

Canon

F-502G

*Scientific Calculator /
Wissenschaftlicher Rechner /
Calculatrice scientifique /
Calculadora científica*

E ENGLISH

Instructions manual (Basic) P.2~10

G DEUTSCH

Bedienungsanleitung (Grundlagen)..... S.11~20

F FRENCH

Manuel d'instructions (Principes de base) P.21~30

ES ESPAÑOL

Manual de instrucciones (Básico) P.31~40

About Using the manual

- * This basic manual briefly introduce F-502G functions, specification and usage precautions.
- * To familiar with F-502G, you can read the **Calculation Examples** for a series of examples, operation procedure's ; and the calculation range of major functions.



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I. HOW TO USE

1) Pre-calculation Check

Before starting calculation, be sure to check:

- (A) Calculation mode from the status indicator(s), such as DEG (degree), BIN (binary), STAT (statistic) and CPLX (complex).
- (B) Display mode, such as Floating mode.

Note! If you get into trouble, press **ON/C** + **0** key to reset the calculator.

2) Keys

Power ON, OFF and Clear keys

■ First time operation:

1. Pull out the battery insulation sheet, then the battery will be loaded and the calculator can be powered on.
2. Press **ON/C** + **0** to reset the calculator.

ON/C Power ON/Clear Key: Turns the calculator on. When power is turned on, all registers except the memory registers are cleared.

Auto Power Off Function

When the calculator is not used for about **7 minutes**, the calculator will automatically power off.

-  **Power OFF Key:** Turns off the calculator when this key is pressed.
-  **Clear Entry Key:** Clears the content just entered.
-  +  **All Clear Key:**
Reset the calculator when these keys are simultaneously pressed. The memory is cleared, and the calculation mode is reset to Decimal Calculation (Floating mode).

Numeric Entry and Mode Selection Keys

-  ~  **Numeric Keys:** Enter numbers.
-  **Decimal Point Key:** Enters a decimal point.
-  **Exponential Key:** Used to enter exponents.
-  **Sign Change Key:** For changing the sign (+ or -) of the displayed mantissa or exponents.
-  **Backspace Key:** Clears the last digit entered and shifts any remaining digits one place to the right.
-  **2nd Function Key:** For performing function indicated above the keys.

Display Mode Keys

-  Engineering Exponential mode.
-  Reverse Engineering Exponential mode
-  Switch between Floating mode and Scientific Exponential mode.

Decimal Point Selection Key

-  Specifies the number of decimal places in the mantissa of decimal calculation results. Pressing  ~  after   keys to specify the number of decimal places.

Note!

To reset the decimal places, press , , then .

Degree/Radian/Gradient Mode Key

-  Changing angle units.
-   **Angle Unit Conversion Mode:**
For converting angle values to different units.
(DEG → RAD → GRAD)
- Relationship of units: $200^{\text{GRAD}} = 180^{\circ} = \pi^{\text{RAD}}$

Basic Calculation Keys

+ **-** **×** **÷** **=** **Arithmetic Keys:**

Used for basic arithmetic calculation.

%
Percent key: Used for percentage, add-on and discount calculations.

(**)** **Open, Close Parenthesis Keys**

- Up to 15 consecutive open parentheses can be used at one time.
- **(** and **)** are always used together. If either key is pressed alone during an operation, the intended result may not be obtained.

Fraction Calculation Keys

$\frac{a}{b/c}$ **Fraction Key:** Use this key to enter both mixed and improper fractions.

$\frac{d}{c}$: d (numerator) → **$\frac{a}{b/c}$** → c (denominator).

$a\frac{b}{c}$: a (integer) → **$\frac{a}{b/c}$** → b (numerator) → **$\frac{a}{b/c}$** → c (denominator)

■ The fraction $\frac{2}{3}$ is displayed as “2┘3”, and $1\frac{2}{5}$ as “1┘2┘5”.

Note!

- Fraction calculation result will be displayed in decimal format automatically whenever the total digits of a fractional value (integer + numerator + denominator + separator marks) exceeds 10.
- **$\frac{a}{b/c}$** can convert the results of fractional calculations to decimal notation, and vice versa.

$\frac{2ndF}{d/c}$ **Mixed/Improper Fraction Conversion Key:**

It converts mixed fraction to improper fraction and vice versa. It changes alternatively at each time the key is pressed.

Random Number Generation

RND
Random Key: To generate a random number between 0.000 and 0.999.

*The value being generated will differ each time.

Memory Keys

The data in the independent memory is retained even when the calculator is turned off.

- M+** **Memory Plus Key:** Add numbers to the independent memory.
- MR** **Memory Recall Key:** Retrieve the value of the independent memory.
- X-M** **Exchange Memory By Display Value:** Replaces the displayed number with the contents of the independent memory.

Binary/Octal/Hexadecimal Number Keys

$\overset{2ndF}{\square} + \overset{\triangleright DEC}{\square} / \overset{\triangleright BIN}{\square} / \overset{\triangleright OCT}{\square} / \overset{\triangleright HEX}{\square} :$

To specify the numbering system Decimal / Binary / Octal / Hexadecimal.

Binary Number Entry Keys: $\square 0 \sim \square 1$

$\square 2 \sim \square 9$ are ignored in Binary mode.

Octal Number Entry Keys: $\square 0 \sim \square 7$

$\square 8$ and $\square 9$ are ignored in Octal mode.

Hexadecimal Number Entry Keys (0~9): $\square 0 \sim \square 9$

Hexadecimal Number Entry Keys (10~15): $\overset{A}{\square} \sim \overset{F}{\square}$

Two's Complement Calculation

In computer calculations the complement is used to express negative values without using + and – signs. And subtraction is performed by adding the complement.

Complex Number Calculation

$\overset{2ndF}{\square} \overset{\triangleright CPLX}{\square} :$ To enter complex mode.

- $\square a$ **Real Part Key:** For storing the real number part in Complex mode.
- $\square b$ **Imaginary Part Key:** For storing the imaginary number part in Complex mode.

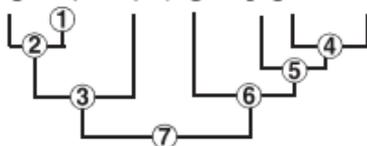
3) Order Of Operations

The calculator will automatically determine the operation priority of each individual command as follows:

HIGHEST PRIORITY

1. Calculation within parentheses ().
2. Exponent (EXP):
3. Function keys:
 x^3 , x^{-1} , $x!$, \circ , \circ , \blacktriangleright , $\blacktriangleright \circ$, \circ , $\%$
 Angle unit conversions (DRG \blacktriangleright , DRG)
 $\sqrt{\quad}$, $\sqrt[3]{\quad}$, \log , \ln , e^x , 10^x ,
 \sin , \cos , \tan , \sin^{-1} , \cos^{-1} , \tan^{-1} , \sinh , \cosh , \tanh ,
 \sinh^{-1} , \cosh^{-1} , \tanh^{-1}
4. Fractions (ab/c, b/c)
5. Negative value ((-))
6. Powers and roots: x^y , $x^{1/y}$
7. Permutations (nPr) and combinations (nCr)
8. \times , \div
9. $+$, $-$

Example: $5 \div 4^2 \times 7 + 3 \times 0.5^{\cos 60^\circ} = 4.308820344$



Levels of calculations (Stack Memory)

During actual calculation, lower precedence calculations are stored in the stack memory and then processed in turn. This stack memory can store up to 5 levels of calculations.

Example: $1 + 2 \times (\sin 30^\circ + 6 \times (2 + 3 \times 2.2)) = 105.2$
 levels

①	②	③	④	⑤

4) Statistical Calculations

Basic procedure

- Before entering Statistic mode, press $\boxed{\text{ON/C}}$ to clear the statistical calculation memory.
- Press $\boxed{\text{2ndF}}$, then $\boxed{\text{STAT}}$. The "STAT" indicator lights up.
- Press $\boxed{\text{Data}}$ and enter the first data.
- * Display will continue to blink until the number is entered.
- After entering the data, press the statistical calculation keys (e.g. \boxed{S} , $\boxed{\bar{x}}$...).
- Press $\boxed{\text{2ndF}}$, then $\boxed{\text{STAT}}$ to exit the statistical calculation mode.

Confirming/Entering statistical data:

- In Statistic mode, press $\boxed{\text{2ndF}}$, then $\boxed{\text{[EDIT]}}$ to enter Edit mode. "ED" will appear.
- Press $\boxed{\text{Data}}$. The first data number and then the contents appear. Each time you press $\boxed{\text{Data}}$, the next entry appears. Refer to calculation example P.29. To add data, you need to exit the Edit mode.
- Press $\boxed{\text{2ndF}}$, then $\boxed{\text{[EDIT]}}$ to exit Edit mode.

Output of Statistical Calculation Results

Output	Operation	Equation
Number of data sample	\boxed{n}	--
Mean of x	$\boxed{\bar{x}}$	$x = \frac{\sum_{i=1}^n \bar{x}_i}{n}$
Sample standard deviation of x	\boxed{S}	$s = \sqrt{\frac{\sum_{i=1}^n (x_i - \bar{x})^2}{(n-1)}}$
Population standard deviation of x	$\boxed{\text{2ndF}}$ $\boxed{[\sigma]}$	$\sigma^n = \sqrt{\frac{\sum_{i=1}^n (x_i - \bar{x})^2}{n}}$
Variance of sample	\boxed{S} $\boxed{[x^2]}$	$v^{n-1} = \frac{\sum_{i=1}^n (x_i - \bar{x})^2}{(n-1)}$
Variance of population	$\boxed{\text{2ndF}}$ $\boxed{[\sigma]}$ $\boxed{[x^2]}$	$v^n = \frac{\sum_{i=1}^n (x_i - \bar{x})^2}{n}$
Summation of x	$\boxed{\text{2ndF}}$ $\boxed{[\Sigma x]}$	Σx
Sum of Square	$\boxed{\text{2ndF}}$ $\boxed{[\Sigma x^2]}$	Σx^2

Note!

- If there is 'NO' data being stored, "dEL Error" will appear when \square^{2ndF} $\square^{[CD]}$ is pressed.
- The maximum number of data is 73. If you enter the 74th data, "FULL 1" appears on the display.

5) Errors

The calculator will overflow in the following instances. Further calculations will not be possible as the calculator will be electronically locked.

- When the calculation result is outside the following range:

$$x = 0, 1 \times 10^{-99} \leq |x| \leq 9.999999999 \times 10^{99}$$

x: Calculation result

- When the contents of the memory are outside the following range:

$$x = 0, 1 \times 10^{-99} \leq |x| \leq 9.999999999 \times 10^{99}$$

x: Memory contents

(The data stored before the overflow error are retained.)

- When numbers are entered outside the following range and a basic function key (+, -, ×, ÷) is pressed.

$$x = 0, 1 \times 10^{-99} \leq |x| \leq 9.999999999 \times 10^{99}$$

- When a $\div 0$ (division by 0) is performed.
- When data exceeds the range of any function or statistical calculation.
- During statistical calculation;
 - (1) If **S** is calculated with only one data Input
 - (2) To find \bar{x} , σ and **S** when $n = 0$
 - (3) When $n < 0$ or $n \geq 10^{10}$
- When stack memory overflow exceeds 5 levels.
- When more than 15 open parentheses are used at one time.

The overflow display is: (E 0.) _____

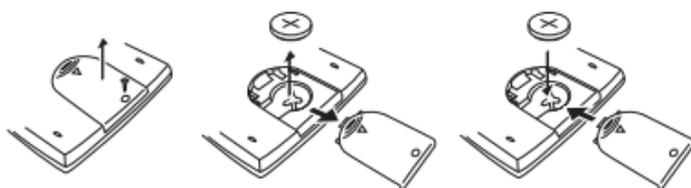
Press $\square^{ON/C}$, to clear the error.

II. BATTERY REPLACEMENT

When the display characters are dim, turn it off, replace the lithium battery immediately

Please replace the lithium battery by the following procedures:

1. Press **OFF** to power off the calculator.
2. Remove the screw that securely fixes the battery cover in place.
3. Slide the battery cover slightly and lift it.
4. Remove the old battery with ball pen or similar sharp object.
5. Load the new battery with positive "+" side facing up.
6. Replace the battery cover, screw, and press **ON/C**, **ON/C** + **0** to initialize the calculator.



Battery Replacement

CAUTION: Risk of explosion if battery is replaced by an incorrect type. Dispose of used battery according to the instruction

■ Electromagnetic interference or electrostatic discharge may cause the display to malfunction or the contents of the memory to be lost or altered. Should this occur, press **ON/C** + **0** to restart the calculator.

III. ADVICE AND PRECAUTIONS

- This calculator contains precision components such as LSI chips and should not be used in place subject to rapid variations in temperature, excessive humidity dirt or dust, or exposed to direct sunlight.
- The liquid crystal display panel is made of glass and should not be subjected to excessive pressure.
- When cleaning the device do not use a damp cloth or volatile liquid such as paint thinner. Instead, use only a soft, dry cloth.
- Do not under any circumstances dismantle his device. If you believe that the calculator is not functioning properly, either bring or mail the device together with the guarantee to service representative of Canon Business office.

- Never dispose the calculator improperly such as burning; it can create risks of personal injury or harm. You are suggested to dispose this product according to your national law.
- Do replace the battery once every two years even it is not used frequently.

Battery Caution!

- Keep the Battery out of reach of children. If the battery is swallowed, contact a doctor immediately.
- Misuse of battery may cause leakage, explosion, damages or personal injury.
- Don't recharge or disassemble the battery, it could cause a short circuit.
- Never expose the battery to high temperatures, direct heat, or dispose by incineration.
- Never leave a dead battery in the calculator as the dead battery may leak and cause damage to the calculator.
- Continue using the calculator in the low battery condition may have improper operation or the stored memory may be corrupted or lost completely. Keep the written records of important data all the time; and replace the battery as soon as possible.

■ When you are not sure the current calculations and setting mode. You are recommended to initialize the calculator to default value by pressing $\boxed{ON/C} + \boxed{0}$.

IV. SPECIFICATIONS

Power Supply : Single Lithium battery (CR2032 x 1)

Power Consumption : DC 3.0V / 0.9mW

Battery Life : Approximately 2 years
(Base on 1 hour operation per day)

Auto power off : Approx. **7 minutes**

Usable Temperature : 0° ~ 40°C (32°F ~ 104°F)

Size: 145 (L) × 83.5 (W) × 20.3 (H) mm (with cover)
5-11/16" × 3-5/16" × 13/16" (with cover)

Weight: 128 g (4.5 oz) (with cover) / 86.5 g (3.05 oz)

*Specifications are subject to change without notice.

NOTE: Calculator bottom case is made from recycled material of Canon product which might lead to black dot(s) or uneven plastic color.