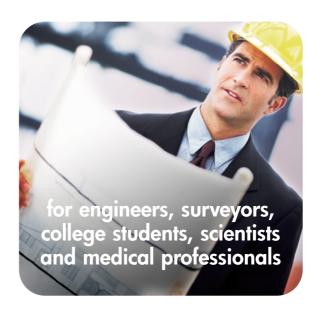
hp 33s

2-line display scientific calculator



electronic specification

• CPU: SPLB31A

• LCD: 14 dot matrix $(5 \times 7 \text{ dots}) \times 2 \text{ lines}$

• power supply: CR2032 \times 2

- battery life expectancy:
 0.73 year @ 1 hr/day
 (approximately 9 months)
- power consumption: 0.03 W
- auto power OFF: approximately 10 minutes

material specification

- plastic/rubber (with upper nameplate)
- material of key top: plastic
- dimensions: $158.0 \times 83.0 \times 16.1$ mm $6.2 \times 3.2 \times .06$ in
- weight: 119 grams





menu type function selection

- MODES: DEG, RAD, GRAD, •, •
- DISPLAY: FIX, SCI, ENG, ALL

key in logic:

• RPN, algebraic

program memory: 32KB

- keystroke programming
- FLAGS: 0~11; SF, CF, FS?
- $X?Y, X?, <, >, =, \leq, \geq, \neq$
- SHOW: press and hold [SHOW] to display CK=value length
- MEM: press [MEM] for the catalog of program labels
- XEQ, R/S: execute a labeled program
- GTO, LBL, SOLVE, INPUT, VIEW, ISG, DSE, FN=, RTN, PSE key
- (i) indirect address
- · solving and integrating programs
- statistics programs:
 - curve fitting: straight line, exponential, logarithmic, power
- normal and inverse-normal distributionsgrouped standard deviation
- miscellaneous programs and equations

statistical function

- one/two-variable statistics
- linear regression
- Σ +: enter data point
- Σ -: remove data point
- SUM: n, Σx , Σy , Σx^2 , $\Sigma y 2$, $\Sigma x y$
- S, σ, Sx, Sy, σx, σy
- x, y:, x, y, xw
- L.R.: r, m, b, x', y'

base-n function

- binary, octal, decimal, and hexadecimal number calculation and conversion
- complement calculation

equations:

- equalities: the equation contains an "=", and the left side contains more than just a single variable
- assignments: the equation contains an "=", and the left side contains just a single variable
- expressions: the equation does not contain an "="
- "EQN" key
- "SPACE" key
- SOLVE: the equation then prompts for a value for every other variable in the equation
- XEQ: returns the value of the equation, regardless of the type of equation
- integration calculation

system

- internal Napier precision
- 13-level parenthesis or maximum number of pending operation: 13 @ALG
- · memory protection while power off
- automatic power off
- decimal point selection
- adjustable contrast
- angle conversions: \rightarrow RAD, \rightarrow DEG
- "SHOW" key
- "MEM" key
- LASTx function
- ¬ key: left shift function key
- ullet key: right shift function key
- C key: CLEAR, ON/OFF
- R↓, R↑ function
- \blacksquare \blacksquare function in equation list and program

edit

- "←" key: deletes
- 4-arrow key in menu:
 "↑" displays previous entry in catalog in
 equation list and program
 "↓" displays next entry in catalog in
 equation list and program
- · display of error message description
- clear display expression

memory

- 27-independent memory (A~Z, i)
- storage arithmetic
- recall arithmetic
- store and clear variable
- · recall variable

mathematical function

- trigonometric, inverse-trigonometric, hyperbolic
- polar-rectangular coordinate conversion
- power, square root, square, cube root, cube, reciprocal
- logarithmic and exponential
- natural logarithmic and exponential
- factorial
- RND
- Int ÷
- IP: truncate to be integer
- FP: truncate to be fraction
- ABS: absolute value
- permutation and combination
- RAND: random number <0,1>
- seed
- SGN: sign

fraction mode

- /c function
- FDISP function: fraction, decimal conversion
- most precise fraction
- factors of denominator
- fixed denominator

40-physics constants scientific, engineering notationunit conversions:

- unit conversions: \rightarrow cm, \rightarrow in, \rightarrow l, \rightarrow gal, \rightarrow kg, \rightarrow lb, \rightarrow °F, \rightarrow °C
- time conversions:
 →HR, →HMS
- engineering notation conversions:
 →ENG, ←ENG

%CHG key

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pocket-sized and full-featured

