Panasonic®

OPERATING INSTRUCTIONS

Personal Computer

Model No. **CF-30** series

Contents

Getting Started

Useful Information

Troubleshooting

Appendix

Getting Started

Useful Information

Troubleshooting

Appendix

For further information about the computer, you can refer to the on-screen manual.
To access the on-screen manual
➔ page 16 "On-screen Manual"

Please read these instructions carefully before using this product and save this manual for future use.

Read Me First

Models for U.S.A.

Federal Communications Commission Radio Frequency Interference Statement

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

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

Warning

To assure continued compliance, use only shielded interface cables when connecting to a computer or peripheral. Also, any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

FCC RF Exposure Warning:

● This equipment is provided with PC Card slot that could be used with wireless transmitters, which will be specifically recommended when they become available. Other third-party wireless transmitters have not been RF exposure evaluated for use with this computer and may not comply with FCC RF exposure requirements.

<Only for model with wireless LAN/Bluetooth>

● This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment.
● This equipment has been approved for mobile operation, and unless otherwise advised in separate supplemental instructions for individual wireless transmitter(s), requires minimum 20 cm spacing be provided between antenna(s) and all person's body (excluding extremities of hands, wrist and feet) during wireless modes of operation.
● This equipment may use multiple installed transmitters, which may be capable of simultaneous transmission.

This device complies with Part 15 of the FCC Rules. 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 undesired operation.

Responsible Party: Panasonic Corporation of North America
One Panasonic Way
Secaucus, NJ 07094
Tel No:1-800-LAPTOP5 (1-800-527-8675)
6-M-1

FCC Regulation Notice for modem
This equipment contains a FCC approved modem.

FC **Tested To Comply**
With FCC Standards
FOR HOME OR OFFICE USE

1. This equipment complies with CFR47 Part 68 rules. On the computer is a label that contains, among other information, the FCC registration number and ringer equivalence number (REN) for this equipment. If required, this information must be provided to the telephone company.
2. An FCC compliant telephone cord and modular plug is provided with this equipment. This equipment is designed to be connected to the telephone network or premises wiring using a compatible modular jack which is Part 68 compliant. See Installation Instructions for details.
3. The REN is used to determine the quantity of devices which may be connected to the telephone line. Excessive RENs on the telephone line may result in the devices not ringing in response to an incoming call. In most, but not all area, 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.
4. If your telephone equipment cause harm to the telephone network, the telephone company will notify you in advice that temporary discontinuance of service may be required. But if advice 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.
5. The telephone company may take changes in its facilities, equipment, operations or procedures that could affect the operation of the equipment. If this happens the telephone company will provide advance notice in order for you to make necessary modifications to maintain uninterrupted service.
6. If trouble is experienced with this equipment, for repair or warranty information, please contact Panasonic Corporation of North America at DIAL TOLL FREE 1-800-LAPTOP5 (1-800-527-8675). 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.
7. There are no user serviceable parts contained in this equipment.
8. This equipment may not be used on coin service provided by the telephone company. Connection to party lines is subject to state tariffs.

Read Me First

9. 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 entry, or other individual sending the message and the telephone number of the sending machine or such business, other entity, or individual. In order to program this information into your fax software, you should refer to the manual of the Fax software being used.

10. According to the FCC's electrical safety advisory, we recommend that you may install an AC surge arrestor in the AC outlet to which this equipment is connected. Telephone companies report that electrical surges, typically lightning transients, are very destructive to customer terminal equipment connected to AC power sources and that this is a major nationwide problem.
"Caution : To reduce the risk of fire, use only No.26 AWG or larger telecommunication line cord."
"ATTENTION : Pour réduire le risque d'incendie, utiliser uniquement des conducteurs de télécommunications 26 AWG ou de section supérieure."

16-M-1

Notice for the products using LCD
This product has a fluorescent lamp that contains mercury. Disposal may be regulated in your community due to environmental considerations.
For disposal or recycling information, please contact your local authorities, or the Electronic Industries Alliance: <http://www.eiae.org/>

24-M-2

Models for Canada

Industry Canada (IC) Notice for modem
This equipment contains an Industry Canada approved modem unit.
The Industry Canada label is affixed on the modem unit.
EQUIPMENT ATTACHEMENT LIMITATIONS
"NOTICE: The Industry Canada label identifies certified equipment. This certification means that the equipment meets telecommunications network protective, operational and safety requirements as prescribed in the appropriate Terminal Equipment Technical Requirements document(s). The Department does not guarantee the equipment will operate to the user's satisfaction.
Before installing this equipment, users should ensure that it is permissible to be connected to the facilities of the local telecommunications company. The equipment must also be installed using an acceptable method of connection. The customer should be aware that compliance with the above conditions may not prevent degradation of service in some situations.
Repairs to certified equipment should be coordinated by a representative designated by the supplier. Any repairs or alterations made by the user to this equipment, or equipment malfunctions, may give the telecommunications company cause to request the user to disconnect the equipment.
Users should ensure for their own protection that the electrical ground connections of the power utility, telephone lines and internal metallic water pipe system, if present, are connected together. This precaution may be particularly important in rural areas. Caution: Users should not attempt to make such connections themselves, but should contact the appropriate electric inspection authority, or electrician, as appropriate."
"NOTICE: The Ringer Equivalence Number (REN) assigned to each terminal device 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 5."
REN: See bottom of the computer

RESTRICTIONS CONCERNANT LE RACCORDEMENT DE MATÉRIEL
"AVIS: L'étiquette d'Industrie Canada identifie le matériel homologué. Cette étiquette certifie que le matériel est conforme aux normes de protection, d'exploitation et de sécurité des réseaux de télécommunications, comme le prescrivent les documents concernant les exigences techniques relatives au matériel terminal. Le Ministère n'assure toutefois pas que le matériel fonctionnera à la satisfaction de l'utilisateur.
Avant d'installer ce matériel, l'utilisateur doit s'assurer qu'il est permis de le raccorder aux installations de l'entreprise locale de télécommunication. Le matériel doit également être installé en suivant une méthode acceptée de raccordement.
L'abonné ne doit pas oublier qu'il est possible que la conformité aux conditions énoncées ci-dessus n'empêche pas la dégradation du service dans certaines situations.
Les réparations de matériel homologué doivent être coordonnées par un représentant désigné par le fournisseur. L'entreprise de télécommunications peut demander à l'utilisateur de débrancher un appareil à la suite de réparations ou de modifications effectuées par l'utilisateur ou à cause de mauvais fonctionnement.
Pour sa propre protection, l'utilisateur doit s'assurer que tous les fils de mise à la terre de la source d'énergie électrique, des lignes téléphoniques et des canalisations d'eau métalliques, s'il y en a, sont raccordés ensemble. Cette précaution est particulièrement importante dans les régions rurales. Avertissement: L'utilisateur ne doit pas tenter de faire ces raccordements lui-même; il doit avoir recours à un service d'inspection des installations électriques, ou à un électricien, selon le cas."
"AVIS: L'indice d'équivalence de la sonnerie (IES) assigné à chaque dispositif terminal indique le nombre maximal de terminaux qui peuvent être raccordés à une interface. La terminaison d'une interface téléphonique peut consister en une combinaison de quelques dispositifs, à la seule condition que la somme d'indices d'équivalence de la sonnerie de touts les dispositifs n'excède pas 5."
IES: Voir sous le fond de l'ordinateur

17-Ca-1

Description of Parts

A ────
EX B
PC C
MP D
E ────

F ────
G ────
H ────
I ────
J ────
K Ⓐ ① ⑪ MP 🖴 ◁MP
K 🔋 ⑫
L ⏻ ▷
K WIRELESS ⚡ 📶
M ────
N ────
O ────
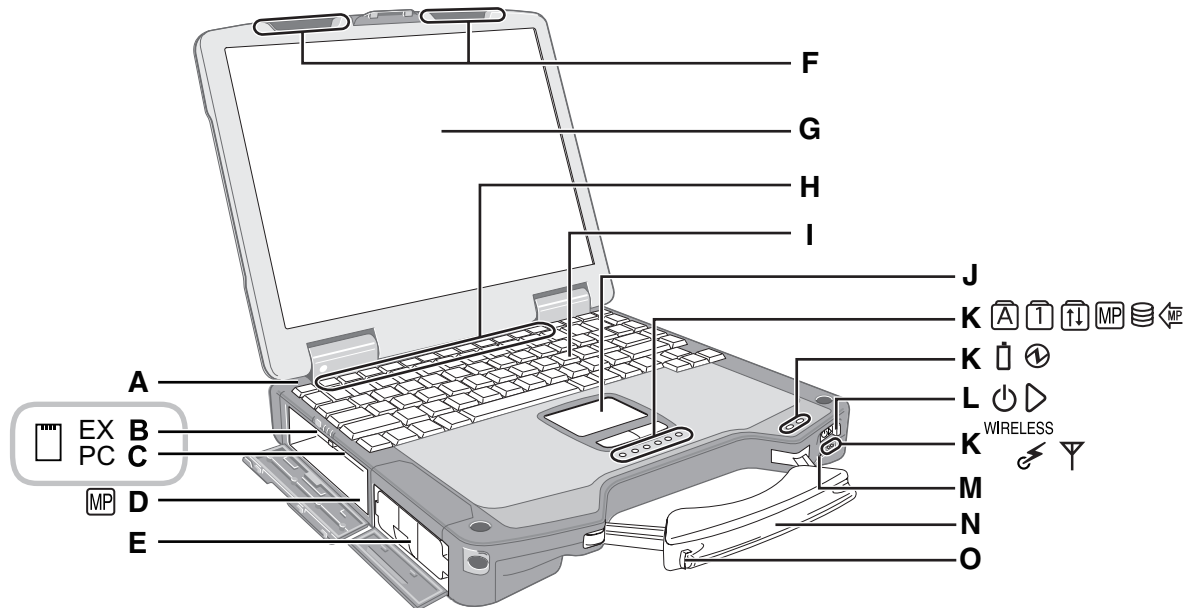
A: Bluetooth Antenna
  <Only for model with Bluetooth>
  ➔ 📖 *Reference Manual* "Bluetooth"

B: ExpressCard Slot
  ➔ 📖 *Reference Manual* "PC Card / ExpressCard"

C: PC Card Slot
  ➔ 📖 *Reference Manual* "PC Card / ExpressCard"

D: Multimedia Pocket
  ➔ 📖 *Reference Manual* "Multimedia Pocket"

E: Battery Pack
F: Wireless LAN Antenna
  <Only for model with wireless LAN>
  ➔ 📖 *Reference Manual* "Wireless LAN"

G: LCD
  <Only for model with touchscreen>
  ➔ 📖 *Reference Manual* "Touchscreen"

H: Function Key
  ➔ 📖 *Reference Manual* "Key Combinations"

I: Keyboard
J: Touch Pad
K: LED Indicator
  Ⓐ : Caps lock
  ① : Numeric key (NumLk)
  ⑪ : Scroll lock (ScrLk)
  MP : Multimedia pocket device status or the second
       battery status
       ➔ 📖 *Reference Manual* "Multimedia Pocket"
          "Battery Power"
  🖴 : Hard disk drive status
  ◁MP : Power status of the multimedia pocket

🔋 : Battery status
  ➔ 📖 *Reference Manual* "Battery Power"
⑫ : Power status
  (Off: Power off/Hibernation, Green: Power on,
  Blinking green: Standby)
WIRELESS ⚡ : Wireless ready[*1]
  This indicator lights when Wireless LAN, Blue-
  tooth, and/or Wireless WAN are connected and
  ready. It does not necessarily indicate the On/Off
  condition of the wireless connection.
    ➔ 📖 *Reference Manual* "Wireless LAN" "Blue-
       tooth" "Disabling / Enabling Wireless Commu-
       nication"
📶 : Wireless WAN status
  <Only for model with wireless WAN>
  ➔ Refer to the instruction manual of the wireless
     device

L: Power Switch
M: Wireless Switch[*1]
  ➔ 📖 *Reference Manual* "Disabling / Enabling Wire-
     less Communication"

N: Carrying Handle
O: Stylus Holder

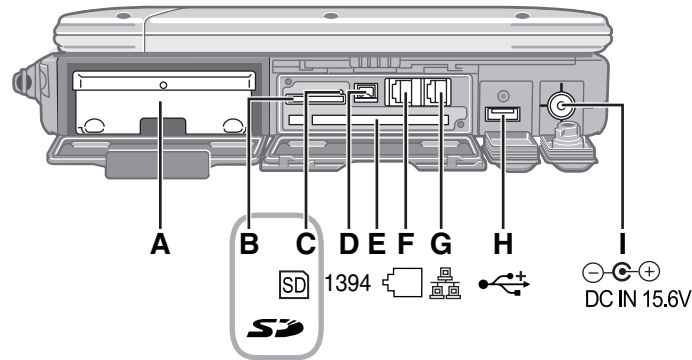[*1] **<Only for model without both wireless LAN and Bruetooth>**
  Both Wireless Switch and Wireless ready indicator are
  equipped with models without Wireless device as well.
  Wireless ready indicator lights up when Wireless Switch
  is turned on, or [Wireless Switch] is set to [Disable] ([En-
  able] in the default setting) on Setup Utility [Advanced]
  menu, but Wireless function does not work. (Do not
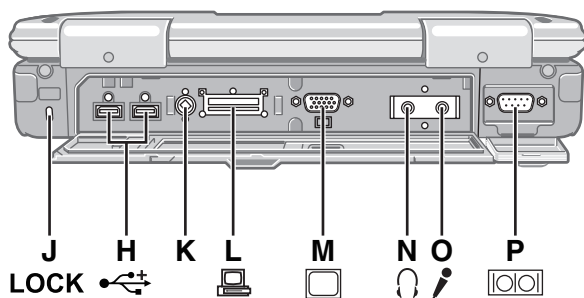 change [Wireless Switch] setting.)

Right side

A   B C   D E F G   H   I

SD 1394 ⊏⟩ 品 •⟵⟶   ⊖–C–⊕
                        DC IN 15.6V

Rear side

J   H   K   L   M   N O   P

LOCK •⟵⟶ 🖳   ▢   ⌒ ⟋ |O|O|

Bottom

Q

R
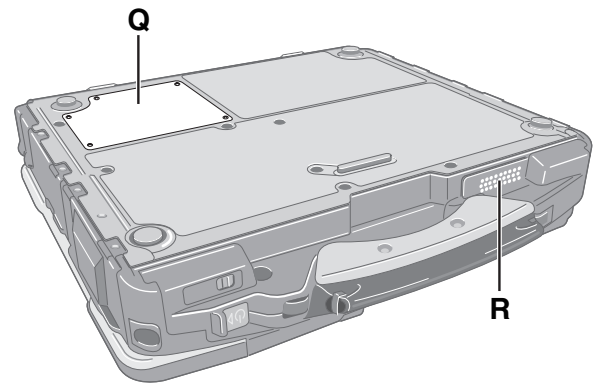
A: Hard Disk Drive
➔ 📖 *Reference Manual* "Hard Disk Drive"

B: SD Memory Card Slot
➔ 📖 *Reference Manual* "SD Memory Card"

C: SD Memory Card Indicator
(Blinking: During access)
➔ 📖 *Reference Manual* "SD Memory Card"

D: IEEE 1394 Interface Connector
➔ 📖 *Reference Manual* "IEEE 1394 Devices"

E: Smart Card Slot
<Only for model with Smart Card slot>
➔ 📖 *Reference Manual* "Smart Card"

F: Modem Port
➔ 📖 *Reference Manual* "Modem"

G: LAN Port
➔ 📖 *Reference Manual* "LAN"

H: USB Port
➔ 📖 *Reference Manual* "USB Devices"

I: DC-IN Jack

J: Security Lock
A Kensington cable can be connected.
For further information, read the manual that comes
with the cable.

K: Ext Antenna Connector

L: Expansion Bus Connector
➔ 📖 *Reference Manual* "Port Replicator"

M: External Display Port
➔ 📖 *Reference Manual* "External Display"

N: Headphone Jack
You can connect headphones or amplified speakers.
When they are connected, audio from the internal
speakers is not heard.

O: Microphone Jack
A condenser microphone can be used. If other types
of microphones are used, audio input may not be pos-
sible, or malfunctions may occur as a result.
• When recording in stereo using a stereo micro-
phone:
Double-click 🔊 in the notification area, click [Op-
tions] - [Properties], and add a check mark for [Re-
cording], click [OK] - [Options] - [Advanced Controls]
- [Advanced], remove a check mark for [Mono Micro-
phone], and then click [Close].
• When using a monaural microphone with a 2-termi-
nal plug:
With the settings outlined above, only audio on the
left track will be recorded.
When monitoring the microphone audio using head-
phones, sounds on the left track cannot be heard,
regardless of the above settings. This is a result of
the computer's specifications, and is not a malfunc-
tion.
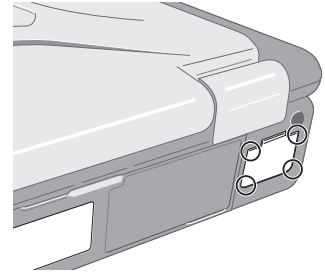
P: Serial Port

Q: RAM Module Slot
➔ 📖 *Reference Manual* "RAM Module"

R: Speaker
➔ 📖 *Reference Manual* "Key Combinations"

11

Description of Parts

To ensure waterproof integrity, close the connector covers completely. When closing the covers, push the four corners and make sure that the cover fits in completely. (The illustration is an example.)
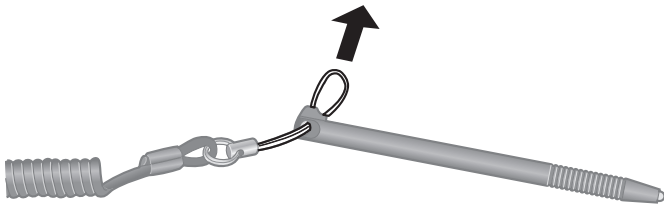
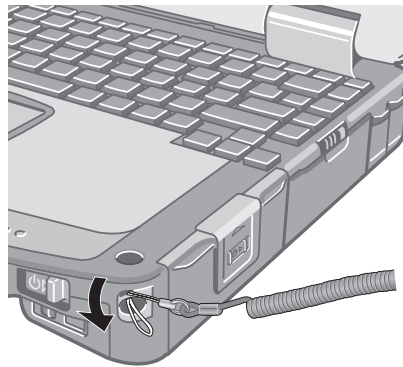## Attaching the stylus to the computer (only for model with touchscreen)

Use the tether to attach the stylus to the computer so you will not lose it. There are holes (A) to attach it.
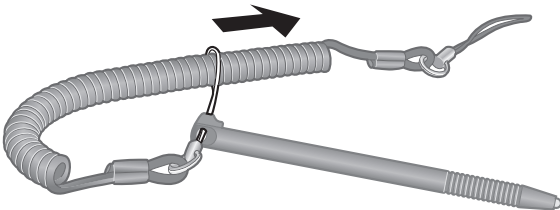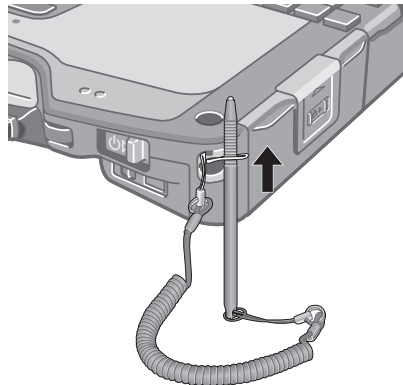
A
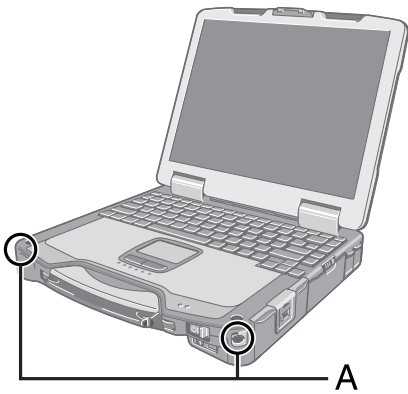
1

3

2

4

First-time Operation

■ **Preparation**

① Check and identify the supplied accessories.
If you do not find the described accessories, contact Panasonic Technical Support (➜ page 38).
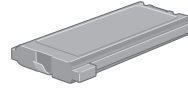
• **AC Adaptor. 1**	• **AC Cord 1**	• **Battery Pack . . . 1**	• **Modem Telephone Cable 1**

Model No: CF-AA1653A   Model No: CF-VZSU46

• **Operating Instructions (This book) . . . 1**
• **Product Recovery DVD-ROM 1**
• **Windows® Book 1**
<Only for model with touchscreen>

• **Soft Cloth 1**	• **Tether 1**	• **Stylus 1**

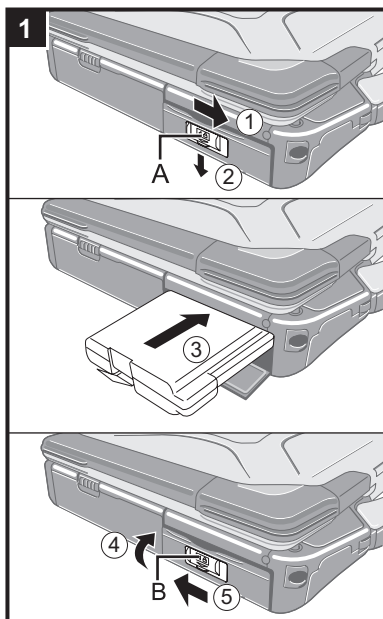(➜ 🖳 *Reference Manual* "Touchscreen")

② Read the LIMITED USE LICENSE AGREEMENT before breaking the seal on the computer's packaging (➜ page 32).

## 1   Insert the battery pack.

① Slide the latch (A) to the right to unlock the cover.
② Slide the latch (A) down, and open the cover.
③ Insert the battery pack until it securely fits the connector.
④ Close the cover until it clicks.
⑤ Slide the latch (B) to the left to lock the cover.

CAUTION

● Make sure the latch is securely locked. Otherwise the battery pack may fall when you carry the computer.
● Do not touch the terminals of the battery pack and the computer. Doing so can make the terminals dirty or damaged, and may cause malfunction of the battery pack and the computer.

First-time Operation
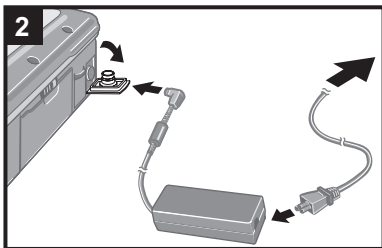
2   Connect your computer to a power outlet.

The battery charging starts automatically.

CAUTION
- Do not disconnect the AC adaptor and do not switch the wireless switch to on until the first-time operation procedure is completed.
- When using the computer for the first time, do not connect any peripheral device except the battery pack and AC adaptor.
- **Handling the AC adaptor**
  - Problems such as sudden voltage drops may arise during periods of thunder and lightning. Since this could adversely affect your computer, an uninterruptible power source (UPS) is highly recommended unless running from the battery pack alone.
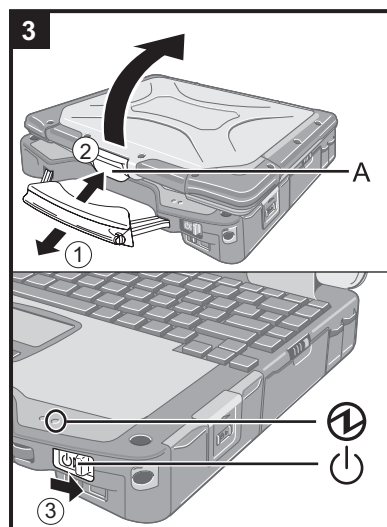
3   Turn on the computer.

① Pull the carrying handle forward.
② Push and hold the latch (A), and lift open the display.
③ Slide and hold the power switch ⏻ for approximately one second until the power indicator ⏼ lights.

CAUTION
- Do not slide the power switch repeatedly.
- The computer will forcibly be turned off if you slide and hold the power switch for four seconds or longer.
- Once you turn off the computer, wait for ten seconds or more before you turn on the computer again.
- Do not perform the following operation until the hard disk drive indicator 🖴 turns off.
  - Connecting or disconnecting the AC adaptor
  - Sliding the power switch
  - Touching the keyboard, touch pad or touchscreen (only for model with touchscreen)
  - Closing the display
- When the CPU temperature is high, the computer may not start up to prevent overheating of the CPU. Wait until the computer cools down, and then turn the power on again. If the computer does not power on even after cooling down, contact Panasonic Technical Support (➔ page 38).

4   Setup Windows.

① Follow the on-screen instructions.

CAUTION
- When you set date/time/time zone and click [Next], the screen may not go to the next step for a few minutes. Do not touch the keyboard or touch pad, and wait until the screen changes.
- If "An unexpected error has occurred…" (or a similar message) is displayed, click [OK]. This is not a malfunction.
- Wait until the hard disk drive indicator 🖴 has turned off.
- This computer periodically records the management information including the hard disk information such as number of hours powered-on, number of times powered-on, internal temperature, replacement sector. The maximum data volume for each record is 750 byte. These information are only used for estimating the cause when the hard disk goes down by any possibility. They are never sent to outside via network nor used for any other purpose except for the purpose described the above.
  To disable the function, add the check mark for [Disable the automatic save function for management information history] in [Hard Disk Status] of PC Information Viewer, and click [OK].

Specifications

This page provides the specifications for the basic model CF-30FTSAZBM/CF-30F3SAZBM.
The model number is different according to the unit configuration.

- To check the model number:
  Check the bottom of the computer or the box the computer came in at the time of purchase.
- To check CPU speed, memory size and the hard disk drive (HDD) size:
  Run the Setup Utility (➔ 🔲 *Reference Manual* "Setup Utility") and select [Information] menu.
  [CPU Speed]: CPU speed, [System Memory]: Memory size, [Hard Disk]: Hard disk drive size

■ Main Specifications

Model No.	CF-30FTSAZBM		CF-30F3SAZBM
CPU	Intel® Core™ 2 Duo Processor L7500 (1.6 GHz, 4 MB[*1] L2 cache, 800 MHz FSB)		
Chipset	Intel® GM965		
Memory[*2*4]	1 GB (4 GB Max.)		
Video Memory[*1*3]	UMA (384 MB Max.)		
Hard Disk Drive[*4]	80 GB		
Display Method	13.3 XGA type (TFT) with Touchscreen		13.3 XGA type (TFT)
Internal LCD[*5]	65,536/16,777,216 colors (800 × 600 dots/1024 × 768 dots)		
External Display[*6]	65,536/16,777,216 colors (800 × 600 dots/1024 × 768 dots/1280 × 768 dots/1280 × 1024 dots)		
Wireless LAN[*7]	➔ page 35		
Bluetooth™[*8]	➔ page 35		
LAN	IEEE 802.3 10BASE-T, IEEE 802.3u 100BASE-TX, IEEE 802.3ab 1000BASE-T		
Modem	Data: 56 kbps (V.92) FAX: 14.4 kbps		
Sound	WAVE and MIDI playback, Intel® High Definition Audio subsystem support, Monaural speaker		
Security Chip	TPM (TCG V1.2 compliant)[*9]		
Card Slot	PC Card	Type I or Type II x 1 (3.3 V: 400 mA, 5 V: 400 mA)	
	ExpressCard	ExpressCard/34[*10] or ExpressCard/54 x 1	
	SD Memory Card[*11]	x 1, Data transfer rate = 8 MB per second[*12]	
	Smart Card[*13]	ISO7816 x 1	
RAM Module Slot	200-pin, 1.8 V, SO-DIMM, DDR2 SDRAM, PC2-4200 Compliant		
Interface	USB port (4-pin, USB 2.0) x 3, Serial port (Dsub 9-pin male), Modem port (RJ-11), LAN port (RJ-45), External display port (Mini Dsub 15-pin female), Expansion Bus Connector (Dedicated 80-pin female), External Antenna Connector (Dedicated 50 Ω coaxial connector), IEEE 1394a Interface Connector (4-pin x 1), Microphone Jack (Miniature jack, 3.5 DIA, Stereo), Headphone Jack (Miniature jack, 3.5 DIA, Impedance 32 Ω, Output Power 4 mW × 2)		
Keyboard / Pointing Device	87 keys / Touch Pad / Touchscreen (Anti-Reflection, Stylus (included) touch capable)		87 keys / Touch Pad
Power Supply	AC adaptor or Battery pack		
AC Adaptor[*14]	Input: 100 V to 240 V AC, 50 Hz/60 Hz, Output: 15.6 V DC, 5.0 A		
Battery Pack	Li-ion 10.65 V, 8.55 Ah		

Operating Time[*15]	Main Battery:
	  Approx. 4 hours at set to maximum LCD brightness setting (typ: 1000 cd/m²)
	  Approx. 5 hours (typ: 500 cd/m²) to Approx. 8 hours (minimum brightness)[*16] (Approx. 7 hours[*17])
	Main Battery + Second Battery:
	  Approx. 6 hours at set to maxmum LCD brightness setting (typ: 1000 cd/m²)
	  Approx. 7.5 hours (typ: 500 cd/m²) to Approx. 12 hours (minimum brightness)[*16] (Approx. 10.5 hours[*17])
			Main Battery:
			  Approx. 5 hours (maxmum brightness) to Approx. 8 hours (minimum brightness)[*16] (Approx. 7 hours[*17])
			Main Battery + Second Battery:
			  Approx. 7.5 hours (maxmum brightness) to Approx. 12 hours (minimum brightness)[*16] (Approx. 10.5 hours[*17])

Charging Time[*15]	Power on	Main Battery: Approx. 8.5 hours Main Battery + Second Battery: Approx. 12.5 hours	
	Power off	Main Battery: Approx. 5 hours Main Battery + Second Battery: Approx. 8 hours	

Appendix

■ Main Specifications

Clock Battery	Coin type lithium battery 3.0 V
Power Consumption[18]	Approx. ●● W[19] / Approx. ●● W (Maximum when recharging in the ON state)
Physical Dimensions (W × H × D) (including the carrying handle)	302 mm × 67.5 - 69.5 mm × 292 mm {11.9" × 2.7 - 2.8" × 11.5"}
Weight (including the carrying handle)	Approx. 3.8 kg {Approx. 8.4 lb.}
Operation Environment	Temperature: 5 °C to 35 °C {41 °F to 95 °F} Humidity: 30% to 80% RH (No condensation)
Storage Environment	Temperature: -20 °C to 60 °C {-4 °F to 140 °F} Humidity: 30% to 90% RH (No condensation)
Operating System	Microsoft® Windows® XP Professional Service Pack 2 with Advanced Security Technologies (NTFS File System)
Utility Programs	DMI Viewer, Microsoft® Windows® Media Player 10, Adobe Reader, PC Information Viewer, SD Utility, Icon Enlarger, Loupe Utility, Intel® Matrix Storage Manager, Intel® PROSet/Wireless Software[7], Bluetooth™ Stack for Windows® by TOSHIBA[8] , Wireless Switch Utility, Hotkey Settings, Battery Recalibration Utility, Panasonic Hand Writing, Infineon TPM Professional Package[20], Recover Pro™ 6[20] or Recover Pro™ VX[20], Power Saving Utility, Wireless Connection Disable Utility
	Setup Utility, Hard Disk Data Erase Utility[21], PC-Diagnostic Utility

■ Wireless LAN <Only for model with wireless LAN>

Atheros WLAN (802.11b + g)[22]	
Data Transfer Rates[23]	IEEE802.11b: 11/5.5/2/1 Mbps (automatically switched) IEEE802.11g: 54/48/36/24/18/12/9/6 Mbps (automatically switched)
Standards Supported	IEEE802.11b/IEEE802.11g
Transmission method	OFDM system, DSSS system
Wireless Channels Used	IEEE802.11b/IEEE802.11g: Channels 1 to 11
RF Frequency Band	IEEE802.11b/IEEE802.11g: 2.412-2.462 GHz

■ Bluetooth™ <Only for model with Bluetooth>

Bluetooth Version	2.0 + EDR
Transmission method	FHSS system
Wireless Channels Used	Channels 1 to 79
RF Frequency Band	2.402-2.48 GHz

[1]   1MB = 1,048,576 bytes
[2]   You can physically expand the memory upto 4 GB, but the total amount of usable memory available will be less depending on the actual system configuration.
[3]   A segment of the main memory is allotted automatically depending on the computer's operating status. The size of the Video Memory cannot be set by the user.
[4]   1GB = 1,000,000,000 bytes. Your operating system or some application software will report as fewer GB.
[5]   A 16,777,216 color display is achieved by using the dithering function.
[6]   Maximum resolution depends on the specifications of the external display.
[7]   Only for model with wireless LAN
[8]   Only for model with Bluetooth
[9]   For information on TPM, click [start] - [Run] and input "c:\util\drivers\tpm\README.pdf", and refer to the Installation Manual of "Trusted Platform Module (TPM)".
[10]   When using ExpressCard/34, the card slot cover cannot be closed.
[11]   Operation has been tested and confirmed using Panasonic SD Memory Cards with a capacity of up to 2 GB.
The transfer rate using the SD Memory Card slot on this computer is 8 MB per second. (This is a theoretical value, and differs from actual speeds.)
The transfer rate is 8 MB per second even if you use an SD Memory Card that supports high-speed transfer rates.
Operation on other SD equipment is not guaranteed.
This computer supports SDHC Memory Cards (SD Memory Cards with a capacity of 4 GB or more).
This computer is not compatible with MultiMediaCards. Do not insert this kind of cards.
[12]   Theoretical value and not the actual speed. The transfer rate does not become higher even if you use a card that supports the higher transfer rate.
[13]   Only for model with Smart Card slot

35

Specifications

[*14] <Only for North America>
The AC adaptor is compatible with power sources up to 240 V AC adaptor. The computer is supplied with a 125 V AC compatible AC cord.   20-M-2-1

[*15] Varies depending on the usage conditions.

[*16] Measured using BatteryMark™ Version 4.0.1

[*17] Measured using MobileMark™ 2005 (LCD brightness: 60 cd/m^2)

[*18] Approx. ●● W when the battery pack is fully charged (or not being changed) and the computer is OFF.

[*19] Rated power consumption   23-E-1

[*20] You need to install to use the feature.

[*21] The Product Recovery DVD-ROM is required.

[*22] It does not correspond to IEEE802.11.n.

[*23] These are speeds specified in IEEE802.11a+b+g standards. Actual speeds may differ.