hp calculators

HP 50g Calculator Modes and Customization

Choosing how to use your Calculator

Examples

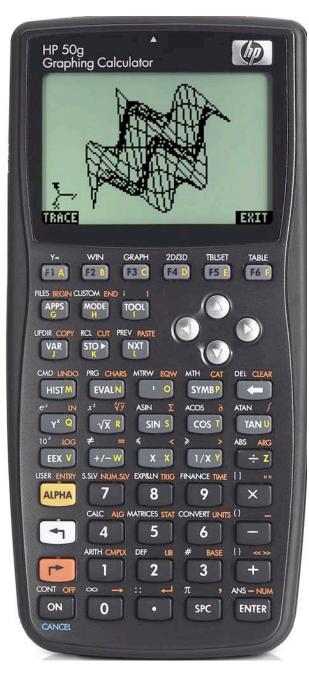Selecting Radians Mode

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Other Modes and Customization

Choosing how to Use your Calculator

The HP 50g gives you many ways to change the calculator to suit your way of working and of solving problems. Just for example, you can (1) measure angles in degrees, radians or gradians, (2) show the time and date in the display, (3) calculate with pounds or kilograms, (4) display numbers in different formats, (5) do financial calculations in Begin or End payment mode, (6) work with equations, or in Algebraic mode or RPN mode, or with lists of numbers, and this is just the beginning. Many of these choices are made on the MODE menu

You can also customize your calculator in ways that almost make it a completely different calculator to the one you bought. For example, you can (1) select USER mode to change what the keys do, (2) write your own programs to create new math functions, (3) create new menus, (4) choose a different font to display numbers and characters, and more!
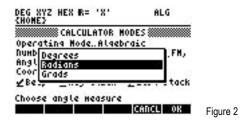
To practice setting the calculator to work the way you want, try these examples.

Selecting Radians Mode

Access the MODE menu by pressing the [MODE] key: The Calculator Modes form is shown. Press the round down-arrow key twice to reach the Angle Measure line [▽] [▽] .

Figure 1

The line of text at the bottom of the display gives a short description of what the highlighted mode does. Now press the menu key below the ▓▓▓▓▓ label to see the choice of angle settings

Figure 2

Use the round up and down arrow keys [▲] and [▽] to highlight Radians, as in Figure 2, then press the [F6] key below the ▓▓▓ menu label and your calculator will be set to Radians mode. Press ▓▓▓ again to quit the Menu Form. Calculations using trig functions will now work in radians, instead of degrees. Note that the mode does not change to the new one until you quit the Menu Form completely. If you change your mind before you quit the Menu Form, you can press the ▓▓▓▓▓ menu key, instead of the ▓▓▓ menu key, to cancel the new setting. You can also you can press the [ON] key, which has $\overline{CANCEL}$ below it to show that it acts as a "cancel" key.

You can change back to degrees, or change to gradians in the same way.

Tip! There is a shortcut for changing the highlighted setting. Instead of using ▓▓▓▓▓ you can press the plus/minus key [+/-] to change the highlighted item until you have the setting you want.

If you select Radians mode, a label at the top left of the display will display RAD. If you choose Degrees mode, you will see DEG as in Figures 1 and 2 above. If you choose Gradians mode the label will show GRAD.

The Modes Form lets you choose other important settings. The Operating Mode, which can be set to Algebraic or RPN, is especially important, and it is described in the separate training aid on "Algebraic and RPN Modes". The Number Format and the Fraction Mark (decimal point or decimal comma) are described separately too. The ▊▊▊▊▊ menu key on the Modes Form lets you make many more choices. The next example shows one such choice.

Displaying the Time and Date

The HP50g can show the time and date in the top right corner of the display. You might find this useful, for example, during an exam to know how much time you have left. Select the Menu Form again and press the ⌐Fı⌐ key below the ▊▊▊▊▊ menu key. You will see the first few "System Flags", with their present settings, and a short explanation of each one. Use the up and down arrow keys to reach flag 40, as in Figure 3.

Tip! If you know which flag number you want, you can press the first number of the flag to find it quickly, for example press 4 to go directly to flag 40. If you press 4 repeatedly you will cycle through all the flags whose numbers begin with 4.

Figure 3

Press the ⌐F3⌐ key below the check menu label to select the clock display mode. A check mark will show next to label 40 and the description will change. Then press the ▊▊▊▊ menu key once to get back to the Modes Form, and again to quit the Modes Form. Now you can see the time and date at the top right of the display area, as in Figure 4. As with the angle mode, the change of the flag setting does not take effect until you quit the Modes Form completely, so you can use the ▊▊▊▊▊ menu key to cancel it.

Figure 4

Tip! You can change a lot more! You can change the clock between 12 hour and 24 hour display with flag 41. You can change the date display between mm/dd/yy and dd.mm.yy with flag 42. And you can change between a digital clock and an analog clock display with flag 67. A training aid in this series shows how the time and date can be set and changed.

When you do not need to see the time and date it is best to cancel their display. The example after the next one shows another way to do this.

Selecting Exact or Approximate Mode

System flag 105 controls an important mode. This selects whether numeric results of calculations are given as exact values, for example 2/3, or as the closest possible numerical approximation, in this case 0.666666666667. You can set this flag from the flags list as above. You can also set it from the CAS Modes form. (CAS is the Computer Algebra System, described in other training aids.) Press (MODE) then press ⌐F3⌐ below the ▊▊▊▊ menu label. Press the down key ▽ twice, then press the ⌐F3⌐ key below the ▊▊▊▊▊ menu label, to set or clear the mode, and press the ▊▊▊▊ menu key twice.

Changing the Display Font

Another customization that the MODE menu allows is changing the font used to display text and numbers. Press the (MODE) key and then the (F4) menu key below the ▮▮▮▮▮▮ label. Press ▮▮▮▮▮▮▮ to see the available fonts.

Figure 5

There are three "System Fonts" built into the HP50g. System Font 8 has the largest letters and is the one that the HP50g uses unless you choose a different one. The fourth selection is Browse which lets you look for other fonts you have copied to the calculator, or have created yourself. Use the up or down key to select the smallest font, System Font 6. Press ▮▮▮▮ twice and the calculator will display everything in the small font. This means that you can see more in the display at one time as Figure 6 shows.

Figure 6

Select the Mode Form and then the Display Modes Form again and you will see that you can choose to use the small font for only some actions, for example only when editing numbers and text so that you can see more of what you are editing. Below the font selections you can choose how many lines of information are shown at the top of the display. You can also show or hide the clock, and choose to display it in digital or analog form.

Figure 7

To finish this example, press CHOOS again and change the System Font back to 8. Press OK and use the down and right arrow keys to select the clock option and press ▮▮▮▮ to hide the clock. Finally press ▮▮▮▮ twice more to return to your normal display.

Tip! You can select italic, bold, or underlined fonts, when you are editing text strings. To find these options press (TOOL) then ▮▮▮▮ then (NXT) (NXT) to reach the third page of the EDIT menu, and the font selection options are in the ▮▮▮▮▮ submenu.

Customization with Menus

The VAR menu, which you select by pressing (VAR), shows the variables and directories you have created. Just by creating new objects and storing them in variables you are customizing your HP50g, especially if the objects are programs you write to do particular calculations or tasks you need.

There is also a Custom menu, which you select by pressing ⟨←⟩ *CUSTOM* . Here you can create a menu to do exactly what you need. This can be a temporary menu, for one task, which you change later to a different one. It can also be a menu you use all the time to do those tasks that you want to do most often.

The MENU command lets you create and display a custom menu. It also lets you display any one of the many menus built into the HP50g. For example, to show the menu of hyperbolic functions, which is menu number 12, type MENU(12) by pressing the keys ⟨ALPHA⟩ ⟨ALPHA⟩ ⟨M⟩ ⟨E⟩ ⟨N⟩ ⟨U⟩ ⟨←⟩ *()* ⟨1⟩ ⟨2⟩ ⟨ENTER⟩ . If you do this, you see the hyperbolic functions menu at the bottom of the display area. You also see MENU(12) and NOVAL in the main display area. MENU(12) is the command you typed. NOVAL is the result of typing the command. The MENU command gives no object as a result, so the HP50g displays NOVAL to warn you that no object was returned by the command. If you are using RPN mode instead of Algebraic, you type 12 first, press ⟨ENTER⟩ , then type MENU and press ⟨ENTER⟩ again. The hyperbolic functions menu is shown and nothing is put on the stack.

Tip! To find the menu number of a menu, select that menu using the keyboard, the pull down menus and the ⟨NXT⟩ key. Then type the RCLMENU command to get the menu number. This is a number in the form **aa.bb** where **aa** is the menu number and **bb** is the page number. If the page number is 01 then this is the first page of the menu and you can ignore it. If it is 02 or 03 then it is the second or third page of the menu, which you normally reach by pressing the ⟨NXT⟩ key once or twice. Use the whole of **aa.bb** with the MENU command to go directly to one of these pages.

Until you create a custom menu, pressing ⟨←⟩ *CUSTOM* shows a row of blank menu labels. To create a custom menu you use the MENU command, and give it a list of key names and key actions, instead of a menu number.

For example here is how you would create a custom menu with three items, a key for the factorial command, a key to bring up the square root of 2 quickly, and a key to select the menu of hyperbolic functions.

The first item is represented by a list with the key name "!" which is the common abbreviation for the factorial function, followed by the function name FACT. The list will look like this { "!" FACT }.

The second item is just the numerical value of the square root of two, 1.41421356237.

The third item is represented by a list containing the key name "HYP" and a program to select MENU 12. The list will be { "HYP" « 12 MENU » }.

To create the custom menu you need to put these three items in a list, and then to tell MENU to use this list. It is not unusual to have lists that contain lists! Creating this list of lists is most easily done in RPN mode.

First select RPN mode. Press the ⟨MODE⟩ key. If the highlighted Operating Mode is "Algebraic" then press the ⟨+/-⟩ to change it to RPN. Then press the ▮▮OK▮▮ menu key.

Now type the list of custom menu keys { { "!" FACT } 1.41421356237 { "HYP" « 12 MENU » } }. To type this list, press keys as follows.

⟨←⟩ *{}* ⟨←⟩ *{}* ⟨→⟩ *""* ⟨ALPHA⟩ ⟨→⟩ ⟨2⟩ ⟨▶⟩ ⟨ALPHA⟩ ⟨ALPHA⟩ ⟨F⟩ ⟨A⟩ ⟨C⟩ ⟨T⟩

At this point, note that the letters FACT have been represented by the letters printed in yellow on the keys ⟨F6⟩ ⟨F1⟩ ⟨F3⟩ ⟨COS⟩ . These are the keys you should press.

Now continue by pressing the keys

⟨ALPHA⟩ ⟨▶⟩ ⟨1⟩ ⟨·⟩ ⟨4⟩ ⟨1⟩ ⟨4⟩ ⟨2⟩ ⟨1⟩ ⟨3⟩ ⟨5⟩ ⟨6⟩ ⟨2⟩ ⟨3⟩ ⟨7⟩

This completes the first list, and gives the square root of two. Continue with

⟨←⟩ *{}* ⟨→⟩ *""* ⟨ALPHA⟩ ⟨ALPHA⟩ ⟨H⟩ ⟨Y⟩ ⟨P⟩ ⟨ALPHA⟩ ⟨▶⟩ ⟨→⟩ *« »* ⟨1⟩ ⟨2⟩ ⟨SPC⟩ ⟨ALPHA⟩ ⟨ALPHA⟩ ⟨M⟩ ⟨E⟩ ⟨N⟩ ⟨U⟩ ⟨ENTER⟩

That completes the whole list. Now type (ALPHA) (ALPHA) (M) (E) (N) (U) (ENTER) to store this list as the custom menu. If you want to work in Algebraic mode, change back to algebraic mode using the same keystrokes as you used above to go to RPN mode.

If you now press (←) CUSTOM you will see your custom menu, as in the figure here.

Figure 8

This works both in RPN mode and in algebraic mode. Press the key labeled ▦ to obtain the factorial function. Press the key with the number ▦▦▦ to obtain the square root of two. Press the key labeled ▦▦▦ to switch to the hyperbolic functions menu. To go back to the custom menu, press (←) CUSTOM again.

Using Flags and Menus to Control Modes Directly

Most calculator modes and settings are controlled by the calculator's "System Flags", flags –1 to –128. The HP50g also has "User Flags", numbered from 1 to 128, for the user's own purposes. A set of commands can be used to control modes and flags directly. This is particularly useful in programs, which can set or clear or test flags, but can not use the Calculator Modes Form.

To find the flag commands, press (←) PRG   Go down the list till you find 10.MODES, or press (I) to reach it, and press the ▦▦▦ menu key. The Modes Menu is now displayed.

Figure 9

This in turn provides a list of mode command types. To select the flag commands press (3) and then the ▦▦▦ menu key. You now see a list of flag commands you can use directly to set, clear, and test the system and user flags. The top item, SF (Set Flag) is highlighted. You could use it to display the clock again. If you have Algebraic mode set, press the ▦▦▦ menu key, then type (+/−) (4) (0) (ENTER) . This sets flag -40, system flag 40, and displays the clock. To hide the clock again, repeat the above, but select CF (Clear Flag) to clear flag -40. To do the same in RPN mode you need to put the number -40 on the stack before pressing (←) PRG .

Whenever you change modes to a special setting for a particular task, it is wise to set them back to normal afterwards, to avoid the risk of these settings causing confusion later.

Other Modes and Customization

Some of the other important modes are described in further training aids. For example the "Operating Mode" is described in the training aid on "Algebraic and RPN Mode".

Customization is described in other training aids too. See the one on "The User Keyboard" to learn how you can change what some of the keys do, to make the HP 50g work exactly the way you want.