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DECLARATION OF CONFORMITY according to FCC Part 15

Responsible Party Name: Fujitsu PC Corporation

Address: 598 Gibraltar Drive
Milpitas, CA 95035

Telephone: (408) 935-8800

Declares that product: Model: LifeBook 420

Complies with Part 1
of the FCC Rules.

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

David Woo
full name

Fujitsu
company

2/18/97
date



CAUTION

Changes or modification not expressly approved by Fujitsu PC Corporation could void this user's authority to operate the equipment.

FCC Notices

Notice to Users of Radios and Television

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 that is on a different circuit than the receiver.

- **Consult the dealer or an experienced radio/TV technician for help.**

Shielded interconnect cables must be employed with this equipment to ensure compliance with the pertinent RF emission limits governing this device.

If you experience trouble with this equipment please contact your support representative, toll free at 1-800-8FUJITSU (1-800-838-5487) or Fujitsu Computer Products of America (FCPA), 7300 NE Evergreen Parkway, Hillsboro, OR 97124, telephone 503-681-7300.

DOC (Industry Canada) Notices

Notice to Users of Radios and Television

This Class B digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations.

CET appareil numérique de la class B respecte toutes les exigence du Règlement sur le matériel brouilleur du Canada.

UL Notice(For Authorized Repair Technicians Only)

CAUTION: For continued protection against risk of fire, replace only with the same type and rating fuse.

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

WARNING: CMOS Battery may explode if mistreated. Do not recharge, disassemble or dispose of in fire.

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Preface

The LifeBook 400 Series from Fujitsu PC Corporation is a powerful notebook computer. It is powered by an Intel Pentium microprocessor, has a built-in color display, a CD-ROM drive and brings the computing power of desktop personal computers (PCs) to a portable environment.

This manual explains how to operate your LifeBook 400 Series' hardware and built-in system software. The LifeBook 400 Series is compatible with the IBM PC AT.[®] Depending on your model, it comes with Windows[®] 95, Windows for Workgroups[™] Version 3.11 and MS-DOS Version 6.22 or only Windows 95 pre-installed. When you first start your notebook, you will be asked to select a single operating system if both are present. (See pages 11-13 for more information on selecting your operating system.)

Your LifeBook 400 Series is a completely self-contained unit with a passive-matrix (DSTN) color LCD display. It has a powerful interface that enables it to support a variety of optional features. (Figure P-1.)



CAUTION

When you first turn on your LifeBook 400 Series the Windows 95 Setup screen will appear. This is true even if you will be using Windows for Workgroups.

LifeBook 400 Series from Fujitsu

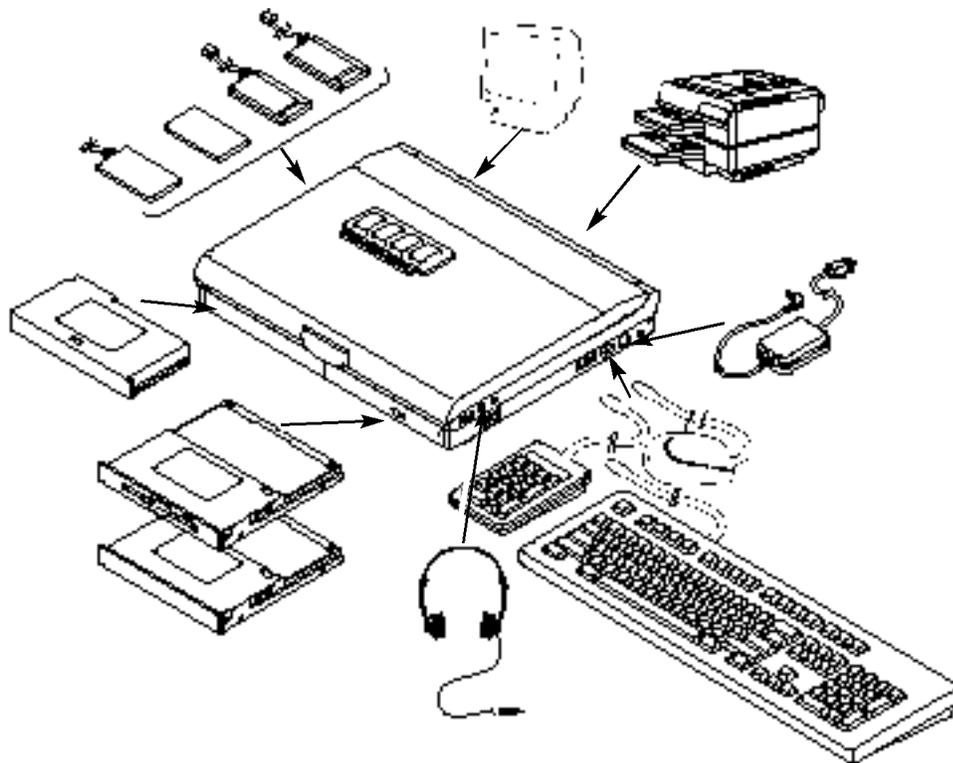


Figure P-1 LifeBook 400 :
with both Fujits
Third Party Op

Conventions Used in the Guide

In this manual, figures which show screens are intended as examples only, and screen and file names may differ in actual use.

Messages displayed by your LifeBook 400 Series appear in Courier type.

Example: Starting MS-DOS

Commands that you enter into your notebook using the keyboard appear in Courier type.

Example: C:>DIR/P

Keyboard keys are shown in boldface Helvetica type.

Example: Fn, F1, Esc, and Ctrl.

Pages with additional information about a specific topic are cross-referenced within the text.

Example: (See page xx.)



POINT

The point icon highlights information that will enhance your understanding of the subject material.



CAUTION

The caution icon highlights information that is important to your safety, to the safe operation of your notebook, or to the integrity of your files. Please read all caution information carefully.

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Section ONE

Setting Up Your LifeBook 400 Series from Fujitsu

This section describes how to set up your LifeBook 400 Series from Fujitsu. We strongly recommend that you read it before using your notebook – even if you are already familiar with notebook computers.

Unpacking

When you receive your notebook, unpack it carefully, and compare the parts you have received with the items listed below.

For a standard configuration you should have:

- LifeBook 400 Series from Fujitsu. (Figure 1-1.)
- AC Adapter with AC power cord (located in the accessories box). (Figure 1-2.)
- Modular 10-speed CD-ROM Drive (already installed in your notebook).
- Modular 3.5" Floppy Disk Drive (located in the accessories box). (Figure 1-3.)

- User's Guide.
- Registration card and customer information pack.
- Microsoft Windows 95 Manual.
- Additional equipment and documentation depending on the option package you have purchased.

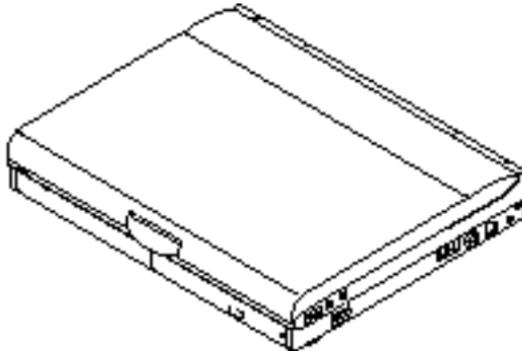


Figure 1-1 LifeBook 400 Series Notebook

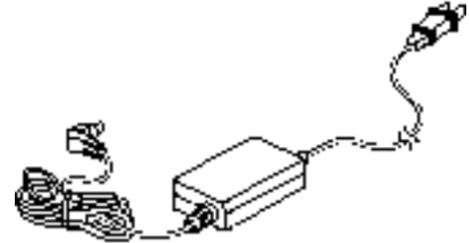


Figure 1-2 AC Adapter Unit



Figure 1-3 Floppy Disk Drive

Setting Up Your LifeBook 400 Series

Once you have checked and confirmed that your notebook system is complete, connect the AC Adapter and follow the instructions on page 9 to accept the conditions for using the LifeBook 400 Series and for selecting the operating system you will use. When you have completed that setup process please complete and send in your registration card.

Overview of LifeBook 400 Series Features

The LifeBook 400 Series is a compact, yet powerful notebook computer available with standard features including:
(See Appendix A, pages 120–123, for detailed information.)

- 120 MHz Intel Pentium™ processor.
- 8MB EDO RAM standard, expandable to 72MB.
- 11.3" passive-matrix (DSTN) color display with 800 x 600 resolution.
- 1MB Video RAM.
- Built-in 1.0GB hard drive.
- Multi-function bay which supports warm swapping of the following:
 - 3.5" floppy disk drive (included with all models).
 - 10-speed CD-ROM drive (included with all models).
- Nickel Metal Hydride (NiMH) Battery Pack.
- 16-bit Sound Blaster™-compatible sound chip.
- Zoom Video port for full motion video acceleration.
- Built-in stereo speakers.
- Two Type II or one Type III PCMCIA slot.
- IrDA 1.0 compatible infrared port for wireless data transfer.
- Integrated TouchPad Pointing Device for easy cursor control.
- External monitor support.
- Full size keyboard with three dedicated Windows 95 keys.
- Hot swap connection for an external keyboard or an external mouse.
- Stereo line input jack.
- Stereo headphone/speaker jack.
- Standard Pre-installed software:
 - Operating System.
 - LapLink 7.0 for file transfers via mode cable or infrared port.
 - PC Doctor for system diagnostics.
 - SoftPEG from CompCore, a MPEG-1 video player.
 - Some models may include additional software.

Component Identification

For detailed specifications refer to Appendix A on pages 120–123.

Display Panel Latch

This latch locks and releases the display panel.

LCD Display Panel

This is a color LCD panel with back lighting for the display of text and graphics.

Brightness Control

The brightness control adjusts the overall intensity of the display screen back lighting.

Contrast Control

The contrast control adjusts the contrast of the display screen. It is located just below the brightness control.

Status Indicator Display

LCD display of the status of the power state and source, Suspend Mode, battery charge, floppy disk drive activity, hard drive activity, CD-ROM drive activity, PCMCIA card activity, Caps Lock, Num Lock and Scroll Lock.

Suspend/Resume Button

The Suspend/Resume Button allows you to suspend computer activity without turning off your notebook power, and to return it to an active state. This feature saves power, and is particularly useful when your notebook is running only on battery power. (See pages 20–21, 36–40, and 67–69 for more information on Power Management.)

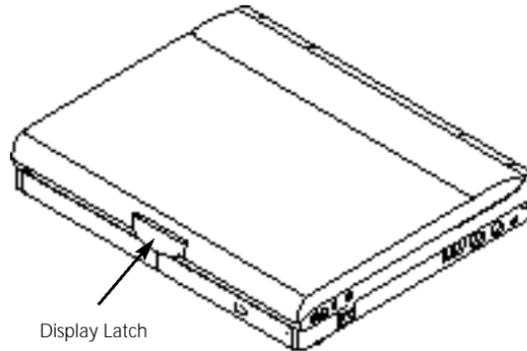


Figure 1-4 Top and Front Panel

Setting Up Your LifeBook 400 Series

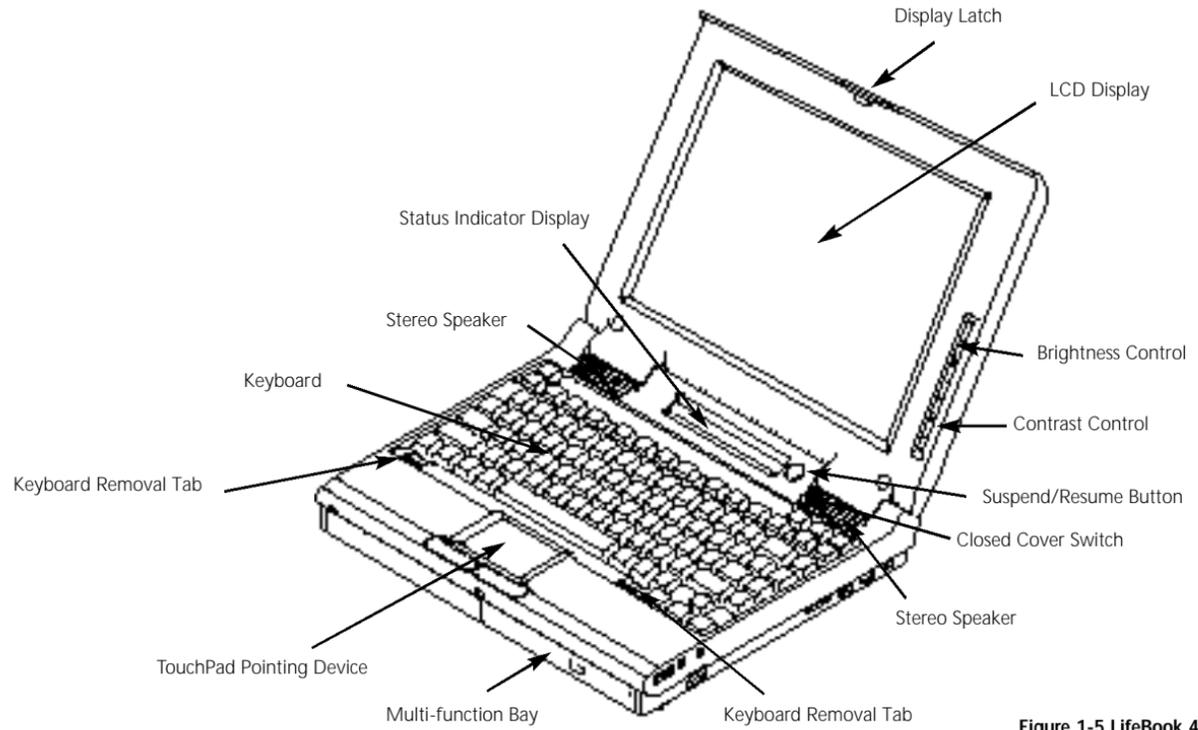


Figure 1-5 LifeBook 400 Series with Display



CAUTION

Be sure you know what settings are active for your Suspend/Resume Button before you use it because misuse can result in data loss. (See the *Power Savings Menu of the BIOS Setup Utility on page 68* for more information.)

Closed Cover Switch

This switch turns off the LCD back lighting when the display panel is closed, thus saving power.

Speakers

The built-in dual speakers output stereo sound from your notebook.

Keyboard

A full size keyboard with dedicated Windows 95 keys for input into your notebook.

Keyboard Removal Tabs

A pair of tabs which cover screws which hold

the front of the keyboard in place. Lifting the tabs is only necessary to access the Memory Expansion Chamber which is under the keyboard. (See pages 76–79 for more information.)



CAUTION

Do not attempt to install or remove a RAM Module if your notebook has been recently used. The surface area under the keyboard can be very hot and may injure you.

TouchPad Pointing Device

A touch sensitive cursor control system with two click buttons.

Multi-function Bay

This bay accommodates:

- 10-speed CD-ROM drive.
- 3.5" floppy disk drive.

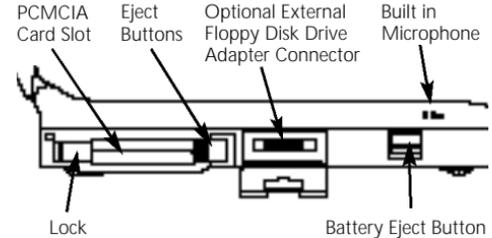


Figure 1-6 LifeBook 400 Series Left Side Panel

PCMCIA Card Slot, with Cover, Lock and Eject Button

The PCMCIA Card Slot allows you to install two type I or II PCMCIA cards or one type III PCMCIA card. (See pages 79–81 for more information on PCMCIA cards.) The button to the left of the card slot locks the card in place, and the buttons to the right of the slot eject the card(s) from the slot.

External Floppy Disk Drive Adapter Connector

A connector for attaching an optional external floppy disk drive adapter. The adapter allows you to use your modular floppy disk drive when the multi-function bay is being used for another purpose.

Setting Up Your LifeBook 400 Series

Main Battery Eject Button

This releases the Removable Main Nickel Metal Hydride Battery Pack for removal and installation.

Built-in Microphone

The built-in microphone allows mono audio input to your notebook.

Volume Control

This knob provides hardware control of sound level of audio outputs from your notebook.

Audio Input Jack

The Audio Input Jack allows you to connect an external audio source to your notebook, like an audio cassette player. This jack will not support an external microphone.

Headphone Jack

You can install headphones or powered external speakers in the Headphone Jack.

Multi-function Bay Release Button

This is the release to allow removal and installation of devices in the Multi-function Bay.

Power Switch

This switch is the main power switch for your notebook.

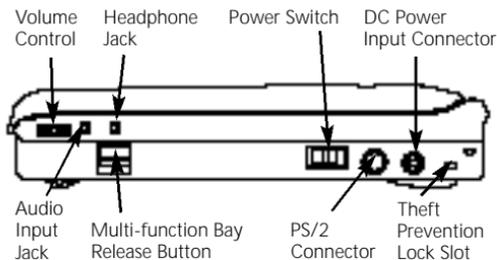


Figure 1-7 LifeBook 400 Series Right Side Panel

PS/2 Connector

The connector allows you to connect an external PS/2 keyboard, mouse, or numeric keypad.

DC Power Input Connector

The DC Power Input Connector allows you to plug in the Fujitsu AC Adapter or the optional Fujitsu Auto Adapter.

Theft Prevention Lock Slot

This is a slot that allows you to attach a physical lock down device.

Serial Interface Connector (COM Port)

The Serial Interface Connector allows you to connect serial RS-232C devices, such as a serial printer or a serial scanner.

Expansion Bus Connector

This connector is for connection to an optical port replicator or docking station. The connector cover must be closed and the sliding panel opened to reveal only the Expansion Bus Connector when connecting a port replicator or docking station.



CAUTION

There are software volume controls. The knob setting and the software settings will interact. Software volume Off will override the knob setting. (See *Volume Control* on page 41 for more information.)

Parallel Interface Connector (LPT Port)

The Parallel Interface Connector allows you to connect parallel devices, such as a parallel printer to your notebook.

External SVGA or Hi Res Monitor Connector

This connector allows you to connect an external VGA or SVGA CRT or Hi-Res monitor.

Infrared IrDA Compatible Communication Port

The IrDA compatible Communication Port allows you to communicate with another IrDA compatible device without a cable. (See page 41 for more information.)

Tilt Adjustment Feet

These are a pair of feet which flip down and hold the back of the keyboard approximately 6° higher than the front when resting on a flat surface. They are designed to make using your notebook keyboard more comfortable.

Main Unit Label

This label has the model number, serial number and other information about your notebook.

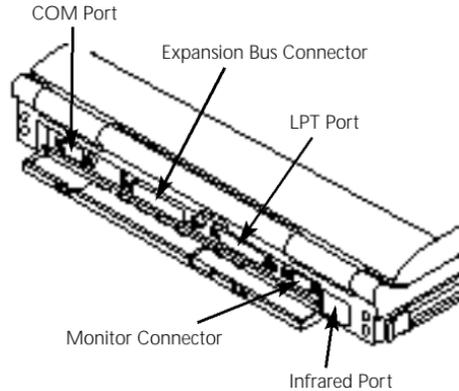


Figure 1-8 LifeBook 400 Series Back



CAUTION

The cover which closes over the connectors on the rear of your notebook can be damaged if it is left open when your notebook is moved around.

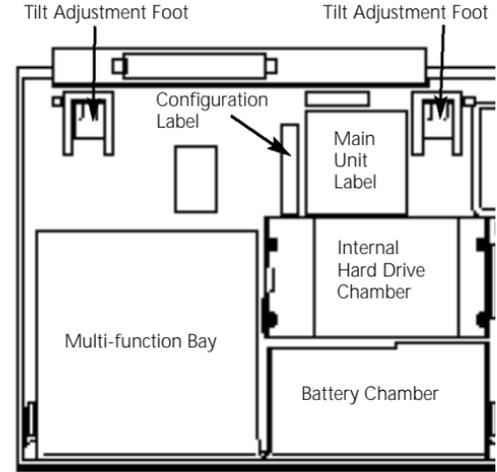


Figure 1-9 LifeBook 400 Series Bottom

Configuration Label

This label has manufacturer information that you will need to give your support representative so that he or she can help you. It exactly identifies the version of various component parts of your notebook.

Internal Hard Drive Chamber

This chamber houses the internal hard drive. It should only be accessed for maintenance by an authorized maintenance provider.

Battery Chamber

This chamber houses the Nickel Metal Hydride Battery Pack or the optional Lithium ion Battery Pack.



CAUTION

The Nickel Metal Hydride Battery Pack is not charged when you purchase your notebook. Initially you will need to connect the AC Adapter or the Auto Adapter to use it. It can take up to 3 hours to charge a Battery Pack if your notebook is Off or in Suspend Mode. If your notebook is in use, it can take up to 9 hours or more to charge a Battery Pack.

Power Sources

Your notebook has three possible power sources: the Nickel Metal Hydride Battery Pack, the AC Adapter, or the optional Auto Adapter.

Connecting the Power Adapters

The AC Adapter or the Auto Adapter provides power for operating your notebook and charging the battery pack. (Figure 1-10.)

To Connect the AC Adapter

1. Plug the DC output cable of the AC Adapter into the DC Power Input Connector on the right side panel of your notebook.
2. Plug the AC Adapter into an AC electrical outlet.

To Connect the Optional Auto Adapter

1. Plug the DC output cable into the DC Power Input Connector on the right side panel of your notebook.
2. Plug the Auto Connector into the cigarette lighter of a car or other vehicle with the ignition key in the On or the Accessories position.

Data Security

Your LifeBook 400 Series has a built-in hard control password security feature that allows to protect the data stored in your notebook from unauthorized access. Your operating system : some applications have software control password security features that allows you to protect all or portions of the data stored in your notebook from unauthorized access.

Hardware Data Security Features

When you are using your notebook built-in hardware control password to gain access to your notebook the actual password will not appear on the screen. This is a safety precaution. The hardware control security parameters are set from the BIOS Setup Utility. (See Security Menu on pages 65–67 for more information on setting and clearing password and enabling and disabling built-in security features.)

Software Data Security Features

The operating system and some applications have security features that are independent of the built-in hardware protection features that are controlled from the BIOS. See your software documentation for more information about these features.



CAUTION

Make sure you memorize your passwords, both hardware and software. If you forget, you may not be able to use your notebook, and you will have to contact your service provider and arrange to have them reset the hardware system password. See your software manuals for what to do if you forget your software security password(s).



CAUTION

Software security feature passwords may not be the same as the hardware security passwords. Be sure you know which features are controlled from software and which from hardware or you may lock yourself out of your own data or lock up your hardware and not be able to operate your notebook.

Starting Your Notebook for the First Time

Booting the System

The first time that you turn on your notebook you will need to attach your AC Adapter as the battery is not charged when it arrives. We strongly recommend that you do not attach any other external devices and do not put any CD or floppy disk in the drives until you have gone through the initial power on sequence.

When you turn on your notebook for the first time it will perform a power on self test and display some status information on the screen with a message

Press <F2> for Setup

if you do nothing the system will read the hard drive for the operating system software and the Windows 95 Setup Screen will appear. (See Power On on pages 21–22 for additional help.) You will then be stepped through the condition of use and operating system selection process. You must complete this initial process before you will be able to use your notebook.



CAUTION

If you have purchased a system which allows you to use a choice of operating systems, the Operating System selection can only be made once. You cannot change your mind, the option will never be available again.

Setting Up Your LifeBook 400 Series

Conditions of Use

The first time you start your notebook you must confirm your acceptance of the copyright limitations for your pre-installed software. If you have purchased a unit which allows you to use a choice of operating systems you must choose between Windows 95 and Windows for Workgroups. Once you have chosen your operating system you cannot change your mind, the other system will not be available to you. Please decide carefully. After your notebook completes the installation of the operating system it will not ask you again for confirmation of the conditions of use nor to choose an operating system.



CAUTION

When you first turn on your notebook the Windows 95 Setup screen will appear. This is true even if you will be using Windows for Workgroups.

Every LifeBook 400 Series Model has 10 screens to read carefully and/or answer questions by typing in information. If your notebook has a choice to use Windows for Workgroups there will be three additional screens. All of the screens are Windows 95 Setup screens.

You cannot use your notebook until this setup process is completed. The bottom of each screen has a <Back Button, a Next> Button and a Cancel Button which are activated by the Integrated Touchpad Pointing Device cursor control and button click. The <Back Button will return you to the previous screen. The Next> Button activates any choices or information you have entered and takes you on to the next screen. The Cancel Button allows you to stop the setup process. If you stop the process your notebook will come back to the place in the Windows 95 Setup where you left off the next time you start your machine. The screens you will be required to respond to are shown with the required action.

Welcome to Windows Setup

Read and then click on the Next> Button.

Regional Settings

Select language, number format, date format etc. for the operating system to use by moving cursor up and down the list to the desired world region shown in the table and then click on the Next> Button. Use the up arrow ↑ and down arrow ↓ keys to move down up and down the text one line at a time.

Keyboard Layout

Select the keyboard language and format you wish to use by moving cursor up and down list to the desired selection shown in the table and then click on the Next> Button. You can scroll through the text using the up arrow ↑ and down arrow ↓ keys to move down up and down the text one line at a time.

User Information – Software Licensing

Fill in your name and your company name you would like to see it on the software license and then click on the Next> Button. You must make an entry in order to continue.

**POINT**

If your system comes with Windows 95 **only**, you will find a Recovery CD-ROM packet in your accessories box. Please store the packet in a safe place in case there is a loss of data. (See *Restoring Your Pre-installed Software from CD-ROM on page 114.*)

License of Windows 95

Read carefully and then click on the **Next>** Button.

License Agreement

Read the agreement carefully. You can scroll through the text using the Integrated TouchPad Pointing Device to activate the scroll bar or use the up arrow ↑ and down arrow ↓ keys to move up and down the text one line at a time. When you finish reading simply point and click to accept or reject the terms of the agreement and then click on the **Next>** Button.

**POINT**

If you reject the terms of the license agreement the operating system setup will abort and shutdown your notebook. When you turn on the system the next time, it will begin the Setup process again.

Certificate of Authenticity

Look in the box that your notebook came in and you will find a Windows 95 Certificate of Authenticity and a Windows 95 Users manual. On the certificate and also on the back of the manual you will find a bar-code with a number above it. These numbers should be the same. They are your product code and the number you should enter on the Certificate of Authenticity screen. When you have entered the number exactly as shown then click on the **Next>** Button.

**CAUTION**

If your system came with a choice of operating systems, you will need to make back up disks. (See *Create System Disks page 13.*)

***Windows Version**

To select Windows for Workgroups point and click on the **Change** Button. To select Windows 95 point and click on the **Next>** Button. (If you select Windows 95 you will go directly to the Configuring the Computer Screen.)

***Operating System Choice**

To select Windows for Workgroups point and click on the Windows for Workgroups selection and then point and click on the **Next>** Button. To select Windows 95 point and click on the Windows 95 selection and then point and click on the **Next>** Button.

Configuring the Computer

If you have a unit with only Windows 95 or have selected Windows 95 this screen will appear when Windows 95 is ready to install. (If you purchased a LifeBook 400 Series which only comes with Windows 95 this screen will appear immediately after the Certificate of Authenticity Screen.) You may be prompted for time zone and printer. You do not need to select a printer at this time.

Setting Up Your LifeBook 400 Series

Installing Devices

This screen will appear while your notebook loads the operating system and when it finishes it will automatically go to the next screen.



CAUTION

If you have chosen Windows for Workgroups please fill out the fulfillment coupon that came in the box with your notebook and send it, and the Windows 95 manual, to the address provided.

When the coupon and manual are received, you will be sent a set of Windows for Workgroups backup disks and manual.

*Create System Disks

If your system came with a choice of operating systems, you will be prompted to create system disks. We strongly recommend that you make a system backup so you can restore your factory

installed software in case of data loss. If you have chosen Windows 95 you will need to backup your operating system and your factory installed applications and drivers. The backup will require 40 floppy disks. If you have chosen Windows for Workgroups you only need to backup the factory installed applications and drivers. The backup will require 9 floppy disks.

Finishing Setup

Click on the Finish Button and your notebook will restart with the selected Windows operating system ready for normal operation.



POINT

If you do not have enough floppy disks available during the setup process you can create system backup disks at any time. From the Start Menu, select Accessories, then System Tools, then Create System Disks.

User Registration

There are three ways to register your notebook.

- 1. Mail-in Registration – Fill in the registration card provided in the box with your LifeBook 400 Series and mail it to Fujitsu.**
- 2. On-line Electronic Registration – Fill out registration form behind the Fujitsu Icon on your Desktop and send it by e-mail.**
- 3. Internet Registration – Use the registration utility on the Fujitsu PC Service and Support Web Site at www.8fujitsu.com to register notebook.**

Learning About Your Operating System and Application Software

Tutorials

All operating systems and most application software have tutorials built-in. We highly recommend that you step through the tutorial before you use an application, even if you are familiar with the same application on a different machine, an earlier version of the application, or with a similar product.

Manuals

In the accessories box you will find manuals for Windows 95 and other pre-installed software. Some software manuals are available on-line and are not in the box. See the help screens of your software. We recommend that you review these manuals for general information on the use of these applications and to get a basic understanding of what is covered in the manual, and how it is organized, should questions arise as you use the applications.

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Section TWO

Using Your LifeBook 400 Series from Fujitsu

This section describes the indicators, buttons, connections and operating modes of your LifeBook 400 Series and their use.

Opening the Unit

Lifting the latch releases the cover and allows your notebook to be opened. Lift the display backward until the screen is at a comfortable viewing angle. (Figure 2-1.)

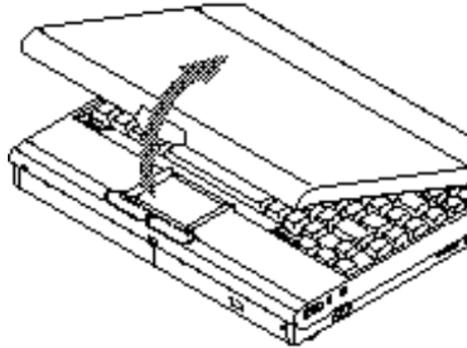


Figure 2-1 Opening the LCD Display

Adjusting the Built-in Display

When you turn on your notebook, you may want to adjust the brightness level of the screen for best visibility. To do this, adjust the brightness slider on the right side of the built-in display screen. You may need to adjust the brightness periodically for different operating environments. You will probably want to adjust the contrast as well as the brightness. To do this, use the contrast slider on the right side of the built-in display screen just below the brightness control. (Figure 2-2.)



POINT

The higher the level of brightness, the more power your notebook will consume, and the faster the battery will discharge.

Adjusting the Keyboard Angle

On the bottom of your notebook, near the back, are a pair of feet which flip down and hold the back of the keyboard about 6° higher than the front when resting on a flat surface.

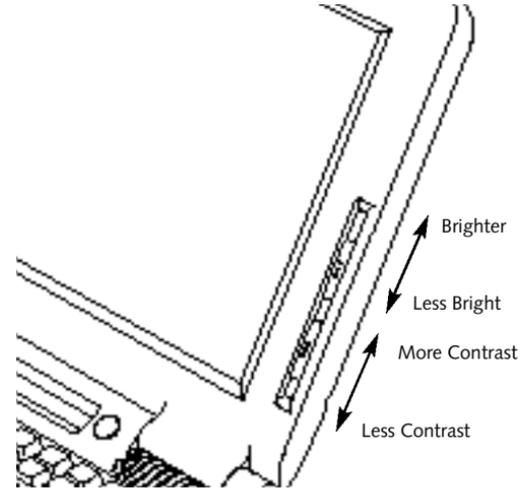


Figure 2-2 Display Adjustments

They are designed to make using your notebook more comfortable when using the keyboard. The feet must be folded flat against the bottom of your notebook when opening or using a CD-ROM or it will not open or operate properly. (Figure 1-9 on page 8.)

Using Your LifeBook 400 Series



CAUTION

Do not operate the CD-ROM drive or attempt to open the tray unless your notebook is sitting on a flat surface and the adjustment feet are folded against the bottom of your notebook. Using a CD-ROM drive when it is not level may damage the drive or prevent proper operation.



CAUTION

When you are not using the adjustment feet be sure that they are folded flat against the bottom of your notebook. They could be broken off, or injure someone, if not used properly.

Status Indicator Panel

The Status Indicator LCD Display Panel is located in the recess just above the keyboard. (Figure 2-3.) The appropriate indicators become visible when you use your notebook.

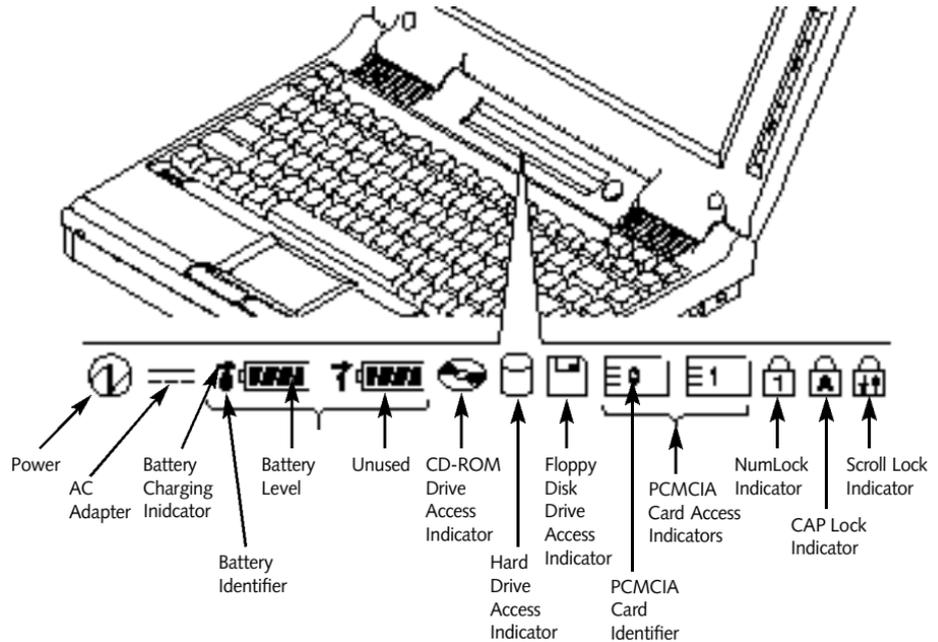


Figure 2-3 Status Indicators

Power Indicator

The Power Indicator tells you when the system is operational. It is on steady when there is power to your notebook, and blinks when the system is in Suspend Mode. It goes off when the system has entered Save-to-Disk Mode, has entered the Windows 95 shutdown inactivity state, or the power is turned off from the Power Switch.



POINT

When your notebook has been shut-down from Windows 95, it is the same as turned off from the Power Switch except that it can be turned on by pressing the Suspend/Resume Button. It is not drawing current in this state.

AC Adapter Indicator

The AC Adapter Indicator tells you whether the system is operating on the AC or Auto Adapter, or running on battery alone. The indicator is On

when either of the adapters is active and Off when power comes from the battery alone. If a battery is charging the power adapter is active regardless of the setting of the Power Switch. The AC Adapter is also active in the Windows shutdown state, regardless of the battery status. If there is no battery charging, and the Power Switch is Off, then the AC Adapter Indicator and the Battery Condition Indicator will all be Off.

Battery Condition Indicator

This indicator shows whether or not the Nickel Metal Hydride Battery Pack is installed and indicates the condition. (Figure 2-3.) Battery 0 is the Nickel Metal Hydride Battery Pack. The Battery Status Indicator is displayed only if the battery is installed. (Battery 1 display will flash when you power up but will never be displayed.)

A small arrow icon appears to the left of the battery symbol and above the number if the battery is charging. The charging indicator flashes if the battery is too hot or too cold to charge. The charging indicator operates whether the Power Switch is Off or On. The symbols inside the bat-

tery outline indicate the operating level available for the battery. (Figure 2-4.) If there is no battery charging and the Power Switch is Off then the AC Adapter Indicator and the Battery Condition Indicator will all be Off.

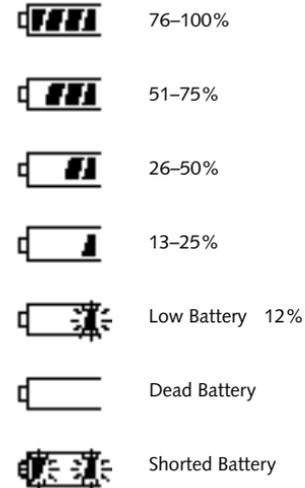


Figure 2-4 Battery Condition Indicator

Using Your LifeBook 400 Series**CAUTION**

Turning off the power with the Power Switch or using the Suspend/Resume Button when any of the Access Indicators are On may cause loss of data and/or system errors.

CD-ROM Drive Access Indicator

The CD-ROM Access Indicator tells you a CD-ROM is being accessed.

**POINT**

When using Windows 95, the CD-ROM automatic insertion function periodically checks for a CD installed in the drive, causing the access indicator to flash. The CD automatic insertion function allows the system to automatically start a CD application as soon as a CD is inserted in the drive and the tray is closed. It will begin playing an audio CD or will start an application if the CD has an auto run file on it.

**POINT**

If you do not wish to have the CD automatic insertion function you can disable it.

In order to disable the CD automatic insertion function proceed as follows:

- 1. Save all data and close all applications.**
- 2. Click on the Start Button.**
- 3. Point to Settings.**
- 4. Click on the Control Panel. The Control Panel window will be displayed.**
- 5. Double click on the System icon. The System Properties dialogue box will be displayed.**
- 6. Click on the Device Manager tab. The device list will be displayed.**

7. Click on the + to the left of the CD-ROM icon. MATSUSHITA UJDCD6710 will be displayed.

8. Click on MATSUSHITA UJDCD6710.

9. Click on Properties. The MATSUSHITA UJDCD6710 Properties dialogue box will be displayed.

10. Click on the Settings tab.

11. Click on the automatic insertion box to toggle it Off.

12. Click on OK.

13. Click on OK in the System Properties dialogue box.

14. Restart your notebook according to the message displayed.

You can re-enable the function by repeating the process except in step 11 change the setting to On.



CAUTION

If you switch off power using the Power Switch or operate the Suspend/Resume Button while any of the access indicators are on, you may cause data to be lost and/or a system error to occur.

Hard Drive Access Indicator

The Hard Drive Access Indicator tells you when the internal hard disk is being accessed.

Floppy Disk Drive Access Indicator

The Floppy Disk Drive Access Indicator tells you a floppy disk is being accessed.

PCMCIA Card Access Indicators

The PCMCIA Card Access Indicator tells you an installed PCMCIA card is being accessed. Card 0 is the bottom connector and Card 1 is the upper connector in the card slot. Type III cards are always Card 0 only.



POINT

Windows 95 displays of PCMCIA slot numbers may be different than the Status Indicator slot numbers.

NumLock Indicator

The NumLock Indicator tells you the internal keyboard is set in ten-key numeric mode. (See pages 29–30 for more information on the numeric keypad.) You can activate the NumLock Mode by pressing the Scr Lk/Num Lk key while holding down the Shift key. Deactivate the mode the same way that you activated it. This indicator is inactive if you are using an external keyboard.

CapsLock Indicator

The CapsLock Indicator tells you when the keyboard is set for all capital letters. Activate the Caps Lock Mode by pressing the CapsLock key on the keyboard. Deactivate the mode the same way that you activated it. This indicator is inactive if you are using an external keyboard.

ScrollLock Indicator

The ScrollLock Indicator tells you when you are in Scroll Lock Mode. You can activate or deactivate the scroll lock mode by pressing the Scr Lk/Num Lk key. Deactivate the mode the same way that you activated it. This indicator is inactive if you are using an external keyboard.

Power Center by Fujitsu

Your notebook desktop has multiple power items. There is a Power Bar which automatically displays the charge condition of the battery and a set of control icons as the pointer moves along near it. There is a power icon in the task bar in the lower right of the display. There is a power management icon in the Startup Folder of the Program Folder of the Start Menu. There is a Power icon in the Control Panel. All of these desktop power items are related to the Power Savings Menu choices in the BIOS Setup Utility. (See pages 67–69 for explanations of each of the BIOS Setup Utility power savings features and their default settings.)

Using Your LifeBook 400 Series

The Power Bar icons allow you to go into Suspend Mode or Save-to-Disk Mode and to select power management features as well as accessing help screens. The AC Mode PM Setup allows you to set Power Savings parameters which your notebook will use whenever a power adapter is providing power. The Low Battery Mode PM Setup allows you to set Power Savings parameters which your notebook will use whenever the battery power reaches the low battery alarm level. The PM Setup allows you to set Power Savings parameters which your notebook will use whenever it is operating on battery power only and the battery levels are above the alarm level. The alarm level is approximately 10% of full power. Each of the three power condition power setups include the same parameters as the BIOS Setup Utility except the Suspend/Resume Button enable and the Modem related settings.

The Power icon in the Control Panel allows you to enable or disable the Allow Windows To Manage Computer Power feature. When it is enabled the settings you choose from the Power

Bar icons will control the power saving features. When it is disabled the BIOS Setup Utility settings will control the power saving features. You can also choose power saving parameters for the internal hard drive and PCMCIA card slots. The saving parameters for the internal hard drive and PCMCIA card slots are not available from the BIOS Setup Utility.



POINT

You must restart your notebook for the Control Panel setting changes to take affect.

The Power Icon in the task bar in the lower right of the display shows the charge condition of the battery power and allows you to enable or disable the low battery warning. The warning is enabled if the check mark appears in front of the statement.

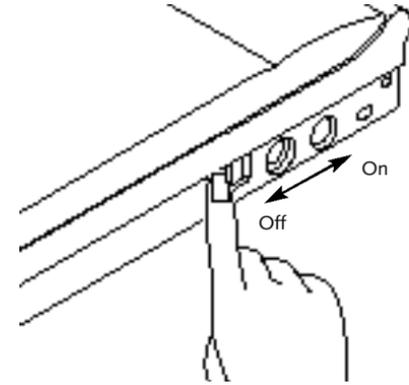


Figure 2-5 Power Switch

Power On

Facing the Keyboard and Built-in Display, move the Power Switch towards the rear of your notebook. This is the On position. (See Figure 2-5.) When you are done working you can leave your notebook in Suspend Mode, (see pages 38 and 69), or you can turn it off. The Power Switch moved toward the front of your notebook is in the Off position. See the section Power Off, (page 23), for recommended shutdown procedures.



CAUTION

After turning your notebook off, make sure that it has been off at least 10 seconds before turning the Power Switch to On. If you do not, it could cause a system error.

When you turn on your notebook be sure you have a power source. This means that the battery is installed and charged, or that the AC Adapter or the Auto Adapter is connected and has power.



CAUTION

When the power is On, do not carry your notebook around, or subject it to shocks or vibration, as you risk damaging your notebook.



CAUTION

The Nickel Metal Hydride Battery Pack is not charged when you purchase your notebook. Initially you will need to connect the AC Adapter to use it.

When the Power Switch is turned On, your notebook carries out a Power On Self Test to check the internal parts and configuration. If a fault is found a beep will sound and/or an error message will be displayed. (See *Troubleshooting on pages 91–109*) Depending on the nature of the problem, you may be able to continue by starting the operating system or by entering the Setup Utility and revising the settings.

After satisfactory completion of the Power On Self Test your notebook will load the operating system. (See *Boot Menu on pages 71–72* to see which kind of disk will be the source.)



CAUTION

Never turn off your notebook during Power On Self Test or it will cause an error message to be displayed when you turn your notebook on the next time. (See the *Trouble-shooting information on pages 110–112.*)

Special Operating System Features
Every Windows desktop has some standard icons. To learn about these icons see the Windows manual or help screens. Your notebook desktop has some icons, such as a Fujitsu Icon, which are not standard Windows Icons. You can click on each one to see what is controlled. It will vary for different models.

Some special control features of your notebook are accessed from icons on the Windows Control Panel: PCMCIA card control; TouchPad cursor control adjustments; multimedia controls; and others.

Using the Fujitsu Icon

The Fujitsu Icon has product registration forms and instructions, change of address information and forms, contact information including telephone numbers and e-mail addresses and an accessory catalog with the information for ordering accessories for your notebook. Double click on the Icon and then on the selection you wish.

Power Off

Before turning off the power by putting the Power Switch in the Off position, check that the Hard Disk, CD-ROM, PCMCIA card and the Floppy Disk Access Indicators are all Off. (See Figure 2-3, page 17.) If you turn off the power while accessing a disk or PCMCIA card there is a risk of loss of data. The Off position is reached by facing the Keyboard and Built-in Display and moving the switch toward the front of your notebook. To assure that your notebook shuts down without error, use the shutdown sequence for the operating system.



CAUTION

Never turn your notebook off while an application is running. Be sure to close all files, exit all applications and shutdown the operating system prior to turning off the power with the Power Switch. If files are open when you turn the power off, you will lose any changes that have not been saved, and may cause disk errors.

Shutting down your notebook from the operating system lets it close down operations and turn off the power in the proper sequence to prevent errors. The sequences are:

Windows 95

1. Go to the Start Button Menu.
2. Click on Shutdown.
3. Verify that Shutdown is selected and click on YES.



POINT

If you do not turn the Power Switch to Off after shutting down you must use the use the Suspend/Resume Button to turn on your notebook as the Power Switch will already be in the On position.

Windows 3.1

1. Save all data and exit all applications.
2. Exit Windows.
3. When the MS-DOS prompt appears put the Power Switch in the Off position.

MS-DOS

1. Save all data and exit all applications.
2. When the MS-DOS prompt appears put the Power Switch in the Off position.

If you are going to store your notebook for a month or more, take the following precautions:

- Remove any CD and/or floppy disk.
- Turn off your notebook using the Power Switch.
- Close the notebook lid.
- Disconnect the AC Adapter.
- Remove the battery and store it separately in a cool dry place.

Restarting the System

When you wish to restart the system be sure that you follow the appropriate procedure for the operating system. The procedures are as follows:

Windows 95

1. Go to the Start Button Menu.

2. Click on

Restart the computer?

3. Verify that Restart the computer? is selected and click on YES. Windows will shutdown and restart your notebook.

NOTE: You may also select Shut down the computer? and once the Power is off for 10

seconds or more you can restart your notebook with the Resume Button. You may also select Shut down the computer and once the Power is Off turn the Power Switch to Off for 10 seconds or more and then turn the Power Switch to On. These alternative methods are not recommended.



POINT

In Windows 95 pressing the Ctrl+Alt+Del keys simultaneously triggers the Shutdown submenu of the Start Button Menu.

Windows 3.1

1. Save all data.

2. Exit all applications.

3. Exit Windows.

4. When the MS-DOS prompt appears press the Ctrl+Alt+Del keys simultaneously. Or, when

the MS-DOS prompt appears put the Power Switch in the Off position for 10 seconds or more and then put the Power Switch in the On position.

MS-DOS

1. Save all data.

2. Exit all applications.

3. When the MS-DOS prompt appears press the Ctrl+Alt+Del keys simultaneously. Or, when the MS-DOS prompt appears put the Power Switch in the Off position for 10 seconds or more, and then put the Power Switch in the On position.



CAUTION

Turning off the Power Switch without exiting Windows 95 may cause an error when you start the next time. Turning the power to On when it has been Off for less than 10 seconds may also cause an error when you start the next time.

Battery

The Nickel Metal Hydride Battery Pack is a rechargeable battery with an operating time of up to 2 hours depending on active Power Savings features and user activity levels. The battery operating time may become shorter than the reference value if it is used under the following conditions:

- When used at temperatures that exceed a low of 5°C or a high of 35°C. High temperatures not only reduce charging efficiency, but can also cause battery deterioration. (The charging icon on the Status Indicator Panel will flash when you try to charge a battery that is outside its operating temperature range.)
- The battery charging capacity is reduced as the battery ages. If the battery is running low quickly, you should replace it with a new one.
- When using a high current device such as a modem, a LAN card, the CD-ROM drive, or the hard drive frequently.

Using the AC Adapter will conserve the battery when using a high current device such as a modem, a LAN card, the CD-ROM drive, or the hard drive frequently.



CAUTION

Actual battery life will vary based on screen brightness, applications, features, power management setting, battery conditioning, and other customer preferences. CD-ROM or hard drive usage may also have a significant impact on battery life.



CAUTION

Do not leave a faulty battery in your notebook. It might damage the AC Adapter, optional Auto Adapter, or your notebook itself. It may also prevent operation of your notebook by draining all available current into the bad battery.



CAUTION

Under federal, state or local law it may be illegal to dispose of batteries by putting them in the trash. Please take care of our environment and dispose of batteries properly. Check with your local government authority for details regarding recycling or

disposing of old batteries. If you cannot find this information elsewhere, contact your support representative at 1-800-8FUJITSU (1-800-838-5487).

Shorted Battery

If the Status Indicator shows a shorted battery, check the installation by removing and reinstalling it. If it still shows that it is shorted, replace it with a new battery.

Recharging the Battery

If you want to check the condition of the Nickel Metal Hydride Battery Pack, check the Battery Status Indicator located on the Status Panel. This indicator changes as the battery level changes. Battery 0 is the Nickel Metal Hydride Battery Pack. (Figure 2-3 on page 17.) You can also check the Fujitsu Power Center.

The battery is recharged internally using the AC Adapter or Auto Adapter. To recharge the battery: Make sure the battery to be charged is installed in your notebook and connect the AC Adapter or Auto Adapter. During charging, an

arrow is displayed just to the left of the battery icon on the Status Indicator. The percentage charge is also shown inside the Battery Icon. (Figure 2-4 on page 18.)

The charging time from fully discharged is up to approximately 3 hours when your notebook is Off or in Suspend Mode. The charge times will be significantly longer if your notebook is in use while the battery is charging (up to approximately 9 hours with normal operating levels).



CAUTION

Using heavy current devices such as LAN cards or frequent CD-ROM accesses may prevent charging completely.

Switching From AC Adapter To Battery Power
1. Be sure that you have a charged battery installed.

2. Remove the AC Adapter.

Low Battery State

When the battery is running low, your notebook beeps about every 15 seconds and the Battery Status Indicator flashes. If you do not respond to the low battery alarm, the battery will continue to discharge until it is too low to operate. When this happens there will be a multiple beep alarm, the Status Indicator will show dead battery, and your notebook will go into Suspend Mode to try and protect your data as long as possible. The Power Savings settings do not affect whether the dead battery alarm level will send your notebook into Suspend Mode. (Figure 2-3 on page 17.)

When the low battery alarm occurs you need to save all your active data and put your notebook into Suspend Mode until you can provide a new power source. You should provide this power as soon as possible. The new power source can be a charged battery or a power adapter, either AC or Auto.



CAUTION

You may not be able to hear the audio alarms if the volume control is set too low, or is turned off by either hardware or software, but you will still be able to see the Battery Status Indicator flash.



CAUTION

When you are in Suspend Mode there must always be at least one power source active at all times. If you turn off the power with the Power Switch, or remove all power sources, Main Battery, AC Adapter or Auto Adapter, while your notebook is in Suspend Mode any data which has not been saved to disk will be lost.

Using Your LifeBook 400 Series

Once your notebook goes into Dead Battery Suspend Mode you will be unable to resume operation until you provide a source of power either from an AC Adapter, or an optional Auto Adapter. Dead Battery Suspend Mode shows on the Status Indicator just like the normal Suspend Mode. Once you have provided power, you will need to press the Resume Button to resume operation. In the Suspend Mode, your data can be maintained for sometime. If a power source is not provided promptly, the Power Indicator will stop flashing and go out, and you will have lost the data that was not stored.

Once you provide power you can continue to use your notebook while an adapter is charging the battery, but the battery trickle charges under these conditions. If you want to charge the battery more quickly, put your notebook into Suspend Mode, or turn it off, while the adapter is charging the battery. (See *Power Off* on page 23 for shutdown procedures.)

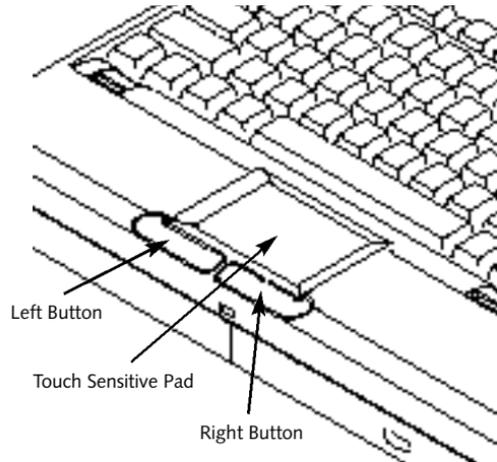


Figure 2-6 TouchPad Pointing Device

Integrated TouchPad Pointing Device

The TouchPad pointing device is composed of a small rectangular touch sensitive pad and two buttons located in front of the keyboard. The TouchPad pointing device has the function of a mouse, and moves the cursor around on the screen – up, down, left and right. A light pressure with the tip of your finger is all that is required to operate the pad. Pencil erasers, etc. do not work. The faster you move your finger the faster the cursor will move. The second part of the TouchPad pointing device – the buttons – function as mouse buttons, and the functions they perform depend on the application you are running. Figure 2-6 shows the position of the pointing device and mouse buttons.



CAUTION

There is no guarantee that data will not be lost once your notebook enters the Dead Battery Suspend Mode.



POINT

An external mouse can be connected to the PS/2 Connector on the right side of your notebook, and used at the same time as the Internal TouchPad Pointing Device.

 **POINT**

The left (primary) mouse button functions can also be performed with your finger on the TouchPad. You can disable the TouchPad actuation of the button functions. (See *TouchPad Pointing Device Sensitivity Adjustments on page 29.*)

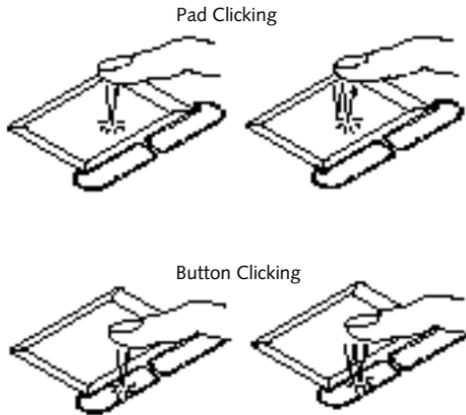


Figure 2-7 Clipping

Clicking

Clicking means pushing and releasing a releasing a button. To left-click (primary-click) move the screen cursor to the item you wish to select, press the left (primary) pointing device button once, and then immediately release it. To right-click, move the mouse cursor to the item you wish to select, press the right pointing device button once so that it makes a clicking sound, and then immediately release it. (Figure 2-7.) You can also left (primary) click by a light tap ending with the finger off the pad, instead of using the button.

Double-Clicking

Double-clicking means following the Clipping procedure above, but pressing the pointing device button twice in rapid succession. Double click works with either the left or the right button. Double left (primary) clicking can be done on the touch pad, instead of using the button. It is similar to single left clicking using the touch pad – two light taps ending with the finger off the pad.

 **CAUTION**

If the interval between clicks is too long, the double-click will not be executed.

 **POINT**

The interval between taps for double clicking, and other parameters of pointing and selecting, can be adjusted with the selections in the menu of the Mouse Icon in the Windows Control Panel.

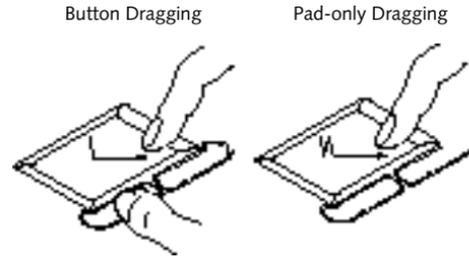


Figure 2-8 Dragging

Dragging

Dragging means selecting an item with the pointing cursor, and while keeping the left (primary) pointing device button depressed, moving the cursor to the desired location, then releasing the button. (Figure 2-8.) Dragging can also be done on the TouchPad without use of the button – two light taps ending with the finger on the pad and then moving. The function of dragging can be adjusted from the Mouse Icon in the Windows Control Panel.

TouchPad Pointing Device Sensitivity Adjustment

The built-in pointing device is controlled by the Mouse Icon in the Control Panel. This mouse driver allows you to tailor the operation to suit your personal taste. The aspects of the TouchPad Pointing Device operation which you can adjust are:

- **Buttons** – Allows you to adjust the interval between clicks that will be recognized as a double-click and also to set the button for left or right-handed primary operation.

- **Pointers** – Allows you to select the look of the cursor during various functions.
- **Motion** – Allows you to set the speed of the cursor relative to the speed of your finger movement and whether to show a trail as the cursor moves.
- **General** – Lets you select the type of mouse. Your TouchPad is a Standard PS/2 Port Mouse and the port for external mouse connection is a Standard PS/2 Port.

You may want to try practicing with different adjustments until you find a combination that is comfortable for you.

Using the Keyboard

Your notebook has an integral 86-key keyboard. (Figure 2-9.) The keys perform all the standard functions of a 101-key keyboard and also include Windows 95 keys and other special function keys. This section describes only those items specific to your notebook. They are the numeric keypad, the cursor keys, the function keys, the function extension key and the Windows 95 keys.

Numeric Keypad

Certain keys on the keyboard perform dual functions as both standard character keys and as a numeric keypad. Figure 2-9 highlights these keys.

To switch into numeric key pad mode, press the Num Lk while holding down the Shift key. You can now enter numerals 0 through 9, perform addition (+), subtraction (-), multiplication (*), or division (/), and enter decimal points (.) using the keys designated as ten-key functions. The keys in the numeric keypad are marked in the lower right corner of the key to indicate their secondary functions.

To return these keys to their normal character function, press the Num Lk while holding down the Shift key again.

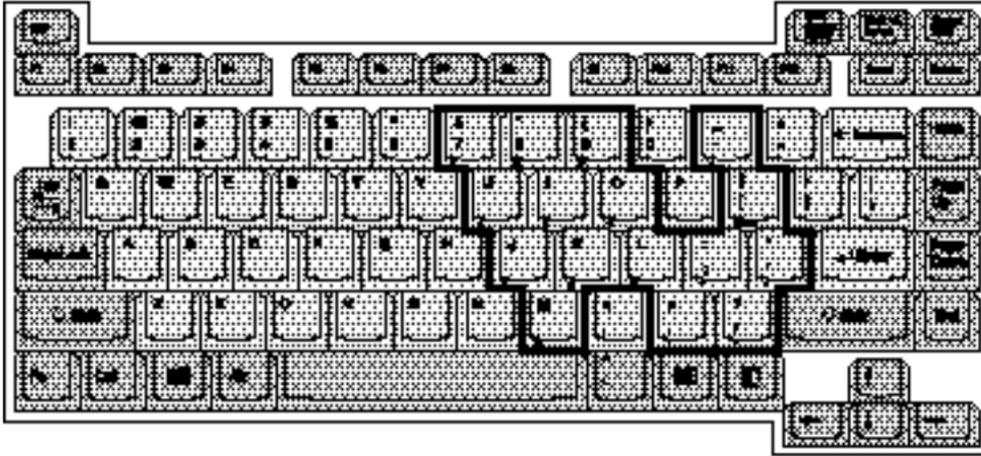


Figure 2-9 Numeric Keypad Function

 **POINT**

When an external keypad is connected to your notebook the NumLock Mode enables the external keypad and disables the built-in keyboard numeric keypad.

Cursor Keys

The cursor keys are the four arrow keys on the keyboard which allow you to move the cursor up ↑, down ↓, left ← and right → as the application allows.

 **POINT**

The Integrated TouchPad Pointing Device and/or an external mouse are also used for moving the cursor around the screen.

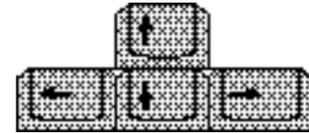


Figure 2-10 Cursor Keys

Function Keys

Your notebook has twelve function keys, F1 through F12. The functions assigned to these keys differ for each application, and you should refer to the software documentation to find out how these keys are used.

Fn Key

The Fn key provides two extended functions for your notebook and is used in conjunction with other keys.

Pressing F5 while holding down the Fn key allows you to toggle between video compensation and no compensation. (Video compensation controls spacing on the display. When it is enabled, displays with less than 800 x 600 pixel resolution will still cover the entire screen.)

Pressing F10 while holding down the Fn key allows you to change your selection of where to send the display video. Each time you press the combination of keys you will step to the next choice. The choices, in order, are: built-in LCD only, external CRT only, or both LCD and CRT.

Windows 95 Keys

Your notebook has three Windows 95 keys, two Start keys and an Application key. The Start key displays the Start Button Menu, when in Windows 95. This is the same as the button on the toolbar which is typically at the bottom of the Windows 95 screens. The Application key has the same function in Windows 95 as the right mouse button, it displays the Shortcut Menu for whatever item is selected. See the Windows 95 documentation for additional information.



CAUTION

The optional External Floppy Disk Adapter is for use with the Removable Floppy Disk Drive only. Installing any other module in the Adapter may damage the module, your notebook, or the Adapter.

Floppy Disk Drive

The Removable Floppy Disk Drive is a 3.5" drive which can read and write on 1.44MB and 720KB memory capacity floppy disks. Floppy disk format is controlled from the operating system. (See the software documentation for more information.) The Removable Floppy Disk Drive can be used externally with the optional External Floppy Disk Adapter (which must be purchased separately). The system will treat the drive in exactly the same way regardless of where it is installed. (For floppy disk drive installation and removal instructions see *Installation and Removal of Devices in the Multi-function*

Bay on pages 84–85 and Installing an External Floppy Disk Drive on pages 82–83.) When the system boots it will always look first for a floppy disk drive in the Multi-function Bay and then look at the external connector.



CAUTION

To get the system to recognize a newly installed floppy disk drive requires restarting your notebook.

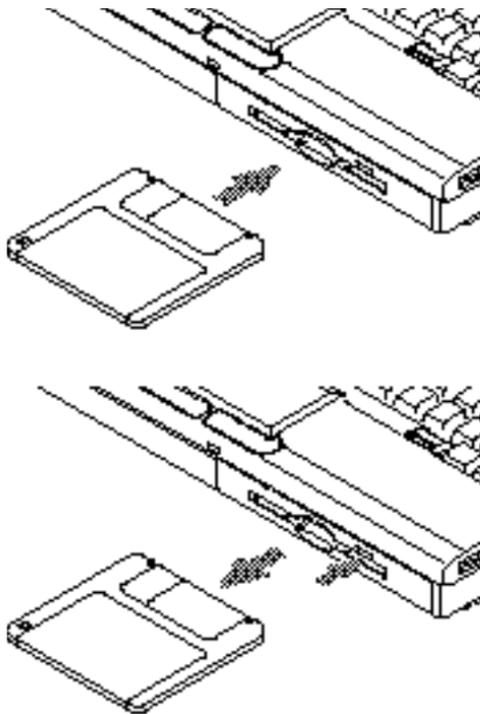


Figure 2-11 Loading/Ejecting a Floppy Disk

Loading a Floppy Disk

To load, insert a floppy disk into the floppy disk drive, shutter side first and label up, until the Eject Button above the floppy disk drive opening pops out. (Figure 2-11)



POINT

When there is no floppy disk in the drive, the Eject Button is flush with the front of your notebook.

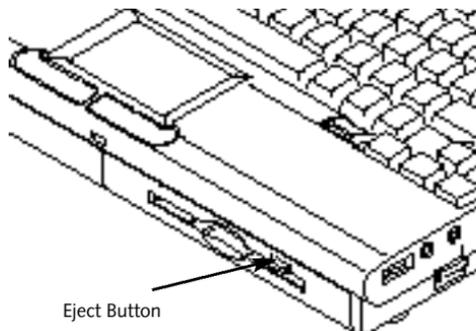


Figure 2-12 Floppy Disk Drive Eject Button

Ejecting a Floppy Disk

To eject a disk, check that the Floppy Disk Access Indicator is off, (see page 20), and press the Eject Button. (See Figure 2-11).



CAUTION

If you eject the disk while the Floppy Disk Access Indicator is On, there is a risk of damaging the data on the disk or the disk drive

Preparing a Floppy Disk for Use

Before you can use a new disk, you need to prepare it so your notebook knows where to store information. This preparation is called formatting or initializing a disk. You need to format new 3.5" floppy disks, unless you purchase preformatted disks. You will use your notebook's operating system software to format a floppy disk. Please refer to the operating system manual for step-by-step instructions.

To prevent data stored on a floppy disk from being erased, slide the write protect tab on the floppy disk to open up the small hole. This makes the disk write-protected. When you want to write data to that disk, slide the write-protect tab the other way to close the small hole.



CAUTION

Formatting a previously used floppy disk is an effective method of clearing a disk as long as you realize that ALL the information on the disk will be erased.

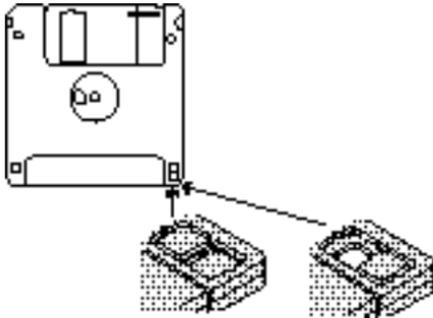


Figure 2-13 Floppy Disk Write Protect

Care of Floppy Disk Drives and Disks

- Avoid storing the floppy disk drive and disks in extremely hot and cold locations, or in locations subject to severe temperature changes.
- Keep the floppy disk drive and disks out of direct sunlight and away from heating equipment.
- Avoid storing the floppy disk drive in locations subject to shock and vibration.
- Avoid using the floppy disk drive and disks in damp and dusty locations.
- Never use the floppy disk drive with any liquid, metal, or other foreign matter inside the floppy disk drive or disk.
- Never store a floppy disk near a magnet or other magnetic field.
- To clean, wipe the floppy disk drive clean with a dry soft cloth or with a soft cloth dampened with water or a solution of neutral detergent. Never use benzene, paint thinner, or other volatile material.
- Never disassemble or dismantle the floppy disk drive.

CD-ROM Drive

The modular CD-ROM Drive is a 10-speed reader.



CAUTION

Do not operate the CD-ROM drive unless your notebook is sitting on a flat surface and the tilt adjustment feet are folded against the bottom of your notebook. Using a CD when the drive is not level may damage the drive or prevent proper operation.

Loading a CD

- Make sure that the tilt adjustment feet (Figure 1-9 on page 8) on the bottom of your notebook are folded against the bottom.
- Make sure there is power to your notebook.
- Push, gently but firmly, and release the eject button on the front of the CD-ROM drive to

open the CD-ROM holder tray, the tray will come out a short distance.

- Gently pull the tray out until a CD-ROM can be easily placed in the tray.
- Make sure that the protective sheet that was in the tray when it was shipped has been removed.
- Place a CD into the tray, label side up, with the hole in the center of the CD snapped onto the raised circle in the center of the tray.
- Close the tray.
- After a CD is loaded, it will take a short time for your notebook to recognize it.



POINT

If you have disabled the automatic insertion function you will have to start the CD from the desktop, as your notebook will not automatically recognize that a CD has been loaded.

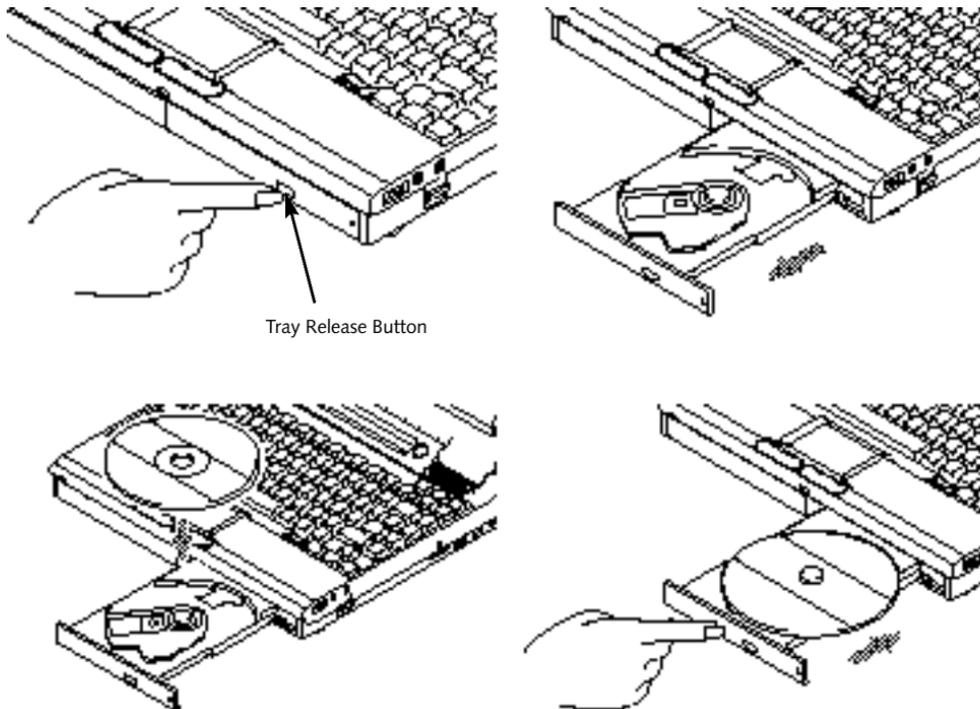


Figure 2-14 Loading a CD-ROM Tray

Using Your LifeBook 400 Series

Care of CD-ROMs

CD-ROMs are precision devices and will function reliably if given reasonable care.

- Always store a CD-ROM in its case when it is not in use.
- When removing a CD-ROM from its case, press down on the holder's center while lifting out the CD-ROM by its edges.
- Always handle a CD-ROM by the edges and avoid touching the surface.
- Avoid storing any CD-ROM where there are temperature extremes.
- Do not bend CD-ROMs or set heavy objects on them.
- Never write on the label surface with a ball point pen, pencil or similar device.
- If a CD-ROM is subjected to a sudden change from cold to warm condensation may form on the surface. Wipe the moisture off with a clean, soft, lint free cloth and then let it dry at room temperature. **DO NOT** use a hair dryer or heater to dry a CD-ROM.

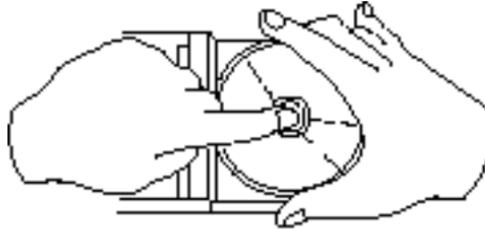


Figure 2-15 CD-ROM Handling

- If a CD-ROM is dirty, use only a CD-ROM cleaner or wipe it with a clean, soft, lint free cloth starting from the inner edge and wiping to the outer edge.

Hard Drive

The internal hard drive capacity is dependent on which model you are using. See Appendix A for model information.

Formatting the Hard Drive

The hard drive inside your notebook is formatted (initialized) at the factory. You do not need to format it under normal circumstances.



CAUTION

If you reformat the internal hard drive ALL data including the operating system, applications software and data will be erased. Unless data is copied to floppy disks or other data storage media it will be permanently lost. All software will need to be re-installed and data files restored from your back-up disks. See the operating system instructions for more information on backing-up your data files. If you have a system that came only with Windows 95, the factory installed software, including the operating system can be restored from the Recovery CD-ROM which came in the accessories box when you purchased your notebook. (See *Restoring Your Pre-installed Software from CD-ROM on page 114 for more information.*) Any application software which you have purchased and installed will have to be reinstalled

(continued)

from the original source. When doing a recovery remember that you must allocate space for the Save-to-Disk function if you have it enabled. (See *Setting Up Your Save-To-Disk File Allocation on page 73 for more information.*)

Power-Saving Modes

Your LifeBook 400 Series features several options for conserving power. One power savings method is to turn the display brightness down. Some power savings functions are automatic and have no user control, while others can be adjusted to suit the user. As with all mobile, battery-powered computers, there is a trade-off between performance and power savings.

The Power Center by Fujitsu provides easy control of the power saving parameters. From the Power Bar on the desktop you can set separate groups of parameters to be used when your notebook is operating on AC power, battery power only with normal charge levels on the

battery and battery power only with battery charge at the low battery alarm level. For each operating condition you can choose one of two factory designed combination of parameter settings, all power saving features turned off or can set each parameter individually. The Power Savings Menu of the BIOS Setup Utility also allows these parameters to be set. The BIOS Setup Utility Power Savings Menu settings will be used if none have been set from the Power Bar.

The combination of settings selected by the factory to save power only when it can be done without sacrificing performance is the Maximum Performance selection. The combination of settings selected by the factory to save power even if it means sacrificing some performance is the Maximum Battery Life selection. The Customize selection requires you to choose the values for each individual parameter. You can choose to turn off all power-saving features by choosing the Off selection. (For more information on the Power Savings parameters, see *Power Savings Menu on pages 67–69.*)

Using the Suspend/Resume Button

When your notebook is active, the Suspend/Resume Button can be used to manually put your notebook into Suspend Mode, or into the Save-to-Disk Mode. Pushing the Suspend/Resume Button and holding it in until it is acknowledged by a beep will activate the selected mode. Which mode it activates depends on the settings of the BIOS Setup Utility Power Savings Menu. The default is Suspend Mode. (See page 69 for how to select Save-to-Disk Mode.)

Your notebook can be suspended to Suspend Mode or Save-to-Disk Mode by:

- Pressing the Suspend Button until acknowledged.
- Selecting Suspend from the Windows 95 Start Menu.
- Selecting Suspend from the Desktop Power Bar.
- Timing out from lack of activity.

If your notebook is suspended, pushing the

not flashing, your notebook is fully operational. If it is visible and flashing, your notebook is in Suspend Mode. If it is not visible, the power is Off, or your notebook is in the Save-to-Disk Mode. (See page 69.) If the Battery Condition Status Indicator is On when the Power Indicator is Off the battery is charging or you are in the Save-to-Disk Mode.

Figure 2-16 Suspend/Resume Button

Suspend/Resume Button again will return it to active operation at the point it went into suspension. The Suspend/Resume Button is located on the front of the Status Indicator LCD Panel of your notebook. (Figure 2-16.)

You can tell whether or not the system is in Suspend Mode by looking at the Power Indicator. (See pages 17–18.) If it is visible and



CAUTION

Be sure you know what settings are active for the Suspend/Resume Button before you use it as misuse can result in data loss. (See *the Power Savings Menu of the BIOS Setup Utility, pages 67–69, for more information.*) When you receive your new notebook it will be set for the default which is Suspend Mode.



POINT

The Suspend/Resume Button can be disabled. (See *the Power Savings Menu of the BIOS Setup Utility, page 68, for more information.*)



CAUTION

The suspension modes should not be used with certain PCMCIA cards. Check the PCMCIA card documentation for more information.



POINT

If your notebook is active when you enter a suspension mode changes to open files are not lost. The files are left open and memory is kept active during Suspend Mode or the memory is transferred to the internal hard disk during Save-to-Disk Mode.

**CAUTION**

If you are running your notebook on battery power, be aware that the battery continues to discharge while your notebook is in Suspend Mode, though not as fast as when fully operational. With a fully charged Nickel Metal Hydride Battery Pack the Suspend Mode will maintain your status for approximately 24 hours or more.

Suspend Mode

The Suspend Mode saves the contents of your notebook's memory (RAM) during periods of inactivity by maintaining power to RAM while turning off the CPU, the display, the hard drive and all of the other internal components except those necessary to recognize the Suspend/Resume Button and restart everything.

Your notebook can be suspended to Suspend Mode by:

- Pressing the Suspend Button until acknowledged.
- Selecting Suspend from the Windows 95 Start Menu.
- Selecting Suspend from the Desktop Power Bar.
- Timing out from lack of activity.
- Battery level reaching the Dead Battery warning condition.

Your notebook's RAM typically stores the file(s) on which you are working, the open application(s) and any other data required to support the operation(s) in progress. When you resume operation from Suspend Mode it returns to the point in the operation where it left off before going into the mode. You must use the Suspend/Resume Button to resume operation and there must be an adequate power source available or your notebook will not resume.

**CAUTION**

Loss of all power sources, including battery, while in the Suspend Mode will cause loss data and inability to return to operation with the Resume Button.

Save-to-Disk Mode

The Save-to-Disk function saves the contents of your notebook's memory (RAM) to hard drive whenever you:

- Press the Suspend Button until acknowledged.
- Select Suspend from the Windows 95 Start Menu.
- Select Save-to-Disk from the Desktop Power Bar.
- Time out from lack of activity.

Using Your LifeBook 400 Series

Your notebook's RAM typically stores the file(s) on which you are working, the open application(s) and any other data required to support the operation(s) in progress. When the Save-to-Disk function is activated your notebook saves the contents of the RAM to a file on the internal hard disk, and then automatically shuts off power to most of your notebook. Just enough power is left on to recognize the Suspend/Resume Button and restart the rest of your notebook. When you resume operation it returns to the point in the operation where it left off before going into Save-to-Disk Mode.

**POINT**

If power is lost during Save-to-Disk Mode the data will be retrieved automatically as soon as power is returned.

**POINT**

The main advantage of using the Save-to-Disk function is power is not required to maintain your data. This is particularly important if you will be leaving your notebook in a suspended state for a prolonged period of time. The drawback of using Save-to-Disk Mode is that it lengthens the power down and power up sequences, since it takes time to write all of the RAM to the hard disk and time to read it back into RAM when you resume operation.

**POINT**

When PCMCIA cards or external devices are in use, Save-to-Disk Mode cannot return you to the exact state prior to suspension because all of the peripheral devices will be re-initialized when the system restarts.

**POINT**

The Save-to-Disk Mode requires allocating a significant amount of hard disk capacity for saving all of RAM, which reduces the usable disk space. When you purchase your notebook it will have space allocated for the memory installed. If you upgrade the original system by adding Expansion Memory without changing the size of the Save-to-Disk allocation you will get an error message when you try to activate the Save-to-Disk Mode and it will not work. Use the PHDISK Utility to increase the size of the Save-to-Disk file, SAVE2DSK.BIN. (Refer to *Setting Up Your Save-to-Disk File Allocation* on page 73 for more information.)

**CAUTION**

Save-to-Disk Mode cannot be used as factory configured if a RAM Module has been added because insufficient disk space has been allocated for the added memory.

Use the PHDISK Utility to increase the size of the Save-to-Disk file. (See the *Setting Up Your Save-To-Disk File Allocation* on page 73 for more information.) If you need help contact your support representative for recommendations.

Standby Mode

The Standby Mode is one of the Power-Savings parameters. When Standby Mode is activated, your notebook puts the CPU in low-speed operation, shuts off the display and turns off the hard drive when there is no activity (key-stroke, pointer action, sound generation, video display change, modem transmission or reception, etc.) on your notebook for the user selected time-out period. (See pages 68–70.) Any

activity will cause your notebook to return to normal operation automatically. This feature is independent of the Suspend/Resume Button.

Video Timeout

The Video Timeout is a parameter of the Power-Saving feature which saves power by turning off the display if there is no keyboard or pointer activity for the user selected timeout period. (See page 40.) Any keyboard or pointer activity will cause the display to restart automatically. This feature is independent of the Suspend/Resume Button.

Hard Disk Timeout

The Hard Disk Timeout is a parameter of the Power-Saving feature which saves power by turning off the hard drive if there is no hard drive access for the timeout period which has been set in the Setup Utility. (See page 68–70.) Any attempt to access the hard drive will cause the hard drive to restart automatically. This feature is independent of the Suspend/Resume Button.

Video and Audio Functions

The LifeBook 400 Series has the following audio and video functions:

- A built-in 16-bit sound chip which is Sound Blaster-compatible. When setting up an application software select Sound Blaster 16.
- A stereo audio input for connecting a line level sound input device such as an audio cassette player.
- Built-in stereo speakers.
- A stereo sound headphone jack for connecting headphones or powered external speakers.

**POINT**

Using the headphone jack will disable the built-in speakers.

- **Zoom Video port (PCMCIA Slot 0)** for full motion video acceleration via a third party supplier PCMCIA card.

Figure 1-5 on page 5, and Figure 1-7 on page 7 show the positions of the external audio features.

Your LifeBook 400 Series comes with installed software for playing audio and video files of various formats. The software includes the Microsoft Media Player.

You start an application by double left-clicking on the application name. The Microsoft Media Player applications can be found with the Start Menu under Accessories and then Multi-media. See the Help screens for guidance if you need it.



POINT

You can modify the set up of certain audio parameters in the BIOS Setup Utility, Advanced Menu – Audio Features Submenu. (See pages 62–63.)



POINT

If you are running applications, including some games, that are MS-DOS based you may need to adjust the Video Features settings of your notebook in order for the entire screen to be used by the application. (See the *BIOS Setup Utility, Advanced Menu – Video Features Submenu, the video compensation setting on page 64.*)

Volume Control

All system and application functions have multiple volume controls which interact with each other. There is the hardware volume control on the right side panel of your notebook. There is a master volume control in the operating system Sound Control Panel and an application may also have a volume control.

Each setting source puts an upper limit on the volume which can be set by the other sources.

For example if the hardware volume control is turned all the way down, the software volume

controls will not make the sound loud no matter how high you make the settings. By the same token, if the operating system Sound Control Panel has the sound turned off, adjusting the hardware or the application software volume setting will not produce sound.

One easy operating method is to use the hardware and operating system volume controls to set an upper limit on sound level and then make fine adjustments at the application software.

File Transfers

Data transfers between your notebook and other devices are controlled by the LapLink by Traveling Software file transfer software, FAX software and various Internet access applications. Data transfers can be via PCMCIA modem or the IrDA-compatible port on the back panel of your notebook. You select the communication software for your current need from the Start Button Menu in the Programs Folder. For direct file transfers such as to other computers use the LapLink program, for FAX or Internet operations select the service for which you are authorized.



POINT

See the LapLink manual and application help screens for operating instructions for the LapLink application. The other applications will also have help screens.



CAUTION

Do not move either device during communication as it may interrupt data transmission.

Infrared Communication Port

Infrared IrDA-compatible communication is a function that allows for wireless data transfer.

The following conditions may interfere with infrared communications:

- **When the infrared communication ports are not directly facing each other, or some obstacle is between them.**
- **When the infrared communication ports are too far apart.**
- **When a television or radio remote control unit, or a wireless headphone is being used nearby.**
- **When a strong light such as direct sunlight, fluorescent light, or incandescent light shines on the port.**

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Section THREE

Configuring Your LifeBook 400 Series from Fujitsu

This section explains the built-in BIOS Setup Utility. The BIOS Setup Utility is required to set the date, time, power saving modes, data security passwords and other operating parameters of your notebook.

Boot Sequence

Each time you power up or restart your LifeBook 400 Series, it goes through a standard boot sequence. This sequence includes the Power On Self Test. When the boot sequence is completed without a failure and without a request for the Setup Utility by pressing the F2 key, the system displays the opening screen of the operating system you selected when you powered up your notebook for the first time and you may proceed to the applications.

The boot sequence is executed when:

- You turn on power to the system using the Power Switch on the right side panel of your notebook. (Figure 2-4 on page 18.)



POINT

When error messages occur see Section Five, pages 110–112, for help in understanding the meaning and required actions to be taken.

- You restart your notebook from the Windows 95 Shutdown Menu of the Start Menu.
- The software initiates a system restart. Example: When you install a new application.
- You reset the system by pressing the three keys Ctrl+Alt+Del at the same time. This method is not recommended since it can result in loss of data.

Identifying the Drives

Your notebook uses drive letters (Example A:, B:, C:, D:, E:) to identify internal and external devices such as hard drives, floppy disk drives, CD-ROM drives and PCMCIA cards. The most commonly assigned drive designators are listed below. If you add other devices, the drive designators may be different. See the operating system manual for setting drive designations.

Drive Designators

A: Floppy disk drive.

Installable in the Multi-function (right front) Bay of your notebook, or in the External Floppy Disk Drive Adapter.

B: Not used with your notebook.

C: Hard drive.

Installed in a chamber in the bottom of your notebook.

D: CD-ROM drive.

Installable in the Multi-function (right front) Bay of your notebook.

Configuring Your LifeBook 400 Series**CAUTION**

Using the three keys **Ctrl+Alt+Del** at the same time to restart the system can result in lost data if used with some applications.

**CAUTION**

A bootable CD-ROM may have either a floppy disk format or a hard disk format. When using a bootable CD-ROM, drive designations will automatically change according to which format is used. (See page 56 for more information.)

BIOS Setup Utility

The BIOS Setup Utility is a program that sets the operating environment for your notebook. It is referred to in this publication as the Setup Utility. There is no need to set or change the environment to operate as it is set at the factory for normal operating conditions.

The Setup Utility configures:

- Standard system parameters, such as date and time.
- Device control features parameters, such as I/O addresses, and boot device.
- Power Management parameters that help to conserve your notebook's battery.
- System Data Security feature parameters, such as passwords.

You will only have to change the utility settings if you want to:

- Change the date or time. (You can also do this without entering the Setup Utility, through the operating system. See the operating system manual.)
- Change the primary boot device.
- Change the power savings parameter settings. (For a more convenient process, see the *Power Center by Fujitsu on page 20.*)
- Change a port address or other parameter.

- Change an audio parameter setting.
- Change the selection of whether to use the built-in display, an external monitor or both. (For a more convenient process, see the *Fn key on pages 30-31.*)
- Change the system data security settings.

Routinely Entering the Setup Utility

You can enter the Setup Utility whenever you turn on or reset the system. To do this:

1. Allow the system to start booting.
2. As soon as the
Press <F2> to enter SETUP
message appears on the screen,
press the F2 key.
3. The Main Menu of the Setup Utility then appears with the current settings of the parameters displayed.
4. If you wish to go to one of the other setup menus, press the ← or the → key to find the menu you require.



POINT

If the data security settings require it, you may be asked for a password before the Main Menu will appear.

Entering the Setup Utility After a Configuration Change or System Failure

If there has been a change in the system configuration that does not agree with the parameter settings stored in the BIOS memory, or there is a failure in the system, the system beeps and/or displays an error message after the Power On Self Test. If the failure is not too severe, it will give you the opportunity to modify the settings of the Setup Utility, as described in the following steps:

1. When you turn on or restart your notebook there is a beep and/or the following message appears on the screen:

```
Error message - please run SETUP
program
```

Press F1 key to continue, F2 to run SETUP

2. If an error message is displayed on the screen, and you want to continue with the boot process and start the operating system anyway, press the F1 key.



CAUTION

If your notebook beeps a series of beeps that sounds like a code and the display is blank, please refer to the Troubleshooting Section. (See pages 91–112.) The Troubleshooting Section includes a list of error messages and their meanings.



POINT

If the data security settings require it, you may be asked for a password before the operating system will be opened.

3. If an error message is displayed on the screen, and you want to enter the Setup Utility, press the F2 key.

4. When the Setup Utility starts with a fault present, the system displays the following message:

```
Warning!
```

```
Error message
```

```
[Continue]
```

5. Press any key to enter the Setup Utility. The system will then display the Main Menu with current parameters values.

Navigating Through the Setup Utility

The BIOS Setup Utility consists of 6 menus; MAIN, ADVANCED, SECURITY, POWER SAVINGS, BOOT and EXIT. The remainder of Section Three explains each menu in turn including all submenus and setting items.

Configuring Your LifeBook 400 Series

The following procedures allow you to navigate the Setup Utility menus:

1. To select a menu, use the cursor keys: ←, →.
2. To select a field within a menu or a submenu, use the cursor keys: ↑, ↓.

**POINT**

Selecting a field causes a help message about that field to be displayed on the right-hand side of the screen.

3. To select the different values for each field, press the Spacebar or + to change to the next higher selection and F5 or - to go to the next lower selection.
4. To activate a submenu press the Enter key.
5. To return to a menu from a submenu, press the Esc key.
6. To go to the Exit Menu from any other menu, press the Esc key.
7. Pressing the F9 key resets all items in the current menu to the default values.
8. Pressing the F10 key resets all items in the current menu to the value which was set when the Setup Utility parameters were last saved.
9. Pressing the F1 key will give you a general help screen.

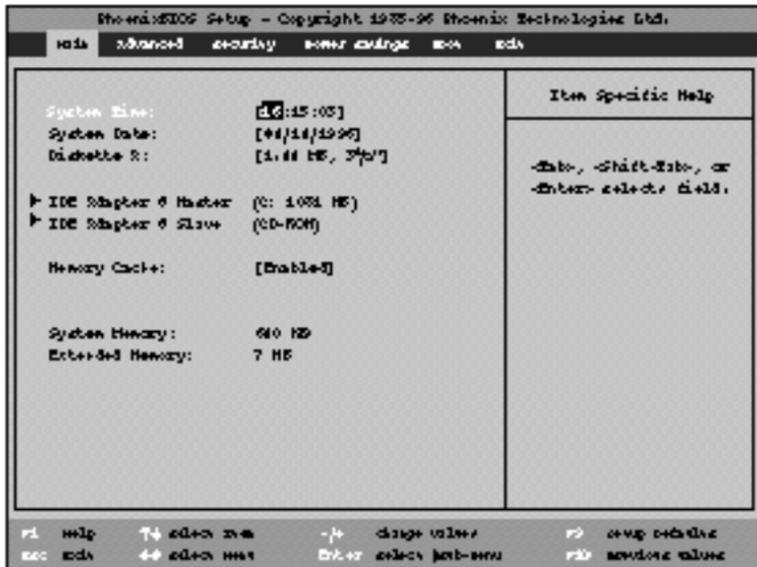


Figure 3-1 Main Menu

Main Menu – Setting Standard System Parameters

The Main Menu allows you to set or view the current System Parameters. Follow the preceding instructions for Navigating Through The Setup Utility to make any changes.

Menu Fields:

System Time: Sets the time.

System Date: Sets the date.

Diskette A: Sets what kind of floppy disk drive, if any is installed.

IDE Adapter 0 Master – allows you to select this submenu, (Figure 3-2), but displays the designator and capacity of the hard disk drive or CD-ROM drive connected to this interface.

IDE Adapter 0 Slave – allows you to select this submenu, (Figure 3-2), but displays the designator and capacity of the hard disk drive or CD-ROM drive connected to this interface.

Memory Cache: Enables or disables the memory cache features.

Configuring Your LifeBook 400 Series

System Memory: Your notebook automatically finds and displays the system memory capacity.

Extended Memory: Your notebook automatically finds and displays the extended memory capacity.

See Table 3-1 for default settings and available options.

**POINT**

System Time and Date can also be set from the operating system without using the Setup Utility. Use the calendar and time icons on the Control Panel for Windows or type time or date for MS-DOS.

**CAUTION**

If the time and date are not updating, open the Power Control Panel in Windows 95 and set Power Management to Advanced to start the clock.

Setting the System Time

The system clock is a 24-hour clock. It shows hours, minutes, and seconds. Example: 16:45:57. The System Time Field allows you to change each segment of the time separately. Move between the segments with the Tab key and/or Shift + Tab keys.

Setting the System Date

The system calendar shows the month, day, and year. Example: 03/20/1996. The System Date Field allows you to change each segment of the date separately. Move between the segments with the Tab key and/or Shift + Tab keys.

Defining the Floppy Disk Drive Format

The Diskette A: Field allows you to define the format of the floppy disk drive.

See Table 3-1 for the options and standard configurations for the floppy disk drive.

Table 3-1 Options and Defaults for the Main Menu

Parameter	Options	Default	Description
System Time			Sets and displays the current time. Time is in a 24 hour format of hours:minutes:seconds with 2 digits for each. (HH:MM:SS)
System Date			Sets and displays the current date. Date is in a month/day/year numeric format with 2 digits each for month and day and 4 digits for year. (MM/DD/YYYY)
Diskette A	1.44MB, 3½"; Not Installed	1.44MB, 3½"	Sets the format for Floppy Disk Drive A if it is installed.
IDE Adapter 0 Master	Selects the IDE Adapter 0 Master Sub-Menu.	C: 1081 MB	Displays the designator and capacity of the hard drive on this interface and when selected allows you to change the interface specifications to suit the particular disk drive. (This is the internal hard drive controller.)
IDE Adapter 0 Slave	Selects the IDE Adapter 0 Slave Sub-Menu	CD-ROM	Displays the designator and capacity of the drive on this interface and when selected allows you to change the interface specifications to suit the particular disk drive. (This is the CD-ROM Drive which can be installed in the Multi-function Bay.)

Configuring Your LifeBook 400 Series

Table 3-1 Options and Defaults for the Main Menu

Parameter	Options	Default	Description
Memory Cache	[Disabled]; [Enabled]	[Enabled]	Enables/Disables the Memory Cache.
System Memory		640KB	Displays size of system memory, which is detected automatically and cannot be changed by the Setup Utility.
Extended Memory		7MB (This depends on the model of LifeBook 400 Series Notebook which you are using and whether you have installed an expansion RAM Module.)	Displays size of extended memory which is detected automatically and cannot be changed by the Setup Utility.

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Head: Sets the number of heads on the hard disk drive. This is a number between 1 and 16 which can be set by incrementing or typing in the number.

Sectors/Track: Sets the number of sectors on the hard disk. This is a number between 0 and 63 which can be set by incrementing or typing in the number.

Write Precomp: Sets the amount of write compression to be used in storing data on the hard disk. This is None or a number up to four digits which can be set by incrementing or typing in the number.

Multi-Sector Transfers: Sets the number of sectors allowed in a block transfer. This is Disabled or 2,4,6,8 or 16 sectors.

LBA Mode Control: Enables or disables Block Addressing in place of Cylinder, Head, Sector addressing

Transfer Mode: Selects the data movement method for the hard disk. The options are

Standard or Fast PIO 1 - Fast PIO 4.

This parameter is not controlled by the selection made for Type:

32 Bit I/O: This allows you to enable or disable 32 bit data transfers.

Enabling Memory Cache:

The Memory Cache Field lets you enable or disable the memory cache feature. The options are Enabled or Disabled. The default is Enabled.

Table 3-2 Options and Defaults for the IDE Adapter Submenu

Parameter	Options	Default	Description
Autotype Fixed Disk:	[Press Enter]		Allows you to activate a computer effort to detect the type of disk drive connected to the interface.
Type:	Auto, None, 1-14,Rsrv, 16-39, User	Auto 1081 MB	Allows you to configure the interface for almost any hard drive. The numbers are 39 preset combinations of parameters. Selecting User lets you set each parameter marked with * individually. Otherwise these fields display the settings determined by the Type Selection. The total memory capacity associated with that selection is displayed to the right of the option selected.
*Cylinders:	A number up to five digits.	When one of the preset combinations is selected the value set is displayed but cannot be changed from the screen. This field can only be changed from the screen when Type: is selected as User.	Sets the number of cylinders for the hard drive. This field can be changed by incrementing or by typing in the number followed by the Enter key.
*Head:	A number between 1 and 16.	When one of the preset combinations is selected the value set is displayed but cannot be changed from the screen. This field can only be changed from the screen when Type: is selected as User.	Sets the number of heads on the hard drive. This field can be changed by incrementing or by typing in the number followed by the Enter key.

Configuring Your LifeBook 400 Series

Table 3-2 Options and Defaults for the IDE Adapter Submenu

Parameter	Options	Default	Description
*Sectors/Track:	A number between 0 and 63.	When one of the preset combinations is selected the value set is displayed but cannot be changed from the screen. This field can only be changed from the screen when Type: is selected as User.	Sets the number of sectors on the hard disk. This field can be changed by incrementing or by typing in the number followed by the Enter key.
*Write Precomp:	None or a four digit number.	When one of the preset combinations is selected the value set is displayed but cannot be changed from the screen. This field can only be changed from the screen when Type: is selected as User.	Sets the amount of write compression to be used in storing data on the hard disk. This field can be changed by incrementing or by typing in the number followed by the Enter key.
*Multi-Sector Transfers:	Disabled; 2;4; 6; 8; 16.	When one of the preset combinations is selected the value set is displayed but cannot be changed from the screen. Only when Type selected is User can this field be set from the screen.	Sets the number of sectors allowed in a block transfer.
*LBA Mode Control:	Enabled; Disabled.	When one of the preset combinations is selected the value set is displayed but cannot be changed from the screen. This field can only be changed from the screen when Type: is selected as User.	Enables or disables Block Addressing in place of Cylinder, Head, Sector addressing.

Table 3-2 Options and Defaults for the IDE Adapter Submenu

Parameter	Options	Default	Description
*Transfer Mode:	Standard, Fast PIO 1 – Fast PIO 4.	When one of the preset combinations is selected the value set is displayed but cannot be changed from the screen. This field can only be changed from the screen when Type: is selected as User.	Selects the data movement method for the hard disk.
32 Bit I/O:	Enabled; Disabled.	Enabled	Enables or disables 32 bit data transfers.

**CAUTION**

A bootable CD-ROM may have either a floppy disk format or a hard drive format. When the bootable CD-ROM is used the drive allocations change automatically, this does not require changing the BIOS setup. If a floppy disk format CD-ROM is used the CD-ROM becomes Drive A. If a hard drive format CD-ROM is used the internal hard drive becomes Drive D and the CD-ROM becomes Drive C and all other drive designations shift as necessary. The boot sequence then follows the changed allocations.

**CAUTION**

Be careful of the operating environment when booting from a CD-ROM or you may overwrite files by mistake.

Configuring Your LifeBook 400 Series

Exiting from the Main Menu

When you have finished setting the parameters on this menu, you can either exit from the Setup Utility, or move to another menu. If you wish to exit from the Setup Utility, press the Esc key or use the cursor keys to go to the Exit Menu. If you wish to move to another menu, use the cursor keys. See *Navigating Through The Setup Utility* on page 46 for more information.

Advanced Menu – Setting Device Feature Controls

The Advanced Menu allows you to:

- Set the I/O addresses for the serial port and the parallel port.
- Set the communication mode for the parallel port.
- Set audio function I/O addresses, interrupt levels and DMA channel.
- Select between the internal LCD display and an external CRT display.
- Enable or disable compensation for the display.
- Set the I/O address for PCIC.

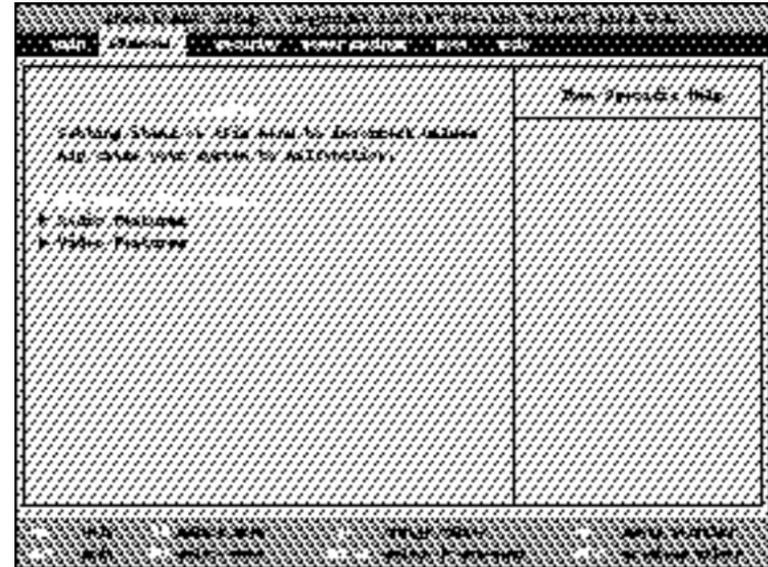


Figure 3-3 Advanced Menu

Advanced Menu Fields

The Advanced Menu fields are:

- Integrated Peripherals
- Audio Features
- Video Features

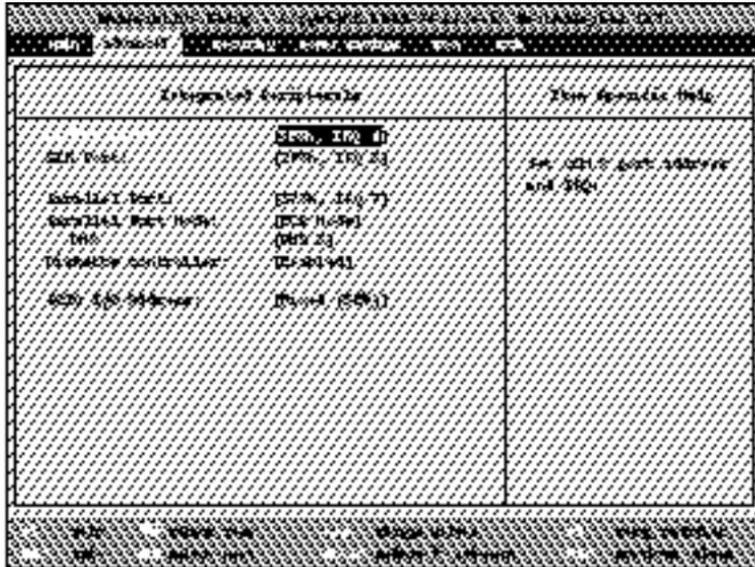


Figure 3-4 Integrated Peripherals Submenu

The Integrated Peripherals is a submenu which allows changing of addresses, etc. The Audio Features is a submenu which allows the hardware address and interrupt levels of audio functions to be set. The Video Features is a submenu which allows setting of the display parameters, including routing of video signals to different displays.

**CAUTION**

No matter how the settings are entered, your notebook will not function normally if any two ports or devices, serial or parallel, have the same I/O address assigned. Some settings will be entered via the BIOS Setup Utility, some from the control software for the I/O device, some maybe set in the hardware. See the hardware and software documentation as well as the Setup Utility to determine settings, limitations, etc.

Configuring Your LifeBook 400 Series**Integrated Peripherals**

Submenu of the Advanced Menu

The Integrated Peripheral Submenu fields are:

Serial Port:

Sets the serial port A, the back panel COM connector, address and interrupt level.

SIR Port:

Sets the serial infrared port address and interrupt level.

Parallel Port:

Sets the parallel port, the back panel LPT connector, address and interrupt level.

Parallel Port Mode:

Sets the parallel port communication mode.

***DMA**

Sets the DMA channel number when ECP mode is selected.

*When ECP Mode is not selected this option does not appear on the screen

Diskette Controller:

Enables or disables the floppy disk drive controller.

PCIC I/O Address:

Sets the PCMCIA Card Interface Controller I/O address.

**POINT**

All I/O addresses in this table are in hexadecimal.

Table 3-3 Default Settings for the Integrated Peripherals Submenu of the Advanced Menu.

Parameter	Options	Default	Description
Serial Port	3F8, IRQ 4; 2F8, IRQ 3; 3E8,IRQ 4; 2E8, IRQ 3; Auto; Disabled	03F8,IRQ 4	Sets the I/O address and interrupt level for the serial port on the back panel of your notebook.
SIR Port	3F8,IRQ 4; 2F8, IRQ 3; 3E8,IRQ 4; 2E8, IRQ 3; Auto; Disabled	2F8, IRQ 3	Sets the I/O address and interrupt level for the internal serial infrared port.
Parallel Port	278,IRQ 7; 378,IRQ 7; 3BC, IRQ 7; 278,IRQ 5; 378, IRQ 5; 3BC,IRQ 5; Auto; Disabled	378,IRQ 7	Sets the I/O addresses and interrupt level for the parallel port on the back panel of your notebook.

Configuring Your LifeBook 400 Series

Table 3-3 Default Settings for the Integrated Peripherals Submenu of the Advanced Menu.

Parameter	Options	Default	Description
Parallel Port Mode	ECP Mode; Normal Mode; Bi-Directional; EPP Mode	ECP Mode	Sets the communication mode of the Parallel Port: ECP Mode allows data transmission with the ECP class of parallel I/O devices; Normal Mode (Half Duplex) allows information to be transferred in only one direction, from your notebook to the printer or similar device; Bi-directional (Full Duplex) allows two-way transfer of information between your notebook and a connected parallel device. Example: if your notebook is connected to a parallel printer, it can transfer data and control information to the printer, and the printer can transfer back status and error information to your notebook; EPP Mode allows data transmission with the EPP class of parallel I/O devices.
DMA	DMA 0; DMA 3; Disabled	DMA 3	Selects the DMA channel that ECP will use. This item is not displayed if ECP Mode is not selected.
Diskette Controller	Enabled; Disabled	Enabled	Activates or deactivates the floppy disk controller for the Multi-function Bay
PCIC I/O Address:	Fixed(3E0); Disabled	Fixed(3E0)	Sets the PCMCIA Card Interface Controller I/O address.

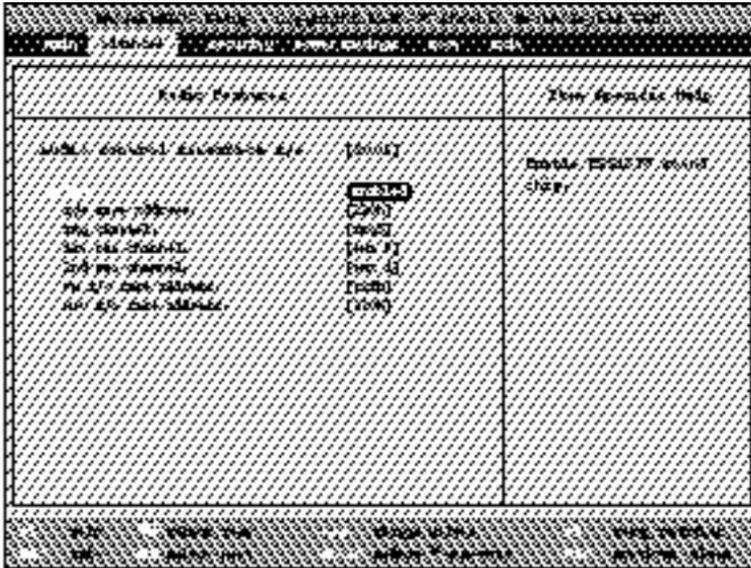


Figure 3-5 Audio Features Submenu

**POINT**

All I/O addresses in Table 3-4 are in hexadecimal.

Audio Features Submenu

The Audio Features Submenu allows you to set the address and interrupt features of the built-in audio functions. The fields are:

Audio Control Interface I/O:

Sets the Audio Control Interface I/O address.

Audio:

Enables or disables the ESS1878 sound chip.

I/O Base Address:

Sets the base address for the internal audio function.

IRQ Channel:

Sets the internal audio interrupt level.

1st DMA Channel:

Sets the 1st DMA channel to be used by the internal audio function.

2nd DMA Channel:

Sets the 2nd DMA channel to be used by the internal audio function.

FM I/O Base Address:

Sets the FM synthesizer base address.

MPU I/O Base Address:

Sets the MIDI interface base address.

The options and defaults for these fields are shown in Table 3-4.

Configuring Your LifeBook 400 Series

Table 3-4 Default Settings for the Audio Features Submenu of the Advanced Menu.

Parameter	Options	Default	Description
Audio Control Interface I/O:	800; 808;810; 818	800	Sets the Audio Control . Interface I/O address.
Audio	Enabled; Disabled	Enabled	When enabled the Audio is reported as a dynamic device in Window 95. When disabled the sub-items of Audio will not be displayed.
I/O Base Address	220; 240;260; 280	220	Sets the internal audio I/O address.
IRQ Channel	5; 7;9; 10; 11	5	Sets the interrupt request (IRQ) level for the internal audio channel.
1st DMA Channel	0; 1; 3	0	Selects the DMA (direct memory access) channel for the internal audio function.
2nd DMA Channel	0; 1; 3	1	Selects the DMA (direct memory access) channel for the MIDI functions.
FM I/O Base Address	B88; B90; B98; BA0	388	Sets the base address for the FM synthesizer.
MPU I/O Base Address	300;330; B10; B20; Disabled	330	Sets the base address for the MIDI Interface.

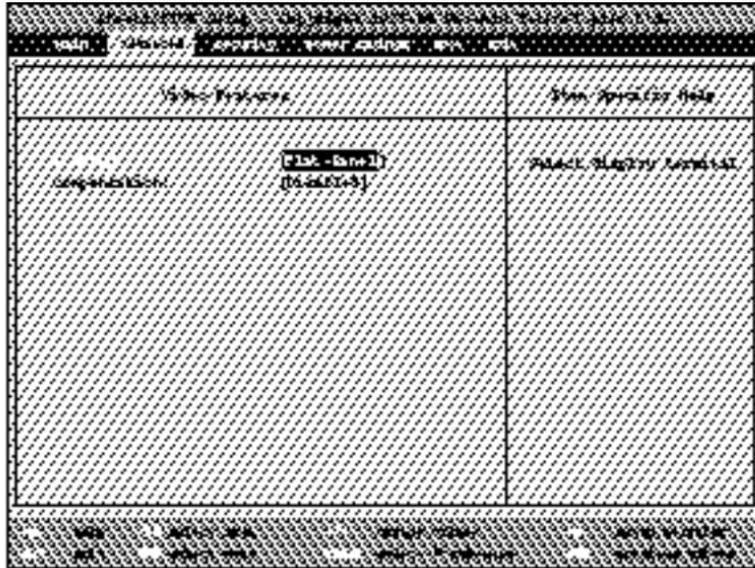


Figure 3-6 Video Features Submenu

Video Features Submenu

The Video Features Submenu fields are:

Display:

Selects where the video signal will be routed. The options are Simultaneous; Flat-Panel (built-in); CRT (external) and the default is Flat-Panel.

Compensation:

Enables or disables compensation which controls spacing on the display. When enabled displays with less than 800 x 600 pixel resolution will still cover the entire screen. The default is Disabled.

Exiting from the Advanced Menu

When you have finished setting the parameters on the Advanced Menu, you can either exit from Setup Utility or move to another menu. If you wish to exit from Setup Utility, press the Esc key to go to the Exit Menu. If you wish to move to another menu, use the cursor keys.

Configuring Your LifeBook 400 Series

Security Menu

The Security Menu allows you to set up the data security features of your notebook to fit your operating needs and to view the current data security configuration. The default condition is no passwords required and no write protection.



POINT

If you set a password, write it down and keep it in a safe place. If you forget the password you will have to contact your support representative to regain access to the secured functions and data.



CAUTION

Entering a password incorrectly 3 times in a row will cause the keyboard and mouse to be locked out and the warning [System Disabled] to be displayed. If this happens restart your notebook by turning off and on the power with the Power Switch and use the correct password on reboot.

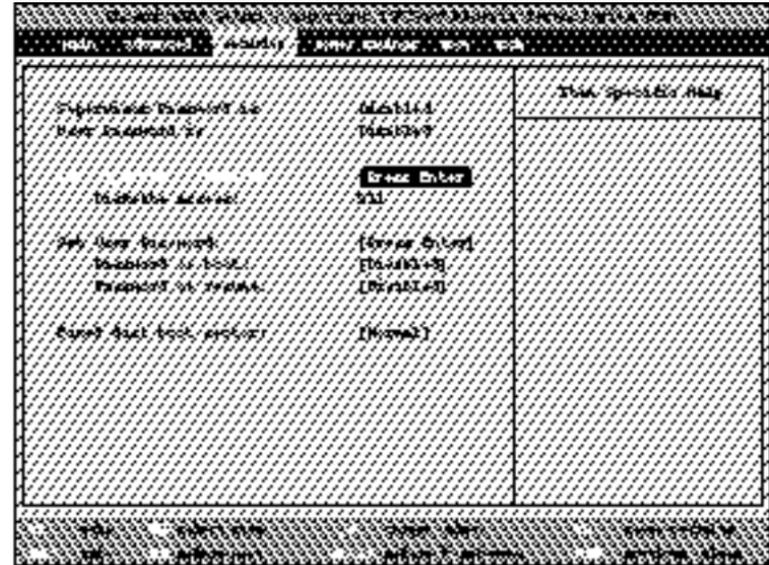


Figure 3-7 Security Menu

Supervisor Password is:

Supervisor Password is a display-only field. Enabled is displayed when the system supervisor password is set and Disabled when it is not.

User Password is:

User Password is a display-only field. Enabled is displayed when the general user password is set, and Disabled when it is not.

Set Supervisor Password:

This field allows you to set, change or cancel the Supervisor Password. The Supervisor Password must be seven characters long and must include only lower-case letters or numbers. To cancel a password press the Enter key instead of entering characters in the Enter New Password field and in the Re-enter New Password field.

Diskette Access:

This field allows the floppy disk access to be secured by a Supervisor Password or a User Password as you choose. If the chosen type of password is set, it must be used to access data on the floppy disk drive. If no password is set

for the selected type None will be required.

The default is User when the Supervisor password is set.

Set User Password:

This field allows you to set, change or cancel the User Password if the Supervisor Password is set.

The User Password must be seven characters long and must include only lower-case letters or numbers. To cancel a password press the Enter key instead of entering characters in the Enter New Password field and in the Re-enter New Password field.



POINT

If you make an error when re-entering the password a [Warning] will be displayed on the screen. To try again press the **Enter** key and then retype the password. Press the **Esc** key to abort the password setting process.

Password on Boot:

When this field is set to Enable a password (user or supervisor) is required after the Power On Self Test before the Operating System will be read from disk. When set to Disabled no password is required. If no Supervisor Password is set this feature is not available and no password is required.

Password on Resume

When this field is set to Enabled you will not be able to resume operation from the Suspend or Save-to-Disk Mode without entering the same password that was used when your notebook power was turned on. When it is Disabled no password is required. If no Supervisor Password is set, this feature is not available, the menu item is not visible and no password is required.



CAUTION

If the Password on Resume is Enabled and the password on boot is Disabled you will not be able to resume operation from the Suspend or Save-to-Disk Modes.

Configuring Your LifeBook 400 Series

Fixed Disk Boot Sector:

The Fixed Disk Boot Sector Field is used to set write protection for the sector of the boot disk which contains the operating system. When set to Write Protect BIOS will prevent any application from writing into the sector of the disk containing the operating system. When set to Normal there is no BIOS protection of the operating system. This feature provides some virus protection.



POINT

Boot Sector Protection must be set to Normal to load or upgrade an operating system.

Exiting from the Security Menu

When you have finished setting the parameters on the Security Menu, you can either exit from Setup Utility or move to another menu. If you wish to exit from Setup Utility, press the Esc key to go to the Exit Menu. If you wish to move to another menu, use the cursor keys.

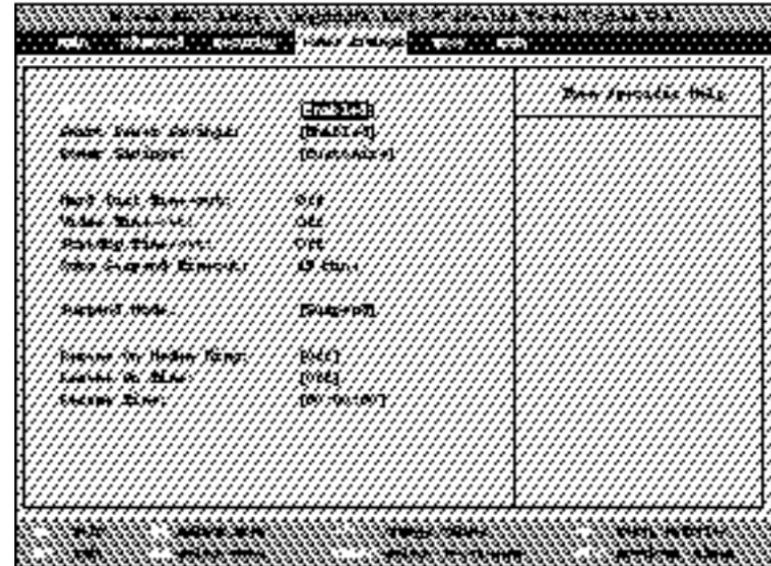


Figure 3-8 Power Savings Menu

Power Savings Menu, Setting Power Management Feature Controls

The Power Savings Menu allows you to set and change the Power Management parameters.

**POINT**

Power Savings parameters can also be set without entering the Setup Utility, through the Power Center Software.

The Power Savings Menu fields are:**SUS/RES Switch:****Smart Power Savings:****Power Savings:****Hard Disk Time-out:****Video Time-out:****Standby Time-out:****Auto Suspend Time-out:****Suspend Mode:****Resume on Modem Ring:****Resume on Time:****Resume Time:****SUS/RES Switch:**

You may choose to Enable or Disable the suspend function of the Suspend/Resume Button. The resume function cannot be disabled.

Smart Power Savings:

Smart Power Savings enables or disables the ability of the power source to control the power savings parameters. When the smart function is enabled the power savings features will not be active when a power adapter is active.

Power Savings:

Power Savings sets the power savings parameters. You may choose to have no power savings features, select a factory combination of parameters for Maximum Performance, select a factory combination of parameters for Maximum Battery Life or you may choose to customize the parameters to suit your special operating needs. Settings for each set of parameters are shown in Table 3-5.

Hard Disk Time-out:

The hard disk timeout parameter is the length of time that the hard disk can be inactive before your notebook automatically turns off the power to the hard drive controller and drive motor. If you choose a fac-

tory combination of parameters this field will display the setting. If you choose to customize the parameters you will be able to set this yourself. The options available vary from Off, which has no inactivity shutoff, to times from 30 seconds to 20 minutes.

Video Time-out:

The video timeout parameter is the length of time without any user input device activity before the display is turned off. If you choose a factory combination of parameters, this field will display the setting. If you choose to customize the parameters, you will be able to set this yourself. The options available vary from Off, which has no inactivity shutoff, to times from 30 seconds to 20 minutes.

Standby Time-out:

The standby timeout parameter is the length of time without any user input device activity before the processor clock is slowed to half-speed putting the CPU in a lowered power consumption condition and turning off the display and the hard disk. If you choose a factory combination of parameters this field

Configuring Your LifeBook 400 Series

will display the setting. If you choose to customize the parameters you will be able to set this yourself. The options available vary from Off, which has no inactivity shutoff, to times from 1 minute to 16 minutes.

Auto Suspend Time-out:

The auto-suspend time-out parameter is the length of time without any I/O activity before your notebook goes into Suspend Mode. If you choose a factory combination of parameters this field will display that setting. If you choose to customize the parameters you will be able to set this yourself. The options available vary from Off, which has no inactivity suspension, to times from 5 to 60 minutes.

Suspend Mode:

The Suspend Mode field allows you to choose the form of suspend state you wish. If you choose Suspend, you will suspend operation with power to RAM, and everything else powered down or in a very low power state. If you choose Save-to-Disk Mode your notebook will save all of RAM to the hard disk before going to Suspend Mode and turn off power to the RAM while in the suspended state.



POINT

When resuming from a Save-to-Disk suspension there will be a delay while the contents of RAM are loaded from the hard disk.



CAUTION

In the Save-to-Disk Mode there is no indication on the Status Indicator to let you know you are suspended rather than shut off from the Power Switch. You may want to make a practice of always trying the Resume Button before using the Power Switch.

Resume On Modem Ring:

Resume On Modem Ring sets whether or not to Resume from the Suspend state when a message is received by telephone line. This feature is not available if the Save-to-Disk Mode is enabled. This feature applies to internal, external and PCMCIA modems.

Resume On Time:

The Resume On Time field sets whether or not to Resume from the Suspend state at a designated time. This feature is available from either the Suspend Mode or the Save-to-Disk Mode.

Resume Time:

The Resume Time Sets the designated time, on a 24-hour clock, when your notebook is to automatically resume operation from the Suspend state. The format of the clock setting is hours:minutes:seconds. Each segment of the time is set separately, either by incrementing or by typing in the numbers. You move between the segments with the Tab key or the Shift+Tab keys. This field does not appear if Resume On Time is set to Off.

Exiting from the Power Savings Menu

When you have finished setting the parameters on the Power Savings Menu, you can either exit from the Setup Utility or move to another menu. If you wish to exit from Setup Utility press the Esc key to go to the Exit Menu. If you wish to move to another menu, use the cursor keys.

Table 3-5 Power Savings Default Settings

Parameter	Maximum Battery Life	Maximum Performance	Custom	None
Video Time-out	30 sec	Off	Off	Off
Hard Disk Time-out	30 sec	Off	Off	Off
Standby Time-out	1 min	Off	Off	Off
Auto Suspend Time-out	5 min	15 min	15 min	Off

Configuring Your LifeBook 400 Series

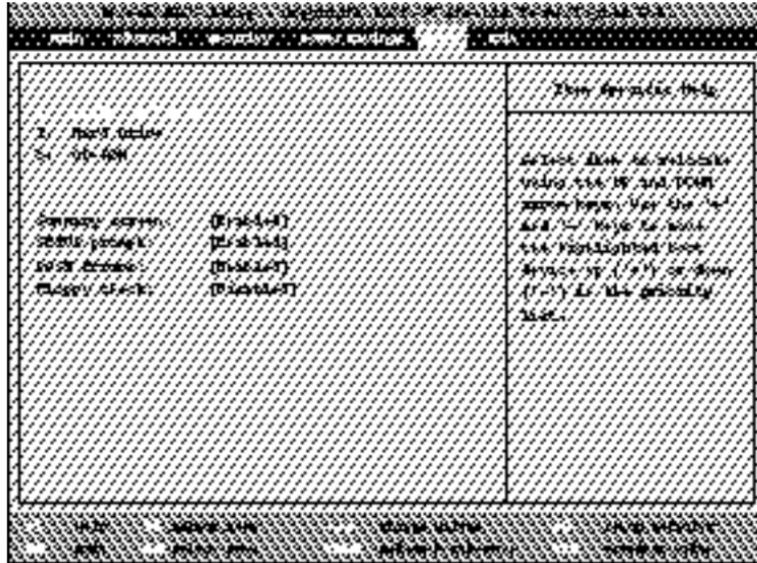


Figure 3-9 Boot Menu

Boot Menu – Selecting the Operating System Source:

The Boot Menu allows you to designate the order in which your notebook searches for an operating system when it boots up and to select which para-

meters will be displayed during boot as well as whether to do automatic checks for the presence of a floppy disk drive.

The Boot Menu fields are:

Boot Sequence:

The Boot Sequence possible sources are the internal hard drive, external floppy disk drive, and whatever kind of drive is in the Multi-function Bay. The default order is floppy disk drive, hard drive and then CD-ROM. This is the order in which the BIOS will search for an operating system unless you change the numbers by using the cursor keys to select item and then press the + or – key to change the order.

Summary Screen:

The Summary Screen Field allows you to enable and disable the display of a screen containing a summary of the configuration of the system. When enabled this screen appears after the completion of Power On Self Test (POST) and before the operating system is loaded. The default is Enabled.

SETUP prompt:

The SETUP prompt field allows you to enable the display of a prompt to press the key to activate the BIOS Setup Utility. The key always works whether the prompt is displayed or not.

POST Errors:

The POST Errors field allows you to disable the

display of error messages when the Power On Self Test finds problems.

Floppy Check:

The Floppy Check Field entry enables or disables the system from checking what kind of floppy disk is installed every time it boots up. Disabling this makes the boot a little bit faster. The default is Disabled.

Exiting from the Boot Menu

When you have finished setting the parameters on the Boot Menu, you can either exit from the Setup Utility or move to another menu. If you wish to exit from Setup Utility press the Esc key to go to the Exit Menu. If you wish to move to another menu, use the cursor keys.

Exit Menu – Leaving the Setup Utility

The Exit Menu is used to leave the Setup Utility.

The Exit Menu options are:

Save Changes and Exit:

Selecting Save Changes and Exit will store all the entries on every menu of the Setup Utility to the BIOS memory and then exit the Setup

Utility. When saving is complete the message Changes have been saved [Continue] will be displayed. Pressing any key will reboot your notebook.

Discard Changes and Exit:

Selecting Discard Changes and Exit will exit the Setup Utility without writing to the BIOS memory. When BIOS recognizes this selection it will load the operating system and begin operation.

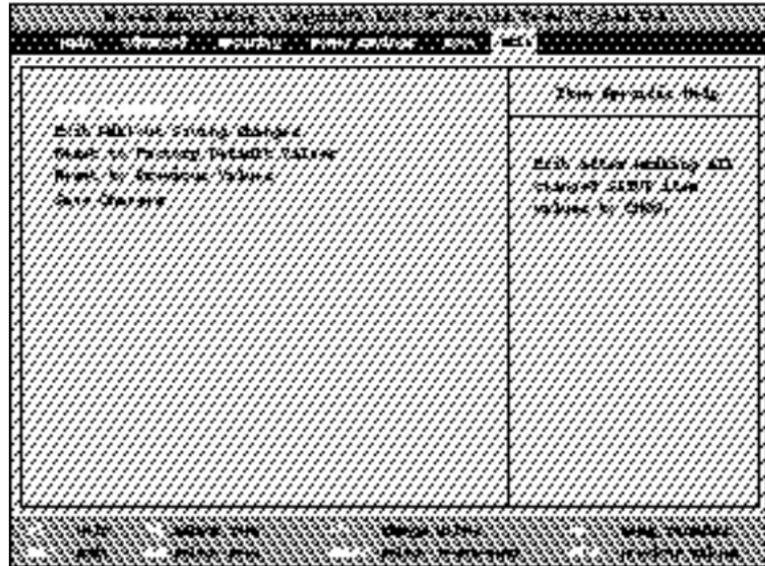


Figure 3-10 Exit Menu

Configuring Your LifeBook 400 Series

Get Default Values:

Selecting **Get Default Values** will load the factory preset default values for all menu fields. When the load is complete the Setup Utility will display the message **Default values have been loaded. [Continue]** . When any key is pressed the Setup Utility will return to the Exit Menu. To return to another menu follow the directions in the **Navigating Through The Setup Utility Section.** (See page 46.)

Load Previous Values:

Selecting **Load Previous Values** will load the BIOS memory values for all menu fields. When the load is complete, the Setup Utility will display the message **Previous values have been loaded [Continue]** . When any key is pressed the Setup Utility will return to the Exit Menu. To return to another menu, follow the directions in the **Navigating Through The Setup Utility Section.** (See page 46.)

Save Changes:

Selecting **Save Changes** will cause the new settings in all menus to be written to the

BIOS memory. When saving is complete the message **Changes have been saved [Continue]** will be displayed. Pressing a key will return the Setup Utility to the Exit Menu. To return to another menu, follow the directions in the **Navigating Through The Setup Utility Section.** (See page 46.)

Setting Up Your Save-To-Disk File Allocation

Your notebook comes with an allocation of space on the internal hard drive adequate to operate the Save-to-Disk function for the amount of memory installed at the factory.

If you add a RAM Module or do not use the Save-to-Disk function and wish to free up the disk space you will need to change the allocation. The utility to change the allocations is PHDISK.EXE and is activated from the MS-DOS prompt.

PHDISK allows you to perform five different functions related to the Save-to-Disk space on the internal hard drive. They are:

1. Allocate a space for the Save-to-Disk function.
2. Remove all space allocation for the Save-to-Disk function.
3. Find out details about the hard drive and the current Save-to-Disk space allocation.
4. Re-allocate space and mark bad blocks in the space allocated to the Save-to-Disk function when a disk error has occurred.
5. Find out how much space is needed to perform the Save-to-Disk function with the current memory configuration and how much unused space is available on the internal hard drive.

To find out how much space is needed to perform the Save-to-Disk function with the current memory configuration and how much unused space is available on the internal hard drive, do the following:

1. Go to the MS-DOS prompt.
(In Windows 95 go to the Start Menu and select MS-DOS Prompt.)
2. Type `CD C:\Fujitsu`

3. Type PHDISK.**4. Press the Enter key.**

5. The screen will display the amount disk space needed to perform the Save-to-Disk function with the current memory configuration and how much unused space is available on the internal hard drive.

To find out details about the hard drive and the current Save-to-Disk space allocation, do the following:

1. Go to the MS-DOS prompt.

(In Windows 95 go to the Start Menu and select MS-DOS Prompt.)

2. Type `CD C:\Fujitsu`**3. Type** `PHDISK/INFO` .**4. Press the Enter key.**

5. The screen will display the size of the space currently allocated to the Save-to-Disk function and other parameters about the space and the hard drive.

To remove all space allocation for the Save-to-Disk function, do the following:

1. Go to the MS-DOS prompt.

(In Windows 95 go to the Start Menu and select MS-DOS Prompt.)

2. Type `CD C:\Fujitsu`**3. Type** `PHDISK/DELETE/FILE` .**4. Press the Enter key.**

5. The utility will remove the space allocation for the Save-to-Disk function and free that space for other use.

To create a space allocation for the Save-to-Disk function, do the following:

1. Go to the MS-DOS prompt.**2. Type** `PHDISK/CREATE/FILE` .**3. Press the Enter key.**

4. The utility will create a Save-to-Disk file called `SAVE2DSK.BIN` in the root directory. It will be of the minimum size needed to

support the Save-to-Disk function with the current memory configuration.

If you have had a read or write error when you tried to perform a Save-to-Disk operation you can re-allocate space to compensate for bad blocks on the drive. To do this:

1. Go to the MS-DOS prompt.**2. Type** `PHDISK/REFORMAT/FILE` .**3. Press the Enter key.**

4. The utility will re-create the Save-to-Disk file called `SAVE2DSK.BIN` with the same usable size and any bad blocks marked.

**CAUTION**

Never use PARTITION instead of FILE with the PHDISK Utility or you will reformat the internal hard drive and all data, applications and operating system will be destroyed.

User Installable Features

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Section FOUR

User Installable Features

Your LifeBook 400 Series has a number of user installable features:

- PCMCIA slots in the left side panel of your notebook allows you to install PCMCIA cards or IC memory cards (SRAM card) or Zoom Video cards (Slot 0).
- A Multi-function Bay in the right front of your notebook allows you to install a modular CD-ROM drive, or a modular Floppy Disk Drive.
- A card slot under the keyboard allows you to install a RAM Module.
- An LPT (parallel) Port in the back of your notebook allows you to connect a printer, a photo or text scanner, etc.
- A COM (serial) Port in the back of your notebook allows you to connect any RS232C devices such as an external modem, a serial interface bar-code scanner, etc.

- A connector in the back of your notebook allows you to connect an external VGA/SVGA or Hi Res monitor.
- A connector on the back of your notebook allows the connection of a port replicator or docking station.
- An Audio Input Jack on the right side of your notebook allows you to connect a sound source.
- An Audio Output Jack on the right side of your notebook allows you to connect headphones or powered speakers.
- A PS/2 Connector on the right side of your notebook allows you to connect an external mouse, keyboard or numeric keypad.
- A Floppy Disk Connector on the left side of your notebook allows you to connect an optional External Floppy Disk Drive Adapter if the Multi-function Bay is in use for something else.

This section describes how to install and remove equipment for each of the expansion features. The section is organized in the same order as the devices are arranged in your notebook.

RAM Module

Your notebook has 8MB of installed RAM. To increase the memory capacity, you may install a RAM Module in the socket in the RAM compartment under the keyboard of your notebook. The RAM Module is a dual-in-line memory module (DIMM). You may add modules of different capacity.

Installing the RAM Module
To install the RAM Module:

1. Turn off power to your notebook using the Power Switch, (see *Power Off* on page 23), and remove any power adapter (AC or Auto).
2. Lift the front of the two tabs at the bottom of the keyboard and tilt them back about 90 degrees. (See *Figure 4-1*.)
3. Remove the screw under each tab.
4. Use the tabs to gently lift the keyboard and pull it slightly forward until the three tabs at the top of the keyboard disengage.
5. Tilt the keyboard back against the display.
6. Remove the RAM Module from the static guarded sleeve.

User Installable Features

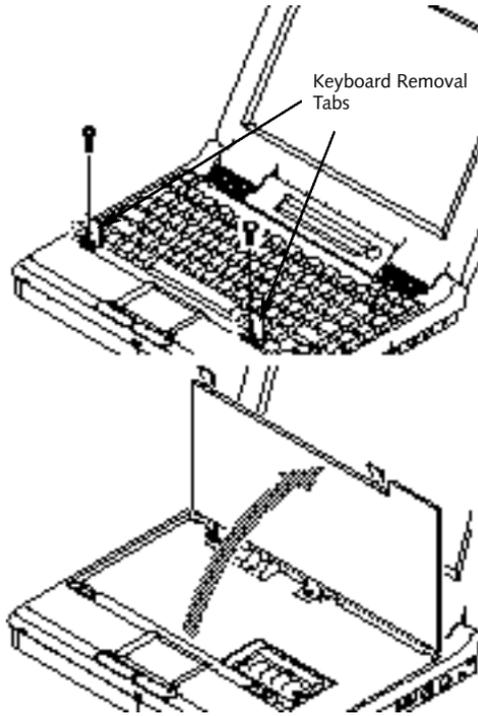


Figure 4-1 Raising the Keyboard



CAUTION

Do not use the keys to lift the keyboard. They could be damaged.



CAUTION

Be careful not to pinch the flat cable.



CAUTION

Do not attempt to install or remove a RAM Module if the notebook has been recently used. The surface areas under the keyboard can be very hot, and may injure you.



CAUTION

The RAM Expansion Module can be severely damaged by electro-static discharge (ESD). Be sure you are properly grounded when installing the module.

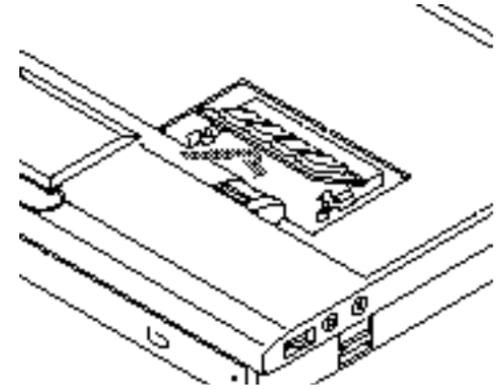


Figure 4-2 Installing the RAM Module

- Align the connector edge of the RAM Module with the connector slot in the compartment. The notch on the module should be on the right with the part side up and the connector pointing towards the back of the notebook and aligned towards the notch in the connector. (Figure 4-2.)

8. Insert the RAM Module at a 45° angle. (Figure 4-2.) Press the connector edge of the module firmly down and into the connector.
9. Press the RAM Module down into the compartment until it lodges under the retaining clip. You will hear a click when it is properly in place.
10. Replace the keyboard by aligning the tabs at the top of the keyboard with the holes in the notebook body and closing the keyboard down until it fits flat and the top of the keyboard is tight against the body of the notebook.
11. Replace the two screws.
12. Close the tabs at the bottom of the keyboard and push firmly until they snap.

Removing the RAM Module

The RAM Module is not something you routinely remove from your notebook. Once it is installed, you can leave it in place unless you want to increase RAM capacity.

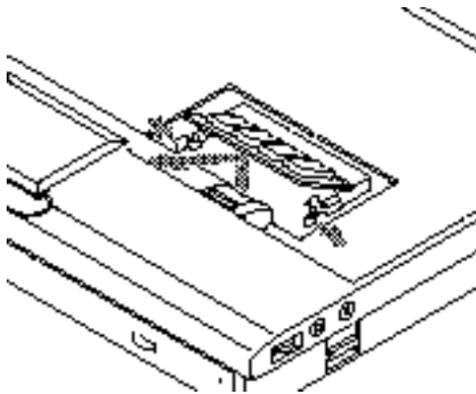


Figure 4-3 Removing the RAM Module



CAUTION

Do not attempt to install or remove a RAM Module if the notebook has been recently used. The surface areas under the keyboard can be very hot, and may injure you.



CAUTION

Before you install or remove the RAM Module, save changes and close all files. Turn power off to your notebook. (See *Power Off* on Page 23.)

To Remove the RAM Module:

1. Perform steps 1 through 5 of Installing the RAM Module.
2. Pull clips sideways from each side of the RAM Module. (Figure 4-3).
3. While holding clips out, remove the module from the slot by lifting it up and pulling towards the front edge of the notebook.
4. Store the RAM Module in a static guarded sleeve.
5. Replace the keyboard by following the instructions in steps 10 through 12 of the instructions for Installing the RAM Module, or install a new RAM Module and then replace the keyboard by following the instructions in steps 6 through 12 of the instructions for Installing the RAM Module.

User Installable Features

Checking the Computer Recognition of New Memory Capacity

When you have changed RAM capacity by adding or removing a RAM Module, be sure to check that your notebook has recognized all of the memory. When you turn the power on to your notebook for the first time after making the change check the display while the system is booting. Memory size and extended memory size is displayed briefly on the screen. Example: A system with the basic 8MB of RAM displays the following:

640K System Memory, 7168K Extended Memory

When you have installed additional memory, the display should change. For example for:

Total RAM Installed	System Memory	Extended Memory
16 MB	640 KB	15360K
24 MB	640 KB	23552K
32 MB	640 KB	31744K
40 MB	640 KB	39936K
48 MB	640 KB	48128K
72 MB	640 KB	72704K

You can also check RAM capacity more leisurely by looking at the Main Menu of the Setup Utility.

To do this:

1. Turn on notebook power using the Power Switch.
2. Enter the Setup Utility by pressing the F2 key as soon as the
Press <F2> to enter SETUP message appears on the screen. (See page 45.)
3. The System Memory and the Extended Memory capacity as detected by the notebook during the Power On Self Test, are displayed at the bottom of the Main Menu screen.

If the total memory displayed is not what you believe it should be, check that your RAM Module is properly installed. If it is properly installed and the capacity is not all recognized, see the Trouble Shooting Section starting on page 91.

PCMCIA Cards

PCMCIA (Personal Computer Memory Card International Association) cards, also referred to as PC cards, perform a wide variety of functions, and are ideal for mobile computers.

Some available PCMCIA cards:

- Fax/data modem cards (Type II).
- Local area network (LAN) cards (Type II).
- Wireless LAN cards (Type II).
- 1MB and 2MB static RAM (SRAM) cards (Type I).
- SunDisk IDE solid-state disk cards (Type II).
- SCSI card (Type II).
- Zoom Video cards (Type II, Slot 0 only).
- ATA card (Type III).
- Other PC cards that conform to PCMCIA 2.1 standards.

For further information, refer to the instructions supplied with the PCMCIA card.

Caring for PCMCIA Cards

PCMCIA cards are durable; however, you must treat them with care. The documentation supplied with the PCMCIA card will provide specific information; however, you should pay attention to the following points:

- To keep out dust and dirt, store PCMCIA cards in their protective sleeves when they are not installed in your notebook.
- Avoid prolonged exposure to direct sunlight or excessive heat.
- Keep the cards dry.
- Do not flex or bend the cards, and do not place heavy objects on top of them.
- Do not force cards into the slot.
- Avoid dropping cards, or subjecting them to excessive vibration.



POINT

Zoom Video support is in Slot 0 only



CAUTION

Do not insert a PCMCIA card into a slot if there is water or any other substance on the card. If you do, you may permanently damage the card, your notebook, or both.

Installing PCMCIA Cards in Your Notebook

PCMCIA cards are installed in the PCMCIA card slot in the left side panel of your notebook.

To install a PCMCIA card:

1. See the PCMCIA card manual for instructions on installation of that specific card.
2. Make sure that there is not already a PCMCIA card in the slot. If there is, eject it, as described in Removing PCMCIA Cards on page 81.



CAUTION

Some PCMCIA cards can only be installed or removed with the power in Suspend Mode or Off. Please check the card documentation for correct usage.

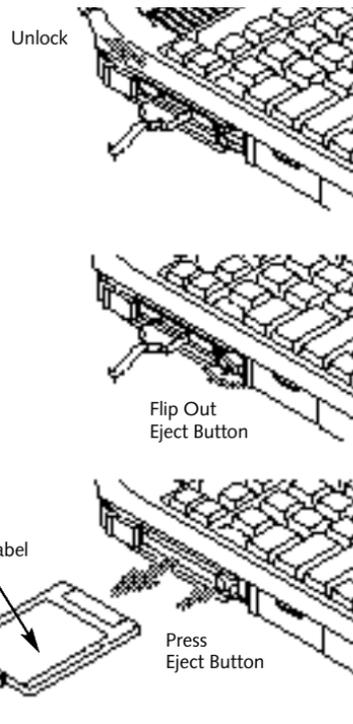


Figure 4-4 Installing and Removing a PCMCIA Card

User Installable Features



CAUTION

Installing or removing a card while your notebook is in the process of going through the power on or power off sequence may damage the card and/or your notebook

3. **Insert the PCMCIA card in the card slot, with the product name label facing up. (Figure 4-4.)**
4. **When the PCMCIA card is fully inserted, the Eject Button will pop out.**
5. **Flip this button toward the front of the notebook to fold it out of the way.**
6. **When the card is installed, lock it in place by sliding the Lock Button to the right. (Figure 4-4.)**



CAUTION

Windows 95 has a shutdown procedure for PCMCIA cards that must be followed before beginning to remove a card.

Removing PCMCIA Cards from your Notebook

If you wish to remove or replace the PCMCIA card, use the following procedure:

Shutdown operation of the card by

Windows 95

1. **Click on the PC Card Indicator on the task bar.**
2. **Select the card to be removed and click on it.**
3. **Verify that the device cannot be removed message does not appear and click on OK.**
4. **If the device cannot be removed message appears, save all files, close all applications, and exit Windows 95 and then**

shutoff the power with the Power Switch. (See Power Off on page 23.)

Other Operating Systems

1. **Save all files, close all applications, then shutoff the power with the Power Switch. (See Power Off on page 23.)**
2. **Slide the PCMCIA card lock toward the back of your notebook to unlock the card.**
3. **Flip the Eject Button toward the back of the notebook.**
4. **Press the Eject Button to eject the card. (Figure 4-4.)**
5. **Grasp the body of the card firmly and pull it out of the slot.**



CAUTION

If the PCMCIA card has an external connector and cable, do not pull on this cable when removing the card.

Installing a Theft Prevention Lock

A physical security system lock can be installed on the right side of your notebook. (See Figure 1-7 on page 7 for the location of the lock slot.) Simply insert the key end of the security system in the slot, rotate 90 degrees and lock.

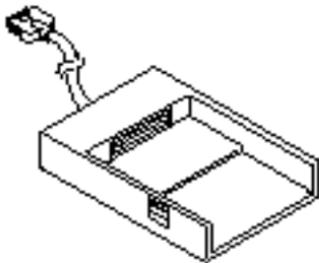


Figure 4-5 Optional External Floppy Disk Drive Adapter

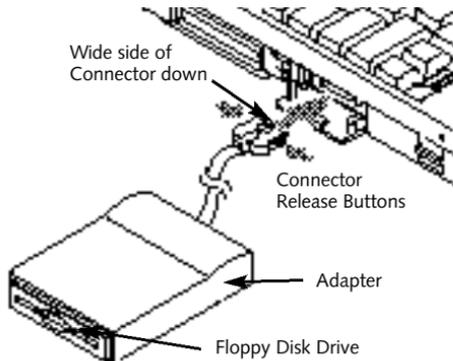


Figure 4-6 Installing an External Floppy Disk Drive

Optional External Installation of The Floppy Disk Drive

To connect the floppy disk drive externally, via the connector on the left side of your notebook:

1. Close all files and exit all applications
2. Turn off power to your notebook, close the display and remove the AC Adapter. (See page 9 for more information.)

To Install

3. Insert the Floppy Disk Drive into the optional External Floppy Disk Drive Adapter
4. Open the External Floppy Disk Drive Adapter Connector cover, (see Figure 1-6 on page 6), by gently pulling on the top of the cover and tilting it down.
5. Align the connector of the Floppy Disk Adapter with the connector towards your notebook with the wide side down.
6. Insert the connector of the adapter into the connector on your notebook and push in firmly until it clicks.



CAUTION

Be careful aligning and seating the Floppy Disk Drive in the Adapter. If the fit is incorrect you may damage the Floppy Disk Drive or the External Floppy Disk Adapter. If the Drive does not move easily, remove it and check for dirt or foreign objects. It will require a firm push to latch the drive in place.

User Installable Features

To Remove

3. Press firmly on the sides of the adapter connector next to the body of your notebook.
 4. Pull the connector free.
 5. Close the connector cover by tilting up and pressing until it latches.
 6. Slide the release latch on the side of the Adapter toward the bottom of the Adapter.
- Note:** Finger ridges are on the bottom of the Floppy Disk Drive module.
7. Slide the Floppy Disk Drive out of the Adapter.



CAUTION

This adapter is designed only for use with a floppy disk drive. Do not connect any other device or you could damage the device or your notebook.

Nickel Metal Hydride Battery Pack

There is a chamber in the bottom of your notebook which contains the Nickel Metal Hydride Battery Pack. Additional Nickel Metal Hydride Battery Packs or Lithium ion Battery Packs are available as options. A charged Battery Pack can be exchanged for a discharged one for additional operating time.

In addition, any battery should be removed if your notebook is not going to be used for an extended period of time.



CAUTION

Removing or installing the Battery Pack with the power on may cause data loss, electric shock and/or damage to the notebook or the battery.

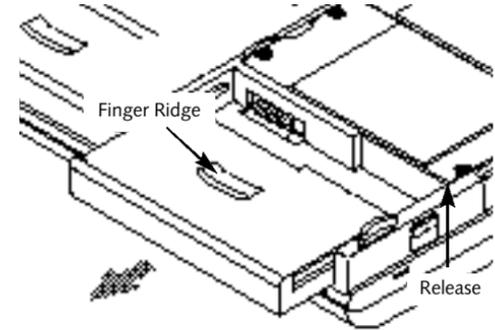


Figure 4-7 Removing the Battery Pack

To Remove the Battery Pack

1. Save all files and close all applications.
2. Turn off the Power Switch and remove the AC Adapter.
3. Slide the Battery Eject Button on the left side of the notebook toward the bottom of the notebook. (Figure 4-7.)
4. Slide the battery towards the front of your notebook until it clears the chamber.

To Install the Battery Pack

1. Save all files and close all applications.
2. Turn off the Power Switch and remove the AC Adapter.
3. With the battery connector toward the back of the notebook align the tracks on the side of the battery with the groves in the side of the bay.
4. Slide the battery toward the back of your notebook until it clicks into place.
5. Plug in the AC Adapter and charge the battery.

CAUTION

Under federal, state or local law it may be illegal to dispose of batteries by putting them in the trash. Please take care of our environment and dispose of batteries properly. Check with your local government authority for details regarding recycling or disposing of the old battery, or contact your support representative at 1-800-8FUJITSU. (1-800-838-5487)

CAUTION

If the Battery Connector is not fully seated, you may not be able to use your notebook or to charge the battery.

Multi-function Bay

The bay on the right front panel of your notebook accommodates the removable modular CD-ROM Drive, or the removable modular Floppy Disk Drive.

POINT

The Multi-function Bay devices can be warm swapped, i.e. installed with the power On and the system in Suspend Mode.

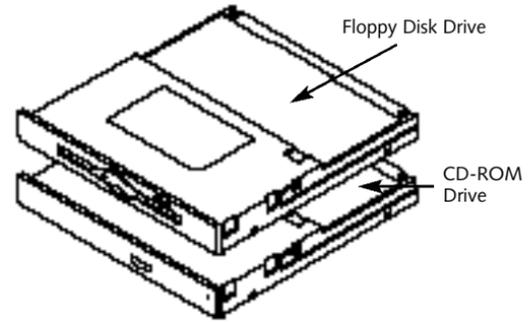


Figure 4-8 Multi-function Bay Modules

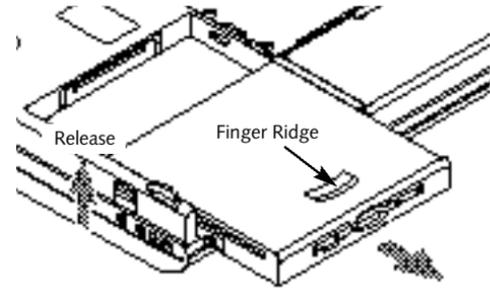


Figure 4-9 Removing a Device from the Multi-function Bay

User Installable Features

To Install or Remove a Device
in the Multi-function Bay

1. Put your notebook into Suspend Mode.

To Remove

2. Slide the release latch on the right side toward the bottom of your notebook.

3. Slide the module forward until the unit is clear of the chamber.

To Install

2. Orient the item to be installed with the finger ridge away from the body of your notebook and the connector toward the body of your notebook.

3. With the module connector toward the back of your notebook align the grooves on the side of the device with the tracks in the side of the bay. (Figure 4-9.)

4. Slide the module toward the back of your notebook until it clicks into place.



CAUTION

Be careful aligning and seating modules in the bay. If the fit is incorrect you may damage the bay or the module. If the module does not move easily, remove it, and check for dirt or foreign objects. It will require a firm push to latch the module in place.

CD-ROM Drive

The removable, modular CD-ROM drive is durable, however, you must treat it with care. Please pay attention to the following points:

- The drive rotates the compact disk at very high speed. Do not carry it around or subject it to shock or vibration with the power on.
- Avoid using or storing the drive or CDs where they will be exposed to extreme temperatures.
- Avoid using or storing the drive or CDs where it is damp or dusty.

- Avoid using or storing the drive near magnets or devices that generate strong magnetic fields.
- Avoid storing the drive where it will be subjected to shock or vibration.
- Do not disassemble or dismantle the CD-ROM drive.

Loading a CD

- Make sure that the tilt adjustment feet on the bottom of the notebook are folded flat against the bottom of your notebook.
- Make sure there is power to your notebook.
- Push and release, gently but firmly, on the eject button on the front of the CD-ROM drive to open the drive. The tray will come out a short distance. (See Figure 2-14 on page 34.)
- Gently pull the tray out until a CD-ROM can be easily placed in the tray.
- Make sure that the protective sheet that was in the tray when it was shipped has been removed.

- Place the CD-ROM label side up with the hole in the center of the CD-ROM fitted onto the raised circle in the center of the tray. (See Figure 2-11 on page 32.)
- Close the tray.
- After the CD-ROM is loaded it will take a short time for your notebook to recognize it.

**POINT**

The modular CD-ROM Drive maybe installed or removed with the notebook in Suspend Mode or the power Off.



Figure 4-10 Optional Hard Drive

Removable Floppy Disk Drive

For information on the care and use of the floppy disk drive see Floppy Disk Drive in Section Two on pages 31-33.

**POINT**

The Removable Floppy Disk Drive maybe installed or removed with the notebook in Suspend Mode or the power Off.

Installing Devices on the LPT Port

When installing a device on the LPT Port, be sure that the connector is the right size, aligned, and fully seated. Tighten the hold-down screw on each end of the connector.

Installing Devices on the COM Port

When installing a device on the COM Port, be sure that the connector is the right size, aligned, and fully seated. Tighten the hold-down screw on each end of the connector.

Installing External Monitors

When installing an external monitor, be sure that the connector is the right size, aligned, and fully seated. Tighten the hold down screw on each end of the connector.

Installing a Mouse or Keyboard

Make sure the connector on the device is the correct size. Align the arrow on the connector to point to the bottom of your notebook and push in until the connector seats. A mouse or keyboard or keypad may be installed and will be automatically recognized by your notebook without restarting or changing setups.

Installing a Replicator Port or Mini-Docking Station

1. To use a docking device with your notebook they both must be on a flat surface.
2. Make sure that the tilt adjustment feet are flat against the bottom of the notebook and the covers of the connectors, both rear panel and left side panel, are closed.
3. Make sure that the slide cover in the rear panel is completely open.

User Installable Features

4. Push the levers on the side of the docking device toward the back so that the ejector guides extend.
5. Carefully set the notebook on to the docking device so that the guides gently push into the holes in the bottom of the notebook.
(See Figure 1-9 on page 8.)
6. Pull the levers forward until the notebook is firmly latched in place.
7. Verify that the docking device connectors are operational. Plugging in an external mouse to the docking device and trying to move the cursor with it is an easy test.

Installing Audio Input Devices

Make sure that the audio device, a cassette recorder, for example, is equipped with an $\frac{1}{8}$ " (3.5 mm) stereo mini-plug. Make sure the plug is aligned and push in until fully seated.

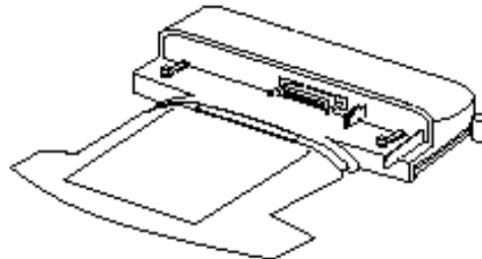


Figure 4-11 Sample Docking Device



CAUTION

This input is not designed for use with microphones.

Installing Audio Output Devices

Make sure that the audio device, stereo headphones for example, is equipped with an $\frac{1}{8}$ " (3.5 mm) stereo mini-plug. Make sure the plug is aligned and push in until fully seated.

User Installable Features

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Section FOUR

User Installable Features

Your LifeBook 400 Series has a number of user installable features:

- PCMCIA slots in the left side panel of your notebook allows you to install PCMCIA cards or IC memory cards (SRAM card) or Zoom Video cards (Slot 0).
- A Multi-function Bay in the right front of your notebook allows you to install a modular CD-ROM drive, or a modular Floppy Disk Drive.
- A card slot under the keyboard allows you to install a RAM Module.
- An LPT (parallel) Port in the back of your notebook allows you to connect a printer, a photo or text scanner, etc.
- A COM (serial) Port in the back of your notebook allows you to connect any RS232C devices such as an external modem, a serial interface bar-code scanner, etc.

- A connector in the back of your notebook allows you to connect an external VGA/SVGA or Hi Res monitor.
- A connector on the back of your notebook allows the connection of a port replicator or docking station.
- An Audio Input Jack on the right side of your notebook allows you to connect a sound source.
- An Audio Output Jack on the right side of your notebook allows you to connect headphones or powered speakers.
- A PS/2 Connector on the right side of your notebook allows you to connect an external mouse, keyboard or numeric keypad.
- A Floppy Disk Connector on the left side of your notebook allows you to connect an optional External Floppy Disk Drive Adapter if the Multi-function Bay is in use for something else.

This section describes how to install and remove equipment for each of the expansion features. The section is organized in the same order as the devices are arranged in your notebook.

RAM Module

Your notebook has 8MB of installed RAM. To increase the memory capacity, you may install a RAM Module in the socket in the RAM compartment under the keyboard of your notebook. The RAM Module is a dual-in-line memory module (DIMM). You may add modules of different capacity.

Installing the RAM Module
To install the RAM Module:

1. Turn off power to your notebook using the Power Switch, (see *Power Off* on page 23), and remove any power adapter (AC or Auto).
2. Lift the front of the two tabs at the bottom of the keyboard and tilt them back about 90 degrees. (See *Figure 4-1*.)
3. Remove the screw under each tab.
4. Use the tabs to gently lift the keyboard and pull it slightly forward until the three tabs at the top of the keyboard disengage.
5. Tilt the keyboard back against the display.
6. Remove the RAM Module from the static guarded sleeve.

User Installable Features

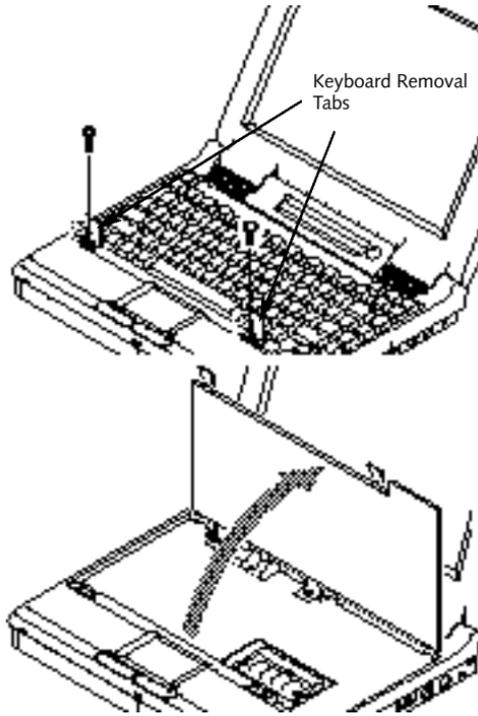


Figure 4-1 Raising the Keyboard



CAUTION

Do not use the keys to lift the keyboard. They could be damaged.



CAUTION

Be careful not to pinch the flat cable.



CAUTION

Do not attempt to install or remove a RAM Module if the notebook has been recently used. The surface areas under the keyboard can be very hot, and may injure you.



CAUTION

The RAM Expansion Module can be severely damaged by electro-static discharge (ESD). Be sure you are properly grounded when installing the module.

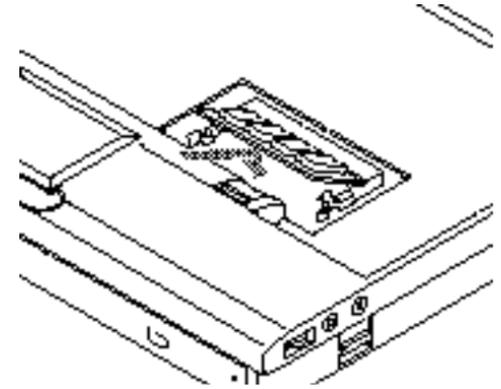


Figure 4-2 Installing the RAM Module

- Align the connector edge of the RAM Module with the connector slot in the compartment. The notch on the module should be on the right with the part side up and the connector pointing towards the back of the notebook and aligned towards the notch in the connector. (Figure 4-2.)

8. Insert the RAM Module at a 45° angle. (Figure 4-2.) Press the connector edge of the module firmly down and into the connector.
 9. Press the RAM Module down into the compartment until it lodges under the retaining clip. You will hear a click when it is properly in place.
 10. Replace the keyboard by aligning the tabs at the top of the keyboard with the holes in the notebook body and closing the keyboard down until it fits flat and the top of the keyboard is tight against the body of the notebook.
 11. Replace the two screws.
 12. Close the tabs at the bottom of the keyboard and push firmly until they snap.
- Removing the RAM Module
The RAM Module is not something you routinely remove from your notebook. Once it is installed, you can leave it in place unless you want to increase RAM capacity.

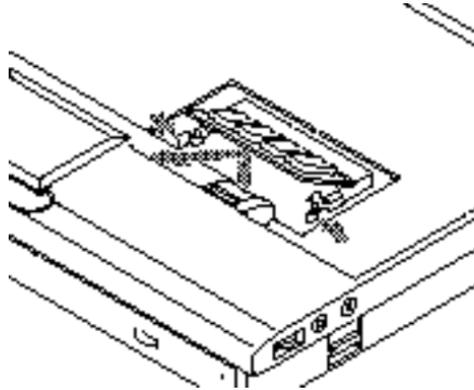


Figure 4-3 Removing the RAM Module

**CAUTION**

Do not attempt to install or remove a RAM Module if the notebook has been recently used. The surface areas under the keyboard can be very hot, and may injure you.

**CAUTION**

Before you install or remove the RAM Module, save changes and close all files. Turn power off to your notebook. (See *Power Off* on Page 23.)

To Remove the RAM Module:

1. Perform steps 1 through 5 of Installing the RAM Module.
2. Pull clips sideways from each side of the RAM Module. (Figure 4-3).
3. While holding clips out, remove the module from the slot by lifting it up and pulling towards the front edge of the notebook.
4. Store the RAM Module in a static guarded sleeve.
5. Replace the keyboard by following the instructions in steps 10 through 12 of the instructions for Installing the RAM Module, or install a new RAM Module and then replace the keyboard by following the instructions in steps 6 through 12 of the instructions for Installing the RAM Module.

User Installable Features

Checking the Computer Recognition of New Memory Capacity

When you have changed RAM capacity by adding or removing a RAM Module, be sure to check that your notebook has recognized all of the memory. When you turn the power on to your notebook for the first time after making the change check the display while the system is booting. Memory size and extended memory size is displayed briefly on the screen. Example: A system with the basic 8MB of RAM displays the following:

640K System Memory, 7168K Extended Memory

When you have installed additional memory, the display should change. For example for:

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24 MB	640 KB	23552K
32 MB	640 KB	31744K
40 MB	640 KB	39936K
48 MB	640 KB	48128K
72 MB	640 KB	72704K

You can also check RAM capacity more leisurely by looking at the Main Menu of the Setup Utility.

To do this:

1. Turn on notebook power using the Power Switch.
2. Enter the Setup Utility by pressing the F2 key as soon as the
Press <F2> to enter SETUP message appears on the screen. (See page 45.)
3. The System Memory and the Extended Memory capacity as detected by the notebook during the Power On Self Test, are displayed at the bottom of the Main Menu screen.

If the total memory displayed is not what you believe it should be, check that your RAM Module is properly installed. If it is properly installed and the capacity is not all recognized, see the Trouble Shooting Section starting on page 91.

PCMCIA Cards

PCMCIA (Personal Computer Memory Card International Association) cards, also referred to as PC cards, perform a wide variety of functions, and are ideal for mobile computers.

Some available PCMCIA cards:

- Fax/data modem cards (Type II).
- Local area network (LAN) cards (Type II).
- Wireless LAN cards (Type II).
- 1MB and 2MB static RAM (SRAM) cards (Type I).
- SunDisk IDE solid-state disk cards (Type II).
- SCSI card (Type II).
- Zoom Video cards (Type II, Slot 0 only).
- ATA card (Type III).
- Other PC cards that conform to PCMCIA 2.1 standards.

For further information, refer to the instructions supplied with the PCMCIA card.

Caring for PCMCIA Cards

PCMCIA cards are durable; however, you must treat them with care. The documentation supplied with the PCMCIA card will provide specific information; however, you should pay attention to the following points:

- To keep out dust and dirt, store PCMCIA cards in their protective sleeves when they are not installed in your notebook.
- Avoid prolonged exposure to direct sunlight or excessive heat.
- Keep the cards dry.
- Do not flex or bend the cards, and do not place heavy objects on top of them.
- Do not force cards into the slot.
- Avoid dropping cards, or subjecting them to excessive vibration.



POINT

Zoom Video support is in Slot 0 only



CAUTION

Do not insert a PCMCIA card into a slot if there is water or any other substance on the card. If you do, you may permanently damage the card, your notebook, or both.

Installing PCMCIA Cards in Your Notebook

PCMCIA cards are installed in the PCMCIA card slot in the left side panel of your notebook.

To install a PCMCIA card:

1. See the PCMCIA card manual for instructions on installation of that specific card.
2. Make sure that there is not already a PCMCIA card in the slot. If there is, eject it, as described in Removing PCMCIA Cards on page 81.



CAUTION

Some PCMCIA cards can only be installed or removed with the power in Suspend Mode or Off. Please check the card documentation for correct usage.

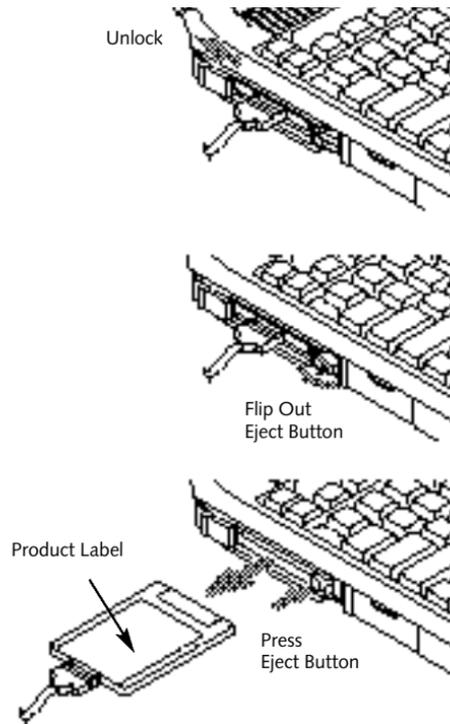


Figure 4-4 Installing and Removing a PCMCIA Card

User Installable Features



CAUTION

Installing or removing a card while your notebook is in the process of going through the power on or power off sequence may damage the card and/or your notebook

3. **Insert the PCMCIA card in the card slot, with the product name label facing up. (Figure 4-4.)**
4. **When the PCMCIA card is fully inserted, the Eject Button will pop out.**
5. **Flip this button toward the front of the notebook to fold it out of the way.**
6. **When the card is installed, lock it in place by sliding the Lock Button to the right. (Figure 4-4.)**



CAUTION

Windows 95 has a shutdown procedure for PCMCIA cards that must be followed before beginning to remove a card.

Removing PCMCIA Cards from your Notebook

If you wish to remove or replace the PCMCIA card, use the following procedure:

Shutdown operation of the card by

Windows 95

1. **Click on the PC Card Indicator on the task bar.**
2. **Select the card to be removed and click on it.**
3. **Verify that the device cannot be removed message does not appear and click on OK.**
4. **If the device cannot be removed message appears, save all files, close all applications, and exit Windows 95 and then**

shutoff the power with the Power Switch. (See Power Off on page 23.)

Other Operating Systems

1. **Save all files, close all applications, then shutoff the power with the Power Switch. (See Power Off on page 23.)**
2. **Slide the PCMCIA card lock toward the back of your notebook to unlock the card.**
3. **Flip the Eject Button toward the back of the notebook.**
4. **Press the Eject Button to eject the card. (Figure 4-4.)**
5. **Grasp the body of the card firmly and pull it out of the slot.**



CAUTION

If the PCMCIA card has an external connector and cable, do not pull on this cable when removing the card.

Installing a Theft Prevention Lock

A physical security system lock can be installed on the right side of your notebook. (See Figure 1-7 on page 7 for the location of the lock slot.) Simply insert the key end of the security system in the slot, rotate 90 degrees and lock.

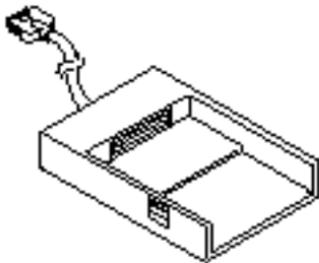


Figure 4-5 Optional External Floppy Disk Drive Adapter

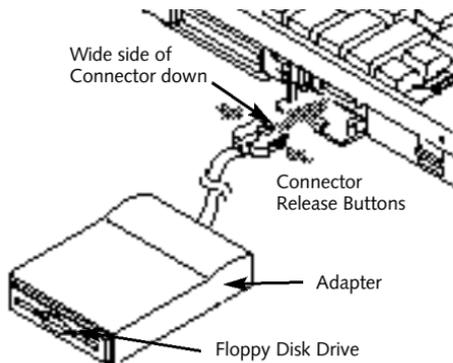


Figure 4-6 Installing an External Floppy Disk Drive

Optional External Installation of The Floppy Disk Drive

To connect the floppy disk drive externally, via the connector on the left side of your notebook:

1. Close all files and exit all applications
2. Turn off power to your notebook, close the display and remove the AC Adapter. (See page 9 for more information.)

To Install

3. Insert the Floppy Disk Drive into the optional External Floppy Disk Drive Adapter
4. Open the External Floppy Disk Drive Adapter Connector cover, (see Figure 1-6 on page 6), by gently pulling on the top of the cover and tilting it down.
5. Align the connector of the Floppy Disk Adapter with the connector towards your notebook with the wide side down.
6. Insert the connector of the adapter into the connector on your notebook and push in firmly until it clicks.



CAUTION

Be careful aligning and seating the Floppy Disk Drive in the Adapter. If the fit is incorrect you may damage the Floppy Disk Drive or the External Floppy Disk Adapter. If the Drive does not move easily, remove it and check for dirt or foreign objects. It will require a firm push to latch the drive in place.

User Installable Features

To Remove

3. Press firmly on the sides of the adapter connector next to the body of your notebook.
 4. Pull the connector free.
 5. Close the connector cover by tilting up and pressing until it latches.
 6. Slide the release latch on the side of the Adapter toward the bottom of the Adapter.
- Note:** Finger ridges are on the bottom of the Floppy Disk Drive module.
7. Slide the Floppy Disk Drive out of the Adapter.



CAUTION

This adapter is designed only for use with a floppy disk drive. Do not connect any other device or you could damage the device or your notebook.

Nickel Metal Hydride Battery Pack

There is a chamber in the bottom of your notebook which contains the Nickel Metal Hydride Battery Pack. Additional Nickel Metal Hydride Battery Packs or Lithium ion Battery Packs are available as options. A charged Battery Pack can be exchanged for a discharged one for additional operating time.

In addition, any battery should be removed if your notebook is not going to be used for an extended period of time.



CAUTION

Removing or installing the Battery Pack with the power on may cause data loss, electric shock and/or damage to the notebook or the battery.

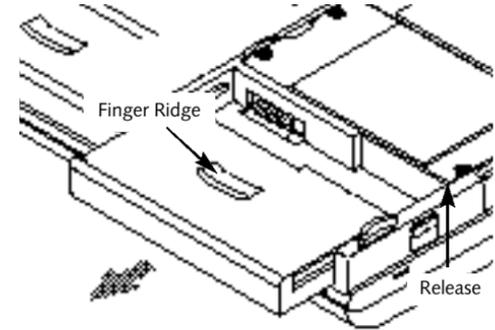


Figure 4-7 Removing the Battery Pack

To Remove the Battery Pack

1. Save all files and close all applications.
2. Turn off the Power Switch and remove the AC Adapter.
3. Slide the Battery Eject Button on the left side of the notebook toward the bottom of the notebook. (Figure 4-7.)
4. Slide the battery towards the front of your notebook until it clears the chamber.

To Install the Battery Pack

1. Save all files and close all applications.
2. Turn off the Power Switch and remove the AC Adapter.
3. With the battery connector toward the back of the notebook align the tracks on the side of the battery with the groves in the side of the bay.
4. Slide the battery toward the back of your notebook until it clicks into place.
5. Plug in the AC Adapter and charge the battery.

CAUTION

Under federal, state or local law it may be illegal to dispose of batteries by putting them in the trash. Please take care of our environment and dispose of batteries properly. Check with your local government authority for details regarding recycling or disposing of the old battery, or contact your support representative at 1-800-8FUJITSU. (1-800-838-5487)

CAUTION

If the Battery Connector is not fully seated, you may not be able to use your notebook or to charge the battery.

Multi-function Bay

The bay on the right front panel of your notebook accommodates the removable modular CD-ROM Drive, or the removable modular Floppy Disk Drive.

POINT

The Multi-function Bay devices can be warm swapped, i.e. installed with the power On and the system in Suspend Mode.

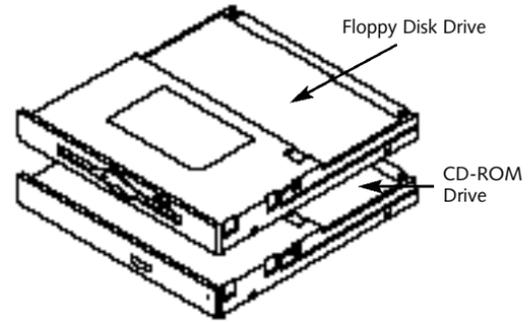


Figure 4-8 Multi-function Bay Modules

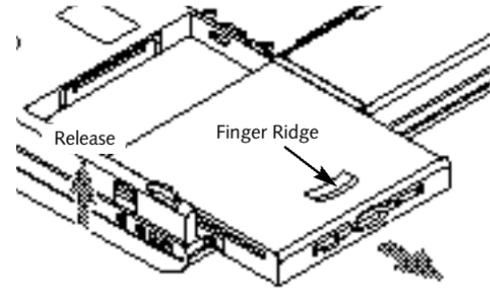


Figure 4-9 Removing a Device from the Multi-function Bay

User Installable Features

To Install or Remove a Device
in the Multi-function Bay

1. Put your notebook into Suspend Mode.

To Remove

2. Slide the release latch on the right side toward the bottom of your notebook.

3. Slide the module forward until the unit is clear of the chamber.

To Install

2. Orient the item to be installed with the finger ridge away from the body of your notebook and the connector toward the body of your notebook.

3. With the module connector toward the back of your notebook align the grooves on the side of the device with the tracks in the side of the bay. (Figure 4-9.)

4. Slide the module toward the back of your notebook until it clicks into place.



CAUTION

Be careful aligning and seating modules in the bay. If the fit is incorrect you may damage the bay or the module. If the module does not move easily, remove it, and check for dirt or foreign objects. It will require a firm push to latch the module in place.

CD-ROM Drive

The removable, modular CD-ROM drive is durable, however, you must treat it with care. Please pay attention to the following points:

- The drive rotates the compact disk at very high speed. Do not carry it around or subject it to shock or vibration with the power on.
- Avoid using or storing the drive or CDs where they will be exposed to extreme temperatures.
- Avoid using or storing the drive or CDs where it is damp or dusty.

- Avoid using or storing the drive near magnets or devices that generate strong magnetic fields.
- Avoid storing the drive where it will be subjected to shock or vibration.
- Do not disassemble or dismantle the CD-ROM drive.

Loading a CD

- Make sure that the tilt adjustment feet on the bottom of the notebook are folded flat against the bottom of your notebook.
- Make sure there is power to your notebook.
- Push and release, gently but firmly, on the eject button on the front of the CD-ROM drive to open the drive. The tray will come out a short distance. (See Figure 2-14 on page 34.)
- Gently pull the tray out until a CD-ROM can be easily placed in the tray.
- Make sure that the protective sheet that was in the tray when it was shipped has been removed.

- Place the CD-ROM label side up with the hole in the center of the CD-ROM fitted onto the raised circle in the center of the tray. (See Figure 2-11 on page 32.)
- Close the tray.
- After the CD-ROM is loaded it will take a short time for your notebook to recognize it.



POINT

The modular CD-ROM Drive maybe installed or removed with the notebook in Suspend Mode or the power Off.



Figure 4-10 Optional Hard Drive

Removable Floppy Disk Drive

For information on the care and use of the floppy disk drive see Floppy Disk Drive in Section Two on pages 31-33.



POINT

The Removable Floppy Disk Drive maybe installed or removed with the notebook in Suspend Mode or the power Off.

Installing Devices on the LPT Port

When installing a device on the LPT Port, be sure that the connector is the right size, aligned, and fully seated. Tighten the hold-down screw on each end of the connector.

Installing Devices on the COM Port

When installing a device on the COM Port, be sure that the connector is the right size, aligned, and fully seated. Tighten the hold-down screw on each end of the connector.

Installing External Monitors

When installing an external monitor, be sure that the connector is the right size, aligned, and fully seated. Tighten the hold down screw on each end of the connector.

Installing a Mouse or Keyboard

Make sure the connector on the device is the correct size. Align the arrow on the connector to point to the bottom of your notebook and push in until the connector seats. A mouse or keyboard or keypad may be installed and will be automatically recognized by your notebook without restarting or changing setups.

Installing a Replicator Port or Mini-Docking Station

1. To use a docking device with your notebook they both must be on a flat surface.
2. Make sure that the tilt adjustment feet are flat against the bottom of the notebook and the covers of the connectors, both rear panel and left side panel, are closed.
3. Make sure that the slide cover in the rear panel is completely open.

User Installable Features

4. Push the levers on the side of the docking device toward the back so that the ejector guides extend.
5. Carefully set the notebook on to the docking device so that the guides gently push into the holes in the bottom of the notebook.
(See Figure 1-9 on page 8.)
6. Pull the levers forward until the notebook is firmly latched in place.
7. Verify that the docking device connectors are operational. Plugging in an external mouse to the docking device and trying to move the cursor with it is an easy test.

Installing Audio Input Devices

Make sure that the audio device, a cassette recorder, for example, is equipped with an $\frac{1}{8}$ " (3.5 mm) stereo mini-plug. Make sure the plug is aligned and push in until fully seated.

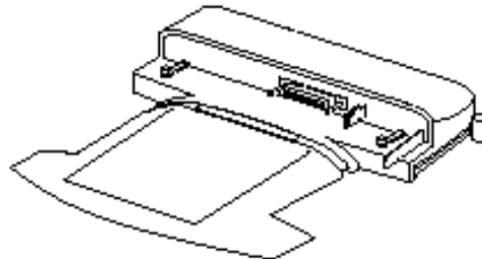


Figure 4-11 Sample Docking Device



CAUTION

This input is not designed for use with microphones.

Installing Audio Output Devices

Make sure that the audio device, stereo headphones for example, is equipped with an $\frac{1}{8}$ " (3.5 mm) stereo mini-plug. Make sure the plug is aligned and push in until fully seated.

T r o u b l e s h o o t i n g

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Internal Hard Drive 113

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from CD-ROM 114

Section FIVE

Troubleshooting

The LifeBook 400 Series from Fujitsu is sturdy and subject to few problems in the field. However, you may encounter simple setup or operating problems that you can solve on the spot, or problems with peripheral devices, that you can solve by replacing the device. The information in this section helps you to isolate and resolve some of these straightforward problems, and to identify failures that require service.

Identifying The Problem

If you encounter a problem, go through the following procedure before you get into more complex troubleshooting:

1. Turn off your notebook using the Power Switch on the right side panel.
2. Make sure the AC Adapter is plugged into your notebook and to an active AC power source.

3. Make sure that any card installed in the PCMCIA Card Slot is seated properly. You can also remove the card from the slot, thus eliminating it as a possible cause of failure.
4. Make sure that any devices connected to the external connectors are plugged in properly. You can also disconnect such devices, thus eliminating them as possible causes of failure.
5. Turn on your notebook using the Power Switch. Make sure it has been off at least 10 seconds before you turn it on.
6. Go through the boot sequence.
7. If the problem has not been resolved, refer to the User Tests, which follow, for more detailed troubleshooting information.



POINT

If you keep notes about what you have tried your support representative may be able to help you more quickly by giving additional suggestions over the phone.



CAUTION

Do not return a failed notebook to your supplier until you have talked to a support representative.

8. If you have tried the solutions suggested in Specific Problems without success, contact your support representative, toll free 1-800-8FUJITSU (1-800-838-5487), FAX 1-800-935-1789, E-mail 8fujitsu@fpc.fujitsu.com, Web Site <http://www.8fujitsu.com>.

Before you place the call, you should have the following information ready so that the customer support representative can provide you with the fastest possible solution:

- Product name.
- Product configuration number.
- Product serial number.
- Purchase date.
- Conditions under which the problem occurred.

- Any error messages that have occurred.
- Hardware configuration.
- Type of printer connected, if any.

See the Configuration Label on the bottom of your notebook for configuration and serial numbers. (Refer to Figure 1-9 on page 8.)

Specific Problems

Using PC Doctor

PC-Doctor is a diagnostic program by Watergate Software Inc. which comes pre-installed on your notebook. If you are an experienced computer user you may find it useful. However, it is intended primarily to help your Fujitsu Support Representative better serve you. When you call for help your Support Representative may ask you to setup your notebook for modem operation, you will be told what to do step by step, and then to hang up the phone and plug the phone line into the back of your notebook. The Support Representative will then use the service computer to call your notebook and will perform

diagnostic tests to find the nature of your problem. Messages will be displayed on the screen explaining what is being done and giving any instructions that you need.

Problem

You turn on your notebook and nothing seems to happen.

Possible Cause

1. The Main Battery is completely discharged and there is no Power Adapter (AC or Auto) installed.

2. The Main Battery is completely discharged and the Power Adapter (AC or Auto) is not plugged in properly.

Possible Solution

1. When the battery is dead there will be a beep when the Power Switch is turned on and the notebook will immediately go into Dead Battery Suspend Mode. (See page 26.) Check the Status Indicator Panel to determine the presence and condition of the battery. (See pages 17-18.) Install the Battery if it is missing or a Power Adapter if the battery is dead or unavailable.

2. When the battery is dead there will be a beep when the Power Switch is turned on and the notebook will immediately go into Dead Battery Suspend Mode. (See page 26.) Check the Status Indicator Panel to determine the presence and condition of the battery and adapter. (See Figures 2-3 and 2-4 on pages 17 and 18.) Verify that the Adapter is connected correctly. (See page 9.)

Troubleshooting

Problem

Possible Cause

3. The Battery is completely discharged and the power adapter (AC or Auto) has no power from the AC outlet or the car's cigarette lighter.

4. The Battery is completely discharged and the power adapter (AC or Auto) is faulty.

Possible Solution

3. When the battery is dead there will be a beep when the Power Switch is turned on and the notebook will immediately go into Dead Battery Suspend Mode. (See page 26.) Check the Status Indicator Panel to determine the presence and condition of the battery and adapter. (See Figures 2-3 and 2-4 on pages 17 and 18.) Move the AC cord to a different outlet or check for a line switch or tripped circuit breaker for the AC outlet or if you are using an Auto Adapter make sure the ignition switch is in the On or Accessories position.

4. When the battery is dead there will be a beep when the Power Switch is turned on and the notebook will immediately go into Dead Battery Suspend Mode. (See page 26.) Verify the cause using the Status Indicator Panel to determine the presence and condition of the battery and adapter. (See Figures 2-3 and 2-4 on pages 17 and 18.) Try a different power adapter or install a charged Battery.

Problem

Possible Cause

Possible Solution

5. Power Switch not actually in the On Position.

5. Try the Resume Button. If that doesn't work slide the Power Switch firmly to the rear, pause and then firmly to the front. If you shut down your notebook from Windows 95 you are really in special suspension mode, the power is on and you can restart with the Resume Button unless it is disabled.

6. The Battery is faulty and there is no power adapter (AC or Auto) installed.

6. Use the Status Indicator Panel to verify the presence and condition of the battery. (See Figure 2-3 on page 17.) If the battery is indicating a short remove the battery and operate from another power source or replace the battery.

7. The battery is low.

7. If the battery is dead there will be a beep when the Power Switch is turned on and the notebook will immediately go into Dead Battery Suspend Mode. (See page 26.) Check the Status Indicator Panel to determine the presence and condition of the battery. (See Figure 2-3 on page 17.) Use a power adapter to operate until the battery is charged or install a charged battery.

Troubleshooting

Problem

Your notebook turns off all by itself.

Possible Cause

- 1. The Power Savings parameters are set for auto timeouts which are too short for your operating style.**
- 2. You are operating on battery only and have ignored a low battery alarm until the battery is at the dead battery state and your notebook has gone into Dead Battery Suspend Mode.**
- 3. You have a failure of the Battery.**
- 4. The Power Adapter has failed or lost it's power source.**

Possible Solution

- 1. Use the keyboard or pointer and if that does not restore operation, push the Resume Button. You may want to close the application and Go to the Setup Utility Power Savings Menu and adjust the timeout values to better suit your operation. (See the Power Savings Menu on pages 67-69, and Power Center by Fujitsu on page 20.)**
- 2. Install a Power Adapter and then push the Resume Button. (See Low Battery State on page 26.)**
- 3. Verify the condition of the battery using the Status Indicator, (Figure 2-3 on page 17), and replace or remove it if it is shorted.**
- 4. Make sure the adapter is plugged in and the outlet has power.**

Problem

Your notebook won't work on battery alone.

Possible Cause

1. **The installed battery is dead.**
2. **No battery is installed.**
3. **The battery is improperly installed.**
4. **The installed battery is faulty.**

Possible Solution

1. **When the battery is dead there will be a beep when the Power Switch is turned on and the notebook will immediately go into Dead Battery Suspend Mode. (See page 26.) Replace the Battery with a charged one or install a power adapter.**
2. **Install a charged battery. (See *Installing the Battery Pack* on pages 83-84.)**
3. **Verify that the battery is properly connected by re-installing it. (See *Installing the Battery Pack* on pages 83-84.)**
4. **Verify the condition of the battery using the Status Indicator, (Figure 2-3 on page 17), and replace or remove it if it is shorted.**

**CAUTION**

A shorted battery is a possible risk to the other circuitry in your notebook.

Troubleshooting

Problem

The batteries seem to discharge too quickly.

Possible Cause

- 1. You are running an application which uses a great deal of power because of frequent hard disk access or CD-ROM access, use of a modem PCMCIA Card or of a PCMCIA LAN Card.**
- 2. The Power Savings features may be disabled.**
- 3. The brightness is turned all the way up.**
- 4. The battery is very old.**
- 5. The battery has been exposed to too high temperatures.**
- 6. The battery is too hot or too cold.**
(See *Battery* on page 25.)

Possible Solution

- 1. Use a power adapter for this application when at all possible.**
- 2. Check the Setup Utility settings in the Power Savings Menu, (see pages 67-69), or the Power Bar on the Windows desktop, (see page 20), and adjust according to your operating needs.**
- 3. Turn down the brightness adjustment. The higher the brightness the more power the display uses.**
- 4. Replace the battery.**
- 5. Replace the battery.**
- 6. Restore the notebook to normal operating temperature. (The charging icon on the Status Indicator Display will flash when the battery is outside its operating range.)**

Problem

The built-in display is blank when you turn on your notebook.

Possible Cause

- 1. Something is pushing on the Closed Cover Switch. (See Figure 1-5 on page 5.)**
- 2. The notebook is set for an external monitor only.**
- 3. The angle of the display and the brightness and contrast settings are not adequate for the lighting conditions.**
- 4. The Power Savings timeouts may be set for very short intervals and you failed to notice the display come on and go off again.**
- 5. The notebook turned on with a series of beeps.**

Possible Solution

- 1. Clear the Closed Cover Switch.**
- 2. Attach an external monitor and use the Setup Utility to change the Display selection to Flat-Screen or Simultaneous or use the Fn and F10 keys to toggle among the display selections without the use of an external monitor. (See Integrated Peripherals Submenu on pages 58-61 and Fn Key on page 30.)**
- 3. Move the display and the brightness and contrast controls until you have adequate visibility.**
- 4. Press any key or move the pointer, if this doesn't work press the Resume Button. (The display may be shut off by Standby Mode, Auto Suspend, or Video Time-out time-outs.)**
- 5. Power On Self Test has detected a failure which does not allow the display to operate. Contact your support representative.**

Troubleshooting

Problem

The display goes blank by itself after you have been using it.

Possible Cause

1. The notebook has gone into Standby Mode, Suspend Mode or Save-to-Disk Mode because you have not used it for a period of time.

2. Something is pushing on the Closed Cover Switch. (See Figure 1-5 on page 5.)

3. The Power Savings timeouts may be set for very short intervals and you failed to notice the display come on and go off again.

1. A foreign object such as a paper clip is stuck between the display and the keyboard.

1. If the spots are very tiny and few in number this is normal for a large LCD display.

2. If the spots are numerous or large enough to interfere with your operation.

Possible Solution

1. Use the keyboard or pointer and if that does not restore operation, push the Resume Button. You may want to close the application and Go to the Setup Utility Power Savings Menu and adjust the timeout values to better suit your operation. (See the Power Savings Menu on pages 67-69, and Power Center by Fujitsu on page 20.)

2. Clear the display shutoff button.

3. Press any key or move the pointer, if this doesn't work press the Resume Button.

1. Remove all foreign objects from the keyboard.

1. This is normal, do nothing.

2. Display is faulty, contact your support representative.

The Built-in Display does not close.

The Built-in Display has bright or dark spots.

Problem

The application display uses only a portion of the screen and is surrounded by a dark band.

Possible Cause

1. You are running an application that does not support 800x600 resolution display and display compression is enabled.

Possible Solution

1. Display compression gives a clearer but smaller display for applications that do not support 800x600 resolution. You can fill the screen but have less resolution by changing the display compression setting. (See the Video Features Sub-menu of the Advanced Menu on page 64.)

The built-in keyboard does not seem to work.

- 1. The notebook has gone into Suspend Mode.**
- 2. The application has locked out the keyboard.**

1. Push the Resume Button.

2. Try to use the TouchPad Pointing Device to access the Start Menu and then the Shut Down Menu and Restart the System. If this fails then turn your notebook off, wait 10 seconds or more, and then turn it on from the Power Switch.

The mouse cursor seems to move of its own accord.

1. Your hand is coming too close to the TouchPad when you are using the keyboard.

1. Be careful not to drag your hand across the TouchPad. An extremely light skin contact can activate the cursor.

Troubleshooting

Problem

Time and Date as shown in Windows 95 is not changing.

The Suspend/Resume Button does not work.

You have installed an external keyboard or mouse, and it does not seem to work.

Possible Cause

1. Windows 95 Power Management setting is turning off the clock.

1. The Suspend/Resume Button is disabled from the Power Savings Menu of the Setup Utility.

2. You did not hold the button in long enough.

3. There may be a conflict with the application software.

1. The external device is not properly installed.

2. The operating system software is not setup with the correct software driver for that device.

Possible Solution

1. Open the Power Control Panel and set Power Management to Advanced.

1. Enable the button from the Power Savings Menu of the Setup Utility. (See pages 67-69.)

2. Hold the button until you hear the acknowledge beep. This can be a very long time if the application is preventing the CPU from checking for button pushes.

3. Close all applications, and try the Button again.

1. Re-install the device. (See *Installing a Mouse or Keyboard* on page 86.)

2. Check the device and operating system documentation and activate the proper driver.

Problem

You have connected an external keyboard or a mouse and it seems to locking up the system.

You have connected an external monitor and it does not come on.

Possible Cause

1. The operating system software is not setup with the correct software driver for that device.

1. The BIOS Setup is not set to enable the external monitor.

2. The external monitor is not properly installed.

3. The operating system software is not setup with the correct software driver for that device.

4. The external monitor is not compatible with your notebook.

Possible Solution

1. Check the device and operating system documentation and activate the proper driver.

1. Try toggling the video destination by pressing Fn and F10 together or check the BIOS Setup and enable the external monitor. (See the Video Features Submenu of the Advanced Menu on page 64.)

2. Reinstall the device. (See Installing an External Monitor on page 86.)

3. Check the device and operating system documentation and activate the proper driver.

4. See the monitor documentation and the External Monitor Support portion of Appendix A on page 121.

Troubleshooting

Problem

The system powers up, and displays power on information, but fails to load the operating system.

Possible Cause

- 1. The boot sequence settings of the Setup Utility are not compatible with the configuration.**
- 2. You have a secured system requiring a password to load the operating system.**
- 3. The Internal Hard Drive was not detected.**

Possible Solution

- 1. Enter the Setup Utility and adjust the Boot Sequence settings from the Boot Menu on page 71.**
- 2. Make sure you have the right password. Enter the Setup Utility and verify the Security settings and the Boot Sequence settings and modify them as appropriate. (See Security Menu on page 65 and Boot Menu on page 71.)**
- 3. Use the BIOS Setup Utility Main Menu, IDE Adapter Master 0 Submenu to try to auto detect the hard drive.**

The power on information screen does not show the correct amount of installed RAM.

- 1. The RAM Module is not properly installed.**
- 2. You have a memory failure.**

- 1. Remove and re-install the RAM Module. (See *Installing and Removing the RAM Module* on pages 76-79.)**
- 2. Make sure display of error messages is enabled, (see *Boot Menu* on page 71), and check for Power On Self Test messages. (See on pages 110-113 for possible messages and their meanings.)**

Problem

You cannot access the floppy disk.

Possible Cause

- 1. Security is set to protect access to floppy disk data.**
- 2. Diskette is not loaded correctly.**
- 3. BIOS Setup Utility has Diskette Controller as Disabled.**
- 4. The Floppy Disk Drive may not be properly installed.**
- 5. You tried to write to a write protected diskette.**

Possible Solution

- 1. Verify your password.**
- 2. Eject diskette and check orientation and re-insert.** (See *Floppy Disk Drive on page 31.*)
- 3. Revise the Setup Utility Integrated Peripherals Submenu settings.** (See *Advanced Menu on pages 58-61.*)
- 4. Remove and re-install the floppy disk drive.** (See *To Install or Remove a Device for the Multi-function Bay on page 84.*)
- 5. Eject the diskette and set it to write enable.** (See *pages 31-33.*)

A card inserted in the PCMCIA Card slot does not work or is locking up the system.

- 1. The card is not properly installed.**
- 2. The card may have been installed with an application running and your notebook doesn't know it is there.**
- 3. The software may not have the correct software driver active.**

- 1. Remove and re-install the card.** (See *Installing a PCMCIA Card on page 79.*)
- 2. Close the application and restart your notebook.**
- 3. See the software documentation and activate the correct driver.**

T r o u b l e s h o o t i n g

Problem

You have installed a parallel-port device, or a serial-port device. Your notebook does not recognize the device, or the device does not seem to work properly.

Possible Cause

- 4. You may have the wrong I/O address selected for the PCMCIA device.**

- 5. The PCMCIA device and another device are assigned the same I/O address.**

- 1. The device is not properly installed.**

- 2. The device may have been installed with an application running and your notebook doesn't know it is there.**

- 3. The software may not have the correct software driver active.**

- 4. You may have the wrong I/O address selected for the device.**

Possible Solution

- 4. See the PCMCIA Card documentation and software documentation to determine the required I/O address. (See also PCIC I/O Address on pages 59 and 61.)**

- 5. Check all I/O addresses in the BIOS Setup Utility and the other installed hardware and software and make sure there are no duplications.**

- 1. Remove and re-install the device. (See *Installing Devices on the LPT Port and Installing Devices on the COM Port on page 86.*)**

- 2. Close the application and restart your notebook.**

- 3. See the software documentation and activate the correct driver.**

- 4. See the device documentation and software documentation to determine the required I/O address. (See also *LPT port and COM port on page 86.*)**

Problem

Possible Cause

Possible Solution

There is no sound coming from the built-in speakers.

5. The device and another device are assigned the same I/O address.

5. Check all I/O addresses in the BIOS Setup Utility and the other installed hardware and software and make sure there are no duplications.

1. The volume knob is turned too low.

1. Adjust the volume control knob on the right side of your notebook.

2. The software volume control is set too low.

2. Adjust the sound volume control settings in the software, both operating system and applications.

3. Headphones are plugged into your notebook.

3. Plugging in headphones disables the built-in speakers, remove the headphones.

4. BIOS Audio settings are incorrect.

4. Set the BIOS Setup Utility, Audio Features Submenu of the Advanced Menu to the default values.

5. Software driver is not configured correctly.

5. Refer to the application and operating system documentation for help.

An error message is displayed on the screen during the notebook turn on (boot) sequence.

1. Power On Self Test has detected a problem.

1. See the Power On Self Test Messages to determine the meaning and severity of the problem. Not all messages are errors, some are simply status.

Troubleshooting

Problem

Error Messages are displayed when the CD-ROM drive is not installed. Messages are:

* CD-ROM Drive not ready, aborting installation

* Device driver not found:
'\OEMCD001'

* No valid CDRom device drivers selected

Notebook fails to recognize CD-ROM.

Possible Cause

1. There are 3 messages that may be displayed during the boot sequence for your notebook when there is no CD-ROM drive in the Multi-function Bay. When you are using Windows 95 these messages flash by quickly and the Windows 95 system loads. For a boot into the MS-DOS operating system the messages will stay on the screen when the C:\> prompt appears.

1. Shipping card is still in the CD-ROM drive tray.

2. CD-ROM is installed with label face down.

3. CD-ROM is not pushed down onto raised center circle of drive.

4. CD-ROM tray is not latched shut.

5. Setup Utility is set to something other than CD-ROM.

Possible Solution

1. These messages are normal and do not indicate a problem with your system. The software to operate a CD-ROM drive is installed and the system looks for one on a regular basis so that it will recognize it as soon as it is installed without having to reboot the system.

1. Remove shipping card and replace CD in tray.

2. Open CD-ROM tray and re-install CD with proper orientation.

3. Open CD-ROM tray and re-install CD properly.

4. Push on the front of the CD-ROM tray until it latches.

5. Revise BIOS settings to set IDE Adapter 0 correctly. (See Main Menu and IDE Adapter 0 Submenu pages 52-56 for more information.)

Problem

The CD-ROM Access Indicator on the Status Indicator Panel blinks at regular intervals when no CD is in the tray or the CD-ROM drive is not installed.

Possible Cause

6. Wrong drive designator was used for CD-ROM in the application.

7. Windows auto insertion function is disabled.

1. The Windows auto insertion function is active and is checking to see if a CD is ready to run.

Possible Solution

6. Verify drive designator used by application in use by operating system. When the operating system is booted from CD-ROM drive designations are automatically adjusted. (See *Boot Menu* on page 71.)

7. Start the CD from the desktop or application software or re-enable the Windows auto insertion function. (See *CD-ROM Access Indicator* on page 19 for more information.)

1. This is normal. You can disable this function if you wish. (See *CD-ROM Access Indicator* on page 19 for more information.)

T r o u b l e s h o o t i n g

Problem

Notebook appears to change setup parameters when you start your notebook.

An error message is displayed on the screen during the operation of an application.

Possible Cause

- 1. BIOS Setup changes were not saved when you made them and exited the BIOS Setup Utility and it returned to original settings.**
- 2. The BIOS CMOS hold-up battery has failed.**

Application software often has its own set of error message displays. Check the documentation or software manufacturers support services.

Possible Solution

- 1. Make sure you select Save Changes And Exit when exiting the BIOS Setup Utility.**
- 2. Contact your support representative for repairs. This is not a user servicable part but has a normal life of 3 to 5 years.**

Power On Self Test Messages

The following is an alphabetic list of error-and-status messages which Phoenix BIOS and/or the operating system can generate and an explanation of each message. Error messages are marked with an *. Comments in italics are suggestions of possible actions for you to consider or risks resulting from ignoring the message.

The most common errors are marked with a #. If an error message is displayed that is not in this list, write it down and check the operating system documentation both on screen and in the manual. If you can find no reference to the message and its meaning is not clear, contact your support representative for assistance.

nnnn Cache SRAM Passed **Where nnnn is the amount of system cache in kilobytes successfully tested by the Power On Self Test. (This can only appear if you have an SRAM PCMCIA Card installed.)**

CD-ROM Drive not ready, aborting installation is a message that appears if the CD-ROM drive is not installed. It does not indicate any problem unless the CD-ROM drive is installed. *This message can be ignored if no CD-ROM drive is installed, otherwise try removing and reinstalling the CD-ROM drive (see page 85) and restarting your notebook.*

Device driver not found:'OEMCD001' is a message that appears if the CD-ROM drive is not installed. It does not indicate any problem unless the CD-ROM drive is installed. *This message can be ignored if no CD-ROM drive is installed, otherwise try removing and reinstalling the CD-ROM drive, (see page 85), and restarting your notebook.*

No valid CD-ROM device drivers selected is a message that appears if the CD-ROM drive is not installed. It does not indicate any problem unless the CD-ROM drive is installed. *This message can be ignored if no CD-ROM drive is installed, otherwise try removing and reinstalling the CD-ROM drive, (see page 85), and restarting your notebook.*

*Diskette drive A error or Diskette drive B error **Drive A: or B:is present but fails the BIOS Power On Self Test diskette tests.** *Check to see that the drive is defined with the proper diskette type in the Utility Setup, (see page 45,) and that the diskette drive is installed correctly, (see page 86). If the disk drive is properly defined and installed avoid using it and contact your support representative.*

*Extended RAM Failed at offset: nnnn **Extended memory not working or not configured properly.** *If you have an installed RAM Module verify that the module is properly installed. If it is properly installed you may want to check the Windows Setup so it is not trying to use unavailable memory until you can contact your support representative.*

nnnn Extended RAM Passed **Where nnnn is the amount of RAM in kilobytes successfully tested.**

*Failing Bits:nnnn **The hex number nnnn is a map of the bits at the RAM address (in System, Extended, or Shadow memory) which failed the**

Troubleshooting

memory test. Each 1 (one) in the map indicates a failed bit. This is a serious fault which might cause you to lose data if you continue. Contact your support representative.

***Fixed Disk x Failure or Fixed Disk Controller Failure (where x = 1-4) Fixed disk is not working or not configured properly. This may mean that the hard drive type identified in the Setup Utility does not agree with the type detected by the Power On Self Test. Run the Setup Utility to check for the hard disk type settings and correct them if necessary. If the settings are OK and the message appears when you restart the system there may be a serious fault which might cause you to lose data if you continue. Contact your support representative.**

***Incorrect Drive A type – run SETUP Type of floppy drive A: not correctly identified in Setup. This means that the floppy disk drive type identified in the Setup Utility does not agree with the type detected by the Power On Self Test. Run the Setup Utility to correct the inconsistency.**

***Incorrect Drive B type – run SETUP Type of floppy drive B: not correctly identified in Setup. This means that the floppy disk drive type identified in the Setup Utility does not agree with the type detected by the Power On Self Test. Run the Setup Utility to correct the inconsistency.**

***Invalid NVRAMmedia type Problem with NVRAM access. In the unlikely case that you see this message you may have some display problems. You can continue operating but should contact your support representative for more information.**

***Keyboard controller error The keyboard controller failed test. You may have to replace the keyboard or keyboard controller but may be able to use an external keyboard until then. Contact your support representative.**

***Keyboard error Keyboard not working. You may have to replace the keyboard or keyboard controller but may be able to use an external keyboard until then. Contact your support representative.**

***Keyboard error nn BIOS discovered a stuck key and displays the scan code for the stuck key. You may have to replace the keyboard but may be able to use an external keyboard until then. Contact your support representative.**

***Monitor type does not match CMOS – Run SETUP Monitor type not correctly identified in Setup. This error probably means the BIOS is corrupted, run the Setup Utility and set all settings to the default conditions. If you still get this error, contact your support representative.**

#*Operating system not found Operating system cannot be located on either drive A: or drive C: Enter the Setup Utility and see if fixed disk and drive A: are properly identified and that the boot sequence is set correctly. Unless you have changed the installation greatly the operating system should be on drive C:. If the Setup Utility is correctly set the hard drive is probably corrupted and the system may have to be re-installed from your back up media.

*Parity Check 1 nnnn **Parity error found in the system bus.BIOS attempts to locate the address and display it on the screen. If it cannot locate the address,it displays ????. This is a potentially data destroying failure. Contact your support representative.**

*Parity Check 2 nnnn **Parity error found in the I/O bus.BIOS attempts to locate the address and display it on the screen. If it cannot locate the address,it displays ????. This is a potentially data destroying failure. Contact your support representative.**

#*Press <F1> to resume,<F2> to SETUP is displayed after any recoverable error message. Press the F1 key to continue the boot process or the F2 key to enter Setup and change any settings.

#Press <F2> to enter SETUP message is displayed during Power On Self Test. The message can be turned off by the Setup Utility Boot Menu, (see page 71), but the F2 key will still perform the same function.

#*Previous boot incomplete – Default configuration used **Previous Power On Self Test did not complete successfully. Power On Self Test loads default values and offers to run Setup. If the failure was caused by incorrect values and they are not corrected, the next boot will likely fail also. If using the default settings does not allow you to complete a successful boot sequence you should turn off the power with the Power Switch and contact your support representative.**

*Real time clock error **Real-time clock fails BIOS test. May require board repair. Contact your support representative.**

*Shadow Ram Failed at offset: nnnn **Shadow RAM failed at offset nnnn of the 64k block at which the error was detected. You are risking data corruption if you continue. Contact your support representative.**

nnnn **Shadow RAM Passed Where nnnn is the amount of shadow RAM in kilobytes successfully tested.**

*System battery is dead – Replace and run SETUP **The BIOS CMOS RAM memory hold up battery is dead. This is part of the BIOS and is a board mounted battery which requires a support representative to change. You can continue operating but you will have to use Setup Utility default values or reconfigure the Setup Utility every time you turn off your notebook. This battery has an expected life of 2 to 3 years.**

System BIOS shadowed **System BIOS copied to shadow RAM.**

*System CMOS checksum bad – run SETUP **BIOS CMOS RAM has been corrupted or modified incorrectly, perhaps by an application program that changes data stored in BIOS memory. Run Setup and reconfigure the system.**

*System RAM Failed at offset: nnnn **System RAM failed at offset nnnn of in the 64k block at which the error was detected. This means that there is a fault in the built-in memory. If you continue to operate you risk corrupting your data. Contact your support representative for repairs.**

Troubleshooting

nnnn System RAM Passed Where nnnn is the amount of system RAM in kilobytes successfully tested.

*System timer error **The timer test failed. The main clock that operates the computer is faulty.** Requires repair of system board. Contact your support representative for repairs.

UMB upper limit segment address:nnnn
Displays the address of the upper limit of Upper Memory Blocks, indicating released segments of the BIOS memory which may be reclaimed by a virtual memory manager.

Video BIOS shadowed **Video BIOS successfully copied to shadow RAM.**

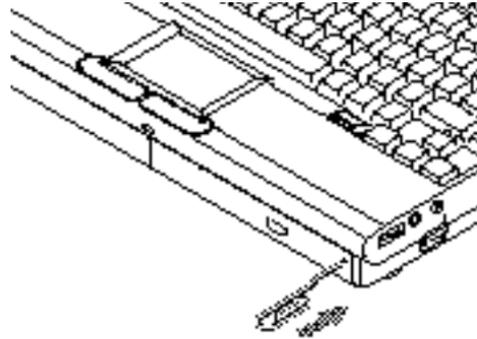


Figure 5-1 Emergency CD-ROM Tray Release

Emergency CD-ROM Tray Release

If for some reason the eject button fails, you can open the CD-ROM tray with a paper clip or similar tool inserted into the eject hole in the far right side of the front of the tray. Straighten one side of a paper clip and push it gently into the hole. The tray will pop out a short distance.

Installing and Removing the Internal Hard Drive

There is a bay in the bottom of your notebook which contains the internal hard drive. The hard drive only needs to be changed if there is a serious drive failure. You may wish to have a trained repair person replace a drive for you and re-install your backed up operating system, applications and data.



CAUTION

Contact your Support Representative before making any hard drive replacement whether you or a trained technician is making the change.

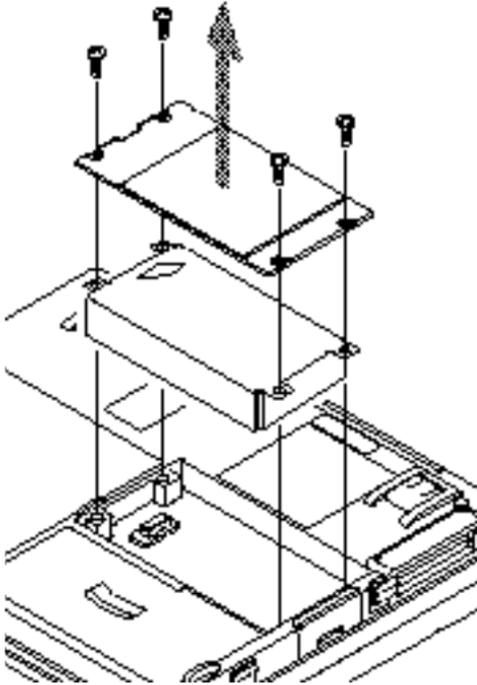


Figure 5-2 Installing and Removing the Internal Hard Drive

To Remove the Hard Drive:

1. Turn off your notebook using the Power Switch and remove any Power Adapter.
2. Remove the four screws from the Hard Drive Chamber in the bottom panel of your notebook. (Figure 5-2.)
3. Carefully remove the cover.
4. Gently tilt and lift out the hard disk being very careful not to damage the flexible circuit connection.
5. Disconnect the connector very carefully or you will damage the connector pins.
6. Remove the hard drive.



CAUTION

Removing or installing the hard drive with the power on may damage the drive, the notebook or shock you.

To Install the Hard Drive

1. Carefully plug in the connector to the new hard drive being sure to align the connector. (Figure 5-2.) Make sure it seats completely.

2. Tilt and slide the disk drive gently into the chamber being careful not to kink the flat cable.

3. Push the disk drive down gently but firmly.

4. Align the cover with the screw holes.

6. Fit the cover tightly in place.

7. Replace the screws.

Restoring Your Pre-installed Software from CD-ROM

To restore your pre-installed software from the recovery CD-ROM follow the instructions on the CD case.



CAUTION

Recovery CD-ROMs for your pre-installed software come with units that have only Windows 95. There are no recovery CD-ROMs available for units that come with a choice of operating systems.

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Section SIX

Care and Maintenance

If you use your LifeBook 400 Series from Fujitsu carefully, you will increase its life and reliability. This section provides some tips for looking after the notebook and the battery pack.

Caring for Your Notebook

- The LifeBook 400 Series is a durable but sensitive electronic device. Treat it with respect and care.
- Make a habit of transporting it in a suitable carrying case.
- Keep it away from food and beverages.
- If you accidentally spill liquid on your notebook:
 - Turn it off.
 - Position it so that the liquid can run out.
 - Let it dry out for 24 hours, or longer if needed.
- If your notebook will not boot after it has dried out, call your support representative.
- Avoid exposure to water, sand, dust, and other environmental hazards.
- Do not expose your notebook to direct sunlight for long periods of time as temperatures above 140° F (60° C) may damage your notebook.
- Keep the covers closed on the connectors and slots when they are not in use.
- Do not put heavy or sharp objects on your notebook.
- If you are carrying your notebook in a briefcase, or any other carrying case, make sure that there are no objects in the case pressing on the lid of your notebook.
- Do not drop your notebook.
- Clean your notebook with a damp, lint-free cloth. Do not use abrasives or solvents.
- Use a soft cloth to remove dust from the screen.

Increasing Battery Life

To increase battery life:

1. Power your notebook through the AC or Auto Adapter whenever possible.
2. If your notebook is running on battery power all day, connect it to the AC Adapter overnight to recharge the battery pack.
3. Keep brightness to the lowest level comfortable.
4. Set the Power Savings Menu for Maximum Battery Life.
5. Put your notebook in Suspend Mode when it is turned on and you are not actually using it.
6. If your notebook is to be stored for a month or longer, turn the machine off and remove the Nickel Metal Hydride Battery Pack. Store your notebook and battery separately in a cool, dry location. If you store your notebook with a battery installed, the battery will discharge, and battery life will be reduced. In addition a faulty battery might damage your notebook.

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Appendix A Specifications

Appendix A provides the hardware and environmental specifications for your LifeBook 400 Series and its peripherals.

Warranty

Your notebook is backed by a limited warranty in the US and includes toll-free technical support; call 1-800-8FUJITSU (1-800-838-5487.) Check your service guide for terms and conditions.

Lifebook 420D Specifications

Microprocessor

Intel Pentium 54CSLM 120 MHz with L1 cache and PCI Bus Architecture.

Memory

System Memory
8MB EDO RAM.

L1 Cache Memory

16KB within CPU.

Expansion Memory

8MB, 16MB, 32MB and 64MB RAM Modules

extend system memory up to 72MB; installable in a DIMM (dual-in-line memory module) slot under the keyboard.

Fujitsu product numbers:

8MB, FPCEM01A.

16MB, FPCEM02A.

32MB, FPCEM03.

64MB, Third party only.

BIOS Memory

512KB Flash ROM.

256 Bytes CMOS-RAM with back-up battery.

Video RAM (VRAM)

1MB.

Mass Storage

Floppy Disk Drive

One removable 3.5", 3 mode floppy disk drive accommodates a 1.44MB floppy diskette, Fujitsu Model FPCFDD01.

Hard Drive

One factory installed 1.0GB, 2.5" (12.7 mm) fixed hard drive unit.

CD-ROM Drive

One removable, factory installed, 10-speed, 2.5" (12.7 mm) drive, Fujitsu Model FPCCD03.

Audio

Sound Blaster-compatible 16-bit stereo PCM/FM sound chip.

Stereo headphone jack, 15 mV rms, or less, minimum impedance 32 Ohms.

Stereo line input jack, 880 mV rms or less, minimum impedance 10K Ohms.

Two built-in speakers – 28 mm diameter (Stereo).
One built-in microphone (Monaural).

Communication

One IrDA 1.0 compatible infrared port (115 Kbps).

Multimedia

MPEG-1 video data decompression software.
Zoom Video port via PCMCIA Slot 0.

Other Pre-Installed Software

Microsoft Windows 95.

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Some units offer a choice of Microsoft Windows 95 or MS-DOS 6.22 and Microsoft Windows 3.1.
Others dependent on options purchased.

Input/Output Connections
PCMCIA one Type III/two Type I/II slot:
 Standard 2.1 with Zoom Video port (Slot 0).
One 6-pin mini DIN PS/2 compatible connector, for external keyboard, external mouse or external numeric keypad.
One 25-pin D-SUB two-way Centronics type connector for parallel input/output devices; Bi-directional, output only or ECP.
One 240-pin connector for optional Port Replicator or Docking Station.
One 15-pin D-SUB connector for VGA external monitor (see Displays specifications).
One 9-pin D-SUB connector for RS-232C serial input/output devices.
One 25-pin special connector for optional external floppy disk drive connection.
One Stereo headphone jack (see Audio specifications).
One Stereo Line input jack (see Audio specifications).

Displays
Built-in color flat-panel DSTN passive matrix LCD display.
Diagonal dimension: 11.3".
800 x 600 pixels resolution, 256 colors.
640 x 480 pixels resolution, 256 colors.
VGA and Hi-Res compatible.

External Monitor Support.
VGA and Hi-Res compatible CRT displays.
1280 x 1024 pixels resolution, 256 colors.
800 x 600 pixels resolution, 64K colors.
640 x 480 pixels resolution, 16M colors.

Keyboards
Built-In Keyboard with all functions of 101 key PS/2 compatible keyboards.
Total number of keys: 86.
Function keys: 12, F1 through F12.
Feature extension key: Fn.
Windows 95 keys: 3, two Start keys and one Application key.
Key pitch: 19 mm.
Key stroke: 3 mm.
Built-in TouchPad Pointing Device with left and right buttons.
Built-in palmrest.

External Keyboard Support
PS/2 compatible.

External Numeric Keypad Support
PS/2 compatible.

External Mouse Support
PS/2 compatible.

Power

Batteries

One Main Nickel Metal Hydride Battery Pack, Fujitsu Model FPCBP07.
Rechargeable, 10.8V, 2250 mAh.
Operating time of up to 2 hours.
Rapid charge (notebook is in Suspend Mode or is Off) in approximately three (3) hours or more.



CAUTION

Actual battery life will vary based on screen brightness, applications, features, power management setting, battery conditioning, and other customer preferences. CD-ROM or hard drive usage may also have a significant impact on battery life.

Standard charge (normal use with limited CD and hard disk access) in approximately nine (9) hours or more.

AC Adapter

Autosensing 100-240V AC, 45W, supplying 16V DC to the Notebook, Fujitsu Model FPCAC02 which includes an AC cable (Also supports FPCAC01A).

Optional Auto Adapter

Autosensing 12/24V DC supplying 16V DC to the Notebook, Fujitsu Model FPCCBA01A.

Power Management

Save-to-Disk, Suspend, and Standby Power Savings Modes

When the battery is fully charged the notebook can remain in Suspend Mode for approximately 24 hours or more.

Dimensions and Weight

Overall Dimensions

**Approximately 11.75" x 9.75" x 2.0"
(298 mm x 248 mm x 51 mm)**

Weight

Approximately 7.3 lbs (3.3 Kg) with floppy disk drive installed.

Environmental Requirements

Temperature

**Operating: 5° to 35° C (41° to 95° F).
Storage: -20° to 65° C (-4° to 149° F).**

Humidity

20% to 90%, relative, non-condensing.

Altitude

**Operating: 10,000 feet (3,0480 m) maximum.
Storage: 40,000 feet (12,192 m) maximum.**

Electro-Static Discharge (ESD)

9 kV.

Theft Prevention Lock

Lock slot on the right side panels for use with physical restraining security systems. The locking system by Kensington is recommended.

Approvals

Emissions

FCC Part 15, FTZ.

Safety

UL, C-UL, CSA.

FCC Certification

See statement at the front of the User's Guide.

DOC (Industry Canada) Certification

See statement at the front of the User's Guide.

Popular Accessories

Other accessories are available, contact your authorized Fujitsu reseller.

Optional External Floppy Disk Drive Adapter, Fujitsu Model FPCFDA01.

Main Lithium ion Battery Pack, Fujitsu Model FPCB06.

Port Replicator, Fujitsu Model FPCPR05.

The Port Replicator provides connections for:

RS232-C Serial Devices (COM Port).

Parallel Devices (LPT Port).

VGA/SVGA Monitor.

Mouse (PS/2).

Keyboard (PS/2).

Optional Modem telephone line (RJ-11)

(Remove for use with LifeBook Model 420D).

The Port Replicator is powered from the AC Adapter, Fujitsu Model FPCAC02.

Mini-Docking Station, Fujitsu Model FPCDS02.

The Mini-Docking Station provides connections for:

RS232 Serial Devices (COM Port).

Parallel Devices (LPT Port).

VGA/SVGA Monitor.

Mouse (PS/2).

Keyboard (PS/2).

Optional Modem telephone line (RJ-11)

**(Remove for use with LifeBook
Model 420D).**

Two Type II/one Type III PCMCIA slots.

Ethernet port (RJ-45).

The Mini-Docking Station is powered from AC power using the power cord.

Appendix B Glossary

AC Adapter

A device which converts the AC voltage from a wall outlet to the DC voltage needed to power your notebook.

Active-Matrix Display

A type of technology for making flat-panel displays which has a transistor or similar device for every pixel on the screen.

ATA

Asynchronous Terminal Adapter.

Auto Adapter

A device which converts the DC voltage from an automobile cigarette lighter to the DC voltage needed to power your notebook.

BIOS

Built-in Operating System. A computer program and set of default parameters stored in ROM which tests and operates your notebook when you turn it on until it loads the installed

operating system from disk. Information from the BIOS is transferred to the installed operating system to provide it with information on the configuration and status of the hardware.

Bit

An abbreviation for binary digit. A single piece of information which is either a one (1) or a zero (0).

bps

An abbreviation for bits per second. Used to describe data transfer rates.

Boot

To start-up a computer and load its operating system from disk, ROM or other storage media into RAM.

Bus

An electrical circuit with at least as many wires as there are bits in the words which passes data between the CPU and the sub-assemblies inside your notebook.

Byte

8 bits of parallel binary information.

Cache Memory

A block of memory built into the micro-processor which is very much faster to access than the system RAM and is used in specially structured ways to make the overall data handling time faster.

CD-ROM

Compact disc read only memory. This is a form of digital data storage which is read optically with a laser rather than with a magnetic head. A typical CD-ROM can contain about 600MB of data and is not subject to heads crashing into the surface and destroying the data when there is a failure nor to wear from reading.

CHS Translation

Cylinder, head and sector translation.

Conversion of hard disk access addressing to the cylinder, head and sector form. The terminology is historical left from the days when data was

Appendices

stored on a series cylindrical drums. The head designates the reading device, similar to the head on a cassette recorder only mounted on a movable arm. Another addressing method is LBA.

CMOS RAM

Complementary metal oxide semiconductor random access memory. This is a technology for manufacturing random access memory which requires very low levels of power to operate.

COM Port

Abbreviation for communication port. This is the serial interface connection to other equipment.

Command

An instruction which you give the operating system. Example: run a particular application or format a floppy disk.

Configuration

The combination of hardware and software that makes up the system and how it is allocated for use.

CRT

Cathode Ray Tube. A display device which uses a beam of electronic particles striking a luminescent screen. It produces a visual image by varying the position and intensity of the beam.

Data

The information a system stores and processes.

DC

Direct current. A voltage or current that does not fluctuate periodically with time.

Default Value

A preprogrammed value to be used if you fail to set your own.

DIMM

Dual-in-line memory module.

Disk

A spinning platter of magnetic data storage media. If the platter is very stiff it is a hard disk, if it is highly flexible it is a floppy disk, if it is a floppy disk in a hard housing with a shutter it is commonly called a diskette.

Disk Drive

The hardware which spins the disk and has the heads and control circuitry for reading and writing the data on the disk.

Diskette

A floppy disk in a hard housing with a shutter.

DMA

Direct Memory Access. Special circuitry for memory to memory transfers of data which do not require CPU action.

DOS

Disk Operating System (MS-DOS is a Microsoft Disk Operating System).

Driver

A computer program which converts application and operating system commands to external devices into the exact form required by a specific brand and model of device in order to produce the desired results from that particular equipment.

DSTN

Double Super Twisted Nematic. An LCD with an extra compensating layer between the main display and the rear polarizer which results in nearly pure black and white images.

ECP

Electromagnetic Compatibility Program: a set of standards for communication and interconnection between electronic devices.

EPP

Enhanced Parallel Port.

ESD

Electro-static Discharge. The sudden discharge of electricity from a static charge which has built-up slowly. Example: the shock you get from a doorknob on a dry day or the sparks you get from brushing hair on a dry day.

Extended Memory

All memory more than the 640KB recognized by MS-DOS as system memory.

FCC

Federal Communication Commission.

Floppy Disk

A spinning platter of magnetic data storage media which is highly flexible.

GB

Gigabyte.

Gigabyte

1,073,741,824 bytes (2 raised to the thirtieth power).

Hard disk

A spinning platter of magnetic data storage media where the platter is very stiff.

Hexadecimal

A decimal notation for the value of a 4 bit binary number. (0-9,A, B, C, D, E, F) Example: 2F in hexadecimal = 00101111 in binary = 47 in decimal.

I/O

Input/Output. Data entering and leaving your notebook in electronic form.

I/O Port

The connector and associated control circuits for data entering and leaving your notebook in electronic form.

IDE

Intelligent Drive Electronics. A type of control interface for a hard disk drive which is inside the hard disk drive unit.

Impedance

The amount of resistance to the flow of electric current.

Infrared

Light just beyond the red portion of the visible light spectrum which is invisible to humans.

IR

An abbreviation for infrared.

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IrDA

Infrared Data Association. An organization which produces standards for communication using infrared as the carrier.

IRQ

Interrupt Request. An acronym for the hardware signal to the CPU that an external event has occurred which needs to be processed.

KB

Kilobyte.

Kilobyte

1,024 bytes (2 raised to the tenth power).

LAN

Local Area Network. An interconnection of computers and peripherals within a single limited geographic location which can pass programs and data amongst themselves.

LBA

Logical Block Addressing. A method of locating data stored on a disk.

LCD

Liquid Crystal Display. A type of display which makes images by controlling the orientation of crystals in a crystalline liquid.

Lithium ion Battery

A type of rechargeable battery which is not subject to the memory effect that Nickel Cadmium batteries are and which have a high power-time life for their size.

LPT Port

Line Printer Port. A way of referring to parallel interface ports because historically line printers were the first and latter the most common device connected to parallel ports.

MB

Megabyte.

Megabyte

1,048,576 bytes (2 raised to the twentieth power).

Megahertz

1,000,000 cycles per second.

Memory

A repository for data and applications which is readily accessible to a computer CPU.

MHz

Megahertz.

MIDI

Musical Instrument Digital Interface. A standard communication protocol for exchange of information between computers and sound producers such as synthesizers.

Modem

A contraction for MODulator-DEMulator. The equipment which connects a computer or other data terminal to a communication line.

Monaural

A system using one channel to process sound from all sources.

MPU-401

A standard for MIDI interfaces and connectors.

Operating System

A group of control programs that convert application commands, including driver programs, into the exact form required by a specific brand and model of microprocessor in order to produce the desired results from that particular equipment.

Parallel Port

A connection to another device through which data is transferred as a block of bits simultaneously with a wire for each bit in the block and with other wires only for control of the device not for transfer of data.

Partition

A block of space on a hard disk which is set aside and made to appear to the operating system as if it were a separate disk and is addressed by the operating system accordingly.

PCMCIA

PCMCIA is a trademark of the Personal Computer Memory Card International Association. The Personal Computer Memory Card International Association is an organiza-

tion that sets standards for add-in cards for personal computers.

Peripheral Device

A piece of equipment which performs a specific function associated with but not integral to a computer. Examples: a printer, a modem, a CD-ROM.

PIO

Parallel Input/Output.

Pitch (keyboard)

The distance between the centers of the letter keys of keyboard.

Pixel

The smallest element of a display, a dot of color on the display screen. The more pixels per area the clearer the image will appear.

POST

Power On Self Test. A program which is part of the BIOS which checks the configuration and operating condition of the hardware whenever power is applied to your notebook. Status and

error messages may be displayed before the operating system is loaded. If failures so serious that operation can not continue are detected the operating system will not be loaded.

Program

An integrated set of coded commands to a computer telling the hardware what to do and how and when to do it.

PS/2

An IBM series of personal computers which established a number of standards for connecting external devices such as keyboards and monitors.

RAM

Random Access Memory. A hardware component of a computer that holds binary information (both program and data) as long as it has the proper power applied to it.

RAM Module

A printed circuit card with memory and associated circuitry which allows the user to add additional memory to a computer without special tools.

Appendices

Reset

The act of reloading the operating system. A reset erases all information stored in RAM.

Restart

See Reset.

Resume

To proceed after interruption. In a computer this refers to returning to active operation after having been in one of the suspension states.

ROM

Read Only Memory. A form of memory in which information is stored by physically altering the material. Data stored in this way can not be changed by the computer and does not require power to maintain it.

SCSI

Small Computer Systems Interface (pronounced scuzzy). An American National Standards Institute (ANSI) standard for connecting multiple (up to 7) high speed parallel devices to a computer.

Serial Port

A connection to another device through which data is transferred one bit at a time on a single wire with any other wires only for control of the device not for transfer of data.

Shadow RAM

A technique of copying data or applications stored in ROM (Read Only Memory) into RAM (Random Access Memory) for access during actual operation. RAM is much faster to access than ROM, however ROM contents are not lost when power is removed. Shadowing allows permanently stored information to be rapidly accessed.

SIR

Serial Infrared.

SRAM

Static random access memory. A specific technology of making RAM which does not require periodic data refreshing.

Status Indicator

A display which reports the condition of some portion of the hardware. On your notebook this is an LCD screen just above the keyboard.

Stereo (audio)

A system using two channels to process sound from two different sources.

Stroke (keyboard)

The amount of travel of a key when it is pressed from resting to fully depressed.

Suspend

To make inoperative for a period of time. Your notebook uses various suspension states to reduce power consumption and prolong the charge of the battery.

SVGA

Super VGA.

System Clock

An oscillator of fixed precise frequency which synchronizes the operation of the system and is counted to provide time of day and date.

TFT

Thin Film Transistor – A technology for flat display panels which uses a thin film matrix of transistors to control each pixel of the display screen individually.

UL

Underwriters Laboratories – An independent organization that tests and certifies the electrical safety of devices.

VGA

Video Graphics Array. A video display standard originally introduced by IBM with the PS/2 series of personal computers.

VRAM

Video Random Access Memory. A memory dedicated to video display data and control.

Write Protect

Prevent alteration of the binary state of all bits in a storage media. Example: all information on a device such as a floppy diskette; a block of space in a storage media such as a partition of a hard disk; a file or directory of floppy diskette or hard disk.

Zoom Video

A PCMCIA port which allows notebook PCs to deliver full screen broadcast quality video through third party PCMCIA cards, including TV tuners, video capture, and MPEG full-motion video.

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