

## Troubleshooting

Problem	Possible Cause	Possible Solutions
LifeBook notebook fails to recognize DVD/CD-RW/CD-ROM's. (continued)	DVD/CD-RW/CD-ROM is dirty or defective.	Wipe DVD/CD-RW/CD-ROM with a non-abrasive CD cleaning cloth and reinsert. If it still will not work try another DVD/CD-RW/CD-ROM in the drive.
The DVD/CD-RW/CD-ROM Access indicator on the Status Indicator Panel blinks at regular intervals when no DVD/CD-RW/CD-ROM is in the tray or the DVD/CD-RW/CD-ROM drive is not installed.	The Windows DVD/CD-RW/CD-ROM auto insertion function is active and is checking to see if a DVD/CD-RW/CD-ROM is ready to run.	This is normal. However, you may disable this feature.
<b>Port Replicator Problems</b>		
Note: Be sure to power down your LifeBook notebook before adding a printer to the Port Replicator parallel port.		
LifeBook notebook does not turn on when installed in the optional Port Replicator	Port Replicator AC adapter is not plugged in.	Provide power to the Port Replicator.
	Notebook is not properly seated in the Port Replicator.	Remove and re-dock your LifeBook notebook.
<b>Floppy Disk Drive Problems</b>		
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. <i>(See Preparing a Disk for Use on page 42 for more information)</i>
	Floppy disk is not loaded correctly.	Eject floppy disk, check orientation and re-insert. <i>(See Ejecting a Disk on page 42 for more information)</i>
	The floppy disk drive may not be properly installed.	Remove and re-install your floppy disk drive.
	Security is set to protect access to floppy disk data.	Verify your password and security settings.
<b>Hard Drive Problems</b>		
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. <i>(See BIOS Setup Utility on page 29 for more information)</i>
	The wrong drive designator was used by an application when a bootable CD-ROM was used to start the 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.
<b>Keyboard or Mouse Problems</b>		
The built-in keyboard does not seem to work.	The 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.

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Problem	Possible Cause	Possible Solutions
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 <i>Device Ports</i> on page 50 for more information)
	Your operating system software is not setup with the correct software driver for that device.	Check your device and operating system documentation and activate the proper driver.
	Your mouse or keyboard is connected to the wrong PS/2 port on the optional Port Replicator.	Plug the mouse into the PS/2 Mouse port and the external keyboard or numeric key pad into the PS/2 Keyboard port. (See <i>PS/2 Port</i> on page 51 for more information)
You have connected an external keyboard or a mouse and it seems to be locking up the system.	Your operating system software is not setup 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 notebook. I
<b>Memory Problems</b>		
Your Power On screen, or Main 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 <i>Memory Upgrade Module</i> on page 45 for more information)
	You have a memory failure.	Check for Power On Self Test (POST) messages. (See <i>Power On Self Test Messages</i> on page 64 for more information)
<b>Modem Problems</b>		
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.
<b>Parallel, Serial, and USB Device Problems</b>		
You have installed a parallel port device, a serial port device or a USB 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 <i>Device Ports</i> on page 50 for more information)
	The device may have been installed while an application was running, so your notebook is not aware of its installation.	Close the application and restart your notebook.
	Your device 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 device.	See your device documentation and software documentation to determine the required I/O address. Change the settings in the BIOS setup utility. (See <i>BIOS Setup Utility</i> 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.

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<b>PC Card Problems</b>		
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. <i>(See PC Cards on page 43 for more information)</i>
	The card may have been installed while an application was running, so your notebook is not aware of its installation.	Close the application and restart your 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. <i>(See BIOS Setup Utility on page 29 for more information)</i>
	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.
<b>Power Failures</b>		
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. <i>(See Status Indicator Panel on page 11 for more information)</i> 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. <i>(See Status Indicator Panel on page 11 for more information)</i> 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. <i>(See Status Indicator Panel on page 11 for more information)</i> Use a Power adapter to operate until a battery is charged or install a charged battery.
	The power adapter (AC or auto/airline) is not plugged in properly.	Verify that your adapter is connected correctly. <i>(See Power Sources on page 27 for more information)</i>
	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.

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Problem	Possible Cause	Possible Solutions
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 Savings menu of the setup utility to adjust the timeout values to better suit your 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 and then push the Power/Suspend/Resume button. (See <i>Power Sources</i> 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 <i>Status Indicator Panel</i> on page 11 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 batteries are dead.	Replace the battery with a charged one or install a Power adapter.
	No batteries are installed.	Install a charged battery.
	The batteries are improperly installed.	Verify that the batteries are properly connected by re-installing them.
	Your installed batteries are faulty.	Verify the condition of the batteries using the Status Indicator panel and replace or remove any batteries that are shorted. (See <i>Status Indicator Panel</i> on page 11 for more information)
The batteries seem to discharge too quickly.	You are running an application that uses a great deal of power due to frequent hard drive access or DVD/CD-ROM access, use of a modem card or a LAN PC card.	Use both the primary battery and an optional second 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 Savings 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.
	The batteries are very old.	Replace the batteries.
	The batteries have been exposed to high temperatures.	Replace the batteries.
	The batteries are too hot or too cold.	Restore the notebook to normal operating temperature. The Charging icon on the Status Indicator panel will flash when the battery is outside its operating range.

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Problem	Possible Cause	Possible Solutions
<b>Shutdown and Startup Problems</b>		
The Suspend/Resume button does not work.	The 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. ( <i>See BIOS Setup Utility on page 29 for more information</i> )
	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. ( <i>See BIOS Setup Utility on page 29 for more information</i> )
	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 on the screen during the notebook (boot) sequence.	Power On Self Test (POST) has detected a problem.	See the Power On Self Test (POST) messages to determine the meaning and severity of the problem. Not all messages are errors; some are simply status indicators. ( <i>See Power On Self Test Messages on page 64 for more information</i> )
Your 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 <b>Save Changes And Exit</b> 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.
Your system display won't turn on when the system is turned on or when the system has resumed.	The system may be password-protected.	Check the status indicator panel to verify that the Security icon is blinking. If it is blinking, enter your password.
<b>Video Problems</b>		
The built-in display is blank when you turn on your LifeBook notebook.	Something is pushing on the Closed Cover switch.	Clear the Closed Cover switch. ( <i>See figure 2-4 on page 6 for location</i> )

## LifeBook S7000 Notebook

Problem	Possible Cause	Possible Solutions
The built-in display is blank when you turn on your LifeBook notebook.  (continued)	The notebook is set for an external monitor only.	Pressing [F10] while holding down the [Fn] key 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 only, external monitor only, both built-in display and external monitor.
	The angle of the display and the brightness settings are not adequate for your lighting conditions.	Move the display and the brightness control until you have adequate visibility.
	The power management time-outs may be set for very short intervals and you failed to notice the display come on and go off again.	Press any button 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 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 notebook has gone into Video timeout, Standby mode, Suspend mode or 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 better suit your operation needs. (See <i>BIOS Setup Utility on page 29 for more information</i> )
	The power management time-outs 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)
	Something is pushing on the Closed Cover switch.	Check the Closed Cover switch. (See <i>figure 2-4 on page 6 for location</i> )
Your system display won't turn on when the system is turned on or when the system has resumed.	The system may be password-protected.	Check the status indicator panel to verify that the Security icon is blinking. If it is blinking, enter your password.
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.

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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. <i>(See BIOS Setup Utility on page 29 for more information)</i> )
The Display is dark when on battery power.	The Power Management utility default is set on low brightness to conserve power.	Press [Fn] + [F7] to increase brightness or double-click on the battery 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.	Try toggling the video destination by pressing [Fn] and [F10] together, or check your BIOS setup and enable your external monitor. (See the Video Features submenu, located within the Advanced Menu of the BIOS. <i>(See BIOS Setup Utility on page 29 for more information)</i> )
	Your external monitor is not properly installed.	Reinstall your device. <i>(See External Monitor Port on page 52 for more information)</i>
	Your operating system software is not setup 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. <i>(See Specifications on page 77 for more information)</i>
<b>Miscellaneous Problems</b>		
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 Phoenix BIOS and/or your operating system can generate and an explanation of each message. Error messages are marked with an \*. If an error message is displayed that is not in this list, 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.

### **\*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 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 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 MEDIA PLAYER DRIVE TRAY RELEASE**

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

## **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 53,000 bps.)
- 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



If your system was delivered with Windows 2000 as the operating system, the Windows 2000 image is on the D: partition, but the Restore Disc contains Windows XP. **If you decide to restore your system from the Restore Disc, you will overwrite Windows 2000 with the Windows XP operating system.**

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, a message will appear informing you that continuing to boot from the CD will overwrite all information on the hard drive, including saved files, and restore the hard drive to its factory configuration. **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 [us.fujitsu.com/](http://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 from Fujitsu.

Although it is not necessary, you can use DISE to store additional image files that you create. For example, if you install several applications and save data files on your hard disk, you can create a new image file 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 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 a backup image at boot-up, you must first change the boot-up priority in the BIOS so that the system will go to the CD 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 the [F2] key 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 will appear informing you that continuing to boot from the CD will overwrite all information on the hard drive, including saved files, and restore the hard drive to its factory configuration.
2. When you are asked if you want to restore the factory image, click [Y]es.

#### 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.
3. 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 a backup image you created. 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 hang.
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.

To re-install drivers and/or applications:

1. Boot up the system and insert the DAR CD after Windows has started. The LifeBook Easy Installation screen appears.
2. Select the drivers and applications you want to install from the list that is displayed.
3. Click [Start]. Follow the prompts that appear to complete installation of the selected drivers and/or applications.

## 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.

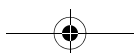
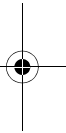
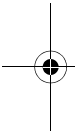
The FDU icon should appear in the system tray at the bottom right of your screen (roll the cursor over the icons to find the correct one). If the FDU icon does not appear in the system tray, it can be started by going to [Start] -> All Programs, and clicking on Fujitsu Driver Update; this will create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



*LifeBook S7000 Notebook*



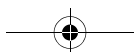
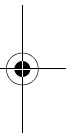
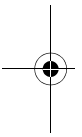


# 6

## Care and Maintenance



*LifeBook S7000 Notebook*



## Care and Maintenance

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

### 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 notebook will not boot after it has dried out, call your support representative.
- Do not use your Fujitsu LifeBook notebook in a wet environment (near a bathtub, swimming pool).
- Always use the AC adapter and batteries that are approved for your notebook.
- Avoid exposure to sand, dust and other environmental hazards.
- Do not expose your notebook to direct sunlight for long periods of time as temperatures above 140° F (60° C) may damage your notebook.
- Keep the covers closed on the connectors and slots when they are not in use.
- Do not put heavy or sharp objects on 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 notebook such that the optical drive is supporting the weight of the notebook.
- Do not drop your notebook.
- Do not touch the screen with any sharp objects.

### Cleaning your LifeBook notebook

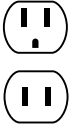



- Always disconnect the power plug. (Pull the plug, not the cord.)
- Clean your LifeBook notebook with a damp, lint-free cloth. Do not use abrasives or solvents.
- Use a soft cloth to remove dust from the screen. Never use glass cleaners.

### Storing your LifeBook notebook

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

### Traveling with your LifeBook notebook

- Do not transport your notebook while it is turned on.
- It is recommended that you carry your notebook with you while travelling, rather than checking it in as baggage.
- Always bring your System Recovery CD that came with your notebook when you travel. If you experience system software problems while traveling, you may need it to correct any problems.
- Never put your notebook through a metal detector. Have your notebook hand-inspected by security personnel. You can however, put your 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 notebook hand-inspected by security personnel. Security officials may require you to turn your 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, Mexico, Japan, Korea, the Philippines, Taiwan
	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

## 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 through the AC or optional auto/airline adapter whenever possible.
- If your 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 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.
- Never use the floppy disk drive with any liquid, metal, or other foreign matter inside the floppy disk drive or disk.
- Never disassemble your floppy disk drive.

## MEDIA CARE

### Caring for your Media (DVD/CD/CD-R)

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 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.



**Care and Maintenance****Caring for your Optical Drive**

Your optical 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 optical drive.
- Use of a commercially available lens cleaner is recommended for regular maintenance of your drive.

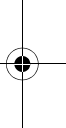
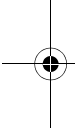
**PC CARDS****Caring for your PC Cards**

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.



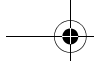
*LifeBook S7000 Notebook*



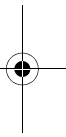
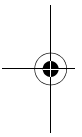


# 7

## Specifications



*LifeBook S7000 Notebook*



## Specifications

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

### CONFIGURATION LABEL

There is a configuration label located on the bottom of your LifeBook notebook. (See figure 2-8 on page 10 for location) This label contains specific information regarding the options you've chosen for your notebook. Following is an example label and information on how to read your own configuration label.

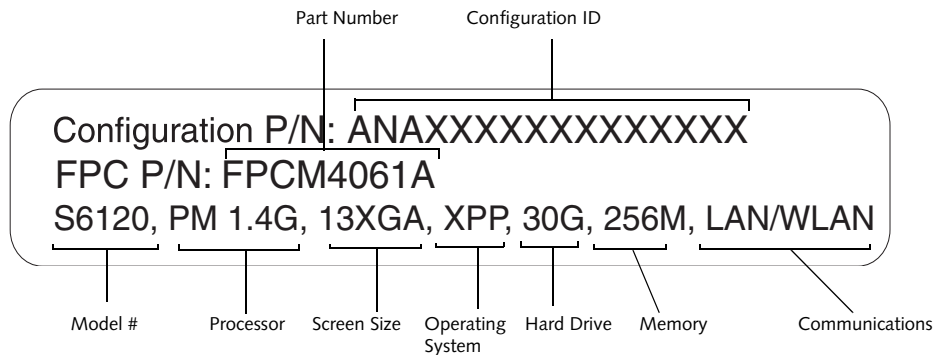


Figure 7-1 Configuration Label

### MICROPROCESSOR

Intel Pentium M processor (Refer to the system label to determine the speed of your processor).

### CHIPSET

Intel 855GME

### MEMORY

#### System Memory

DDR 333 MHz SDRAM memory module.  
256 MB pre-installed in one DIMM slot;  
one open DIMM slot available for upgrade.  
Upgradeable to 2 GB of total memory (1 GB x 2)

#### Cache Memory

1MB L2 on-die

### VIDEO

Built-in color flat-panel TFT active matrix LCD display with simultaneous display capability

#### Video Color and Resolution

14.1" TFT XGA

- Internal: 1024 x 768 pixel resolution, 16M colors
- External: 1600 x 1200 pixel resolution, 16M colors
- Simultaneous Video: 1024 x 768, 16M colors. XGA, SVGA and VGA compatible

#### Video RAM

Intel® 855GME video graphics chip with integrated 32-bit 3D/2D gfx core with Accelerated Graphics Port (AGP) support. Up to 64 MB shared video memory using Dynamic Video Memory Technology (DVMT).

### AUDIO

- Sigmatel ST9751T codec
- Stereo headphone jack, 3.5 mm, 1 V<sub>rms</sub> or less, minimum impedance 32 Ohms
- Mono microphone jack, 3.5 mm, 100 mV<sub>p-p</sub> or less, minimum impedance 10K Ohms
- Two built-in stereo speakers, 20 mm diameter

### MASS STORAGE DEVICE OPTIONS

#### Hard Drive

80 GB, 60 GB, 40 GB, or 30 GB fixed hard drive, Ultra DMA 100 (4200 rpm), 2.5", 9.5 mm

#### Media Player

Depending upon the configuration of your system, one of the following is installed.

- CD Drive (modular 24x maximum), or,
- Combo DVD/CD-RW Drive (modular 8x maximum DVD/24x maximum write, 10x maximum rewrite, 24x maximum read CD-RW combo drive), or,
- 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)

## FEATURES

### Integrated Pointing Device

- Touchpad pointing device with scroll button
- Optional Quick Point cursor control button

### Communications

**Modem:** Internal V.90 standard 56K fax/modem (ITU V.90, 56K data, 14.4K fax)

**Gigabit LAN:** Internal wired 10Base-T/100Base-Tx/1000Base-T/Tx Ethernet LAN

### Wireless LAN:

*Certain configurations of the Lifebook S7000 notebook have an optional Wireless LAN device installed. If you have an IntelPRO device installed, your system is classified as a Centrino product. If you have a Wireless LAN device other than IntelPRO installed, your system is classified as a Pentium M product. (For additional information about the Wireless LAN device, refer to the Wireless LAN User's Guide on page 93).*

- S7010 Model: Integrated Intel PRO Wireless LAN (802.11b/g), Wi-Fi-compliant
- S7010D Model: Optional integrated Atheros Wireless LAN (802.11a/b/g), Wi-Fi-compliant
- Optional Bluetooth device for wireless personal area network communication

### LifeBook Security/Application Panel

The Application Launcher buttons on your LifeBook notebook default to the following applications:

Table 7-1 Application Launcher Defaults

Button Label	Button Function	Default Application
1	Application A	Notepad
2	Application B	Calculator
3	Internet	Internet Explorer
4	E-Mail	Netscape Messenger

### Theft Prevention Lock

Lock slot for use with security restraint systems. The Kensington locking system is recommended.

## DEVICE PORTS

### On the LifeBook notebook:

- PC Card slots for two Type I or Type II cards: PCMCIA Standard 2.1 with CardBus support
- One 15-pin D-SUB connector for VGA external monitor (see Display specifications)
- Three USB 2.0 (Universal Serial Bus) connectors for input/output devices
- One IEEE 1394 (4-pin type) jack
- One stereo line-in jack
- One modular modem (RJ-11) connector

- One LAN (RJ-45) connector
- One stereo headphone jack. (See Audio specifications)
- One mono microphone jack. (See Audio specifications)
- Embedded Smart Card Reader (requires third-party application)
- Wireless LAN antenna with pre-installed on/off switch
- Optional Bluetooth module with antenna

### On the Optional Port Replicator:

- One 6-pin mini DIN PS/2 compatible connectors for external keyboard or mouse
- One 25-pin D-SUB connector for parallel input/output devices; Bi-directional, output only or ECP
- One 15-pin D-SUB connector for VGA external monitor (see Display specifications)
- One 9-pin D-SUB connector for RS-232C serial input/output devices
- Four USB 2.0 (Universal Serial Bus) connectors for input/output devices
- One LAN (RJ-45) connector
- One DC In connector
- One microphone In jack
- One headphone jack
- One Digital Video (DVI-D) jack
- One power/suspend/resume button

## KEYBOARD

Built-in keyboard with all functions of 101 key PS/2 compatible keyboards.

- Total number of keys: 84
- Function keys: F1 through F12
- Feature extension key: Fn
- Two Windows keys: one Start key, one application key
- Key pitch: 19 mm
- Key stroke: 3 mm
- Built-in Touchpad pointing device with left and right buttons and scroll button.
- Built-in Palm Rest
- Optional Quick Point cursor control button

### External Keyboard Support

USB or PS/2-compatible (PS/2 compatible with Port Replicator only)

### External Mouse Support

USB or PS/2-compatible (PS/2 compatible with Port Replicator only)

## POWER

### Batteries

One 6-cell Lithium ion battery, rechargeable, 10.8V, 4400 mAh, 47.5 Wh

Optional Flexible Bay battery: 6-cell Lithium ion battery, rechargeable, 10.8V, 3400 mAh, 36.7 Wh

### AC Adapter

Autosensing 100-240V AC, supplying 19V DC, 3.15A, 60W to the LifeBook notebook, Fujitsu Model FPCAC26AP, which includes an AC cable.

## Specifications

### Power Management

Conforms to ACPI (Advanced Configuration and Power Interface).

### DIMENSIONS AND WEIGHT

#### Overall Dimensions

Approximately 12.05"(w) x 9.72"(d) x 1.0"/1.3"(h)  
(306 mm x 247 mm x 25.4/33.0 mm)

#### Weights

Approximately 3.85 lbs (1.75 kg) with battery and weight saver.

Approximately 4.3 lbs (1.95 kg) with battery and DVD/CD-RW Combo drive.

### ENVIRONMENTAL REQUIREMENTS

#### Temperature

Operating: 41° to 95° F (5° to 35° C)

Non-operating: 5° to 140° F (-15° to 60° C)

#### 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

### POPULAR ACCESSORIES

For ordering or additional information on Fujitsu accessories please visit our Web site at [us.fujitsu.com/computers](http://us.fujitsu.com/computers) or call 1-800-733-0884.

#### Memory Upgrades

- 256 MB SDRAM
- 512 MB SDRAM
- 1GB SDRAM

#### Docking

- Port Replicator

#### Power

- Main Lithium ion battery
- Battery Charger
- Auto/Airline Adapter
- AC Adapter

#### PC Cards

- Wireless PC Card
- 4-in-1 Media Card Adapter
- Compact Flash Media Card Adapter

#### Additional Accessories

- Wireless Keyboard and Mouse
- External USB Floppy Disk Drive
- Presentation Audio System
- TeleAdapt 16' TeleCord
- Notebook Guardian Lock
- IBM Modem Saver

### Carrying Cases

- Diplomat
- Backpack
- Director
- MobileMax Wheeled Case

### PRE-INSTALLED SOFTWARE

Depending on your pre-installed operating system, your Fujitsu LifeBook 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. The following list indicates the pre-installed software associated with your system.

- Adobe Acrobat Reader
- Drive Image Special Edition (DISE)
- EarthLink 5.0
- BatteryAid
- Fujitsu HotKey/Fujitsu BatteryAid
- LifeBook Security/Application Panel
- Symantec Norton AntiVirus 2004 (90-day free trial)
- Netscape 7.0
- Quicken 2004 New User Edition
- Microsoft Works 7.0
- MS Reader\*
- Journal Viewer\*
- Zinio™ Reader\*
- Newsstand™ Reader\*

\* Indicates that the software is available for user installation in the "third-party software".

### LEARNING ABOUT YOUR SOFTWARE

#### 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.

#### Adobe Acrobat Reader

The Adobe Acrobat Reader, located in the Service and Support Software folder, allows you to view, navigate, and print PDF files from across all of the major computing platforms.

#### BatteryAid (Windows 2000 only)

BatteryAid allows you to control the display brightness of your notebook in order to maximize battery life. (*See your BatteryAid online help for more information on the correct way to use this program*)

**Drive Image Special Edition (DISE) by PowerQuest**

DISE by PowerQuest 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.

**Earthlink 5.0**

Software suite that allows you to connect with the Internet.

**Fujitsu HotKey (Windows XP only)**

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

**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, on-line banking and bill paying features. This application is for new users who are using Quicken software for the first time. Full version upgrade information is available on line.

**LifeBook Security/Application Panel Software**

Your LifeBook notebook is pre-installed with software utilities that let you operate and configure your LifeBook Security/Application Panel.

The Security Panel portion allows for password protection while the system is off or in Suspend mode. The Security Panel utilities are found under the Start menu, under Programs, then under LifeBook Security Panel.

The Application Panel utilities are found under the Start menu, Settings/Control Panel, then Application Panel. To open the CD Player and Application Panel Help, select Start, Programs, LifeBook Application Panel.

**Norton AntiVirus 2004**

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.

**Netscape 7.0**

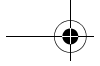
Browser suite, including integrated E-mail accounts, instant messaging, address book, search, and other tools and plug-ins.



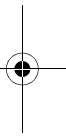
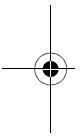


# 8

## Glossary



*LifeBook S7000 Notebook*



# Glossary

## AC Adapter

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

## ACPI

Advanced Configuration and Power Interface

## 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.

## AdHoc

A name of a wireless LAN configuration.

It is a type of communication using wireless cards only.

Another type of communication is called Infrastructure (using a wireless card and an access point).

## ADSL

### Asymmetric Digital Subscriber Line

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

## AGP

Accelerated Graphics Port

Graphics port specifically designed for graphics-intensive devices, such as video cards and 3D accelerators.

## 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 disk, 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-ROM

Compact disk 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 600MB of data and is not subject to heads crashing into the surface and destroying the data when there is a failure nor to wear from reading.

## Channel

A radio frequency band used for communication between wireless cards and access points.

## CMOS RAM

Complementary metal oxide semiconductor random access memory. This is a technology for manufacturing random access memory which requires very low levels of power to operate.

## COM Port

Abbreviation for communication port. This is 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.

**Default Value**

A pre programmed value to be used if you fail to set your own.

**DHCP**

Dynamic Host Configuration Protocol

A protocol used to automatically acquire parameters required for the communication, such as IP address.

The sender of IP address is called a DHCP server, and the receiver is called a DHCP client.

**DIMM**

Dual-in-line memory module.

**DISE**

Drive Image Special Edition.

A utility that allows you to restore the original factory image on your hard drive in the event of corruption or accidental erasure of files or applications.

**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.

**DNS**

Domain Name System

A function to control the association between the IP address and the name assigned to the computer.

If you do not know the IP address but if you know the computer name, you can still communicate to that computer.

**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.

**DVMT**

Dynamic Video Memory Technology

A video memory architecture that increases the efficiency of the motherboard by using innovative memory utilization and direct AGP.

**ECP**

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

**Encryption Key (Network Key)**

Key information used to encode data for data transfer.

This device uses the same encryption key to encode and decode the data, and the identical encryption key is required between the sender and receiver.

**ESD**

Electro-Static Discharge. The sudden discharge of electricity from a static charge which has built-up slowly.

Example: the shock you get from a doorknob on a dry day or the sparks you get from brushing hair on a dry day.

**Extended Memory**

All memory more than the 640KB recognized by MS-DOS as system memory.

**FCC**

Federal Communication Commission.

**Floppy Disk**

A spinning platter of magnetic data storage media which is highly flexible.

**GB**

Gigabyte.

**Hard drive**

A spinning platter of magnetic data storage media where the platter is very stiff.

**I/O**

Input/Output. Data entering and leaving your notebook in electronic form.

**I/O Port**

The connector and associated control circuits for data entering and leaving your notebook in electronic form.

**IDE**

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

**Infrared**

Light just beyond the red portion of the visible light spectrum which is invisible to humans.

**Infrastructure**

A name of a wireless LAN configuration. This type of communication uses an access point.

Another type of communication is called AdHoc.

**IP Address**

An address used for computers to communicate in the TCP/IP environment.

Current IPv4 (version 4) uses four values in the range between 1 and 255. (Example: 192.168.100.123).

There are two types of IP address: global address and private address.

The global address is an only address in the world. It is controlled by JPNIC (Japan Network Information

Center). A private address is an only address in the closed network.

**IR**

An abbreviation for infrared.

**IrDA**

Infrared Data Association. An organization which produces standards for communication using infrared as the carrier.

**IRQ**

Interrupt Request. An acronym for the hardware signal to the CPU that an external event has occurred which needs to be processed.

**KB**

Kilobyte.

**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 because historically line printers were the first and latter the most common device connected to parallel ports.

**MAC Address**

Media Access Control Address

A unique physical address of a network card. For Ethernet, the first three bytes are used as the vendor code, controlled and assigned by IEEE. The remaining three bytes are controlled by each vendor (preventing overlap), therefore, every Ethernet card is given a unique physical address in the world, being assigned with a different address from other cards. For Ethernet, frames are sent and received based on this address.

**MB**

Megabyte.

**Megahertz**

1,000,000 cycles per second.

**Memory**

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

**MHz**

Megahertz.

**MIDI**

Musical Instrument Digital Interface. A standard communication protocol for exchange of information between computers and sound producers such as synthesizers.

**Modem**

A contraction for MOdulator-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.

**MTU**

Maximum Transmission Unit

The maximum data size that can be transferred at a time through the Internet or other networks. You can set a smaller MTU size to obtain successful communication, if you have difficulty transferring data due to the fact that the maximum size is too large.

**Norton AntiVirus**

Web-based software that protects you email, instant messages, and other files by removing viruses, worms, and Trojan horses.

**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.

**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.

**PCI**

Peripheral Component Interconnect

Self-configuring PC local bus. Designed by Intel, PCI has gained wide acceptance as a standard bus design.

**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 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.

**Protocol**

Procedures and rules use to send and receive data between computers.

- Method of sending and receiving data
- Process used to handle communication errors

Conditions required for communication are organized in procedures for correct transfer of information.

### **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 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 notebook and does not require power to maintain it.

### **SDRAM**

Synchronous Dynamic Random Access Memory.

### **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.

### **SMART**

Self-Monitoring, Analysis and Reporting Technology (SMART) is an emerging technology that provides near-term failure predictions for hard drives. When SMART is enabled the hard drive monitors pre-determined drive attributes that are susceptible to degradation over time. If a failure is likely to occur, SMART makes a status

report available so that the LifeBook notebook can prompt the user to back up the data on the drive. Naturally not all failures are predictable. SMART predictability is limited to those attributes which the drive can self-monitor. In those cases where SMART can give advance warning, a considerable amount of precious data can be saved.

### **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.

### **Standby**

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.

### **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.

### **SVGA**

Super VGA.

### **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.

### **TCP/IP**

Transmission Control Protocol/Internet Protocol. A standard Internet protocol that is most widely used.

### **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.

**USB**

Universal Serial Bus.

Standard that allows you to simultaneously connect up to 127 USB devices such as game pads, pointing devices, printers, and keyboards to your computer.

**VGA**

Video Graphics Array. A video display standard originally introduced by IBM with the PS/2 series of personal computers.

**VRAM**

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

**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.

**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 Web site at: [www.wirelessethernet.com](http://www.wirelessethernet.com).

**WLAN**

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

**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 VGA.

**Zip Drive**

A 100MB or 250MB read/write removable media disk drive.



## 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 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 as shown on the label. 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.

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 effect 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 Corporation, 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 exigences du Règlement sur le matériel brouilleur du Canada.

**Notice to Users of the Canadian Telephone Network**

**NOTICE:** This equipment 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 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 effectuées 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 téléphoniques 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.

**Regulatory Information**

**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 3.15 A.

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.

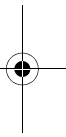
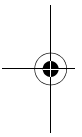
**System Disposal**



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



*LifeBook S7000 Notebook*

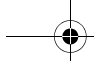




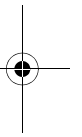
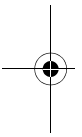
# Appendix

## Integrated Wireless LAN\* User's Guide

\* Optional device



*LifeBook S7000 Notebook*



## **FC** FCC REGULATORY INFORMATION

Please note the following regulatory information related to the optional wireless LAN module.

### 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.

#### For Atheros Wireless LAN:

For operation within 5.15~5.25GHz frequency range, it is restricted to indoor environment, and the antenna of this device must be integral.

### 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 Radiation Exposure Statement

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with a minimum distance of 20 centimeters between the Wireless LAN/Bluetooth antenna (located on the top edge of the LCD screen) and your body. The transmitters in this device must not be co-located or operated in conjunction with any other antenna or transmitter.

### 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

The Integrated Wireless LAN is an optional device available for Fujitsu mobile computers. This manual describes the basic operating procedures for the Wireless LAN (referred to as the “device” in this manual) and how to set up a wireless LAN network. Before using this device, read this manual carefully to ensure correct operation of the device. Keep this manual in a safe place for reference while using the device.

### Types of Wireless LANs Covered by this Document

This document is applicable to systems containing one of the following two devices. Most of the procedures are identical. Sections that differ between the two devices have been noted in the text:

- Intel PROSet Wireless LAN
- Atheros Wireless LAN

If your system is a Stylistic S7010, your wireless module is the Intel PROSet wireless LAN; if your system is a Stylistic S7010D, your wireless module is the Atheros wireless LAN;

### Characteristics of the Device

This device consists of a wireless LAN card that is attached inside the computer via a mini-PCI slot.

The main characteristics are as follows:

- It operates in the 2.4 GHz Industrial, Scientific, and Medical (ISM) RF band; additionally, the Atheros wireless LAN operates in the 5 GHz RF band.
- It does not require an FCC license to operate.
- It uses Direct Sequence Spread Spectrum (DSSS), an RF modulation scheme that is resistant to noise.

- This wireless module is Wi-Fi compliant. The module can communicate at a maximum data rate of 54 Mbps.
- The maximum communication range is approximately 80 feet (25 meters) inside a building. Please note that the range you achieve may be shorter or longer than 80 feet, depending upon factors such as obstructions, walls, columns, construction material, and reflective objects.
- The wireless modules support a number of industry-standard security mechanisms, including WEP, TKIP, and 802.1x/EAP (LEAP, TLS, PEAP, MD5).

### Wireless LAN Modes Using this Device

#### Ad Hoc Mode (See Figure 1)

“Ad Hoc Mode” refers to a type of wireless network that involves connecting multiple computers without the use of an Access Point. Network connectivity between computers can be established using only wireless LAN cards in a peer-to-peer fashion.

Ad Hoc networks are an easy and inexpensive method for establishing network connectivity between multiple computers.

In the Ad Hoc mode, you can use the function supported by Microsoft Network, such as File and Print Sharing to exchange files and share a printer or other peripheral devices.

To use Ad Hoc Mode, you must set the same SSID and the same encryption key for all the computers that are connected. Communication between computers in an Ad Hoc network will occur provided they are within each other’s RF coverage area.

Figure 1. Ad Hoc Mode Network

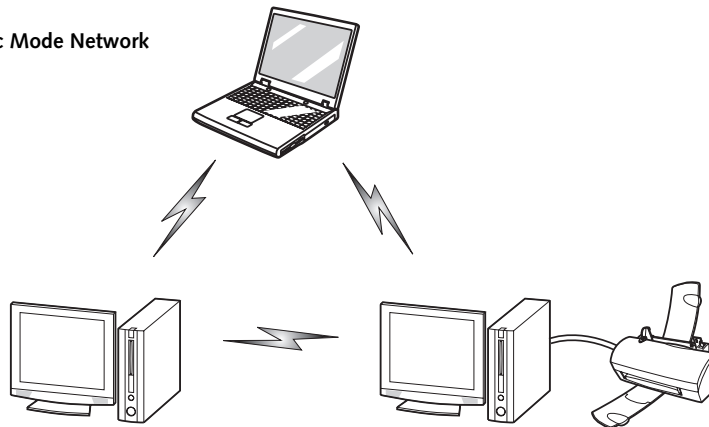
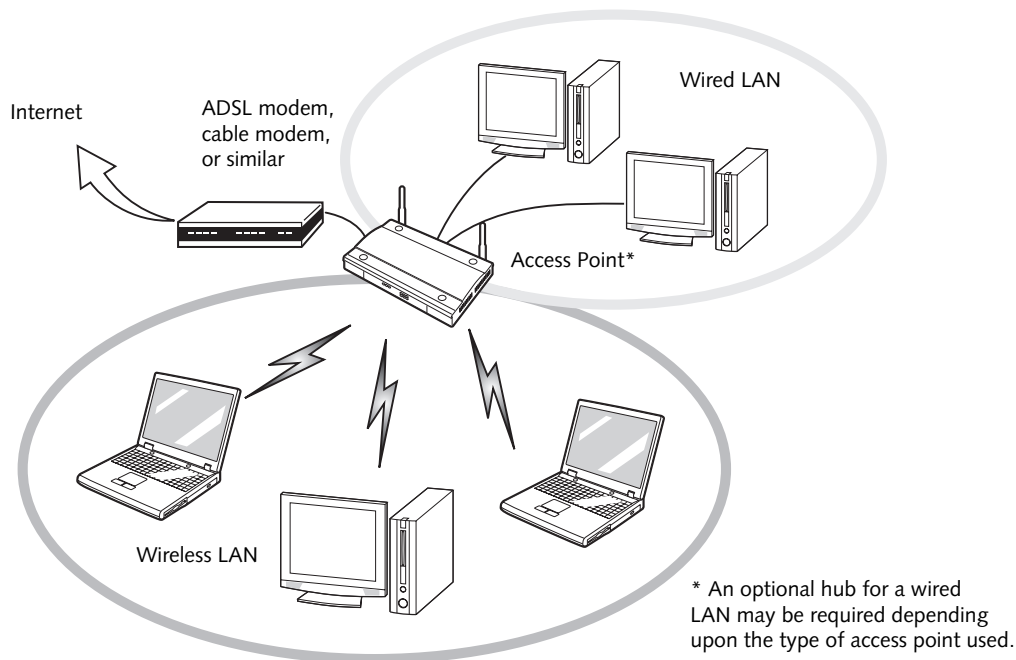




Figure 2. Access Point (Infrastructure) Mode Network



#### Access Point (Infrastructure) Mode (See Figure 2)

If a number of computers are connected simultaneously in the Ad Hoc mode, the transfer rate may be reduced, communications may become unstable, or the network connection could fail. This is because all wireless LAN cards are using the same radio frequency in the network.

To improve this situation, you can use a wireless LAN access point, which is sold separately. The wireless LAN network is in the "Access Point mode" when it uses an access point, and such a connection is called the "Access Point Network" or "Infrastructure Network".

By using an access point, you can set and use a different communication channel for each network group. Each channel is given a different radio frequency, and it eliminates the collision of communications and provides a more stable communications environment.

#### How to Handle This Device

The Integrated Wireless LAN device is already installed in your mobile computer. Under normal circumstances, it should not be necessary for you to remove or re-install it. The LAN has been configured to support the operating system with which your system shipped.

#### FOR BETTER COMMUNICATIONS

This personal computer may not operate properly due to the operating environment. Strictly observe the following precautions when installing the main unit of the computer:

- For optimum wireless communications, it recommended that operation of the wireless LAN module occur within 25 meters of the Access Point. Wireless range is dependent on a multitude of factors including number of obstructions, walls, type of construction material, reflective objects, etc.
- If the computer is unable to communicate properly, change the channel to be used or the installation location. During the use of a microwave oven or other equipment generating strong high-frequency energy, in particular, the personal computer may be highly susceptible to the energy and unable to communicate properly.
- Broadcast stations or wireless communication equipment that operate in the 2.4GHz or 5GHz RF Frequency band may interfere with the operation of the wireless LAN module. Increasing of transmit power or relocating Access Points may be necessary to combat the effects of the interference.

## STOPPING TRANSMISSION

To use this product inside hospitals, clinics, or airplanes, or in other places where the use of electronic equipment is regulated, stop the transmission of radio waves from the wireless LAN beforehand.

### Deactivation using the wireless switch

The transmission of radio waves from the wireless LAN can be stopped by setting the wireless switch to the Off position. Note that the Wireless LAN On/Off switch has no effect on non-Wireless LAN models.

(See Figure 3 for Wireless LAN switch location.)

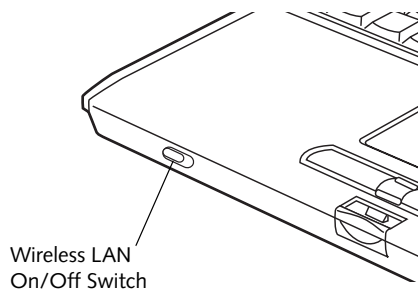


Figure 3. Wireless LAN On/Off Switch

### Deactivation using Windows

#### Intel PROSet Wireless LAN:

1. Click [Start] --> [(All) Programs] --> [Intel Network Adapters] --> [Intel(R) PROSet]. The Intel(R) PROSet window will be displayed.
2. Click the General tab.
3. Select [Off] for the wireless communications Switch Radio: function, and then click the [OK] button. Wireless communications on/off switching will be deactivated and the transmission of radio waves from the wireless LAN will be stopped.



To restart transmission, select [On] for the wireless communications Switch Radio: function, and then click the [OK] button.

#### Atheros Wireless LAN

1. Click [Start] --> [Settings (Windows 2000 only)] --> [Control Panel] --> [Atheros Wireless Utility]. The Atheros Wireless Configuration Utility window will be displayed.
2. Click the Wireless Networks tab.
3. Click the [Enable Radio] box to clear it, then click the [OK] button. Wireless communications on/off

switching will be deactivated and the transmission of radio waves from the wireless LAN will be stopped.



To restart transmission, check the [Enable Radio] checkbox to select it, then click the [OK] button.

## STARTING TRANSMISSION

To communicate using the wireless LAN function, set the computer to a status from which it can transmit, as follows:

#### Intel PROSet Wireless LAN:

1. Set the wireless switch to the On position.
2. Click [Start] --> [(All) Programs] --> [Intel Network Adapters] --> [Intel(R) PROSet]. The Intel(R) PROSet window will be displayed.
3. Click the [General] tab if it is not already selected.
4. Select [ON] for the Switch radio: function, then click [OK]. Wireless communications on/off switching will be activated and the transmission of radio waves will be restarted.

#### Atheros Wireless LAN:

1. Click the Wireless Network Connection icon in the system tray at the lower right of your screen.
2. Click [Enable Radio]. The radio will be turned on. **Access Point Mode:** Transmission is enabled. **Ad Hoc Mode:** Restart your computer to enable the radio.

## Connection using Wireless Zero Configuration Tool

### FLOW OF OPERATIONS

The wireless LAN connection procedure contained in this section is outlined below.

1. Make sure the mobile computer is ready for the transmission of radio waves from the wireless LAN. For further details, see *(See Starting Transmission on page 98 for more information)*.
2. Assign the parameters required for wireless LAN connection. *(See Preparation for wireless LAN connection on page 99 for more information)*.
  - Enter the network name (SSID) and other data.
  - Enter the network key (the Wired Equivalent Privacy or WEP key used to encode 802.11b communications data).
3. Perform setting operations relating to network connection. *(See Connection to the network on page 101 for more information)*
  - Specify TCP/IP as the protocol, and confirm the name of the work group and other settings.
  - Enter the data required for file/printer sharing on the network. Perform this operation as required.
  - For access point (or “infrastructure”) connection, enter data for the access point. Refer to the manual of the access point for further details.
  - Verify that you are able to connect your computer to the network.

### PREPARATION FOR WIRELESS LAN CONNECTION

This section explains the preparations required for the use of the wireless LAN.

#### Assigning parameters

Configure the network name (SSID), the network key, and other data required for wireless LAN connection. Please contact your network administrator for the correct configuration parameters.

- To use access point (infrastructure) connection, refer to the access point manual for the access point-setting procedure.
- You do not need to set the channel when using access point (infrastructure) mode. Channel selection is controlled by the access point. In ad hoc networks, channel selection defaults to channel 11; however, channel selection can be manually changed if desired. This can be accomplished only when using the client utility.



If it is necessary to change the channel, change the setting of the access point. For the setting procedure, refer to the manual of the access point.

1. Make sure the Wireless LAN switch is switched on.
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” under Control Panel the left frame. (If you are already in Classic view, “Switch to Category View” will be displayed instead.)
4. Double-click the Network Connections icon. A list of currently installed networks will be displayed.
5. 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.
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. If the SSID of your access point does not appear in the list, click [Add]. The [Wireless Network Properties] window will be displayed.
8. Select the Association tab if it is not already selected.
9. Enter the information required for connection to the wireless LAN, as follows.
  - a. Enter the network name (SSID). (i.e., Enter the name of the desired network in less than 33 ASCII characters).

**For ad hoc connection:** Assign the same network name to all the personal computers to be connected.

**For access point (infrastructure) connection:**

Assign the appropriate SSID. The SSID must be identical to the SSID of the access point. Refer to the access point manual, or contact your network administrator.

**b. For ad hoc connection, check the following field.**

**For access point (infrastructure) connection,** clear the check mark for the following field:

[This is a computer-to-computer (ad hoc) network; wireless access points are not used.]

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



It is strongly recommended that you enter the network key for encoding communications data. If the network key is not entered, since the network can be accessed from all personal computers containing the wireless LAN function, there is the danger of your data being stolen or damaged by other users.

- a. Choose the Network Authentication method appropriate for your wireless LAN. Options include Open, Shared, WPA, and WPA-PSK.
- b. Choose the Encryption method appropriate for your wireless LAN. Options for Open or Shared Authentication are Disabled or WEP. Options for WPA or WPA-PSK are TKIP or AES.
- 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 consult your network administrator for the correct settings.
- d. Static WEP keys are to be 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.

**For ad hoc connection:** Assign the same network key to all the personal computers to be

connected.

**For access point (infrastructure) connection:**

Assign the identical network key that is programmed into the access point. For this setting, refer to the access point manual or contact your network administrator.

- e. If using static WEP keys, confirm the Network key by re-entering the same data in the [Confirm network key:] field.
11. Click the [Authentication] tab and then verify the settings of [Enable IEEE 802.1x authentication for this network].

For internal use at an organization such as a company, when access by wireless LAN clients is to be limited using IEEE 802.1x authentication, check the [Enable IEEE 802.1x authentication for this network] check box.

For home use, clear the check mark from [Enable IEEE 802.1x authentication for this network].

For the setting method relating to IEEE 802.1x authentication, refer to the manual of the access point which you are using.

12. After completion of setting operations, click the [OK] button. Processing will return to the [Wireless Network Connection Properties] window.
13. Verify that the network name entered in step 7 above is added in [Preferred Networks], and then click the [OK] button.



In [Preferred Networks], register only the desired connection settings.

14. Close the [Wireless Network] window.

## 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 115 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. Click



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.

[Sharing] if it isn't already selected.

4. Click the link stating "If you understand the security risks, but want to share files without running the wizard, click here".
5. Click "Just enable file sharing" and click [OK].
6. 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.

7. 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 [Start] and then [Printers and Faxes]. 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 102 will be displayed.
5. Double-click the folder to be accessed.

### Confirming the status of the radio

1. Right-click the Atheros icon in the lower right corner of the screen.
2. Click [Open Client Utility]. The Atheros Client Utility window opens.
3. On the Current Status tab, 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.)
  - **Profile Name**  
The current configuration profile is displayed.
  - **Network Type - Configured Network Type**  
[Access Point] or [AdHoc] will be displayed.
  - **Current Mode**  
Indicates the frequency and data rate currently used by the radio.

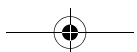
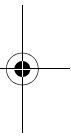
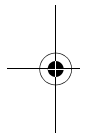
- **Current Channel**  
The channel number currently used by the radio.
- **Link Status**  
Displays the current connected state of the WLAN module.
- **Encryption Type**  
Displays the encryption type currently used by the radio.
- **IP Address**  
Displays the current TCP/IP address assigned to the WLAN adapter.

On the Current Status tab, click the [Advanced] button. The following information will be displayed.

- **Country**  
The country with the country code for which the radio is configured.
- **Transmit Power Level**  
Displays the current transmit power level of the radio.
- **Network Name (SSID)**  
Displays the Network Name (SSID) currently used by the radio.
- **Power Save Mode**  
Displays the configured Power Save Mode currently used by the radio. [Off], [Normal], or [Maximum] will be displayed.
- **BSSID**  
Displays the Basic Service Set Identifier. This is typically the MAC address of the Access Point or in the case of AdHoc networks, is a randomly generated MAC address.
- **Frequency**  
Displays the center frequency currently being used by the radio.
- **Transmit Rate**  
Displays the current data rate used by the radio to transmit data.
- **Receive Rate**  
Displays the current data rate used by the radio to receive data.



*LifeBook S7000 Notebook*





## Connection using Atheros Client Utility

### FLOW OF OPERATIONS

The wireless LAN connection procedure is outlined below.

1. Make sure that the personal computer is ready for the transmission of radio waves from the wireless LAN. For further details, see "Starting the transmission" on page 98.
2. Assign the parameters required for wireless LAN connection. For further details, see "Preparation for wireless LAN connection" on page 99.
  - Enter the network name (SSID) and other data.
  - Enter the network key (the key to be used to encode communications data).
3. Perform setting operations relating to network connection. For further details, see "Connection to the network" on page 101.
  - Specify TCP/IP as the protocol, and confirm the name of the work group and other settings.
  - Enter the data required for file/printer sharing on the network. Perform this operation as required.
  - For access point (infrastructure) connection, enter data for the access point. Refer to the manual of the access point for further details.
  - Verify that you have been able to connect your computer to the network.

### PREPARATION FOR WIRELESS LAN CONNECTION

This section explains the preparation (parameter assignment) required for the use of the wireless LAN.

#### Assigning parameters

Enter the network name (SSID), the network key, and other data required for wireless LAN connection. If there is the administrator of the network, contact the network administrator for data settings.

- To use access point (infrastructure) connection, refer to the access point manual for the access point-setting procedure.
- You do not need to set the channel when using access point (infrastructure) mode. Channel selection is controlled by the access point. In ad hoc networks, channel selection defaults to channel 11; however, channel selection can be manually changed if desired. This can be accomplished only when using the client utility.



If it is necessary to change the channel, change the setting of the access point. For the setting procedure, refer to the manual of the access point.

1. Right-click the Atheros Wireless Utility icon in the system tray in the lower right corner of your screen.
2. Click [Open Client Utility]. The [Atheros Client Utility] window will be displayed.
3. Select the [Profile Management] tab.
4. Click the [New] button. The Profile Management window will appear.
5. Enter the following information required to establish connection to the wireless LAN:

#### Profile Name

Enter a name for this configuration profile

#### Network names

Enter the appropriate SSID(s) of the wireless networks to which this device will connect. You have the option of entering up to three SSID's.

6. Select the [Advanced] tab.
7. Choose appropriate Power Save Mode setting. Options are [Off], [Normal], and [Maximum]. [Normal] is the default setting.
8. Choose the appropriate type of network connection. Options are [Access Point] (same as infrastructure mode) and [AdHoc].
9. Select the [Security] tab.
10. Select the appropriate security method for your wireless network.

#### WPA

Choose the appropriate WPA EAP type - PEAP or TLS. Please see your network administrator for the

appropriate configuration settings.

#### WPA-PSK

Enter the appropriate pre-shared key. Please see your network administrator for the appropriate configuration settings.

#### 802.1x

Choose the appropriate 802.1x/EAP type: TLS, PEAP, or LEAP. Please see your network administrator for the appropriate configuration settings.

#### Pre-Shared Key

Same as Network Key or WEP Key. Entry methods include hexadecimal or ASCII text. If you wish to use ASCII characters, enter the network key in a string consisting of five or thirteen characters. The characters that can be used for the Network Key are: 0 - 9, A - Z, a - z, and \_.

If you wish to use a hexadecimal number, enter the network key in a string consisting of 10 to 26 characters. The characters that can be used for the network key are: 0 - 9, A - F, and a - f. For ad hoc connections, enter the same network key for all computers connected to the network. For access point (infrastructure) connection, enter the value to match the access point. For information about the access point, refer to the access point manual.

## CONNECTION TO THE NETWORK

If there is the administrator of the network, contact the network administrator for data settings prior to connecting to the network.

### Setting the network

Perform the "Setting TCP/IP" and "Confirming the computer and work group names" operations 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 [Start] -> [Control Panel].
2. Double-click the [Network and Dial-up Connections] icon. The [Network and Dial-up Connection] window will be displayed.
3. Right-click [Local Area Connection], and click [Properties] in the menu displayed. The [Local Area Connection Properties] window will be displayed.

4. Click [Internet Protocol (TCP/IP)] and then click [Properties]. The [Properties] window will be displayed.
5. Set the IP address:
  - **For ad hoc connection**  
Select [Use the following IP address:], then enter data in [IP address] and [Subnet mask]. See page 115 for IP address setting.
  - **For access point (infrastructure) connection**  
Select [Obtain an IP address automatically] and [Obtain DNS server address automatically].

Follow directions from the network administrator about IP address settings, DNS server setting, and the default gateway.
6. Click the [OK] button. Processing will return to the [Properties] window.
7. Click the [OK] button. If a message is displayed that requests you to restart the personal computer, click [Yes] and then restart the computer.

#### Confirming the computer and workgroup names



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

1. Click [Start] -> [Control Panel].
2. Double-click the [System] icon. The [System Properties] window will be displayed.
3. Click the [Network Identification] tab.
4. Confirm the settings of [Full computer name] and [Work group].
  - The setting of [Full computer name] denotes the name for identifying the computers on the network. Any name can be assigned. The computer name will be identified more easily if the model number, the user name, and other factors are already set.
  - [Workgroup] denotes the group name of the network.
5. To change the name, click [Properties], then proceed in accordance with the instruction messages displayed on the screen. Processing will return to the [System Properties] window.

#### 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 workgroup to be accessed.

- Click the [OK] button. If a message is displayed that requests you to restart the personal computer, click [Yes].

**Setting the sharing function**

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

- Click [Start] -> [Control Panel].
- Double-click the [Network and Dial-up Connections] icon. The [Network and Dial-up Connections] window will be displayed.
- Right-click [Local Area Connection], and click [Properties] in the menu displayed. The [Properties] window will be displayed.
- If [File and Printer Sharing for Microsoft Networks] is displayed, proceed to step 5. If [File and Printer Sharing for Microsoft Networks] is not displayed, skip to step 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" on page 102.
- Click [Install]. The [Select Network Component Type] window will be displayed.
- Click [Service], and then click the [Add] button. The [Select Network Service] window will be displayed.
- 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.
- Click the [OK] button.

**Setting the file-sharing function**

The procedure for setting the file-sharing function is laid down below taking the "work" folder within drive C as an example.

- Double-click [My Computer] on the Desktop, and then double-click [Local Disk (C:)].
- Right-click the "work" folder (or whichever folder you wish to share), and click [Sharing...] in the menu displayed. The [Properties] window will be displayed.
- Select the [Sharing] tab if it isn't already selected.
- Select [Share this folder], then enter data as required:
  - "Share name"  
Enter the name of the folder to be shared.
  - "Comment"  
Enter explanatory statements or notes about the folder to be shared.
  - "User limit"  
Enter the number of users who share the folder.
  - [Permissions]  
Click the [Permissions] button to set permission levels for access to the folder.
  - [Caching]  
Click the [Caching] button to configure settings for the off-line access to the folder.
- 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**

- Click [Start] -> [Printers]. A list of connected printers will be displayed.
- 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.
- Click the Sharing tab if it is not already selected.
- Check the [Shared as] checkbox and confirm the name of the printer to be shared or enter a new name. Click [OK]. Printer sharing will be set and the display of the icon for the printer will change.

**Confirming connection**

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

In the case of an 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. Double-click [My Network Places] on the Desktop. The [My Network Places] window will be displayed.
2. Double-click the [Computers Near Me] icon. The personal computers connected to the network will be listed.
3. Double-click the name of the personal computer to which you wish to connect your own personal computer. The folder that specified in "Setting the file-sharing function" on page 102 will be displayed.
4. Double-click the folder to be accessed. The contents of the folder will be displayed.

### Confirming the radio status

1. Right-click the Atheros Wireless icon in the lower right corner of the screen.
2. Click [Open Client Utility]. The Atheros Client Utility window opens.
3. On the Current Status tab, 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.)
  - **Profile Name**  
The current configuration profile is displayed.
  - **Network Type - Configured Network Type**  
[Access Point] or [AdHoc] will be displayed.
  - **Current Mode**  
Indicates the frequency and data rate currently used by the radio.
  - **Current Channel**  
The channel number currently used by the radio.
  - **Link Status**  
Displays the current connected state of the WLAN module.
  - **Encryption Type**  
Displays the encryption type currently used by the radio.
  - **IP Address**  
Displays the current TCP/IP address assigned to the WLAN adapter.

On the Current Status tab, click the [Advanced] button. The following information will be displayed.

- **Country**  
The country with the country code for which the radio is configured.

- **Transmit Power Level**  
Displays the current transmit power level of the radio.
- **Network Name (SSID)**  
Displays the Network Name (SSID) currently used by the radio.
- **Power Save Mode**  
Displays the configured Power Save Mode currently used by the radio. [Off], [Normal], or [Maximum] will be displayed.
- **BSSID**  
Displays the Basic Service Set Identifier. This is typically the MAC address of the Access Point or in the case of AdHoc networks, is a randomly generated MAC address.
- **Frequency**  
Displays the center frequency currently being used by the radio.
- **Transmit Rate**  
Displays the current data rate used by the radio to transmit data.
- **Receive Rate**  
Displays the current data rate used by the radio to receive data.

## Other settings

### SETTING OF POWER-SAVING FUNCTION

You can set the power-saving function of wireless LAN. Default setting is auto-setting. In case of using the power-saving function, manually control the communication performance.

#### Intel PROSet Wireless LAN:

1. Click [Start] -> [(All) Programs] -> [Intel Network Adapters] -> [Intel(R) PROSet]. The Intel(R) PROSet window will be displayed.
2. Click the [Adapter] tab.
3. Click the [Configure] button in [Power settings]. The [Power settings] window will be displayed.
4. Select [Manual], and adjust the bar to set the power-saving function.

#### Setting of transmission power during ad hoc connection

By controlling the transmission power during ad hoc connection, you can broaden or narrow the communication range. This setting is only effective during ad hoc connection. It will be ineffective during access point connection.

#### Intel PROSet Wireless LAN:

1. Click [Start] -> [(All) Programs] -> [Intel Network Adapters] -> [Intel(R) PROSet]. The Intel(R) PROSet window will be displayed.
2. Click the [Adapter] tab.
3. Click the [Configure] button in [Power settings]. The [Power settings] window will be displayed.
4. Adjust the "Transmission Power (Ad Hoc)" bar to set the transmission power.

#### Setting of channels during ad hoc connection

You can set channels during ad hoc connection. Channel 11 is set by default. When connecting to an existing ad hoc network, no channel setting will be effective.

This setting is only effective during ad hoc connection; it will be ineffective during access point connection.



When changing channels during ad hoc connection, change the channel settings of all connected computers with the same Network name (SSID) at the same time. After changing the channels, turn off all computers and -- after they are all turned off -- turn them back on.

#### Intel PROSet Wireless LAN:

1. Click [Start] -> [(All) Programs] -> [Intel Network Adapters] -> [Intel(R) PROSet]. The Intel(R) PROSet window will be displayed.
2. Click the [Adapter] tab.
3. Click the [Configure] button in [Ad hoc settings]. The [Ad hoc settings] window will be displayed.
4. Change channels during ad hoc connection by selecting a new channel from the drop down list.
5. Click [OK].

#### Atheros Wireless LAN:

1. Click on the My Computer icon. Select [View system information] from the left frame.
2. Select the Hardware tab and click [Device Manager].
3. Double-click "Atheros BCM4306 Wireless LAN Adapter" under [Network Adapters].
4. In the Atheros BCM4306 Wireless LAN Adapter window, select the Advanced tab.
5. Select IBSS Channel Number from the list, and change the value from the [Value:] dropdown list to the desired channel.
6. Click [OK].

## 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
<b>Unavailable network connection</b>	Incorrect network name (SSID) or network key	<p><b>Ad hoc connection:</b> 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.</p> <p><b>Access Point (Infrastructure) connection:</b> set the network name (SSID) and network key to the same values as those of the access point.</p> <p>Set the Network Authentication value identically to that of the Access Point. Please consult your network administrator for this value, if necessary.</p> <p>For the method of setting network authentication, refer to the following pages:· Windows XP: "Assigning parameters" on page 99· Windows 2000: "Assigning parameters" on page 105</p>
	Poor radio wave condition	<p>Ad hoc connection: Retry connection after shortening the distance to the destination computer or removing any obstacles for better sight.</p> <p>Access Point (Infrastructure) connection: Retry connection after shortening the distance to the access point or removing any obstacles for better sight.</p> <p>To check the wave condition, refer to the following pages:· Windows XP: "Confirming the status of the radio waves" on page 103· Windows 2000: "Confirming the status of the radio waves" on page 108</p>
	Radio wave transmission has stopped	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 98.
	The computer to be connected is turned off	Check if the computer to be connected is turned ON.
	Active channel duplication due to multiple wireless LAN networks	If there is any other wireless LAN network nearby, change channels to avoid active channel duplication. For the method of checking active channels, refer to the following pages:· Windows XP: "Confirming the status of the radio waves" on page 103· Windows 2000: "Confirming the status of the radio waves" on page 108
	No right of access to the network to be connected	Check if you have a right of access to the network to be connected with.
	Incorrectly-performed network setting	Check the protocol, work group name or shared setting. For the method of checking, refer to the following pages:· Windows XP: "Connection to the Network" on page 101· Windows 2000: "Connection to the Network" on page 106
	Unmatched [Network authentication (shared mode)] settings in Windows XP	If the setting of [Network authentication (shared mode)] is not matched with that of access point or computer to be connected with, no communication can be established. Check the parameter setting. Refer to "Assigning parameters" on page 99.

Problem	Possible Cause	Possible Solution
<b>Unavailable network connection (continued)</b>	It takes too long to retrieve the network and display the connected computers.	Retrieve computers as follow: <b>Windows XP:</b> 1. Click [Start] button, then click [Search]. 2. Click [Computers or people]. 3. Click [Computers on the network]. 4. Input the name of computer to be connected with in [Computer name] and click [Search]. 5. Double-click the icon of connected computer. <b>Windows 2000:</b> 1. Click [Start] -> [Find] -> [Files and folders]. 2. Click [Computer] in [Find other items]. 3. Input the name of computer to be connected with in [Computer name] and click [OK]. 4. Double-click the icon of connected computer.
	Incorrect setting of IP address	Check the network setting. <b>Windows XP:</b> "Setting the network" on page 101. <b>Windows 2000:</b> "Setting the network" on page 106 In case of using TCP/IP protocol, you can check IP address as follows: 1. <b>Windows XP:</b> Click [Start] -> [All programs] -> [Accessories] -> [Command prompt]. <b>Windows 2000:</b> Click [Start] button -> [Program] -> [Accessories] -> [Command prompt]. 2. In [Command prompt] or [MS-DOS prompt] window, input [IPCONFIG] command as follows, then press [Enter] key. Example: In case of C drive being the hard disk: C:\ipconfig [Enter] Check that the IP address is correctly displayed: IP Address.....: 10.0.1.3 Subnet Mask.....: 255.255.255.0 Default Gateway.....: 10.0.1.1 When IP address is displayed as [169.254.XXX.YYY] or [0.0.0.0], IP address is not correctly fetched from the access point. In that case, restart the computer itself. If the display is still unchanged, check the setting of TCP/IP. If [Cable Disconnected] or [Media Disconnected] is displayed without showing IP address, check the setting of network name (SSID) and network key. Also, set the network authentication according to the access point.

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Problem	Possible Cause	Possible Solution
<b>Communication is disconnected soon after connection to the access point</b>	Access control may be disabled	<p>In case of Windows XP, check the setting of "Enable network access control using IEEE 802.1X". Refer to "Assigning parameters" on page 99.</p> <p>When restricting the access of wireless LAN clients using IEEE802.1X authentication, put a check mark on "Enable network access control using IEEE 802.1X".</p> <p>When using at home, remove a check mark on "Enable network access control using IEEE802.1X".</p> <p>For the method of setting related with IEEE802.1X authentication, refer to the access point manual.</p>



## Wireless LAN Glossary

### Ad hoc

A designation for wireless LAN network configuration. It indicates a form of communication limited to those personal computers which have wireless LAN function. For details, refer to "Ad hoc connection" on page 96.

### Channel

The frequency band of wireless LAN to be used in communications over wireless LAN or at the access point.

### DHCP (Dynamic Host Configuration Protocol)

A protocol used for automatically fetching communication parameters such as IP addresses. The side which assigns IP address is called DHCP server and the side that is assigned it is called DHCP client.

### DNS (Domain Name System)

A function that controls the correspondence of IP addresses assigned to a computer with the name. Even for those computers whose IP addresses are unknown, if their names are known, it is possible to communicate with them.

### IEEE802.11a

One of the wireless LAN standards prescribed by the 802 committee in charge of establishing standards of LAN technology in IEEE (Institute of Electrical and Electronic Engineers). It allows communications at the maximum speed of 54 Mbps by using a 5GHz band which can freely be used without radio communication license.

### IEEE802.11b

One of the wireless LAN standards prescribed by 802 committee in charge of establishing standards of LAN technology in IEEE (Institute of Electrical and Electronic Engineers). It allows communications at the maximum speed of 11Mbps by a band of 2.4 GHz (ISM band) which can freely be used without radio communication license.

### Access point

A designation of Wireless LAN network configurations. It indicates a form of communication using an Access Point. For details, refer to "access point connection" on page 96.

### IP address

An address used by computers for communicating in TCP/IP environment. IP addresses have global and private addresses. A global address is a unique address in

the world. A private address is a unique address within a closed network.

### LAN (Local Area Network)

An environment connecting computers within a relatively small range, such as the same floor and building.

### MAC address (Media Access Control Address)

A physical address inherent to a network card. For Ethernet, the top three bytes are controlled/assigned as a vendor code. The remaining three bytes comprise the code uniquely (to avoid duplication) controlled by each vendor. As a result, there is no Ethernet card with the same physical address in the world. In Ethernet, the frame transmission/reception is performed based on this address.

### 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 authentication

The method of authentication performed by wireless LAN clients to connect with the access point. There are two types: open system authentication and shared key authentication. The type of authentication must be set to each client and also coincide with the setting of access point with which to communicate. Network authentication is sometimes called authentication mode.

### 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

One of network authentication types for wireless LAN. Since there is no check of network key upon authentication, clients can connect to the access point without

submitting correct network keys. However, in case of actual communications, the same network key must be set. Open system authentication is sometimes called Open key authentication.

**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**

One of the network authentication types for wireless LAN. Upon authentication, the access point checks whether the same network key is set to the client. If the client uses a wrong network key or the network key itself is not set, authentication is unsuccessful, allowing no communications with the access point.

**SSID (Security Set Identifier)**

See "Network name"

**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**

Indicates that the interconnectivity test of the organization which guarantees the compatible connection of wireless LAN (Wi-Fi Alliance) has been passed.

## 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:

Windows 2000: [Obtain an IP address automatically]

Windows XP: [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)

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## Specifications

Item	Specification
Type of network	Conforms to IEEE 802.11a/802.11b/g (Wi-Fi based)*
Transfer rate	(Automatic switching) 54 Mbps maximum data rate
Active frequency	802.11b/g: 2400~2473 MHz 802.11a: 4900 ~ 5850 MHz
Number of channels	802.11a: 8 independent channels 802.11b/g: 11 channels, 3 non-overlapping channels
Security	Network name (SSID) Network key (64 bits/128 bits)** WPA 1.0 compliant Supports TKIP, and WEP encryption algorithms 802.1x/EAP
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.

## Using the Bluetooth Device

The Integrated Bluetooth module is an optional device available for Fujitsu mobile computers.

### WHAT IS BLUETOOTH

Bluetooth technology is designed as a short-range wireless link between mobile devices, such as laptop computers, phones, printers, and cameras. Bluetooth technology is used to create Personal Area Networks (PANs) between devices in short-range of each other.

### WHERE TO FIND INFORMATION ABOUT BLUETOOTH

The Bluetooth module contains a robust Help user's guide to assist you in learning about operation of the Bluetooth device.

To access the Help file, click [Start] -> All Programs, and click on Toshiba. Select Bluetooth, then select User's Guide.

For additional information about Bluetooth Technology, visit the Bluetooth Web site at: [www.bluetooth.com](http://www.bluetooth.com).

### FCC Radiation Exposure Statement

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with a minimum distance of 20 centimeters between the Wireless LAN/Bluetooth antenna (located on the top edge of the LCD screen) and your body.

The transmitters in this device must not be co-located or operated in conjunction with any other antenna or transmitter

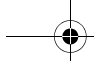
### Canadian Notice

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."

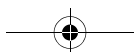
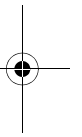
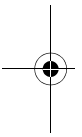
### WARRANTY

Users are not authorised to modify this product. Any modifications invalidate the Warranty.

This equipment may not be modified, altered or changed in any way without signed written permission from Fujitsu. Unauthorised modification will void the equipment authorisation from the FCC and Industry Canada and the warranty.



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