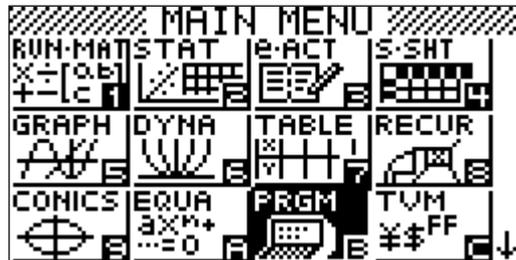


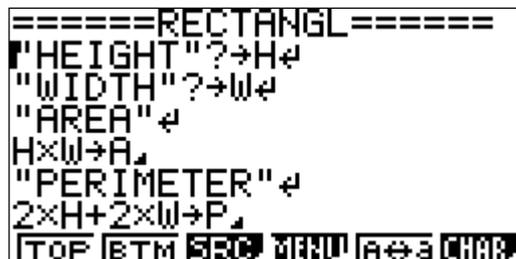
How to write a program for your fx-9860G – Part 2

This is the second in a series of four basic tutorials on how to start programming your fx-9860G calculator.



In the last issue (fxNews 2007 Volume 1) we

- Started out with a brief look at assigning, displaying and calculating numbers using the inbuilt A to Z variable memories of your calculator.
- Summarized a few programming commands used in nearly all programs.
- Looked at how to create a program – from turning on your calculator to the point at which you were ready to write the substance of your program.
- And lastly created a program that took advantage of the calculator's ability to do lots of calculations quickly - a loop that repeated until we got our desired result.



In this issue we'll develop these skills further. In particular, we'll

- Recap the few programming commands used in nearly all programs.
- Recap how to create a program – from turning on your calculator to the point at which you're ready to write the substance of your program.
- Learn how to ask the program user for information required, such as the width and length of an object.

Programming your fx-9860G

Commands, tests and functions

These are reference pages. All you need to do at this stage is skim through them and remember they're here when you're looking for certain commands or tests.

There are a few commands used in nearly all programs. It is useful to become familiar with how to find (or type) these quickly and correctly. Incorrect typing or spacing usually results in a 'syntax' error when you try to run a program. The key sequences below assume you are already in the program editor (see next section).



COMMANDS:

- | | |
|-------------------------|------------------------|
| 1. ? | SHIFT PRGM F4 |
| 2. \blacktriangleleft | SHIFT PRGM F5 |
| 3. ClrText | SHIFT PRGM F6 F1 F1 |
| 4. Locate | SHIFT PRGM F6 F4 F1 |
| 5. If | SHIFT PRGM F1 F1 |
| 6. Then | SHIFT PRGM F1 F2 |
| 7. Else | SHIFT PRGM F1 F3 |
| 8. IfEnd | SHIFT PRGM F1 F4 |
| 9. For | SHIFT PRGM F1 F6 F1 |
| 10. To | SHIFT PRGM F1 F6 F2 |
| 11. Step | SHIFT PRGM F1 F6 F3 |
| 12. Next | SHIFT PRGM F1 F6 F4 |
| 13. Do | SHIFT PRGM F1 F6 F6 F3 |
| 14. LpWhile | SHIFT PRGM F1 F6 F6 F4 |

OTHER:

- | | |
|-----------------|---------------------|
| 15. " | ALPHA F2 |
| 16. = | SHIFT PRGM F6 F3 F1 |
| 17. \emptyset | SHIFT PRGM F6 F3 F2 |
| 18. > | SHIFT PRGM F6 F3 F3 |
| 19. < | SHIFT PRGM F6 F3 F4 |
| 20. \dot{u} | SHIFT PRGM F6 F3 F5 |
| 21. \div | SHIFT PRGM F6 F3 F6 |
| 22. And | OPTN F6 F6 F4 F1 |
| 22. Or | OPTN F6 F6 F4 F2 |
| 22. Not | OPTN F6 F6 F4 F3 |
| 23. Frac | OPTN F6 F4 F3 |
| 24. Int | OPTN F6 F4 F2 |
| 25. Ran# | OPTN F6 F3 F4 |

Some example commands

? \rightarrow A \blacktriangleleft Prompts for a value to store as A

A \blacktriangleleft Displays the value of A and pauses until any key is pressed

ClrText \blacktriangleleft Clears all text from the screen

Locate 1,3,A \blacktriangleleft Displays the value of A starting at column 1 on row 3 of the screen. The screen has 21 columns and 7 rows

If A>B \blacktriangleleft
Then A \rightarrow B \blacktriangleleft
Else B \rightarrow A \blacktriangleleft
IfEnd \blacktriangleleft

For 1 \rightarrow N To 20 Step 1 \blacktriangleleft

Locate 1,1,N \blacktriangleleft

Next \blacktriangleleft

'Step 1' is optional in the For... Next loop. The default is to count up in 1's.

Do \blacktriangleleft

N+1 \rightarrow N \blacktriangleleft

LpWhile N<20 \blacktriangleleft

If Frac(N \div 2)=0 And N \neq 0 \blacktriangleleft
Then "N IS EVEN" \blacktriangleleft
IfEnd \blacktriangleleft

Programming your fx-9860G

Creating a program

This section takes you from turning on your calculator to the point at which you're ready to write the substance of your program.



NEW PROGRAM

From the main menu select PRGM. You are then presented with a list of existing programs on your calculator.

Press F3 to start a new program, type in a suitable name (*Note: Alpha lock key is already selected*) and press EXE. You are now in the program editor and ready to begin.

To quit the editor use EXIT (repeatedly).

EXECUTING

To execute (or run) a program highlight it in the program list and press F1 (EXE).

EDITING

If you want to edit an existing program in the program list, highlight it and press F2.

ERRORS

If an error occurs during a program a message will display on the screen. Pressing the EXIT key will open the program editor and place the cursor *somewhere* near the source of the error.

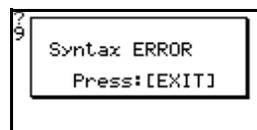
ESCAPING

If a program gets stuck in a loop or simply won't stop try pressing AC twice.

DELETING

To delete an unwanted program go to the program list, highlight the program, press F4 and confirm YES with F1.

Some example screens



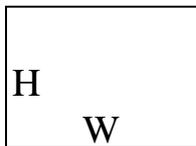
Programming your fx-9860G

A simple problem - basic input and output

Nearly all programs require some method of input of initial values from the user and return some output to the screen as an answer or solution.

Initial problem:

Find the area and perimeter of a rectangle of width W and height H .



General solution:

1. Input the height of the rectangle and store in memory H .
2. Input the width and store in memory W .
3. Calculate the area of the rectangle, store this value in memory A and output the value of A to the screen.
4. Calculate the perimeter of the rectangle, store this value in memory P and output the value of P to the screen.

Improvements:

To make this or any other program more user friendly add prompts when values are input or calculated values are returned. This is obviously more time consuming to create but does make the program much easier to use when it is run.

Note how each line ends with either a carriage return \downarrow (pressing EXE) or the pause and display command \blacktriangleleft .

Several commands can be entered per line but each must be separated by a colon. Stick to one command per line for now - it makes the program easier to read.



Example commands and screens

This is the basic program to type in:

```
?→H↓
?→W↓
H×W→A▲
2×H+2×W→P▲
```

A screenshot of the calculator's program editor showing the code: =====RECTANGL=====, ?→H, ?→W, H×W→A, 2×H+2×W→P, and a menu bar at the bottom with options: TOP, BTM, SRC, MENU, ←, →, CHOP.

Running the above program produces a screen like this:

A screenshot of the calculator's display showing the input values 4 and 7, and the calculated results 28 for area and 22 for perimeter. The screen shows: 4, 7, 28, 22, and - Disp -.

Adding prompts, the program looks like this:

```
"HEIGHT"?→H↓
"WIDTH"?→W↓
"AREA"▲
H×W→A▲
"PERIMETER"▲
2×H+2×W→P▲
```

A screenshot of the calculator's program editor showing the code with prompts: "HEIGHT"?→H, "WIDTH"?→W, "AREA"▲, H×W→A, "PERIMETER"▲, 2×H+2×W→P. The menu bar at the bottom shows: TEST, MATH, COLP, CALC, STAT, and a cursor.

A screenshot of the calculator's display showing the prompts and results: HEIGHT?, 4, WIDTH?, 7, AREA, and 28. The screen shows: HEIGHT?, 4, WIDTH?, 7, AREA, 28, and - Disp -.