hp calculators

HP 50g The User Keyboard

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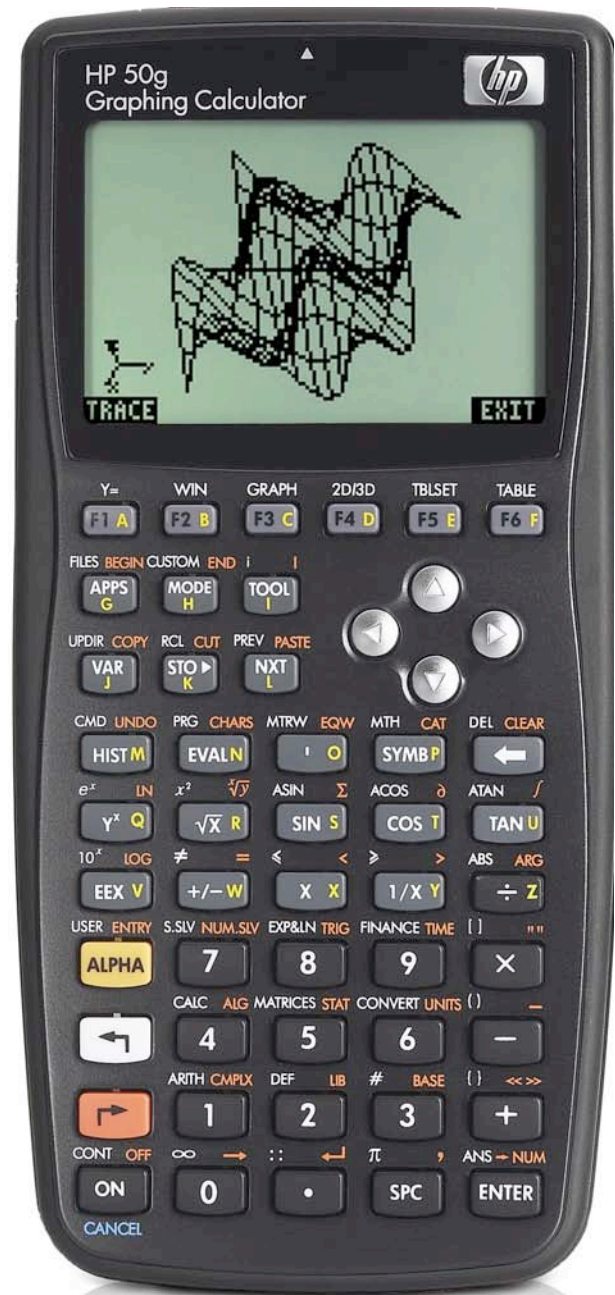Assigning the Factorial Function to a Key

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Key Assignments and User Mode

The HP50g has far more functions than can be shown on the keyboard. Access to these functions is through menus and the CAT (Catalog) command. It can be very useful to add some of these functions to the keyboard. The ASN and STOKEYS commands assign functions to keys. This lets you build up your own User Keyboard, with keys doing what you assign to them. Pressing ⟨←⟩ USER sets User Mode and gives access to the User Keyboard.

Assigning a variable name to a key

As an example, assign the variable name LENGTH to a key and see how to use it. For this example to work, you must not yet have a variable called LENGTH, if you have one, use a different name here. Use the ⟨x⟩ key for this assignment. This key is in row 6 down from the top, and in column 3 across from the left, so its keycode is 63. If you are using Algebraic mode you need to type ASN(LENGTH,63) so press the keys ⟨ALPHA⟩ ⟨ALPHA⟩ ⟨A⟩ ⟨S⟩ ⟨N⟩ ⟨←⟩ ⟨()⟩ ⟨L⟩ ⟨E⟩ ⟨N⟩ ⟨G⟩ ⟨T⟩ ⟨H⟩ ⟨→⟩ ⟨,⟩ ⟨6⟩ ⟨3⟩ ⟨ENTER⟩ . Making an assignment does not create an object as a result, so the HP50g gives the result NOVAL.

If you are working in RPN mode type ⟨ALPHA⟩ ⟨ALPHA⟩ ⟨L⟩ ⟨E⟩ ⟨N⟩ ⟨G⟩ ⟨T⟩ ⟨H⟩ ⟨ENTER⟩ ⟨6⟩ ⟨3⟩ ⟨ENTER⟩ ⟨ALPHA⟩ ⟨ALPHA⟩ ⟨A⟩ ⟨S⟩ ⟨N⟩ ⟨ENTER⟩ .

Now you can use this key assignment as shorthand for the variable name. To store the number 873.21 in this variable, in algebraic mode, type ⟨8⟩ ⟨7⟩ ⟨3⟩ ⟨·⟩ ⟨2⟩ ⟨1⟩ ⟨STO▸⟩ ⟨←⟩ USER ⟨x⟩ ⟨ENTER⟩ .

In RPN mode, type ⟨8⟩ ⟨7⟩ ⟨3⟩ ⟨·⟩ ⟨2⟩ ⟨1⟩ ⟨←⟩ USER ⟨x⟩ ⟨STO▸⟩ .

Now you can use the key assignment to get the variable name or the variable value. Press ⟨←⟩ USER to activate the User Keyboard, then press ⟨x⟩ to get the variable value, 873.21, in a calculation, or to get the variable name LEN when you are writing an expression or a program.

Locking the User Keyboard

When you press ⟨←⟩ USER to activate the User Keyboard, it works very much like an additional shift key. Instead of the right-shift or left-shift symbol, you see 1US at the top of the display. This tells you that the User Keyboard has been activated for *one* keystroke, and then you will be returned to the normal keyboard. If you want the User Keyboard to remain active, press ⟨←⟩ USER ⟨←⟩ USER , in other words press the keys twice. The letters USR will be seen at the top, showing that the User Keyboard is active all the time until you press ⟨←⟩ USER again.

Assigning the Factorial Function to a Key

To assign a command or a function built into the HP50g to a key, use the command STOKEYS instead of ASN. Try using this to assign the factorial command to the right-shifted ⟨x⟩ key. As before, the key number is 63 because ⟨x⟩ is the third key in the sixth row, but this time the keycode to use is 63.3 because .3 specifies that the key is right shifted. If you are not using RPN mode, do ⟨MODE⟩ ⟨+L⟩ ▦▦▦ first to set RPN mode. Now press the keys ⟨←⟩ ⟨()⟩ (Note:these are the "curly brackets" on the left-shifted ⟨+⟩ key, not the round brackets above the ⟨−⟩ key). Then continue by pressing ⟨ALPHA⟩ ⟨ALPHA⟩ ⟨F⟩ ⟨A⟩ ⟨C⟩ ⟨T⟩ ⟨SPC⟩ ⟨6⟩ ⟨3⟩ ⟨·⟩ ⟨3⟩ ⟨ENTER⟩ ⟨ALPHA⟩ ⟨ALPHA⟩ ⟨S⟩ ⟨T⟩ ⟨O⟩ ⟨K⟩ ⟨E⟩ ⟨Y⟩ ⟨S⟩ ⟨ENTER⟩ . To return to Algebraic mode, if you wish, press ⟨MODE⟩ ⟨+L⟩ ▦▦▦ again.

To try the new assignment press ⟨←⟩ USER ⟨→⟩ ⟨x⟩ and you will see the FACT function displayed. In RPN mode, the function is executed at once, first type the number whose factorial you want.

In this way the USER key acts as an extra shift key, giving you even more commands on the keyboard, through the User Keyboard. Assignments can be made to ALPHA keys and shifted ALPHA keys too.

Assignments to shifted and alpha keys

The code .3 used above allowed you to make an assignment to a right-shifted key. You can use the following codes like this: .0 or .1 is the unshifted key, .2 is the left-shifted key, .3 is the right-shifted key, .4 is the unshifted alpha key, .5 is the left-shifted alpha key, and .6 is the right-shifted alpha key.

This means that if you run out of keys, you can assign objects, commands and functions to unshifted and shifted keys on the Alpha keyboard too.

To check what key assignments have been made, use the RCLKEYS command. You will see the display showing the result as in Figure 1.

Figure 1

The result at the bottom of the display is a list made up of { S LENGTH 63.1 FACT 63.3 }. This shows that LENGTH is assigned to the unshifted ⊂X⊃ key, and FACT is assigned to the same key, right-shifted. The letter S is a special assignment, meaning that all keys without a different assignment are assigned to their normal operation. It is possible to remove this assignment. If this is done, all keys without an assignment become inactive. This can be dangerous, as it can make it difficult to get out of User mode. If that happens, the RESET button at the back of the calculator can be used to return the calculator to its normal mode.

Add Hyperbolic Functions to the Keyboard

Many calculators have a "hyp" key to make the trig function keys calculate hyperbolic functions. The same can be done on the HP50g with the User Keyboard. It would be possible to assign each key separately, but, in this case, it is quicker to make all the assignments at one time with STOKEYS.

As before, select RPN mode, then type { SINH 53.0 ASINH 53.2 COSH 54.0 ACOSH 54.2 TANH 55.0 ATANH 55.2 } (ENTER) STOKEYS (ENTER) and then return to Algebraic mode if you wish.

Now press (←) _USER_ (←) _USER_ and you have the calculator locked in user mode so that the unshifted and shifted (SIN) (COS) and (TAN) keys work as hyperbolic functions instead of the normal trig functions. To use them as trig functions again, just press (←) _USER_ to quit out of the User Keyboard.

Deleting Key Assignments

To remove all the assignments made so far, use the DELKEYS command.

In Algebraic mode, type the command DELKEYS(63), or select the DELKEYS() command from the catalog provided when you press (→) _CAT_ and then type 63. Then press (ENTER) . Alternatively, in RPN mode, type the number 63 first and press (ENTER) , then type DELKEYS and press (ENTER) , or select the command from the catalog and press (ENTER) . Repeat this for the second assignment, 63.3.

You can delete many keys at the same time by giving DELKEYS a list containing the keys to delete, for example in Algebraic mode use the list {53.0, 53.2, 54.0, 54.2, 55.0, 55.2} with DELKEYS to delete all the remaining assignments. In RPN mode, the numbers in the list should be separated by spaces and not commas.

Easier Access to the Key Assignment Commands

If you do not like typing the whole name of the commands ASN, STOKEYS, RCLKEYS and DELKEYS, every time you need to use them, you can find them in a list of commands. Press ⬅️ PRG to reach the Program menu. Then type ⬜/ and press ▦▦▦ to select the Modes menu. Use the arrow keys or type ⬜4 to select the Keys menu and press ▦▦▦ again. Now you see all the above commands and can select which one you want. An even neater way to make these commands accessible is to assign them themselves to keys on the User Keyboard.

Redefining the Whole Keyboard

It is possible to redefine the whole keyboard, so that in User mode the calculator becomes a tool for a particular task. For example, it is possible to define a binary number keyboard, so the User Keyboard can be used to do nothing but type binary numbers, and you can not accidentally put any other digit than 0 or 1 in a number. To do this, assign the digit 0 to the 0 key, assign the digit 1 to the 1 key, and assign the USER key to itself so that you can get out of USER mode. Then disable all other keys. To do that, use the DELKEYS command as above, but to delete the special assignment S, mentioned earlier. In Algebraic mode type
(ALPHA) (ALPHA) (D) (E) (L) (K) (E) (Y) (S) (⬅️) (/)___ (S) (ENTER) or in RPN mode type (ALPHA) (ALPHA) (S) (SPC) (D) (E) (L) (K) (E) (Y) (S) (ENTER).

It may seem strange to assign key functions to their own keys, but this is the way to keep these keys active when all unassigned keys are disabled.

When you are finished with using the User Keyboard with the unassigned keys disabled, be sure to enable them again, and cancel the assignments you have made. In Algebraic mode type (ALPHA) (ALPHA) (D) (E) (L) (K) (E) (Y) (S) (⬅️) (/)___ (0) (ENTER) or in RPN mode type
(0) (ALPHA) (ALPHA) (D) (E) (L) (K) (E) (Y) (S) (ENTER).

Once all the examples have been completed it may be helpful to clear the stack by pressing (➡️) CLEAR.