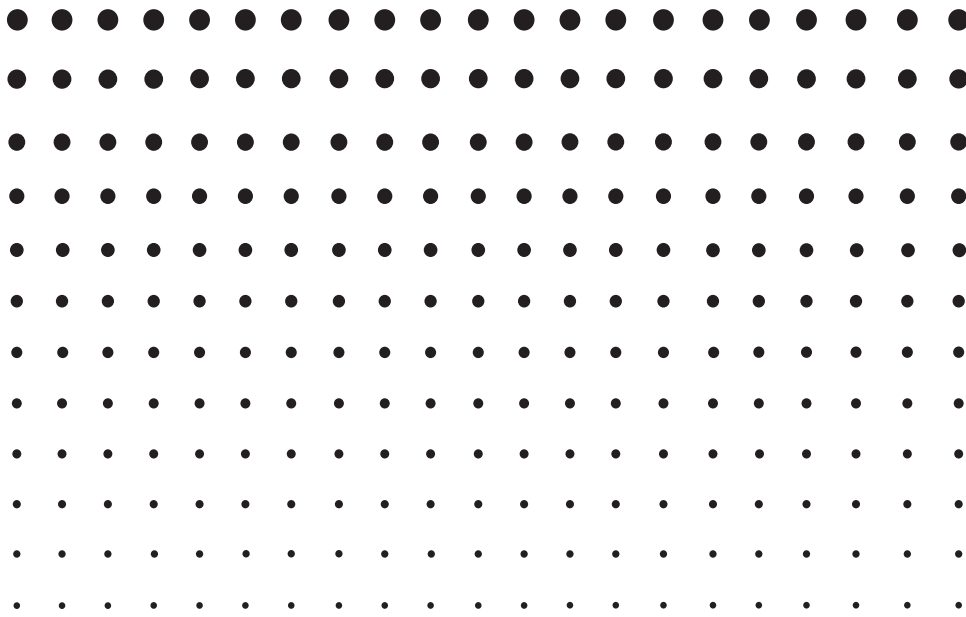


fx-CG50

Hardware User's Guide



CASIO Worldwide Education Website

<http://edu.casio.com>

Manuals are available in multi languages at

<http://world.casio.com/manual/calc>

GUIDELINES LAID DOWN BY FCC RULES FOR USE OF THIS UNIT IN THE U.S.A. (not applicable to other areas).

NOTICE

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 dealer or an experienced radio/TV technician for help.

FCC CAUTION

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Proper connectors must be used for connection to host computer and/or peripherals in order to meet FCC emission limits.

Connector SB-62	Calculator to Calculator
USB connector that comes with the fx-CG50	Calculator to Windows® compatible PC
	Calculator to Mac OS PC

Declaration of Conformity

Model Number: fx-CG50
Trade Name: CASIO COMPUTER CO., LTD.
Responsible party: CASIO AMERICA, INC.
Address: 570 MT. PLEASANT AVENUE, DOVER, NEW JERSEY 07801
Telephone number: 973-361-5400

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.

*Windows is a registered trademark of Microsoft Corporation.
Company and product names used in this manual may be registered trademarks or trademarks of their respective owners.*

Contents

Attaching and Removing the Front Cover	EN-2
Before Using the Calculator for the First Time... ..	EN-3
Precautions when Using this Calculator	EN-5
Handling Precautions.....	EN-6
Key Layout	EN-7
Display Brightness and Battery Life.....	EN-8
Specifications	EN-9
Restart and Reset	EN-11
Power Supply.....	EN-12

Be sure to keep physical records of all important data!

The large memory capacity of the unit makes it possible to store large amounts of data.

You should note, however, that low battery power or incorrect replacement of the batteries that power the unit can cause the data stored in memory to be corrupted or even lost entirely. Stored data can also be affected by strong electrostatic charge or strong impact. It is up to you to keep back up copies of data to protect against its loss.

Since this calculator employs unused memory as a work area when performing its internal calculations, an error may occur when there is not enough memory available to perform calculations. To avoid such problems, it is a good idea to leave 1 or 2 kbytes of memory free (unused) at all times.

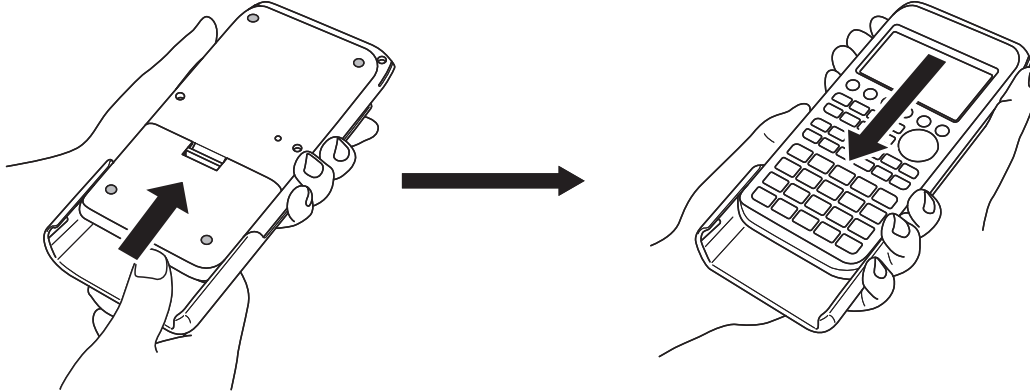
In no event shall CASIO Computer Co., Ltd. be liable to anyone for special, collateral, incidental, or consequential damages in connection with or arising out of the purchase or use of these materials. Moreover, CASIO Computer Co., Ltd. shall not be liable for any claim of any kind whatsoever against the use of these materials by any other party.

- The contents of this User's Guide are subject to change without notice.
- No part of this User's Guide may be reproduced in any form without the express written consent of the manufacturer.
- Be sure to keep all user documentation handy for future reference.

Attaching and Removing the Front Cover

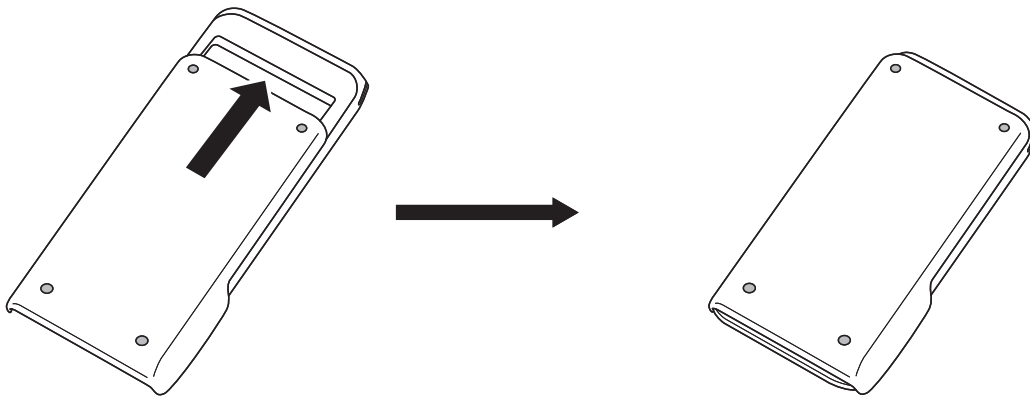
- **To remove the front cover**

Before using the calculator, remove the front cover and attach it to the back.




- **To attach the front cover**

When you are not using the calculator, attach the front cover to the front.



Important!

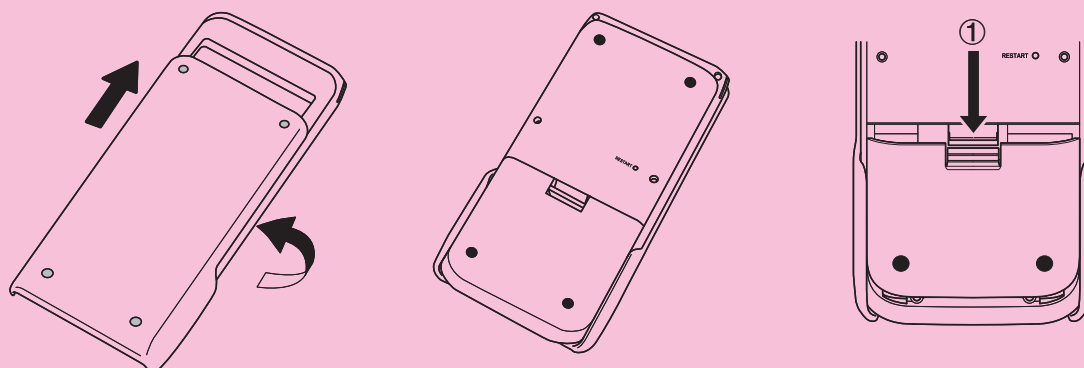
Always attach the front cover to the calculator whenever you are not using it. Otherwise, accidental operation of the  key can cause the power to turn on and run down the batteries.

Before Using the Calculator for the First Time...

Batteries are not loaded in your calculator at the factory.

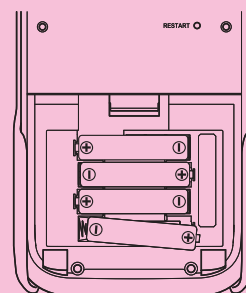
Be sure to follow the procedure below to load batteries and adjust the display brightness before trying to use the calculator for the first time.

1. Making sure that you do not accidentally press the **AC/ON** key, attach the front cover to the front of the calculator and then turn the calculator over. Remove the battery cover from the calculator by pulling with your finger at the point marked ①.



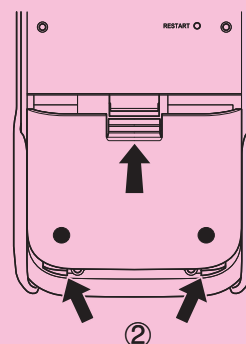
2. Load the four batteries that come with the calculator.

- Make sure that the positive (+) and negative (-) ends of the batteries are facing correctly.



3. Replace the battery cover, making sure that its tabs enter the holes marked ②.

- This automatically turns on the calculator.

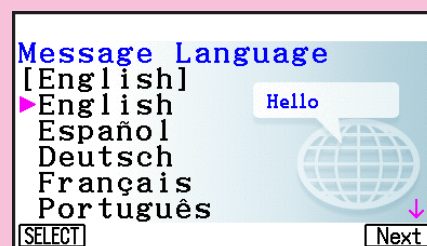


4. Turn the calculator front side up and remove the front cover from the calculator.

- Check to make sure that the message language selection screen is displayed. If this screen does not appear, press the **RESTART** button on the back of the calculator.

Important!

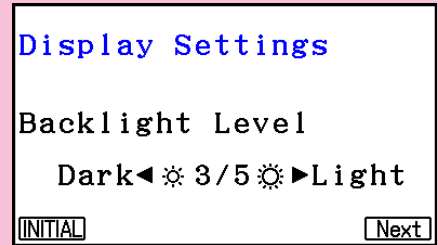
It may take a little time for your calculator to start up after you press the **RESTART** button.



5. Use the **▲** and **▼** to select the language you want, and then press **F1** (**SELECT**).

- When a language selection confirmation message appears, press **EXIT**.

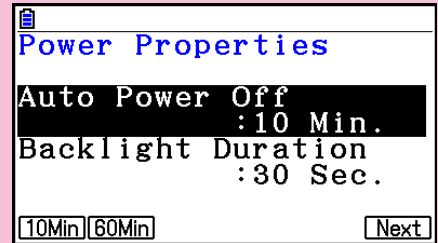
6. Press **F6** (Next). This displays the Display Settings screen.



7. Press **◀** to make the screen darker, or **▶** to make it brighter.

- **F1** (INITIAL) returns display brightness to its initial default.

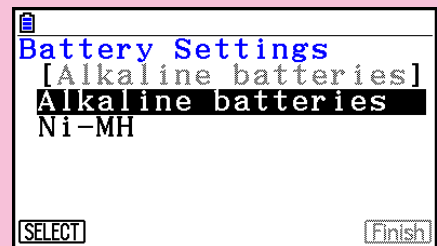
8. Press **F6** (Next). This displays the Power Properties screen.



9. Specify the auto power off trigger time.

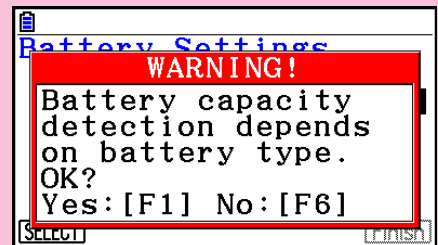
- Press **F1** (10Min) to specify approximately 10 minutes or **F2** (60Min) to specify approximately 60 minutes.

10. Press **F6** (Next). This displays the Battery Settings screen.



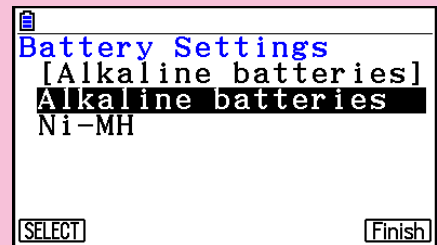
11. Use **▲** and **▼** to move the highlighting to the battery type that matches the batteries loaded in the calculator and then press **F1** (SELECT).

- If you are using the batteries that came with the calculator, select “Alkaline batteries”.
- Pressing **F1** (SELECT) causes a confirmation dialog box to appear.

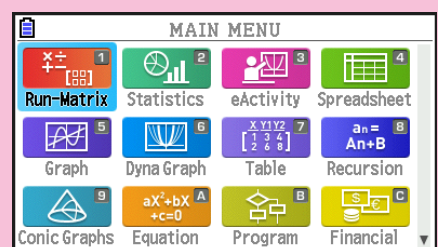


12. Press **F1** (Yes) to change the setting or **F6** (No) to cancel and return to the Battery Settings screen.

- Pressing **F1** will return to the Battery Settings screen, with “Finish” displayed for the F6 function menu item.

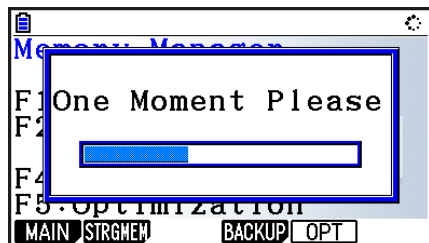


13. Press **F6** (Finish) to complete the setting procedure and display the Main Menu.

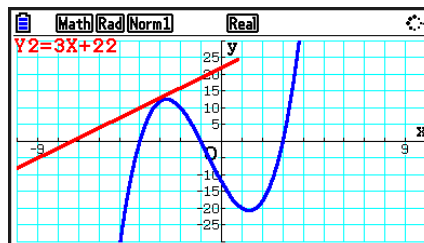


Precautions when Using this Calculator

A progress bar and/or a busy indicator appear on the display whenever the calculator is performing a calculation, writing to memory, or reading from memory.



Progress bar



Busy indicator

Never press the RESTART button or remove the batteries from the calculator when the progress bar or busy indicator is on the display. Doing so can cause memory contents to be lost and can cause malfunction of the calculator.

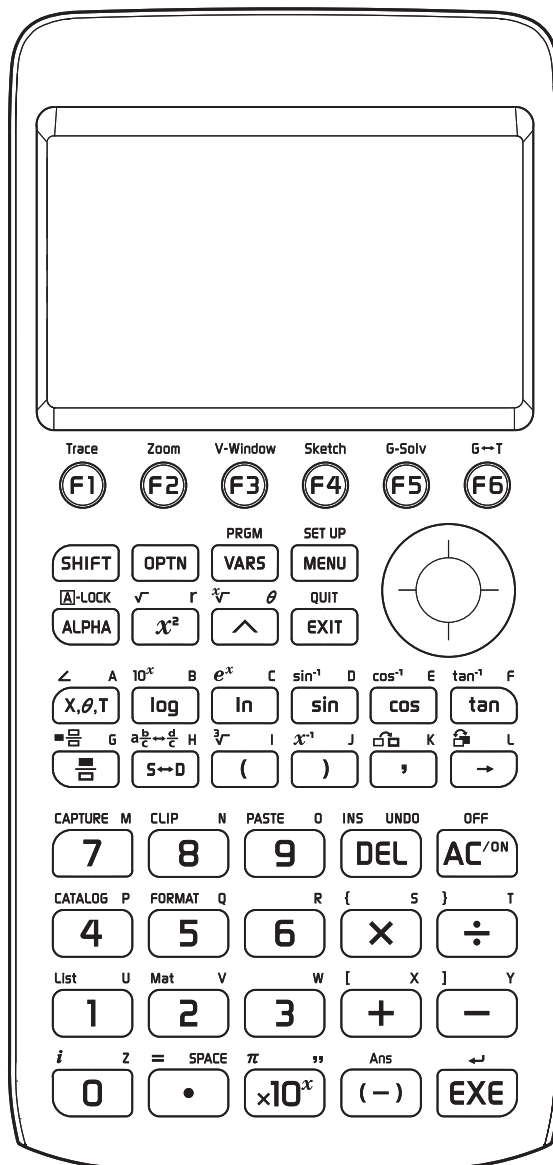
The calculator is equipped with flash memory for data storage. It is recommended that you always backup your data to flash memory. For details about the backup procedure, see “Using the Memory Manager” (page 11-1) in the separate Software User’s Guide.

You can also transfer backup files (page 11-11) to a computer by establishing a USB connection between the calculator and a computer. For information about transferring files from a computer to the calculator, see “Chapter 13 Data Communication” in the separate Software User’s Guide.

Handling Precautions

- Your calculator is made up of precision components. Never try to take it apart.
- Avoid dropping your calculator and subjecting it to strong impact.
- Do not store the calculator or leave it in areas exposed to high temperatures or humidity, or large amounts of dust. When exposed to low temperatures, the calculator may require more time to display results and may even fail to operate. Correct operation will resume once the calculator is brought back to normal temperature.
- Your calculator supports use of both alkaline batteries and rechargeable nickel-metal hydride batteries. Note that the amount of operation between charges provided by nickel-metal hydride batteries is shorter than the life of alkaline batteries. Use only batteries that are specifically recommended for this calculator.
- Replace the batteries once every one year regardless of how much the calculator is used during that period. Never leave dead batteries in the battery compartment. They can leak and damage the unit. Immediately remove nickel-metal hydride batteries from the calculator after their charge is used up. Leaving uncharged nickel-metal hydride batteries in the calculator can cause them to deteriorate.
- Keep batteries out of the reach of small children. If swallowed, consult a physician immediately.
- Avoid using volatile liquids such as thinner or benzene to clean the unit. Wipe it with a soft, dry cloth, or with a cloth that has been moistened with a solution of water and a neutral detergent and wrung out.
- Always be gentle when wiping dust off the display to avoid scratching it.
- In no event will the manufacturer and its suppliers be liable to you or any other person for any damages, expenses, lost profits, lost savings or any other damages arising out of loss of data and/or formulas arising out of malfunction, repairs, or battery replacement. It is up to you to prepare physical records of data to protect against such data loss.
- Never dispose of batteries, the liquid crystal panel, or other components by burning them.
- Be sure that the power switch is set to OFF when replacing batteries.
- If the calculator is exposed to a strong electrostatic charge, its memory contents may be damaged or the keys may stop working. In such a case, perform the Reset operation to clear the memory and restore normal key operation.
- If the calculator stops operating correctly for some reason, use a thin, pointed object to press the RESTART button on the back of the calculator. Note, however, that this clears all the data in calculator memory.
- Note that strong vibration or impact during program execution can cause execution to stop or can damage the calculator's memory contents.
- Using the calculator near a television or radio can cause interference with TV or radio reception.
- Do not use this calculator in areas where the use of electronic devices is prohibited.
- The liquid crystal panel used for the calculator's LCD incorporates high-precision technology for an effective pixel yield of at least 99.99%. Even at this level, some pixels may fail to light or may remain lit at all times. This is normal and does not indicate malfunction.
- Due to limitations of the LCD equipped in this calculator, graphic images may not appear as they do on your computer display in terms of color, etc.
- Before assuming malfunction of the unit, be sure to carefully reread this User's Guide and ensure that the problem is not due to insufficient battery power, programming or operational errors.

Key Layout



Display Brightness and Battery Life

■ Display Brightness

You can select a display brightness value in the range of 1 (least bright) to 5 (brightest). The initial factory default brightness setting is 3.

Display brightness will change to a level that is darker than 1 (least bright) if you do not perform any operation on the calculator for about 30 seconds. Performing an operation will return display brightness to the level specified by the current setting value.

For details about how to configure the display brightness setting, see “Chapter 12 System Manager” in the separate Software User’s Guide.

■ Battery Life

Battery life is affected by the display brightness and backlight duration settings. Battery life is also affected by how the calculator is used. Using a program to execute a long series of calculations, for example, will shorten battery life.

Calculator Operation	Display Brightness	Batteries	Approximate Battery Life* ¹
Repeat of following three-step cycle each hour. (1) Menu display for 5 minutes (2) Run-Matrix mode calculation for 5 minutes (3) Flashing cursor in Run-Matrix mode for 50 minutes	Display brightness settings during each of the three steps described to the left. (1) 3 for first 30 seconds, darker than 1 thereafter (2) 3 (3) 3 for first 30 seconds, darker than 1 thereafter	Alkaline	170 hours
		Nickel-metal hydride (recommended type only)	100 hours

*¹ New alkaline batteries or fully-charged new nickel-metal hydride batteries used in an ambient temperature of 25°C. Battery life values are approximate and are intended for reference only.

Specifications

Variables: 28

Calculation range:

$\pm 1 \times 10^{-99}$ to $\pm 9.999999999 \times 10^{99}$ and 0. Internal operations use 15-digit mantissa.

Exponential display range: Norm 1: $10^{-2} > |x|, |x| \geq 10^{10}$

Norm 2: $10^{-9} > |x|, |x| \geq 10^{10}$

Program capacity: 61,440 bytes (max.)

Storage memory capacity: 16MB (max.)

Power supply: Four AAA-size alkaline batteries LR03 (AM4), or four nickel-metal hydride batteries

Power consumption: 0.6 W

Approximate battery life:

- New alkaline batteries or fully-charged new nickel-metal hydride batteries used in an ambient temperature of 25°C.
- Operating Conditions
 - (a) Non-stop flashing cursor display in **Run-Matrix** mode. Each hour, display brightness 3 for first 30 seconds, and then darker than 1 thereafter.
 - (b) Repeat of one-hour cycle of (1), (2), and (3) below.
 - (1) Menu display for 5 minutes (The display brightness setting is 3 for first 30 seconds, and then darker than 1 thereafter.)
 - (2) **Run-Matrix** mode calculation for 5 minutes (display brightness 3)
 - (3) Flashing cursor in **Run-Matrix** mode for 50 minutes (The display brightness setting is 3 for first 30 seconds, and then darker than 1 thereafter.)
 - (c) Power off

Operating Conditions	(a)	(b)	(c)
Batteries			
Four AAA-size alkaline batteries LR03 (AM4)	300 hours	170 hours	1 year
Four nickel-metal hydride batteries (recommended type only)	180 hours (Reference)	100 hours (Reference)	/

* Battery life can be reduced dramatically by the conditions described below.

- Continuous program calculation execution
- Manufacturer and type of battery used, differences between individual batteries
- Operating conditions (applications used)
- Calculator settings (display brightness, backlight duration)

Auto power off:

Power is automatically turned off approximately 10 minutes or approximately 60 minutes after last operation.

Ambient temperature range: 0°C to 40°C (32°F to 104°F)

Dimensions: 18.6mm (H) × 89mm (W) × 188.5mm (D)
3/4" (H) × 3 1/2" (W) × 7 3/8" (D)

Approximate weight: 230 g (8.1 oz) (including batteries)

Data Communication

3-pin serial port

Method: Start-stop (asynchronous), half-duplex

Transmission speed (BPS):

115200 bits/second (normal)

9600 bits/second (When connected to CFX-9850G series or fx-7400G series calculator;
Send/Receive commands)

38400 bits/second (Send38k/Receive38k commands)

<115200 bits/second>

Parity: EVEN

Bit length: 8 bits

Stop bit:

Send: 1 bit

Receive: 1 bit

Includes parity (None) 1-bit

X ON/X OFF Control: None

<9600, 38400 bits/second>

Parity: None

Bit length: 8 bits

Stop bit:

Send: 3 bits

Receive: 2 bits

Includes parity (None) 1-bit

X ON/X OFF Control: None

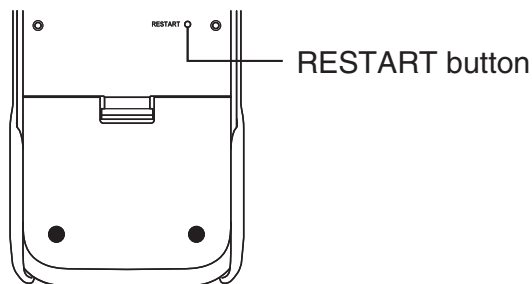
USB port

In accordance with USB 2.0 standards

Restart and Reset

• Restart

Should the calculator start to act abnormally, you can restart it by pressing the RESTART button. Note, however, that you should only use the RESTART button only as a last resort. Normally, pressing the RESTART button reboots the calculator's operating system, so programs, graph functions and other data in calculator memory is retained.



Important!

The calculator backs up user data (main memory) when you turn power off and loads the backed up data when you turn power back on.

When you press the RESTART button, the calculator restarts and loads backed up data. This means that if you press the RESTART button after you edit a program, graph function, or other data, any data that has not been backed up will be lost.

• Reset

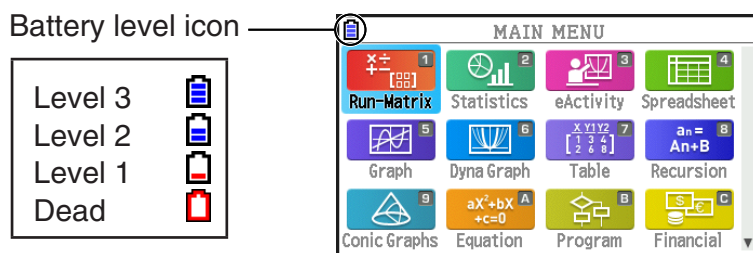
Use reset when you want to delete all data currently in calculator memory and return all mode settings to their initial defaults.

Before performing the reset operation, first make a written copy of all important data. For details, see "Reset" (page 12-4) in the separate Software User's Guide.

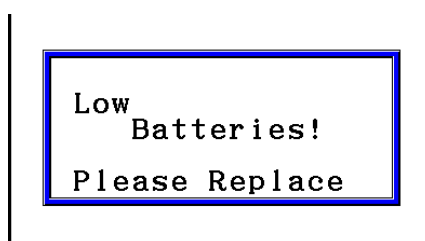
Power Supply

This calculator is powered by four AAA-size alkaline batteries LR03 (AM4), or four nickel-metal hydride batteries.

An icon in the upper left corner of the screen indicates the current battery level.



If the following message appears on the display, immediately turn off the calculator and replace the batteries as instructed.



If you try to continue using the calculator, it will automatically turn off in order to protect memory contents. You will not be able to turn power back on until you replace batteries.

Be sure to replace the batteries at least once every one year, no matter how much you use the calculator during that time.

The batteries that come with this calculator discharge slightly during shipment and storage. Because of this, they may require replacement sooner than the normal expected battery life.

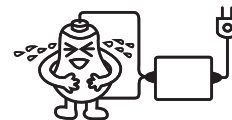
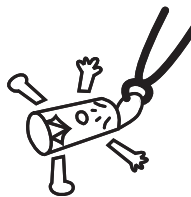
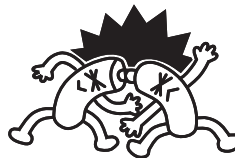
■ Replacing Batteries

Precautions:

Incorrectly using batteries can cause them to burst or leak, possibly damaging the interior of the calculator. Note the following precautions:

- Use only the batteries that are specifically listed in “Recommended Batteries” (page EN-13). Never use any other type of batteries.
- Be sure that the positive (+) and negative (–) poles of each battery are facing in the proper directions.
- Never mix batteries of different brands or models.
- When using nickel-metal hydride batteries, make sure to fully charge the batteries before use.
- For details about how to charge nickel-metal hydride batteries, see the user documentation that comes with the batteries.
- Note that the amount of operation between charges provided by nickel-metal hydride batteries may be shorter than the life of alkaline batteries.

- Never mix batteries of different types.
- Never mix old batteries and new ones.
- Never leave dead batteries in the battery compartment.
- Remove the batteries if you do not plan to use the calculator for long periods.
- Never try to recharge the batteries supplied with the calculator.
- Do not expose batteries to direct heat, let them become shorted, or try to take them apart.
- For details about how to use batteries, see the user documentation that comes with the batteries.



(Should a battery leak, clean out the battery compartment of the calculator immediately, taking care to avoid letting the battery fluid come into direct contact with your skin.)

Keep batteries out of the reach of small children. If swallowed, consult with a physician immediately.

• Recommended Batteries

AAA-size alkaline batteries:

LR03 (AM4)

AAA-size nickel-metal hydride batteries:

Duracell rechargeable

Energizer rechargeable

Panasonic eneloop (SANYO eneloop)

• To replace the batteries

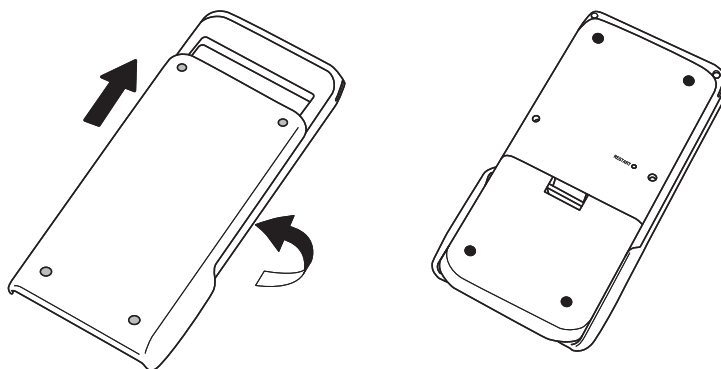
Important!

- Never turn on the calculator while the batteries are removed or not loaded correctly. Doing so can cause memory data to be deleted and malfunction of the calculator. If mishandling of batteries causes such problems, correctly load batteries and then perform the restart operation to resume normal operation.
- Be sure to replace all four batteries with new ones.
- After replacing batteries, check to make sure that battery settings are configured correctly.

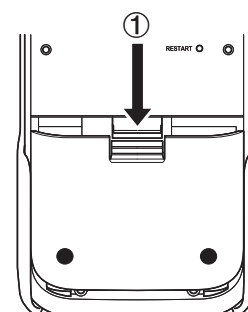
1. Press **SHIFT** **AC/ON** (OFF) to turn off the calculator.

Warning!

- Be sure to turn the calculator off before replacing batteries. Replacing batteries with power on will cause data in memory to be deleted.
2. Making sure that you do not accidentally press the **AC/ON** key, attach the front cover to the front of the calculator and then turn it over.



3. Remove the battery cover from the calculator by pulling with your finger at the point marked ①.
4. Remove the four old batteries.
5. Perform steps 2 through 13 of the procedure under “Before Using the Calculator for the First Time...” on page EN-3.



■ About the Auto Power Off Function

Calculator power turns off automatically if you do not perform any operation within the Auto Power Off trigger time you specify. You can specify either approximately 10 minutes or approximately 60 minutes as the trigger time (see “Power Properties Settings” on page 12-2 in the separate Software User’s Guide). To restore power, press **AC/ON**.

Note

Any data in calculator main memory (ongoing calculation operation, ongoing graphing operation data, etc.) is retained for approximately 60 minutes when power is turned off manually or by Auto Power Off. This means the data will be restored if you turn the calculator back on within about 60 minutes after it is turned off. If you turn the calculator back on after 60 minutes, main memory data is cleared and the initial screen of the mode you were in when you turned off the calculator will appear on the display. Storage memory contents are unchanged.

EAC

Canadian Regulatory Information
Information concernant la Réglementation Canadienne

This Class B digital apparatus complies with Canadian ICES-003.

Cet appareil numérique de la classe B est conforme à la norme NMB-003 du Canada.



Manufacturer:
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6-2, Hon-machi 1-chome, Shibuya-ku, Tokyo 151-8543, Japan
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CASIO®

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6-2, Hon-machi 1-chome
Shibuya-ku, Tokyo 151-8543, Japan

One or more of the following patents may be used in the product.
U.S.Pats. 7,927,221 8,214,413 8,576,230 8,817,027 9,007,376

SA1703-A

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