CFX-9970G

CASIO

GUIDELINES LAID DOWN BY FCC RULES FOR USE OF THE 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 WARNING

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	Power Graphic Unit to Power Graphic Unit
Connector FA-122	Power Graphic Unit to PC for IBM/Macintosh Machine

Declaration of Conformity

Model Number:	CFX-9970G
Trade Name:	CASIO COMPUTER CO., LTD.
Responsible Party:	CASIO, INC.
Address:	570 MT PLEASANT AVENUE, DOVER, NEW JERSEY 07801
Telephone Number:	973-361-5400

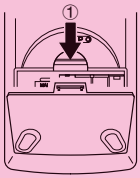
This device complies with Part 15 of FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

SA9808-003101A Printed in Japan

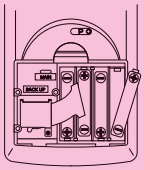
BEFORE USING THE CALCULATOR FOR THE FIRST TIME ONLY...

This calculator does not contain any main batteries when you purchase it. Be sure to perform the following procedure to load batteries, reset the calculator, and adjust the color contrast before trying to use the calculator for the first time.

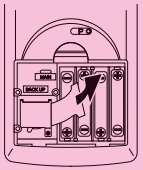
1. Slide the back cover from the unit by pulling with your finger at the point marked ①.



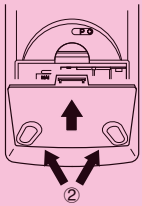
2. Load the four batteries that come with calculator.
   - Make sure that the positive (+) and negative (–) ends of the batteries are facing correctly.

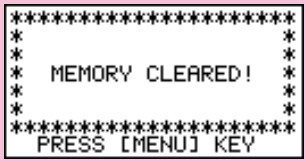


3. Remove the insulating sheet at the location marked “BACK UP” by pulling in the direction indicated by the arrow.

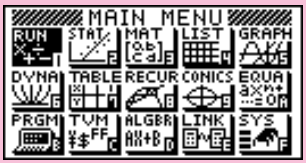


4. Replace the back cover, making sure that its tabs enter the holes marked ② in the illustration.

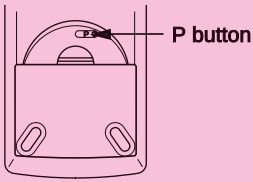




5. Press MENU .



If the Main Menu shown to the right is not on the display, press the P button on the back of the calculator to perform memory reset.



6. Use the cursor keys (▲, ▼, ◀, ▶) to select the **SYS** icon and press EXE or simply press F tan .

7. Use the cursor keys (▼, ▲) to highlight **Color Contrast** and then press EXE to display the contrast adjustment screen.

8. Adjust the display color.

• To adjust the color contrast

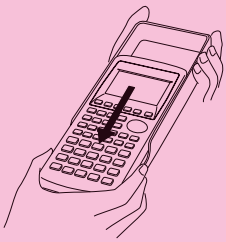
1. Use ▲ and ▼ to move the pointer to CONTRAST.
2. Press ▶ to make the figures on the display darker, and ◀ to make them lighter.

• To adjust the tint

1. Use ▲ and ▼ to move the pointer to the color you want to adjust (ORANGE, BLUE, or GREEN).
2. Press ▶ to add more green to the color, and ◀ to add more orange.

9. To exit display color adjustment, press MENU .

REMOVING AND REPLACING THE CALCULATOR'S COVER

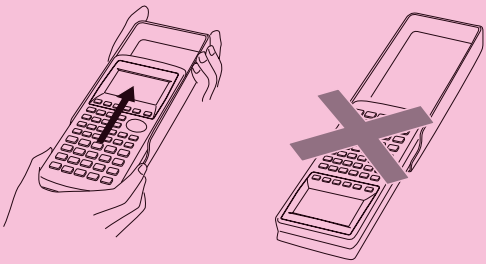


To remove the cover

Grasp the top of the cover, and slide the unit out from the bottom.

To replace the cover

Grasp the top of the cover, and slide the unit in from the bottom.



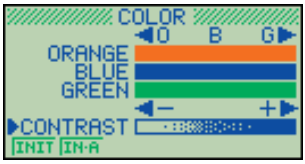
Always slide the unit into the cover with the unit's display end first. Never slide the keyboard end of the unit into the cover.

ABOUT THE COLOR DISPLAY

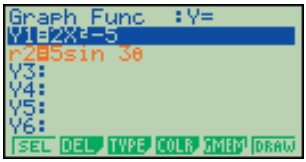
The display uses three colors: orange, blue, and green, to make data easier to understand.

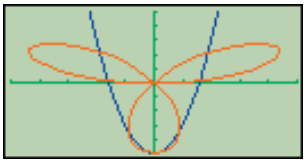
• Main Menu

• Display Color Adjustment



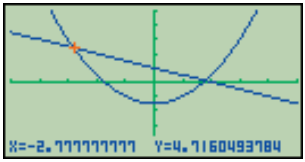
• Graph Function Menu



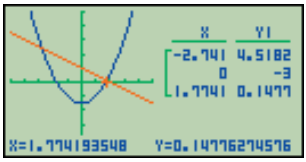


• Graph Display (Example 1)

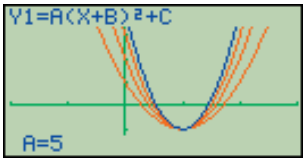
• Graph Display (Example 2)



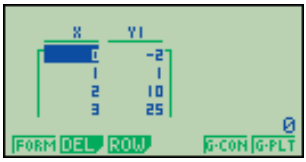
• Graph-To-Table Display



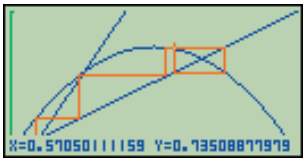
• Dynamic Graph Display



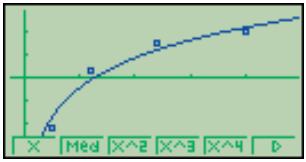
• Table & Graph Numeric Table



• Recursion Formula Convergence/ Divergence Graph Example



• Statistical Regression Graph Example



- When you draw a graph or run a program, any comment text normally appears on the display in blue. You can, however, change the color of comment text to orange or green.

Example: To draw a sine curve

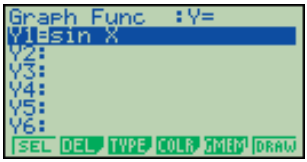
1. Enter the GRAPH Mode and input the following.

   F3 (TYPE) F1 (Y=)

   (Specifies rectangular coordinates.)

   sin X,θ,T EXE ▲

   (Stores the expression.)



F4

2. F4 (COLR)

F2

- Press the function key that corresponds to the color you want to use for the graph:
  F1 for blue, F2 for orange, F3 for green.

3. F2 (Orng)

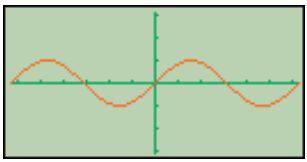
   (Specifies the graph color.)

   EXIT

F6

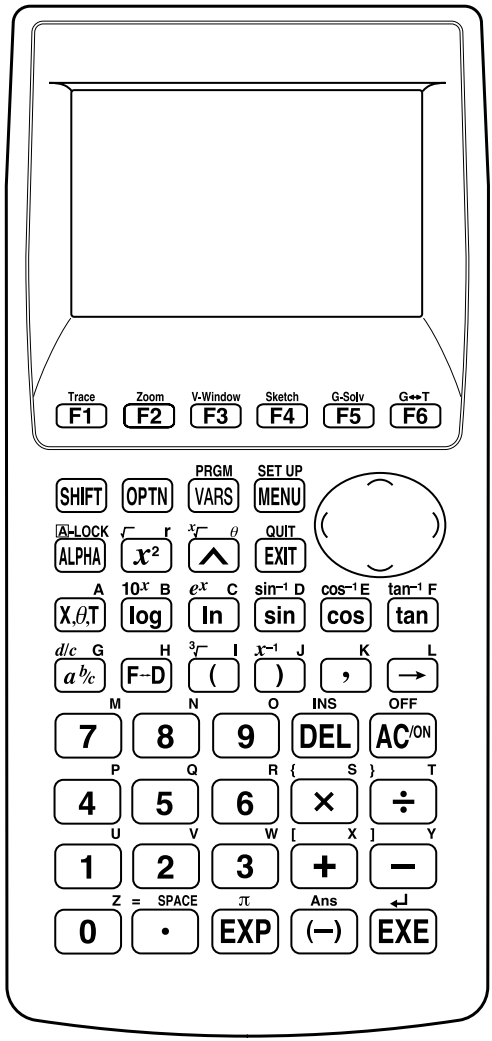
4. F6 (DRAW)

   (Draws the graph)



You can also draw multiple graphs of different color on the same screen, making each one distinct and easy to view.

KEYS

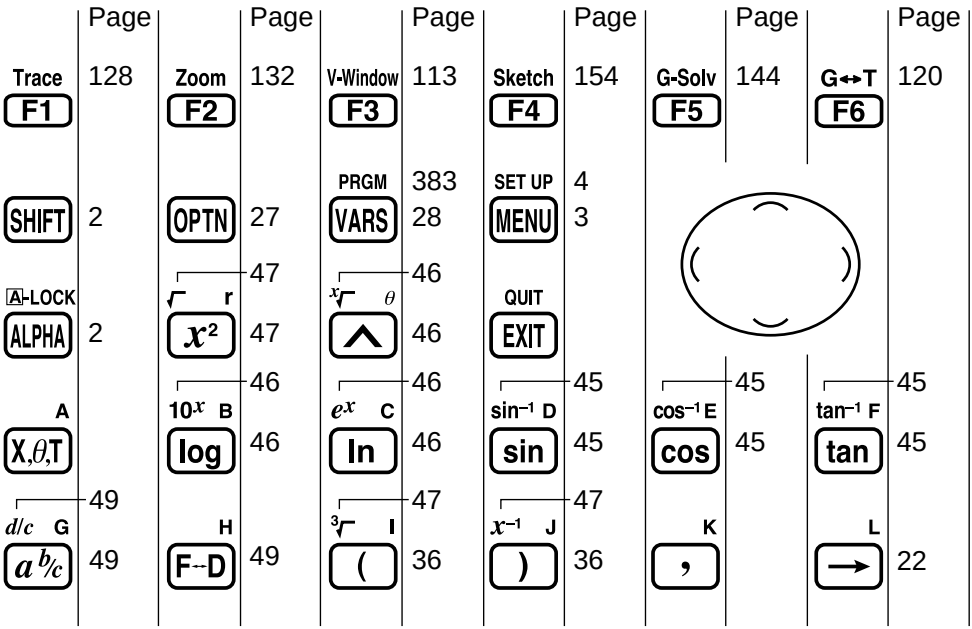


Note that pressing ÷ displays the character "/" for division, not "÷".

Alpha Lock

Normally, once you press ALPHA and then a key to input an alphabetic character, the keyboard reverts to its primary functions immediately. If you press SHIFT and then ALPHA, the keyboard locks in alpha input until you press ALPHA again.

KEY TABLE


Page
Trace
F1
128
Zoom
F2
132
V-Window
F3
113
Sketch
F4
154
G-Solv
F5
144
G↔T
F6
120
PRGM
383
SET UP
4
SHIFT
2
OPTN
27
VARS
28
MENU
3
47
46
A-LOCK
r
QUIT
ALPHA
2
x²
47
EXIT
46
46
45
45
45
A
10^x B
e^x C
sin⁻¹ D
cos⁻¹ E
tan⁻¹ F
X,θ,T
log
46
ln
46
sin
45
cos
45
tan
45
49
47
47
d/c G
H
I
J
K
L
a b/c
49
F↔D
49
36
36
22
Page
Page
Page
Page
Page
M
N
O
INS
21
OFF
7
8
9
DEL
20
AC/ON
P
Q
R
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}
T
4
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×
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÷
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W
[
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Y
1
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3
+
36
−
36
Z
=
SPACE
π
45
Ans
39
0
•
EXP
36
(−)
36
EXE

Quick-Start

Turning Power On And Off
Auto Power Off Function
Using Modes
Basic Calculations
Replay Features
Fraction Calculations
Exponents
Graph Functions
Dual Graph
Box Zoom
Dynamic Graph
Table Function

Welcome to the world of color graphing calculators and the CASIO “CFX-9970G”.

Quick-Start is not a complete tutorial, but it takes you through many of the most common functions, from turning the power on, to specifying colors, and on to graphing complex equations. When you’re done, you’ll have mastered the basic operation of the “CFX-9970G” and will be ready to proceed with the rest of this user’s guide to learn the entire spectrum of functions available.

Each step of the examples in Quick-Start is shown graphically to help you follow along quickly and easily. When you need to enter the number 57, for example, we’ve indicated it as follows:

Press [5] [7]

Whenever necessary, we’ve included samples of what your screen should look like. If you find that your screen doesn’t match the sample, you can restart from the beginning by pressing the “All Clear” button [AC/ON].

TURNING POWER ON AND OFF

To turn power on, press [AC/ON].

To turn power off, press [SHIFT] [AC/ON] (OFF).

AUTO POWER OFF FUNCTION

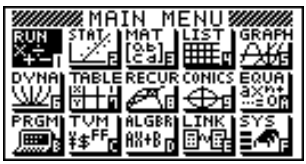
Note that the unit automatically turns power off if you do not perform any operation for about six minutes (about 60 minutes when a calculation is stopped by an output command (◢)).

USING MODES

The “CFX-9970G” makes it easy to perform a wide range of calculations by simply selecting the appropriate mode. Before getting into actual calculations and operation examples, let’s take a look at how to navigate around the modes.

To select the RUN Mode

1. Press [MENU] to display the Main Menu.



2. Use ◀ ▶ ▲ ▼ to highlight **RUN** and then press [EXE].

   This is the initial screen of the RUN mode, where you can perform manual calculations, and run programs.

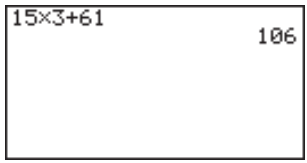
BASIC CALCULATIONS

With manual calculations, you input formulas from left to right, just as they are written on paper. With formulas that include mixed arithmetic operators and parentheses, the calculator automatically applies true algebraic logic to calculate the result.

Example: 15 × 3 + 61

1. Press [AC/ON] to clear the calculator.

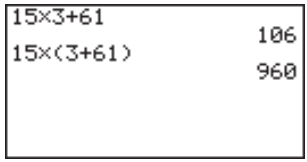
2. Press [1] [5] [×] [3] [+] [6] [1] [EXE].



Parentheses Calculations

Example: 15 × (3 + 61)

1. Press [1] [5] [×] [(] [3] [+] [6] [1] [)] [EXE].



Built-In Functions

The “CFX-9970G” includes a number of built-in scientific functions, including trigonometric and logarithmic functions.

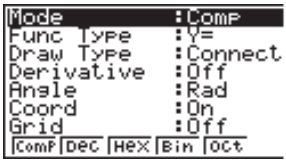
Example: 25 × sin 45°

Important!

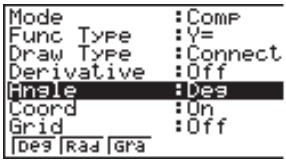
Be sure that you specify Deg (degrees) as the angle unit before you try this example.

1. Press [AC/ON].

2. Press [SHIFT] [SET UP MENU] to switch the set up display.



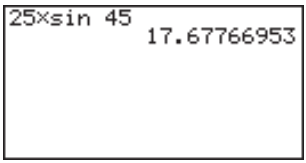
3. Press [▼] [▼] [▼] [▼] [F1] (Deg) to specify degrees as the angle unit.



4. Press [EXIT] to clear the menu.

5. Press [AC/ON] to clear the unit.

6. Press [2] [5] [×] [sin] [4] [5] [EXE].



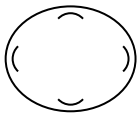
REPLAY FEATURES

With the replay feature, simply press [◀] or [▶] to recall the last calculation that was performed. This recalls the calculation so you can make changes or re-execute it as it is.

Example: To change the calculation in the last example from ($25 \times \sin 45^\circ$) to ($25 \times \sin 55^\circ$)

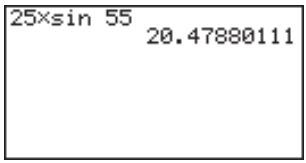
1. Press [◀] to display the last calculation.

2. Press [◀] twice to move the cursor under the 4.



3. Press [5].

4. Press [EXE] to execute the calculation again.



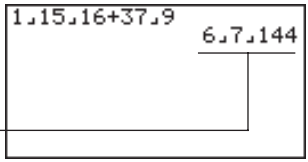
FRACTION CALCULATIONS

You can use the $a\frac{b}{c}$ key to input fractions into calculations. The symbol " ⌟ " is used to separate the various parts of a fraction.

Example: $1\ {}^{15}/_{16} + {}^{37}/_{9}$

1. Press AC/ON.

2. Press 1 $a\frac{b}{c}$ 1 5 $a\frac{b}{c}$ 1 6 + 3 7 $a\frac{b}{c}$ 9 EXE.

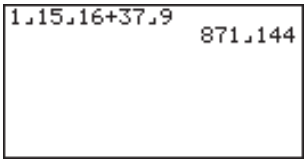


Indicates $6\ {}^{7}/_{144}$

Converting a Mixed Fraction to an Improper Fraction

While a mixed fraction is shown on the display, press SHIFT $a\frac{b}{c}$ (d/c) to convert it to an improper fraction.

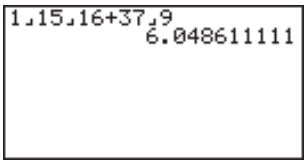
Press SHIFT $a\frac{b}{c}$ (d/c) again to convert back to a mixed fraction.



Converting a Fraction to Its Decimal Equivalent

While a fraction is shown on the display, press F↔D to convert it to its decimal equivalent.

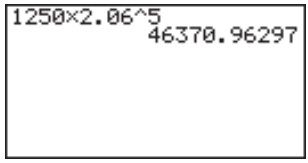
Press F↔D again to convert back to a fraction.



EXPONENTS

Example: 1250×2.06^5

1. Press [AC/ON].
2. Press [1] [2] [5] [0] [×] [2] [•] [0] [6].
3. Press [^] and the **^** indicator appears on the display.
4. Press [5]. The **^5** on the display indicates that 5 is an exponent.
5. Press [EXE].



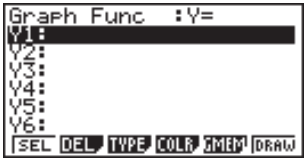
GRAPH FUNCTIONS

The graphing capabilities of this calculator makes it possible to draw complex graphs using either rectangular coordinates (horizontal axis: x ; vertical axis: y) or polar coordinates (angle: θ ; distance from origin: r).

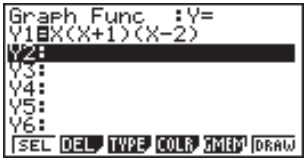
***Example* 1:** To graph Y = X(X + 1)(X – 2)

1. Press [MENU].

2. Use [◀], [▶], [▲], and [▼] to highlight **GRAPH**, and then press [EXE].

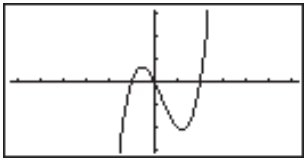


3. Input the formula.
   [X,θ,T] [(] [X,θ,T] [+] [1] [)]
   [(] [X,θ,T] [−] [2] [)] [EXE]



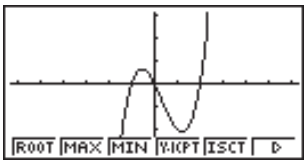
[F6]

4. Press [F6] (DRAW) or [EXE] to draw the graph.



***Example* 2:** To determine the roots of Y = X(X + 1)(X – 2)

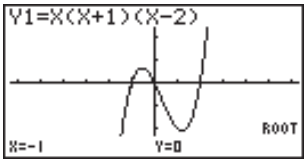
1. Press [SHIFT] [F5] (G-Solv).



[F1]

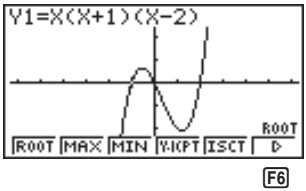
2. Press [F1] (ROOT).

   Press ▶ for other roots.



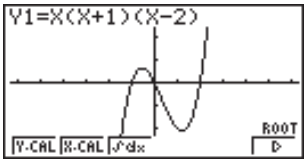
***Example* 3:** Determine the area bounded by the origin and the X = –1 root obtained for Y = X(X + 1)(X – 2)

1. Press [SHIFT] [F5] (G-Solv).



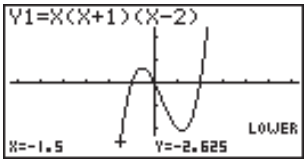
[F6]

2. Press [F6] (▷).

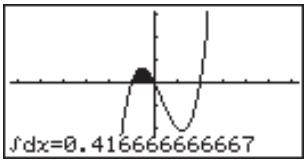


[F3]

3. Press [F3] ($\int dx$).



4. Use ▶ to move the pointer to the location where X = –1, and then press [EXE]. Next, use ▶ again to move the pointer to the location where X = 0, and then press [EXE] to input the integration range, which becomes shaded on the display.



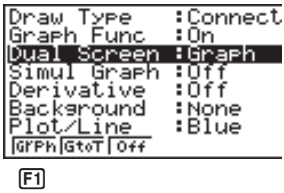
DUAL GRAPH

With this function you can split the display between two areas and display two graphs on the same screen.

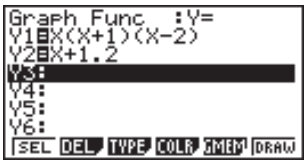
Example: To draw the following two graphs and determine the points of intersection

Y1 = X(X + 1)(X – 2)
Y2 = X + 1.2

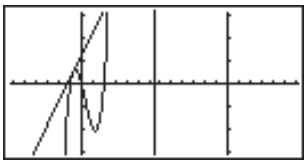
1. Press [SHIFT] [SET UP] [▼] [▼] [F1] (Grph) to specify "Graph" for the Dual Screen setting.



2. Press [EXIT], and then input the two functions.
   [X,θ,T] [(] [X,θ,T] [+] [1] [)]
   [(] [X,θ,T] [−] [2] [)] [EXE]
   [X,θ,T] [+] [1] [•] [2] [EXE]



3. Press [F6] (DRAW) or [EXE] to draw the graphs.

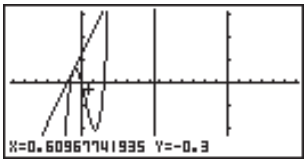


BOX ZOOM

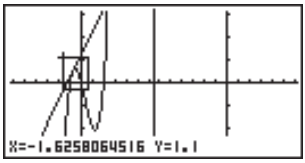
Use the Box Zoom function to specify areas of a graph for enlargement.

1. Press [SHIFT] [F2] (Zoom) [F1] (BOX).

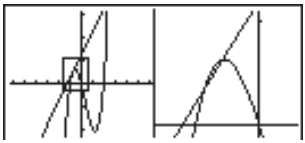
2. Use [◀], [▶], [▲], and [▼] to move the pointer to one corner of the area you want to specify and then press [EXE].



3. Use ◀, ▶, ▲, and ▼ to move the pointer again. As you do, a box appears on the display. Move the pointer so the box encloses the area you want to enlarge.



4. Press EXE, and the enlarged area appears in the inactive (right side) screen.



DYNAMIC GRAPH

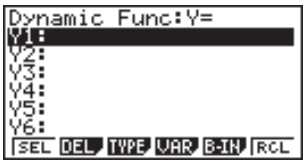
Dynamic Graph lets you see how the shape of a graph is affected as the value assigned to one of the coefficients of its function changes.

Example: To draw graphs as the value of coefficient A in the following function changes from 1 to 3

$$Y = AX^2$$

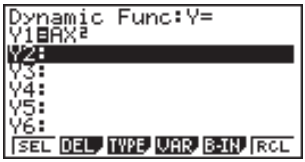
1. Press MENU.

2. Use ◀, ▶, ▲, and ▼ to highlight **DYNA**, and then press EXE.



3. Input the formula.

ALPHA A X,θ,T x^2 EXE



F4

4. Press F4 (VAR) 1 EXE to assign an initial value of 1 to coefficient A.

F2

5. Press F2 (RANG) 1 EXE 3 EXE 1 EXE to specify the range and increment of change in coefficient A.

6. Press EXIT.

7. Press F6 (DYNA) to start Dynamic Graph drawing. The graphs are drawn 10 times.

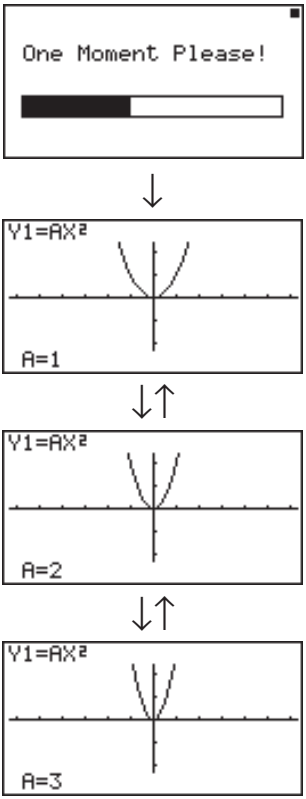


TABLE FUNCTION

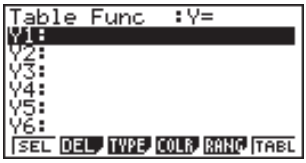
The Table Function makes it possible to generate a table of solutions as different values are assigned to the variables of a function.

Example: To create a number table for the following function

$$Y = X\,(X+1)\,(X-2)$$

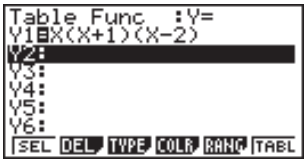
1. Press [MENU].

2. Use [◀], [▶], [▲], and [▼] to highlight **TABLE**, and then press [EXE].



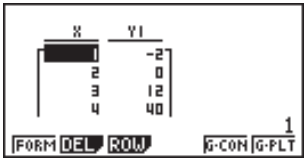
3. Input the formula.

[X,θ,T] [(] [X,θ,T] [+] [1] [)]
[(] [X,θ,T] [−] [2] [)] [EXE]



[F6]

4. Press [F6] (TABL) or [EXE] to generate the number table.



After you've completed this Quick-Start section, you are well on your way to becoming an expert user of the CASIO "CFX-9970G" Calculator.

To learn all about the many powerful features of the "CFX-9970G", read on and explore!

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.
- The display will go blank and keys will not operate during calculations. When you are operating the keyboard, be sure to watch the display to make sure that all your key operations are being performed correctly.
- Replace the main batteries once every 2 years 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.
- Keep batteries out of the reach of small children. If swallowed, consult with a physician immediately.
- Avoid using volatile liquids such as thinner or benzine to clean the unit. Wipe it with a soft, dry cloth, or with a cloth that has been dipped in 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. The user should 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.
- When the “Low battery!” message appears on the display, replace the main power supply batteries as soon as possible.
- 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 P 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.
- 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.

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.

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.
- The options described in Chapter 22 of this user's guide may not be available in certain geographic areas. For full details on availability in your area, contact your nearest CASIO dealer or distributor.

CFX-9970G

Contents

Getting Acquainted
— Read This First!

About this User's Guide

•Function Keys and Menus

- Many of the operations performed by this calculator can be executed by pressing function keys F1 through F6. The operation assigned to each function key changes according to the mode the calculator is in, and current operation assignments are indicated by function menus that appear at the bottom of the display.
- This user's guide indicates the current operation assigned to a function key in parentheses following the key cap marking for that key. F1 (Comp), for example, indicates that pressing F1 selects {Comp}, which is also indicated in the function menu.
- When {▷} is indicated in the function menu for key F6, it means that pressing F6 displays the next page or previous page of menu options.

•Menu Titles

- Menu titles in this user's guide include the key operation required to display the menu being explained. The key operation for a menu that is displayed by pressing OPTN and then {COLR} would be shown as: **[OPTN]-[COLR]**.
- F6 (▷) key operations to change to another menu page are not shown in menu title key operations.

•Command List

- The Program Mode Command List (page 468) provides a graphic flowchart of the various function key menus that shows how to maneuver to the menu of commands you need.

  Example: The following operation displays Xfct: **[VARS]**-**[FACT]**-**[Xfct]**

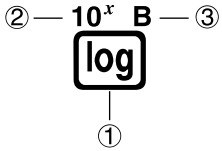
•Icons Used in This User's Guide

- The following are the meanings of the icons used in this user's guide.

 : Important  : Note  : Reference page

1. Key Markings

Many of the calculator's keys are used to perform more than one function. The functions marked on the keyboard are color coded to help you find the one you need quickly and easily.



	Function	Key Operation
①	log	log
②	10^x	SHIFT log
③	B	ALPHA log

The following describes the color coding used for key markings.

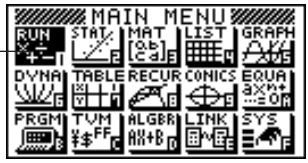
Color	Key Operation
Orange	Press SHIFT and then the key to perform the marked function.
Red	Press ALPHA and then the key to perform the marked function.

2. Selecting Icons and Entering Modes

This section describes how to select an icon in the Main Menu to enter the mode you want.

•To select an icon

1. Press [MENU] to display the Main Menu.



Currently selected icon

2. Use the cursor keys (◀, ▶, ▲, ▼) to move the highlighting to the icon you want.
3. Press [EXE] to display the initial screen of the mode whose icon you selected.

- You can also enter a mode without highlighting an icon in the Main Menu by inputting the number or letter marked in the lower right corner of the icon.
- Use only the procedures described above to enter a mode. If you use any other procedure, you may end up in a mode that is different than the one you thought you selected.

The following explains the meaning of each icon.

Icon	Mode Name	Description
	RUN	Use this mode for arithmetic calculations and function calculations, and for calculations involving binary, octal, decimal and hexadecimal values.
	STATistics	Use this mode to perform single-variable (standard deviation) and paired-variable (regression) statistical calculations, to perform tests, to analyze data and to draw statistical graphs.
	MATrix	Use this mode for storing and editing matrices.
	LIST	Use this mode for storing and editing numeric data.
	GRAPH	Use this mode to store graph functions and to draw graphs using the functions.
	DYNAmic graph	Use this mode to store graph functions and to draw multiple versions of a graph by changing the values assigned to the variables in a function.

Icon	Mode Name	Description
	TABLE	Use this mode to store functions, to generate a numeric table of different solutions as the values assigned to variables in a function change, and to draw graphs.
	RECURsion	Use this mode to store recursion formulas, to generate a numeric table of different solutions as the values assigned to variables in a function change, and to draw graphs.
	CONICS	Use this mode to draw graphs of implicit functions.
	EQUAtion	Use this mode to solve linear equations with two through six unknowns, quadratic equations, and cubic equations.
	PRoGraM	Use this mode to store programs in the program area and to run programs.
	Time Value of Money	Use this mode to perform financial calculations and to draw cash flow and other types of graphs.
	ALGeBRa	Use this mode to obtain mathematical expression results using natural mathematical display notation.
	LINK	Use this mode to transfer memory contents or back-up data to another unit.
	SYStem	Use this mode to check how much memory is used and remaining, to delete data from memory, and to initialize (reset) the calculator. It also lets you adjust display contrast.

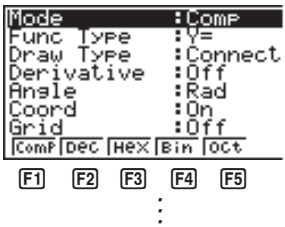
■ Using the Set Up Screen

The mode's set up screen shows the current status of mode settings and lets you make any changes you want. The following procedure shows how to change a set up.

•To change a mode set up

1. Select the icon you want and press [EXE] enter a mode and display its initial screen. Here we will enter the RUN Mode.

2. Press [SHIFT] [SETUP] to display the mode's set up screen.
   - This set up screen is just one possible example. Actual set up screen contents will differ according to the mode you are in and that mode's current settings.



3. Use the ▲ and ▼ cursor keys to move the highlighting to the item whose setting you want to change.
4. Press the function key (F1 to F6) that is marked with the setting you want to make.
5. After you are finished making any changes you want, press EXIT to return to the initial screen of the mode.

■ Set Up Screen Function Key Menus

This section details the settings you can make using the function keys in the set up display.

•Mode (calculation /binary, octal, decimal, hexadecimal mode)

P.75

- {**Comp**} ... {arithmetic calculation mode}
- {**Dec**}/{**Hex**}/{**Bin**}/{**Oct**} ... {decimal}/{hexadecimal}/{binary}/{octal}

•Func Type (graph function type)

P.123 ~ P.125

- {**Y=**}/{**r=**}/{**Parm**}/{**X=c**} ... {rectangular coordinate}/{polar coordinate}/{parametric coordinate}/{X = constant} graph

P.126

- {**Y>**}/{**Y<**}/{**Y≥**}/{**Y≤**} ... {$y>f(x)$}/{$y<f(x)$}/{$y\geq f(x)$}/{$y\leq f(x)$} inequality graph

- The X,θ,T key inputs one of three different variable names. Which variable name it inputs is determined by the {Func Type} setting you make.

•Draw Type (graph drawing method)

P.128

- {**Con**}/{**Plot**} ... {connected points}/{unconnected points}

•Derivative (derivative value display)

P.129 P.177 P.209

- {**On**}/{**Off**} ... {display on}/{display off} while Graph-to-Table, Table & Graph, and Trace are being used

•Angle (default unit of angular measurement)

P.14

- {**Deg**}/{**Rad**}/{**Gra**} ... {degrees}/{radians}/{grads}

•Coord (graph pointer coordinate display)

P.130

- {**On**}/{**Off**} ... {display on}/{display off}

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●Grid (graph gridline display)

- {**On**}/{**Off**} ... {display on}/{display off}

●Axes (graph axis display)

P.121

- {**On**}/{**Off**} ... {display on}/{display off}

●Label (graph axis label display)

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- {**On**}/{**Off**} ... {display on}/{display off}

●Display (display format)

P.14
P.15

- {**Fix**}/{**Sci**}/{**Norm**}/{**Eng**} ... {fixed number of decimal places specification}/{number of significant digits specification}/{exponential format display range toggle}/{Engineering Mode}

●Integration (Integration calculation)

P.60

- {**Gaus**}/{**Simp**} ... integration calculation using {Gauss-Kronrod rule}/{Simpson's rule}.

●Stat Wind (statistical graph view window setting method)

P.251

- {**Auto**}/{**Man**} ... {automatic}/{manual}

●Graph Func (function display during graph drawing and trace)

P.187

- {**On**}/{**Off**} ... {display on}/{display off}

●Background (graph display background)

P.140

- {**None**}/{**PICT**} ... {no background}/{graph background picture specification}

●Plot/Line (plot and line graph color setting)

- {**Blue**}/{**Orng**}/{**Grn**} ... {blue}/{orange}/{green}

●Resid List (residual calculation)

P.266

- {**None**}/{**LIST**} ... {no calculation}/{list specification for the calculated residual data}

●List File (list file specification)

P.248

- {**File 1**} to {**File 6**} ... {specification of which list file to display while using the List function}

•Dual Screen (Dual Screen Mode status)

The Dual Screen Mode settings you can make depends on whether you pressed SHIFT SET UP while in the GRAPH Mode, TABLE Mode, or RECUR Mode.

GRAPH Mode

P.168 P.176

• {**Grph**}/{**GtoT**}/{**Off**} ... {graphing on both sides of Dual Screen}/{graph on one side and numeric table on the other side of Dual Screen}/{Dual Screen off}

TABLE/RECUR Mode

P.215

• {**T+G**}/{**Off**} ... {graph on one side and numeric table on the other side of Dual Screen}/{Dual Screen off}

•Simul Graph (simultaneous graphing mode)

• {**On**}/{**Off**} ... {simultaneous graphing on (all graphs drawn simultaneously)}/{simultaneous graphing off (graphs drawn in area numeric sequence)}

•Dynamic Type (Dynamic Graph type)

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• {**Cnt**}/{**Stop**} ... {non-stop (continuous)}/{automatic stop after 10 draws}

•Locus (Dynamic Graph Locus Mode)

P.188

• {**On**}/{**Off**} ... {locus identified by color}/{locus not drawn}

•Variable (Table Generation and Graph Draw settings)

P.208

• {**Rang**}/{**LIST**} ... {use table range}/{use list data}

•Σ Display (Σ value display in recursion table)

P.224

• {**On**}/{**Off**} ... {display on}/{display off}

•Slope (display of derivative at current pointer location in implicit function graph)

• {**On**}/{**Off**} ... {display on}/{display off}

•Payment (payment period setting)

P.329

• {**BGN**}/{**END**} ... {beginning}/{end} setting of payment period

•Date Mode (number of days per year setting)

P.322

• {**365**}/{**360**} ... interest calculations using {365}/{360} days per year

* The 365-day year must be used for date calculations in the Financial Mode. Otherwise, an error occurs.

•Answer Type (type of numbers for results)

P.362

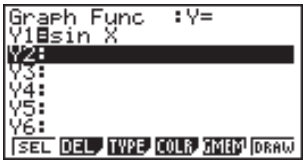
• {Real}/{Cplx} ... {use real numbers only}/{include imaginary numbers} when displaying results of processes with real number expressions.

3. Display

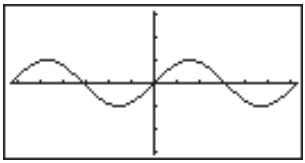
■ About the Display Screen

This calculator uses two types of display: a text display and a graphic display. The text display can show 21 columns and eight lines of characters, with the bottom line used for the function key menu, while the graph display uses an area that measures 127 (W) × 63 (H) dots.

Text Display



Graph Display



■ About Display Colors **[OPTN]-[COLR]**

The calculator can display data in three colors: orange, blue, and green. The default color for graphs and comment text is blue, but you can specify orange or green if you want.

- {**Orng**}/{**Grn**} ... {orange}/{green}
- The above setting affects the color of graphs and comment text. Specify the color you want to use before inputting the graph's function or the program comment text.

■ About Menu Item Types

This calculator uses certain conventions to indicate the type of result you can expect when you press a function key.

• Next Menu

Example: HYP

Selecting HYP displays a menu of hyperbolic functions.

• Command Input

Example: sinh

Selecting sinh inputs the sinh command.

• Direct Command Execution

Example: DRAW

Selecting DRAW executes the DRAW command.

■ Exponential Display

The calculator normally displays values up to 10 digits long. Values that exceed this limit are automatically converted to and displayed in exponential format. You can specify one of two different ranges for automatic changeover to exponential display.

Norm 1 ..... 10^{-2} (0.01) > |*x*|, |*x*| ≧ 10^{10}

Norm 2 ..... 10^{-9} (0.000000001) > |*x*|, |*x*| ≧ 10^{10}

•To change the exponential display range

1. Press SHIFT SETUP to display the set up screen.
2. Use ▲ and ▼ to move the highlighting to “Display”.
3. Press F3 (Norm).

The exponential display range switches between Norm 1 and Norm 2 each time you perform the above operation. There is no display indicator to show you which exponential display range is currently in effect, but you can always check it by seeing what results the following calculation produces.

AC 1 ÷ 2 0 0 EXE

(Norm 1)

(Norm 2)

All of the examples in this manual show calculation results using Norm 1.

•How to interpret exponential format

1.2E+12 indicates that the result is equivalent to 1.2×10^{12}. This means that you should move the decimal point in 1.2 twelve places to the right, because the exponent is positive. This results in the value 1,200,000,000,000.

1.2E–03 indicates that the result is equivalent to 1.2×10^{-3}. This means that you should move the decimal point in 1.2 three places to the left, because the exponent is negative. This results in the value 0.0012.

■ Special Display Formats

This calculator uses special display formats to indicate fractions, hexadecimal values, and sexagesimal values.

•Fractions

456⌟12⌟23
456⌟12⌟23 ..... Indicates: $456\frac{12}{23}$

•Hexadecimal Values

ABCDEF12
ABCDEF12 ..... Indicates: $ABCDEF12_{(16)}$, which equals $-1412567278_{(10)}$

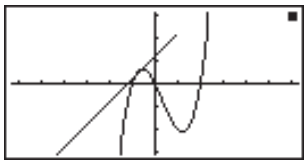
•Sexagesimal Values

12.58244
12°34'56.78" ..... Indicates: 12° 34' 56.78"

- In addition to the above, this calculator also uses other indicators or symbols, which are described in each applicable section of this manual as they come up.

■ Calculation Execution Indicator

Whenever the calculator is busy drawing a graph or executing a long, complex calculation or program, a black box (■) flashes in the upper right corner of the display. This black box tells you that the calculator is performing an internal operation.



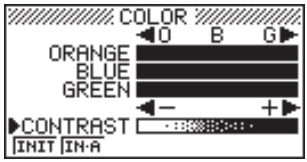
4. Color Adjustment

Adjust the color whenever objects on the display appear dim or difficult to see. There are two different settings you can make to get color the way you want it.

- Color contrast
- Tint adjustment for each color

●To display the color adjustment screen

1. Highlight the **SYS** icon in the Main Menu and then press [EXE].
2. Highlight **Color Contrast** and then press [EXE].



- {**INIT**}/{**IN·A**} ... {initialize highlighted color}/ {initialize all colors}

Use the following procedures while the color adjustment screen is on the display to adjust the color contrast and tint settings.

●To adjust the color contrast

1. Use the cursor ▲ and ▼ keys to move the pointer so it is next to CONTRAST.
2. Press the ▶ cursor key to make the display darker and the ◀ cursor key to make it lighter. Holding down either key changes the setting at high speed.

●To adjust the color tint

1. Use the cursor ▲ and ▼ keys to move the pointer so it is next to the color (ORANGE, BLUE, GREEN) whose tint you want to adjust.
2. Press the ▶ cursor key to give the color a greener tint and the ◀ cursor key to give it an orange tint. Holding down either key changes the setting at high speed.

●To exit the color adjustment screen

Press [MENU] to return to the Main Menu.

- It is recommended that you always adjust the CONTRAST setting first, and then adjust the tint settings for individual colors.

- You can change the CONTRAST setting at any time without displaying the color adjustment screen. Simply press [SHIFT] and then ◀ or ▶ to change the setting. Press [SHIFT] once again after get the display looking the way you want.

5. When you keep having problems…

If you keep having problems when you are trying to perform operations, try the following before assuming that there is something wrong with the calculator.

■ Get the Calculator Back to its Original Mode Settings

1. In the Main Menu, select the **RUN** icon and press [EXE].
2. Press [SHIFT] [SETUP] to display the set up screen.
3. Highlight “Angle” and press [F2] (Rad).
4. Highlight “Display” and press [F3] (Norm) to select the exponential display range (Norm 1 or Norm 2) that you want to use.

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5. Now enter the correct mode and perform your calculation again, monitoring the results on the display.

■ In Case of Hang Up

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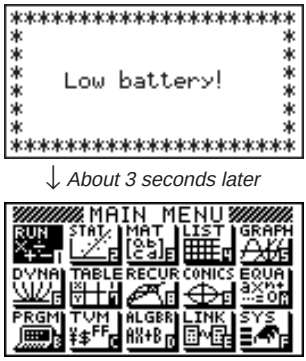
- Should the unit hang up and stop responding to input from the keyboard, press the P button on the back of the calculator to reset the memory. Note, however, that this clears all the data in calculator memory.

■ Low Battery Message

The low battery message appears whenever you press [AC/ON] to turn power on or [MENU] to display the Main Menu while the main battery power is below a certain level.

[AC/ON] or [MENU]



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If you continue using the calculator without replacing batteries, power will automatically turn off to protect memory contents. Once this happens, you will not be able to turn power back on, and there is the danger that memory contents will be corrupted or lost entirely.

- You will not be able to perform data communications operations once the low battery message appears.