hp calculators

HP 20b Operating modes, clearing options and error messages

Mode menu options

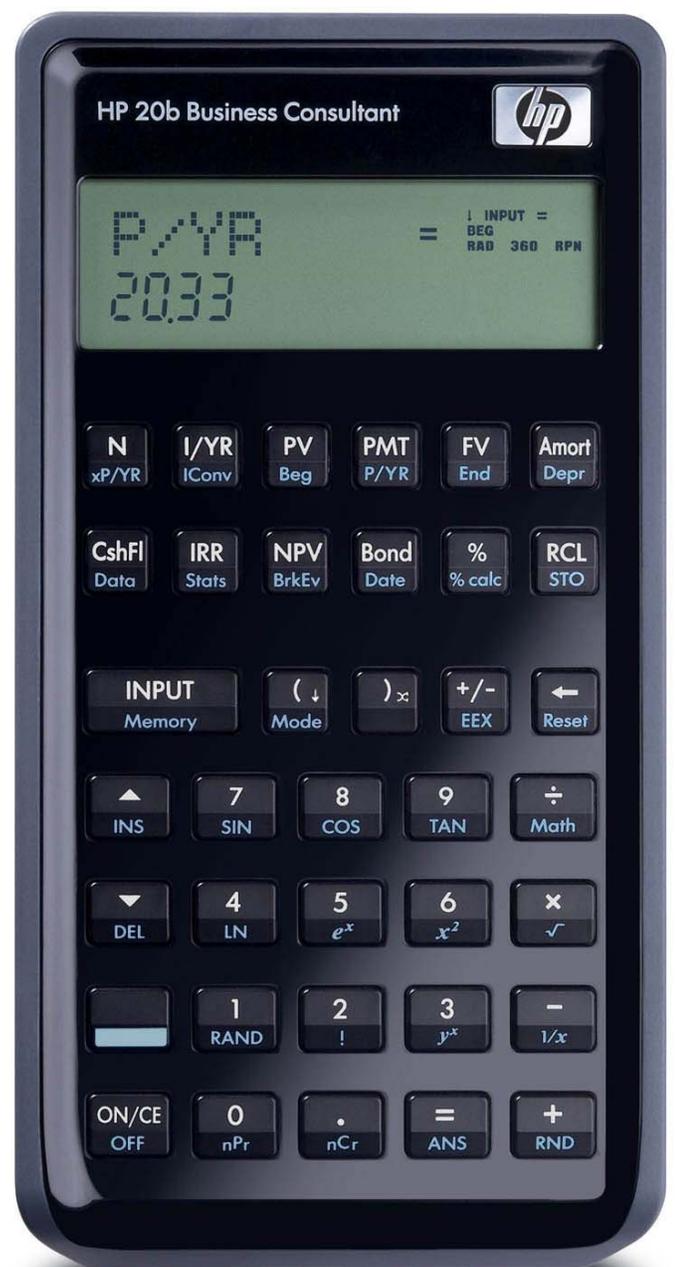Begin/End mode

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Mode menu options

The HP 20b Mode function, accessed by pressing ▱ [Mode], allows users to customize the appearance and operation of the HP 20b to suit themselves. Table 1-1 below indicates the options you can change in the Mode menu, and the default settings, as when the HP-20b is in a new or reset state. When using this menu, you may exit the menu by pressing [ON/CE].

Table 1-1 Mode Menu Settings

Setting	Display Description
FIX= 2	Number of digits displayed to the right of the decimal point. Default is *2* decimal places. Key in the number of digits you want and press [INPUT], or press [=] until the number of digits you want is displayed. If you specify a value of -1 for FIX, the calculator displays numbers with the most appropriate number of digits after the decimal point. **Tip**: if you find you need to change the *FIX* setting often, use this shortcut 1. Press ▱ and release it. Check that the shift key annunciator is displayed. 2. Press ▱ again, and, without releasing it, press a key, [0] through [9], that corresponds to the desired *FIX* setting, of 0 through 9 digits. Note: pressing [·] selects *FIX= -1* as described above. *FIX* settings for 10 and 11 are not available using this shortcut.
Degree or Radian	Angular mode for trigonometric functions. Default is *Degree*. Pressing [INPUT] toggles between these options.
Date: mm dd yyyy or dd mm yyyy	Format for dates. December 3, 2010 is entered as *12.032010* in *mm dd yyyy* format, or *3.122010* in *dd mm yyyy* format. Note the (.) in both formats separating the first and second groups. Default is *mm dd yyyy* format. Pressing [INPUT] toggles between these options. Note that when a date is displayed, a number between 1 and 7 is displayed at the right of the display. This number indicates the day of the week corresponding to that date. Monday is 1 and Sunday is 7. Note: in 360-day calendar mode (Cal.360), days of the week are displayed only if the date is valid.
1.23 or 1,23	Selects decimal point or comma as decimal separator. Default is decimal point, *1.23* Pressing [INPUT] toggles between these options.
1000.00 or 1,000.00 or 1000,00 or 1.000,00	Selects thousands separator. Default is none, 1000.00. Pressing [INPUT] cycles through these options. Note: the 1000.00 and 1,000.00 options are only available if the decimal separator is set for point. 1000,00 and 1.000,00 are available only if the decimal separator is set for comma.
Chain, Algebraic, or RPN	Calculation mode. Default is *Chain*. Pressing [INPUT] cycles through these options.
English, Français, Deutch or Español	Language settings for the messages. Default is *English*. Pressing [INPUT] cycles through these options.
Actual or Cal.360	Calendar options for bonds and dates. Cal.360 uses twelve 30-day months. Default is *Actual*. Pressing [INPUT] toggles between these options.
Annual or Semiannual	Bond interest payment type. Default is *Annual*. Pressing [INPUT] toggles between these options.

Begin/End mode

A special mode setting relates to the solution of problems known as annuities. This mode tells the HP 20b to solve these problems assuming that payments are made either at the beginning of a period or at the end of a period, which is why this mode is called Begin / End mode. When the HP 20b is in Begin mode, the display will show the word BEG in the top right corner of the screen. There is no indication in the HP 20b display when the calculator is in End mode, other than by the absence of the word BEG.

This mode is changed using the shifted BEG and END functions. The begin mode is on the front of the [PV] key and you press [▬][Beg] to activate begin mode. The end mode is on the front of the [FV] key and you press [▬][End] to activate end mode. When in begin mode, the HP 20b display will show a small BEG annunciator in the top right corner of the screen. If you receive an unexpected result when solving an annuity problem, make sure that the calculator is in the proper mode and try resolving the problem.

Adjusting display contrast

To adjust the brightness of the display, press and hold [ON/CE] while pressing the [+] or [-] keys. Each press of the [+] or [-] keys slightly increases or decreases the contrast of the display.

Clearing options

Pressing [ON/CE] one time cancels current number entries, mathematical operations, or a menu selection, in that order. Pressing [ON/CE] repeatedly, with multiple operations pending, cancels one operation at a time, from the latest to the earliest. In algebraic or chain mode, to ensure nothing is pending at the start of a new calculation, press [ON/CE] twice.

The Reset menu

The Reset menu allows you to reset some, or all, of the menu items, variables, and registers to their default values. To open the Reset menu, press [▬][Reset]. *TVM* displays on the top line. Press [▼] repeatedly to scroll to a specific item. If you select the command to reset all values, *All*, you will be prompted to confirm your choice. To reset, press [INPUT]. At the *All Reset* message, press [INPUT] to reset all data in the calculator or [ON/CE] to cancel.

Pressing [▬][Reset] while working within a particular menu takes you directly to the item of the Reset menu that allows you to reset that menu. Say, for example, you are working in the Bond menu and you wish to reset all your entries in the Bond menu. From anywhere in the Bond menu, press [▬][Reset]. *Bond* displays on screen. At this prompt, pressing [INPUT] resets the Bond menu and returns you to the last item you were working with in the Bond menu.

Since entering data in menus can represent a significant amount of work, when the reset commands for the cash flows, statistics and delete all (*Del.All?*) functions are used, you will be asked to confirm your choice. At the prompt, press [INPUT] to confirm, or [ON/CE] to cancel. Once cleared, press [ON/CE] to return to the cash flow or statistics menu.

Number entry

Enter numbers by pressing [0]-[9], [.], the [+/-] key, and by entering an exponent by pressing [▬][EEX].

To correct a number entry, press [←]. Each press of [←] erases the last digit or symbol entered, starting with the least significant digit at the far right of the number. If you press [←] after a calculation, the least significant digit of the result

will be deleted, with each successive press deleting another digit. Note: This will delete the least significant digit of the number, which may not be the least significant digit displayed due to the chosen display setting.

TIP: This is perhaps the easiest way to see all the digits of a number, regardless of the chosen display format. Simply press ⌐ after a calculation to see all the digits. Pressing [ON/CE] one time will exit this edit mode without clearing the number in the display.

To enter a number in the display, press the digits successively. A number can have up to 12 digits. To change the sign of a number from positive to negative, press [+/-]. Scientific notation is used to enter very large and very small numbers. For example, to enter the number *1.2345^{123}* in scientific notation, first enter the mantissa, *1.2345,* then press: ▭ [EEX] and enter the number representing the exponent, *123.* The exponent must have a value between -499 and +499.

Error messages

The table that follows shows the error messages that the HP 20b can produce and their meanings.

Error Message	Cause or explanation
ER: Underflow	The calculation generated an underflow (result of 0).
ER: x/0	Division by zero.
ER: 0/0	Zero divided by zero
ER:∞*0	Infinity multiplied by zero.
ER: ∞/∞	Infinity divided by infinity.
ER:√ (x<0)	Square root of a negative number.
ER: LN (0)	Attempted to take the natural log (LN) of 0.
ER: LN (x<0)	Attempted to take the natural log (LN) of a negative number.
ER: ATrig(|x|>1)	ASIN or ACOS of a number > 1.
ER: 1^ ∞	Attempted calculation of 1^(+/- infinity)
ER: (x<0)^ ∞	Attempted calculation of the infinite power of a negative number.
ER: ∞^0	Attempted calculation of +/-∞^0.
ER: ∞^(Frac)	Attempted calculation of +/-∞^(non-integer y).
ER: (x<0)^(Frac)	Attempted calculation of x^(non-integer y).
ER: Out of Bounds	Input out of bounds.
ER: Invalid P/YR	Returned by TVM functions if payments per year are invalid (<0 or non-integer).
ER: Invalid Input	Returned by any functions if arguments are invalid for any reason.
ER: Invalid I%	Returned by finance functions if I% is ≤ -100%.
ER: No Solution	Returned when there is no solution to the problem.
ER: Many or No Solutions	Returned if there is no solution, or more than 1 solution to the problem.
ER: Many Solutions	Returned when there are many solutions to the problem.
ER: Invalid N	Returned by time value of money or amortization functions if the number of periods per year definition is invalid.

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Error Message	Cause or explanation
ER: User Abort	Returned by long functions if user requests break.
ER: ∞ Result	Returned if the result is infinite.
ER: Insufficient Data	Returned by statistics functions if there is insufficient data for analysis.
ER: No Payback	Returned by payback function if there is no payback on this problem.
ER: Unique solution to IRR Not Found	Returned if IRR tries to calculate a solution but cannot find it. User should supply a new guess and try again.
ER: Stack	Stack overflow.
ER: Parenthesis:	An error linked to use of parentheses: unmatched, too many, etc.
ER: Insufficient Memory	Insufficient memory.
ER: No Solution Found	No solution found.