Soft-Key Menus for the hp35s

Jake Schwartz

Recently, I imagined myself the winner of an HP contest where the first prize is implementation of one significant change of my choice to the hp35s firmware. That change has been in the forefront of my mind probably since the hp33s came out; which is switching the 35s menus to a soft-key menu system like that on the 32s. We know that the Corvallis folks did a very nice job with the limited single-line LCD of the 32SII, where by simply adding "arrow" annunciators to the bottom of the screen, they were able to utilize the top row of keys for a simple soft-key menu. This technique makes choosing menu selections both simple and quick, since the number of keystrokes is minimized to one and the keys are directly identified in the display. The 33S removed this convenience with its numbered-choice menu system, which was probably necessary due to that chevron-shaped direction-arrow tool at the top of the keyboard separating the LCD from the "true" top row of keys. (Also, with the key rows being "V"-shaped, all bets were off….) Since the top row of keys is straight again and is also almost exactly in the same position with respect to its LCD as in the 32SII, the concept of soft-key menus could again be restored. The figures at the end of this paper present a comparison between the original 32SII menus, the current 35s menus and two different possible 35s soft-key menu proposals (captured via scans of the 35s). This concept would not require any hardware or physical markings changes whatsoever….only firmware changes.

The first proposal of two puts the menu choices in the top row of the LCD along with arrows in the bottom row, pointing to the appropriate top-row keys. For this experiment, the capital "V" is used to represent a solid arrow character, which would be added to the LCD character set for this purpose. All five of the top-row keys (including the up-arrow key on the right side) are available. An example using the FLAGS menu is shown in figure 1 below from an altered scanned image of the 35s. (This was achieved using the "Horn/Wright" equation-mode method. The solid-arrow character was faked using graphics techniques.)

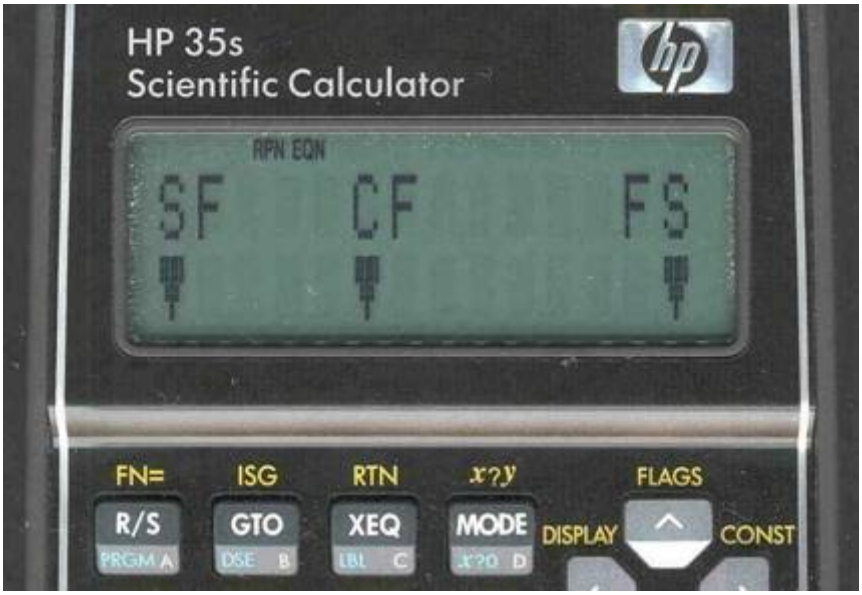


Figure 1. A sample soft-key "flag" menu for the hp35s.

The dynamics of these menus are just like the 32SII: a key is pressed to activate a menu and the top row of keys are redefined and labeled in the LCD (with the non-labeled keys being inoperative). After a menu-choice key is pressed, the menu is removed and the keys in the top row revert back to their default definitions. For menus which require additional rows of choices, the up- or down-arrow annunciators would be lit and the up- or down-arrow keys could traverse between them. An exception would be the "CONST" menu which, with its many rows plus the capability to preview the values of each constant prior to making a selection, probably should remain the same.

The second and final proposal (shown in the rightmost column in the large table starting on page 4) suggests that if the soft-key labels could be shown in the bottom row of the LCD without arrows, then an HP42S-like situation could be achieved. This way, after a menu-choice key was pressed, the LCD showing both the X and Y registers (or two program lines) would change to show the soft-key menu in the bottom LCD row and the X register (or only the current program line) in the top LCD row. An example of this is shown in figure 2.

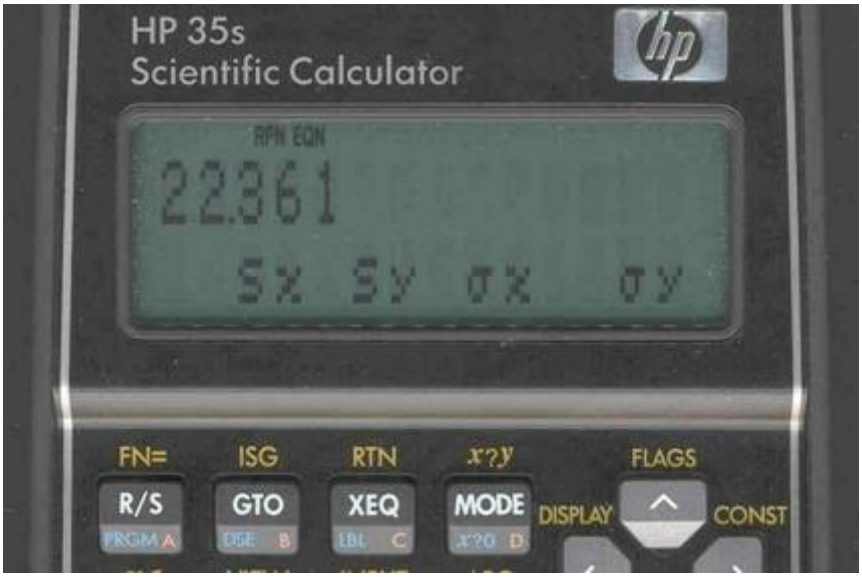


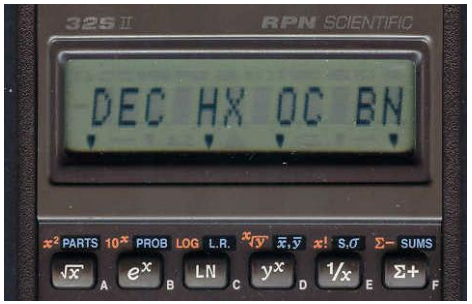
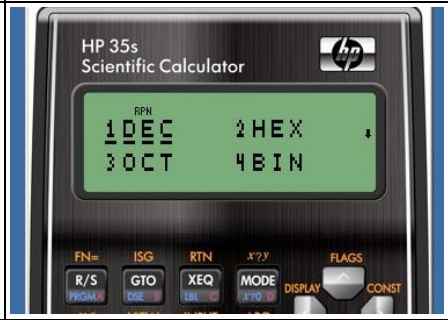
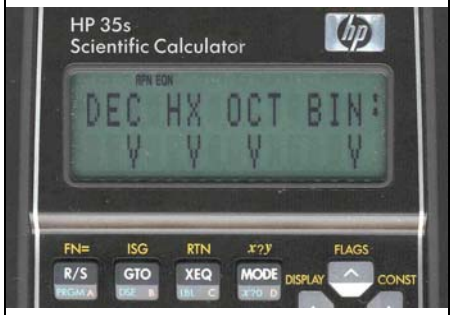
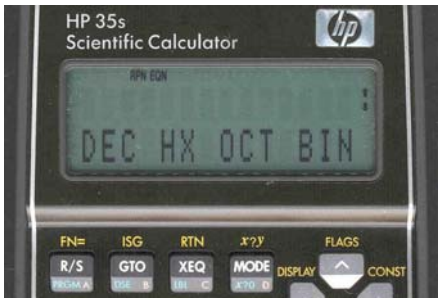
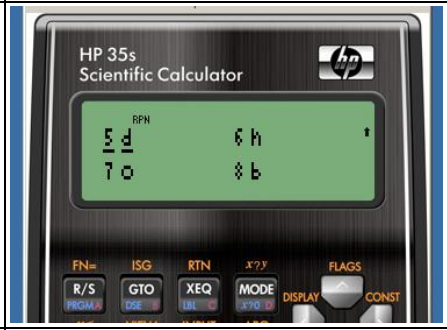
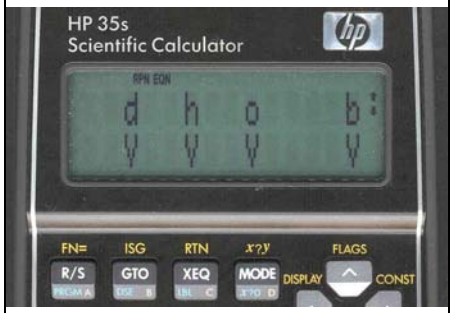
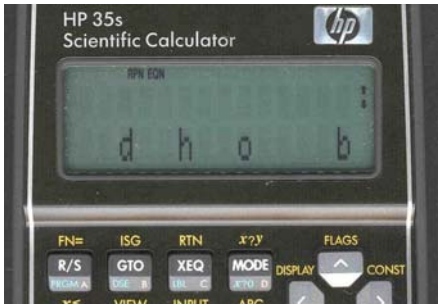
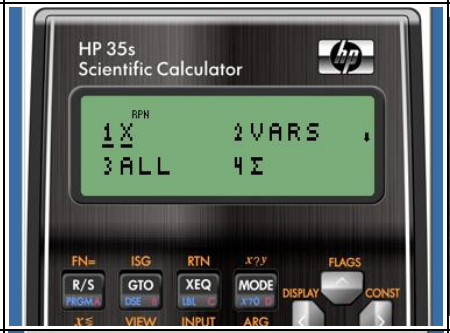
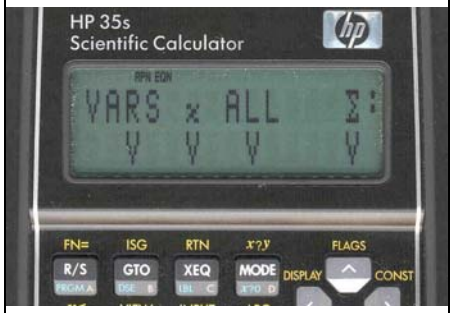
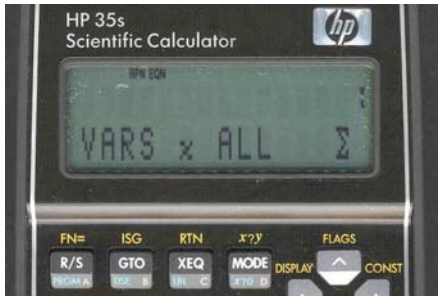
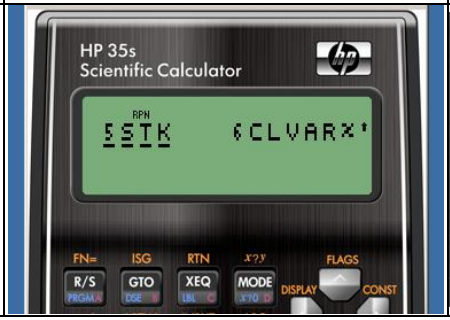
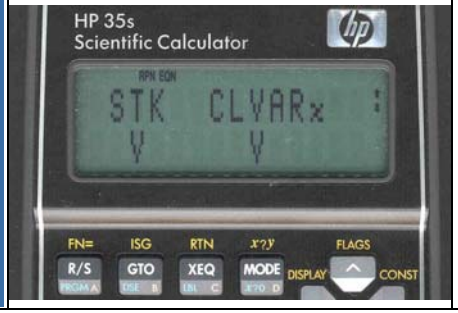
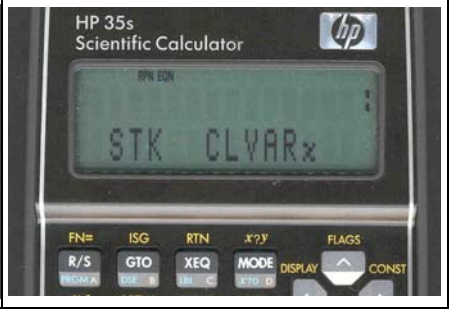
Figure 2. Another soft-key menu method: X register plus key labels.

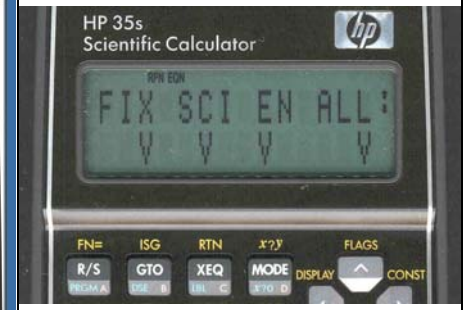
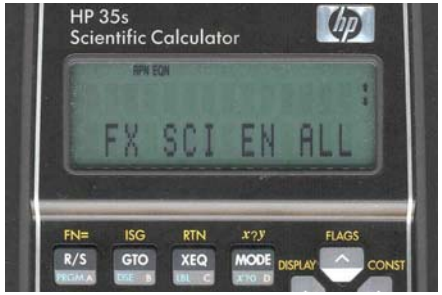
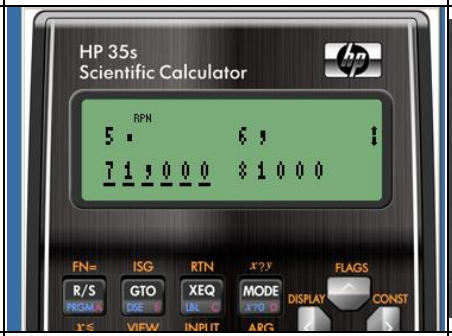
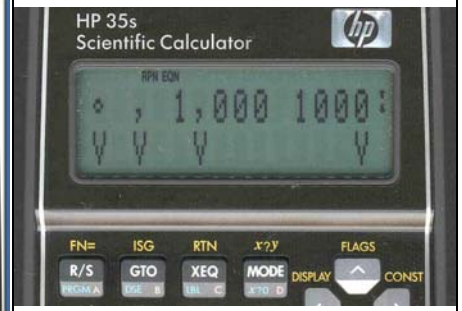
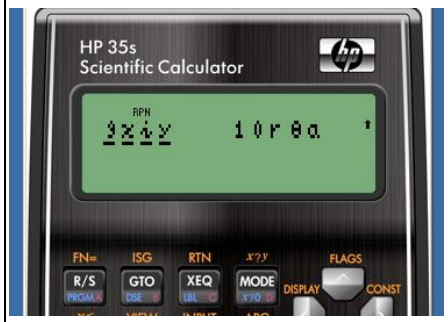
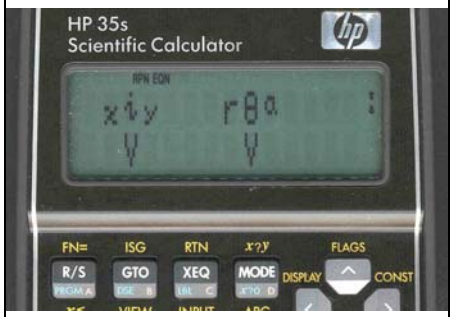
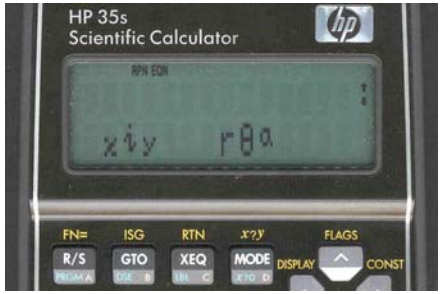
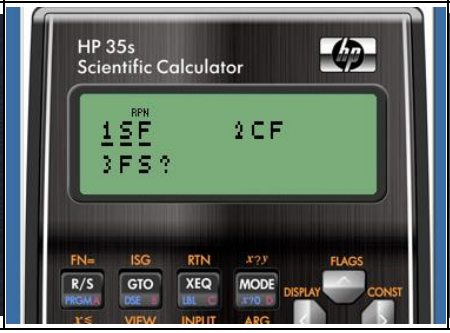
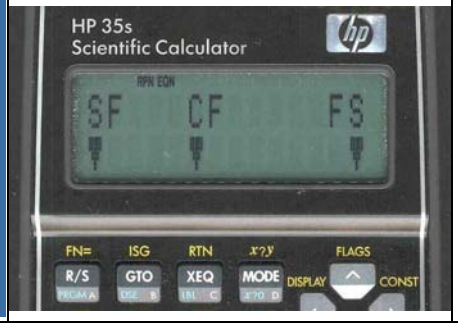
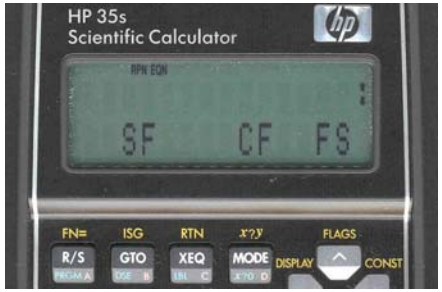
With this method, following a press of a menu key, the key action would take place but the menu could remain active. Pressing the "C" key at the bottom left (which would act like the "EXIT" key on the 42S) would dismiss the menu and the screen would revert to two-line stack (or program) and the top row of keys would return to their default definitions.

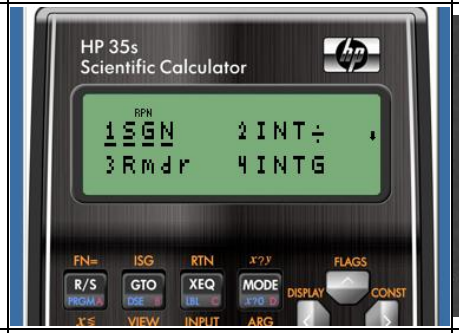
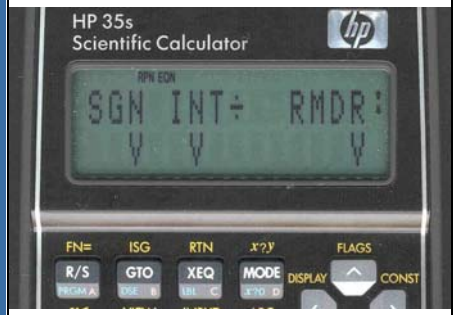
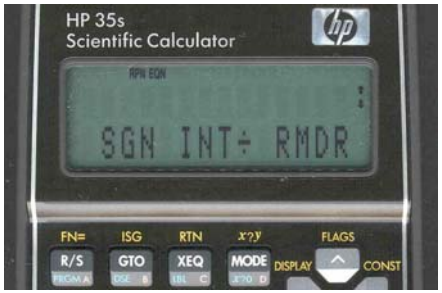
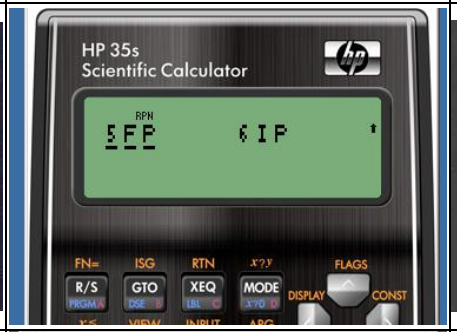
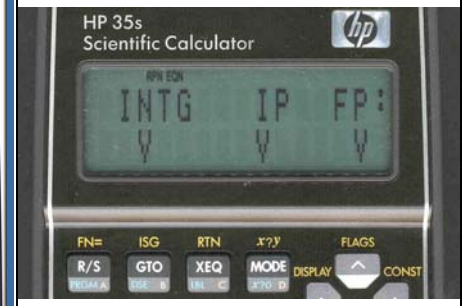
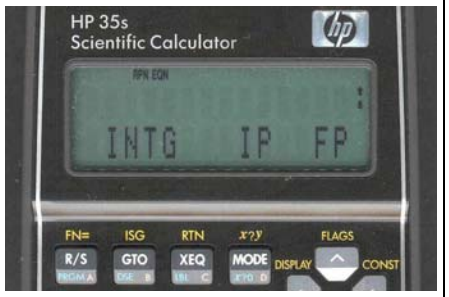
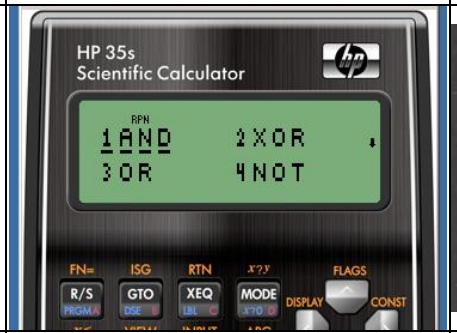
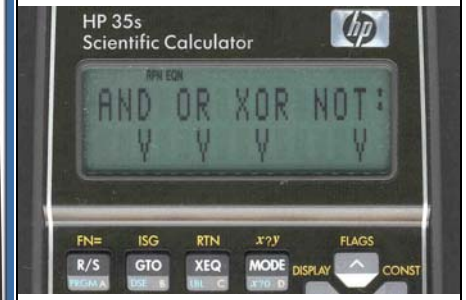
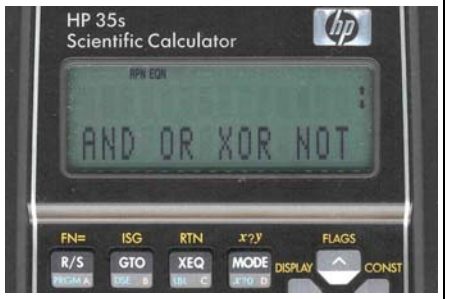
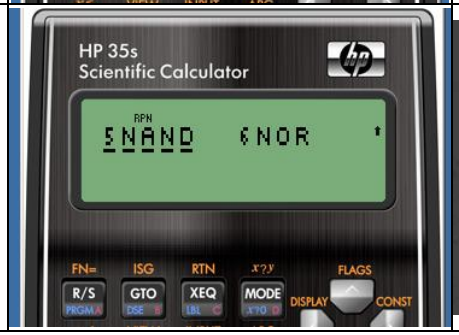
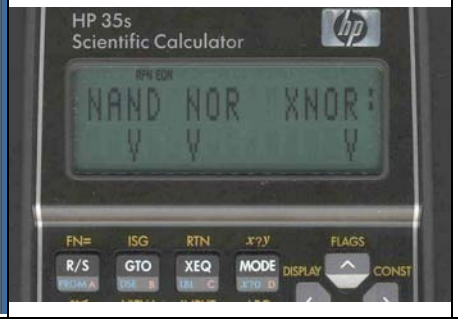
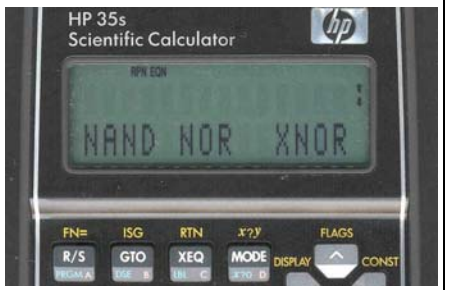
This second method opens up other possibilities, such as a possible USER mode like the one on the 15C, which would redefine the top row of keys to be 5-key sets of the active program labels "A", "B", etc. that could be accessed with a single key press (to replace XEQ A ENTER on the existing 35s). Also, should we not be able to convince HP that the current BASE-mode data entry system is critically flawed, the second page of a revised BASE menu using this method would at least allow for the h, d, o and b keys to remain on the screen and used repeatedly on numeric entry until no longer needed.

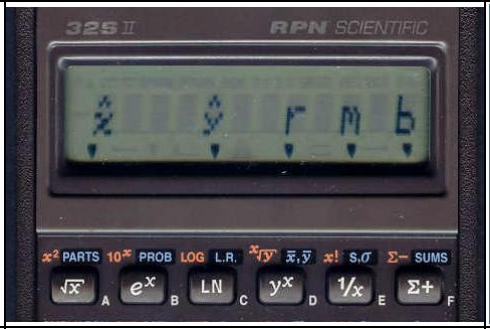
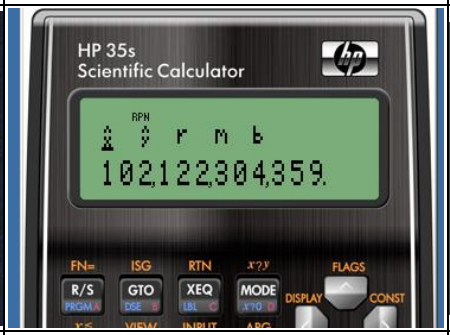
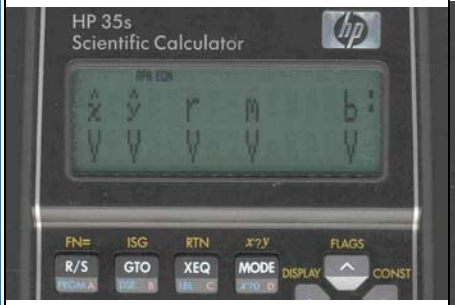
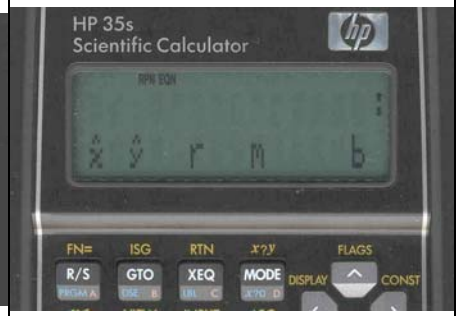
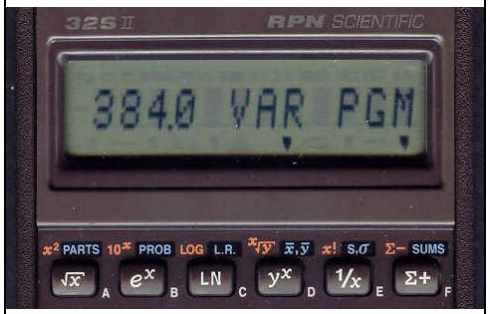
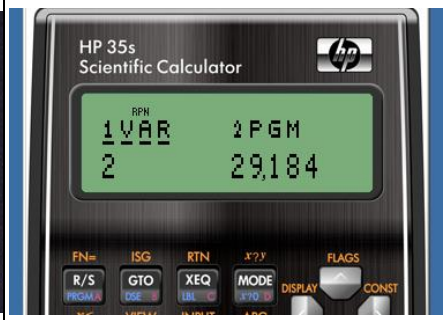
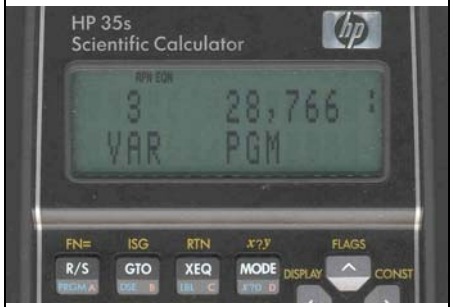
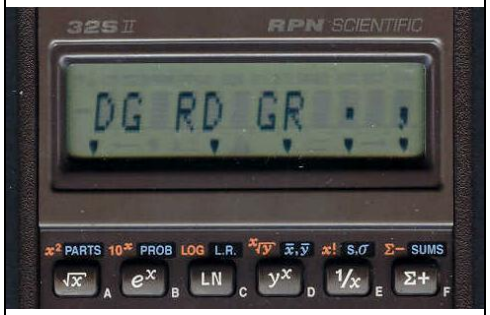
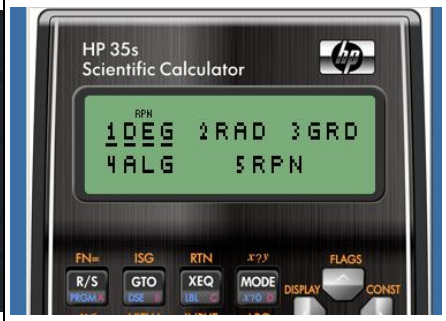
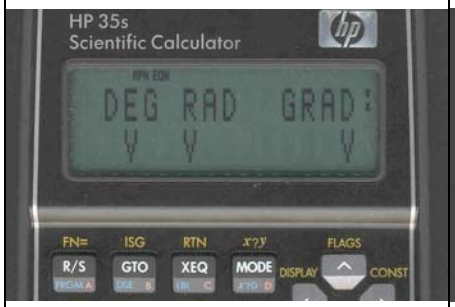
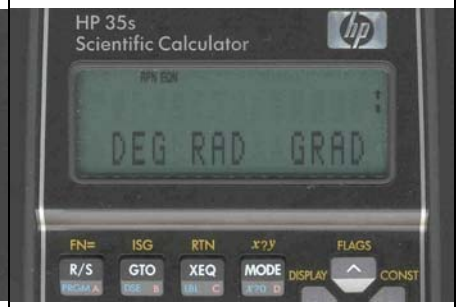
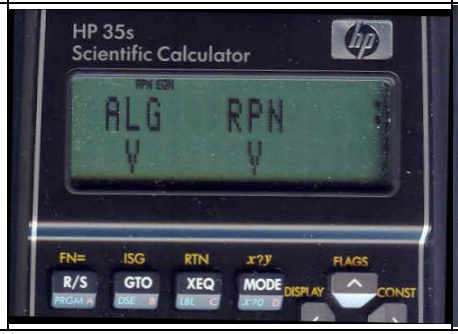
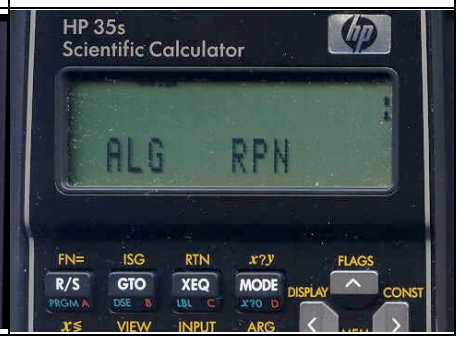
Some additional comments related to the table of displays starting on page 4 are listed below.

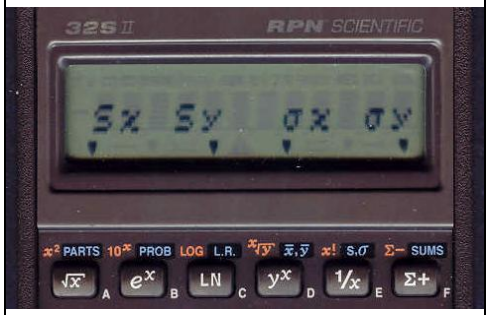
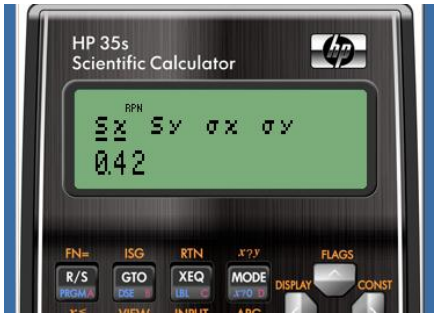
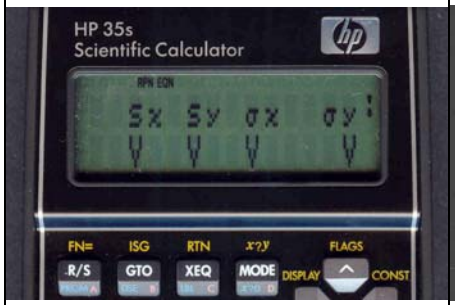
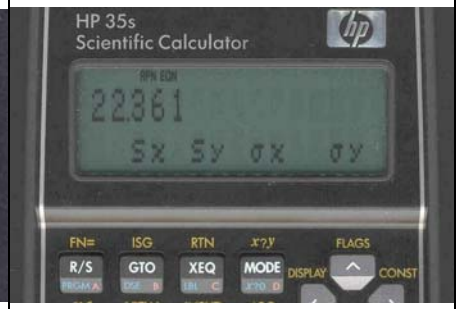
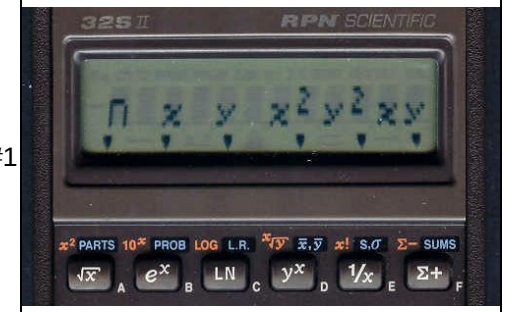
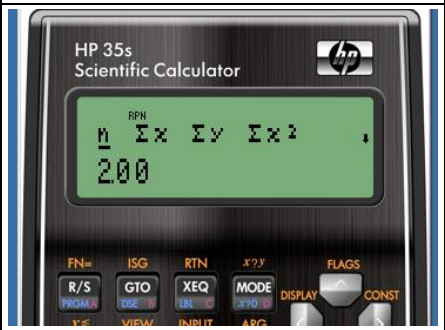
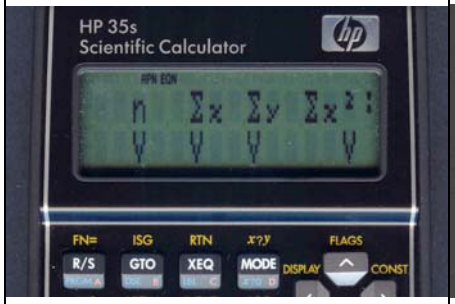
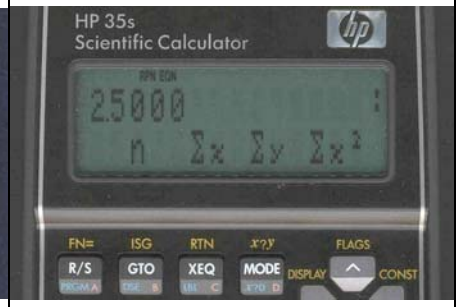
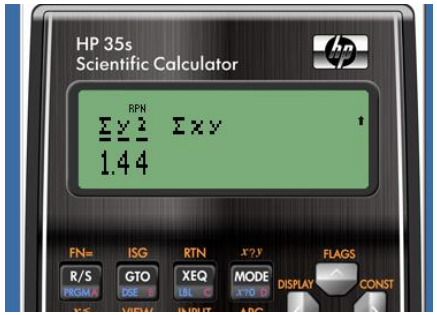
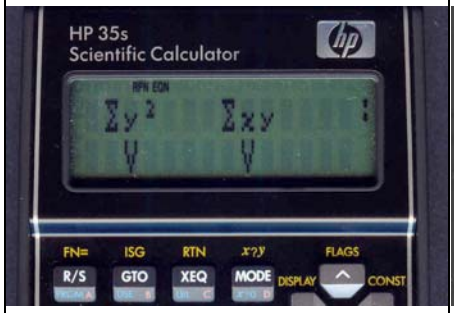
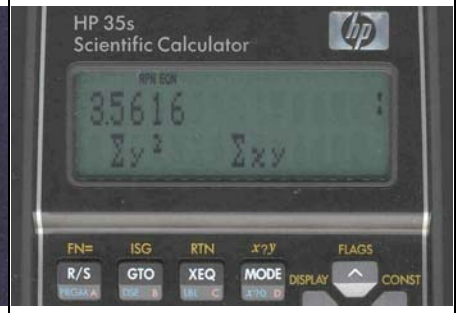
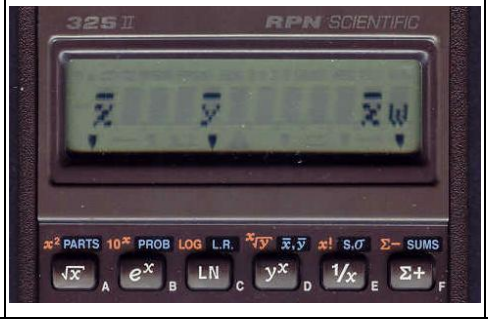
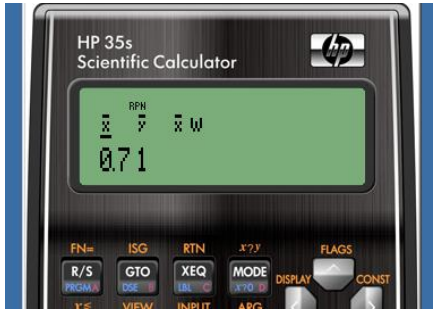
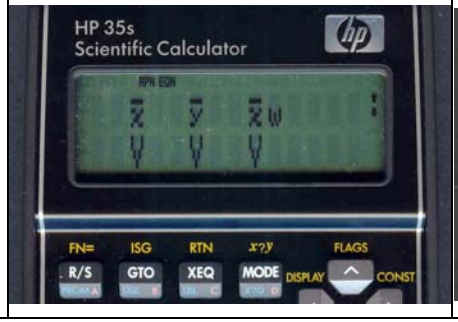
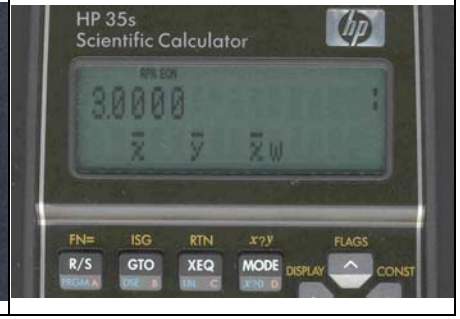
1. On page 1 of the CLEAR menu, the function order was rearranged to better align the names with the keys in the top row.
2. On page 2 of the DISPLAY menu, the degree symbol was used to represent the lone decimal point, since the decimal point character was not available to use by itself in the equation mode for this example.
3. Although in the original 35s, the L.R., S/sigma, SUMS and x-bar/y-bar menus allow the user to preview the values of each choice prior to selection, this translates into a relatively large keystroke sequence which may be replaced by a single keypress using the proposed method(s). I feel that the reduction in keystroke count far outweighs the "preview" capability here.
4. For the page 1 of the INTG menu, since the "INTG" function itself did not fit on the first page, it was moved to page 2.
5. On page two of the LOGIC menu, I took the liberty to add an "XNOR" function for demo purposes only.
6. For the MEM menu, the two rows of the display were reversed to have the soft-key definitions on the bottom and the numeric values on the top.
7. For the "x?y" and "x?0" menus, since I could not locate the <,>,etc. characters in the equation mode for this demo, I used the old FORTRAN "LE", "LT", "GT", "GE", "EQ" and "NE" representation. In the real machine, the original symbols would be used. However, since there are only 5 top-row keys instead of six, this menu requires two pages instead of one. This is why the embedded arrow keys within the regular keyboard rows (like the HP48 series) would be superior, in my opinion.

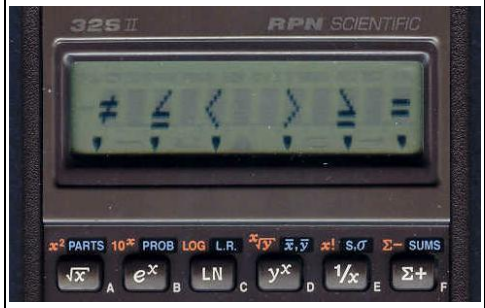
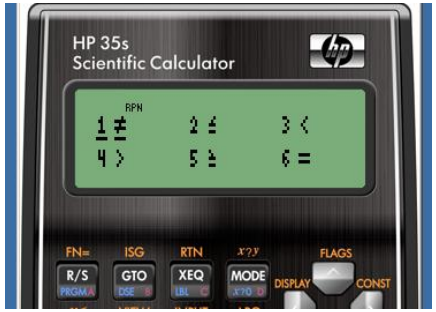
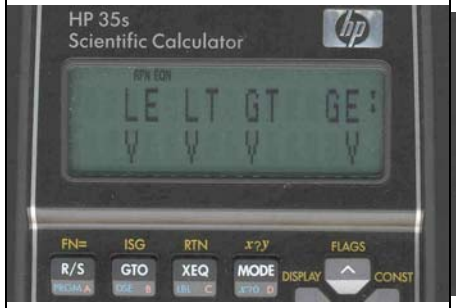
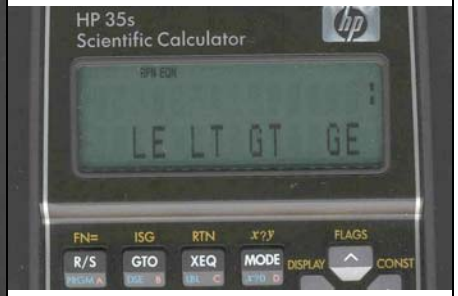
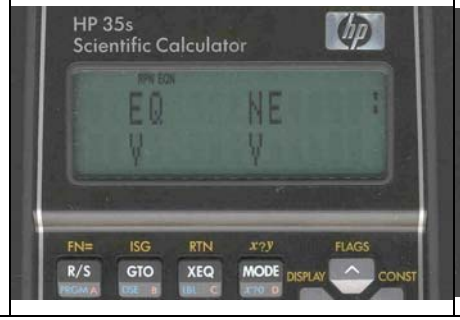
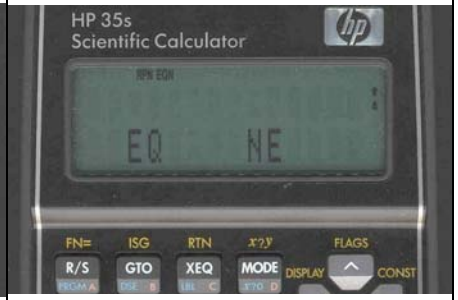
	Original 32sII Menu	Original 35s Menu	Proposed 35s Menu Proposal #1	Proposed 35s Menu Proposal #2
BASE #1				
BASE #2				
CLEAR #1				
CLEAR #2				

	Original 32sII Menu	Original 35s Menu	Proposed 35s Menu Proposal #1	Proposed 35s Menu Proposal #2
DISPLAY #1				
DISPLAY #2				
DISPLAY #3				
FLAGS				

	Original 32sII Menu	Original 35s Menu	Proposed 35s Menu Proposal #1	Proposed 35s Menu Proposal #2
INTG #1				
INTG #2				
LOGIC #1				
LOGIC #2				

	Original 32sII Menu	Original 35s Menu	Proposed 35s Menu Proposal #1	Proposed 35s Menu Proposal #2
L.R.				
MEM				
MODE #1				
MODE #2				

	Original 32sII Menu	Original 35s Menu	Proposed 35s Menu Proposal #1	Proposed 35s Menu Proposal #2
S σ				
SUMS #1				
SUMS #2				
x-bar, y-bar				

	Original 32sII Menu	Original 35s Menu	Proposed 35s Menu Proposal #1	Proposed 35s Menu Proposal #2
x?y, x?0				
x?y #2