor is moved around the LCD display

Tap
A tap is a quick light action. The finger tip should be gently *bounced* on the Touchpad for an instant.

Tap and Drag
Move the cursor over the object. Now tap the Touchpad two times rapidly, holding your finger on the Touchpad for the second tap. Drag your finger to move the object around the display.

Two or Three Finger Drag
When dragging two or three fingers, the fingers should be dragged in unison.

Standard Features

Mouse Function	TP3 Standard Touchpad Equivalents
Move cursor	Slide finger
Left button click	Tap one finger
Middle button click	Tap two fingers
Right button click	Tap three fingers
Left button double click	Double tap one finger
Middle button double click	Double tap two fingers
Right button double click	Double tap three fingers
Left button drag	Tap and drag
Middle button drag	Drag two fingers
Right button drag	Drag three fingers

Scrolling Features

The TP3 Touchpad has a special feature which allows you to scroll through documents and zoom in on objects. The following table describes these features.

Mouse Wheel Function	TP3 Standard Touchpad Equivalents
Rotate wheel *Scroll function*	Slide finger up or down in the right border of the Touchpad
[Ctrl] + rotate wheel *Zoom function*	Slide finger up or down in the right border of the Touchpad, while pressing the [Ctrl] key
[Shift] + rotate wheel *Data Zoom, jump to hyperlink or return to previous Web site when using the Internet*	Slide finger up or down in the right border of the Touchpad, while pressing the [Shift] key
Click on the wheel (middle mouse button) *Autoscroll function*	Tapping with two fingers drops an origin mark in a document. As the cursor is moved away from the origin mark, the document starts scrolling. The direction and distance the cursor is moved controls the scrolling direction and speed. Any subsequent keystroke or Touchpad button click deactivates autoscroll.
Press the wheel (middle mouse button)	The same function as autoscroll, except the function is deactivated by lifting the fingers.

Smart Edges

Touchpad Action	Function
	The *Smart Edges* function is activated when your finger stops at the edge of the Touchpad while dragging an object. The cursor continues moving until your finger is lifted, or until you move your finger away from the edge. When your finger stops at the left or right edge, the cursor continues moving horizontally. If you move your finger up or down the edge of the Touchpad, the cursor moves up or down accordingly, while continuing its horizontal motion. When your finger stops at the top or bottom edge, the cursor continues moving vertically. If you move your finger left or right along the edge of the Touchpad, the cursor moves left or right accordingly, while continuing its vertical motion.

Touchpad Precautions

The Touchpad is a pressure sensitive device. If not properly cared for, it can be easily damaged. Please take note of the following precautions:

- Make sure the Touchpad does not come into contact with dirt, liquids or grease.
- Do not touch the Touchpad if your fingers are dirty.
- Do not rest heavy objects on the Touchpad or the Touchpad buttons.

Data Storage and Retrieval

Data storage and retrieval are two of the most fundamental tasks you will perform when working with your computer. The Notebook is equipped with an enhanced IDE drive, a CD-ROM drive or a DVD-ROM drive, and a 3.5" floppy disk drive or an LS-120 disk drive. These drives and their associated circuitry comprise your computer's data storage and retrieval system. The following sections will cover instructions for operating each of these drives.

> **Note!**
>
> ***The CD-ROM drive — unlike the IDE drive and floppy disk drive, is a read only device. This means data can be read or accessed from the disc but not written to it.***

The HDD Module

A hard disk is similar to a floppy diskette in that it magnetically stores data and retains that data when the computer is turned off. The hard disk is comprised of several rigid platters that are hermetically sealed in a protective environment that is free from dust and other contaminants.

The platters are stacked on top of each other, which means the hard disk drive can access more than one platter at a time. Hard disk drives have higher capacities and operate at much faster speeds than floppy disk drives.

Your Notebook comes equipped with a hard disk drive already installed and prepared for operation. Your computer's hard disk drive is an integrated drive electronics drive, commonly referred to as an IDE drive, with a form factor of 2.5 inches (12.7mm). IDE drives have become an industry standard for PC hard drives because they provide a reliable, fast, and cost-effective mass storage solution.

The CD-ROM/DVD-ROM (optional)

In recent years, CD-ROM discs have become increasingly popular as a mass storage medium for PCs. One reason is clearly their large storage capacity; CD-ROM discs can hold up to 640MB of data. Moreover, because they are randomly accessible, data can be easily organized for quick retrieval during a search. CD-ROM Discs can also store a large variety of information, including audio and video data, as well as text files and programs.

The Notebook comes with a built-in CD-ROM drive module. The CD-ROM drive employs sophisticated laser and drive technology, yet requires very little maintenance. The CD-ROM drive allows you to run the latest multimedia CD titles providing a new educational and entertainment dimension to your personal computing experience.

The Notebook's CD-ROM drive can be exchanged with a DVD-ROM drive. DVD-ROM drives are the next generation in video CDs and high-capacity CD-ROMs. The disc is the same diameter as a CD-ROM, but can be recorded on both sides. Each side holds 4.7GB, equivalent to seven CD-ROMs, or 14 CD-ROMs, if both sides are used. A dual-layer version is also planned that yields 8.5GB per side or the equivalent of 28 CD-ROMs if both sides are used.

Note!

CD-I disks can store data in the form of audio, still video and animated graphics. CD-R technology allows user's to create their own CD-ROMs for archiving or publishing. CD-R discs can only be written once.

Features of the CD-ROM Module

The features of the CD-ROM drive are listed below.

- The Audio Play feature allows you to play music CDs
- Front panel load/unload button
- 290 msec. ATAPI/IDE Interface for high speed performance
- 640 MB capacity
- MSCDEX compatible
- Supports CD-DA, CD-ROM mode 1 and mode 2, Multi-Session Photo CD™, CD-I/Video CD (ps.)
- Low power consumption

Precautions for Handling CD-ROM/DVD Discs

Keep these precautions in mind when handling CD-ROM discs.

- Data stored on a CD-ROM is read from one side or *surface* only (usually the side with no writing or label). Never place the disc on a table with the *readable surface* facing down.
- Always hold the disc by the edges; avoid touching the *surface* of the disc.
- Use a clean, dry, cloth to remove dust, smudges, or fingerprints. Wipe from the center outward.
- Do not write on the *surface* of the disc.
- Extremes in temperature may damage discs. Store discs in a cool dry place.
- Do not use benzene, thinners, or cleaners with detergent. Only use CD-ROM cleaning kits.
- Do not bend or drop the discs.
- Do not place objects on top of discs.

Note!

Equal care should be taken when handling and loading both CD-ROM and DVD discs. However, keep in mind that both sides of DVD discs are recordable. Never place the disc on a counter top; always hold the disc by the edges and store it in the supplied case after use.

Loading a Disc

To load a CD disc, follow the instructions listed below.

1. Press the eject button. The tray ejects partially from the drive. Pull the tray out fully.
2. Place the disc into the tray with the disc's label facing up. Align the tray's center piece with the disc's center. Gently press the disc down to seat it in place.
3. Push the tray back in fully.

To remove a CD disc, follow the instructions listed below.

1. Press the eject button. The tray ejects partially from the drive. Pull the tray out fully.
2. Put your index finger on the center piece and your thumb on the edge of the disc. Slowly lift your thumb until the disc pops free.
3. Remove and store the disk, and push the tray back in fully.

CAUTION!

Do not insert any foreign objects into the disc tray. Do not force the tray to open or close manually. When not in use, keep the tray closed to prevent dust or dirt from entering the drive unit. If you experience difficulty when removing a CD disc, stretch a paper clip (or use a pin or a thin metal rod) and insert it into the emergency eject hole located on the right side of the front panel. The CD disk tray should eject immediately. This procedure can also be used to remove a CD from the drive when the Notebook is powered off.

Reading CDs

The CD-ROM/DVD-ROM drive is designated drive **D:** by default. However, the CD-ROM is treated as a low priority device by the system. For instance, if you have PCMCIA drives installed, they take precedence over the CD-ROM. The CD-ROM will always surrender to the designated next priority drive.

CD Types

There is a variety of CD products on the market. They go by various names, such as CD-I, CD-Title, Audio-CD, or Video-CD, to name but a few. Before playing a CD, you should determine what type of CD it is, and run a playback program capable of running that type of CD.

Windows 95 comes with an applet (a mini application) that will run different types of CDs. Try it by clicking *Start*, *Programs*, *Accessories*, *Multimedia*, and *Media Player*. You can choose the application you want under "Device."

The Floppy Disk Drive/LS-120 (optional)

Your Notebook features a built-in high-density 3.5" floppy disk drive (FDD) module. The floppy disk drive interfaces with the rest of the Notebook's system via a disk drive controller. The disk drive controller is an integral part of the computer's main board architecture. The disk drive transfers data between the diskette and memory as requested by the system. The floppy disk drive is designated drive **A:** by the operating system.

The FDD module can be exchanged with an optional LS-120 high capacity floppy disk drive (manufacturer's option). The LS-120 floppy disk drive uses 120MB diskettes housed in a redesigned 3.5" floppy disk cartridge. It also reads and writes 1.44MB diskettes up to three times as fast as standard floppy drives.

Using Floppy Diskettes

The floppy diskette is the most widely used data storage medium for transferring data from one PC to another. When you insert the diskette in the drive, the diskette's metal shutter automatically opens, exposing the disk to the drive's magnetic read/write head.

Depending on the operation performed, the read/write head detects or alters the magnetic orientation of the ferric oxide particles that coat the disk. The read/write head can carry out four basic operations as prescribed by the disk operating system (Windows 95):

- **read** data currently stored on the diskette
- **write** new data to the diskette
- **erase** data from the diskette
- **format** a diskette

Your computer's floppy disk drive accepts both 720KB double-density (2DD) diskettes and 1.44MB high-density (2HD) diskettes. These diskettes are sometimes labeled by the manufacturer as double-density 1.0MB and high-density 2.0MB diskettes. These labels, however, indicate the unformatted capacities of the

diskettes. The Notebook FDD also supports 3 mode 1.2MB format in accordance with NEC PC compatibility.

Caring for Diskettes

Under normal conditions, a diskette's rigid plastic case will protect it from damage. However, data stored on floppy diskettes are easily corrupted. Follow the protective measures listed below to preserve the integrity of data stored on floppy diskettes.

Never touch the magnetic surface of the disk. When handling diskettes, take care that you do not drop them. Keep diskettes away from liquids.

Never turn off, reboot, or reset the computer when a diskette is in the drive and the drive activity LED is on. Do not transport the computer with diskettes inserted in the drive.

Do not expose diskettes to extreme temperatures or high humidity.

Keep diskettes away from magnetic fields generated by power supplies, monitors, magnets, etc.

Do not smoke in the same room where diskettes are used or stored. Particles from cigarette smoke are large enough to scratch the surface of the disk. Store diskettes in a dry, dust-free environment.

CAUTION!

Never turn off or reset the Notebook while the FDD activity LED is on. Always store your diskettes in a dry, clean container, to protect them from the environment and magnetic fields.

The Notebook's Multimedia Sound System

The Notebook's built-in audio capabilities allow you to take advantage of a wide range of education and entertainment multimedia software available on today's growing market without the additional costs of add-on cards and peripheral hardware. The multimedia sound system features a sophisticated on-board digital audio generator that produces realistic music and human voice sounds in 16-bit stereo. The Notebook is equipped with two internal stereo speakers, a microphone, and input/output audio ports. An external microphone can be connected to the microphone jack. External speakers or headphones can be connected to the Notebook's audio-out jack. The internal stereo speakers are user-directed to provide high-quality sound. The speakers can be heard clearly even when the LCD panel is closed.

The Notebook's multimedia sound system includes the following features:

- ESS Audio Accelerator chipset
- Built-in 16-bit stereo
- Sound Blaster Pro compatible
- Built-in microphone
- Two built-in stereo speakers encased in mini speaker cabinets
- 64-Voice, 4MB Pipelined Wavetable Synthesizer
- Four built-in jacks for Mic-in, Line-in, Line-out, and Headphones
- Three Audio Power Amplifiers and one headphone amplifier
- Audio Drive Digital Mixer
- Integrated 3-D spatializer

- Software Wavetable support
- Built-in 3D Audio Sound Effects
- AC '97 CODEC Interface

For more information on the above features, refer to Chapter Four *Connecting Peripheral Devices.*

Audio Volume Control

The Notebook is equipped with hot key combinations to control the audio output volume:

- **[Fn] + [End] :** Speaker On/Off (mute).
- **[Fn] + [F11] :** increases audio output volume.
- **[Fn] + [F12] :** decreases audio output volume.

IR Communication

The Notebook is equipped with two Infrared (IR) communication modules located on the rear and front of the Notebook. If you are having trouble finding these modules, please see ***Figures 1-2 and 1-4***. The IR module consists of one Light Emitting Diode (LED) and one photo sensor. The operation of the IR module is similar to the operation of a television remote control device. The LED functions as a transmitter and the photo sensor acts as a receiver. The transmitter emits a signal stream consisting of data in the form of pulses of infrared light. The receiver picks up pulses of infrared light transmitted by other IR modules.

The IR module enables you to perform wireless, serial communication. Use an FIR-specified application to transmit or receive data via the Notebook's FIR module.

The following table briefly describes each of the IR modes available. You must set these modes in BIOS. Please refer to Chapter Six for information on the BIOS Setup program.

IR Type	Description	Baud Rates
FIR	Fast Infrared	IrDA 1.1, 4.0Mbps
SIR	Amplitude shift keyed infrared port	IrDA 1.0, 115.2Kbps

Follow the guidelines listed below when using the Infrared Communication module to transmit or receive data.

- Make sure the Infrared Communication field in the BIOS Setup program is set to FIR. Refer to Chapter Six for information on the BIOS Setup program.
- Ensure that the Notebook's FIR module is properly lined up with the other device's Infrared Communication module. The angle between the two Infrared Communication modules should not exceed ±15°.
- There should be a clear, unobstructed path between the two Infrared Communication modules; otherwise, the optical signal will be blocked. Likewise, do not place anything between the two Infrared Communication modules during data transmission.
- Make sure the distance between the Notebook's FIR module and the other device's Infrared Communication module does not exceed one meter.
- Do not move either the Notebook or the other device during transmission of data; otherwise, data transmission will be distorted resulting in loss of data or a system crash.
- An error can occur if FIR transmission is conducted in an environment with high levels of noise. To avoid transmission errors do not transmit Infrared Communication signals near equipment with compressors, such as refrigerators or air conditioners.

PCMCIA Cards and Expansion Sockets

The Notebook features two PCMCIA expansion sockets designed to interface with one or two Type II cards or stacked to accommodate one Type III card. This sophisticated innovation allows you to expand and customize your computer to meet a wide range of computing needs without sacrificing portability. PC cards accommodate a number of expansion options. Memory cards, modems, hard disks, and network adapters are just a small sample of the PC card products available on today's market.

Using PCMCIA Cards

The PCMCIA (Personal Computer Memory Card International Association) is a widely accepted industry standard that defines the design and operation of PC cards. PC cards that conform to the PCMCIA standard are plug-and-play devices, i.e.; they can be inserted into the PCMCIA expansion sockets while the computer is powered on. This type of hot insertion does not apply to all PC cards. Refer to the documentation that came with your PC card for detailed information on the operation of PC cards.

The Notebook's PCMCIA interface supports a Zoomed Video port (ZV port), which provides you with hardware MPEG support. This feature allows you to insert a ZV Port-compliant MPEG PC Card into the lower slot (only the lower slot supports zoomed video) of the Notebook's PCMCIA expansion sockets. The ZV port is an extension to the PC Card (PCMCIA) standard that provides a high transfer rate for your computer's video and audio applications. The ZV port achieves this performance enhancement by routing video data directly to the display controller and audio data directly to the audio controller, thus bypassing the CPU and system bus. This allows for full-screen, full-motion playback of digital video.

The PCMCIA interface also supports the 32-bit *CardBus* PC Card specification.

Note!

To take advantage of this feature, your MPEG PC Card must be ZV Port-compliant. For installation instructions and details on how to use a ZV Port-compliant MPEG PC Card, refer to the user's manual that comes with the PC Card.

Inserting a PCMCIA Card

Your Notebook is installed with two spring loaded dust protector doors to protect the bay from dust or other foreign objects. Follow these instructions and refer to ***Figure 3-6*** to insert a PCMCIA card:

1. Hold the PCMCIA card with the arrow side up and the connector side toward the socket.
2. Align the card connectors with the appropriate socket and carefully slide the card into the socket until it locks into place.
3. To remove a PC card locate the eject buttons situated next to each slot on the left. Note that there are two eject buttons, one per slot. Push the appropriate eject button; the button pops out. Push the button again to eject PC cards. The upper button will eject a Type II PCMCIA card from the upper socket. The lower button will eject a Type II or Type III PCMCIA card from the lower socket. After removing the card, store it properly.

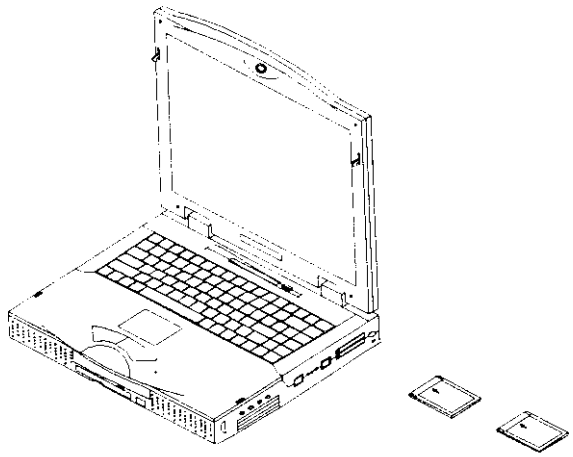


Figure 3-6: PCMCIA Card Installation

Note!

When inserting a Type III PC card make sure the connector is inserted in the lower socket. Before ejecting a PC card, ensure that it is not being accessed by the system. Memory card users must never change a card's write protect switch while the card is inserted into a PCMCIA socket. For example, if the message "Write protect error writing Drive x" is displayed, the user has to change the write protect switch setting on the memory card. To change the switch setting, (a) eject the card, (b) change the switch setting, and (c) re-insert the card.

System Memory Expansion

The Notebook provides two memory expansion slots for installing one or two 3.3-volt EDO/SDRAM memory modules. Expansion memory modules are available in five sizes: 8MB, 16MB, 32MB, 64MB and 128MB and can be purchased from your dealer.

Removing and Installing RAM Modules

Your Notebook's computer chips, especially RAM (random access memory), are extremely static-sensitive. Static electricity can permanently damage computer chips. It is therefore important to discharge the static electricity from your body before installing the memory module. Discharge your body's electricity by touching the metal shielding around the connectors on the rear of the Notebook computer. Typical grounds are a radiator or a printer case when your unit is plugged in.

Removing RAM Modules

Refer to the following instructions to remove memory modules in your Notebook.

1. Turn off the Notebook, disconnect the AC adapter and close the LCD cover.
2. Remove the screw holding the RAM module cover in place and remove the cover itself.
3. Remove the single screw that secures the RAM module compartment cover to the chassis and set it aside. Remove the cove.
4. Locate the RAM module(s).
5. Using your fingers or a small screwdriver, pull the two plastic tabs on the sides of the RAM module away from the modules. The RAM module should pop out slightly.
6. Gently pull out the RAM module(s).

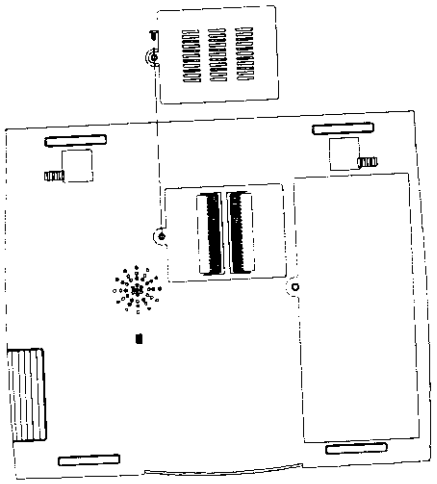


Figure 3-7: Locating the RAM Compartment

Installing RAM Modules

Refer to the following instructions to install memory modules in your Notebook.

1. Locate the RAM module sockets within the RAM module compartment.
2. Carefully align the connector of the RAM module with the RAM module socket (The module can only be inserted in one direction).
3. At the same time, gently pull out the two plastic tabs on the sides of the RAM module socket and insert the RAM module at an angle into the connectors. Gently, but firmly push the module in until the module is connected. Then set the module between the plastic tabs and release

them to lock the module in place.

4. Replace the RAM compartment door and screw it into place.

5. Turn on your computer. Your Notebook's system should automatically detect your RAM upgrade. Check your BIOS opening screen setup program under Main/System Memory and Extended Memory to verify that the system has automatically detected your RAM upgrade (Refer to BIOS Setup in Chapter 6). When initially partitioning your hard drive, a 260MB partition is automatically set up. Thus, there is no need to repartition your hard drive after you upgrade your RAM.

Note!

If your computer begins beeping after you have installed new RAM modules, they may not be installed properly. Turn off your Notebook and reinsert the RAM modules and then restart your computer. If you do not feel completely confident installing your RAM modules by yourself, it is highly recommended that you consult your dealer.

The CCD Image Sensor Camera

Your Notebook has a built-in CCD Image Sensor camera. With a display resolution of 704 x 480 at 30 fps, you are assured of clear crisp images. A video capture software application, e.g. Iphone or NetMeeting (Free with Windows '98, refer to the section below entitled "Installing NetMeeting"), must first be purchased and then loaded into the Notebook before the camera can generate a picture. There are many new applications currently available, some have an image capture function and some do not. Check with your software dealer to determine the right CCD camera software for your particular needs. To use your CCD camera, follow the steps below.

1. Open your CCD software application (must be purchased separately. Refer to your CCD camera software program's *Readme* file, help file or User's Guide on how to operate the software).
2. Turn the CCD camera on by pressing [Fn] + [F2]. A popup screen will appear notifying you that the camera is on.
3. When an image is on screen, adjust the camera's viewing angle by adjusting the LCD and adjust the focus by rotating the camera lens to the right or to the left.
4. To save power, always remember to turn off the CCD camera by pressing [Fn] + [F2] again. A popup screen will appear notifying you that the camera is off.

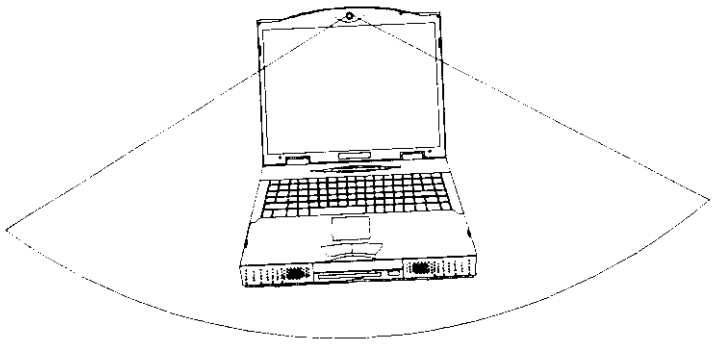


Figure 3-8: CCD Image Sensor Camera

Installing NetMeeting

Windows '98 comes with video conferencing software called NetMeeting. In order to use this software for video conferencing, you must first install the CCD driver (Refer to the "Notebook Driver Supplement"), have an internal modem installed or have a PC Card modem installed. To install NetMeeting, follow the instructions below.

1. Click the Windows' *Start* button at the bottom-left-hand side of your screen, then click *Settings*. Click the *Control Panel* icon. The **Control Panel** will open.
2. Double click the *Add/Remove Programs* icon. The **Add/Remove Programs Properties** window will open.
3. Click the *Windows Setup* tab. Windows Setup will search for installed components.
4. Click on the *Communications* icon and then click OK.
5. A window will appear asking you to insert the disk labeled "Windows '98 CD-ROM". Insert the disk and click OK.
6. A **Copying Files...** window will appear. Click the *Browse* button.
7. From the **Open** window, click the scroll button under *Drives:*, then click "d:".
8. Double click the Win98 folder. It should read "maserv.dll" under the *File name* window. Click OK.
9. You will be returned to the **Copying Files...** window. Under the *Copy files from:* drop box it should read "D:\win98". Click OK.
10. Windows will begin copying the files. When copying is completed, you will be asked to restart your computer. Click OK and restart your computer.
11. When your computer has restarted, click on the **Start** button. Then go to *Programs/Internet Explorer/Microsoft NetMeeting* and click once on NetMeeting.
12. A **Microsoft NetMeeting** window will appear. Follow the instructions on screen.
13. When the *Microsoft NetMeeting* application software window opens up, use the NetMeeting *Help* or consult the *Readme file* for more information. To view an image

of yourself, press [Fn] + [F2] to power up the CCD camera. Then select *Tools/Video* and click on *Detach My Video*. When the **My Video** window appears, click the play button at the bottom of the window.

14. When an image is on screen, adjust the camera's viewing angle by adjusting the LCD and adjust the focus by turning the camera lens to the right or to the left. Be sure to remember to power off your CCD camera by pressing [Fn] + [F2] when you are finished.

> ***NOTE!***
>
> ***The Image Sensor camera is equipped with a popup video capture control device that turns the CCD camera on or off by pressing the [Fn] + [F2] hot-key combination. The camera can not generate a picture without initially loading a CCD software program which must be purchased separately. Some software programs do not support image capture.***

This concludes Chapter Three. The next chapter tells you how to connect peripheral devices to your Notebook.

NOTES

Chapter 4

CONNECTING PERIPHERAL DEVICES

Your Notebook computer is equipped with several ports for connecting a number of peripheral devices such as a printer, a modem, or an external monitor. The Notebook is also equipped with the industry standard Universal Serial Bus (USB) connectors.

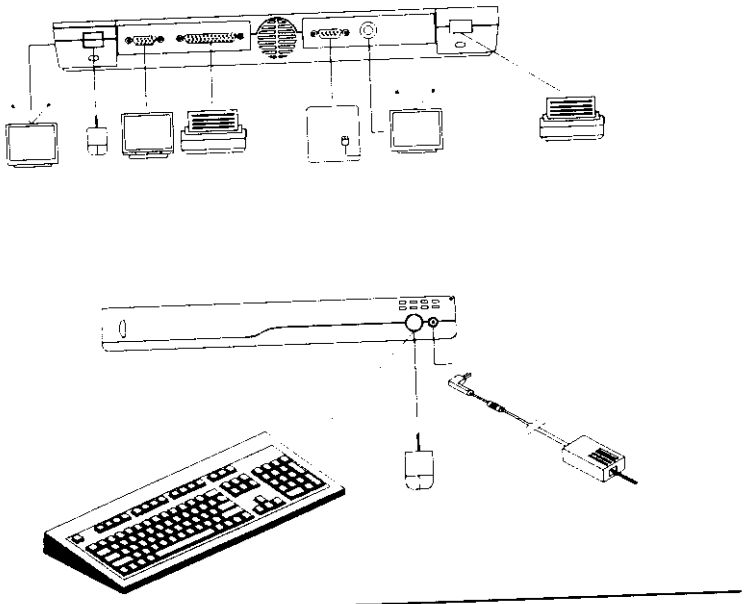


Figure 4-1: Connecting Peripheral Devices

This chapter covers the following topics:

- An overview of the I/O ports and the peripherals that can be connected to the Notebook
- The necessary requirements for using these peripherals with your Notebook
- Instructions on how to connect these peripheral devices to your Notebook

Overview of the Notebook's I/O Ports.

Before attempting to connect a peripheral device to the computer, make sure you are familiar with the Notebook's various I/O ports. Refer to ***Figures 1-2,1-3 and 1-4*** of Chapter One to identify the following I/O ports:

- Serial port
- Parallel port
- External keyboard or PS/2 mouse connector
- Two USB ports
- TV-out port (S-video)
- RCA Jack (Composite Video)
- Internal modem connector (RJ-11 telephone connector)
- Audio Line-out jack (external speakers connector)
- Audio Line-in jack (external audio source connector)
- MIC jack (external microphone connector)
- Headphones jack
- VGA Display port (external monitor connector)
- 2 FIR modules (front and rear panels)
- Two PCMCIA slots

Connecting External Devices

This section provides instructions on how to connect peripheral devices. Before you connect any device, check the documentation that comes with the equipment to see if you need to make any settings or adjustments to the equipment before using it. This might include setting switches to configure the equipment so that it will operate properly with the Notebook and the software you plan to use.

Connecting Serial Devices

For serial communications, the Notebook has a standard 9-pin RS-232C 16550 UART compatible serial port. Serial devices such as mice, serial printers, plotters, modems and graphics tablets can be connected to the serial port. Refer to ***Figure 1-4*** to locate the serial port. External modems or Fax/Modems will usually employ a standard cable. If you have any doubt about the cables required for equipment you plan to purchase, you should consult your Notebook dealer to ensure that you have the correct cables.

> ***Note!***
>
> ***You can attach another pointing device such as a mouse or a graphics tablet to either of the USB ports, the PS/2 port or the serial port. You should refer to your pointing device's manual for information on which port to choose. When you connect a serial mouse to the serial port, run the Setup program and from the BIOS Features menu ensure that the PS/2 mouse function control is disabled. Refer to Chapter Six for details.***

Connecting Parallel Devices

Refer to ***Figure 1-4*** to locate the parallel port. This port uses a 25-pin connector, allowing you to attach any equipment that is

compatible with this connector standard. The parallel port is most commonly used for connecting a printer. Most printers have a parallel interface. These include dot matrix, ink-jet, and laser printers. The Notebook's parallel port supports EPP, ECP, and SPP capabilities. The parallel port can be configured in the BIOS Setup program (see Chapter Six).

Note!

Your application must be EPP aware to take advantage of the enhanced parallel port's greater throughput. Likewise, your application must be ECP aware to make use of the parallel port's ECP capabilities. The EPP, ECP, and SPP modes are configured in the BIOS setup.

To connect a parallel device to the computer you will need the standard parallel 25-pinned connector cable. Check the documentation that comes with the equipment to see if you need to make any settings or adjustments to the equipment before using it. Once the equipment is ready, all you will probably need to do is attach the connecting cable.

Connecting a Printer

To connect a printer refer to the following instructions:

1. Connect the printer cable to the printer. The printer cable has two heads on it. One head plugs into the printer, and one head plugs into the parallel port on the back of the Notebook. The larger head plugs into the printer.
2. Connect the 25-pin printer cable head to the Notebook's parallel port.

Connecting an External Keyboard or PS/2 Mouse

The 6-pin PS/2 port at the left side of the Notebook allows you to attach a PS/2 keyboard or PS/2 mouse. Refer to ***Figure 1-2*** to locate this port. You can use any standard PS/2 101/102-key

enhanced keyboard or 104/105-key Windows keyboard commonly used with desktop computers. You should be able to obtain a PS/2 adapter from your dealer allowing you to connect a keyboard or mouse that uses the larger jack, which is standard for most desktop computers.

The procedure for connecting both devices is identical. To connect a keyboard, perform the following steps:

1. It is not necessary to turn the Notebook off.
2. Connect the keyboard PS/2 jack to the PS/2 adapter and then plug the adapter into the computer's PS/2 port.

Connecting USB Devices

The USB connector features two ports. Please refer to ***Figure 1-4*** to locate the USB connector. The USB connector and its supporting circuitry were designed in full compliance with the Universal Serial Bus Specification 1.0. Any device that uses this standard can be connected to these ports providing it is fitted with a USB compliant connector. Devices can be hot-plugged, so it is not necessary to power off the Notebook when making the connection.

> ***Note!***
>
> ***USB ports began to appear on computers in 1997. The USB has a total bandwidth of 1.5MB per second, allowing up to 127 devices to be attached in a daisy chain fashion. For example, a USB compliant monitor or keyboard could host several ports for additional devices. It is expected to be used for such devices as keyboards, printers, and scanners.***

Connecting a TV Display

The Notebook has two TV connective options: An S-video TV-out port located on the right side of the Notebook (see ***Figure 1-3***) and a Composite video RCA jack located on the rear side of the

Notebook (see ***Figure 1-4***). Both of these devices help the Notebook support a TV as an external monitor. This feature is available in Windows 95 and Windows 98, but is not available in DOS. The S-video port and RCA jack are strictly TV-out devices and cannot support Video-in via TVs, camcorders or VCRs. To connect a television set to the S-video port or to the RCA jack, follow the instructions listed below:

1. Connect the video in/out cable to the S-video port or to the RCA jack; then connect the other end to the video input of your television.
2. Click the Windows' *Start* button at the bottom-left-hand side of your screen, then click *Settings*. Click the *Control Panel* icon. The **Control Panel** will open.
3. Double click the *Display* icon. The **Display Properties** window will open. Click the *Settings* tab.
4. Click the *Advanced...* button. Then click the NeoMagic tab.
5. Under "External Display", click the box entitled *TV*. If you cannot click on the TV box, you'll need to go back to the Settings tab. Under *Color palette*, switch the display setting to "True Color (24 bit)" or "256 Color". The Notebook does not support an external TV in "High Color (16 bit)".
6. Click OK. In order for the new settings to take effect, you must restart your computer.

Refer to *Adjusting the Display* in Chapter Three for instructions on adjusting your display brightness.

Setting Up a Dual View TV Display

A Dual View TV Display is a nice new feature of Windows 98. If you have installed Windows 98, you can hook up a TV to your Notebook and use this function to increase the size of your screen.

Essentially the TV screen acts like an extension of your LCD. You can drag items from your LCD to your TV screen and vice versa. Follow the directions below to set up a dual display with a TV monitor and your Notebook's LCD.

Setting Up a Dual View TV Display under Windows 98

1. Click the Windows' *Start* button at the bottom-left-hand side of your screen, then click *Settings*. Click the *Control Panel* icon. The **Control Panel** will open.
2. Double click the *Display* icon. The **Display Properties** window will open. Click the *Settings* tab.
3. Click the *Advanced...* button. Then click the NeoMagic tab.
4. Click on the *Set Dual Display* box. Then check the TV box under "External Display". Click OK. In order for the new settings to take effect, you must restart your computer. For more information, refer to your Windows 98 User's Guide or to the Windows 98 *help* tab.

Setting Up a Dual TV Display under Windows 95

1. Click the Windows' *Start* button at the bottom-left-hand side of your screen, then click *Settings*. Click the *Control Panel* icon. The **Control Panel** will open.
2. Double click the *Display* icon. The **Display Properties** window will open. Click the *NeoMagic* tab.
3. Click on the *Set Dual Display* box. Then check the TV box under "External Display". Click OK. In order for the new settings to take effect, you must restart your computer. For more information, refer to your Windows 95 User's Guide or to the Windows 95 *help* tab.

Note!

The Notebook does not support High Color (16 bit)

dual TV display. Your Color palette must be set to 256 Color or True Color (24 bit).

Connecting External Speakers

The audio Line-out jack supplies access to the computer's audio output (including the output from the CD-ROM). Please refer to ***Figure 1-3*** to locate this jack. Follow the instructions listed below to connect external speakers.

1. It is not necessary to turn the power off.
2. Insert the 1/8-inch connector plug into the audio Line-out jack.

Connecting Headphones

The audio Headphones jack allows you to connect headphones to the Notebook. Please refer to ***Figure 1-3*** to locate this jack. Follow the instructions listed below to connect headphones.

1. It is not necessary to turn the power off.
2. Insert the 1/8-inch connector plug into the Headphones jack.

Connecting an Audio Device

The audio Line-in jack allows you to connect an external audio device, such as a CD player to your Notebook. Please refer to ***Figure 1-3*** to locate this jack. Follow the instructions listed below to connect an external audio device.

1. It is not necessary to turn the Notebook off.
2. Insert the audio device's 1/8-inch connector plug into the audio Line-in jack.

Connecting an External Microphone

In addition to the Notebook's internal microphone, you can also connect an external microphone to the Mic-in jack. Please refer

to ***Figure 1-3*** to locate this jack. Follow the instructions provided below to connect a microphone.

1. It is not necessary to turn the Notebook off.
2. Insert the microphone's 1/8-inch connector plug into the Mic-in jack.

You are now ready to record sound files using the Audio Applications software installed under Windows.

> ***Note!***
>
> ***The Notebook is equipped with an internal stereo microphone that has already been configured to work with the computer's sound system. The internal microphone is located on the upper-right of the LCD panel (please refer to Figure 1-2).***

Connecting an External Monitor

The Notebook has a port for connecting an external VGA monitor. Refer to ***Figure 1-4*** to locate the VGA port. It is a standard 15-pin analog connector commonly used with VGA monitors. The display output of the computer supports standard VGA colors and resolutions on a color monitor.

The Notebook supports "hot swapping". This means the monitor can be connected to the Notebook's VGA port without turning off the Notebook. Perform the following steps to connect an external monitor:

1. Ensure that the monitor is the correct type. Do not use a monitor that does not match the VGA standard.
2. Connect the monitor cable to the monitor before connecting the cable to the Notebook's VGA port.
3. Connect the monitor to a power source.
4. Turn on the monitor.

5. Press the **[Fn] + [F10]** "hot keys" to enable the external monitor. Press them again to enable the LCD and again to view both the LCD and CRT simultaneously.

Fast Infrared Device

The Notebook is equipped with two Fast Infrared (FIR) communication modules located on the front and rear of the Notebook. If you are having trouble finding these modules, please see ***Figures 1-2 and 1-4***. The FIR module enables you to perform wireless, serial communication. Use an FIR-specified application to transmit or receive data via the Notebook's FIR module.

> ***Note!***
>
> ***If you are having trouble with FIR transmissions, ensure that the FIR option is enabled in the BIOS Setup program. (Refer to Chapter Six for more information.)***

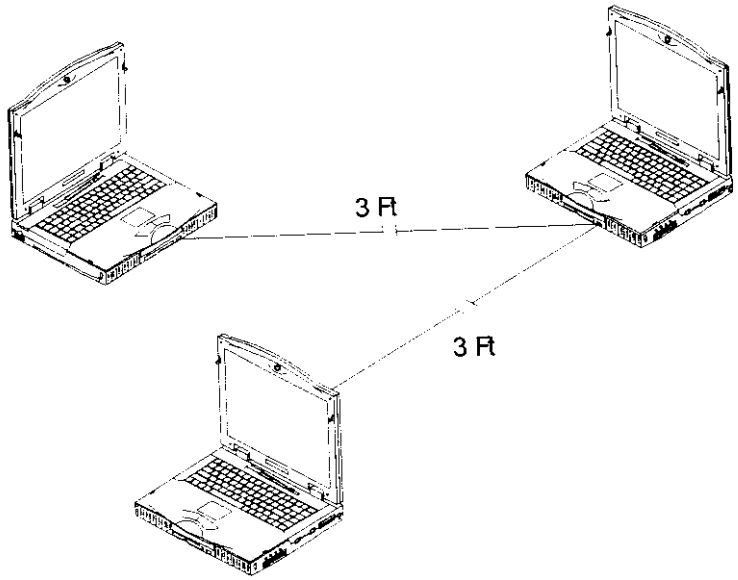


Figure 4-2: Operating the FIR Device

Refer to the *IR Communication* section in Chapter Three for more information on operating the FIR device.

Connecting a Phone Line to the Fax/Modem

The Fax/Modem RJ-11 jack is located on the right side of the Notebook (see ***Figure 1-3***). Refer to the following to connect a phone line to the RJ-11 jack:

1. Connect the phone line to the RJ-11 jack. You should test the line first for a dial tone.
2. Now install the Fax/Modem device driver to activate the Fax/Modem module. (Refer to *Installing Device Drivers*, in the "Notebook Driver Supplemental Guide".)

This concludes Chapter Four. The next chapter covers matters related to the Notebook's power system.

NOTES

Chapter 5

THE POWER SYSTEM

This chapter contains information on the Notebook's power system, including the AC Adapter, the battery system, recharging the battery, and tips for conserving battery power. Also included is a detailed description of power management and each of the power modes.

The power system is comprised of two parts, the AC Adapter and the battery system. The AC Adapter converts AC power from a wall outlet to the DC power required by the computer. There is a battery housing on the left side of the Notebook for the removable battery pack.

This section will cover AC and battery power operation and explain the software power saving features that are built into the computer.

The Battery Power System

The Notebook's removable battery pack is housed in the battery compartment on the left side of the Notebook. Please see ***Figure 1-2.***

A fully charged pack will provide approximately 4-5 hours of battery life before you have to recharge or replace the battery. Additional battery packs are optional pieces of equipment and can be purchased separately.

Before using the computer on battery power for the first time, check the battery status indicator to make sure the battery is fully charged. Please see ***Figure 5-1***.

Charging the battery takes 4 hours when the system is off or suspended and 6 hours if the system is on. If possible, always charge the battery completely.

A safety feature automatically stops the charging process after the battery has reached its full charging capacity. This prevents dangerous conditions from occurring if there is a fault somewhere in the charging circuitry.

> CAUTION!
> Do not remove the battery while the system is suspended to RAM, unless the Notebook is connected to an AC power source. Otherwise, all unsaved data in RAM will be lost.

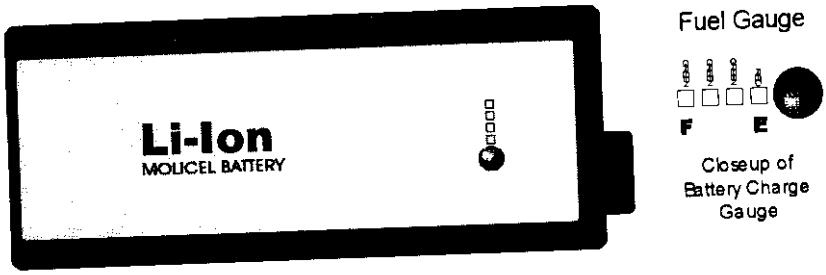


Figure 5-1: The Main Battery Module

Notice on the front of the battery casing there are 4 LEDs. Please refer to ***Figure 5-1***. These LEDs indicate how much battery life is remaining. If all four LEDs light up, the battery is charged to capacity. Each LED represents approximately 25% battery charge. There is 75% battery life remaining if three LEDs are lit. If one LED is flashing, the battery needs to be recharged. Please refer to the following table:

LED (light emitting diode)	% Charged
4 LEDs lit (3 Green and 1 Red)	100% charged
3 LEDs lit (2 Green and 1 Red)	75% charged
2 LEDs lit (1 Green and 1 Red)	50% charged
1 LED lit (1 Red)	25% charged
1 Red LED flashing	Battery needs recharging

CAUTION!

Danger of explosion if battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the manufacturer. Using a battery not recommended by the manufacturer could damage your Notebook's circuitry. Discard used batteries according to the manufacturer's instructions. Do not place the battery contacts near metal objects.

Inserting the Battery Pack

When the Notebook is shipped, the battery pack is not installed. To insert the charged battery pack into the Notebook, refer to ***Figure 5-2*** and the following instructions.

1. Turn off the Notebook's power and disconnect the AC adapter.
2. Close the Notebook's cover, ensuring that it snaps into place. Turn the Notebook over.
3. Remove the screw from the battery bay cover.
4. Slide the battery bay cover away from the screw hole to release the cover.
5. Gently lower the battery into the battery bay with the label facing up and the connector fitting onto the connector socket. Make sure that the two battery ribbons are resting on top of the battery so that it is easier to remove.
6. After the battery is seated, replace the lid and then fasten the screw.

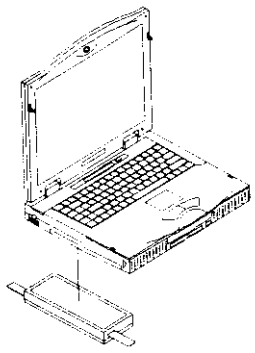


Figure 5-2: Inserting and Removing the Battery Pack

Removing the Battery Pack

To remove the battery pack from its housing, refer to ***Figure 5-2*** and the following instructions.

1. Turn off the Notebook's power and disconnect the AC adapter.
2. Close the Notebook's cover, ensuring that it snaps into place.
3. Turn the Notebook so that the battery bay is facing you.
4. Remove the screw from the battery bay cover.
5. Slide the battery bay cover away from the screw hole to release the cover.
6. Extend the pullout ribbons and pull the battery from its bay.

Automatic Battery Pack Charging Function

You can automatically charge the battery pack by using the AC Adapter. When running the Notebook via AC power, the inserted battery pack will automatically be recharged while you are working on your Notebook. The charge time is 4 hours with the Notebook power turned off and 6 hours with the notebook powered on.

Using Battery Power

The battery system will provide approximately 4-5 hours of power to the Notebook when Power Management is disabled. This figure will vary depending on how you use the power saving features, your general work habits, and the type of CPU and LCD, which your Notebook has. We recommend you use the AC Adapter as often as possible to conserve battery power.

Battery Status Indicators

The Notebook comes with several sophisticated Battery Status indicators to help clearly indicate the status of the battery pack when you are using battery power.

1. There is one battery charging LED located on top of the LCD panel (refer to ***Figure 1-1***). A) When the Notebook is powered on and the battery is charging, this LED will turn orange. When the battery is fully charged, the LED will turn back to green. B) When the Notebook is powered off and the battery is charging, this LED will turn red. When the battery is fully charged, the LED will turn off.

2. There is a battery charging icon located on the System Status Indicator (refer to ***Figure 3-4***). This icon will blink when the battery is charging. When the battery is fully charged, this icon will disappear.

3. There is a battery power icon located on the System Status Indicator (refer to ***Figure 3-4***). This icon has four simulated LEDs. When 4 LEDs are shown, the battery is fully charged.

When 3 LEDs are shown, the battery is approximately 75% charged. When 2 LEDs are shown, the battery is approximately 50% charged. When 1 LED is shown, the battery is approximately 25% charged. And when one LED is blinking, the battery charge is below 10% and needs to be recharged.

4. When the battery's charge drops below 10%, a Low Battery Warning Beep will be heard to inform the user of the low battery state. To turn off this beep, press [Fn] + [Esc].

5. The Notebook is equipped with a battery status function key (refer to ***Figure 3-2***). Press [Fn] + [F1] and a battery status popup window will appear. This window will instantly display a battery charge percentage.

Power Management Overview

This section contains information on the Notebook's power management features.

Your computer has a number of automatic power-conservation features you can use to minimize the computer's power consumption. You can control many of these features through the Power menu in the Setup program.

The computer is made up of electronic components, all of which consume electricity to operate. Some components consume much more power than others do. The power management features are designed to conserve as much electricity as possible by putting these components into a low power consumption mode as often as possible.

The system monitors certain actions, which are treated as power events. The power consumption state of the computer varies according to the events detected by the system. Power events include:

- Keystrokes
- HDD activity
- Pointing device usage
- Printing

- Serial port access
- Display activity
- IRQ events

With the exception of display activity, all of these events are treated as *primary activity* events. When primary activity events are detected, the system automatically transits to full power mode. Display activity can also be configured as a primary activity.

For more information about primary activity settings, refer to the BIOS Setup section of Chapter Six.

The Modes

The power management modes are primarily designed to conserve power during periods of system inactivity. To change power management settings, run the Power Management Setup in the BIOS Setup program. For more information on the BIOS Setup program refer to Chapter Six. The sections that follow give a full explanation of each power management-operating mode.

Full On Mode

The computer operates in Full On mode when power management is disabled. When the computer is operating in Full On Mode, the Power LED remains on (refer to ***Figure 1-2*** to locate this LED). If you are conscious of power consumption, do not operate the computer with all power management features disabled.

Sleep Mode

There is a hardware timer built into the system that serves as a Sleep timer. The system automatically transits from Full On mode to Sleep mode when no primary activity is detected. When the system enters Sleep mode, the CPU clock will switch to low speed.

The system will resume operation at Full On mode when primary activity is detected.

Suspend Modes

In Suspend mode, the CPU clock speed is reduced and most of the computer's peripheral components are put in their lowest active states. These include the hard disk and the LCD screen (the screen will go blank). The Suspend icon will be displayed on the System Status Indicator while the Notebook is in Suspend mode. The computer enters Suspend mode when the [Fn] + [F3] or [Fn] + [F4] key combinations are pressed, or when the system remains idle for a specified amount of time. Time-out options are set in BIOS. To resume operations from Suspend Mode, quickly press the Power button. *If you press and hold the Power button for more than four seconds, the notebook will turn off.*

Suspend to RAM Mode

The computer enters Suspend mode when the [Fn] + [F3] keys are pressed, or when the system remains idle for a specified amount of time. Time-out options are set in BIOS. Press the [Fn] + [F3] keys to resume system operation. When the system Suspends to RAM, quickly press the Power button to resume the system from Suspend to RAM. *If you press and hold the Power button for more than four seconds, the notebook will turn off.*

Suspend to Hard Disk Mode

The Suspend to Hard Disk function requires that you first use the Suspend Utility bundled with your utility software diskettes or CD-ROM to assign a disk partition in which data will be saved when suspending to disk. Please refer to the Suspend Utility section later in this chapter for more information.

Press the [Fn] + [F4] keys to enter Suspend to Hard Disk mode. Time-out options are set in BIOS. Quickly press the Power button to resume system operation. *If you press and hold the Power button for more than four seconds, the notebook will turn off.*

Power Management Habits

While operating the Notebook on battery power, it is important to develop good power saving habits to maximize battery life. Al-

though the Notebook provides automatic power saving features that can be enabled, you can still improve on them by keeping power conservation in mind.

The AC Adapter

The most obvious way to conserve battery power is to avoid using the battery when there is an available AC power source. The AC Adapter is lightweight and compact, making it very convenient to carry while traveling. By using the AC Adapter as much as possible, you can ensure you will have a charged battery whenever you really need it.

Screen Brightness

The brighter the LCD display screen is, the more electricity it requires. To save battery power, avoid setting the screen brightness level higher than necessary.

The Serial Ports

The computer has one serial port, which draws some power if *Enabled* although no serial device is being used with the computer. If you are not using a serial device, you can turn the COM port off by using the BIOS program to conserve battery power. Please see Chapter Six for a complete discussion of enabling and disabling the Notebook's ports.

The Floppy Disk Drive

The floppy disk drive consumes a substantial amount of battery power. Use the FDD as little as possible when you are operating the computer on battery power.

> ***Note!***
>
> ***It is preferable that you do not turn off the computer if you will only be stepping away from it for a short time. Switching power off and on frequently is not good for the computer's electromechanical components and circuitry.***

This concludes the chapter on the Notebook's power system. The next chapter covers the Notebook's BIOS.

NOTES

Chapter 6

THE BIOS SETUP PROGRAM

A built-in Setup program allows you to customize your Notebook to suit your personal work habits. This program gives you control over your Notebook's power management and security system, allowing you to configure your Notebook for different working environments such as the home, the office, or on the road.

The Setup program, or more specifically the BIOS (Basic Input and Output System) Setup program, employs a menu-driven graphical user interface. This intuitive program can be controlled by both a mouse and a keyboard.

With easy-to-use menus, you can configure such items as:

- Hard Drives and Peripherals
- Bootup Drive Sequence
- Password Protection
- Power Management Features

You should run the Setup program under the following conditions:

- You have set up the computer for the first time and you get a message prompting you to run the BIOS Setup program
- You want to configure your Notebook to use a different booting device
- You want to reset the system clock
- You want to redefine the communication ports to prevent any conflicts

- You want to make changes to the Power Management configuration

> **Note!**
> ***The above items are only a few examples and are by no means a complete list.***

This chapter will guide you through the Setup program by providing clear explanations for all Setup options. A standard configuration has already been set in the Setup program, so you will very likely have little to worry about for now. However, we recommend that you read this chapter just in case you need to make any changes in the future.

The next section discusses how to move around in the BIOS Setup program, as well as how to specify and save your new settings. A brief discussion of the optional settings among the different sub-menus follows.

Using the BIOS Setup Program

The Setup program has been designed to make it as easy to use as possible. It is a menu driven program, which means you can scroll through the various sub-menus and make your selections among the various predetermined choices. If you accidentally make a setting and do not know which one to switch back to, the Setup program has a default option that allows you to return to the previous value. The default options are discussed in more detail later in this chapter.

When turning on the Notebook for the first time you may get a message prompting you to run the BIOS Setup program. A warning message may appear on the screen if the hardware configuration is changed or the POST fails. This message will inform you of any errors or invalid settings and prompt you to run the Setup program to correct the problem.

Even if you are not prompted by a message instructing you to use the Setup program, at some time in the future you may want to change the configuration of your computer. For example, you may want to enable the Security Password Feature or make changes to the Power Management settings. It will then be necessary to reconfigure your system using the Setup program so that the computer can recognize these changes.

Note!

The BIOS is subject to change by the manufacturer. To upgrade your BIOS with the latest version, consult your dealer or the manufacturer.

BIOS Setup

Enter the Setup program's Main Menu as follows:

Turn on or reboot the system. The system will perform a series of diagnostic checks. These checks are called the "POST" (Power On Self Test).

When the message "Press <F2> to enter SETUP" appears, press the function key [F2] to enter the PhoenixBIOS Setup Utility. The *Main* menu will appear (refer to *The Main Menu* section).

Navigating in BIOS

Navigating in BIOS is easy. You can use the keyboard to move the cursor, make changes, or input setup values.

Navigating with the Keyboard

Use the left and right arrow keys [← →] to choose one of the BIOS setup screens. Use the up and down arrow keys [↑ ↓] to select an item in the screen. Some of the screen items have the symbol ▶ next to them. Pressing [Enter] when these items are

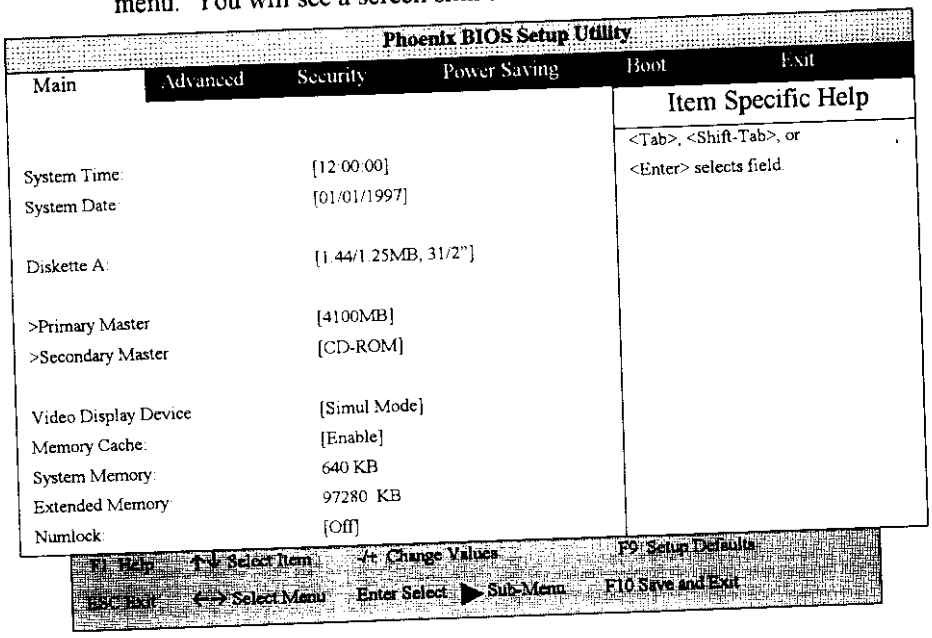
selected will bring up a sub menu from which you can choose more options.

The "Item Specific Help" window on the right side of the screen and the command window at the bottom of the screen provide you with available navigating and setup commands.

In the next sections we will go through each Menu in order and explain the options and field settings.

The Main Menu

This is the Main menu of the BIOS Setup program. Changes to the Notebook's basic system configuration can be made from this menu. You will see a screen similar to the following submenu.



Each of the fields displayed in this menu is covered below in detail.

Field	Options	Description
System Time:	[12:25:21]	Sets your system to the time that you specify (usually the current time). The format is hour, minute, second. Insert the appropriate information. Use the [Tab] or [Shift] + [Tab] keys to move between the hour, minute, and second fields.
System Date:	[07/01/1998]	Sets your system to the date that you specify (usually the current date). The format is month, day, year. Type in the appropriate information. Use the [Tab] or [Shift] + [Tab] keys to move between the month, day, and year fields.
Diskette A:	• [1.44/1.25 MB 3½"] • [LS-120]	Specifies a drive type for diskette drive A. Drive A is the factory-included floppy disk drive.
▶ Primary Master	[4100MB]	Pressing [Enter] when this field is selected brings up a submenu. Refer to the following section entitled *Primary and Secondary Master Sub-Menu Options*.
▶ Secondary Master	[CD-ROM]	The arrow head icon ▶ indicates that this field contains a submenu. The submenu is used to configure an IDE Hard Disk or CD-ROM/DVD installed in the

		system. To configure a hard disk drive or CD-ROM/DVD, move the cursor to highlight the *Secondary Master* field, and press the [Enter] key. The Secondary *Master* submenu screen will appear. When set to "User" the fields and options on this submenu are the same as the *Primary Master* submenu described below in the section entitled "Primary and Secondary Master Submenu Options".
Video Display Device	• [Simul Mode] • [CRT Only] • [LCD Only]	Allows you to choose the display mode. Setting this field to *Simul Mode* allows you to view the video output on the Notebook LCD panel and an external CRT.
Memory Cache	• [Enable] • [Disable]	Enables or disables the L2 memory cache. Enabling this will speed up Notebook operations.
System Memory	640 KB	This field displays the amount of conventional memory detected by the system during bootup. You do not need to make changes to this field. This is a display only field.
Extended Memory	31744 KB	This field displays the amount of extended memory detected by the system during boot-up. You do not need to make changes to this field. This is a display only field.

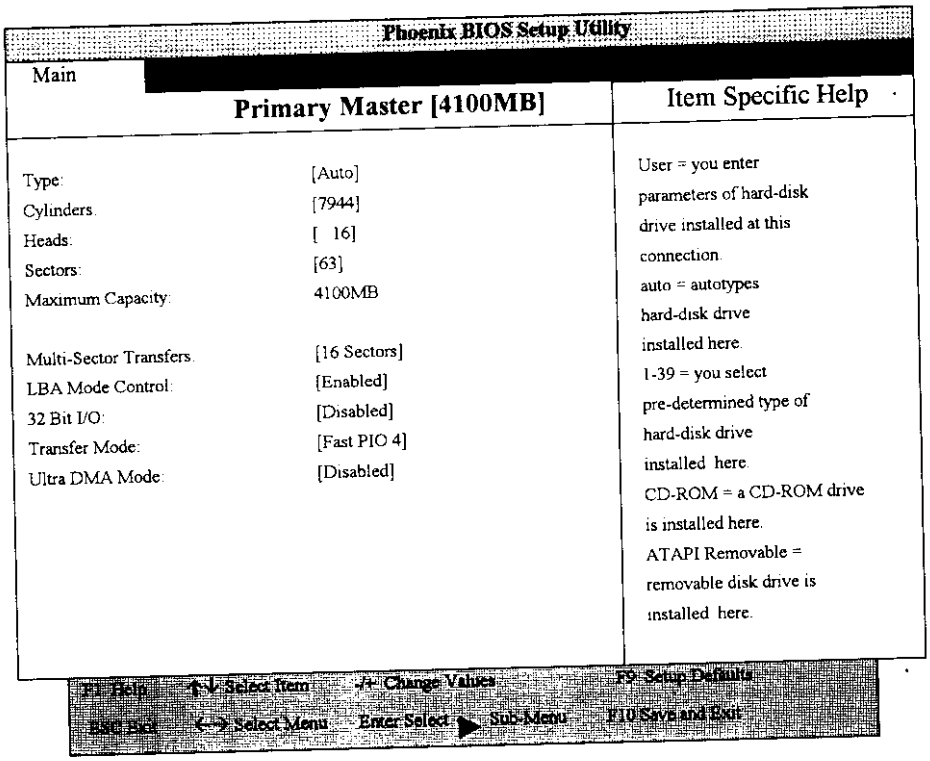
Numlock	• [On] • [Off]	Selects the Power-on state for Numlock

Primary and Secondary Master Submenu Options

> **Note:**
> ***Before attempting to configure a hard disk drive, make sure you have the configuration information supplied by the manufacturer of your hard drive. Incorrect settings can result in your system not recognizing the installed hard disk.***

Primary Master

Move the cursor to the *Primary Master* item and press [Enter]. You will see a screen similar to the following.



Each menu item is described below.

Field	Options	Description
Type	• [Auto] • [User] • [ATAPI Removable] • [None] • [CD-ROM]	Select *Auto* to automatically configure an IDE type drive. This option only works with standard IDE drives. If your drive is an IDE type, it will be automatically recognized and properly configured. If automatic detection is successful, the correct values will be

	filled in for the remaining fields on this submenu. If no drive is installed or if you are removing a drive and not replacing it, select *None*. Select *CD-ROM* if a CD-ROM is installed as the Primary or Secondary Master. Select *ATAPI Removable* if the drive is an ATAPI type drive that supports high-capacity storage diskettes that are compatible with 1.44MB diskettes. This option would be used in the event that you have installed an ATAPI type removable drive (for example, an LS 120 drive) instead of an FDD.
Cylinders	This field configures the drive's number of cylinders. Refer to your drive's documentation or look on the drive to determine the correct value to enter for this field. If the system has successfully detected the drive automatically, there is no need to adjust this field. In order to make changes to this field, the Type field must be set to *User*.
Heads	This field configures the drive's number of read/write heads. Refer to your drive's documentation or look on the

		drive to determine the correct value to enter for this field. If the system has successfully detected the drive automatically, there is no need to adjust this field. In order to make changes to this field, the Type field must be set to *User*.
Sectors		This field configures the drive's number of sectors per track. Refer to your drive's documentation or look on the drive to determine the correct value to enter for this field. If the system has successfully detected the drive automatically, there is no need to adjust this field. In order to make changes to this field, the Type field must be set to *User*.
Maximum Capacity		This field gives the maximum formatted capacity of the hard disk drive. This is a display only field.
Multi-Sector Transfers	• [16 Sectors] • [Disabled] • [2 Sectors] • [4 Sectors] • [8 Sectors]	This option automatically sets the number of sectors per block to the highest number supported by the drive. This field can also be configured manually. Note that when this field is automatically configured, the set value may not always be the fastest value for the drive. Refer to the documentation that came with your hard drive to de-

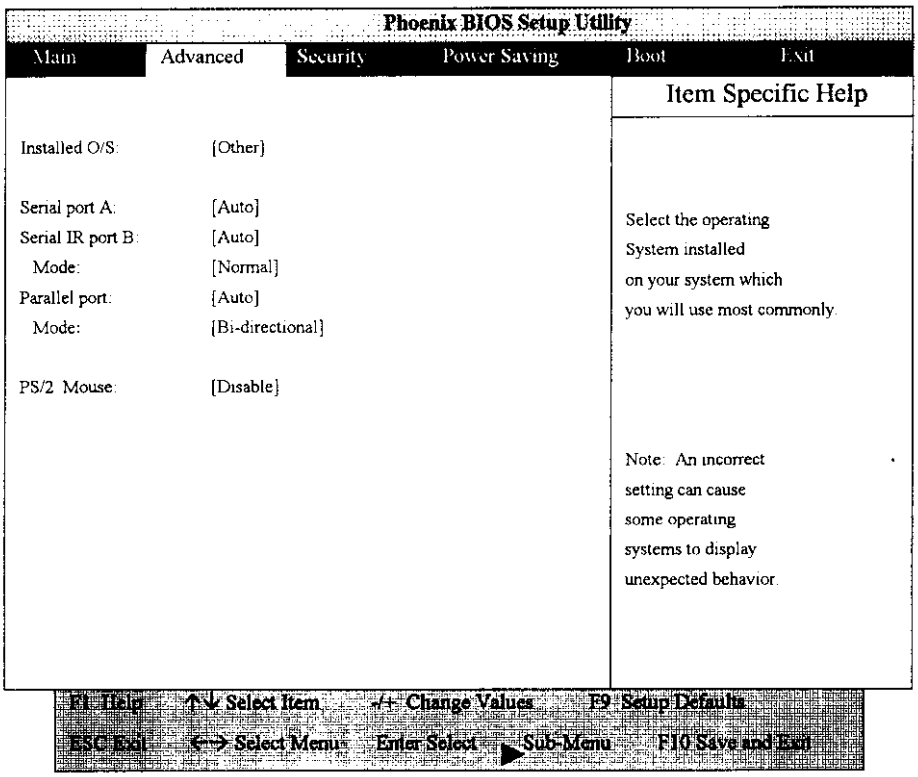
		termine the optimal value and set it manually. In order to make changes to this field the Type field must be set to *User*.
LBA Mode Control	• [Enabled] • [Disabled]	When enabled, this option uses 28-bit addressing of the hard drive without regard for cylinders, heads, and sectors. Note that Logical Block Access may decrease the access speed of the hard disk. However, LBA Mode is necessary to use drives with greater than 528MB in storage capacity. In order to make changes to this field, the Type field must be set to *User*.
32 Bit I/O	• [Disabled] • [Enabled]	When enabled, this option speeds up communication between the CPU and the IDE controller. This option supports PCI local bus only. ISA bus is not supported. In order to make changes to this field, the Type field must be set to *User*.
Transfer Mode	• [Fast PIO 4] • [FPIO 3/ DMA 1] • [FPIO 4/ DMA 2] • [Standard] • [Fast PIO 1]	When enabled, this option speeds up communication between the system and the IDE controller by using enhanced I/O transfer modes (PIO Modes). In order to make changes to this field, the Type field must be set to

	• [Fast PIO 2] • [Fast PIO 3]	*User*.
Ultra DMA Mode	• [Mode 2] • [Mode 0] • [Mode 1] • [Disabled]	When enabled, this option speeds up data transfer to and from the drive. In order to make changes to this field, the Type field must be set to *User*.

After using the legend keys to make changes to this submenu, press the [Esc] key to exit back to the Main menu.

The Advanced Menu

The Advanced Menu allows you to make changes to the internal port settings and enable or disable the Plug and Play Operating system. Move the cursor to the *Advanced Menu* item and press [Enter]. You will see a screen similar to the following.



Each menu item is described below.

Field	Options	Description
Installed O/S	• [Other] • [Win95]	This field allows you to enable the Plug and Play operating system to set up your hardware devices. Select *Win95* if you have installed the Windows 95 operating system. Choose Other

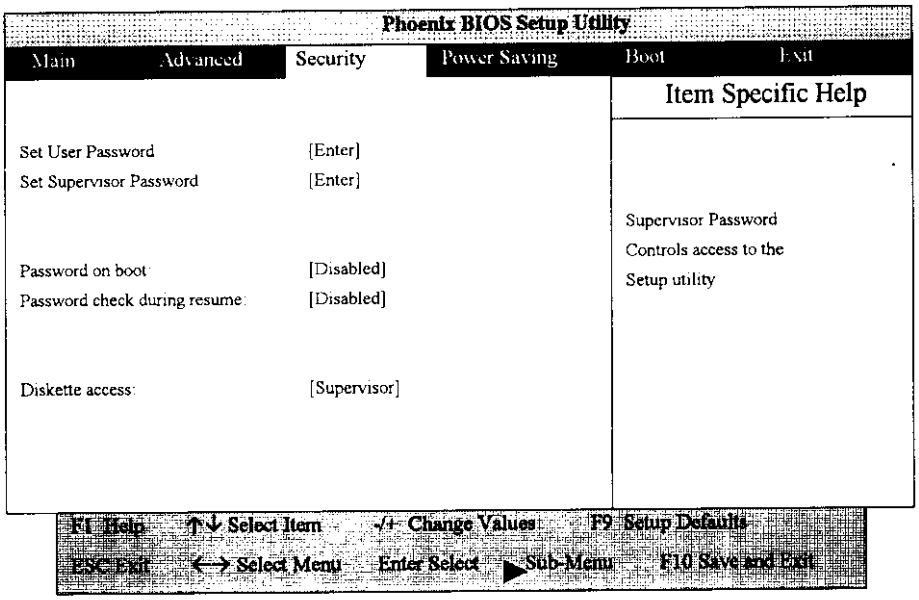
		if you have installed another operational system other than Win95. The default setting is *Other.*
Serial port A	• [Auto] • [Disabled] • [Enabled]	This field allows you to configure the Notebook's serial COM1 port. When *Enabled* is selected, the *Base I/O Address* menu item appears.
Base I/O Address (Serial port A)	• [3F8 IRQ4] • [2F8 IRQ3] • [3E8 IRQ4] • [2E8 IRQ3]	When the Serial Port A field is set to Enabled, the "Base I/O Address" field becomes available and you can set the serial port's IRQ and I/O address.
Serial IR port B	• [Auto] • [Disabled] • [Enabled]	This field allows you to configure the Notebook's serial COM2 port. When *Auto* is selected, the Mode item becomes available. When *Enabled* is selected, the Base I/O address and the Mode become available.
Base I/O Address (Serial IR port B)	• [3F8 IRQ4] • [2F8 IRQ3] • [3E8 IRQ4] • [2E8 IRQ3]	When the Serial IR port B is set to *Enabled*, the "Base I/O Address" field becomes available and you can set the serial port's IRQ and I/O address.
Mode	• [FIR]	This field allows you to enable or disable the

	• [SIR] • [Normal]	Notebook's Fast Infrared (FIR) communication module. When FIR is selected, the DMA channel menu item appears.
Parallel port	• [Auto] • [Disabled] • [Enabled]	This field allows you to configure the Notebook's parallel port. When *Enabled* is selected, the Mode and the Base I/O address become available.
Mode (Parallel port)	• [Output only] • [Bi-directional] • [EPP] • [ECP]	This field allows you to configure the Notebook's parallel port transmission mode. When ECP is selected, the DMA channel menu item appears.
Base I/O Address (Parallel port)	• [278 IRQ7] • [378 IRQ7]	When the Parallel port is set to *Enabled,* the "Base I/O Address" field becomes available and you can set the serial port's IRQ and I/O address.
PS/2 Mouse	• [Disable] • [Enable]	

The Security Menu

The Notebook's advanced system of security allows you to set a password to prevent unauthorized access to system resources, data, and the BIOS Setup Program. This section covers each pa-

rameter of the Security Setup. Open the *Security* menu. You will see a screen similar to the following.



Each menu item is described below.

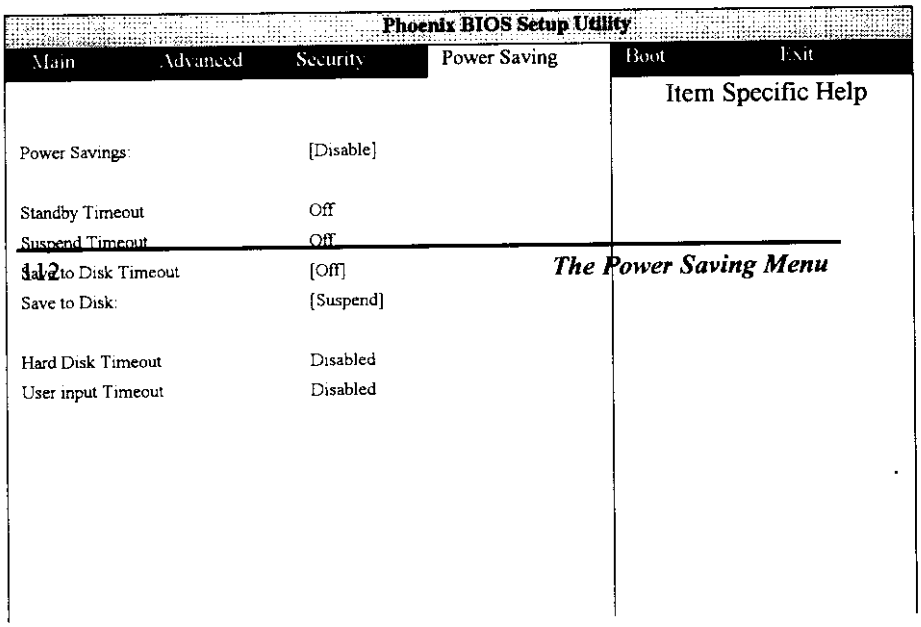
Field	Options	Description
Set User Password	Press Enter	This field allows you to set the *User* password. This field requires that the *Supervisor* password be set prior to setting the *User* password. To set the *User* password, highlight this field and press the [Enter] key. Type the password and press the [Enter] key. You can type

		up to eight alphanumeric characters. Symbols and other keys are ignored. To confirm the password, type the password again and press the [Enter] key. The *User* password is now set. This password allows full access to the BIOS Setup menus. To clear a password, highlight this field and press the [Enter] key. The **Set User Password** dialog box will appear. Press the [Enter] key twice. The password is now cleared. The *User* password allows restricted access to the Setup menus.
Set Supervisor Password	Press Enter	This field allows you to set the *Supervisor* password. To set the *Supervisor* password, follow the same instructions for setting the *User* password.
Password on boot	• [Disabled] • [Enabled]	This option requires prior setting of the *Supervisor* password to function. When enabled, the system will then require either the *Supervisor* or *User* password before the system can bootup.
Password check during resume	• [Disabled] • [Enabled]	Enables or disables password during resume from suspend mode
Diskette	• [Supervisor]	This option requires prior setting of the *Supervisor*

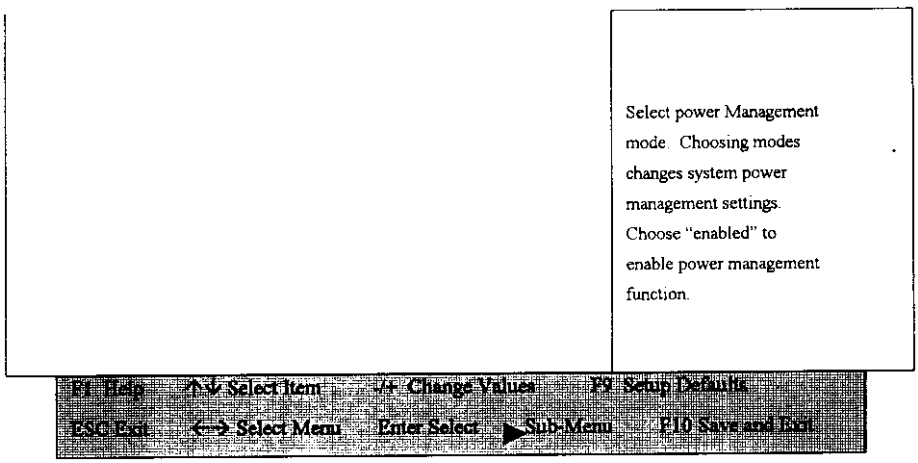
access:	• [User]	password to function. When set to *User*, the system will then require either the *Supervisor* or *User* password before allowing access to the Floppy Disk Drive (FDD). When set to Supervisor, only the *Supervisor* password will allow access to the FDD. There is no Ls-120 access control function.

The Power Saving Menu

The Power menu of the Setup program allows you to enable and adjust the Notebook's advanced power saving features. Enabling these features will extend the life of the battery pack between charges. To make changes to power management settings, select *Power* from the menu bar. This section covers each parameter of the Power Savings setup. Open the *Power Saving* menu. A screen similar to the following will open.



The Power Saving Menu



Each menu item is described below.

Field	Options	Description
Power Savings	• [Enabled] • [Disabled]	Select power management setting based on the system power source. Choosing "Enabled" enables power management function in both AC power and battery power. Choosing "Disabled" disables all power management time-outs.
Standby Timeout	• [Off] • [1, 2, 4, 8, 15 Minutes]	This field allows you to specify how much time of inactivity must elapse before the system automatically transits to Standby mode. In Standby mode, all devices are powered off and the system enters a low power CPU state.

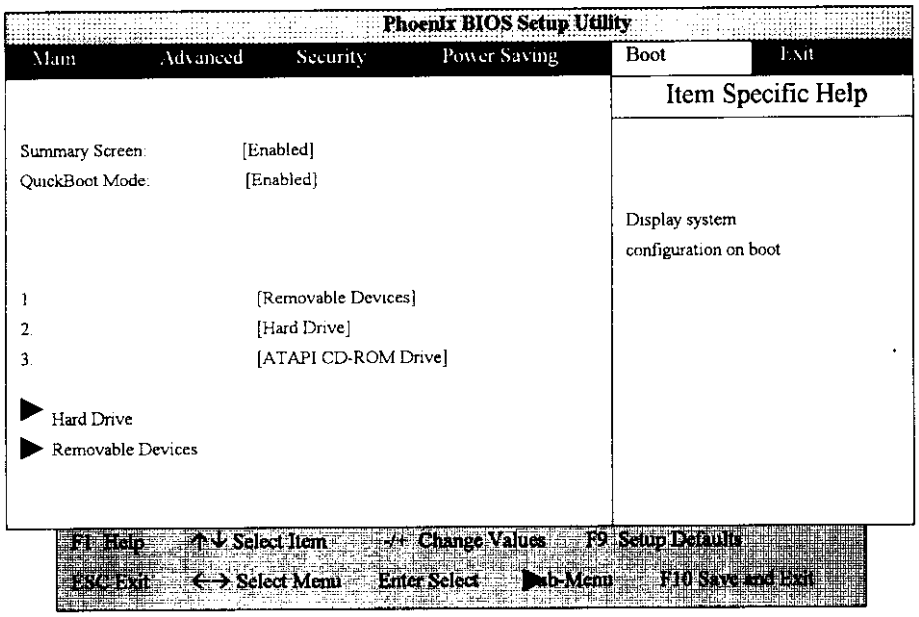
Suspend Timeout	• [Off] • [1, 2, 4, 8, 15 Minutes]	This field determines how much system idle time must pass before the system enters Suspend mode. When set to *Off*, the system cannot enter Suspend mode which is the lowest power state for the Notebook.
Save To Disk Timeout	• [Off] • [After 1 Hour]	Turn on or off the Auto "Save To Disk" feature. When Auto Save To Disk is turned on, the system will save its state to disk and then power off after being in Suspend mode for a period.
Save to Disk	• [Suspend] • [Save To Disk]	Select the type of suspend Mode. If you choose *Save To Disk* the system will save its state to disk and power off. If you choose *Suspend* the system will save its state but remain in a low power mode. If you choose *Suspend* then you also have the option of choosing *Save To Disk*.
Hard Disk Timeout	• [Off] • [1, 2, 4, 8, 15 Minutes]	This field allows you to specify the period of inactivity required before the hard disk spins down and enters the Standby (motor off) state.
User Input Timeout	[Off] [1, 2, 4, 8, 15 Minutes]	Amount of time the user-input devices (such as the keyboard, Touchpad or external PS/2 mouse) need to be inactive before the screen is turned off.

Resume On Modem Ring	• [On] • [Off]	Turning this feature on will wake the system up when an incoming call is detected on your modem. If Suspend Mode is set to "Save To Disk", the *Resume On Modem Ring* will not work.
Resume On Time	• [On] • [Off]	Turning this feature on will wake the system up at a specific time. If Suspend Mode is set to "Save To Disk", the *Resume On Time* will not work.
Resume Date	[Month:Day:Year]	Specifies the time when the system is to wake up. [Tab], [Shift + Tab], or [Enter] selects field.
Resume Time	our:Minute:Second]	This option allows you to specify the time the system will resume. The *Resume On Time* field must be set to *On* for the settings in this field to function. Enter the time in hours, minutes and seconds in a 24-hour format. For example, indicate that the system should resume normal operation at 1:00 PM by setting this field with a value of 13:00 hours.

The Boot Menu

The Boot menu allows the user to specify the order in which the Notebook is to check for a device to boot the system. You can also configure the way that the system will boot up. To make

changes, select *Boot* from the menu bar. This section covers each parameter of the Boot Menu Options. Open the *Boot* menu. A screen similar to the following will appear.



Each menu item is described below.

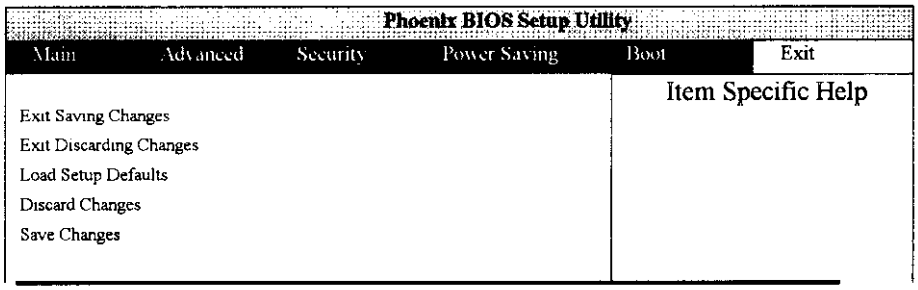
Field	Options	Description
Summary Screen	• [Enable] • [Disable]	This field allows you to display the system configuration screen during boot-up.
QuickBoot Mode	• [Enable] • [Disable]	Allows the system to skip certain tests while booting. This will decrease the time needed to boot the system

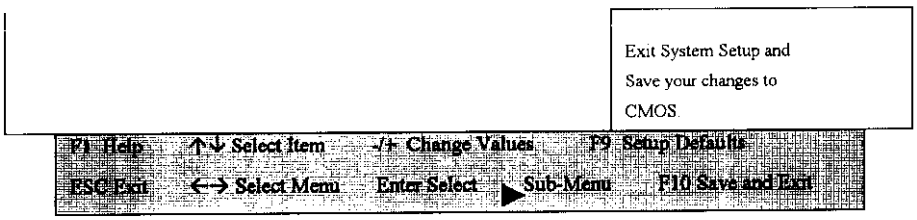
1.	[Removable Devices]	Use [↑] or [↓] to select a device, then press [+] to move it up the list, or [–] to move it down the list. Press [Esc] to exit this menu.
2.	[ATAPI CD-ROM Drive]	
3.	[Hard Drive]	

▶ Hard Drive	1. [Bootable Add-in Cards] 2. [TOSHIBA MK4006MAV-(PM)]	The operating system assigns drive letters to these devices in the order displayed. Use [↑] or [↓] to select a device, then press [+] to move it up the list, or [–] to move it down the list. Press [Esc] to exit this menu.
▶ Removable Devices	1. [Legacy Floppy Drives or LS-120 SLIM 02-(SS)]	The operating system assigns drive letters to these devices in the order displayed. Use [↑] or [↓] to select a device, then press [+] to move it up the list, or [–] to move it down the list. Press [Esc] to exit this menu.

The Exit Menu

Once you have made all of your selections from the various menus in the Setup program, you should save your changes and exit Setup. Select *Exit* from the menu bar to display a screen similar to the following menu:





Each menu item is described below.

Field	Description
Exit Saving Changes	Once you are finished making your selections, choose this option from the Exit menu and enter [Yes] at the **Setup Confirmation** screen to ensure the values you selected are saved to Non-Volatile RAM. Changes you made to the Setup program must be changed to Non-Volatile RAM in order to make them operative. Non-Volatile RAM differs from standard RAM memory in that it is sustained by an on-board battery even when the Notebook is turned off. The next time you bootup the Notebook, the BIOS will attempt to load the values you saved in Non-Volatile memory. If these values cause the system boot to fail, reboot and press [F2] to enter the Setup program. Once in Setup, you can try to change the values that caused the system boot to fail. If the problem persists, load the default values as described below.
Exit Discarding Changes	This option should only be used if you do not want to save the changes you have made to the Setup program. If

	you have made changes to the fields other than to the system date, system time and password, the system will ask for confirmation when choosing Exit Discarding Changes.
Load Setup Defaults	This option allows you to load the default values for each of the parameters on the Setup menus. After selecting this option and entering [Yes] at the **Setup Confirmation** screen, the default settings will be loaded
Discard Changes	This option allows you to discard the selections you've made and restore the values you previously saved. After selecting this option and entering [Yes] at the **Setup Confirmation** screen, all selections are updated.
Save Changes	This option saves your selections without exiting the Setup program. You can then return to other menus and make changes. After selecting this option and entering [Yes] at the **Setup Confirmation** screen, all selections are saved.

Note:

To exit BIOS Setup without saving your changes, select Exit Discarding Changes from the Exit menu and press [Enter]. When prompted by BIOS to save your changes before exiting, select [No] and press [Enter].

Chapter 7

CREATING A SYSTEM PARTITION

This chapter covers the creation of a Suspend to Disk partition and a system partition.

Zero-Volt Suspend to Disk Utility

In order to use the Suspend to Disk function you must first create a Suspend to Disk (S2D) partition on the Notebook's hard disk. The Suspend to Disk Partition Make Utility (PHDISK) is used to create the partition. During the Suspend to Disk operation the system's state is written to this S2D partition. When you restart your computer, the system returns to the state it was in when you suspended to disk. You can resume work from where you left off.

You must run the Suspend to Disk Partition Make Utility to create a suspend to disk partition *before* you install an operating system. If your Notebook already has an operating system installed, then your Suspend to Disk partition should have already been created on your Hard Drive. However, if you install a new Hard Drive, you'll need to run the Suspend to Disk Partition Make Utility on your new HDD.

Using the Utility

From the DOS prompt insert the S2D Partition Make Utility diskette into FDD drive "A". Change to drive "A" and type "cd (space) PHDISK" and then press [ENTER]. At the A:\ PHDISK> prompt type "MKS2DMAX.BAT" and then press [ENTER]. It should look like the following:

```
A:\cd  PHDISK [ENTER]
A:\PHDISK>MKS2DMAX.BAT  [ENTER]
```

The next section is an in-depth explanation on how to use the Suspend to Disk Partition Make Utility.

Creating a Suspend to Disk Partition

The procedure for creating a Suspend to Disk partition is outlined below.

> **WARNING!**
> Creating a disk partition will cause loss of existing data on the hard drive. We recommend this method only for new systems with no data on the hard drive.

1. Copy the files FDISK.EXE, FORMAT.COM, and the Suspend to Disk Utility (PHDISK) to a bootable diskette or to your Windows Startup diskette.
2. Boot the system from drive A with a bootable diskette or with your Windows 95/98 start-up diskette.
3. If you are partitioning a previously used Hard Disk Drive, use the DOS FDISK utility (FDISK.EXE) to remove any partitions from the fixed disk. Consult your DOS manual for information on using the FDISK utility.
4. Turn off your computer and then restart it. If you are booting up from an MS-DOS diskette, you'll also need to exit MS-DOS.
5. Insert the "Utility" diskette into drive "A".
6. Type "cd PHDISK" after the "A" prompt and press [ENTER].
7. After the "A" prompt it should read "PHDISK>". Then type "MKS2DMAX.BAT" and press [ENTER]. It should look like the following:

`A:\cd` PHDISK *[ENTER]*

`A:\`PHDISK`>MKS2DMAX.BAT` *[ENTER]*

This creates a 260MB (266,240KB) partition on the HDD. If you would like to manually change the amount of RAM on the batch file, then open your MS-DOS Editor. Insert your Utility diskette and open the **a:\MKS2DMAX.BAT** folder. Where it reads "266240", write in the amount of RAM you would like the batch file to create (E.G., 131,072; 65,536 or 32,768). We recommend adding an additional 4 megabytes to protect your data. Hence, 256 megabytes plus 4 megabytes equals 260 megabytes (266,240KB).

The computer will automatically set up the partition and when completed, will request you to restart the computer. Insert a bootable diskette and then press any key to restart the system.

8. Now you will need to create a *System Partition* that uses the remainder of the disk and activates the partition. Refer to the following section for information on creating a System Partition.

Creating a System Partition

Creating a System Partition onto your hard drive will format it for use. A formatted hard drive is required to run your Notebook computer. Your hard drive will be automatically formatted when installing MS-DOS, Windows 95 and Windows 98. The steps to format your hard drive manually are outlined below.

1. Restart the computer and boot it up from a bootable diskette. If you are booting up from an MS-DOS diskette, you'll also need to exit MS-DOS.
2. Insert the FDISK diskette and type "FDISK" at the "A" prompt and press [ENTER].

3. The computer may prompt you with the following question:

   Do you wish to enable large disk support (Y/N).....? [N].

   Type "Y" and then press [ENTER]

4. At the **FDISK Options** screen you will be given a series of choices. Select "1"—*Create DOS partition or Logical DOS Drive*. Then press [ENTER].

5. At the **Create DOS Partition or Logical DOS Drive** screen you will be given another series of choices. Select "1" —*Create Primary DOS Partition*. Then press [ENTER]. The computer will begin verifying the drive's integrity.

6. Then you will be queried with the following question:

   Do you wish to use the maximum available size for a Primary DOS Partition and make the partition active (Y/N).....? [Y].

   Type "Y" and press [ENTER].

7. The computer will once again verify the drive's integrity. When the computer has completed verifying, you will be directed to restart your computer. Restart your computer.

8. Boot up from a bootable diskette. If you are booting up from an MS-DOS diskette, you'll also need to exit MS-DOS.

9. At the "A" prompt, enter the following:

   A:\>format c:/s [ENTER]

   This will instruct your computer to boot up from your **c:** drive.

10. You will be prompted with the following:

```
WARNING ALL DATA ON NON-REMOVABLE DISK
DRIVE C:  WILL BE LOST!

Proceed with format (Y/N)?
```

Type "Y" and then press [ENTER].

11. The computer will then begin formatting your hard drive. When it has completed, you will be prompted with the following message: *Volume label (11 characters, ENTER for none)?* Enter a label name of 11 characters or less or press [ENTER] if you do not want a label. Next, your Volume Serial Number will be displayed. At the "A" prompt eject the diskette from drive "A". Restart your computer and boot up from you hard drive. The system can now perform Ø-volt suspend and resume operations. For information on Volume labels and Volume Serial Numbers, refer to your MS-DOS User's Manual.

    Note: You may get a warning notifying you that, "Your Boot Sector 0 has changed." If you get this warning, enter BIOS and go to the **Disks** menu and disable "Virus Alert".

The Disk Operating System

All personal computers require a disk operating system. The most popular operating systems for personal computers are DOS or Windows. Once your computer's hard drive has been partitioned and formatted, it's OK to install a Disk Operating System (DOS). The operating system is the foundation on which all other programs and software applications operate. It is responsible for allocating system resources such as memory, CPU time, disk space, and access to peripheral devices.

For this reason, the operating system constitutes the basic interface between you and your computer. Windows 95 and Windows 98 also provide an intuitive graphical user interface. This inter-

face allows you to use a pointing device (the Touchpad) to launch programs and execute commands.

How familiar you need to become with the operating system largely depends on the kind of work you will be doing with your computer. Programmers need to know much more about the operating system than people who only need to run word processors and spread sheet programs. Refer to the DOS, Windows 3.1, Windows 95/98 on-line help or the Windows 95/98 User's Guide for details about working with the operating system that you have installed on your Notebook.

Disk Caching

A disk cache is used to increase hard disk performance. A disk cache program sets aside a portion of the computer's system memory where frequently used data from the hard disk is temporarily stored. Because typical memory access time is several thousand times faster than disk access time, a disk cache can yield a phenomenal increase in your computer's overall performance.

The SMARTDRV.EXE program included with MS-DOS is an example of a program that can be used to implement a disk cache. This program allows you to specify the amount of memory to be used as a disk cache. Refer to the MS-DOS help or the MS-DOS User's Guide for instructions on how to use the SMARTDRV.EXE program.

Note!

If a program's documentation specifies to disable a memory cache, it is not referring to a disk cache program like SMARTDRV.EXE. Memory cache is different from a disk cache. A disk cache is used to speed up disk access, whereas a memory cache is normally used to speed up access to DRAM.

This concludes Chapter Seven. In the following Appendixes, you will find detailed information on your Notebook's specifications, a *Troubleshooting* section, an *Abbreviations and Glossary* section, and an *Index*.

NOTES

Appendix A

SPECIFICATIONS

Processor

- Mobile Module Pentium II 266/300MHz
- Intel 440BX PCI chipset and 443BX Host Bridge Controller

System Memory

- 2-Slot 144-Pin / 64-bit Access SO-DIMM Memory Module
- 3.3 Voltage FPM / EDO RAM and SDRAM Module Support
- 8, 16, 32, 64, 128 up to 256MB user expandable

Cache Memory

- Internal L1/L2 cache
- External 512KB Pipeline Burst Mode

Indicators

- Power-on, suspend to RAM
- Battery Charging, Caps Lock, Scroll Lock, Num Lock
- Battery Gauge, Battery Low Warning, FDD/LS-120, CD-ROM/DVD-ROM, HDD and PCMCIA

Power Management

- APM 1.2 Standard Compliant
- Full On, Sleep, Suspend to DRAM and Suspend to Disk
- Auto Suspend on Low-Low Battery
- Accurate Status LED Fuel Gauge
- ACPI Platform Solution for PC 98 Standard

Disk Storage

- 1.44MB 3.5" FDD module
- 5.25" 24 x CD-ROM module
- 12.7mm height 2.5" HDD module
- 2-speed DVD-ROM & LS-120 (optional)

Display

- 15.0" TFT XGA
- 1024 X 768 X 16.7M True Color
- Built-in CCD Image Sensor Camera 704 X 480 at 30 fps
- 128/256-bit GUI Engine
- One Zoomed video port
- 2.5MB or 4.5MB NMG6 SGRAM (optional)
- Embedded Software MPEGII

Audio

- ESS Maestro-2M PCI Audio Accelerator Chipset
- Built-in 3D audio sound effects with integrated 3-D spatializer
- 64-Voice, 4MB Pipelined Wavetable Synthesizer
- 16-bit Stereo Sound and an AC '97 CODEC interface
- Built-in microphone
- Sound Blaster Pro compatible and Software Wavetable support
- 2 Encased Internal Rare Earth Speakers
- Three Audio Power Amplifiers
- AudioDrive Digital Mixer
- Built-in Jacks for Line-out, Line-in, and Mic-in

Security

- System/Setup Password
- Power on Password
- Kensington Security Lock

Keyboard/Pointing Device

- 86 keys, Microsoft Windows 95 compatible, multiple language
- All keyboards come with hot-key functions and Win95 keys
- Touchpad pointing device

PCMCIA Interface

- PCMCIA 2.1 Standard Compliant
- Has one Type III or two Type II PCMCIA slots
- Supports one ZV port
- Supports CardBus

I/O Ports

- IrDA compatible FIR port
- Two USB ports
- One RS-232 serial port
- External VGA port
- EPP/ECP/SPP 25-pin parallel port
- One PS/2 port / One PS/2 keyboard port
- TV-out (S-video)
- Line-out, Line-in, and Mic-in jacks
- RCA Jack for Composite Video
- AC-in
- RJ-11 Jack

Battery

- Fuel gauge on battery pack
- Smart battery compliant
- Built-in safety mechanisms
- Battery Life: Li-Ion 4-5hrs.

AC Adapter

- 2-pin Power Cord
- 60W, 90V~264V full range and auto-sensing AC adapter
- Universal input, Auto switching

Options

- Additional battery pack
- DVD-ROM
- LS-120 Disk Drive

Dimensions

- 13.3"(W) x 11.46"(D) x 1.93"(H)
  338(W) x 291(D) x 49(H)mm
- 3.5kg (7.7lbs) without battery

*The manufacturer reserves the right to change design specifications without prior notice.

*All products and corporate names are trademarks of their respective owners.

Appendix B

TROUBLESHOOTING

Your Notebook has passed through a series of rigorous quality assurance tests to guarantee reliable performance. However, your new Notebook is a sophisticated piece of equipment and as such may malfunction if used incorrectly or if one of its components fails. Included are important tips and information you will need to help locate and solve some of the problems you may encounter.

An Approach to Troubleshooting

In general, troubleshooting involves an organized systematic approach to problem solving. Try to isolate the problem and identify the defective device (hardware) or improper setting (software). When you have a problem, you should do a thorough visual inspection of the Notebook. If none of the indicators are lit and you cannot hear the HDD spinning, then the Notebook is probably not receiving power. Make sure the power cord is plugged in, and the AC Adapter is securely connected. If you are using a power strip or surge protector, ensure that these devices are turned on.

Often problems are caused by improperly connected cables. If you are using peripherals such as a mouse or keyboard, make sure they are properly connected to their respective ports. Ensure that none of the connectors' pins are bent or broken. Check all cables connected to the Notebook. If any are cut, frayed, or damaged in any way, replace them right away.

Never use a damaged cable. A damaged cable is not only a fire hazard, it may also cause a short circuit, resulting in irreparable damage to the Notebook.

Isolating the Problem

The problems that you will encounter can be divided into two basic categories: hardware problems and software problems. Hardware problems can be further divided into electrical and mechanical problems. You will know you have a hardware problem if the screen is dark, the computer cannot read the disk drives, or you get an error message during the Power-On Self Test (POST).

Software errors can occur at several levels. The ROM BIOS and the operating system can give you a large number of error messages. In addition, each application software package has its own set of error messages. It is important to determine whether the software error message you are getting is from the application or the operating system. Once you know this, you can refer to the respective software manual for a solution to the problem.

Checking Cables and Connections

Start by performing a careful visual inspection of the exterior of the computer. If no lights are displayed, make sure that your computer and its peripherals are getting power and communicating with each other properly.

To check the power cables, and connections:

1. If you have been using battery power, connect the computer to an external power source and make sure that the battery has a charge.
2. If you are using the computer with the AC adapter, check the power outlet, the power cord, and any power switches that may affect your computer:
   - Check the wall outlet or power strip with an item that you know is functioning properly. A lamp or radio is a convenient item for checking the power. You may also need to check the fuses and breakers in your electric box.
   - If the outlet is controlled by a wall switch, make sure that the switch is on.

- If the outlet is controlled by a dimmer switch, use a different outlet.
- If your computer is plugged into a power strip with an On/Off switch, make sure the switch is on.

3. With the computer's power switched off, check all cable connections. If the computer is connected to any peripheral devices, look for loose or disconnected cables. If the computer is too close to a wall, a cable connection may be loose or the cables may be crimped.

4. When you are certain that you have power available and all connections are good, turn the computer on again. If the computer still does not start, you may have a hardware problem.

> ***Note!***
>
> ***Do not substitute the Notebook's cable with another cable from a different type of device even if the cables look exactly the same. The wiring inside the cables may be different***

The Power-On Self Test

The Power-On Self Test (POST) runs every time you turn on or reset the computer. The POST checks memory, the main system board, the display, the keyboard, the disk drives, and other installed options.

A few seconds after you turn on your computer, a copyright message appears on your display screen. A memory test message appears next; as the test continues, memory size increases until all installed memory is tested. Normally, the only test routine visible on the screen will be the memory test.

Two classifications of malfunctions can be detected during the POST:

- **Error messages that indicate a failure with the hardware, the software, or the *Basic Input/Output System* (BIOS).** These *critical malfunctions* prevent the computer from operating at all or could cause incorrect and apparent results. An example of a critical error is microprocessor malfunction.
- **Messages that furnish important information on the power-on and boot processes (such as memory status).** These *non-critical malfunctions* are those that cause incorrect results that may not be readily apparent. An example of a non-critical error would be a memory chip failure.

In general, if the POST detects a system board failure (a critical error), the computer halts and generates a series of beeps. If failure is detected in an area other than the system board (such as the display, keyboard, or an adapter card) an error message is displayed on the screen and testing is stopped. It is important to remember that the POST does not test all areas of the computer, only those that allow it to be operational enough to run diagnostic programs.

If your system does not successfully complete the POST, but displays a blank screen, emits a series of beeps, or displays an error code, consult your dealer.

General Hardware Problems

A few common hardware problems and suggested solutions are presented in the table below:

Problem	Solution
You turn on the computer and nothing happens.	If the Notebook is running on battery power, check to see that the batteries are not completely exhausted. Check the power LED indicator. If it is on (GREEN) then power is being supplied to the Notebook. If the LED is not on, make sure that the power cord is securely connected to a live power source. Check all connections — make sure that the AC adapter jack is securely connected to the AC adapter port. If the Notebook still does not come on, remove the battery from its compartment, reinsert it, and try again. If there is still no power, contact your dealer.
The display screen is dark	Make sure that the computer is not in Suspend mode. Check the Brightness and Contrast controls for the screen. If the controls are turned too far down, the screen will be dark. If after trying this the screen is still blank, try rebooting the computer by pressing the **[Crtl]** + **[Alt]** + **[Delete]** keys. If this does not solve the problem, turn the computer off, wait five seconds, and then turn it back on. If the problem persists after trying all of these suggestions, turn off the computer and consult your dealer or a qualified service technician.

Problem	Solution
An incorrect date and time are displayed.	Correct the date and time using the DOS DATE and TIME commands or the options in the Setup Utility. (You can also set the date and time in Windows 95 by double clicking the clock on the task bar or in the control panel.) If the date and time become incorrect after a short time, your CMOS battery may be faulty. Contact your dealer to change the battery.
The message "Invalid system disk Replace the disk, and then press any key" appears during boot.	Check and make sure that you do not have a non-bootable floppy diskette inserted in your floppy drive. If your FDD is clear, check that the "Hard Disk" setting in the BIOS program is set correctly for your Notebook's hard disk drive. The setting has to be correct or the Notebook will not work. If the BIOS settings are correct but the problem persists, you may not have an operating system installed on your drive. Contact technical support for assistance.
The computer keeps making a beeping noise at regular intervals.	When the Notebook is low on battery power, it emits an audible warning signal. Save your work, turn off the computer, and switch to AC power.
You hear irregular beeps during operation of the Notebook and the system halts.	The problem is beyond the scope of this manual. Contact technical support.

Problem	Solution
An unidentified message is displayed.	Reboot the computer and run the BIOS system setup. Confirm the Setup parameters. If the same message is displayed after booting up again, contact technical support for assistance.
When you turn on the computer, you cannot access the hard drive.	Check that the "Hard Disk" setting in the BIOS program is set correctly for your Notebook's hard disk drive. The setting has to be correct or the Notebook will not work.
You turn on the computer, but do not get a prompt (usually "C:\") on the screen. The computer seems to be running.	Are you sure that an operating system is installed on the Notebook's Hard Disk? If not, you should get a message prompting you to insert a bootable disk into drive A. Also, check the brightness and contrast controls to make sure they are set correctly.
The Touchpad does not work.	The software you are using might require an extra device driver. Check your Touchpad utility diskette to see if the required device driver is available.
The system cannot access the CD-ROM drive.	Check that a CD is properly inserted in the drive. Make sure that you are using the correct program for that kind of CD. For example, the system cannot read a data CD using an audio program.
You cannot operate the printer.	Check the printer cable connection. Ensure that the printer power switch is turned on.

	Confirm that the printer is on-line.
Problem	**Solution**
Your screen freezes up and it does not respond to any external input.	Press the [Ctrl] + [Alt] + [Del] keys simultaneously. The computer should ask you if you want to "wait" or "end" task. If you click wait, you must wait for the computer to finish processing. If you click "end task," the computer will close the program. If you press the [Ctrl] + [Alt] + [Del] keys again, the computer will shut down.
Your screen freezes up and nothing happens when you press [Ctrl] + [Alt] + [Del].	This unfortunately happens to every computer. Turn off the power switch and then turn the computer back on. When you see the boot up screen, press [F8]. Then press 3, "Enter your computer on Safe Mode". This will protect your data and allow you to solve the possible problem safely. Then restart your computer.
Your screen freezes up and nothing happens when you turn the on/off switch on and off.	You are experiencing a power lock. Turn off the computer and unplug the AC adapter and remove the battery, if installed. Then replug the AC adapter in and turn the computer back on. When you see the boot up screen, press [F8]. Then press 3, "Enter your computer on Safe Mode". This will protect your data and allow you to solve the possible problem safely. Then restart your computer.

Problem	Solution
You cannot save data to a floppy diskette.	Ensure that the disk has been formatted. Consult your operating system manual for information on formatting floppy diskettes. The diskette is write-protected. Eject the diskette, slide the write-protect tab to the closed position, and try again. The diskette is full. Try using another diskette or free up some space on the diskette. The floppy disk drive is not operating. Contact your dealer for support.

If after trying all of the suggested solutions you still have a problem, make a list of what steps you have taken to correct the problem and contact your dealer.

Contacting Your Dealer

If you still have a problem after reading the preceding sections, the next step is to contact your dealer. Your dealer can determine if the problem is something that requires the computer to be taken to the shop. Before you call your dealer, however, prepare the following information:

- How is your computer configured? Your dealer needs to know what peripheral devices you are using.
- What messages, if any, are on the screen?
- What software were you running at the time?
- What have you done already to try to solve the problem? If you have overlooked a step, your dealer may be able to
- solve the problem over the phone.

Appendix C

ABBREVIATIONS

Abbreviation	Meaning
ADC	Analog to Digital Converter
APM	Automatic Power Management
ASKIR	Amplitude shift keyed infrared port
ATA	AT Attachment (Advanced Technology Attachment)
ATAPI	AT Attachment Packet Interface
BIOS	Basic Input/Output System
CMOS	Complementary Metal Oxide Semiconductor
CCD	Charged Coupled Device
CPU	Central Processing Unit
DIMM	Dual In-line Memory Module
DMA	Direct Memory Access
DRAM	Dynamic Random Access Memory
D-STN	Dual Scan STN (Super Twisted Nematic)
ECP	Enhanced Capabilities Port
EDO DRAM	Enhanced Data Output DRAM. This type of memory is 30 to 50 percent faster than conventional DRAM. Unlike conventional DRAM, EDO DRAM does not have to be refreshed between each data access; therefore, the cycle time is much shorter.
EIDE	Enhanced IDE (Integrated Drive Electronics)
EPP	Enhanced Parallel Port
Abbreviation	**Meaning**

FDC	Floppy disk controller
FIR	Fast Infrared
GB	Gigabyte (1GB = 1,073,741,824 bytes or 1,024MB)
HP SIR	Hewlett-Packard Serial InfraRed
I/O	Input/Output
IDE	Integrated Drive Electronics (internal hard disk drive interface)
IEEE	Institute of Electrical and Electronics Engineers
IrDA	Infrared Data Association
IRQ	Interrupt ReQuest
ISA	Industry Standard Architecture
JEIDA	Japanese Electronic Industry Development Association. A Japanese trade and standards organization. The PC card specifications JEIDA 4.1 and PCMCIA 2.0 are the same.
KB	Kilobyte (1KB = 1,024 bytes)
LAN	Local Area Network
LCD	Liquid Crystal Display
LCM	Liquid Crystal Module
LED	Light Emitting Diode
Li-Ion	Lithium Ion (battery)
MB	Megabyte (1MB = 1,048,576 bytes or 1,024KB)
MESI	Modified Exclusive Shared and Invalid (protocol)
MIDI	Musical Instrument Digital Interface
MMU	Memory Management Unit
MPEG	Motion Picture Experts Group
MS-DOS	Microsoft Disk Operating System

Abbreviation	Meaning
NiMH	Nickel Metal Hydride
NTSC	(National TV Standards Committee) The US color TV standard administered by the FCC. It currently broadcasts at 525 lines of resolution that are transmitted as 30 interlaced frames per second (60 half frames per second, or 60 "fields" per second in TV jargon).
PAL	(Phase Alternating Line) A European color TV standard that broadcasts an analog signal at 625 lines of resolution 25 interlaced frames per second (50 half frames per second).
PCI	Peripheral Component Interconnect
PCMCIA	Personal Computer Memory Card International Association
PGA	Pin Grid Array
PIO	Programmed Input/Output
POST	Power On Self-Test
RAM	Random Access Memory
ROM	Read Only Memory
RTC	Real Time Clock
SIR	Serial Infrared
SMI	System Management Interrupt
SPP	Standard Parallel Port
SRAM	Static Random Access Memory
SVGA	Super Video Graphics Array
S-Video	Super Video. S-video hookups use a special 5-pin connector rather than the common RCA phone plug.
TFT	Thin Film Transistor
USB	Universal Serial Bus

Abbreviation	Meaning
VGA	Video Graphics Array
XGA	Extended Graphics Array
ZV Port	Zoomed Video Port

Appendix D

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