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Handling the cord on this product will expose you to lead, a chemical known to the State of California to cause birth defects or other reproductive harm.

Wash hands after handling.

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according to FCC Part 15

Responsible Party Name:	Fujitsu Computer Systems Corporation
Address:	1250 E. Arques Avenue, M/S 122 Sunnyvale, CA 94085
Telephone:	(408) 746-6000
Declares that product:	Model Configurations: LifeBook C2310 notebook complies with Part 15 of the FCC Rules.

This device complies with Part 15 of the FCC rules. Operations are 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.

Fujitsu LifeBook® C Series notebook

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Preface

ABOUT THIS GUIDE

The LifeBook® C Series notebook from Fujitsu is an all-in-one notebook featuring the Intel® Pentium® M processor and an integrated Intel 855GM graphics controller with support for up to 64 MB of shared memory. This combination delivers the resources to tackle video editing, computer gaming, and general business applications. A large and bright 15-inch Crystal View display adds to the computing experience, bringing applications to life wherever you are.

This manual explains how to operate your LifeBook notebook's hardware and built-in system software.

Your LifeBook notebook comes with Microsoft® Windows XP Home or Windows XP Professional pre-installed.

Conventions Used in the Guide

Keyboard keys appear in brackets.
Example: [Fn], [F1], [ESC], [ENTER] and [CTRL].

Pages with additional information about a specific topic are cross-referenced within the text.
Example: (See page xx.)

On screen buttons or menu items appear in bold
Example: Click **OK** to restart your notebook computer.

DOS commands you enter appear in Courier type.
Example: `Shut down the computer?`

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

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

The warning icon highlights information that can be hazardous to either you, your LifeBook notebook, or your files. Please read all warning information carefully.

FUJITSU CONTACT INFORMATION

Service and Support

You can contact Fujitsu Service and Support in the following ways:

- Toll free: 1-800-8Fujitsu (1-800-838-5487)
- Fax: 408-764-2724
- E-mail: 8fujitsu@us.fujitsu.com/computers
- Web site: http://us.fujitsu.com/computers

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 device connected, if any

Fujitsu Online

You can go directly to the online Fujitsu product catalog for your LifeBook notebook by clicking on the LifeBook Accessories web site link, located in the Windows Start menu.

You can also reach Fujitsu Service and Support on-line by clicking on the Fujitsu Service and Support Web site link, located in the Service and Support Software folder of the Windows Start menu.

You must have an active internet connection to use the online URL links.

WARRANTY

Your LifeBook notebook is backed by a one year International Limited Warranty. Check the service kit that came with your LifeBook notebook for warranty terms and conditions.

2
Getting to Know Your Computer

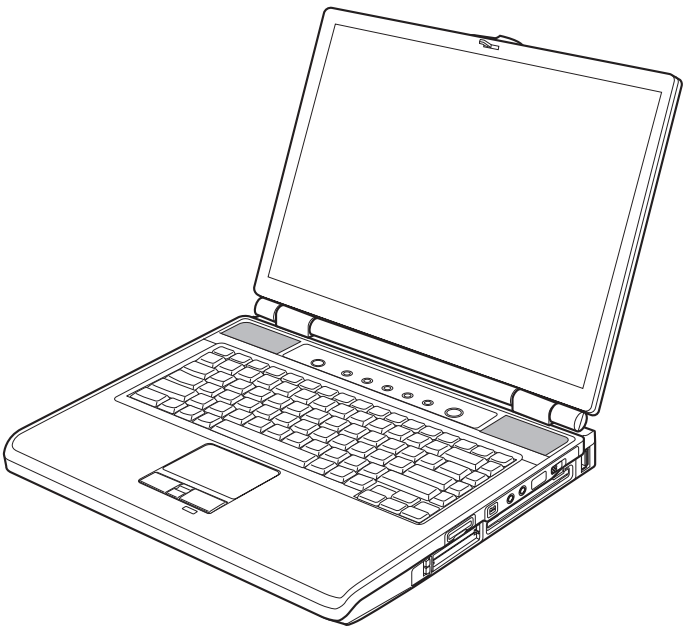


Figure 2-1. LifeBook C Series notebook

Overview

This section describes the components of your LifeBook notebook. 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 LifeBook notebook, unpack it carefully, and compare the parts you have received with the items listed below.

For a pre-configured model you should have:

- LifeBook C Series notebook *(Figure 2-1)*
- Lithium ion battery, pre-installed
- AC adapter with AC power cord *(Figure 2-2)*
- Phone/Modem (RJ-11) telephone cable
- Drivers and Applications CD
- Restore DVD
- Getting Started Guide
- User's Guide (this document)
- Premium Care registration information
- International Limited Warranty Brochure
- Microsoft-associated product materials

Depending upon the configuration of your notebook, you may have also received one of the following items:

- WinDVD Creator™ Plus and RecordNow™ (included with systems that have DVD-RW or Super-Multi drive)
- RecordNow™ (included with systems that have combo drive)
- An additional main battery

Once you have checked and confirmed that your LifeBook system is complete, read through the following pages to learn about all of your notebook's components.

Detailed specifications about your LifeBook notebook can be found in the chapter entitled "Specifications" on page 91.

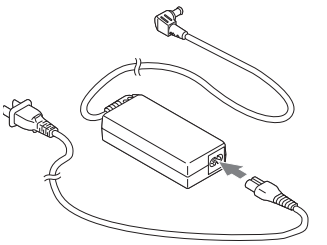


Figure 2-2. Typical AC Adapter

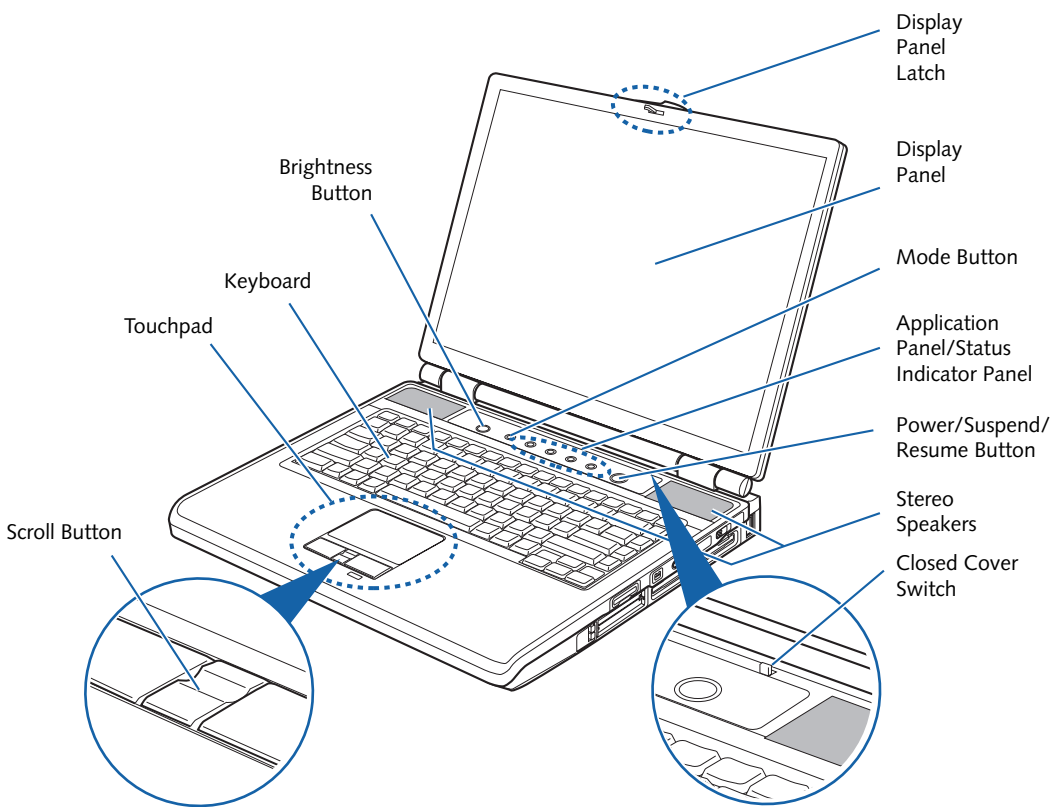


Figure 2-3. LifeBook notebook with display open

Locating the Controls and Connectors

TOP AND FRONT COMPONENTS

The following is a brief description of your LifeBook notebook's top and front components. *(Figure 2-3)*

Display Panel Latch

The display panel latch locks and releases the display panel.

Display Panel

The display panel is a color LCD panel with back lighting for the display of text and graphics. *(See Display Panel on page 28 for more information.)*

Mode Button

The mode button allows you to switch the modes of the application panel buttons from Application mode to Media Player mode.

Closed Cover Switch

The closed cover switch suspends the system when the cover is closed.

LifeBook Application Panel

The LifeBook Application Panel allows you to either launch your favorite applications by the touch of a button or to use as a media player when your unit is on. *(See LifeBook Application/Media Player Panel on page 21 for more information.)*

Status Indicator Panel

The Status Indicator Panel displays symbols that correspond with a specific component of your LifeBook notebook. *(See Status Indicator Panel on page 14 for more information.)*

Power/Suspend/Resume Button

The Power/Suspend/Resume button allows you to suspend notebook activity without powering off, resume your notebook from suspend mode, and power on your notebook when it has been shut down from Windows. *(See Power/Suspend/Resume Button on page 31 for more information.)*

Stereo Speakers
The built-in boxless dual speakers provide stereo sound.

Keyboard
A full-size keyboard with dedicated Windows keys. *(See Keyboard on page 16 for more information.)*

Touchpad Pointing Device/Scroll Button
The Touchpad pointing device is a mouse-like cursor control with three buttons (left, right, and scroll buttons). *(See Touchpad Pointing Device on page 19 for more information.)*

Brightness Button
The brightness button is used to change the brightness of the display to maximum brightness ot to return it to preset brightness.

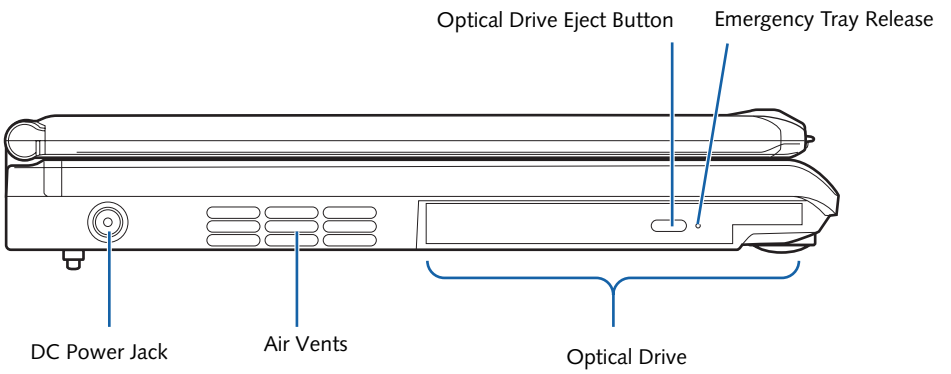


Figure 2-4. LifeBook notebook left-side panel

LEFT-SIDE PANEL COMPONENTS

The following is a brief description of your LifeBook notebook's left-side components. *(Figure 2-4)*

DC Power Jack

The DC power jack allows you to plug in the AC adapter or the optional Auto/Airline adapter to power your LifeBook notebook and charge the internal Lithium ion battery.

Air Vents

The air vents are used to cool the system to prevent overheating.

Do not obstruct the air vents while the system is running; doing so could cause your system to overheat.

Optical Drive

The optical drive allows you to play back a media disc. *(See Optical Drive on page 38 for more information.)*

- The optical drive that your LifeBook notebook uses is determined by the configuration of your system.
- The terms "media" and "media disc" in this document refer to any of the possible media drives (Super-Multi DVD, DVD-RW, or DVD/CD-RW) or media discs available for your notebook (DVD, DVD-RW, CD-ROM, CD-R, or CD-RW).

Emergency Optical Drive Tray Release

The Emergency Optical Drive Tray Release allows you to open the media player tray without powering on your LifeBook notebook.

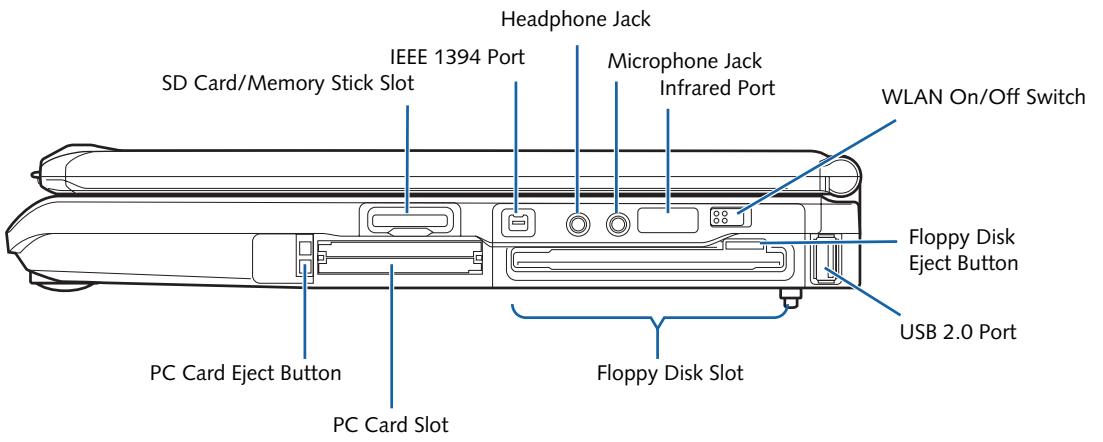


Figure 2-5. LifeBook notebook right-side panel

RIGHT-SIDE PANEL COMPONENTS

The following is a brief description of your LifeBook notebook's right-side components. *(Figure 2-5)*

SD Card/Memory Stick Slot

The Secure Digital/Memory Stick card slot allows you to install a flash memory card for data storage. This architecture allows you to transfer data from a variety of different digital devices. *(See Installing Memory Stick/SD Cards on page 41 for more information.)*

IEEE 1394 (4-pin) Port

The 1394 port is used to connect between your LifeBook notebook and a peripheral such as a digital video camera.*(See IEEE 1394 Port on page 46 for more information.)*

Headphone Jack

The headphone jack allows you to connect headphones or powered external speakers. *(See Headphone Jack on page 47 for more information.)*

Microphone Jack

The microphone jack allows you to connect an external mono microphone. *(See Microphone Jack on page 47 for more information.)*

Infrared Port

The fast IrDA-compatible port allows you to communicate with another IrDA-compatible infrared device without a cable.

Wireless LAN On/Off Switch

The Wireless LAN On/Off Switch turns the optional wireless LAN on and off. *(See Integrated Wireless LAN* User's Guide on page 91 for more information.)*

USB 2.0 Port

The USB port allows you to connect Universal Serial Bus 2.0 or USB 1.1 devices. Note that there are three additional USB 2.0 ports on the rear of the system. *(See Universal Serial Bus Ports on page 47 for more information.)*

Internal Floppy Disk Drive

A standard floppy disk drive to accommodate 3.5" floppy disks. *((See Floppy Disk Drive on page 37 for more information.)*

PC Card Slots

The PC Card Slots allow you to install two Type I/II PC Cards or one Type III PC Card. *(See PC Cards on page 42 for more information.)*

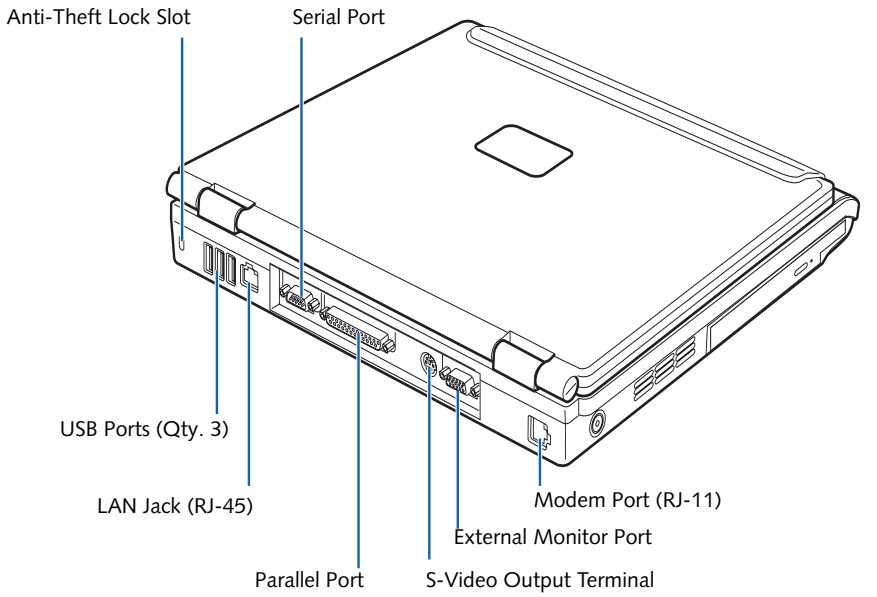


Figure 2-6. LifeBook notebook back/top panel

BACK/TOP PANEL COMPONENTS

The following is a brief description of your LifeBook notebook's back panel components. *(Figure 2-6)*

Anti-theft Lock Slot

The anti-theft lock slot allows you to attach an optional physical lock-down device.

USB Ports

The four USB 2.0 ports (three on the rear, one on the right side) allow you to connect Universal Serial Bus devices. *(See Universal Serial Bus Ports on page 47 for more information.)*

Serial Port

The serial port allows you to connect serial RS-232 devices, such as serial printers or serial scanners. *(See Serial Port on page 48 for more information.)*

LAN Jack (RJ-45)

The LAN jack is designed to accept a Local Area Network (LAN) RJ-45 plug. *(See Internal LAN (RJ-45) Jack on page 46 for more information.)*

Parallel Port

The parallel port allows you to connect parallel devices, such as a printer. (This is also sometimes referred to as an LPT port.) *(See Parallel Port on page 48 for more information.)*

S-Video Out Port

The S-Video output is used to transmit a higher resolution video signal to a compatible TV or VCR.*(See S-Video Out Port on page 47 for more information.)*

External Monitor Port

The external monitor port allows you to connect an external monitor. *(See External Monitor Port on page 47 for more information.)*

Modem (RJ-11) Telephone Jack

The Modem (RJ-11) telephone jack is for attaching a telephone line to the internal 56K modem. *(See Modem (RJ-11) Telephone Jack on page 46 for more information.)*

- The internal modem is designed to the ITU-T V.90 standard. Its maximum speed of 53000bps is the highest allowed by FCC, and its actual connection rate depends on the line conditions. The maximum speed is 33600 bps at upload.
- The internal modems on all LifeBook notebooks from are certified for use in the United States and Canada. The modem may be certified in other countries.

The internal modem is not intended for use with Digital PBX systems. Do not connect the internal modem to a Digital PBX as it may cause serious damage to the internal modem or your entire LifeBook notebook. Consult your PBX manufacturer's documentation for details. Some hotels have Digital PBX systems. Be sure to find out BEFORE you connect your modem.

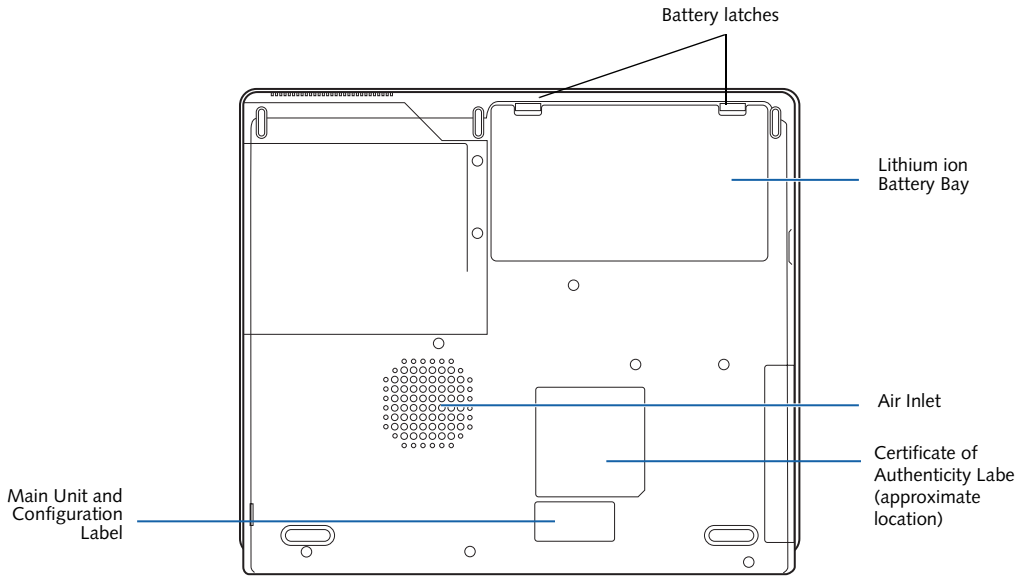


Figure 2-7. LifeBook notebook bottom panel

BOTTOM COMPONENTS

The following is a brief description of your LifeBook notebook's bottom panel components. *(Figure 2-7)*

Main Unit and Configuration Label

The configuration label shows the model number and other information about your LifeBook notebook. In addition, the configuration portion of the label has the serial number and manufacturer information that you will need to give your support representative. It identifies the exact version of various components of your LifeBook notebook. *(See Configuration Label on page 91 for more information.)*

Lithium ion Battery Bay

The battery bay contains the internal Lithium ion battery. It can be opened for the removal of the battery when stored over a long period of time or for swapping a discharged battery with a charged Lithium ion battery. *(See Lithium ion Battery on page 35 for more information.)*

Air Inlet

The air inlet allows the cooling fan to draw air into the computer for cooling purposes.

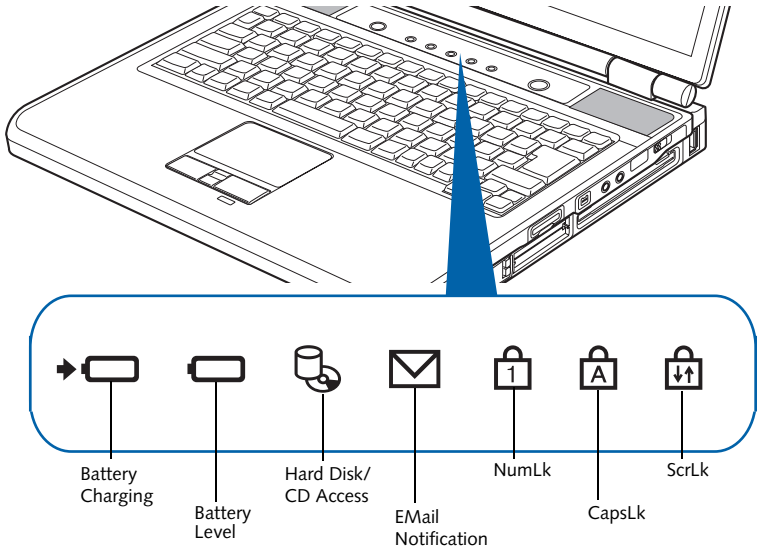


Figure 2-8 Status Indicator Panel

Status Indicator Panel

The Status Indicator displays symbols that correspond with a specific component of your LifeBook notebook. These symbols (when visible) tell you how each of those components is operating. *(Figure 2-8)*. When you turn off the system, all indicators will go off, except when the battery is being charged.

BATTERY CHARGING INDICATOR

When the AC adapter is connected to your system, this indicator shows the status of the battery charging, as follows:

- **Green, solid:** The battery is either fully charged or the AC adapter is connected and there is no battery pack installed.
- **Orange, solid:** The battery pack is charging.
- **Orange, blinking:** Charging is suspended due to excessively high or low battery temperature.
- **Off:** No AC adapter is connected.

BATTERY LEVEL INDICATOR

The Battery Level indicator displays the charge level of the battery pack, as follows:

- **Green, solid:** Battery is between 51% and 100% charged.
- **Orange, solid:** Battery is between 13% and 50% charged.
- **Red, solid:** Battery is between 0% and 12% charged.
- **Orange, blinking:** Blinks during battery status measurement (Four seconds after the battery is installed).
- **Red, blinking:** There is a problem with the battery.
- Off: There is no battery installed.

- If the battery pack is installed while the power is turned off, the battery level indicator will display the charge level for five seconds after it blinks orange.
- If the AC adapter is not connected or the battery pack is not fully charged when the computer is switched to standby mode, the indicator will blink. The LED blinks at the rate of one second on/five seconds off.

- Batteries subjected to shocks, vibration or extreme temperatures can be permanently damaged.
- A shorted battery is damaged and must be replaced.

HARD DISK/CD ACCESS INDICATOR

The Hard Disk/CD access indicator lights when the hard disk or optical drive is being accessed. To prevent corruption of data, do not press the power button when the hard disk/CD access indicator is lit.

EMAIL NOTIFICATION INDICATOR

The Email notification indicator blinks when Email is received. (This function assumes the application button is set for Email notification.) For additional information, see “Configuring the Application Panel” on page 21.

NUMLK INDICATOR

The NumLk indicator lights when the keyboard is in NumLk mode (during which you can use the keyboard as a ten-digit numeric keypad). To turn on or off, toggle the [NumLk] key on your keyboard.

CAPSLOCK INDICATOR

The CapsLock indicator lights when your keyboard is set to type in all capital letters. To turn on or off, toggle the [CapsLk] key on your keyboard.

SCRLK INDICATOR

The ScrLk indicator lights when the active window is locked to prevent the user from scrolling up or down. To turn on or off, press the [NumLk] key while pressing the [Fn] key.

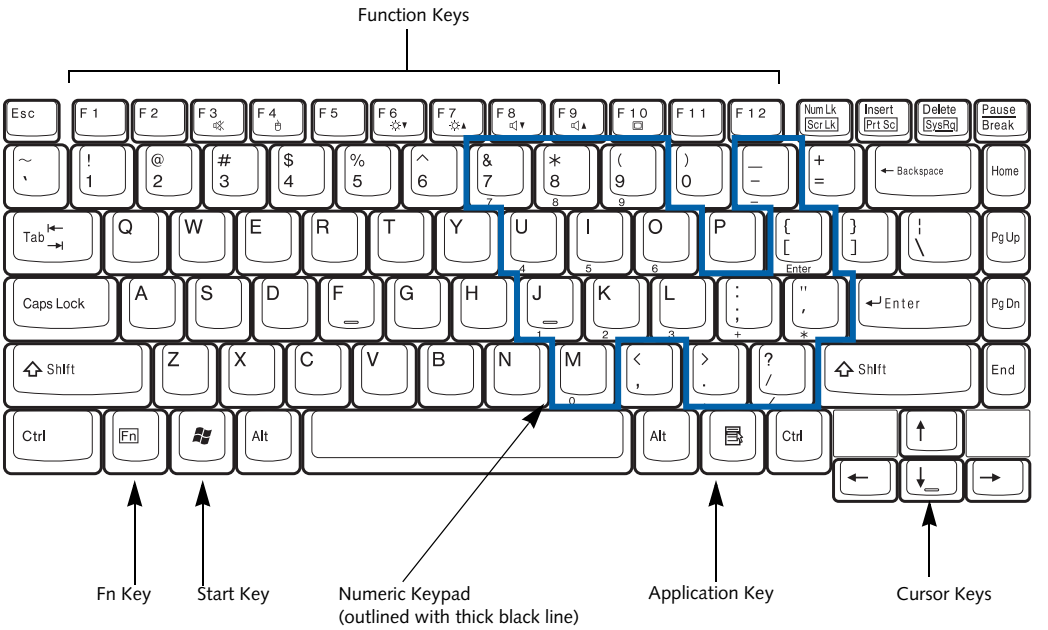


Figure 2-9. Keyboard

Keyboard

USING THE KEYBOARD

Your LifeBook notebook has an integral 87-key keyboard. The keys perform all the standard functions of a 101-key keyboard, including the Windows keys and other special function keys. This section describes the following keys.

- Numeric keypad
- Cursor keys
- Function keys
- Windows keys

NUMERIC KEYPAD

Certain keys on the keyboard perform dual functions as both standard character keys and numeric keypad keys. NumLk can be activated by pressing the [NumLk] keys. Turning off the NumLk feature is done the same way. Once this feature is activated you can enter numerals 0 through 9, perform addition (+), subtraction (-), multiplication (*), or division (/), and enter decimal points (.) using the keys designated as ten-key function keys. The keys in the numeric keypad are marked on the front edge of the key to indicate their secondary functions.

WINDOWS KEYS

Your LifeBook notebook has two Windows keys, consisting of one Start key and one Application key. The Start key displays the Start menu. This button functions the same as your on-screen Start menu button. The Application key functions the same as your right mouse button and displays shortcut menus for the selected item. (Refer to your Windows documentation for additional information regarding the Windows keys.)

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 in applications. In programs such as Windows Explorer, it moves the “focus” (selects the next item up, down, left, or right).

FUNCTION KEYS

Your LifeBook notebook has 12 function keys, F1 through F12. The functions assigned to these keys differ for each application. You should refer to your software documentation to find out how these keys are used.

The [Fn] key provides extended functions for the LifeBook notebook and is always used in conjunction with another key.

- [Fn+F3]: Pressing [F3] while holding [Fn] will toggle the Audio Mute on and off.

- [Fn+F4]: Pressing [F4] while holding down [Fn] allows you to toggle between an internal mouse (touchpad) and an external mouse (USB-type).
- [Fn+F5]: Pressing [F5] while holding [Fn] 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 1024 x 768 or 800 x 600 pixel resolution will still cover the entire screen.)
- [Fn+F6]: Pressing [F6] repeatedly while holding [Fn] will lower the brightness of your display.
- [Fn+F7]: Pressing [F7] repeatedly while holding [Fn] will increase the brightness of the display.
- [Fn+F8]: Pressing [F8] repeatedly while holding [Fn] will decrease the volume of your LifeBook notebook.
- [Fn+F9]: Pressing [F9] repeatedly while holding [Fn] will increase the volume of your LifeBook notebook.
- [Fn+F10]: Pressing [F10] while holding [Fn] allows you to change your selection of where to send your display video. Each time you press the combination of keys you will step to the next choice. The choices, in order, are: built-in display panel only, both built-in display panel and external monitor or external monitor only.

Volume Control

Your LifeBook notebook has multiple volume controls which interact with each other.

- Any software that contains audio files will also contain a volume control of its own. If you install an external audio device that has an independent volume control, the hardware volume control and the software volume control will interact with each other. It should be noted that if you set your software volume to Off, you will override the external volume control setting.
- Using the Fn+F8 and Fn+F9 combinations to control volume will override software volume controls.

CONTROLLING THE VOLUME

The volume can be controlled in several different ways:

- Volume can be set from within the Volume Control on the Taskbar.
- Volume can be controlled with the [F8] and [F9] function keys. Pressing [F8] repeatedly while holding [Fn] will decrease the volume of your notebook. Pressing [F9] repeatedly while holding [Fn] will increase the volume of your notebook.
- Volume can be controlled by many volume controls that are set within individual applications.
- Certain external audio devices you might connect to your system may have hardware volume controls.

Each source discussed above puts an upper limit on the volume level that must then be followed by the other sources.

We recommend that you experiment with the various volume controls to discover the optimal sound level.

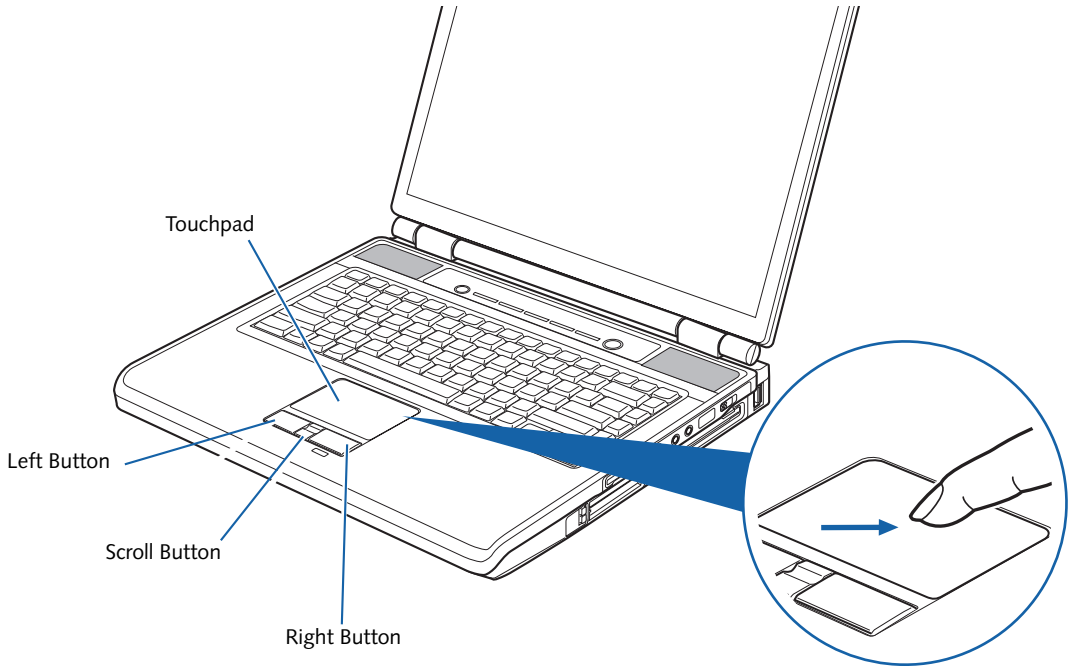


Figure 2-10. Touchpad pointing device

Touchpad Pointing Device

The Touchpad pointing device comes built into your LifeBook notebook. It is used to control the movement of the pointer to select items on your display panel. The Touchpad is composed of a cursor control, a left and right button, and a scrolling button. The cursor control works the same way a mouse does, and moves the cursor around the display. It only requires light pressure with the tip of your finger. The left and right buttons function the same as mouse buttons. The actual functionality of the buttons may vary depending on the application that is being used. The scrolling button allows you to navigate quickly through pages, without having to use the scroll bars. *(Figure 2-10)*

CLICKING

Clicking means pushing and releasing a button. To left-click, move the cursor to the item you wish to select, press the left button once, and then immediately release it. To right-click, move the mouse cursor to the item you wish to select, press the right button once, and then immediately release it. You can also perform the clicking operation by tapping lightly on the Touchpad once. *(Figure 2-11)*

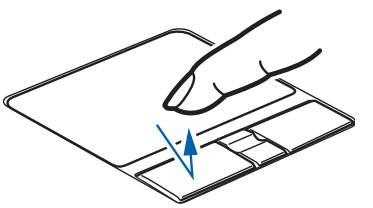


Figure 2-11. Clicking

DOUBLE-CLICKING

Double-clicking means pushing and releasing the left button twice in rapid succession. This procedure does not function with the right button. To double-click, move the cursor to the item you wish to select, press the left button twice, and then immediately release it. You can also perform the double-click operation by tapping lightly on the Touchpad twice. *(Figure 2-12)*

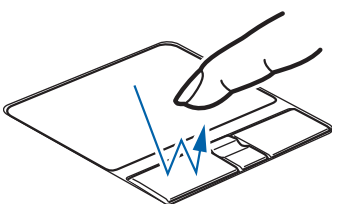


Figure 2-12. Double-clicking

- If the interval between clicks is too long, the double-click will not be executed.
- Parameters for the Touchpad can be adjusted from the Mouse Properties dialog box located in the Windows Control Panel.

DRAGGING

Dragging means pressing and holding the left button, while moving the cursor. To drag, move the cursor to the item you wish to move. Press and hold the left button while moving the item to its new location and then release it. Dragging can also be done using the Touchpad. First, tap the Touchpad twice over the item you wish to move making sure to leave your finger on the pad after the final tap. Next, move the object to its new location by moving your finger across the Touchpad, and then releasing your finger. *(Figure 2-13)*

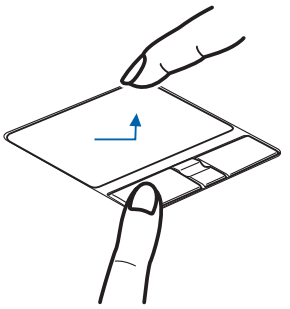


Figure 2-13. Dragging

SCROLLING

Using the Scrolling button allows you to navigate through a document quickly without using the window's scroll bars. This is particularly useful when you are navigating through on-line pages. To use the Scrolling button, press the crescent shape at the top or bottom of the button to scroll up or down a page. When you have reached the desired section of the page, release the button. *(Figure 2-14)*

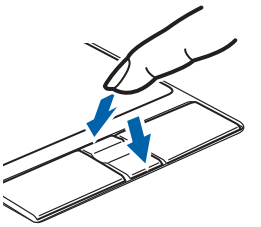
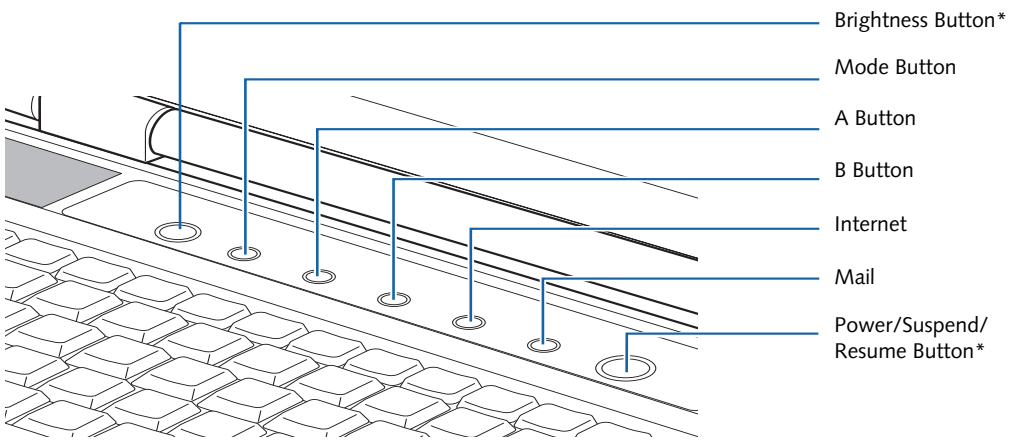


Figure 2-14. Scrolling

TOUCHPAD CONTROL ADJUSTMENT

If you need to change or adjust any of the touchpad control functions, you can customize them from the Mouse properties dialog box in the Control Panel. Click on Start, select Settings > Control Panel, then double-click Mouse.



* While not an integral part of the application panel, the Brightness and Power/Suspend/Resume buttons are included here for reference.

1

Figure 2-15. LifeBook Application Launcher Buttons

LifeBook Application/ Media Player Panel

A unique feature of your LifeBook notebook is the LifeBook Application Panel. The LifeBook Application Panel makes your LifeBook notebook more than just another computer. This panel allows you to launch applications with the touch of one button or to operate the optical drive as an independent audio media player.

- The LifeBook Application Panel uses the date and time settings of your LifeBook notebook. If the date and time are incorrect, you can adjust the settings in the Windows Control Panel.
- The media player that your LifeBook notebook uses is determined by the configuration of your system.

Your LifeBook notebook is pre-installed with software utilities that let you operate and configure your LifeBook Application Panel. These utilities are found under [Start] -> Control Panel -> Application Panel.

The panel consists of the following elements:

MODE BUTTON

Located adjacent to the brightness button, the mode button allows you to select the function of the panel either as an Application Launcher or a media player.

When you press the Mode button, the button label will change. If Application mode is selected, "Application" will appear above the button; if Media mode is selected, "Media" will appear below the button.

The Mode indicator LED is not automatically turned off in Suspend mode or Power Off mode. It cannot be turned off in Suspend mode, but in Power Off mode, it can be turned off by pressing and holding the Power/ Suspemnd/Resume button for four or more seconds.

APPLICATION LAUNCH/ MEDIA PLAYER BUTTONS

When Application mode is active, pressing any of the four application buttons (A, B, Internet, or Mail) will launch a user-defined application. When Media mode is selected, the buttons operate the media player.

CONFIGURING THE APPLICATION PANEL

When you start your system, the LifeBook Application Panel is automatically activated. As an application launcher, the LifeBook Application Panel is very flexible, giving you a variety of options. To set up the panel to best suit your needs, the Application Panel Setup utility will quickly and easily help you make the most of this valuable feature.

To configure your LifeBook Application Panel with the Application Panel Setup utility:

1. Click on [**Start**] -> **Control Panel.** (Note that depending upon the View you are using, you may need to click **Settings** before clicking **Control Panel**).
3. Double-click on **Application Panel**. The Application Panel Setup utility will appear.

The utility window has tabs that correspond to the application buttons on the application panel. When you receive your notebook, these buttons are pre-configured to launch specific programs. *(See Specifications on page 91 for more information).*

The tabs in Application Panel Setup may not be in the same order as the buttons on your LifeBook notebook. Please select the tab you wish to change carefully.

To change an application associated with one of the buttons, click on the tab for the button you would like to reconfigure. Click on the **Browse** button. Scroll down to the application you want to associate with the buttons, click on the application you wish to launch with this button, and then click **Open**. Click **OK**, and the button will now launch the new application.

One of the buttons may be preconfigured to launch your default Internet browser. In order to reconfigure it to launch a different program, follow these easy steps:

1. Click on the Internet tab of the application panel utility. Click on the down-arrow in the **Specify the button action:** field. Select **Start Other Program** from the dropdown list.
2. Click on the **Browse** button.
3. Scroll down the list of applications, and click on the application you wish to launch with this button. Click on **Open**.
4. Click **OK**.

The button will now launch the new application. If you want to return to launching your default Internet browser with this button, you need only click on "Default Internet Browser" from the dropdown list. Be aware that you will erase the settings for the other application. If you wish to go back to launching the other application from this button, you will need to reconfigure it as described above.

The E-mail tab can be modified in the same manner as the Internet tab.

At the bottom of each application setup page are two selectable options. The first will enable/disable the button when your LifeBook notebook is in Standby mode, and the second will enable/disable the button when your LifeBook notebook is in the pseudo-off state. You can enable/disable either or both of these functions simply by clicking on the option.
When you have finished with Application Panel utility, click on **OK**, and the new settings will take effect. You can reconfigure your LifeBook Application Panel as often as you like.

If you choose to use the buttons when the notebook is in standby, they will function even if hit accidentally, and will turn on your notebook even if you are not present or using the notebook. This could deplete your battery, and you will need to recharge it before using the notebook. As a precaution, press the selector switch for four or more seconds to lock the buttons when you are away from your notebook. To unlock the buttons, repeat the procedure.

USING THE MEDIA PLAYER

The media player allows you to use your LifeBook notebook's optical drive as an audio media player.

- If you shut down from Windows while the media player is playing an audio CD, it will stop.
- You cannot go into Suspend Mode or Hibernation (Save-to-Disk) Mode while the media player is playing a CD.
- The media player will only play when the system is powered on.

There is no configuration required for media player operation. The buttons are pre-configured to work like a normal media player. When the selector switch is in the bottom position, the buttons will operate as follows:

- **Stop/Eject**: This is the first button to the right of the Mode button. Press it once to stop an audio CD that is playing. Press it twice to eject the audio CD.
- **Play/Pause**: This is the second button to the right of the Mode button. Press this button to start playing an audio CD starting at Track 1. While the audio CD is playing, press it to pause. Press it again to continue.

- If you press the play button and nothing happens, you either have the Selector switch locked, there is no audio CD in the media player drive, you have a CD other than an audio CD in the drive, or system is not powered on.
- Because of the Windows CD auto-insertion function, audio CDs will start playing immediately after they are inserted if your LifeBook notebook is on. This will not happen if you are using the media player in Suspend or Pseudo-off modes.

- **Fast Backward**: This is the third button to the right of the Mode button. Press this button once to skip one track back.
- **Fast Forward**: This is the fourth button to the right of the Selector switch. Press this button once to skip forward one track.

DESKTOP CONTROL PANEL

Your LifeBook notebook includes a desktop control panel for your notebook's desktop that you can use at any time. You may use this panel to operate the media player when you have the Selector switch in the Application position or Lock mode.

To use the desktop control panel:

1. Click on **Start**.
2. Click on **Programs**.
3. Click on **Lifebook Application Panel**.
4. Click on **CD Player**.

The desktop control panel will appear in the upper corner of your screen. To close the panel:

1. Click on the "**x**" button.

To minimize the panel:

2. Click on the "-" button.

You can select from four appearances for your desktop control panel. Simply double-click on the track display area of the panel, and a menu will appear which will allow you to select from a pull down menu. On the same pop-up are two other options: "Always on top" and "Continuous Play". If you click on "Always on top" the desktop controls will always be seen on your screen, no matter what other application you are running. If you click on "Continuous Play", your media player will automatically start over at the beginning of the CD in the drive as soon as it finishes the last track.

You can move the desktop control panel to anywhere on your desktop. Drag it by clicking on the track number display, holding it down, and dragging the control panel. When you place it where you would like, release the mouse button.

- If you have your display set to 256 colors, the basic display will appear no matter which one you select. You will need to set your display colors to more than 256 in order to select other display appearances.
- When you close the media player's desktop control panel, it will stop the audio media player. Simply press the Play button if you would like to continue listening, and the media player will restart at track 1. The Selector switch must be in the media player position.

Deactivating and Activating the LifeBook Application Panel

To deactivate the LifeBook Application Panel, follow these easy steps:

1. Click on **Start**.
2. Click on **Programs**.
3. Click on **LifeBook Application Panel**.
4. Click on **Stop Application Panel**.

To reactivate, follow the same procedure, except for step 4. Click on **Start Application Panel** instead.

Every time you start Windows, the LifeBook Application Panel is activated, even if you deactivated it before you shut down.

Application Panel Setup

- If you insert an audio CD which has both audio and data tracks into the media player drive, the media player may fail to play the first audio track.
- The Volume Up, Volume Down and Mute controls for the media player desktop control panel adjusts the volume of the CD audio line only. It does not adjust your LifeBook notebook's master software volume control.
- The media player desktop control panel is designed to be displayed in High Color (16-bit) or in True Color (24-bit or more). If you have your LifeBook notebook's display set for 256 colors or less Media Player will display in a "basic" mode.

3 Getting Started

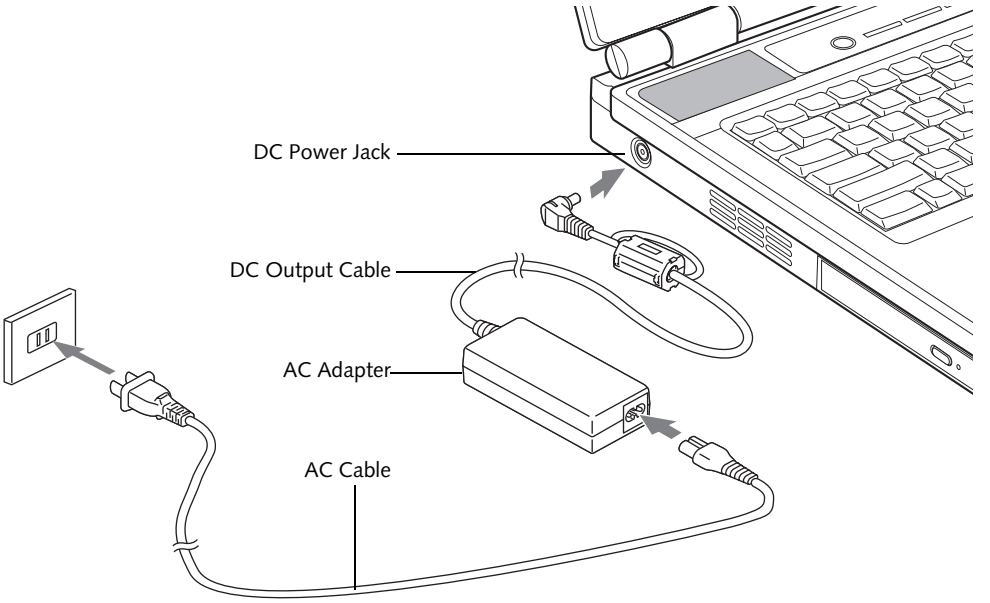


Figure 3-1. Connecting the AC Adapter

Power Sources

Your LifeBook notebook has three possible power sources: a primary Lithium ion battery, an AC adapter or an optional Auto/Airline adapter.

CONNECTING THE POWER ADAPTERS

The AC adapter or optional Auto/Airline adapter provides power for operating your LifeBook notebook and charging the batteries.

Connecting the AC Adapter

1. Plug the DC output cable into the DC power jack of your LifeBook notebook. *(Figure 3-1)*
2. Plug the AC adapter into an AC electrical outlet.

Connecting the Optional Auto/Airline Adapter

1. Plug the DC output cable into the DC power jack on your LifeBook notebook.
2. Plug the Auto/Airline adapter into the cigarette lighter of an automobile with the ignition key in the On or Accessories position.

   OR
3. Plug the Auto/Airline adapter into the DC power jack on an airplane seat.

Switching from AC Adapter Power or the Auto/Airline Adapter to Battery Power

1. Be sure that you have a charged battery installed.
2. Remove the AC adapter or the Auto/Airline adapter. Your notebook will automatically switch from DC power to battery power.

The Lithium ion battery is not charged upon purchase. Initially, you will need to connect either the AC adapter or the Auto/Airline adapter to use your LifeBook notebook while the battery charges.

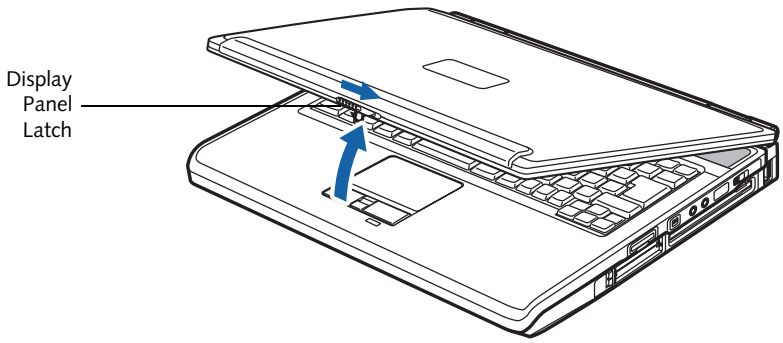


Figure 3-2. Opening the Display Panel

Display Panel

Your LifeBook notebook contains a display panel that is backlit for easier viewing in bright environments and maintains top resolution through the use of active-matrix technology. Your system has a 15" SXGA display panel.

OPENING THE DISPLAY PANEL

1. Slide the latch located at the top of the display panel to the right. This releases the locking mechanism and raises the display slightly.
2. Lift the display backwards, being careful not to touch the screen, until it is at a comfortable viewing angle.

ADJUSTING DISPLAY PANEL BRIGHTNESS

Once you have turned on your LifeBook notebook, you may want to adjust the brightness level of the screen to a more comfortable viewing level. There are two ways to adjust the brightness, keyboard and power management utility.

The higher the brightness level, the more power the LifeBook notebook will consume and the faster your batteries will discharge. For maximum battery life, set the brightness to as low a level as possible.

Keyboard

Adjusting the brightness using the keyboard changes the setting only temporarily.

- [Fn+F6]: Pressing repeatedly will lower the brightness of your display.
- [Fn+F7]: Pressing repeatedly will increase the brightness of the display.

CLOSING THE DISPLAY PANEL

1. Holding the edge of your display panel, pull it forward until it is flush with the body of your LifeBook notebook.
2. Push down until you hear a click. This will engage the locking mechanism and prevent your display panel from opening unexpectedly.

Starting Your LifeBook Notebook

POWER ON

Power/Suspend/Resume Button

The Power/Suspend/Resume button is used to turn on your LifeBook notebook from its off state. Once you have connected your AC adapter or charged the internal Lithium ion battery, you can power on your notebook.

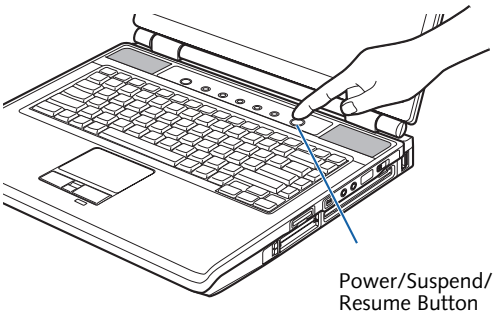


Figure 3-3. Starting the system

When you turn on your LifeBook notebook be sure you have a power source. This means that at least one battery is installed and charged, or that the AC or Auto/Airline adapter is connected and has power.

To turn on your LifeBook notebook from its off state, press the Power/Suspend/Resume button located on the right above the keyboard *(Figure 3-3)*. When you are done working you can either leave your LifeBook notebook in Suspend mode, *(See Suspend Mode on page 31 for more information)*, or you can turn it off. *(See Power Off on page 32 for more information)*

Do not carry your notebook around with power on or subject it to shocks or vibration, as you risk damaging your notebook.

When you power on your notebook, it will perform a Power On Self Test (POST) to check the internal parts and configuration for correct functionality. If a fault is found, your LifeBook notebook will emit an audio warning and/or an error message will be displayed. *(See Power On Self Test Messages on page 78 for more information)* Depending on the nature of the problem, you may be able to continue by starting the operating system or by entering the BIOS setup utility and revising the settings.

After satisfactory completion of the POST, your LifeBook notebook will load your operating system.

Never turn off your notebook during the POST or it will cause an error message to be displayed when you turn it on the next time. *(See Power On Self Test Messages on page 78 for more information)*

BOOT SEQUENCE

The procedure for starting-up your LifeBook notebook is termed the Bootup sequence and involves your notebook's Basic Input-Output System (BIOS). When your notebook is first turned on, the main system memory is empty, and it needs to find instructions to start up your notebook. This information is in the BIOS program. Each time you power up or restart your notebook, it goes through a boot sequence which displays a Fujitsu logo until your operating system is loaded. During booting, your LifeBook notebook is performing a standard boot sequence including a POST. When the boot sequence is completed without a failure and without a request for the BIOS Setup Utility, the system displays the operating system's opening screen.

The boot sequence is executed when:

- You turn on the power to your LifeBook notebook.
- You restart your LifeBook notebook from the Windows Shut Down dialog box.
- 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].

BIOS SETUP UTILITY

The BIOS Setup Utility is a program that sets up the operating environment for your LifeBook notebook. Your BIOS is set at the factory for normal operating conditions, therefore there is no need to set or change the BIOS' environment to operate your notebook.

The BIOS Setup Utility allows you to:

- Device control feature parameters, such as changing I/O addresses and boot devices.
- System data security feature parameters, such as passwords.

Entering the BIOS Setup Utility

To enter the BIOS Setup Utility do the following:

1. Turn on or restart your LifeBook notebook.
2. Press the [F2] key once the Fujitsu logo appears on the screen with a prompt below it. This will open the main menu of the BIOS Setup Utility with the current settings displayed.
3. Press the arrow keys to scroll through the other setup menus to review or alter the current settings.

BIOS Guide

A guide to your LifeBook notebook's BIOS is available online. Please visit our service and support web site at http://us.fujitsu.com/computers. Once there, click on the Support link, then select Notebooks under User's Guides in the side bar. Select LifeBook BIOS Guides from the pull-down menu for your LifeBook model.

If your data security settings require it, you may be asked for a password before the BIOS main menu will appear.

BOOTING THE SYSTEM THE FIRST TIME

We strongly recommend that you not attach any external devices or put a DVD/CD in your drive until you have gone through the initial power-on sequence.

When you turn on your LifeBook notebook for the first time, it will display a Fujitsu logo on the screen. If you do nothing the system will load the operating system, and then the Windows Welcome will begin.

Designed to accommodate the needs of many users, in many countries, Windows needs to be configured the first time you use it. Windows has two parts:

- Getting Started: You have the opportunity to review the Windows License Agreement, to enter custom information for your system, and to set up your modem so that your LifeBook notebook will be prepared to dial out.
- Registration: Easy online registration for Windows with Microsoft.

You may click Cancel at any time within this process to shut down Windows. You may restart this process at any time in the future, but you must complete it in order to use your computer.

GETTING STARTED

Read the instructions on the screens carefully and fill in the information as directed. You will be asked to read the Windows End User License Agreement. When you finish, you must accept or reject the terms of the agreement.

If you reject the terms of the License Agreement you will be returned to the beginning of the Windows Welcome Process, even if you shut your notebook down and start it up again.

You will then be asked for such items as the language you wish to use, the country in which you live, your first and last name, and about how you dial out from where you will be using your notebook. For the modem settings, enter your current location information where you will be using your notebook. If you are not connected to a phone line and plan to register at a later time, you may click the **Skip** button.

Once you have set up your LifeBook notebook to dial out, Windows will make a free telephone call to test the settings. If the call is unsuccessful, you will be returned to the phone settings page where you may try to fix them. If you are unable to fix the settings please contact Fujitsu Service and Support. *(See Fujitsu Contact Information on page 3 for more information)* If you would simply like to move on, and register at a later time, you may click the **Skip** button.

Windows Registration

If your connection is successful, you will receive an acknowledgement from Microsoft that your registration was successful.

WINDOWS PRODUCT ACTIVATION

If your system has Windows XP as an operating system, it has *already* been pre-installed and pre-activated when you receive the system.

In the event you need to re-install Windows XP (e.g., after making significant configuration changes), it may be necessary to reactivate the operating system. To do so, use the following information.

- After re-installing Windows XP, you have thirty days to activate it. Product activation ensures that you are the authorized owner of the operating system.
- Until you activate the product, you will be prompted whenever you turn on the system that activation is required. Follow the on-screen directions to activate your operating system. The product only needs to be activated once, unless significant hardware changes are made to your system.
- Note that Product Activation and Registration are not the same thing. Registration is optional, whereas Product Activation is a required procedure.

REGISTERING YOUR LIFEBOOK NOTEBOOK

How do I register my LifeBook notebook?

To register your LifeBook notebook, visit our Web site at: http://us.fujitsu.com/computers.

INSTALLING CLICK ME!

The first time you boot up your system, you will see an icon called Click Me! in the Start folder. When you click the Click Me! icon, your system will automatically build the icon tray in the bottom right of the screen. These icons provide links to utilities that you will frequently access.

Power Management

Your LifeBook notebook has many features for conserving battery power. Some of these features are automatic and need no user intervention, such as those for the internal modem. However, others depend on the parameters you set to best suit your operating conditions, such as those for the display brightness. Internal power management for your LifeBook notebook may be controlled from settings made in your operating system, pre-bundled power management application, or from settings made in the BIOS setup utility.

Besides the options available for conserving battery power, there are also some things that you can do to prevent your battery from running down as quickly. For example, you can create an appropriate power saving profile, put your LifeBook notebook into Suspend mode when it is not performing an operation, and you can limit the use of high power devices. As with all mobile battery-powered computers, there is a trade-off between performance and power savings.

POWER/SUSPEND/RESUME BUTTON

When your LifeBook notebook is active, the Power/Suspend/Resume button can be used to manually put your LifeBook notebook into Suspend mode. Push the Power/Suspend/Resume button when your LifeBook notebook is active, but not actively accessing anything, and immediately release the button. You will hear two short beeps and your system will enter Suspend mode.

If your LifeBook notebook is suspended, pushing the Power/Suspend/Resume button will return your LifeBook notebook to active operation.

SUSPEND MODE

Suspend mode saves the contents of your LifeBook notebook's system memory during periods of inactivity by maintaining power to critical parts. This mode will turn off the CPU, the display, the hard drive, and all of the other internal components except those necessary to maintain system memory and allow for restarting. Your LifeBook notebook can be put in Suspend mode by:

- Pressing the Power/Suspend/Resume button when your system is turned on.
- Selecting Standby from the Windows Shut Down menu.
- Timing out from lack of activity (if the power profile has been set up accordingly).
- Allowing the battery to reach the Dead Battery Warning condition.

Your LifeBook notebook's system memory typically stores the files on which you are working, open applications information, and any other data required to support the operations in progress. When you resume operation from Suspend mode, your LifeBook notebook will return to the point where it left off. You must use the Power/Suspend/Resume button to resume operation, and there must be an adequate power source available, or your LifeBook notebook will not resume.

If you are running your LifeBook notebook on battery power, be aware that the battery continues to discharge while your LifeBook notebook is in Suspend mode, though not as fast as when fully operational.

HIBERNATION (SAVE-TO-DISK) FEATURE

The Hibernation (Save-to-Disk) feature saves the contents of your LifeBook notebook's system memory to the hard drive as a part of the Suspend/Resume mode. You can enable or disable this feature.

Enable or Disable the Hibernation Feature

Hibernation is the default setting for Windows XP. To disable or enable the Hibernation feature, follow these steps:

1. From the **Start** menu, select **Control Panel**.
2. From the **Control Panel**, double-click the **Power Options** icon.
3. Select the **Hibernate** tab. Select or deselect the box to enable or disable this feature.

Using the Hibernation Feature

1. From the **Start** menu, select **Control Panel**.
2. From the **Control Panel**, select **Power Options**.
3. Select the **Advanced** tab. Select **Hibernate** from the pull down menu for Power buttons. (Note that **Hibernate** will only appear as an option if it has been enabled in the **Hibernate** tab).

The Suspend or Hibernation (Save-to-Disk) mode should not be used with certain PC Cards. Check your PC Card documentation for more information.

- If your notebook is actively accessing information when you enter the Suspend or Hibernation (Save-to-Disk) modes 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 drive during Hibernation (Save-to-Disk) mode.
- When PC Cards or external devices are in use, Save-to-Disk mode cannot return to the exact state prior to suspension, because all of the peripheral devices are re-initialized when the system restarts.
- The main advantage of using Hibernation is that power is not required to maintain your data. This is important if you will be leaving your notebook in a suspended state for a prolonged period of time. The drawback of using Hibernation mode is that it lengthens the power down and power up sequences and resets peripheral devices.

DISPLAY TIMEOUT

The Video Timeout is one of the power management parameters. This feature saves power by turning off the display if there is no keyboard or pointer activity for the user selected timeout period. Any keyboard or pointer activity will cause the display to restart automatically. This feature is independent of the Power/Suspend/Resume button and can be enabled and disabled in Windows and the BIOS setup utility. *(See BIOS Setup Utility on page 29 for more information)*

HARD DISK TIMEOUT

The Hard Disk Timeout is another one of the power management parameters. This feature saves power by turning off the hard drive if there is no hard drive activity for the user selected timeout period. Any attempt to access the hard drive will cause it to restart automatically. This feature is independent of the Power/Suspend/Resume button and can be enabled and disabled in Windows and BIOS setup utility. *(See BIOS Setup Utility on page 29 for more information)*

WINDOWS POWER MANAGEMENT

The Power Options icon in the Windows Control Panel allows you to configure some of the power management settings. For example, you can use the Power Management to set the timeout values for turning off the display and hard disks whether you are running the notebook on battery power or one of the adapters. *(See Pre-Installed Software on page 93 for more information)* The settings may also be changed in the BIOS. *(See BIOS Setup Utility on page 29 for more information)*

RESTARTING THE SYSTEM

If your system is on and you need to restart it, be sure that you use the following procedure.

1. Click the **Start** button, and then click **Shut Down**.
2. Select the **Restart** option from within the Windows Shut Down dialog box.
3. Click **OK** to restart your LifeBook notebook. Your notebook will shut down and then reboot.

Turning off your LifeBook notebook without exiting Windows or turning on your notebook within 10 seconds of the notebook being shut off may cause an error when you start the next time.

POWER OFF

Before turning off the power by choosing Shut Down from Windows, check that the Hard Drive, optical drive, PC Card and Floppy Disk Drive Access indicators are all Off. *(See figure 2-8 on page 14)* If you turn off the power while accessing a disk or PC Card there is a risk of data loss. To ensure that your LifeBook notebook shuts down without error, use the Windows shut down procedure.

Never turn your LifeBook notebook off while an application is running. Be sure to close all files, exit all applications, and shut down your operating system prior to turning off the power. 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.

Using the correct procedure to shut down from Windows, allows your LifeBook notebook to complete its operations and turn off power in the proper sequence to avoid errors. The proper sequence is:

1. Click the **Start** button, and then click **Shut Down**.
2. Select the **Shut Down** option from within the Windows Shut Down dialog box.
3. Click **OK** to shut down your LifeBook notebook.

If you are going to store your LifeBook notebook for a month or more, see the Care and Maintenance section of this manual.

4 User-Installable Devices and Media

Lithium ion Battery

Your LifeBook notebook has a Lithium ion battery that provides power for operating your notebook when no external power source is available. The battery is durable and long lasting, but should not be exposed to extreme temperatures, high voltages, chemicals or other hazards.

The Lithium ion battery operating time may become shorter if it is used under the following conditions:

- The operating temperature range of the Lithium ion battery is 5°C to 30°C. If the battery is used outside these temperature ranges, charging efficiency will be greatly reduced and the likelihood of battery deterioration will greatly increase. The Battery Charging indicator on the Status Indicator Panel will flash orange when you try to charge a battery that is outside its operating temperature range. *(See Battery Charging Indicator on page 14 for more information)*
- When using a high current device such as a modem, DVD, or hard drive, using the AC adapter will conserve your battery life.

- Actual battery life will vary based on screen brightness, applications, features, power management settings, battery condition and other customer preferences. Media player drive or hard drive usage may also have a significant impact on battery life. The battery charging capacity is reduced as the battery ages. If your battery is running low quickly, you should replace it with a new one.
- Do not leave a faulty battery in your LifeBook notebook. It may damage your AC adapter, optional Auto/Airline adapter, or your LifeBook notebook itself. It may also prevent operation of your notebook by draining all available current into the bad battery.
- 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).

RECHARGING THE BATTERIES

If you want to know the charge condition of the primary Lithium ion battery, check the Battery Level indicator located on the Status Indicator panel *(See Battery Level Indicator on page 14 for more information)*. The indicator changes as the battery level changes.

The Lithium ion battery is recharged internally using the AC adapter or Auto/Airline adapter. To recharge the battery, make sure the battery is installed in your notebook and connect the AC or Auto/Airline adapter.

Make sure that the Battery Charging indicator and the percentage charge is indicated by the Battery Level icon on the Status Indicator Panel.

It is not necessary to discharge the battery completely before recharging. Charge times will be much longer if your notebook is in use while the battery is charging. 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 Management on page 31 for more information on Suspend mode and shutdown procedure)*

Using heavy current devices such as a modem or frequent media player accesses may prevent charging completely.

Low Battery State

When the battery is running low, a low battery notification message will appear. If you do not respond to the low battery message, the batteries will continue to discharge until they are too low to operate. When this happens, your LifeBook notebook will go into Suspend mode. There is no guarantee that your data will be saved once the notebook reaches this point.

- Once the low battery notification message appears, you need to either plug in an AC power adapter or Auto/Airline adapter, or save all your active data, power down your system, and install a charged battery as soon as possible.
- When you are in Suspend mode there must always be at least one power source active. If you remove all power sources while your LifeBook notebook is in Suspend mode, any data that has not been saved to the hard drive will be lost.

Once your LifeBook notebook battery goes dead, you will be unable to resume operation until you provide a source of power either from an adapter or a charged battery. Once you have provided power, you will need to press the Power/Suspend/Resume button to resume operation. If your battery dies, your data will be lost if a power source is not provided promptly. Once you provide power, you can continue to use your LifeBook notebook while an adapter is charging the battery.

Damaged Batteries

The Battery Level indicator displays the operating level available in that battery. (See "Battery Level Indicator" on page 14). If this icon is red and blinking, it means that the battery is damaged and must be replaced so it does not damage any other parts of your notebook.

REPLACING THE BATTERY

With the purchase of an additional battery, you can have a fully charged spare to swap with one that is not charged. *(Figure 4-1)*

1. Have a charged battery ready to install.
2. Shut down your LifeBook notebook and disconnect the AC adapter.
3. Press the battery release latches while lifting the battery.
4. Remove the battery from the bay.
5. Insert the new battery into the bay. The pins will automatically align with the connector.
6. Press the battery down until the battery release latches snap into place.
7. Plug in the AC adapter and turn the power on.

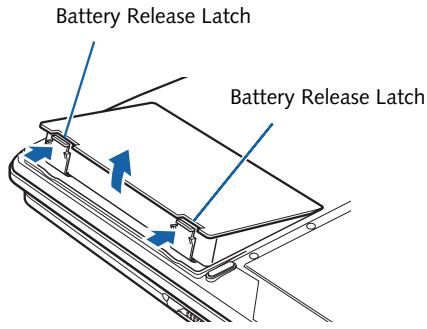


Figure 4-1. Replacing the Battery

If the Lithium ion battery connector is not fully seated, you may not be able to use your LifeBook notebook or charge your battery.

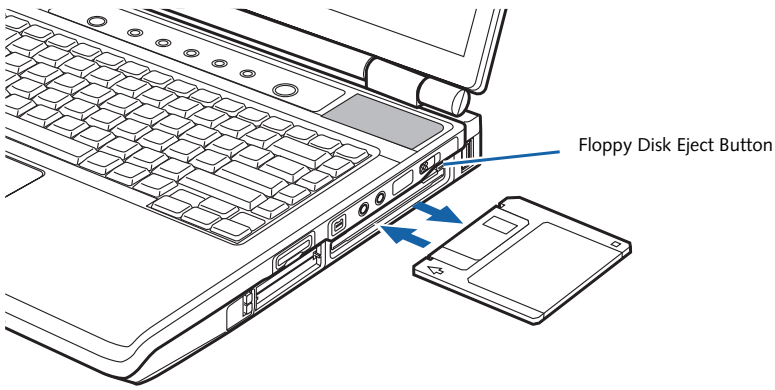


Figure 4-2. Loading/Ejecting a 3.5" Floppy Disk

Floppy Disk Drive

Your LifeBook notebook has an internal floppy disk drive which can read and write information on removable 1.44 MB and 720 KB floppy disks.

LOADING A DISK

To load a disk into your disk drive, follow these steps:

1. Position the disk so that its label is facing upwards and the shutter side is pointing towards the drive. *(Figure 4-2)*
2. Push the disk into the drive until the Eject button pops out and you hear a click.

When there is no disk in the drive, the Eject button is flush with your LifeBook notebook.

EJECTING A DISK

To eject a disk from the disk drive, follow these steps:

1. Press the Eject button. This will push your disk partially out of the drive.
2. Remove the disk.

Formatting a floppy disk that already contains data will erase all of the information on the disk.

PREPARING A DISK FOR USE

Before you can use a new disk, it needs to be prepared so that your notebook knows where to store information. This procedure is called formatting or initializing a disk. You need to format new disks, unless they are preformatted. *(Please refer to your operating system manual for step-by-step instructions on formatting a disk)*

To prevent accidental erasure of the data stored on a disk, slide the "write protect" tab until a small hole is exposed. This sets the disk into a protected state in which nothing can be added or removed. If you want to add or remove data on a protected disk, slide the "write protect" tab to close the small hole. *(Figure 4-3)*

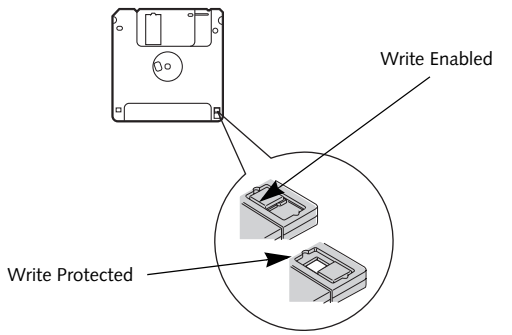


Figure 4-3. Floppy Disk Write Protect

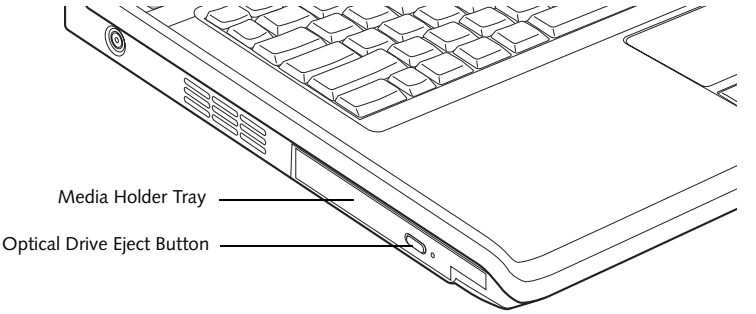


Figure 4-4. Optical Drive

Optical Disk

Your system may have a DVD/CD-RW combo drive, a DVD-RW drive, or a Super-Multi DVD drive. Collectively, these are known as "optical drives". A variety of media is available to use with your system, depending upon the system configuration you have selected.

DVD-R and DVD-RW discs hold up to 4.7 GB of data. A DVD-R disc can only be written to once; DVD-RW discs can be written to over and over. DVD-R and DVD-RW discs can be played on most standard DVD players.

CD-R and CD-RW discs hold up to 640 MB of data. A CD-R disc can only be written to once; CD-RW discs can be written to over and over.

Depending upon the configuration of your notebook, you may have one of the following optical drives:

- **DVD/CD-RW combo:** A DVD/CD-RW combo drive allows you to access movie, software, data, or audio DVD/CDs, and to write data onto recordable CD-R and CD-RW discs.
- **DVD-RW:** A DVD-RW drive allows you to play CD's and DVD's, record CD-R's and CD-RW's, and record DVD-R's and DVD-RW's.
- **Super-Multi DVD drive:** This allows you to access movies, software, and audio DVD/CDs as well as to read and write to CD-R, CD-RW, DVD-R, DVD+R, DVD-RW, DVD+RW, and DVD RAM discs.

Install your media player software before first using the optical drive. Refer to the applicable readme file on the Driver Applications CD-ROM.

- Do not operate your optical drive unless your LifeBook notebook is sitting on a flat surface. Using a drive when the system is not level may damage the drive or prevent proper operation.
- Prolonged use of the optical drive, such as watching a DVD movie, will substantially reduce your battery life if no other power source is attached.

- You should regularly check the Fujitsu web site at http://us.fujitsu.com/computers for current updated drivers.
- All LifeBook DVD players are set to play DVD titles with region code number 1 which is specified for the North American market. The region number is a regional restriction code defined by the DVD Forum acting on Hollywood requirements. Different region codes are recorded on video DVD titles for publication in different areas of the world. If the regional code of the DVD player does not match the codes on the titles, then playback is impossible.
- You can change the region code on the DVD player using the Properties menu of the DVD software. Note, however, that **you can only change the region code up to four times.** After the fourth change, the last code entered becomes permanent, and cannot be changed.

LOADING MEDIA ON YOUR DRIVE

To load a disc into your optical drive:

1. Push and release the eject button on the front of the optical drive to open the holder tray. The tray will come out of the LifeBook notebook a short distance.
2. Gently pull the tray out until a media disc can easily be placed in the tray.

There may be a protective sheet in the tray from when it was shipped; please make sure it is removed before operating the drive.

3. Place the media into the tray, label side up, with the hole in the center of the disc. Snap the disc onto the raised circle in the center of the tray.
4. Gently push the holder tray back in until you hear a click. *(Figure 4-5)*

If you have disabled the Auto Insert Notification Function, you will have to start the drive from your desktop, since your LifeBook notebook will not automatically recognize that media has been loaded.

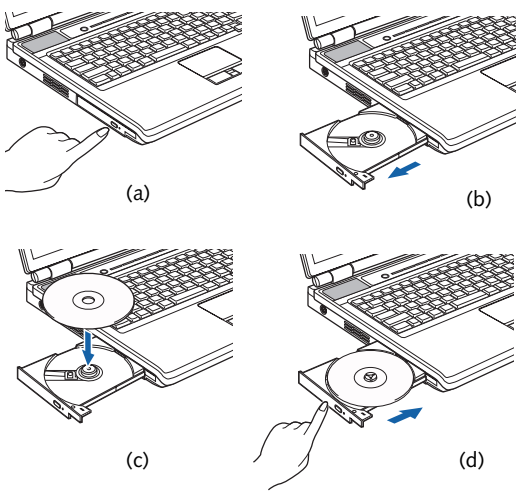


Figure 4-5. Loading/Ejecting Media

REMOVING MEDIA

1. Push and release the eject button on the front of the optical drive. This will stop the drive and the holder tray will come out of the LifeBook notebook a short distance.
2. Gently pull the tray out until the disc can easily be removed from the tray.
3. Carefully remove the media disc from the holder tray.
4. Gently push the holder tray back in until you hear a click.

USING THE MEDIA PLAYER SOFTWARE

Depending upon its configuration, your system may not have the media player software pre-installed. If it is not installed, reference the documentation that accompanies the media application.

Starting a DVD Movie

1. Insert the DVD movie into your optical drive. If the CD AutoRun feature activates, skip Step 2.
2. The first time you insert a movie into the DVD/CD-RW tray, you will be prompted to select what you want the system to do when discs are inserted (e.g., start automatically or wait for a prompt). Until you make a selection, you will receive the same prompt whenever you insert a disc.
3. Click **OK** to close the About DVD Player Performance dialog box and the movie will begin.

Opening the Media Player Control Panel

With most DVD-ROMs, you have the option of altering how the movie should play and what you wish to view. You can do this by using the media player control panel and the mouse.

1. Right-click on the movie screen to open a dropdown menu for options.
2. Select **View,** then **Player** for all the controls available. This will open the control panel into the bottom of the screen.

Using the Media Player Control Panel

The media player software allows you to watch the movie much like a VCR player. You have the option to pause, rewind, fast-forward and stop the movie at any point.

1. To **Pause** the movie, click the on-screen ⏸ button.
2. To **Rewind** the movie, click the ⏪ button to rewind to a specific portion of the movie, or the ⏮ button to return to the opening screen.
3. To **Fast-forward** the movie, click the ⏩ button to forward to a specific portion of the movie, or the⏭ button to jump to the ending credits.
4. To **Stop** the movie, click the ■ button.

Exiting the Media Player

1. Click the ✕ located in the upper right corner of the title bar. This will open a media player dialog box.
2. Click Yes to stop and exit the movie, or No to close the media player dialog box and return to the movie.

USING DOLBY™ HEADPHONE

The Dolby Headphone utility lets you enjoy multi-channel sound sources, such as DVD movies, with realistic virtual surround sound using *conventional* stereo headphones. The Dolby Headphone is a utility that is available in the InterVideo WinDVD application.

Dolby Headphone is a signal processing system that enables your stereo headphones to realistically emulate the sound of a multi-speaker playback system.

- Media discs which do not have the Dolby Surround 5:1 symbol will not support Dolby Headphone.
- After making changes to the Dolby Headphone feature and clicking OK, wait at least ten seconds before making another change in order to allow the system to stabilize.

To use the Dolby Headphone feature, perform the following steps:

1. Double click the InterVideo WinDVD icon on your desktop.
2. On the toolbar that appears, click the Properties button (the fourth button from the left, with the image of a wrench).
3. On the Properties window, select the Dolby Headphone tab.
4. To enable Dolby Headphone, check the Enable Dolby Headphone box. To change the type of surround sound, select one of the radio buttons listed under Room Filter Setting.
5. Click OK. The Dolby Headphone feature will now be enabled until you disable it by unchecking Enable Dolby Headphone.

USING OPTICAL DRIVE ON BATTERY POWER

Since optical drives consume a lot of power, your overall battery life will be significantly shorter when operating the drive continuously (such as watching a DVD movie) than during standard operation. Many movie run-times are longer than your LifeBook notebook can support on a single charged battery. If you are watching a DVD movie on battery power you may need to swap in an additional, charged battery or attach AC power during the movie to view it in its entirety.

An additional fully-charged battery is recommended if you will be watching DVD movies on battery power. If you don't have an additional battery, you may purchase one either online at http://us.fujitsu.com/computers or by calling 1-877-372-3473.

To Watch a Movie on Battery Power:

1. Have an additional full-charged battery or your AC adapter ready for use.
2. Start watching your DVD movie.
3. When the low battery warning occurs, immediately stop the movie and exit the media player.

If you do not stop the optical drive quickly and the LifeBook notebook attempts to auto-suspend (critical battery low state) the notebook will shut down improperly. If this occurs, you will need to perform a hard reset and follow any instructions presented before the system will reboot.

4. Power down your LifeBook notebook and replace the discharged battery with an additional fully-charged battery. If you do not have an additional battery, you should attach AC power as soon as you see the low battery warning.
5. Resume your notebook operation by pressing the Suspend button again.This is not required if you attached AC power without entering suspend mode.
6. Restart your optical drive, locate and skip to the chapter of the movie you were last watching.
7. Continue watching your DVD movie.

Some shorter DVD movies may not require you to swap batteries or attach AC power to complete them; however, it is best to be prepared since actual battery life while operating the media player cannot be guaranteed.

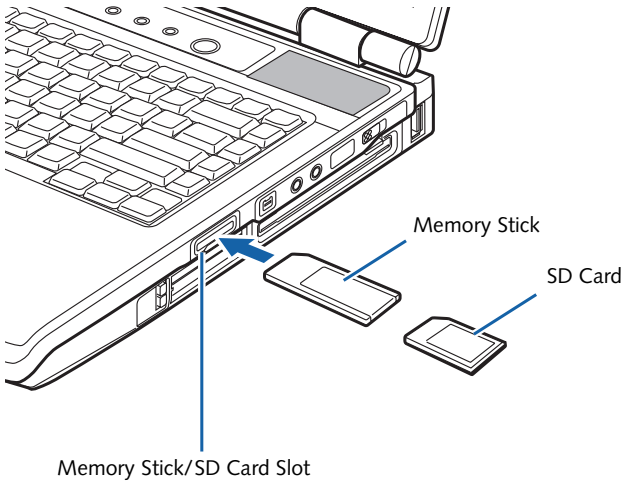


Figure 4-6. Installing a Memory Stick/SD Card

Memory Stick/ Secure Digital Media

Your LifeBook notebook supports Memory Stick/ Memory Stick Pro and Secure Digital (SD) cards, on which you can store and transfer data to and from a variety of digital devices. These cards use flash memory architecture, which means they don't need a power source to retain data.

Memory Stick is a flash memory technology developed by Sony Electronics. Memory Stick allows you to record, transfer and share digital content, such as digital pictures, movies, music, voice, and computer data and applications.

Secure Digital (SD) Cards are very similar to Memory Sticks, but they are shorter. Like the Memory Stick, SD Cards allow portable storage among a variety of devices, such as cell phones, GPS systems, digital cameras, and PDAs. SD Cards transfer data quickly, with low battery consumption. Like the memory stick, it uses flash memory architecture.

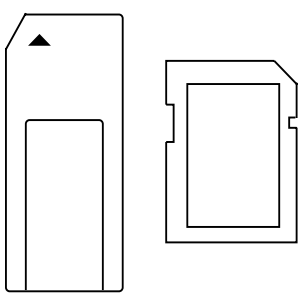


Figure 4-7. Memory Stick (left) and Secure Digital Card (right)

INSTALLING MEMORY STICK/SD CARDS

Memory Sticks and SD Cards are installed in the Memory Stick/SD Card slot *(Figure 4-6)*. To install a Memory Stick or SD Card, follow these steps:

- Installing or removing a Memory Stick or SD Card during your LifeBook notebook's shutdown or bootup process may damage the card and/or your LifeBook notebook.
- Do not insert a card into a slot if there is water or any other substance on the card as you may permanently damage the card, your LifeBook notebook, or both.

1. See your Memory Stick or SD Card manual for instructions on the installation of your card. Some cards may require that your notebook is off while installing them.
2. Make sure there is no card currently in the slot. If there is, see Removing a Memory Stick/SD Card.
3. Insert your PC Card into the slot with the product label facing up.
4. Push the card firmly into the slot until it is seated in the connector.

REMOVING A MEMORY STICK/SD CARD

To remove a Memory Stick or SD Card, follow these easy steps:

1. See your Memory Stick or SD Card manual for instructions on the removal of your card. Some cards may require your LifeBook notebook to be in Suspend Mode or Off while removing them.

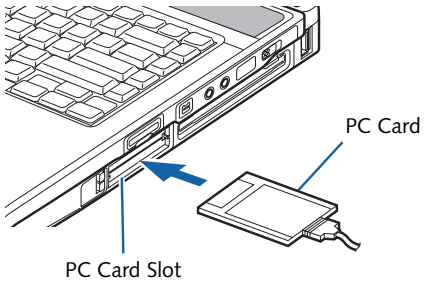


Figure 4-8. Installing/Removing PC Cards

PC Cards

Your LifeBook notebook supports Type I, Type II and Type III PC Cards, which can perform a variety of functions depending on which type of card you install. You can install one or two PC Cards at a time, depending on its type. Type I/II PC Cards can be installed together, while Type III PC Cards must be installed alone.

Some available PC Cards:

- Local area network (LAN) cards (Type II)
- IDE solid-state disk cards (Type II)
- SCSI cards (Type II)
- Hard Drive (ATA) cards (Type III)
- Other PC Cards that conform to PCMCIA 2.1 or CardBus standards

For further information, refer to the instructions supplied with your PC Card.

INSTALLING PC CARDS

PC Cards are installed in the PC Card slot. To install a PC Card(s), follow these steps:

- Installing or removing a PC Card(s) during your LifeBook notebook's shutdown or bootup process may damage the card and/or your LifeBook notebook.
- Do not insert a PC Card into a slot if there is water or any other substance on the card as you may permanently damage the card, your LifeBook notebook, or both.

You may be required to log on as an Administrator or a member of the Administrator's Group to complete this procedure. If your computer is connected to a network, network policy settings may also prevent you from completing this procedure.

1. See your PC Card manual for instructions on the installation of your card. Some cards may require that your notebook is off while installing them.
2. Make sure there is no PC Card currently in the slot. If there is, see Removing PC Cards.
3. If either of the eject buttons is extended, press it in until it clicks.
4. Insert your PC Card into the slot with the product label facing up.
5. Push the card firmly into the slot until it is seated in the connector.

REMOVING PC CARDS

To remove a PC Card(s), follow these steps:

1. See your PC Card manual for specific instructions on removing your card. Some PC Cards may require your LifeBook notebook to be in Suspend Mode or Off while removing them.

- Windows has a shutdown procedure for PC Cards that must be followed before removing a card. (Review your operating system manual for the correct procedure.) It is good practice to remove devices using the Unplug or Eject Hardware icon in the system tray.
- If the dialog box states that the device cannot be removed, you must save all of your open files, close any open applications and shut down your notebook.

2. Unlock the card from the slot by pressing the eject button associated with the slot in which the card is located. When pressed, the button will pop out.
3. Firmly press the button again until it is flush with the notebook. This will eject the card slightly out of the slot allowing you to remove the card.

If the PC Card(s) has an external connector and cable, do not pull the cable when removing the card.

Memory Upgrade Module

Your LifeBook notebook comes with 256 MB of on-board high speed Synchronous Dynamic RAM (SDRAM, PC2100-type, DDR, 266 MHz) factory installed. To increase your LifeBook notebook's memory capacity, you may install an additional memory upgrade module. The memory upgrade must be a dual-in-line (DIMM) SDRAM module. To ensure 100% compatibility, purchase the SDRAM module only from the Fujitsu web store at: http://us.fujitsu.com/computers.

Fujitsu **highly recommends** that only memory modules purchased from Fujitsu or recommended by Fujitsu be installed. The installation of incompatible memory modules can cause numerous problems which could result in loss of data.

INSTALLING A MEMORY UPGRADE MODULE

To install a memory upgrade module follow these steps:

- Turn off power and remove any telephone line connections before performing the memory upgrade.
- If the computer has been used recently, it may be hot. Make sure the system has cooled off completely before changing memory.

1. Turn off power to your LifeBook notebook and remove any power adapter (AC or auto/airline) and telephone line connections.
2. Place your LifeBook notebook on a clean work surface.
3. Open the top cover all the way, so that it is lying flat on the work surface.
4. Slide the access cover slightly to the left until it becomes disengaged. Remove it from the system *(Figure 4-9)*

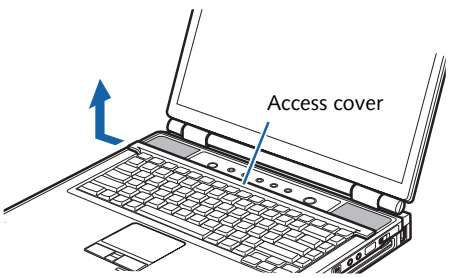


Figure 4-9. Sliding the access cover

The memory upgrade module can be severely damaged by electrostatic discharge (ESD). Be sure you are properly grounded when handling and installing the module, and follow ESD precautions noted in the literature that accompanies the memory module.

5. Push the keyboard toward the back of the system until it disengages and can be lifted freely. *(Figure 4-10)*

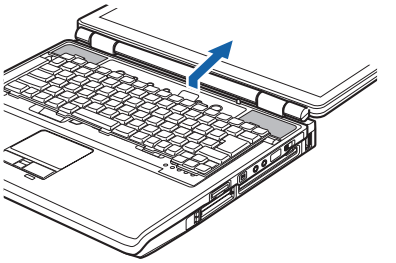


Figure 4-10. Sliding the keyboard

6. Carefully pivot the front of the keyboard away from the laptop until it is lying on the display. *(Figure 4-11)*

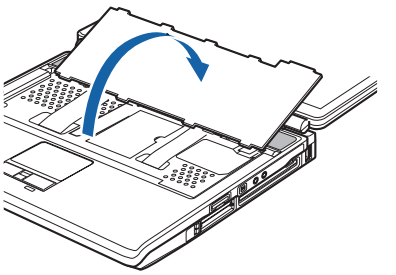


Figure 4-11. Folding the keyboard back

7. Lift the memory cover and align the connector edge of the memory upgrade module, chip side up, with the connector slot in the compartment. The module is keyed so that it can only be aligned in one position. *(Figure 4-12)*
8. Insert the memory upgrade module at a 45° angle and press it firmly onto the connector.
9. Press the memory upgrade module down into the compartment until it locks underneath the retaining clip. You will hear a click when it is properly in place. *(Figure 4-12)*

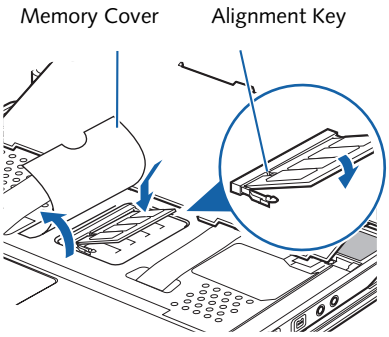


Figure 4-12. Inserting a new memory module

10. Carefully flip the keyboard back into its original position, and slide it towards the front of the unit until it is seated. *(Figure 4-13)*

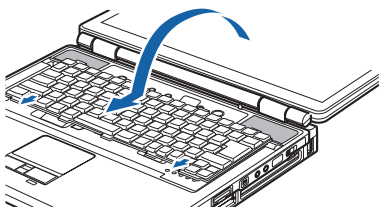


Figure 4-13. Reinstalling the keyboard

11. Replace the access cover you removed in step 4. *(Figure 4-14)* Installation of the new memory module is now complete.

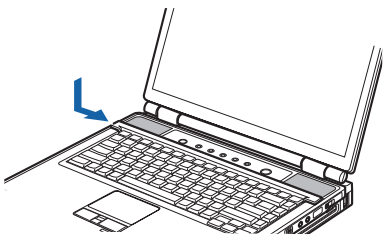


Figure 4-14. Replacing the access cover

The memory upgrade module is not something you routinely remove from your notebook. Once it is installed, you should leave it in place unless you want to increase system memory capacity.

REMOVING A MEMORY UPGRADE MODULE

1. Perform steps 1 through 7 of Installing a Memory Upgrade Module.
2. Pull the clips sideways away from each side of the memory upgrade module at the same time. *(Figure 4-15)*

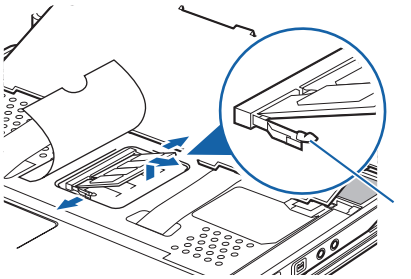


Figure 4-15. Removing a memory module

3. While holding the clips out, remove the module from the slot by lifting it up and pulling towards the back of your LifeBook notebook.
4. Store the memory upgrade module in a static guarded sleeve.
5. Replace the keyboard by following steps 11 and 12 of Installing a Memory Upgrade Module.

After changing your memory module configuration, you must complete the Resetting the Hibernation (Save-to-Disk) Parameters procedure in order for the Hibernation (Save-to-Disk) mode to operate properly on your LifeBook notebook. *(See Hibernation (Save-to-Disk) Feature on page 31 for more information)*

CHECKING THE COMPUTER RECOGNITION OF NEW MEMORY CAPACITY

Once you have changed the system memory capacity by either adding or removing a memory upgrade module, be sure to check that your LifeBook notebook has recognized the change.

You can check the memory capacity by looking at the Info menu of the BIOS setup:

1. Turn on the power to your LifeBook notebook using the Power/Suspend/Resume button.
2. Allow the system to start booting and press the F2 key once the Fujitsu logo appears on the screen with a prompt below it. This will open the main menu of the BIOS setup with the current settings displayed. *(See BIOS Setup Utility on page 29 for more information)*. Use the right arrow key to select **Info** in the BIOS Setup menu.

The System Memory and the Extended Memory capacity, as detected by your LifeBook notebook during the Power On Self Test (POST), are displayed at the bottom of the Info menu screen. The chart below shows the possible displays that can be shown on the screen.

If the total memory displayed is incorrect, check that your memory upgrade module is properly installed. (If the module is properly installed and the capacity is still not correctly recognized, see the Troubleshooting section starting on page 69)

Memory Displayed		
Onboard	**Memory Slot**	**Total Memory**
256 MB	0	256 MB
256 MB	256 MB	512 MB
256 MB	512 MB	768 MB
256 MB	1 GB	1.25 GB

Device Ports

Your LifeBook notebook comes equipped with multiple ports to which you can connect external devices including: disk drives, keyboards, modems, printers, etc.

MODEM (RJ-11) TELEPHONE JACK

The modem (RJ-11) telephone jack is used for an internal modem. To connect the telephone cable follow these easy steps: *(Figure 2-16)*

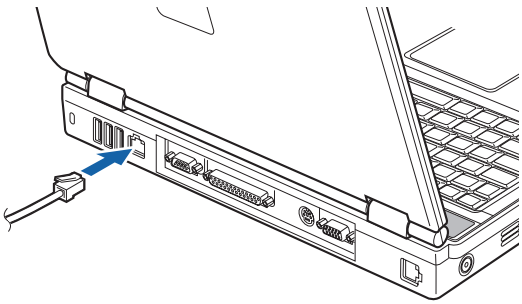


Figure 2-16 Connecting a modem

1. Align the connector with the port opening.
2. Push the connector into the port until it is seated.
3. Plug the other end of the telephone cable into a telephone outlet.

The internal modem is not intended for use with Digital PBX systems. Do not connect the internal modem to a Digital PBX as it may cause serious damage to the modem or your entire LifeBook notebook. Consult your PBX manufacturer's documentation for details. Some hotels have Digital PBX systems. Be sure to find out BEFORE you connect your modem.

- The internal modem is designed to the ITU-T V.90 standard. Its maximum speed of 53000bps is the highest allowed by FCC, and its actual connection rate depends on the line conditions. Maximum speed is 33600bps at upload.
- The internal modem on all LifeBook notebooks are certified for use in the United States and Canada. The modem may be certified in other countries.

INTERNAL LAN (RJ-45) JACK

The RJ-45 jack is used to connect the internal Fast Ethernet (10/100 Base-T/Tx) to a Local Area Network (LAN) in your office or home, or broadband devices such as a cable modem, DSL, or satellite internet. If your notebook has been configured with internal LAN capability you will need to configure your notebook to work with your particular network. (To properly set up your LAN environment, consult a networking professional. Refer to your network administrator for information on your network configuration.) To connect the LAN cable follow these easy steps: *(Figure 2-17)*

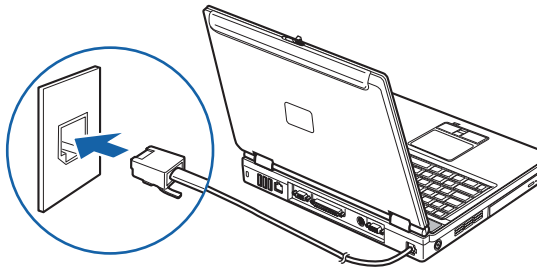


Figure 2-17 Connecting a LAN

1. Align the connector with the port opening.
2. Push the connector into the port until it is seated.
3. Plug the other end of the cable into a LAN outlet.

IEEE 1394 PORT

The 4-pin 1394 port allows you to connect digital devices that are compliant with IEEE 1394 standard (also known as "FireWire"). The IEEE 1394 standard is easy to use, connect, and disconnect. This port allows up to 400 Mbps transfer rate. A third-party application may be required to operate your device with the 1394 port.

The 1394 port used in this system uses a four-pin configuration. If you intend to interface with devices which use a six-pin configuration, you will need to purchase an adapter.

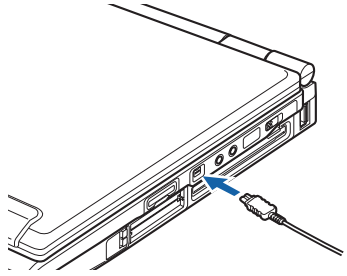


Figure 2-18 Connecting a IEEE 1394 device

In order to connect a 1394 device, follow these steps:*(Figure 2-18)*

1. Align the connector with the port opening.
2. Push the connector into the port until it is seated.

UNIVERSAL SERIAL BUS PORTS

A Universal Serial Bus (USB) 2.0 port allows you to connect USB devices such as game pads, pointing devices, keyboards and speakers. USB 2.0 is downward-compatible with USB 1.1 devices, so older USB devices will work with these ports. USB 2.0 is a much faster design, running forty times faster than USB 1.1.

Your LifeBook notebook has four USB 2.0 ports; three on the back and one on the right side. To connect a USB device follow these steps: *(Figure 2-19)*

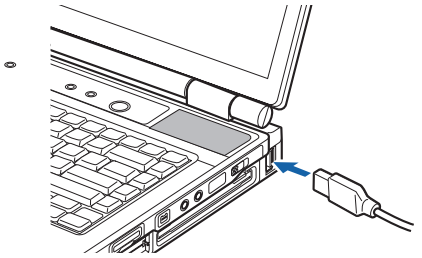


Figure 2-19 Connecting a USB device

1. Align the connector with the port opening.
2. Push the connector into the port until it is seated.

Due to ongoing changes in USB technology and standards, not all USB devices or drivers are guaranteed to work.

MICROPHONE JACK

The microphone jack allows you to connect an external mono microphone. Your microphone must be equipped with a 1/8"(3.5 mm) mono mini-plug in order to fit into the microphone jack of your LifeBook notebook. In order to connect a microphone follow these easy steps: *(See Figure 2-5 on page 11 for location)*

1. Align the connector with the port opening.
2. Push the connector into the port until it is seated.

HEADPHONE JACK

The headphone jack allows you to connect headphones or powered external speakers to your LifeBook notebook. Your headphones or speakers must be equipped with a 1/8" (3.5 mm) stereo mini-plug. In order to connect headphones or speakers follow these steps:

1. Align the connector with the port opening.
2. Push the connector into the port until it is seated.

- If you plug headphones into the headphone jack, you will disable the built-in stereo speakers.
- For information about using Dolby™ Headphone, refer to "Using Dolby™ Headphone" on page 40

S-VIDEO OUT PORT

The S-Video port allows you to connect and use directly any S-Video device, such as a VCR or television. The S-Video standard provides for a higher quality picture than NTSC or PAL. To connect an S-Video device, follow these steps: *(Figure 2-20)*

1. Align the connector with the port opening.
2. Push the connector into the port until it is seated.

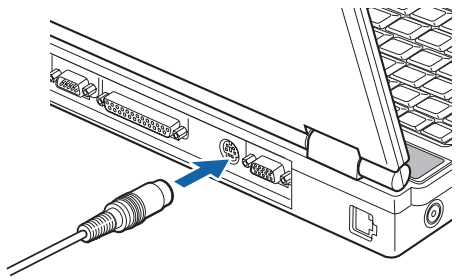


Figure 2-20 Connecting an S-Video device

EXTERNAL MONITOR PORT

The external monitor port allows you to connect an external monitor. To connect an external monitor follow these steps:

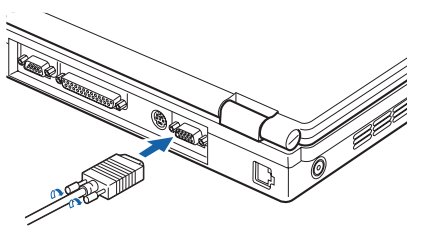


Figure 2-21 Connecting an external monitor

1. Align the connector with the port opening.
2. Push the connector into the port until it is seated.
3. Tighten the two hold-down screws, located on each end of the connector.

Pressing the [Fn] + [F10] keys allows you to change the destination of your display video. Each time you press the key combination, you will step to the next choice, starting with the built-in display panel only, moving to the external monitor only, finally moving to both the built-in display panel and an external monitor.

INFRARED PORT

The Infrared IrDA (4 Mbps) port allows for wireless data transfer between your notebook and other IrDA-compatible devices, such as another computer or a printer, without the use of a cable. *(See Figure 2-5 on page 11 for location)*

It is important to keep in mind that while carrying out this form of communication, both devices must be placed so their infrared ports are directly facing each other without obstruction. The devices must also be separated by at least 6" but no more than 36" for maximum performance.

- Do not move either device while communication is active as it may interrupt data transmission.
- Be careful not to scratch the infrared port lens. Dirt, scratches, or other surface marks can degrade operation.

PARALLEL PORT

The parallel port, or LPT port allows you to connect parallel devices, such as a printer to your notebook. In order to connect a parallel interface device follow these easy steps:

1. Align the connector with the port opening.
2. Push the connector into the port until it is seated.
3. Tighten the two hold-down screws, located on each end of the connector.

SERIAL PORT

The serial port, or COM port allows you to connect serial devices, such as printers or scanners. In order to connect a serial interface device follow these easy steps:

1. Align the connector with the port opening.
2. Push the connector into the port until it is seated.
3. Tighten the two hold-down screws, located on each end of the connector.

5

Using the Integrated Wireless LAN

FCC REGULATORY INFORMATION

Please note the following regulatory information related to the wireless LAN device.

Regulatory Notes and Statements

Wireless LAN, Health and Authorization for use

Radio frequency electromagnetic energy is emitted from Wireless LAN devices. The energy levels of these emissions, however, are far much less than the electromagnetic energy emissions from wireless devices such as mobile phones. Wireless LAN devices are safe for use by consumers because they operate within the guidelines found in radio frequency safety standards and recommendations. The use of Wireless LAN devices may be restricted in some situations or environments, such as:

- On board an airplane, or
- In an explosive environment, or
- In situations where the interference risk to other devices or services is perceived or identified as harmful.

In cases in which the policy regarding use of Wireless LAN devices in specific environments is not clear (e.g., airports, hospitals, chemical/oil/gas industrial plants, private buildings), obtain authorization to use these devices prior to operating the equipment.

Regulatory Information/Disclaimers

Installation and use of this Wireless LAN device must be in strict accordance with the instructions included in the user documentation provided with the product. Any changes or modifications made to this device that are not expressly approved by the manufacturer may void the user's authority to operate the equipment. The manufacturer is not responsible for any radio or television interference caused by unauthorized modification of this device, or the substitution or attachment of connecting cables and equipment other than those specified by the manufacturer. It is the responsibility of the user to correct any interference caused by such unauthorized modification, substitution or attachment. The manufacturer and its authorized resellers or distributors will assume no liability for any damage or violation of government regulations arising from failure to comply with these guidelines.

This device must not be co-located or operating in conjunction with any other antenna or transmitter.

Federal Communications Commission statement

This device complies with Part 15 of FCC Rules.

Operation is subject to the following two conditions: (1) This device may not cause interference, and, (2) This device must accept any interference, including interference that may cause undesired operation of this device.

FCC Interference Statement

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy. If not installed and used in accordance with the instructions, it 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 and correct the interference by one or more of the following measures:

1. Reorient or relocate the receiving antenna.
2. Increase the distance between the equipment and the receiver.
3. Connect the equipment to an outlet on a circuit different from the one the receiver is connected to.
4. Consult the dealer or an experienced radio/TV technician for help.

FCC Radio Frequency Exposure statement

This Wireless LAN radio device has been evaluated under FCC Bulletin OET 65C and found compliant with the requirements as set forth in CFR 47 Sections 2.1091, 2.1093, and 15.247 (b) (4) addressing RF Exposure from radio frequency devices. The radiated output power of this Wireless LAN device is far below the FCC radio frequency exposure limits.

The maximum SAR value measured from the device is:

- Intel PROSet Wireless LAN: 0.605 W/kg

Export restrictions

This product or software contains encryption code which may not be exported or transferred from the US or Canada without an approved US Department of Commerce export license. This device complies with Part 15 of FCC Rules., as well as ICES 003 B / NMB 003 B. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesirable operation. Modifications not expressly authorized by Fujitsu PC Corporation may invalidate the user's right to operate this equipment.

Canadian Notice

To prevent radio interference to the licensed service, this device is intended to be operated indoors and away from windows to provide maximum shielding. Equipment (or its transmit antenna) that is installed outdoors is subject to licensing.

Before Using the Wireless LAN

This manual describes the procedures required to properly setup and configure the integrated Wireless LAN Mini-PCI device (referred to as "WLAN device" in the rest of the manual). Before using the WLAN device, read this manual carefully to ensure it's correct operation. Keep this manual in a safe place for future reference.

Wireless LAN Device Covered by this Document

This document is applicable to systems containing an Intel PRO/Wireless 2200BG Mini-PCI wireless network card.

Characteristics of the WLAN Device

- The WLAN device is a Mini-PCI card attached to the mainboard of the mobile computer.
- It operates in the license-free 2.4GHz Industrial, Scientific, and Medical (ISM) RF band, therefore eliminating the need to procure an FCC license to operate.
- It is capable of two operating modes, IEEE802.11b and IEEE802.11g, wireless LAN standards governed by the IEEE (Institute of Electronics and Electrical Engineers).
- Encoding of data is modulated using Direct Sequence Spread Spectrum (DSSS) and Complementary Code Keying (CCK) when the WLAN device is operating in IEEE 802.11b mode and Orthogonal Frequency Division Multiplexing (OFDM) when operating in IEEE 802.11g mode.
- The WLAN device is Wi-Fi certified and operates at the maximum data transfer rate of 54 Mbps in IEEE802.11g mode and 11 Mbps in IEEE802.11b mode.
- The maximum communication range indoors is approximately 80 feet (25 meters). However, that range will increase or decrease depending on factors such as number of walls, reflective material, or interference from external RF sources.
- The WLAN device supports the following encryption methods - WEP, TKIP, and AES encryption.

WIRELESS LAN MODES USING THIS DEVICE

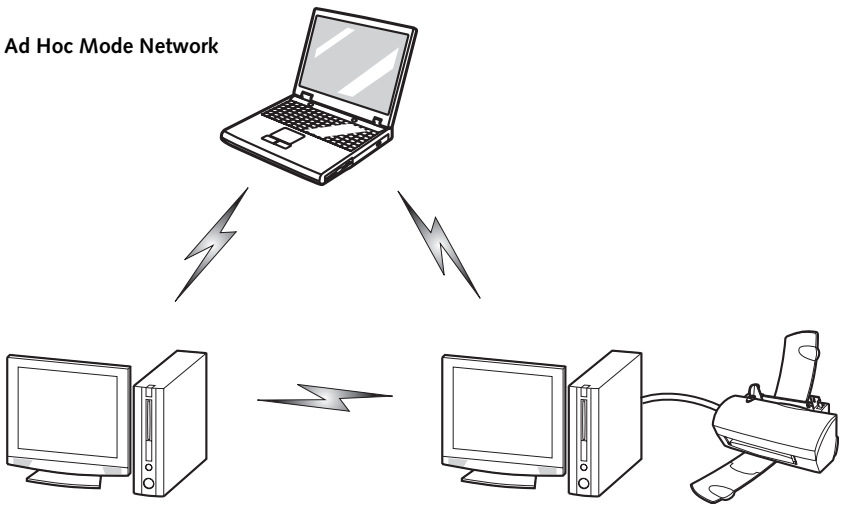
Ad Hoc Mode

(See Figure 5-1)

"Ad Hoc Mode" refers to a wireless network architecture where wireless network connectivity between multiple computers is established without a central wireless network device, typically known as Access Point(s). Connectivity is accomplished using only client devices in a peer-to-peer fashion. That is why Ad Hoc networks are also known as peer-to-peer networks. Ad Hoc networks are an easy and inexpensive method for establishing network connectivity between multiple computers.

Ad Hoc mode requires that the SSID, network authentication, and encryption key settings are identically configured on all computers in the Ad Hoc network.

Figure 5-1. Ad Hoc Mode Network



Access Point (Infrastructure) Mode

(See Figure 5-2)

Infrastructure mode refers to a wireless network architecture in which devices communicate with wireless or wired network devices by communicating through an Access Point. In infrastructure mode, wireless devices can communicate with each other or can communicate with a wired network. Corporate wireless networks operate in infrastructure mode because they require access to the wired LAN in order to access computers, devices, and services such as file servers, printers, and databases.

How to Handle This Device

The WLAN device comes pre-installed in your mobile computer. Under normal circumstances, it should not be necessary for you to remove or re-install it. The Operating System that your mobile computer comes with has been pre-configured to support the WLAN device.

WIRELESS NETWORK CONSIDERATIONS

- This WLAN device cannot communicate with IEEE802.11a devices or networks.
- The WLAN device is a dual-mode wireless network card (supports IEEE802.11b/g).
- The WLAN device operates in the 2.4GHz ISM band; 802.11a devices operate in the 5 GHz lower and middle UNII bands.
- The maximum range of the WLAN device indoors is typically 80 feet (25 meters). Please note that the maximum range you achieve may be shorter or longer than 80 feet, depending on factors such as access point transmit power, number and density of obstructions, or external RF interference.
- Microwave ovens will interfere with the operation of WLAN device as microwave ovens operate in the same 2.4GHz frequency range that IEEE802.11b/g devices operate in.
- Wireless devices that transmit in the 2.4GHz frequency range may interfere with the operation of the WLAN device. Symptoms of interference include reduced throughput, intermittent disconnects, and large amounts of frame errors. It is HIGHLY recommended that these interfering devices be powered off to ensure the proper operation of the WLAN device.

DEACTIVATING THE WLAN DEVICE

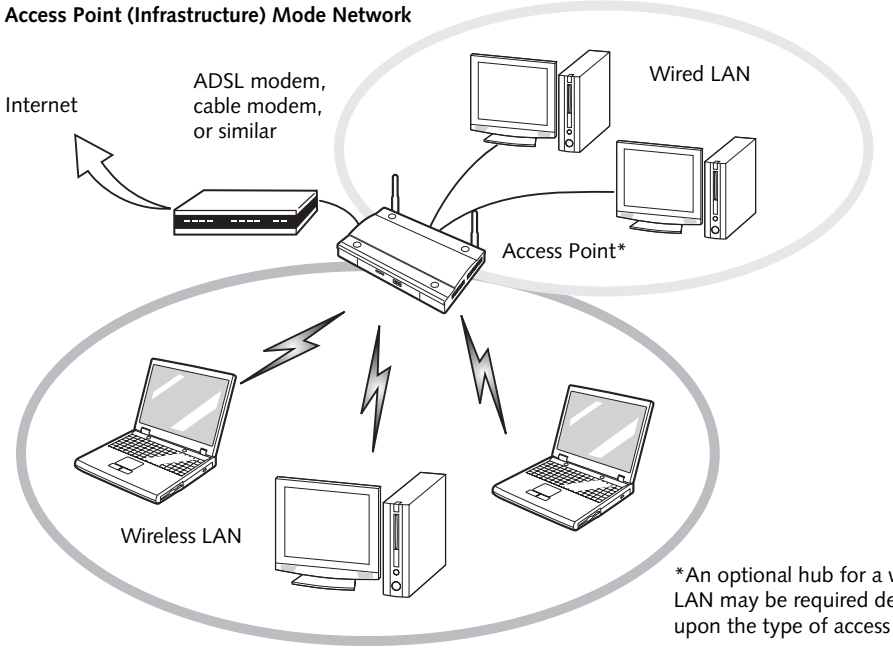
Deactivation of the WLAN device may be desired in certain circumstances (to extend battery life) or where certain environments require it (i.e. hospitals, clinics, airplanes, etc.). Fujitsu mobile computers employ two methods with which to deactivate the WLAN device, 1) the Wireless On/Off Switch and 2) in Windows using the Intel PROSet Software.

Deactivation using the Wireless On/Off Switch

The WLAN device can be deactivated quickly and efficiently by toggling the Wireless On/Off Switch to the Off position. *(Figure 5-3)*

The Wireless On/Off switch has no effect on non-Wireless LAN models.

Figure 5-2. Access Point (Infrastructure) Mode Network



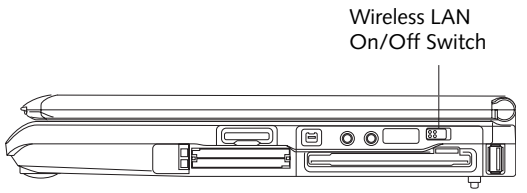


Figure 5-3. Wireless LAN On/Off Switch Location

Deactivation using the Intel PROSet Software

The WLAN device can also be deactivated in Windows using the Intel PROSet Software. The procedure to accomplish this:

1. Click [Start]-> [Control Panel].
2. If the Control Panel is in Category view, switch to Classic view by clicking "Switch to Classic View" which can be found in the left frame of the Control Panel window.
3. Double-click on the Intel PROSet for Wireless icon which will execute the Intel PROSet application.
4. Select the General tab if it is not already selected.
5. Check the Off radio button next to "Switch radio:" then click the [OK] button.

ACTIVATING THE WLAN DEVICE

Activation of the WLAN device can be accomplished using the same methods as the deactivation process

- Using the Wireless On/Off Switch
- In Windows using the Intel PROSet Software

Configuration of the WLAN Device

The WLAN Device can be configured to establish wireless network connectivity using one of the following tools:

- Windows XP Wireless Zero Configuration (WZC) - The WZC allows for multiple profile setup and support for most industry standard security solutions.
- Intel PROSet Software - The Intel PROSet Software allows for multiple profile setup and supports automatic profile switching. Support for most industry standard security solutions as well as Cisco Compatible Extensions (CCX) is contained in this software.

FLOW OF OPERATIONS

1. Activate the WLAN Device (See Activating the WLAN Device on page 54 for more information).
2. Configure the Wireless Network parameters (See Configure Wireless Network Parameters on page 56 for more information).
   - Enter the network name (SSID)
   - Choose the appropriate WLAN architecture (Ad Hoc or Infrastructure)
   - Choose Authentication method: Open, Shared, WPA, or WPA-PSK
   - If using static WEP keys, enter static WEP key and choose key index.
3. Configure network settings (See Configure Network Parameters on page 56 for more information)
   - TCP/IP settings
   - Workgroup or Domain settings.

CONFIGURATION USING WIRELESS ZERO CONFIGURATION TOOL

This section explains the procedure to properly configure the WLAN device using the WZC. Pre-defined parameters will be required for this procedure. Please consult with your network administrator for these parameters:

Network Name - Also known as the SSID

Network Key (WEP) - Required if using static WEP keys.

Authentication Type - Open, Shared, WPA, or WPA-PSK

Procedure

1. Activate the WLAN device using either the Wireless On/Off Switch or the Intel PROSet software.
2. Click the [Start] button first and then [Control Panel].
3. If the Control Panel is in Category view, switch to Classic view by clicking "Switch to Classic View" which can be found in the left frame of the Control Panel window.
4. Double-click the Network Connections icon. A list of previously configured networks will be displayed.
5. Right-click [Wireless Network Connection] in the list, and then click [Properties] in the menu displayed.
6. Click the [Wireless Networks] tab.
7. Click [Refresh], then choose the correct SSID from the [Available Networks] window. Click [Configure] and proceed to step 8. Please note that only wireless networks that broadcast their SSID will be displayed. If the SSID of the wireless network is not visible, you must manually add it. This can be accomplished by clicking [Add]
8. From within the Association tab configure the appropriate WLAN parameters. Please have ready the following parameters:
   - Network name (SSID) - ASCII string of up to 33 characters used by the WLAN to logically separate wireless networks.
   - Authentication Type - Options include Open, Shared, WPA, or WPA-PSK
   - Network Key - If Authentication Type is Open or Shared, choices are None or WEP. If Authentication Type is WPA or WPA-PSK, choices are WEP or TKIP.

   Ad Hoc Networks: All computers in an Ad Hoc network must be assigned with the same SSID and the checkbox for the field [This is a computer to computer (ad hoc) network, wireless access points are not used.] must be checked.

   Access Point (Infrastructure) Networks: The SSID must be identical to the SSID of the access point(s) and the checkbox for the following field must be unchecked [This is a computer to computer (ad

hoc) network wireless access points are not used.] Refer to the access point manual, or contact your network administrator

9. Configure Wireless Network Key parameters (Network Authentication and Encryption).

   a. Choose the Network Authentication method appropriate for your wireless LAN. Options include Open, Shared, WPA, and WPA-PSK.

      Ad Hoc Networks: Network Authentication settings must be identical for all computers in the Ad Hoc network.

      Access Point (Infrastructure Networks): Network Authentication setting must be configured to match the setting of the Access Point(s). Please contact your network administrator for this information.

   b. Choose the Encryption method appropriate for your wireless LAN. Options for Open or Shared Authentication are None or WEP. Options for WPA or WPA-PSK are WEP or TKIP.

   c. If using static WEP keys, clear the check mark from the [The key is provided for me automatically] check box. If using an authentication method that uses dynamic WEP (e.g., WPA, WPA-PSK, 802.1x/EAP), the check box should remain checked. Please contact your network administrator for the correct settings.

   d. Static WEP keys (if applicable) are entered in the [Network Key] box. Configuration of the [Network Key] is not required if the [The key is provided for me automatically] check box is checked.

      - Static WEP keys entered in ASCII code format will be either five characters (40-bit) or thirteen characters (104-bit) in length. Valid characters are 0 - 9, A - Z.
      - Static WEP keys entered in hexadecimal code format will be either ten characters (40-bit) or twenty-six characters (104-bit) in length. Valid characters are 0 - 9, A - F.

      Ad Hoc Networks: Assign the same net-work key to all the personal computers to be connected.

      Access Point (Infrastructure) Networks: Assign the identical network key that is programmed into the access point. Please contact your network administrator for this information.

   e. If using static WEP keys, confirm the Network key by re-entering the same data in the [Confirm network key:] field.

   f. The Key index used must be identical to the transmit key used in the Access Point or other wireless device. This is only applicable when static WEP keys are used. Please contact your network administrator for this information.

10. **Access Point (Infrastructure) Networks Only**: If the wireless network you are establishing connectivity to implements an access control security mechanism, configuration of 802.1x parameters may be necessary. Please contact your network administrator for these settings. Configuration of these parameters is not applicable to home users.

11. Click [OK] to close the [Wireless Network] window which will cause the WLAN device to re-establish wireless network connectivity using the recently configured parameters.

CONFIGURATION USING INTEL PROSET SOFTWARE

This section explains the procedure to properly configure the WLAN device using the Intel PROSet Software. Pre-defined parameters will be required for this procedure. Please consult with your network administrator for these parameters:

Network Name - Also known as the SSID

Network Key (WEP) - Required if using static WEP keys.

Authentication Type - Open, Shared, WPA, or WPA-PSK

Procedure

1. Activate the WLAN device using either the Wireless On/Off Switch or the Intel PROSet software.
2. Click the [Start] button first and then [Control Panel].
3. If the Control Panel is in Category view, switch to Classic view by clicking "Switch to Classic View" which can be found in the left frame of the Control Panel window.
4. Double-click the icon [Intel PROSet] to execute the Intel PROSet Software.
5. From the General page, click the Networks tab.
6. Click the [Add] button. The General Settings dialog displays.
7. From the General page, click the Networks tab.

8. Click the [Add] button. The General Settings dialog displays.
9. Enter a profile name in the Profile Name field.
10. Enter the network SSID, in the Network Name (SSID) field.
11. Click Infrastructure or Ad Hoc for the operating mode.
12. The Mandatory AP option is only used if Infrastructure mode is selected. Use this option to connect to a specific access point. Click the Mandatory AP button, enter the MAC address for the access point. Click OK to save the setting and return to the General Settings page.
13. If you are using Cisco CCX, click the Enable Cisco Client eXtentions option to enable Cisco CKIP data encryption on the Security Settings page. If you have checked the Cisco's "Mixed-Cell" box in the Advanced Setting, this option must also be checked.
14. Click Next.
15. Click the Security tab
16. Select Open, Shared, WPA, or WPA-PSK in the Network Authentication options.
17. Select either None, WEP, CKIP (if Enable Cisco Client eXtentions is enabled on the General Settings page), or TKIP for the data encryption.
18. If WEP is selected, select either 64 or 128-bit for the Encryption Level.
19. Select the key index 1, 2, 3 or 4.
20. Enter the WEP key if required. If your network does not employ a 802.1x/EAP security mechanism, please skip to step 24.
21. Click the 802.1x Enabled checkbox to enable the 802.1x security option. Please contact your network administrator if configuration of this setting is required.
22. Select the appropriate 802.1x/EAP Type. Please contact your network administrator if configuration of this setting is required.
23. After selecting your authentication type, click the Configure button to open the Settings dialog. Enter the user name and password of the user you have created on the authentication server. The user name and password do not have to be the same as name and password of your current Windows user login. The "Server Identity" can be use the default setting. The "Client Certificate" should be the one obtained from your RADIUS server or other certification server.
24. Click Close to save the settings.
25. From the General settings page, click the new profile name shown in the Profile List. Use the up and down arrows to position the priority of the new profile in the priority list.
26. Click the Advanced button to set the network connection preferences.
27. Click the Connect button to connect to the network.
28. Click OK to close the Intel(R) PROSet for Wireless utility

CONNECTION TO THE NETWORK

This section explains connection to the network.

If there is an administrator of the network, contact the network administrator for data settings.

Setting the network

Perform the "Setting TCP/IP" and "Confirming the computer and work group names" operations required for network connection.

Setting TCP/IP

To change the setting of the IP address, you need to be logged in from Windows as an administrator.

1. Click the [Start] button first and then [Control Panel].
2. If the Control Panel is in Category view, switch to Classic view by clicking "Switch to Classic View" under Control Panel the left frame. (If you are already in Classic view, "Switch to Category View" will be displayed.)
3. Double-click [Network Connections]. A list of currently installed networks will be displayed.
4. Right-click [Wireless Network Connection] in the list, and then click [Properties] in the menu displayed. The [Wireless Network Connection Properties] window will be displayed.
5. Click the [General] tab if it is not already selected.
6. Click [Internet Protocol (TCP/IP] and then click [Properties]. The [Internet Protocol (TCP/IP) Properties] window will be displayed.
7. Set the IP address as follows:
   - **For ad hoc connection**: Select [Use the following IP address:] and then enter data for [IP address] and [Subnet mask]. See page 64 for IP address setting.
   - **For access point (infrastructure) connection:** If your network uses DHCP, select [Obtain an IP address automatically] and [Obtain DNS server address automatically]. If your network uses static IP addresses, consult with your network administrator for the correct IP address settings.
8. Click the [OK] button. Processing will return to the [Wireless Network Connection Properties] window.
9. Click the [OK] button.
10. Close the [Network Connection] window.

Following this operation, confirm the names of the computer and the workgroup as follows.

Confirming the computer and work group names

To modify the computer name and/or the work group name, you need to be logged in from Windows as an administrator.

1. Click the [Start] button, then [Control Panel].
2. If the Control Panel is in Category view, switch to Classic view by clicking "Switch to Classic View" under Control Panel the left frame. (If you are already in Classic view, "Switch to Category View" will be displayed.)
3. Double-click the [System] icon. The [System Properties] window will be displayed.
4. Click the [Computer Name] tab.
5. Confirm the settings of [Full computer name:] and [Workgroup:].
   a. The setting of [Full computer name:] denotes the name for identifying the computer. Any name can be assigned for each personal computer.

   To change the name, click [Change] and then proceed in accordance with the instruction messages displayed on the screen.

   Enter the desired name in less than 15 ASCII character code format. Identifiability can be enhanced by entering the model number, the user name, and other factors.

   b. [Workgroup name] is the group name of the network. Enter the desired name in less than 15 ASCII character code format.

   For ad hoc connection: Assign the same network name to all personal computers existing on the network.

   For access point (infrastructure) connection: Assign the name of the work group to be accessed.
6. Click the [OK] button. If a message is displayed that requests you to restart the personal computer, click [Yes] to restart the computer.

Setting the sharing function

Set the sharing function to make file and/or printer sharing with other network-connected personal computers valid.

This operation is not required unless the sharing function is to be used.

The folder and printer for which the sharing function has been set will be usable from any personal computer present on the network.

To share a file and/or the connected printer, you need to be logged in as an administrator.

Setting the Microsoft network-sharing service

1. Click the [Start] button first and then [Control Panel].
2. If the Control Panel is in Category view, switch to Classic view by clicking "Switch to Classic View" under Control Panel the left frame. (If you are already in Classic view, "Switch to Category View" will be displayed.)
3. Double-click [Network Connections]. A list of currently installed networks will be displayed.
4. Right-click [Wireless Network Connection] in the list, and then click [Properties] in the menu displayed. The [Wireless Network Connection Properties] window will be displayed.
5. **If [File and Printer Sharing for Microsoft Networks] is displayed, proceed to step 6.** If [File and Printer Sharing for Microsoft Networks] is not displayed, skip to step 7.
6. Make sure that the [File and Printer Sharing for Microsoft Networks] check box is checked, and then click the [OK] button. Skip to "Setting file-sharing function".
7. Click [Install]. The [Select Network Component Type] window will be displayed.
8. Click [Service], then click the [Add] button. The [Select Network Service] window will be displayed.
9. Click [File and Printer Sharing for Microsoft Networks] and then click the [OK] button. Processing will return to the [Wireless Network Connection Properties] window, and [File and Printer Sharing for Microsoft Networks] will be added to the list.
10. Click the [Close] button.

Setting the file-sharing function

The procedure for setting the file-sharing function follows, with the "work" folder in drive C: as an example.

1. Click the [Start] button first and then [My Computer].
2. Double-click [Local disk (C:)].
3. Right-click the "work" folder (or whichever folder you want to share), and then click [Sharing and Security...] in the menu displayed. The [*Folder Name* Properties] window will be displayed.

Setting the file-sharing function for the file which has been used to execute Network Setup Wizard is suggested on the screen. For the wireless LAN, however, since security is guaranteed by entry of the network name (SSID) and the network key, the steps to be taken to set the file-sharing function easily without using Network Setup Wizard are given below.

4. Click [Sharing] if it isn't already selected.
5. Click the link stating "If you understand the security risks, but want to share files without running the wizard, click here".
6. Click "Just enable file sharing" and click [OK].
7. Check the [Share this folder on the network] check box.

To specify the corresponding folder as a read-only folder, select the [Read only] checkbox under the General tab.

8. Click the [OK] button. The folder will be set as a sharable folder, and the display of the icon for the "work." folder will change.

Setting the printer-sharing function

1. Click the [Start] button first and then [Printers and FAX]. A list of connected printers will be displayed.
2. Right-click the printer for which the sharing function is to be set, and then click [Sharing] in the menu displayed. The property window corresponding to the selected printer will be displayed.

Setting the printer-sharing function when Network Setup Wizard has been executed is suggested on the screen. For the wireless LAN, however, since security is guaranteed by entry of the network name (SSID) and the network key, the steps to be taken to set the printer-sharing function without using Network Setup Wizard are laid down below.

3. Click the [Sharing] tab.
4. Click [Share this printer].
5. Enter the sharing printer name in [Share name].
6. Click the [OK] button.

Confirming connection

After you have finished the network setup operations, access the folder whose sharing has been set for other personal computers. Also, confirm the status of the radio waves in case of trouble such as a network connection failure.

In the case of access point (infrastructure) connection, enter the necessary data for the access point before confirming connection. Refer to the manual of the access point for the access point setup procedure.

Connecting your personal computer to another personal computer

1. Click [Start] first and then [My Computer]. The [My Computer] window will be displayed in the left frame.
2. Click [My Network Places] in the "Other Places" list. The window [My Network Places] will be displayed.
3. Click [View workgroup computers] under Network Tasks in the left frame.
4. Double-click the personal computer to which your personal computer is to be connected. The folder that was specified in "Setting the file-sharing function" on page 59 will be displayed.
5. Double-click the folder to be accessed.

Confirming the status of the radio

1. Right-click the Intel PRO Wireless icon in the lower right corner of the screen.
2. Click [Open Intel PROSet for Wireless]. The Intel PROSet for Wireless window opens.
3. Contained within the General tab and the Details section (accessed by pressing the [Details] button), you will find the current operating status of the radio. (When the radio is turned off or the computer is not yet connected, some of the conditions will not be displayed.)

    - **Network Name (SSID)**
      Displays the Network Name (SSID) currently used by the radio.
    - **Profile Name**
      The current configuration profile is displayed.
    - **Mode**
      Displays the current operating mode. [Infrastructure (AP)] or [Ad Hoc] will be displayed.
    - **Security**
      Displays the current security status of the profile being used:
      None: No encryption used.
      WEP: WEP encryption algorithm used.
      CKIP: WEP encryption algorithm used.
      TKIP: WEP encryption algorithm used.
    - **Speed**
      Displays the highest data rate of the associated access point in mega-bits-per-second (Mbps) until data transfer occurs.
      802.11g: 1, 2, 5.5, 6, 9, 11, 12, 18, 24, 36, 48, or 54.
      802.11b: 1, 2, 5.5, or 11.
    - **Band (Frequency)**
      Displays the current band and frequency being used. Displays Out of Range if no band and frequency is displayed. Displays:
      802.11g (2.4 GHz) or 802.11b (2.4 GHz)
    - **Channel**
      Displays the current transmit and receive channel being used.
    - **802.1x Protocol**
      Displays Enabled if the profile uses 802.1x authentication. Default is Disabled.

Troubleshooting

Causes and countermeasures for troubles you may encounter while using your wireless LAN are described in the following table.

Problem	Possible Cause	Possible Solution
Unavailable network connection	**Incorrect network name (SSID) or network key**	**Ad hoc connection:** verify that the network names (SSID's) and network keys (WEP) of all computers to be connected have been configured correctly. SSID's and WEP key values must be identical on each machine. **Access Point (Infrastructure) connection:** set the network name (SSID) and network key to the same values as those of the access point. Set the Network Authentication value identically to that of the Access Point. Please consult your network administrator for this value, if necessary. For the method of setting network authentication, refer to the following page:·"Assigning parameters" on page 56·
	Weak received signal strength and/or link quality	Ad hoc connection: Retry connection after shortening the distance to the destination computer or removing any obstacles for better sight. Access Point (Infrastructure) connection: Retry connection after shortening the distance to the access point or removing any obstacles for better sight. To check the wave condition, refer to the following page:· "Confirming the status of the radio waves" on page 60.
	The WLAN device has been deactivated or diabled	Check if the wireless switch is turned ON. Also verify "Disable Radio" is not checked in "Network setting" window. Refer to "Starting Transmission" on page 54.
	The computer to be connected is turned off	Check if the computer to be connected is turned ON.
	RF interference from Access Points or other wireless networks	The use of identical or overlapping RF channels can cause interference with the operation of the WLAN device. Change the channel of your Access Point to a channel that does not overlap with the interfering device.
	Wireless network authentication has failed	Re-check your Network Authentication, Encryption, and Security settings. Incorrectly configured security settings such as an incorrectly typed WEP key, a mis-configured LEAP username, or an incorrectly chosen authentication method will cause the LAN device to associate but not authenticate to the wireless network.
	Incorrectly configured network settings	Recheck the configuration of your network settings. For the method of checking, refer to the following page:·"Connection to the Network" on page 58.
	Incorrect IP address configuration	This only applies to networks using static IP addresses. Please contact your network administrator for the correct settings.

Wireless LAN Glossary

Ad Hoc Mode

Ad Hoc Mode refers to a wireless network architecture where wireless network connectivity between multiple computers is established without a central wireless network device, typically known as Access Points. Connectivity is accomplished using only client devices in a peer-to-peer fashion. For details, refer to "Ad hoc connection" on page 52.

Channel

Range of narrow-band frequencies used by the WLAN device to transmit data. IEEE802.11b/g - 11 channels, 22 MHz wide channels.

DHCP (Dynamic Host Configuration Protocol)

A protocol that provides a means to dynamically allocate IP addresses to computers on a local area network.

DNS (Domain Name System)

A data query service that provides a mechanism with which to translate host names into Internet addresses.

IEEE802.11a

Wireless LAN standard that supports a maximum data rate of 54 Mbps. 802.11a devices operate in the 5 GHz lower and middle UNII bands.

IEEE802.11b

Wireless LAN standard that supports a maximum data rate of 11 Mbps. 802.11b devices operate in the 2.4 GHz ISM band.

Access point

Wireless network device used to bridge wireless and wired network traffic.

IP address

The logical 32-bit host address defined by the Internet Protocol that uniquely identifies a computer on a network. The IP address is usually expressed in dotted decimal notation.

LAN (Local Area Network)

A LAN or Local Area Network is a computer network (or data communications network) which is confined to a limited geographical area.

MAC address (Media Access Control Address)

A MAC address (also called an Ethernet address or IEEE MAC address) is the 48-bit address (typically written as twelve hexadecimal digits, 0 through 9 and A through F, or as six hexadecimal numbers separated by periods or colons, e.g., 0080002012ef, 0:80:0:2:20:ef) which uniquely identifies a computer that has an Ethernet interface.

MTU (Maximum Transmission Unit)

The maximum size of data which can be transmitted at one time in networks including the Internet. In an environment whose maximum size of data is too large to correctly receive data, normal communications can be restored by setting the size of MTU to a smaller value.

Network key

Data that is used for encrypting data in data communication. The personal computer uses the same network key both for data encryption and decryption, therefore, it is necessary to set the same network key as the other side of communication.

Network name (SSID: Security Set Identifier)

When a wireless LAN network is configured, grouping is performed to avoid interference or data theft. This grouping is performed with "Network name (SSID)". In order to improve security, the network key is set allowing no communication unless "Network name (SSID)" coincides with the network key.

Open system authentication

Null authentication method specified in the 802.11 standard that performs no authentication checks on a wireless client before allowing it to associate.

PPPoE (Point to Point Protocol over Ethernet)

A method of allowing the authentication protocol adopted in telephone line connection (PPP) to be used over an Ethernet.

Protocol

A procedure or rule of delivering data among computers. Ordered data communication is allowed by making all conditions required for communication including the method of data transmission/reception and actions upon communication errors into procedures.

Shared key authentication

802.11 network authentication method in which the AP sends the client device a challenge text packet that the client must then encrypt with the correct WEP key and return to the AP. If the client has the wrong key or no

key, authentication will fail and the client will not be allowed to associate with the AP. Shared key authentication is not considered secure, because a hacker who detects both the clear-text challenge and the same challenge encrypted with a WEP key can decipher the WEP key.

SSID (Service Set Identifier)

Service Set Identifier, a 32-character unique identifier attached to the header of packets sent over a WLAN that acts as a password when a mobile device tries to connect to the BSS. The SSID differentiates one WLAN from another, so all access points and all devices attempting to connect to a specific WLAN must use the same SSID. A device will not be permitted to join the BSS unless it can provide the unique SSID. Because the SSID is broadcast in plain text, it does not supply any security to the network.

Subnet mask

TCP-IP network is controlled by being divided into multiple smaller networks (subnets). IP address consists of the subnet address and the address of each computer. Subnet mask defines how many bits of IP address comprise the subnet address. The same value shall be set among computers communicating with each other.

TCP/IP (Transmission Control Protocol/Internet Protocol)

A standard protocol of the Internet.

Wi-Fi

Wi-Fi, or Wireless Fidelity, is a set of standards for wireless local area networks (WLAN) based on the IEEE 802.11 specifications. Certified products can use the official Wi-Fi logo, which indicates that the product is interoperable with any other product also showing that logo.

IP address information

IP addressing is much more complicated than can be briefly explained in this document. You are advised to consult with your network administrator for additional information.

If IP address is unknown, set IP address as follows:

If you have an access point (DHCP server) on the network, set the IP address as follows:

[Obtain an IP address automatically]

A DHCP server is a server that automatically assigns IP addresses to computers or other devices in the network. There is no DHCP server for the AdHoc network.

If the IP address is already assigned to the computer in the network, ask the network administrator to check the IP address to be set for the computer.

If no access point is found in the network:

An IP address is expressed with four values in the range between 1 and 255.

Set the each computer as follows: The value in parentheses is a subnet mask.

<Example>

Computer A: 192.168.100.2 (255.255.255.0)

Computer B: 192.168.100.3 (255.255.255.0)

Computer C: 192.168.100.4 (255.255.255.0)

:

:

Computer X: 192.168.100.254 (255.255.255.0)

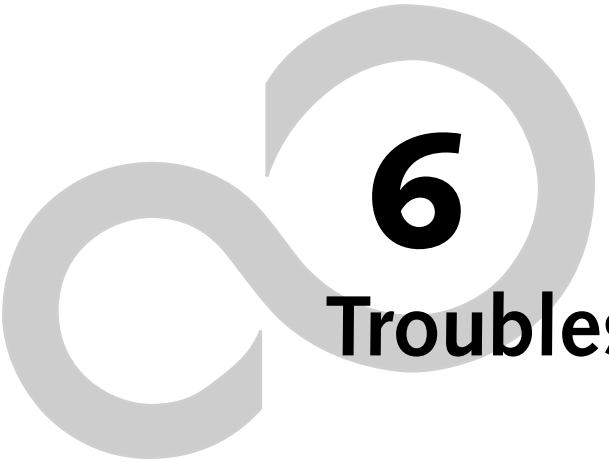
Specifications

Item	Specification
Type of network	Conforms to IEEE 802.11b/802.11g (Wi-Fi based)*
Transfer rate	(Automatic switching) 54 Mbps maximum data rate
Active frequency	2400~2473 MHz
Number of channels	11 channels, 3 non-overlapping channels
Security	Network name Network key (64 bits/128 bits)** *Authentication Methods:* Open, Shared, WPA, WPA-PSK, LEAP, EAP-TLS, PEAP. *Encryption Types:* Static WEP (64-bit or 128-bit), Dynamic WEP (TKIP), CKIP, CKIP+MIC, AES
Maximum recommended number of computers to be connected over wireless LAN (during ad hoc connection)	10 units or less ***

* "Wi-Fi based" indicates that the interconnectivity test of the organization which guarantees the interconnectivity of wireless LAN (Wi-Fi Alliance) has been passed.

** Encryption with network key (WEP) is performed using the above number of bits, however, users can set 40 bits/104 bits after subtracting the fixed length of 24 bits.

*** Depending on practical environments, the allowable number of computers to be connected may be decreased.



6 Troubleshooting

Troubleshooting

Your LifeBook notebook 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 isolate and resolve some of these straightforward problems and identify failures that require service.

IDENTIFYING THE PROBLEM

If you encounter a problem, go through the following procedure before pursuing complex troubleshooting:

1. Turn off your LifeBook notebook.
2. Make sure the AC adapter is plugged into your LifeBook notebook and to an active AC power source.
3. Make sure that any card installed in the PC 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 LifeBook notebook. 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 Troubleshooting Table that follows for more detailed troubleshooting information.

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

8. If you have tried the solutions suggested in the Troubleshooting Table without success, contact your support representative:

   Toll free: 1-800-8Fujitsu (1-800-838-5487)
   Fax: 408-764-2724
   E-mail: 8fujitsu@us.fujitsu.com/computers
   Web site: http://us.fujitsu.com/computers.

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 device connected, if any

See the Configuration Label on the bottom of your LifeBook notebook for configuration and serial numbers. *(See Figure 2-7 on page 13 for location)*

SPECIFIC PROBLEMS

Using the Troubleshooting Table

When you have problems with your LifeBook notebook, try to find the symptoms under the Problem column of the troubleshooting table for the feature giving you difficulty. You will find a description of common causes for that symptom under the column Possible Cause and what, if anything, you can do to correct the condition under Possible Solutions. All possible causes or solutions may not apply to your LifeBook notebook.

TROUBLESHOOTING TABLE

Problem	Possible Cause	Possible Solutions
Audio Problems		
There is no sound coming from the built-in speakers.	The software volume control is set too low.	Adjust the sound volume control settings in your software, operating system and applications.
	Headphones are plugged into your LifeBook notebook.	Plugging in headphones disables the built-in speakers, remove the headphones.
	BIOS audio settings are incorrect.	Set the BIOS setup utility to the default values within the Multimedia Device Configuration menu. *(See BIOS Setup Utility on page 29 for more information)*
	Software driver is not configured correctly.	Refer to your application and operating system documentation for help.
Optical Drive Problems		
LifeBook notebook fails to recognize media discs.	The disc is not pushed down onto raised center circle of the drive.	Open media player tray and re-install the media disc properly.
	Media player tray is not latched shut.	Push on the front of the media player tray until it latches.
	Setup utility is set to something other than media player or Auto for Secondary Master Controller.	Revise BIOS settings for the Secondary Master Controller. *(See BIOS Setup Utility on page 29 for more information)*
	Wrong drive designator was used for media player in the application.	Verify the drive designator used by the application is the same as the one used by the operating system. When the operating system is booted from a media player, drive designators are automatically adjusted.
	Windows Media Player auto insert notification function is disabled.	Start the media player from the desktop or application software or re-enable the Windows media player auto insert notification function.
	Media disc is dirty or defective.	Wipe the disc with a non-abrasive CD cleaning cloth and reinsert. It if still will not work try another media disc in the drive.
The Media Player Access indicator on the Status Indicator Panel blinks at regular intervals when no disc is in the tray or the media drive is not installed.	The Windows media player auto insert notification function is active and is checking to see if a media disc is ready to run.	This is normal.

Problem	Possible Cause	Possible Solutions
The media player will not play international DVD titles	The region code for the DVD does not match that of the media player.	All Fujitsu notebook DVD players are set to play DVD titles with region code number 1, which is specified for the North American market. The region number is a regional restriction code defined by the DVD Forum acting on the requirements of Hollywood. Different region codes are recorded on video DVD titles for publication in different areas of the world. If the regional code of the DVD player does not match the regional codes on the titles, then playback is impossible. NOTE: You can change the region code on the DVD player using the Properties menu of the DVD software. Note, however, that **you can only change the region code up to four times.** After the fourth change, the last region code entered becomes permanent, and cannot be changed.
The LifeBook notebook fails to Auto-Play a DVD movie.	The media player software has not been installed.	Locate and install the DVD-ROM Applications CD.
Floppy Disk Drive Problems		
You cannot access your floppy disk.	You tried to write to a write protected floppy disk.	Eject the floppy disk and set it to write enable. *(See Floppy Disk Drive on page 37 for more information)*
	Floppy disk is not loaded correctly.	Eject floppy disk, check orientation and re-insert. *(See Floppy Disk Drive on page 37 for more information)*
	BIOS setup utility states Floppy `Disk Controller: Disabled.`	Revise the setup utility Main menu settings to enable Diskette Controller. *(See BIOS Setup Utility on page 29 for more information)*
	Security is set to protect access to floppy disk data.	Verify your password and security settings.
Hard Drive Problems		
You cannot access your hard drive.	The setup utility is incorrectly set for your internal (Primary Master) or optional second hard drive (Primary Slave).	Revise BIOS settings to set both Primary Master and Primary Slave correctly. *(See BIOS Setup Utility on page 29 for more information)*
	The wrong drive designator was used by an application when a bootable CD-ROM was used to start the LifeBook notebook.	Verify drive designator used by application is in use by the operating system. When the operating system is booted from a CD, drive designations are automatically adjusted.
	Security is set so your operating system cannot be started without a password.	Verify your password and security settings.

Problem	Possible Cause	Possible Solutions
Keyboard or Mouse Problems		
The built-in keyboard does not seem to work.	The LifeBook notebook has gone into Suspend mode.	Push the **Power/Suspend/Resume** button.
	Your application has locked out your keyboard.	Try to use your integrated pointing device to restart your system. If this fails, turn your LifeBook notebook off press the Power/Suspend/Resume button for 10 seconds or more, and then turn it back on.
You have installed an external keyboard or mouse, and it does not seem to work.	Your external device is not properly installed.	Re-install your device. *(See Device Ports on page 46 for more information)*
	Your operating system software is not set up with the correct software driver for that device.	Check your device and operating system documentation and activate the proper driver.
You have connected an external keyboard or a mouse and it seems to be locking up the system.	Your operating system software is not set up with the correct software driver for that device.	Check your device and operating system documentation and activate the proper driver.
	Your system has crashed.	Try to restart your LifeBook notebook. If this fails, turn your LifeBook notebook off press the Power/Suspend/Resume button for 10 seconds or more, and then turn it back on.
Memory Problems		
Your Info menu of the BIOS setup utility information, does not show the correct amount of installed memory.	Your memory upgrade module is not properly installed.	Remove and re-install your memory upgrade module. *(See Memory Upgrade Module on page 43 for more information)*
	You have a memory failure.	Check for Power On Self Test (POST) messages. *(See Power On Self Test Messages on page 78 for more information)*
Modem Problems		
Messages about modem operation.	Messages about modem operation are generated by whichever modem application is in use.	See your application software documentation for additional information.
USB, Parallel, or IR Device Problems		
You have installed a USB, parallel, or IR device. Your LifeBook notebook does not recognize the device, or the device does not seem to work properly.	The device is not properly installed.	Remove and re-install the device. *(See Device Ports on page 46 for more information)*
	The device may have been installed while an application was running, so your LifeBook is not aware of its installation.	Close the application and restart your LifeBook notebook.
	Your software may not have the correct software driver active.	See your software documentation and activate the correct driver.

Problem	Possible Cause	Possible Solutions
You have installed a USB, parallel, or IR device. Your LifeBook notebook does not recognize the device, or the device does not seem to work properly.	You may have the wrong I/O address selected for your device.	See your device documentation and software documentation to determine the required I/O address. Change the settings in the BIOS setup utility. *(See BIOS Setup Utility on page 29 for more information)*
	Your device and another device are assigned the same I/O address.	Check all I/O addresses located within the BIOS setup utility and any other installed hardware or software to make sure there are no duplications.
	Parallel port is set to output only.	Check parallel port setting in the BIOS and set to bi-directional or ECP.
PC Card Problems		
A card inserted in the PC Card slot does not work or is locking up the system.	The card is not properly installed.	Remove and re-install the card. *(See PC Cards on page 42 for more information)*
	The card may have been installed while an application was running, so your LifeBook notebook is not aware of its installation.	Close the application and restart your LifeBook notebook.
	Your software may not have the correct software driver active.	See your software documentation and activate the correct driver.
	You may have the wrong I/O address selected for your PC Card device.	See your PC Card documentation to determine the required I/O address. Change the settings in the BIOS. *(See BIOS Setup Utility on page 29 for more information)*
	Your PC Card device and another device are assigned the same I/O address.	Check all I/O addresses located within the BIOS setup utility and any other installed hardware or software to make sure there are no duplications.
	The card may have been "removed" using the Unplug or Eject Hardware utility.	If the Unplug or Eject Hardware utility has been used to "remove" the PC card, the system will not recognize the card, even if it is still present in the slot. Physically remove the card and reinstall it in the slot. If that is not successful, reboot the system.
Power Failures		
You turn on your LifeBook notebook and nothing seems to happen.	The installed primary battery is completely discharged, there is no optional second battery installed or there is no power adapter (AC or Auto/Airline) installed.	Check the Status Indicator Panel to determine the presence and condition of the batteries. *(See Status Indicator Panel on page 14 for more information)* Install a charged battery or a power adapter.
	The primary battery is installed but is faulty.	Use the Status Indicator panel to verify the presence and condition of the batteries. *(See Status Indicator Panel on page 14 for more information)* If a battery is indicating a short, remove that battery and operate from another power source or replace that battery.
	The battery or batteries are low.	Check the Status Indicator Panel to determine the presence and condition of the batteries. *(See Status Indicator Panel on page 14 for more information)* Use a power adapter to operate until a battery is charged or install a charged battery.

Problem	Possible Cause	Possible Solutions
You turn on your LifeBook notebook and nothing seems to happen. (continued)	The power adapter (AC or auto/airline) is not plugged in properly.	Verify that your adapter is connected correctly. *(See Power Sources on page 27 for more information)*
	The power adapter (AC or auto/airline) has no power from the AC outlet, airplane seat jack, or the car's cigarette lighter.	Move the AC cord to a different outlet, check for a line switch or tripped circuit breaker for the AC outlet. If you are using an auto/airline adapter in a car make sure the ignition switch is in the On or Accessories position.
	The power adapter (AC or auto/airline) is faulty.	Try a different power adapter or install a charged optional second battery.
Your LifeBook notebook turns off all by itself.	The power management parameters are set for auto timeouts which are too short for your operating needs.	Press any button on the keyboard, or move the mouse to restore operation. If that fails, push the Power/Suspend/Resume button. Check your power management settings, or close your applications and go to the Power Options menu of the setup utility to adjust the timeout values to better suit your operation needs.
	You are operating on battery power only and have ignored a low battery alarm until the batteries are all at the dead battery state and your machine has gone into Dead Battery Suspend mode.	Install a power adapter or a charged battery, then push the Power/Suspend/Resume button. *(See Power Sources on page 27 for more information)*
	You have a battery failure.	Verify the condition of the batteries using the Status Indicator Panel, and replace or remove any batteries that are shorted. *(See Status Indicator Panel on page 14 for more information)*
	Your power adapter has failed or lost its power source.	Make sure the adapter is plugged in and the outlet has power.
Your LifeBook notebook will not work on battery alone.	The installed battery is dead.	Replace the battery with a charged one or install a power adapter.
	No battery is installed.	Install a charged battery.
	The battery is improperly installed.	Verify that the battery is properly connected by re-installing it.
	Your installed battery is faulty.	Verify the condition of the battery using the Status Indicator panel and replace or remove any battery that is shorted. *(See Status Indicator Panel on page 14 for more information)*
The battery seems to discharge too quickly.	You are running an application that uses a great deal of power due to frequent hard drive or media player drive access, use of a modem card or a LAN PC card.	Use both the primary battery and/or use a power adapter for this application when at all possible.
	The power savings features may be disabled.	Check the power management and/or setup utility settings in the Power Options menu and adjust according to your operating needs.
	The brightness is turned all the way up.	Turn down the brightness adjustment. The higher the brightness the more power your display uses.

Problem	Possible Cause	Possible Solutions
The battery seems to discharge too quickly. (continued)	The battery is very old.	Replace the battery.
	The battery has been exposed to high temperatures.	Replace the battery.
	The battery is too hot or too cold.	Restore the LifeBook to normal operating temperature. The Battery Charging icon on the indicator panel will flash when the battery is outside operating range.
Shutdown and Startup Problems		
The Power/Suspend/ Resume button does not work.	The Power/Suspend/Resume button is disabled from the Advanced submenu of the Power menu of the setup utility.	Enable the button from the setup utility.
	You did not hold the button in long enough.	Hold the button longer. This may need to be a few seconds if your application is preventing the CPU from checking for button pushes.
	There may be a conflict with the application software.	Close all applications and try the button again.
The system powers up and displays power-on information, but fails to load the operating system.	The boot sequence settings of the setup utility are not compatible with your configuration.	Set the operating source by pressing the [ESC] key while the Fujitsu logo is on screen or use the [F2] key and enter the setup utility and adjust the source settings from the Boot menu. *(See BIOS Setup Utility on page 29 for more information)*
	You have a secured system requiring a password to load your operating system.	Make sure you have the right password. Enter the setup utility and verify the Security settings and modify them as accordingly. *(See BIOS Setup Utility on page 29 for more information)*
	Internal hard drive was not detected.	Use the BIOS setup utility or Primary Master submenu, located within the Main menu, to try to auto detect the internal hard drive.
An error message is displayed during the LifeBook notebook (boot) sequence.	Power On Self Test (POST) has detected a problem.	See Power On Self Test (POST) messages to determine the meaning of the problem. Not all messages are errors; some are status indicators. *(See Power On Self Test Messages on page 78 for more information)*
Your LifeBook notebook appears to change setup parameters when you start it.	BIOS setup changes were not saved when you made them and exited the BIOS setup utility returning it to previous settings.	Make sure you select **Save Changes And Exit** when exiting the BIOS setup utility.
	The BIOS CMOS hold-up battery has failed.	Contact your support representative for repairs. This is not a user serviceable part but has a normal life of 3 to 5 years.
Video Problems		
Display is blank when you turn on the system.	Something is pushing on the Closed Cover switch.	Clear the Closed Cover switch. *(See Figure 2-3 on page 8 for location)*

Problem	Possible Cause	Possible Solutions
Display is blank when you turn on the system. (continued)	The LifeBook notebook is set for an external monitor only.	Pressing [F10] while holding down the [Fn] key allows you to change the destination of your display video. Each time you press the combination of keys you will step to the next choice. The choices, in order, are: built-in display only, external monitor only, both built-in display and external monitor.
	The angle and brightness settings of the display are not adequate for the lighting conditions.	Move the display and the brightness control until you have adequate visibility.
	The power management timeouts may be set for very short intervals and you failed to notice the display come on and go off again.	Press any button on the keyboard, or move the mouse to restore operation. If that fails, push the Power/Suspend/Resume button. (The display may be shut off by Standy mode, Auto Suspend or Video Timeout)
When the ATI Driver CD is first installed, you receive a Microsoft message informing you that the ATI driver is not compatible with your operating system.	The warning does not apply to your LifeBook; the driver has been thoroughly tested and its installation will not jeopardize the performance of your system.	If this message appears on your screen, click the **Continue Anyway** or **Yes** buttons to proceed.
The LifeBook notebook turned on with a series of beeps and your built-in display is blank.	Power On Self Test (POST) has detected a failure which does not allow the display to operate.	Contact your support representative.
The display goes blank by itself after you have been using it.	The LifeBook notebook has gone into Video timeout, Standby mode, Suspend mode or Hibernation (Save-to-Disk) mode because you have not used it for a period of time.	Press any button on the keyboard, or move the mouse to restore operation. If that fails, push the Power/Suspend/Resume button. Check your power management settings, or close your applications and go to the Power Savings menu of the setup utility to adjust the timeout values to suit your operation needs. *(See BIOS Setup Utility on page 29 for more information)*
	Something is pushing on the Closed Cover switch.	Check the Closed Cover switch. *(See Figure 2-3 on page 8 for location)*
	The power management timeouts may be set for very short intervals and you failed to notice the display come on and go off again.	Press any button on the keyboard, or move the mouse to restore operation. If that fails, push the Power/Suspend/Resume button. (The display may be shut off by Standby Mode, Auto Suspend or Video Timeout)
The built-in display does not close.	A foreign object, such as a paper clip, is stuck between the display and the keyboard.	Remove all foreign objects from the keyboard.
The built-in display has bright or dark spots.	If the spots are very tiny and few in number, this is normal for a large LCD display.	This is normal; do nothing.
	If the spots are numerous or large enough to interfere with your operation needs.	Display is faulty; contact your support representative.

Problem	Possible Cause	Possible Solutions
The application display uses only a portion of your screen and is surrounded by a dark frame.	You are running an application that does not support 800 x 600/ 1024 x 768 pixel resolution display and display compression is enabled.	Display compression gives a clearer but smaller display for applications that do not support 800 x 600 /1024 x 768 pixel resolution. You can fill the screen but have less resolution by changing your display compression setting, (See the Video Features submenu, located within the Advanced menu of the BIOS. *(See BIOS Setup Utility on page 29 for more information)*
The Display is dark when on battery power.	The BatteryAid default is set on low brightness to conserve power.	Press [Fn] + [F7] to increase brightness or double-click on BatteryAid gauge and adjust Power Control under battery settings.
You have connected an external monitor and it does not display any information.	Your BIOS setup is not set to enable your external monitor.	Toggle the video destination by pressing [Fn] and [F10] together, or check your BIOS setup and enable your external monitor. (See Video Features submenu, located within the Advanced Menu of the BIOS. *(See BIOS Setup Utility on page 29 for more information)*
	Your external monitor is not properly installed.	Reinstall your device. *(See External Monitor Port on page 47 for more information)*
	Your operating system software is not set up with the correct software driver for that device.	Check your device and operating system documentation and activate the proper driver.
You have connected an external monitor and it does not come on.	Your external monitor is not compatible with your LifeBook notebook.	See your monitor documentation and the External Monitor Support portions of the Specifications section.
The Properties section of the Intel Graphics Technology window displays an incorrect amount of Video RAM present.	This is not a problem; it is a result of UMA technology.	The Intel graphics chipset uses Unified Memory Architecture (UMA) which allows the video chipset to share up to 128 MB of the system's main memory. The amount being used will vary with the system needs, and the amount of video RAM indicated will vary as well.
Miscellaneous Problems		
An error message is displayed on the screen during the operation of an application.	Application software often has its own set of error message displays.	See your application manual and help displays screens for more information. Not all messages are errors some may simply be status.

POWER ON SELF TEST MESSAGES

The following is an alphabetic list of error-and-status messages that BIOS and/or your operating system can generate and an explanation of each message. Error messages are marked with an *. The most common errors are marked with a #. If an error message is displayed, write it down and check your 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 PC Card installed.)

***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 Setup Utility, *(See BIOS Setup Utility on page 29 for more information)* and that the diskette drive is installed correctly. 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 memory upgrade module, verify that the module is properly installed. If it is properly installed, you may want to check your Windows Setup to be sure it is not using unavailable memory until you can contact your support representative.

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

***Failing Bits: nnnn The hex number nnnn**
This is a map of the bits at the memory address (in System, Extended, or Shadow memory) which failed the memory test. Each 1 (one) in the map indicates a failed bit. This is a serious fault that may 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)**
The fixed disk is not working or not configured properly. This may mean that the hard drive type identified in your setup utility does not agree with the type detected by the Power On Self Test. Run the setup utility to check for the hard drive 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 your 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 your setup utility does not agree with the type detected by the Power On Self Test. Run the setup utility to correct the inconsistency.

***Invalid NVRAM media 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 test failed. You may have to replace your 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 your 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 your 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 your 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 both the fixed disk, and drive A: are properly identified and that the boot sequence is set correctly. Unless you have changed your installation greatly, the operating system should be on drive C:. If the setup utility is correctly set, your hard drive may be corrupted and your 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
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.

#*Previous boot incomplete – Default configuration used
Previous Power On Self Test did not complete successfully. The Power On Self Test will load default values and offer to run Setup. If the previous 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/Suspend/Resume button 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 your 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 your setup utility every time you turn off your LifeBook 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 memory failed at offset nnnn of in the 64k block at which the error was detected. This means that there is a fault in your built-in memory. If you continue to operate, you risk corrupting your data. Contact your support representative for repairs.

nnnn System RAM Passed
Where nnnn is the amount of system memory 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.

EMERGENCY OPTICAL DRIVE TRAY RELEASE

If for some reason the eject button fails, you can open the optical drive 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.

MODEM RESULT CODES

The operating system and application software that is factory installed detects the modem characteristics and provides the necessary command strings to operate the modem. The internal modem operation is controlled by generic AT commands from the operating system and application software. The standard long form result codes may, in some cases, be displayed on your screen to keep you informed of the actions of your modem. The operating system and application software may suppress display of the result codes.

Examples of result codes are:

- OK
- NO CARRIER
- NO DIALTONE
- CONNECT 53000 (Connection complete at 53 Kbps.)
- ERROR
- FAX
- RING (This means an incoming call.)
- BUSY
- NO ANSWER

When using the internal modem with applications that are not factory installed refer to the application documentation.

RESTORING YOUR PRE-INSTALLED SOFTWARE

The Drivers and Applications Restore (DAR) CD contains:

- Sets of device drivers and Fujitsu utilities (in specific directories) that are unique to your LifeBook notebook configuration for use as documented below.
- A link to the Drive Image Special Edition (DISE) utility on your hard disk drive.
- Read-me files that provide additional use information for items on this CD-ROM.

- If the DAR CD is in the drive when you boot up the system, and the Boot Sequence is set in the BIOS to boot from the CD drive first (see "Creating a backup image when booting up" on page 80), a message will appear informing you that if you proceed, you will have a choice of: creating a new backup of drive C:, restoring a previous backup, or restoring the original factory image.

  Note that creating a new backup will overwrite any previous backups, and restoring a backup or factory image will overwrite all information on the hard drive, including saved files. If you wish to install drivers or applications **only** from the CD, remove the disk from the drive, reboot the system, and insert the CD after Windows has started.

If you have access to the internet, visit the Fujitsu Support web site at www.us.fujitsu.com/computers to check for the most current information, drivers and hints on how to perform recovery and system updates.

DRIVE IMAGE SPECIAL EDITION (DISE)

PowerQuest Drive Image Special Edition (DISE) provides a way to restore your computer if you experience a hard disk crash or other system failure. Fujitsu has used DISE to create an image of everything installed on the computer at the time you purchased it. The image is saved on a separate partition on the hard disk. You can use DISE to restore the factory image and return your computer to the state in which it was shipped.

Although it is not necessary, you can use DISE to store additional image files you create. For example, if you install several applications and save data files on your hard disk, you can create a new image that includes them and then save that image file on the hard disk. Then, in the event of a hard disk failure, you can restore the image that includes the applications and data files you use.

Using the DISE feature will reduce the amount of usable disk space on your hard disk drive.

Creating a Backup Image

You can create a system backup image of your C:\ drive at any time. The C:\ partition must be a FAT, FAT32, or NTFS partition, and it must be directly before the backup partition on your hard disk.

There are two ways to implement the DISE utility: when booting up the system, or from the desktop.

Creating a backup image when booting up

Before creating an image at boot-up, you must change the boot-up priority in the BIOS so that the system will go to the media drive first, rather than trying to boot-up from the hard drive or an external floppy disk drive.

To change the boot-up priority:

1. Start your system and press [F2] when the Fujitsu logo appears. You will enter the BIOS Setup Utility.
2. Using the arrow keys, go to the Boot menu.
3. Arrow down to the Boot Device Priority submenu and press [Enter].
4. Arrow down to the CD-ROM drive in the list, and press the space bar (or the + key) to move the CD-ROM drive to the top of the list. (The system attempts to boot from the devices in the order in which they are listed.)
5. Press [F10], then click on [Yes] to exit the BIOS Setup Utility and return to the boot process.

After you have changed the boot priority, you can create a backup image when you are booting up:

1. Install the DAR CD in the drive prior to booting up. When bootup begins, a message appears informing you that if you proceed, you will be able to:
   - Create a new backup of drive C
   - Restore a previous backup, or,
   - Restore the original factory image.

   Note that creating a new backup will overwrite any previous backups, and restoring a backup or factory image will overwrite all information on the hard drive, including saved files.
2. After you click [**Y**]**es**, you will be presented with two options: [**Create New Backup**] and [**Restore Backup**].
   After you click [**Create New Backup**], follow the on-screen instructions. By selecting [**Create New Backup**], a new image will be written to your backup partition. This will overwrite any previously created image.

Creating a backup image from the desktop

To create a backup image from the desktop, select Drive Image SE from the Program list. You will initially be prompted to create a backup diskette. It is not necessary to create the backup diskette, since the DAR CD performs the same function.

1. At the Drive Image Special Edition main screen, click **Options**> **Create New Backup.** DISE displays a warning that it must go to DOS to create the image.
2. Click **Yes.** DISE creates an image file in the backup partition. If you created a backup image previously, the new image overwrites the old one.

Enlarging the Backup Partition

If there is not enough unused space in the backup partition on your hard disk, DISE will resize the partition. DISE will display the minimum, maximum, and recommended sizes for the backup partition. You choose the size you want.

DISE takes the space from the FAT, FAT32, or NTFS partition that you are backing up. If there is not enough unused space in that partition to take, you will not be able to resize the backup partition and create an image file. You can delete files from the FAT, FAT32, or NTFS partition to create more unused space on the hard disk.

Restoring a Backup Image

You can restore either a factory image or backup image. Be aware that restoring a backup image will replace the contents of the C:\ partition with the image you restore.

1. Disable virus protection software. If virus protection software is enabled, DISE will lock up.
2. From the DISE main window, click **Options** > **Restore Backup** to restore an image you created, or click **Options** > **Restore Factory Backup** to restore the factory image.

   DISE shuts down to DOS and restores the image file.

Re-Installing Individual Drivers and Applications

The Drivers and Application CD can be used to selectively re-install drivers and/or applications that may have been un-installed or corrupted.

The file paths used below assume the drive designator for your DVD/CD-RW drive is E:. If the designator for your drive is a different letter, use the correct letter.

The EZ Install utility is used to install the system applications, drivers, and utilities. Perform the following steps to proceed with installation.

1. Install the Drivers and Applications CD in your drive. The LifeBook Easy Installation window should open automatically. (If it doesn't open automatically, click [Start] -> Run, enter "E:\Ezinst.exe, then click the [OK] button.)
2. Click the application or driver that you want to install from the list that appears. (Before installing the Fujitsu HotKey utility, see "Installing Fujitsu HotKey" below.)
3. Click [Install] and follow the instructions that appear.

Before Re-Installing Fujitsu HotKey

Prior to installing the Fujitsu HotKey utility, you must first install the FUJ02B1 LCD Control Driver as follows.

1. Click Start -> Control Panel.
2. Click on "Printers and Other Hardware".
3. In the left frame, click on "System".
4. Click the Hardware tab, then click [Device Manager].
5. Click the "+" sign next to "Other Devices" so that you can see the "Unknown Device" icon.
6. Double-click "Unknown Devices" and select the Driver tab.
7. Click [Update Driver].
8. Select "Install from a list or specific location (Advanced)". Click [Next].
9. Select "Search for the best driver in these locations" and remove the check from "Search removable media (floppy, CD-ROM...)".
10. Select "Include this location in the search".
11. Enter "E:\Utilities\HotKey" in the text box.
12. Click [Next].
13. Select "Fujitsu FUJ02B1 Device Driver" and click [Finish].
14. Close the "Fujitsu FUJ02B1" driver property.
15. Close the "Device Manager".
16. Close "System Properties".

AUTOMATICALLY DOWNLOADING DRIVER UPDATES

Your system has a convenient tool called the Fujitsu Driver Update (FDU) utility. With FDU, you can choose to automatically or manually go to the Fujitsu site to check for new updates for your system.

The FDU icon should appear in the system tray at the bottom right of your screen (roll the cursor over the icons to find the correct one). If the FDU icon does not appear in the system tray, it can be started by going to [Start] -> All Programs, and clicking on Fujitsu Driver Update; this will create the icon automatically.

To invoke the FDU menu, you can either right-click on the FDU icon or hold the pen on the icon for a couple of seconds until the menu appears. The menu contains the following items:

- **Check for updates now**
  Allows for manual driver update search. The first time it is used, you are prompted to agree to a user agreement. After clicking on the icon, the FDU automatically connects with the Fujitsu site to check for updates and downloads them. While downloading, the icon has a red bar through it, indicating that it cannot be used while the download is in process. When the update is complete, a message appears informing you of the fact.
- **Enable Automatic Update Notifications**
  Automatically searches for new updates on a regular basis (approximately every 3 days).
- **Show update history**
  Brings up a screen that displays a history of updates that have been made via the FDU.
- **About Fujitsu Driver Update**
  Displays the FDU version number and copyright information
- **Fujitsu Driver Update Readme**
  Displays the FDU readme.

7 Care and Maintenance

Care and Maintenance

If you use your LifeBook notebook carefully, you will increase its life and reliability. This section provides some tips for looking after the LifeBook notebook and its devices.

Electrical equipment may be hazardous if misused. Operations of this product or similar products must always be supervised by an adult. Do not allow children access to the interior of any electrical products and do not permit them to handle any cables.

LIFEBOOK NOTEBOOK

Caring for your LifeBook notebook

- Your LifeBook notebook is a durable but sensitive electronic device. Treat it with respect and care.
- Make a habit of transporting it in a suitable carrying case.
- Do not attempt to service the computer yourself. Always follow installation instructions closely.
- Keep it away from food and beverages.
- If you accidentally spill liquid on your LifeBook notebook:
  1. Turn it off.
  2. Position it so that the liquid can run out.
  3. Let it dry out for 24 hours, or longer if needed.
  4. If your LifeBook notebook will not boot up after it has dried out, call your support representative.
- Do not use your LifeBook notebook in a wet environment (near a bathtub, swimming pool).
- Always use the AC adapter and batteries that are approved for your LifeBook notebook.
- Avoid exposure to sand, dust and other environmental hazards.
- Do not expose your LifeBook 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 the computer.
- If you are carrying your LifeBook notebook in a briefcase, or any other carrying case, make sure that there are no objects in the case pressing on the lid.
- Never position your LifeBook notebook such that the media player drive is supporting the weight of the notebook.
- Do not drop your LifeBook notebook.
- Do not touch the screen with any sharp objects.

Cleaning your Fujitsu notebook

- Always disconnect the power plug. (Pull the plug, not the cord.)
- Clean your LifeBook notebook with a damp, lint-free cloth. Do not use abrasives or solvents.
- Use a soft cloth such as a lens cleaning cloth to remove dust from the screen. Never use glass cleaners.

Storing your Fujitsu notebook

- If storing your LifeBook notebook for a month or longer, turn your LifeBook notebook off, fully charge the battery, the remove and store all Lithium ion batteries.
- Store your LifeBook notebook and batteries separately. If you store your LifeBook notebook with a battery installed, the battery will discharge, and battery life will be reduced. In addition, a faulty battery might damage your LifeBook notebook.
- Store your LifeBook notebook in a cool, dry location. Temperatures should remain between 13°F (-25°C) and 140°F (60°C).

Traveling with your Fujitsu notebook

- Do not transport your LifeBook notebook while it is turned on.
- Do not check your LifeBook notebook as baggage. Carry it with you.
- Avoid putting your LifeBook notebook through a metal detector. Have your notebook hand-inspected by security personnel. You can however, put your LifeBook notebook through a properly tuned X-ray machine. To avoid problems, place your notebook close to the entrance of the machine and remove it as soon as possible or have your LifeBook notebook hand-inspected by security personnel. Security officials may require you to turn your LifeBook notebook on. Make sure you have a charged battery on hand.
- When traveling with the hard drive removed, wrap the drive in a non-conducting materials (cloth or paper). If you have the drive checked by hand, be ready to install the drive if needed. Never put your hard drive through a metal detector. Have your hard drive hand-inspected by security personnel. You can however, put your hard drive through a properly tuned X-ray machine.
- Take the necessary plug adapters if you're traveling overseas. Check the following diagram to determine which plug adapter you'll need or ask your travel agent.

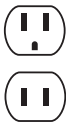
Outlet Type	Location
	United States, Canada, parts of Latin America, Japan, Korea, Mexico, Taiwan, the Philippines
	Russia and the Commonwealth of Independent States (CIS), most of Europe, parts of Latin America, the Middle East, parts of Africa, Hong Kong, India, most of South Asia
	United Kingdom, Ireland, Malaysia, Singapore, parts of Africa
	China, Australia, New Zealand

Figure 7-1. International Outlet Types

BATTERIES

Caring for your Batteries

- Always handle batteries carefully.
- Do not short-circuit the battery terminals (that is, do not touch both terminals with a metal object). Do not carry loose batteries in a pocket or purse where they may mix with coins, keys, or other metal objects. Doing so may cause an explosion or fire.
- Do not drop, puncture, disassemble, mutilate or incinerate the battery.
- Recharge batteries only as described in this manual and only in ventilated areas.
- Do not leave batteries in hot locations for more than a day or two. Intense heat can shorten battery life.
- Do not leave a battery in storage for longer than 6 months without recharging it.

Increasing Battery Life

- Power your LifeBook notebook with the AC or optional auto/airline adapter whenever possible.
- If your LifeBook notebook is running on battery power all day, connect it to the AC adapter overnight to recharge the battery.
- Keep brightness to the lowest level comfortable.
- Set the power management for maximum battery life.
- Put your LifeBook notebook in Suspend mode when it is turned on and you are not actually using it.
- Limit your media drive access.
- Disable the media player auto insert notification function.
- Always use fully charged batteries.
- Eject PCMCIA cards when not in use.

FLOPPY DISKS AND DRIVES

Caring for your Floppy Disks

- Avoid using the floppy disks in damp and dusty locations.
- Never store a floppy disk near a magnet or magnetic field.
- Do not use a pencil or an eraser on a disk or disk label.
- Avoid storing the floppy disks in extremely hot or cold locations, or in locations subject to severe temperature changes. Store at temperatures between 50° F (10°C) and 125°F (52°C).
- Do not touch the exposed part of the disk behind the metal shutter.

Caring for your Floppy Disk Drive

- 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.
- Avoid storing the floppy disk drive in extremely hot or cold locations, or in locations subject to severe temperature changes. Store at temperatures between 50° F (10°C) and 125°F (52°C).
- Keep the floppy disk drive out of direct sunlight and away from heating equipment.
- Avoid storing the floppy disk drive in locations subject to shock and vibration.
- Never use the floppy disk drive with any liquid, metal, or other foreign matter inside the floppy disk drive or disk.
- Never disassemble or dismantle your floppy disk drive.

MEDIA CARE

Caring for your Media (DVD/CD/CD-R/DVD+/-R/DVD+/-RW)

Media discs are precision devices and will function reliably if given reasonable care.

- Always store your media disc in its case when it is not in use.
- Always handle discs by the edges and avoid touching the surface.
- Avoid storing any media discs in extreme temperatures.
- Do not bend media discs or set heavy objects on them.
- Do not spill liquids on media discs.
- Do not scratch media discs.
- Do not put a label on media discs.
- Do not get dust on media discs.
- Never write on the label surface with a ballpoint pen or pencil. Always use a felt pen.
- If a media disc is subjected to a sudden change in temperature, cold to warm condensation may form on the surface. Wipe the moisture off with a clean, soft, lint free cloth and let it dry at room temperature. DO NOT use a hair dryer or heater to dry media discs.
- If a disc is dirty, use only a DVD/CD cleaner or wipe it with a clean, soft, lint free cloth starting from the inner edge and wiping to the outer edge.

Caring for your Media Drive

Your media player drive is durable but you must treat it with care. Please pay attention to the following points:

- The drive rotates the compact disc at a 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 where it will be exposed to extreme temperatures.
- Avoid using or storing the drive where it is damp or dusty.
- Avoid using or storing the drive near magnets or devices that generate strong magnetic fields.
- Avoid using or storing the drive where it will be subjected to shock or vibration.
- Do not disassemble or dismantle the media player drive.

PC CARDS

Caring for your PC Cards

PC Cards are durable, but you must treat them with care. The documentation supplied with your PC Card will provide specific information, but you should pay attention to the following points:

- To keep out dust and dirt, store PC Cards in their protective sleeves when they are not installed in your LifeBook 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.

8 Specifications

Specifications

This section provides the hardware, software, and environmental specifications for your LifeBook notebook. Specifications of particular configurations will vary.

CONFIGURATION LABEL

Your LifeBook notebook contains a configuration label located on the bottom of your LifeBook notebook. *(See figure 2-7 on page 13 for location)* This label contains information about the options you've chosen for your LifeBook notebook. Following is a typical label and information on how to read your configuration label.

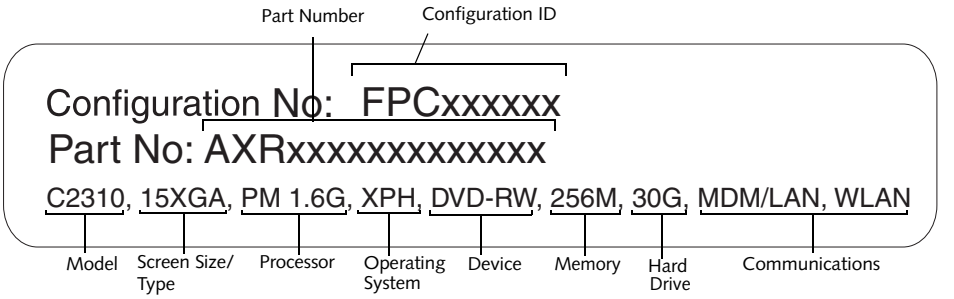


Figure 8-1. Configuration Label

MICROPROCESSOR

Intel Pentium M processor
(To determine the speed of your processor, refer to the configuration label on the bottom of your system).

MEMORY

System Memory
256 MB on-board PC2100 (DDR 266), with one open DIMM slot for expansion up to 1.25 GB SDRAM, via DIMM modules. (Reference the table on page 44 for a list of memory configurations.)

BIOS Memory
1 MB BIOS ROM

VIDEO

Built-in 15" Crystal View XGA color flat-panel TFT active matrix LCD display with simultaneous display capability.

Video Color and Resolution

- Internal: 1024 x 768 pixel resolution, 16M colors.
- External: 1600 x 1200 (max) pixel resolution, 16M colors.
- Simultaneous Video: 1024 x 768 pixel resolution

Video RAM
Integrated Intel® 855GM graphics chipset. The video memory is shared with system memory and is automatically adjusted (up to 64 MB) by the system, depending upon the graphics requirements.

INTEGRATED POINTING DEVICE

Touch pad pointing device with scrolling button.

AUDIO

- Intel 82081DBM / STAC9751T, 18-bit stereo audio 3D-Stereo supported
- Stereo headphone jack, 1 V_{rms}, or less, minimum impedance 32 Ohms
- Mono microphone jack, 125 mV_{p-p} or less, minimum impedance 10K Ohms
- Two built-in speakers, 28 mm diameter, stereo, boxless

MASS STORAGE DEVICE OPTIONS

Floppy Disk Drive
Internal 3. 5" Floppy Disk Drive, which accommodates 1.44 MB or 720 KB floppy disks.

Hard Drive
30 GB, 40 GB, 60 GB, or 80 GB fixed hard drive, Ultra DMA 100, 4200 rpm

Media Player Drive
(One of the following devices, depending upon the configuration of your system).

- **Super-Multi DVD Drive:**
  (modular 4x DVD-R, 2x DVD-RW, 2.4x DVD+R, 2.4x DVD+RW, 2x DVD-RAM, 8x DVD-ROM, 16x CD-R, 8x CD-RW, 24x CD-ROM)
- **DVD-RW Drive:**
  1x (DVD-R) / 1x (DVD-RW) / 8x (DVD-ROM) / 16x (CD-R) / 10x (CD-RW) / 24x (CD-ROM)
- **DVD/CD-RW Combo Drive:**
  16x (CD-R) / 10x (CD-RW) / 24x (CD) / plus 8x DVD

Flash Media Slot

- Memory Stick/Memory Stick PRO, shared with Secure Digital (SD) slot

COMMUNICATIONS

- Modem: Internal multinational V.90 standard 56K* fax/modem (ITU V.90, 56K data, 14.4K fax.)
- LAN: 10/100 Base-Tx Ethernet
- Intel ProSET Wireless LAN (802.11b/802.11g)

* Actual speeds over U.S. telephone lines vary and are less than 56 Kbps due to the current FCC regulations and line conditions. The internal modems on all LifeBook notebooks are only qualified for use with telephone systems inside the United States and Canada and may not operate in other countries.

LIFEBOOK APPLICATION PANEL

Application Launcher and Audio CD Player. The Application Launcher is pre-set with the following defaults assigned to each button:

Application A:	**Notepad**
Application B:	**Calculator**
Internet:	**Internet Explorer or default browser**
Mail:	**Netscape Messenger**

THEFT PREVENTION LOCK SLOT

Lock slot for use with physical restraining security systems. The Kensington lock system is recommended.

DEVICE PORTS

- Combination PC Card slot for one Type III/two Type II cards: PCMCIA Standard 2.1 with CardBus support
- One media slot for a Memory Stick or Secure Digital (SD) card
- One 15-pin D-SUB connector for VGA external monitor (see Video specifications).
- Four connectors for USB 2.0 (Universal Serial Bus) input/output devices.
- One modular modem (RJ-11) connector.
- One modular Ethernet (RJ-45) jack
- One IEEE 1394 jack (4-pin type)
- Fast IR (up to 4 Mbps) compatible infrared port for wireless data transfer
- One 25-pin D-SUB connector for parallel input/output devices (bi-directional output only for ECP)
- One mono microphone jack. (See Audio specifications)
- One headphone jack. (See Audio specifications)
- One S-Video out port
- One 9-pin serial port

KEYBOARD

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
- Two Windows keys: one Start key and one application key
- Key pitch: 19 mm
- Key stroke: 3 mm
- Built-in touchpad with scroll button
- Built-in Palm Rest

External Keyboard Support
USB-compatible

External Mouse Support
USB-compatible

POWER

Batteries
One 4-cell Lithium ion Battery, rechargeable, 14.4 V, 2000 mAh

AC Adapter
Autosensing 100-240 V AC, 60 W, supplying 19 VDC, 3.16A to the LifeBook notebook, Fujitsu Model FPCAC26, which includes an AC cable.

Power Management
Conforms to ACPI (Advanced Configuration and Power Interface).

Electrostatic Discharge (ESD): 9 kV

DIMENSIONS AND WEIGHT

Overall Dimensions
12.95" (w) x 11.24" (d) x 1.78/1.92" (h)
(329.0 x 285.5 x 45.2/48.7 mm)

Weight
Approximately 7.72 lbs. (3.5 kg), including battery and DVD drive.

ENVIRONMENTAL REQUIREMENTS

Temperature
Operating: 5° to 35° C (41° to 95° F).
Non-operating: –10° to 60° C (14° to 140° F).

Humidity
Operating: 20% to 85%, relative, non-condensing.
Non-operating; 8% to 85%, relative, non-condensing.

Altitude
Operating: 10,000 feet (3,048 m) maximum

PRE-INSTALLED SOFTWARE

Your LifeBook Series notebook comes with pre-installed software for playing audio and video files of various formats. In addition there is file transfer software, virus protection software, and Power Management software.

- Microsoft Works
- Adobe Acrobat Reader
- Fujitsu HotKey
- Drive Image Special Edition (DISE)
- EarthLink 5.0
- LifeBook Application Panel
- WinDVD
- Norton AntiVirus from Symantec (90-day free trial)
- Netscape 7.0
- Quicken 2004 New User Edition

Tutorials

All operating systems and most application software have tutorials built-into them upon installation. We highly recommend that you step through the tutorial before you use an application.

Manuals

Included with your notebook you will find manuals for your installed operating system and other pre-installed software. Any manuals that are not included, are available online through the help system of the software. We recommend that you review these manuals for general information on the use of these applications.

Microsoft Windows

Depending upon the configuration of your system, Microsoft Windows XP Home or Windows XP Professional is installed as your operating system.

Adobe Acrobat Reader by Adobe Systems, Inc.

The Adobe Acrobat Reader allows you to view, navigate, and print PDF files from across all of the major computing platforms.

Drive Image Special Edition (DISE) by PowerQuest

DISE provides a way to restore your computer if you experience a hard disk crash or other system failure. DISE is used to restore the factory image and restore the system to its original state.

Norton AntiVirus from Symantec

Your system is preinstalled with a free 90-day trial version of Symantec's Norton AntiVirus™ 2003. Norton AntiVirus is a program designed to protect your LifeBook notebook from computer viruses. It assists in the protection of the data currently residing on your hard disk from destruction or contamination. The 90-day trial version is activated upon your acceptance of software license agreement. After 90 days, it will be necessary to purchase a subscription from Symantec to download latest virus definitions. *(See your online help or manual for more information on how and when to run this program)*

LifeBook Application Panel Software

Your notebook is pre-installed with software utilities that let you operate and configure your LifeBook Application Panel. These utilities are found under the Start menu, under Programs, then under LifeBook Application Panel.

WinDVD

WinDVD is a versatile DVD player software application. WinDVD provides high-quality video and audio playback on your system.

Netscape 7.0

Browser suite, including integrated E-mail accounts, instant messaging, address book, search, and other tools and plug-ins.

Microsoft Internet Explorer

Internet Explorer is installed as your default Internet browser.

Earthlink 5.0

Software suite that allows you to connect with the Internet.

Microsoft Works 7.0

Microsoft Works 7.0 is a suite of software containing the basic tools to write letters and reports, track family and friends with address books, manage home finances, and create a home inventory.

Quicken 2004 New User Edition

Quicken 2004 New User Edition by Intuit is a personal money management program. It has features such as portfolio management, account registries, online banking and bill paying features. This version is for new users who are using Quicken software for the first time. Full version upgrade information is available online.

Fujitsu HotKey

Fujitsu HotKey allows you to control the display brightness of your notebook in order to maximize battery life.

Fujitsu Driver Update Utility

Your notebook contains a handy utility caled Fujitsu Driver Update (FDU) pre-installed. With FDU, you can choose to automatically or manually go to the Fujitsu site to check for new updates for your system. For more information about FDU, see "Automatically Downloading Driver Updates" on page 81.

Regulatory Information

NOTICE

Changes or modifications not expressly approved by Fujitsu 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.

Notice to Users of the US Telephone Network

This equipment contains a Fujitsu Media Devices Modem MBH7MD33 that complies with Part 68 of the FCC rules, and the requirements adopted by ACTA. On the bottom of this equipment is a label that contains, among other information, the FCC registration number and ringer equivalence number (REN) for this equipment; or a product identifier in the format US:AAAEQ##TXXXX. If requested, this information or number must be provided to the telephone company.

This equipment is designed to be connected to the telephone network or premises wiring using a standard jack type USOC RJ11C. A plug and jack used to connect this equipment to the premises wiring and telephone network must comply with the applicable FCC Part 68 rules and requirements adopted by the ACTA. A compliant telephone cord and modular plug is provided with this product. It is designed to be connected to a compatible modular jack that is also compliant.

The ringer equivalent number (REN) of this equipment is 0.0B. The REN is used to determine the number of devices that may be connected to a telephone line. Excessive RENs on a telephone may result in the devices not ringing in response to an incoming call. In most but not all areas, the sum of RENs should not exceed five (5.0). To be certain of the number of devices that may be connected to a line, as determined by the total RENs, contact the local telephone company. For products approved after July 23, 2001, the REN for this product is part of the product identifier that has the format US:AAAEQ##TXXXX. The digits represented by ## are the REN without a decimal point (e.g., 00 is a REN of 0.0). For earlier products, the REN is separately shown on the label.

If this equipment causes harm to the telephone network, the telephone company will notify you in advance that temporary discontinuance of service may be required. But if advance notice isn't practical, the telephone company will notify the customer as soon as possible. Also, you will be advised of your right to file a complaint with the FCC if you believe it is necessary.

The telephone company may make changes in its facilities, equipment, operations or procedures that could affect the operation of the equipment. If this happens, the telephone company will provide advance notice in order for you to make necessary modifications to maintain uninterrupted service.

If trouble is experienced with this equipment, for repair or warranty information, please refer to the manual or contact Fujitsu Computer Systems, Customer Service. If the equipment is causing harm to the telephone network, the telephone company may request that you disconnect the equipment until the problem is resolved.

The equipment cannot be used on public coin service provided by the telephone company. Connection to party line service is subject to state tariffs. (Contact the state public utility commission, public service commission or corporation commission for information).

If your home has specially wired alarm equipment connected to the telephone line, ensure the installation of this computer does not disable your alarm equipment. If you have any questions about what will disable alarm equipment, consult your telephone company or a qualified installer.

The Telephone Consumer Protection Act of 1991 makes it unlawful for any person to use a computer or other electronic device to send any message via a telephone fax machine unless such message clearly contains in a margin at the top or bottom of each transmitted page or on the first page of the transmission, the date and time it is sent, and an identification of the business or other entity, or other individual sending the message and the telephone number of the sending machine or such business, other entity, or individual.

DOC (INDUSTRY CANADA) NOTICES

Notice to Users of Radios and Television

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

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

Notice to Users of the Canadian Telephone Network

NOTICE: This equipment (internal modem Fujitsu Media Devices MBH7MD33) meets the applicable Industry Canada Terminal Equipment Technical Specifications. This is confirmed by the registration number. The abbreviation, IC, before the registration number signifies that registration was performed based on a Declaration of Conformity indicating that Industry Canada technical specifications were met. It does not imply that Industry Canada approved the equipment.

Before connecting this equipment to a telephone line the user should ensure that it is permissible to connect this equipment to the local telecommunication facilities. The user should be aware that compliance with the certification standards does not prevent service degradation in some situations.

Repairs to telecommunication equipment should be made by a Canadian authorized maintenance facility. Any repairs or alterations not expressly approved by Fujitsu or any equipment failures may give the telecommunication company cause to request the user to disconnect the equipment from the telephone line.

NOTICE: The Ringer Equivalence Number (REN) for this terminal equipment is 0.0. The REN assigned to each terminal equipment provides an indication of the maximum number of terminals allowed to be connected to a telephone interface. The termination on an interface may consist of any combination of devices subject only to the requirement that the sum of the Ringer Equivalence Numbers of all the devices does not exceed five.

For safety, users should ensure that the electrical ground of the power utility, the telephone lines and the metallic water pipes are connected together. Users should NOT attempt to make such connections themselves but should contact the appropriate electric inspection authority or electrician. This may be particularly important in rural areas.

Avis Aux Utilisateurs Du Réseau Téléphonique Canadien

AVIS: Le présent matériel (Fujitsu Media Devices Modem MBH7MD33) est conforme aux spécifications techniques d'Industrie Canada applicables au matériel terminal. Cette conformité est confirmée par le numéro d'enregistrement. Le sigle IC, placé devant le numéro d'enregistrement, signifie que l'enregistrement s'est effectué conformément à une déclaration de conformité et indique que les spécifications techniques d'Industrie Canada ont été respectées. Il n'implique pas qu'Industrie Canada a approuvé le matériel.

Avant de connecter cet équipement à une ligne téléphonique, l'utilisateur doit vérifier s'il est permis de connecter cet équipement aux installations de télécommunications locales. L'utilisateur est averti que même la conformité aux normes de certification ne peut dans certains cas empêcher la dégradation du service.

Les réparations de l'équipement de télécommunications doivent être eVectuées par un service de maintenance agréé au Canada. Toute réparation ou modification, qui n'est pas expressément approuvée par Fujitsu, ou toute défaillance de l'équipement peut entraîner la compagnie de télécommunications à exiger que l'utilisateur déconnecte l'équipement de la ligne téléphonique.

AVIS: L'indice d'équivalence de la sonnerie (IES) du présent matériel est de 0.0. L'IES assigné à chaque dispositif terminal indique le nombre maximal de terminaux qui peuvent être raccordés à une interface téléphonique. La terminaison d'une interface peut consister en une combinaison quelconque de dispositifs, à la seule condition que la somme d'indices d'équivalence de la sonnerie de tous les dispositifs n'excède pas 5.

Pour assurer la sécurité, les utilisateurs doivent vérifier que la prise de terre du service d'électricité, les lignes télphoniques et les conduites d'eau métalliques sont connectées ensemble. Les utilisateurs NE doivent PAS tenter d'établir ces connexions eux-mêmes, mais doivent contacter les services d'inspection d'installations électriques appropriés ou un électricien. Ceci peut être particulièrement important en régions rurales.

UL Notice

This unit requires an AC adapter to operate. Use only UL Listed Class 2 Adapters with an output rating of 19 VDC, with a current of 3.16A.

AC Adapter output polarity:

The modem-to-telephone network connection must be a line cord using a minimum #26 AWG wire.

For Authorized Repair Technicians Only

- For continued protection against risk of fire, replace only with the same type and rating fuse.
- Danger of explosion if Lithium (clock) 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.

System Disposal

Hg LAMP(S) INSIDE THIS PRODUCT CONTAIN MERCURY AND MUST BE RECYCLED OR DISPOSED OF ACCORDING TO LOCAL, STATE, OR FEDERAL LAWS.

9 Glossary

Glossary

802.11g
802.11g is a wireless communications architecture that allows data transfer at up to 54 Mbps, nearly five times the speed of the IEEE 802.11b standard. 802.11g is backward-compatible with IEEE 802.11b, and operates at the same 2.4 GHz frequency.

AC Adapter
A device which converts the AC voltage from a wall outlet to the DC voltage needed to power your LifeBook notebook.

ACPI
A power management specification that allows the operating system to determine the amount of power given to each connected device.

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.

ADSL
Asymmetric Digital Subscriber Line

Technology for transporting high bit-rate services over ordinary phone lines.

AGP
Accelerated Graphics Port. High-performance, component-level interconnect that enhances 3D graphical display.

APM
Advanced Power Management.

Auto/Airline Adapter
A device which converts the DC voltage from an automobile cigarette lighter or aircraft DC power outlet to the DC voltage needed to power your LifeBook notebook.

BIOS
Basic Input-Output System. A program and set of default parameters stored in ROM which tests and operates your LifeBook notebook when you turn it on until it loads your 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 disc, ROM or other storage media into RAM.

Bus
An electrical circuit which passes data between the CPU and the sub-assemblies inside your LifeBook notebook.

Byte
8 bits of parallel binary information.

Cache Memory
A block of memory built into the micro-processor which is much faster to access than your system RAM and used in specially structured ways to make your overall data handling time faster.

CardBus
A faster, 32-bit version of the PC Card interface which offers performance similar to the 32-bit PCI architecture.

CD-R
Compact disc - read. A CD-R disc allows you to record to it once, then play it repeatedly. CD-R's typically contain about 640 MB of data.

CD-ROM
Compact disc read only memory. This is a form of digital data storage which is read optically with a laser rather than a magnetic head. A typical CD-ROM can contain about 640 MB 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.

CD-RW
Compact disc - read/write. A CD-RW disc allows you to record to it multiple times, then play it repeatedly. CD-RW's typically contain about 640 MB of data.

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.

COMM Port
Abbreviation for communication port. This is your serial interface connection.

Command
An instruction which you give your operating system. Example: run a particular application or format a floppy disk.

Configuration
The combination of hardware and software that makes up your 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.

DDR
Double Data Rate. A new memory module design that allows data transfer between memory and the processor at a rate that is double the bus rate. Faster transfer enhances application and multimedia performance. DDR memory modules are typically used in high performance PCs.

Default Value
A pre programmed 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 drive, 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.

DMI
Desktop Management Interface. A standard that provides PC management applications with a common method of locally or remotely querying and configuring PC computer systems, hardware and software components, and peripherals.

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.

DVD
Digital Video Disc. A type of CD-ROM that holds up to 4.7 GB of data, enough for a full-length movie. DVDs are backward-compatible with CD-ROMs, so that DVD players can play old CD-ROMs, video CDs, and new DVD-ROMs.

DVD-R
Digital Video Disc - Readable. DVD-R discs can be written to only once, then read. DVD-R discs hold up to 4.7 GB of data.

DVD-RW
DVD Read-Write. DVD-RW allows you to edit home movies. DVD-RW discs are designed to be compatible with existing players and drives. Discs are recordable over 1,000 times, and hold up to 4.7 GB of data.

ECP
Extended Capability Port. A set of standards for high speed data communication and interconnection between electronic devices.

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 640 KB 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.

Hard drive
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 LifeBook notebook in electronic form.

I/O Port
The connector and associated control circuits for data entering and leaving your LifeBook notebook in electronic form.

IDE
Intelligent Drive Electronics. A type of control interface for a hard drive which is inside the hard drive unit.

IEEE 1394
A fast external bus that allows transfer rates of up to 400 Mbps.

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.

LAN
Local Area Network. An interconnection of computers and peripherals within a single limited geographic location which can pass programs and data amongst themselves.

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 has a high power-time life for its size and is not subject to the memory effect as Nickel Cadmium batteries.

LPT Port
Line Printer Port. A way of referring to parallel interface ports. Historically line printers were the first and later the most common device connected to parallel ports.

MB
Megabyte.

Megahertz
1,000,000 cycles per second.

Memory
A repository for data and applications which is readily accessible to your LifeBook notebook CPU.

Memory Stick
Memory Stick is a flash memory technology developed by Sony Electronics. Memory Stick allows you to record, transfer and share digital content, such as still and moving images, music, voice, and computer data and applications.

Memory Stick PRO
Memory Stick PRO is an advancement over the Memory Stick, offering much greater capacity and transfer speed. The 1 GB Memory Stick PRO can hold up to six hours of MPEG4 movies, or 20 minutes of DVD-quality MPEG2 movies.

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-DEModulator. 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.

NTSC
National TV Standards Commission. The standard for TV broadcast and reception for the USA.

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 micro-processor 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 drive which is set aside and made to appear to the operating system as if it were a separate disk, and 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 organization 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.

Pitch (keyboard)
The distance between the centers of the letter keys of a keyboard.

Pixel
The smallest element of a display, a dot of color on your display screen. The more pixels per area the clearer your image will appear.

POST
Power On Self Test. A program which is part of the BIOS which checks the configuration and operating condition of your hardware whenever power is applied to your LifeBook notebook. Status and error messages may be displayed before the operating system is loaded. If the self test detects failures that are so serious that operation can not continue, the operating system will not be loaded.

PPPoE
Point to Point Protocol over Ethernet.

A protocol for Ethernet, using a Point-to-Point Protocol (PPP), which is used for connection on the phone line.

Program
An integrated set of coded commands to your computers telling your hardware what to do and how and when to do it.

RAM
Random Access Memory. A hardware component of your LifeBook notebook 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 the computer without special tools.

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 your LifeBook notebook 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 your LifeBook notebook and does not require power to maintain it.

SD
See *Secure Digital.*

SDRAM
Synchronous Dynamic Random Access Memory.

Secure Digital
A Secure Digital (SD) card is a small memory card that allows portable storage among a variety of devices, such as cell phones, GPS systems, digital cameras, and PDAs. SD cards transfer data quickly, with low battery consumption. Like the memory stick, it uses flash memory architecture. This means that a power source is not required to retain data.

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.

SPDIF
Sony Philips Digital Interface Format. The optical digital audio format that allows you to download digital audio onto a MiniDisc recorder or connect to your sound system to play MP3 files with high fidelity sound.

SRAM
Static random access memory. A specific technology of making RAM which does not require periodic data refreshing.

SSID
Service Set Identifier

Specifies which network you are joining. Some systems allow you to specify any SSID as an option so you can join any network.

Status Indicator
A display which reports the condition of some portion of your hardware. On your LifeBook 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 LifeBook notebook uses various suspension states to reduce power consumption and prolong the charge of your battery.

SVGA
Super VGA. Standard that provides 800x600 pixel resolution and a palette of 16M colors.

S-Video
Super Video. A component video system for driving a TV or computer monitor.

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.

UMA
Unified Memory Architecture. A computer architecture that uses graphics chips on the motherboard that use part of the main memory for video memory.

USB
Universal Serial Bus. The USB 2.0 specification is a peripheral bus standard for connecting external devices at up to 480 Mbps. Some features of the standard include support for up to 127 concurrent USB devices, dynamic insertion and removal of devices, and self-identifying peripheral configuration for true plug-and-play functionality. USB 1.0 connects external devices at up to 11 Mbps. USB 2.0 is backward-compatible with USB 1.0 devices to allow you to connect older devices to the ports.

VGA
Video Graphics Array. A video display standard originally introduced by IBM with the PS/2 series of personal computers. Provides resolutions of 720 x 400.

VRAM
Video Random Access Memory. A memory dedicated to video display data and control.

WEP
Wired Equivalent Privacy

WEP is an encryption algorithm that is part of the 802.1x standard. WEP works by encrypting data while being transmitted over radio waves.

Wi-Fi Compatible

Wi-Fi (Wireless Fidelity) Identifies that the product has passed the interoperability test, supplied by the WECA (Wireless Ethernet Compatibility Alliance), which guarantees the interoperability of wireless IEEE 802.11 LAN products. For more information on the Wi-Fi standard, go to the WECA website at: www.wirelessethernet.com.

WFM
Wired for Management is Intel's broad-based initiative to reduce the total cost of ownership (TCO) of business computing without sacrificing power and flexibility.

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 drive; a file or directory of floppy diskette or hard drive.

XGA
Extended graphics array. Standard that provides resolutions of 640x480 or 1024x764, supporting 64k colors.

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