

The Hewlett-Packard

# HP-45

Advanced Scientific  
Pocket Calculator





# The HP-45 sets you free!

- **Free** from having to depend upon the slow, limited-function slide rule. The HP-45 performs log, trig and math functions 10 times faster than a slide rule—and with accuracy up to 10 digits.
- **Free** from being tied down to cumbersome log and trig tables. They're all pre-programmed into the HP-45.
- **Free** from the tedious chore of working out complex equations. All you do is press the keys.
- **Free** from having to write down intermediate solutions. The operational stack and addressable memory registers remember them for you.
- **Free** from having to wait your turn to use an on-line computer.

You can use the HP-45 any time . . . anywhere.



In today's fast-moving world, your time is too valuable to spend it solving problems the old-fashioned way. The HP-45 lets you solve even the most complex scientific and engineering problems quickly and easily.

## It's like having a computer in your pocket!

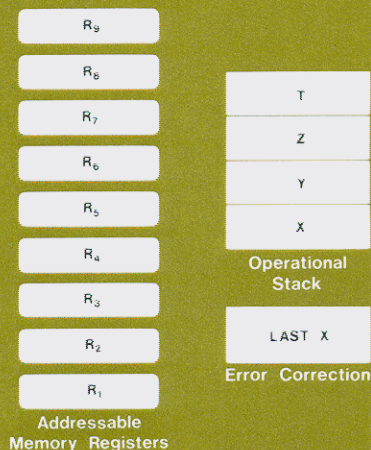
The HP-45 is an advanced version of the popular HP-35 precision electronic slide rule, more than seventy thousand of which are now in use throughout the world. Like the HP-35, the new calculator is a breakthrough in pocket calculator capability, a unique problem-solver with more user benefits than any pocket-sized calculator you've ever seen. It comes in a printing desk top version, too, the HP-46.

### Unique "Gold Key" doubles the functions of 24 keys

It gives the HP-45 increased capability with no increase in size. These problem-solving functions—besides the basic four arithmetic functions—let you quickly solve your mathematical problems.

### 9 memory registers are addressable

You can store data in any of the nine registers . . . retrieve data instantly from any register . . . even do register arithmetic using or modifying data in any register. A 10th register is used for automatically storing the last input argument of a calculation, for error correction or performance of multiple operations on the same number.



## Operational stack holds intermediate solutions

This four-register stack lets you store and retrieve intermediate solutions at the appropriate time. The stack design permits roll-down of any entry to the display for review or other operation. The operational stack, coupled with reverse Polish notation, provides the most efficient means known to computer science for evaluating mathematical expressions.

## Two display modes offer versatility

Unless programmed otherwise, the HP-45 automatically rounds off the display to two decimal places. But by pressing **FIX**, then any digit key from 0 to 9, you can specify the number of decimal places shown on the display. (Full accuracy is always maintained internally.) Fixed decimal display automatically overflows to full scientific display and underflows to zero. By pressing the Gold Key, then **SCI** **FIX**, you can manually change the display to scientific notation, which is useful when working with very large or very small numbers. You can specify the number of significant digits displayed after the decimal (from 0 to 9) in either mode.



# The HP-45 helps you solve complex mathematical problems with unprecedented speed, ease and accuracy!

**Trigonometric functions may be performed in any of 3 selectable angular modes, with instant conversion to or from degrees/minutes/seconds**

You can perform trig operations in degrees, radians or grads (European system) simply by pressing the Gold Key, then the appropriate mode key. All trig functions calculate decimal angles in whichever angular mode is specified. You can instantly convert an angle in any angular mode to degrees/minutes/seconds (e.g.,  $33^{\circ} 6' 5'' = 33.0605$ ), with the answer automatically rounded to the nearest second. Or you can convert from degrees/minutes/seconds to the equivalent decimal angle.

**→R**  
**→P** **Polar coordinates in any of the 4 quadrants can be converted to rectangular coordinates — or vice versa**

Simply press this key to convert to polar coordinates, or press the Gold Key and then this key to convert to rectangular coordinates. Vector calculations are simple on the HP-45. To add or subtract vector components, you may combine the polar-rectangular function with the accumulation function:  $\Sigma+$ . You can also perform two dimensional accumulations.

cm/in    kg/lb    ltr/gal  
7    8    9

**Metric—U.S. unit constants are pre-programmed in for immediate conversion**

You can quickly convert U.S. units to metric units, or convert metric units to U.S. units, for rapid calculation of any problem involving length, weight or volume. And you get 10-digit accuracy.

$n!$   
 $xzy$  **The factorial function lets you quickly calculate combinations and permutations**  
 Merely press the Gold Key, then the key  $xzy$  to quickly calculate the factorial of positive integers. Instead of spending many minutes on such problems, you can do them in just seconds.

$\Sigma+$      $\bar{x}, s$   
 $\Sigma+$      $R+$  **These keys make statistical analysis easy**

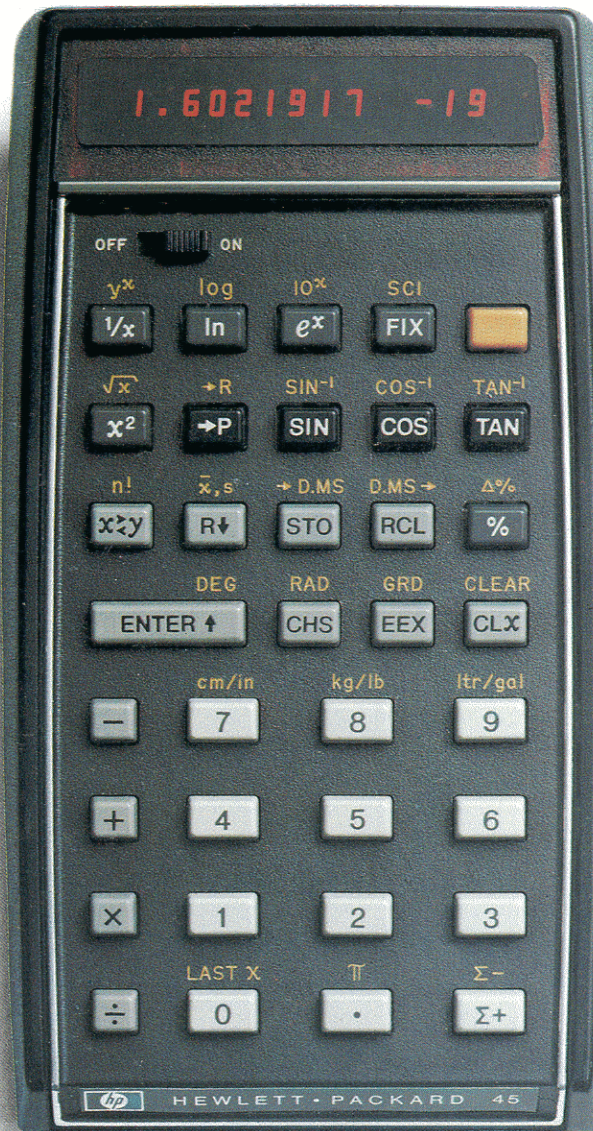
The  $\Sigma+$  key not only provides a running total when adding numbers, but it automatically computes the sum of the squares of all entries and keeps track of the number of entries. The  $\bar{x}, s$  key calculates the arithmetic mean and standard deviation of the entries made with the  $\Sigma+$  key.

$\Delta\%$   
 $\%$  **It's as easy to use as an adding machine . . .**

Calculate percentage problems by simply pressing  $\%$  after entering the percent value. There's no need to convert percents to their decimal equivalent. Press

the Gold Key, then  $\Delta\%$  to instantly compute the difference between two numbers. You can also instantly calculate the net amount, by pressing  $+$  or  $-$  after figuring the percentage.

$y^x$      $10^x$   
 $1/x$      $e^x$   
 Raise a positive number (an integer or decimal) to any power by simply entering the number, then pressing the Gold Key and  $y^x$ . You can extend it to up to nine decimal places.



Shown actual size.



Pressing the  $e^x$  key (natural antilog) raises  $e$  (2.718 . . .) to the power of the value in the display. Pressing the Gold Key, then the key for  $e^{10^x}$  (common antilog) raises 10 to the power of the value in the display.

**log**  
 $\ln$  For the natural log, press  $\ln$ ; it takes the log of the value in the display in base  $e$  (2.718 . . .). For the common log, press the Gold Key, then the key for  $\log_{10}$ ; it takes the log of the value in the display in base 10.

$\sqrt{x}$   
 $x^2$  To find the square root of a number, key in the number, then press the Gold Key, then the key for  $\sqrt{x}$ . The "x" in the symbol represents the currently displayed value, so you can calculate its square root without re-entering the number. To square a number currently displayed, just press  $x^2$ .

$y^x$   
 $1/x$  To calculate reciprocals, key in the number, then press  $1/x$ . The "x" in the symbol represents the currently displayed value, so you can calculate the reciprocal of a value in a previous calculation without re-entering the number. Use the  $1/x$  key with the  $y^x$  key to extract roots.

LAST X  
 $\square$  When a function is performed, the last input argument of the calculation is automatically stored in the "LAST X" register. By pressing the Gold Key, then the key for "LAST X," you can recall the argument to correct an error or perform another operation, using the same number.

**CHS** You are able to key in negative numbers by first entering a positive number, then pressing the "Change Sign" key. Or you can change the sign of any number already displayed by pressing this key.

**EEX** The "Enter Exponent" key lets you key in numbers having exponents—either positive or negative. You may also save time in certain calculations by keying in exact powers of 10.

**R+** **STO** **RCL** **ENTER**  $\uparrow$

These data control keys let you load and manipulate data. You can: load constant values, so you can use the numbers repeatedly; store numbers for deferred calculations; display numbers previously saved in the operational stack; reverse the order of the numbers saved.

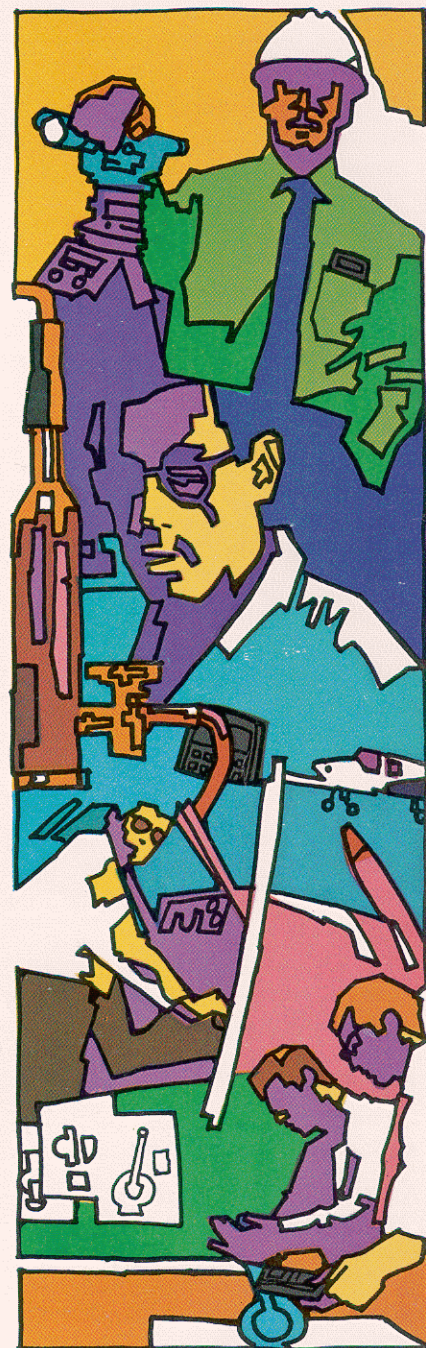
### The HP-45 gives you portable computing power

The HP-45 is the ideal, go anywhere calculator for scientists and engineers. It solves complex problems in seconds, eliminating the need for cumbersome tables, scratched notes and time-consuming interpolation.

Its shirt-pocket size and battery or AC operation give you complete portability. And, when you're not using the HP-45 you can lock it safely in your desk, or keep it in your pocket.

### Try the HP-45 for 15 days

Shirt-pocket test the powerful HP-45 for 15 days. See for yourself how much time and effort it can save you. Get in touch with Hewlett-Packard to find out how you can take advantage of this trial offer.





## The HP-45 Scientific Pocket Calculator does so much more for you than any pocket calculator you've ever seen!

Beyond the basic four functions (+ - × ÷), the HP-45 is pre-programmed to . . .

### Perform trigonometric functions:

- Sine
- Arc sine
- Cosine
- Arc cosine
- Tangent
- Arc tangent

### Perform logarithmic functions:

- Common logarithm
- Natural logarithm
- Common antilogarithm
- Natural antilogarithm

### And perform:

- Serial calculations
- Mixed serial calculations
- Chain calculations
- Mixed chain calculations

### Calculate:

- The square root of the number displayed
- The square of the number displayed
- The reciprocal of the number displayed
- The raising of a positive number to a power
- The factorial of positive integers
- Percentage
- Percent difference
- The mean of entries made with the  $\Sigma$  key
- The standard deviation of entries made with the  $\Sigma$  key

### Automatically convert:

- The decimal angle in the display (using the angular mode as set) to degrees/minutes/seconds
- The degrees/minutes/seconds angle in the display to a decimal angle

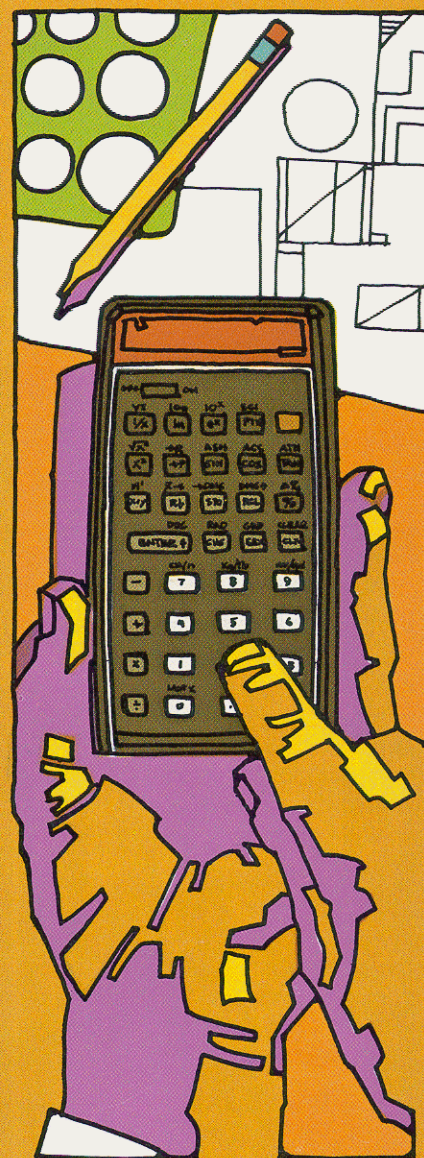
- Polar coordinates to rectangular coordinates
- Rectangular coordinates to polar coordinates
- Centimeters to inches
- Inches to centimeters
- Kilograms to pounds
- Pounds to kilograms
- Liters to gallons
- Gallons to liters

### And the HP-45 will also:

- Simultaneously accumulate two sets of entries for statistical and vector calculations
- Recall the last argument for error correction
- Display (at the touch of a key) the constant Pi
- Allow for selective storage and retrieval
- Permit selective round-off (0 to 9 places in fixed or scientific mode)
- Provide answers in scientific notation if desired
- Operate in any of three trigonometric modes—degrees, radians or grads
- Perform register arithmetic
- Perform vector arithmetic

### It's easy to use

The HP-45 comes with an exclusive quick reference guide that enables you to master the calculator quickly. It provides key-by-key instructions for the most commonly used functions, but the HP-45 is so easy to use, you probably won't need the guide after you do a few calculations. A fully illustrated operator's handbook gives comprehensive instructions and examples.





## The complete HP-45 outfit includes:

- HP-45 advanced scientific pocket calculator
- Battery pack that under normal use provides 3 to 5 hours of operation
- 115/230 V AC adapter-recharger that lets you operate the HP-45 on AC while the battery pack is recharging
- Soft carrying case, with handy belt loop
- Safety travel case that holds the HP-45 and recharger
- Illustrated Owner's Handbook
- Quick Reference Guide
- Self-adhesive owner's name tags

**Optional accessories:** Security cradle; hard leather field carrying case; spare battery holder with pack (details sent with the HP-45)

### Features and Specifications

- Display: Up to 10 significant digits plus two-digit exponent and appropriate signs
- Dynamic range:  $10^{-99}$  to  $10^{99}$
- Free field data entry with exponent
- Single keystroke functions
- Four-register operational stack
- Nine addressable memory registers
- Serial calculation
- Chain calculation
- Mixed chain calculation
- Automatic doubling
- "LAST X" register for error correction
- Automatic decimal point positioning
- Selective round-off; range: 0-9 decimal places
- Two display modes: fixed point and scientific
- Indicators for improper operations and low battery condition
- Operates on rechargeable batteries or AC
- Solid state electronics (MOS/LSI)



- Light-emitting diode (LED) display
- Tactile feedback keyboard
- Compact, contoured case

### Power:

AC: 115 or 230 V,  $\pm 10\%$ , 50 to 60 Hz, 5 watts

Battery: 500 mw derived from nickel-cadmium rechargeable battery pack

### Weight:

HP-45: 9 ounces

Recharger: 5 ounces

Shipping Weight: 2 lbs. (approx.)

### Dimensions:

Length: 5.8 inches

Width: 3.2 inches

Height: 0.7 to 1.3 inches

### Temperature Operating Range:

32°F to 122°F (0°C to 50°C)

### Warranty

The HP-45 is warranted against defects in materials and workmanship for one (1) year from the date of delivery. Hewlett-Packard will repair or replace components which prove to be defective during the warranty period, providing the defective units are returned to Hewlett-Packard. No other warranty is expressed or implied. Hewlett-Packard is not liable for consequential damage. Service is available directly from Hewlett-Packard.



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