# "HP17BII+-Style" Solver Menus on the HP30b

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The HP30b inherits its menu system from the HP20b such that when a menu is entered, the initial function of the menu is shown where (1) data may be entered, (2) a value may be computed or (3) the user may simply scroll up or down to another value in the menu. In the case of the Date menu (which actually represents one of a handful of specialized versions of the solver), the initial values of "Date1", "Date2" and "Days Between Dates" may be accessed for either entering numeric data or calculating a revised value based on data having been entered into any of the other variables. To enter a value, one navigates to the item in question, keys in the new value and presses [INPUT]. Recalculating a value after navigating to the item requires simply pressing the [=] key. Consider the following example:

Compute days between 1 January 1999 and 1 February 1999[1]:
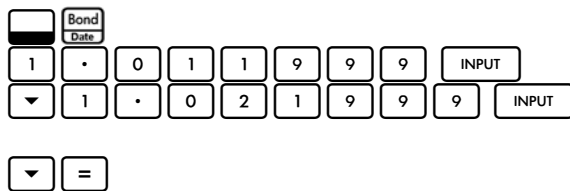
	Start the DATE menu to reveal Date1
	Enter Date1 and press INPUT
	Navigate down, enter Date2 and press INPUT
	Navigate down and press equal to compute the Days Between Dates to be 31

Now, solve for the new Date1 if the days between dates is set to 50:

	Enter 50 as the new days between dates
	Navigate up twice to Date1 & press equal to compute the new Date1 as 13 Dec. 1998

Now in the HP17BII+, the Date soft-key menu, found under ▨▨▨ > ▨▨▨, provides soft keys in the top row, labelled "DATE1", "DATE2" and "DAYS" for this calculation. The user enters the first date and presses "DATE1", enters the second date and presses "DATE2" and then simply presses "DAYS" to yield the resultant days-between-dates value. Then, entering any of the three variables with a different value followed by pressing the appropriate soft key allows "back-solving" for another variable by simply pressing the key corresponding to the value to be solved. Repeating our example on the HP17BII+, we would have:
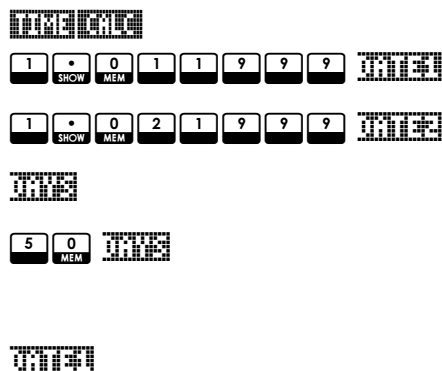
▨▨▨▨▨	Navigate to the Date menu
▨▨▨▨▨▨▨▨ ▨▨▨	Enter Date1 and press DATE1 key
▨▨▨▨▨▨▨▨ ▨▨▨	Enter Date2 and press DATE2 key
▨▨▨	Press DAYS key to solve as 31 days
▨▨ ▨▨▨	Enter new days between dates and press DAYS key
▨▨▨	Press DATE1 key to back-solve to obtain 13.121998

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[1] It is assumed that the calculator is in RPN mode and "dd.mmyyyy" date mode.

As no navigating within the menu is required here, the 17BII+ method seems more straightforward. Therefore, an attempt was made to replicate the 17BII+ method on the HP30b, using its macro-style programs and key assignments. The result is not as streamlined as had been hoped, but does eliminate the need to navigate within the Date menu using the up- and down-arrow keys.

In the 17BII+ itself, each menu soft key serves dual functions for data entry and for solving for the corresponding variable. Since there appears to be no way to determine within a 30b program whether numeric data has just been entered, the dual functionality was not possible, so separate programs were devised for each of the functions; resulting in six programs and key assignments.

They are as follows:

Prgm 1: D1in [INPUT] [▬] [Bond Date] [⊓] [⊓] [⊓] [⊓] [INPUT]   (14 bytes, chksm 224)

Prgm 2: D2in [INPUT] [▬] [Bond Date] [⊓] [⊓] [⊓] [⊓] [▬]+[▼] [INPUT]   (15 bytes, chksm 068)

Prgm 3: Dysin [INPUT] [▬] [Bond Date] [▬]+[▲] [▬]+[▲] [⊓] [⊓] [⊓] [⊓] [INPUT]   (17 bytes, chk 087)

Prgm 4: D1cmp [▬] [Bond Date] [=]   (10 bytes, chksm 232)

Prgm 5: D2cmp [▬] [Bond Date] [▬]+[▼] [=]   (11 bytes, chksm 113)

Prgm 6: Dyscmp [▬] [Bond Date] [▬]+[▲] [▬]+[▲] [=]   (13 bytes, chksm 157)

The "dot-matrix" text strings (such as "D2cmp") represent strings entered via the shift-and-hold [▬]+[9] ("MSG") program instruction, as described in the HP30b Programming Reference learning module. These strings allow the programs to "self-identify" when in [▬] [Prgm] mode. The programs with "in" in the name strings represent those which allow data entry and those with "cmp" solve for the variable values. Programs 1 through 6 would be assigned to the shift-and-hold 1 through 6 keys, respectively. These are assigned by entering each program, using up-arrow to move back to step zero and then entering the shift-and-hold key to which the program is to be assigned. (Program steps listed above with a "+" between them represent shift-and-hold key entry. Thus, [▬]+[▲] inserts an "UP" step into the program.)

Getting back to our sample problem using the new programs and assigned keys, we have:

[1] [.] [0] [1] [1] [9] [9] [9] [▬]+[1]	Enter Date1 and press Sh+1 ("D1in")
[1] [.] [0] [2] [1] [9] [9] [9] [▬]+[2]	Enter Date2 and press Sh+2 ("D2in")
[▬]+[6]	Press Sh+6 ("Dyscmp") to solve and see 31 as the days between dates
[5] [0] [▬]+[3]	Enter 50 and press Sh+3 ("Dysin")
[▬]+[4]	Press Sh+4 ("D1cmp") to back-solve and see 13 Dec. 1998 as the new Date1

For someone who frequently uses the Date-menu functions and prefers the 17BII+ method, this might be a more convenient solution. Other menus such as the "% calc", "BrkEv" or "IConv" could likewise be converted using this method. Perhaps a homemade full-keyboard overlay with the functions clearly labelled over the appropriate keys would also be a benefit. Unfortunately, since the 30b is limited to a maximum of ten programs at once, only one of these menu systems could work in the calculator at any point in time.