hp 33s

2-line display scientific calculator

for engineers, surveyors, college students, scientists and medical professionals

electronic specification

- CPU: SPLB31A
- LCD: 14 dot matrix
  (5 × 7 dots) × 2 lines
- power supply: CR2032 × 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 × 83.0 × 16.1mm
  6.2 × 3.2 × .06in
- weight:
  119 grams

hp

invent

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?, <, >, =, ≤, ≥, ≠
- 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 distributions
  – grouped standard deviation
- miscellaneous programs and equations

statistical function
- one/two- variable statistics
- linear regression
- $\Sigma+$: enter data point
- $\Sigma-$: remove data point
- SUM: n, Σx, Σy, Σx^2, $\Sigma y2$, Σxy
- 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: →RAD, →DEG
- "SHOW" key
- "MEM" key
- LASTx function
- ⌐ key: left shift function key
- ⌐ key: right shift function key
- C key: CLEAR, ON/OFF
- R↓, R↑ function
- ▲ ▼ 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: →cm, →in, →l, →gal, →kg, →lb, →°F , →°C
- time conversions:
  →HR, →HMS
- engineering notation conversions:
  →ENG, ←ENG

%CHG key

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pocket-sized
and
full-featured