



**HP-31E, HP-32E, and HP-33E Calculator Specifications.**

Length: 140 mm (5.6 in.) Width: 75 mm (3.0 in.)  
 Height: 30 mm (1.2 in.) Weight: 220 g (7.7 oz.)  
 Recharger Weight: 170 g (6.0 oz.)  
 Shipping Weight: 910 g (2.0 lb.)  
 Operating Temperature: 0° to 45°C (32° to 113°F)  
 Charging Temperature: 15° to 40°C (59° to 104°F)  
 Storage Temperature: -40° to 55°C (-40° to 131°F)  
 Recharger Power Requirements: 90 to 120 VAC, 50 to 60 Hz,  
 or 198-242 VAC, 50 to 60 Hz.  
 Battery: 2.5 VDC quick-charge nickel-cadmium battery pack.  
 Charging Time: Calculator off, 5 to 9 hours. Calculator on,  
 17 hours.  
 Operating Time: Typically 3 hours of continuous operation.

**One Year Limited Warranty.\***

The HP-31E, HP-32E and HP-33E calculators and their accessories are warranted by Hewlett-Packard against defects in materials and workmanship for one year.

During the warranty period, we will repair or at our option replace an HP-31E, HP-32E, or HP-33E that proves to be defective at no charge provided that you return the product, shipping prepaid, to the Hewlett-Packard Repair Center.

**What Is Not Covered.**

This warranty does not apply if the product has been damaged by accident or misuse, or as a result of service or modification by other than an authorized Hewlett-Packard Repair Center.

No other express warranty is given by Hewlett-Packard.

\*A copy of the complete warranty is available upon request from your dealer or by mail from Hewlett-Packard.

Hewlett-Packard reserves the right to make changes in materials, specifications or accessories without notice.

Hewlett-Packard Products are manufactured by Hewlett-Packard worldwide.



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 Switzerland

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 Palo Alto, California 94304, U.S.A.

**In Canada ...**  
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 Mississauga, Ontario L4U-1L9  
 Canada

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# INTRODUCING A NEW GENERATION OF SCIENTIFIC CALCULATORS FROM HEWLETT- PACKARD.



Each calculator in the new Hewlett-Packard Series E line gives you more calculating power, more ease-of-use features, at a lower price than any comparable calculator we've ever offered. Whether you choose the HP-31E Scientific, the HP-32E Advanced Scientific with Statistics, or the HP-33E Programmable Scientific, you'll find these same great features.

**New easy-to-read display—plus commas.**

To help you read large numbers more easily, commas\* are automatically inserted, just as you would write them yourself. And the large, bright red digits are tilted forward for positive reading from any working angle.

**New exclusive self-check capacity, error codes, and improved accuracy.**



An internal self-test routine is built right in. At the press of two keys, the calculator quickly checks all of its internal circuitry, then flashes -8,8,8,8,8,8,8,8,8,8, to reassure you of correct operation.

Also, if you make a mistake in your calculations, special error codes show in the display to help you track it down.

And improved accuracy, previously found only in higher priced calculators, lets you proceed with greater confidence in any complex problem.

**New convenient shape and size.**

Perfectly shaped to fit your hand, sized to easily fit your pocket, elegantly designed to



\*Or points depending upon local convention.

be a handsome and prestigious addition to your desk.

**New low price range.**

You get more functions and more ease-of-use features for your money than with any other calculator we've ever offered.

**Time-proven RPN.**

RPN encourages and assists you in approaching calculations naturally and consistently. You don't need parenthesis keys. Intermediate answers are displayed and stored automatically in a four memory stack so you never need to write them down and risk making errors. And because intermediate answers are stored, the size and complexity of problems that can be handled with RPN logic are virtually unlimited. Compared to algebraic logic, the RPN logic system is faster, more efficient and more versatile in solving the complex problems faced by today's and tomorrow's professionals in engineering and science.

**And traditional Hewlett-Packard attention to detail.**



Pick up one of these fine Series E calculators and you immediately notice the quality *feel* for which Hewlett-Packard is famous. What you may not notice are the important details that make the power in your calculator more usable: the positive click-action keys; the helpful color-coding on the keyboard; the comprehensive, high-quality owner's handbooks and applications books; the rugged construction that keeps it going when other calculators fail; and more.

These instruments have been designed—in every detail—to be the finest of their kind in the world. Pick up one today.

# THE HP-31E, HP-32E AND HP-33E PROVIDE MORE FEATURES, LOWER COST AND TRADITIONAL HEWLETT- PACKARD QUALITY.



Hewlett-Packard's new HP-31 gives you an excellent blend of mathematical and scientific functions at a new low price.

The HP-31 has been designed in the tradition of the famed HP-35 and the popular HP-21 calculators—a basic no-nonsense machine to slice through the toughest scientific and mathematical problems with ease. And the HP-31 Scientific Calculator has great new features, together with an unparalleled combination of keyboard and display functions.

### Mathematical Functions.

The HP-31 has the functions you need for science or engineering. Exponentials, reciprocals, square roots, pi, and per cent, all available at the press of a key. And of course, the HP-31 adds, subtracts, multiplies and divides—all with 10-digit accuracy.

### Trigonometric Capability.

The HP-31 quickly and accurately computes sine, cosine, or tangent, as well as arc sine, arc cosine, and arc tangent—all with a choice of degrees, radians, or grads mode. And you can convert directly between degrees and radians, too.

### Rectangular/Polar Conversions.

The HP-31 converts directly between rectangular coordinates (x,y) and polar coordinates (magnitude r, angle  $\theta$ ).

### Logarithms.

Common and natural logarithms, as well as antilogarithms, are generated at the touch of a key by the HP-31.

### Metric Conversions.

The HP-31 gives you instant, two-keystroke conversions between inches and millimeters, Fahrenheit and Centigrade, and pounds and kilograms.

### Four Addressable Registers and LAST X.

Besides the four-register automatic memory stack, the HP-31 contains four *addressable* storage registers for selectively storing and recalling constants, results, or other data. Because you can perform arithmetic on any HP-31 storage register, each addressable register can be like a separate four-function calculator by itself.

And the HP-31's LAST X register automatically stores the last value present before any calculation, an extremely useful function in recalling a constant or redoing a problem because of an error.

### Display Modes.

The HP-31 is equipped with the new Series E display—larger, brighter LED's tilted forward for easy readability whether the calculator is in your hand or on your desk, and automatic separation of thousands. A choice of two display modes—fixed or scientific—lets you view any number as either a full, 10-digit (or less) mantissa or as a mantissa of up to seven digits followed by a two-digit exponent of 10. No matter what display you've selected, the HP-31 internally maintains full 10-digit accuracy—and you can see the full 10-digit mantissa at any time by simply pressing the MANT key.

### Stack Review.

You can roll down the contents of the automatic memory stack for review at any time. Or you can exchange the contents of only the displayed X-register and the Y-register.

### Selective Clearing Options.

The versatile HP-31 lets you select the portion of the calculator you want to clear before proceeding. You can clear the entire calculator, clear only the storage registers, or clear only the automatic memory stack. You can even clear a prefix key you've mistakenly pressed.

### The HP-31E comes complete with:

- *Solving Problems with Your Hewlett-Packard Calculator*, a booklet that helps a user new to HP calculators put the power of RPN to work solving difficult problems in a matter of minutes
- *HP-31E Owner's Handbook*, a helpful guide to every function of your finely crafted calculator.
- AC adapter/recharger, lets you operate your HP-31 from AC house current while simultaneously charging its battery pack.
- Battery pack (installed in calculator before shipping), containing rechargeable nickel-cadmium batteries that give you portable power for about three hours of continuous operation.
- Carrying case, tough yet pliable, for protecting your HP-31 and attaching it to your belt.

See the back of this brochure for complete physical specifications and additional warranty and accessory information.

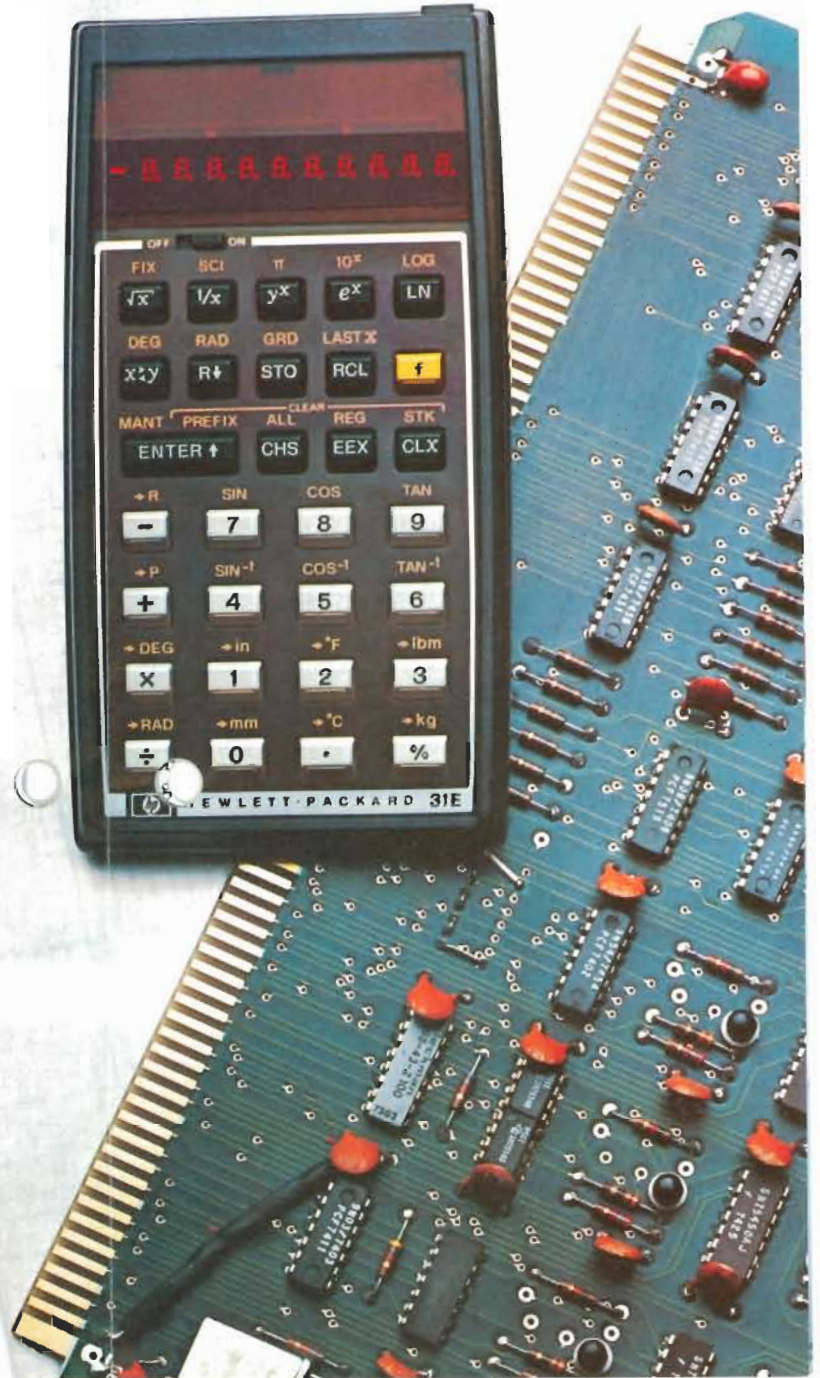
Displays are photographed separately to simulate typical appearance.

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# THE HP-31E SCIENTIFIC CALCULATOR.

Orders accepted starting May 1, 1978



Hewlett-Packard's new HP-32 is the most powerful scientific preprogrammed calculator we've ever built. Like the classic HP-45, the HP-32 is packed with dozens of invaluable mathematical and scientific functions that make the solutions to your toughest problems only a few keystrokes away.

But that's not all! The HP-32 has more addressable storage registers and increased statistical capability to create an advanced scientific calculator that puts unparalleled power at your fingertips.

### Superior Statistics.

For the manager, the statistician, or anyone who must reduce and interpret data, the HP-32 gives you features never before offered on a Hewlett-Packard pocket calculator.

### Normal Distribution.

The HP-32 is equipped with the normal and inverse normal distribution functions—it can compute the area under a standard normal distribution curve to the left of  $x$ , and it can also compute  $x$  given the area under the curve.

### Two-Variable Means and Standard Deviations.

At the press of a key you can calculate the means of two variables. And the HP-32 can also give you the sample standard deviations of those sets of data.

### Linear Regression and Linear Estimate.

The HP-32 calculator easily computes linear regression, calculating the slope and  $y$ -intercept of a least-squares line for data. In addition, the HP-32 linear estimate function can actually predict new values along the line.

### Correlation Coefficient.

At the press of a key, you can see in the display a parameter for "goodness of fit" between  $x$  and  $y$  values and a least-squares line.

### Data Accumulation and Correction.

$\Sigma +$  automatically accumulates  $\Sigma x$ ,  $\Sigma y$ ,  $\Sigma xy$ ,  $\Sigma x^2$ , and  $\Sigma y^2$  in designated storage registers—and these registers will hold numbers up to a magnitude of  $10^{99}$ . Correcting a data pair is easy, too, with  $\Sigma -$ .

### Factorial.

The HP-32 easily computes the factorial ( $n!$ ) of a number in the display.

### 15 Storage Registers

To help you store and recall data, results, constants, or statistical information, the HP-32 is equipped with 15 addressable storage registers. In addition, you can perform any arithmetic operation on the contents of any of these storage registers without affecting other registers or the stack.

The HP-32 also has a LAST X register which automatically preserves the contents of the display present before the last operation.

### Trigonometric Functions Including Hyperbolics

Besides providing sine, cosine, and tangent and their inverses, the HP-32 also computes hyperbolic trigonometric functions ( $\sinh$ ,  $\cosh$ ,  $\tanh$  and their inverses).

### Rectangular/Polar Conversions and Vector Arithmetic.

The HP-32 quickly converts rectangular coordinates ( $x, y$ ) to polar coordinates ( $r, \theta$ ), or vice versa. And vector arithmetic is easy using the rectangular/polar functions with the accumulation functions  $\Sigma +$  and  $\Sigma -$ .

### Three Display Modes.

The large numbers in the bright red LED display can be seen in fixed mode up to 10 digits long, or in any scientific mode up to a seven-digit mantissa and a two-digit exponent of 10. In addition, you can specify engineering notation, where the exponent of 10 is always a multiple of three (e.g.,  $10^3$ ,  $10^{-6}$ ), and you can always see the full 10-digit mantissa, regardless of display mode, by pressing the MANT key.

### Metric and Degree Conversions.

The HP-32 converts between gallons and liters, pounds and kilograms, inches and millimeters, or Fahrenheit and Centigrade. You can also change decimal hours or degrees to hours, minutes, seconds or degrees, minutes, seconds at the press of a key; and you can convert directly between degrees and radians.

### A Full Range of Mathematical Functions.

The HP-32's mathematical power includes  $1/x$ ,  $\sqrt{x}$ ,  $\pi$ ,  $x^2$ , and  $y^x$ , besides the usual arithmetic functions.

### A Variety of Useful Percent Calculations.

On the HP-32, you can easily calculate percent, percent of sum, and percent change.

### Logarithmic Functions.

The HP-32 is loaded with logarithmic functions, including natural and common logarithms and antilogs.

### The HP-32E comes complete with:

- *Solving Problems with Your Hewlett-Packard Calculator*, a booklet that helps a user new to HP calculators put the power of RPN to work solving difficult problems in a matter of minutes.
- *HP-32E Owner's Handbook*, a comprehensive guide for every function of your finely-crafted calculator.
- AC adapter/recharger, lets you operate your HP-32 from AC house current while simultaneously charging its battery pack.
- Battery pack (installed in calculator before shipping), containing rechargeable nickel-cadmium batteries that give you portable power for about three hours of continuous operation.
- Carrying case, tough yet pliable, for protecting your HP-32 and attaching it to your belt.

See the back of this brochure for complete physical specifications and additional warranty and accessory information.

# THE HP-32E ADVANCED SCIENTIFIC CALCULATOR WITH STATISTICS

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Orders accepted starting July 1, 1978.





# THE HP-33E PROGRAMMABLE SCIENTIFIC CALCULATOR.

Orders accepted starting May 1, 1978.



The HP-33 is an advanced scientific calculator that is also programmable! Like its famous predecessor the popular HP-25, the new HP-33 remembers a series of keystrokes as you press them, then executes the sequence later at your command. But the HP-33 has a combination of features w never before offered on a key-stroke programmable calculator—including a new low price.

## Programming Enhances Your Capabilities.

Not only does programming remove the drudgery of lengthy or repetitive calculations, but a program can actually make decisions for you. And programming the HP-33 is so simple—just switch to PRGM and press a problem-solving series of keystrokes to be remembered by the calculator. Then switch to RUN, key in any known data, and hit the R/S (run/stop) key. The HP-33 does the rest, executing those keystrokes in a few seconds, over and over as many times as you like. There's no complicated programming language to learn, no elaborate "start-up" procedures to memorize.

## 49 Lines of Program Memory.

The HP-33 remembers your program in a special memory—49 lines of it. And no matter whether a keyboard operation is one, two, or three keystrokes, it occupies only a single line of memory, so you can easily load programs of 100 keystrokes or more.

## Double-Duty Display.

In RUN mode, the display shows you data and intermediate and final results. In PRGM mode, the display gives you program information. Each line of program memory is shown in the display with a line number and then a "keycode" that tells you what instruction is loaded in that line.

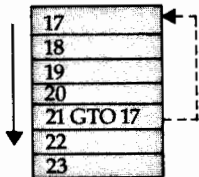
This keycode shows you're at line 23 of program memory, and the instruction loaded there is G DEG: the key in the 1st row of the keyboard, 5th key from the left, followed by the key in the 1st row of the keyboard, 1st key on the left.

**More Programming Features.**

Besides 49 lines of fully merged program memory, the HP-33 has a variety of specialized functions to make your programming useful, powerful, and even fun.

**Go To.**

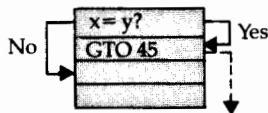
The GTO (go to) command transfers an executing program to a specified line of memory—permitting you to create branches and loops in your programs.



And for editing, you can also use GTO from the keyboard to go to any line number.

**Powerful Decision-Making Capability.**

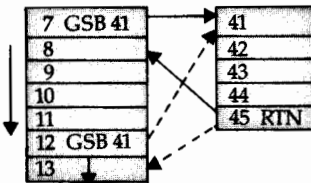
Andamental to the operation of even the largest computer is its ability to make a decision. The HP-33 has eight conditionals which actually compare two values and make a decision based on the outcome of the comparison.



When a running program executes  $x = y?$ , for example, it compares the values in the X and Y registers of the stack and asks the question "Does x equal y?" If the answer is *no*, the program skips a line before continuing—if *yes*, the program continues with the next line where a GTO instruction is used, as shown here, to transfer execution to another part of the program.

**Three Levels of Subroutines.**

Using the GSB (go to subroutine) instruction, you can save memory and make your programs much more efficient. After a section of memory has been called up as a subroutine, a RIN (return) instruction then returns execution to the next line after the GSB call.



Subroutines permit you to use the same section of a program several times, saving valuable memory space. And you can nest subroutines three levels deep in the HP-33.

**Single-Step Execution.**

For debugging, editing, or just viewing the operation of a program, you can execute it one line at a time with the SST (single-step) key.

**Fast, Easy Editing.**

Besides being able to go to any line number with GTO, you can also use SST and BST to single-step or back-step through a program, *without* execution, to any point you want in program memory. Changing a program is easy, too—you just key in a new instruction and it automatically replaces the old one.

**Pause.**

The PAUSE function in a program actually lets you see a result or an intermediate answer for a second before resuming execution. For a longer display time, you can insert several pa

**Eight Addressable Storage Registers.**

In addition to the 49-line program memory, the four-register stack and the LAST X register, the HP-33 has 8 addressable storage registers for data. And you can perform storage register arithmetic on these addressable registers, too.

**Display Control.**

The HP-33 has all the display control functions you expect, including a choice of fixed, scientific, or engineering notation (where exponents of 10 are always a multiple of three, e.g.  $10^3$ ,  $10^{-6}$ ). The HP-33 has a MANT key that lets you view the full 10-digit mantissa of any number regardless of display mode.

**A Full Range of Scientific and Mathematical Functions.**

The new HP-33 has the functions you need— $x^2$ ,  $\sqrt{x}$ ,  $\pi$ ,  $\%$ ,  $1/x$  and  $y^x$ . It features trigonometric functions (sine, cosine, tang and their inverses) in degrees, radians or grads; and it performs direct degree/radian and decimal hours/hours-minutes-seconds conversions.

With a full range of logarithmic functions, rectangular/polar conversion, and statistics which include mean, standard deviation, linear regression, linear estimate, and correlation coefficient, the HP-33 is truly a complete calculator.

**The HP-33E comes complete with:**

- Solving Problems with Your Hewlett-Packard Calculator.
- HP-33E Owner's Handbook.
- HP-33E Applications.
- HP-33E Quick Reference Card.
- AC adapter/recharger.
- Rechargeable battery pack (installed in calculator before shipping).
- Carrying case.

**Optional Applications Books.**

You can also purchase these optional applications books, each one containing programs in a specialized area for the HP-33.

- Mathematics Applications.
- Statistics Applications.
- Surveying Applications.
- Student Engineering Applications.

See the back of this brochure for complete physical specifications and additional warranty and accessory information.