MICROCODE: Electronic Building Blocks for Calculators.


NEW!
The HP-10 Handheld Printing Calculator
The HP-19C Advanced Printing Programmable with Continuous Memory
The HP-29C Advanced Programmable with Continuous Memory
The HP-92 Investor

HP CATALOG BEGINS ON PAGE 7!
When you choose HP you’ve solved your problems.

You get power plus a wide range of solutions with an HP calculator. All can provide you with invaluable help—in science, engineering or business.

Prerecorded solutions for owners of fully-programmable calculators.

The solution you require may already exist in one of ten HP Application Pacs. Prerecorded magnetic cards program your HP-67 or HP-97 in less than 2 seconds. Each program is fully documented with helpful comments.

New Library Solutions add another 40 program booklets.

We recently published forty booklets of up to 76 pages each. They cover business, engineering, mathematics, medicine, statistics, physical science, life science and other subjects. You can easily record the programs in these booklets on magnetic cards for repeated use.

More help from the HP-67/97 Users' Library.

HP has long maintained the well-known Users' Library from which programs contributed by HP-67/97 users are available to others on subscription. And a periodic Newsletter serves as a clearing house of current programming information.

Convenient solutions in the comprehensive Application Books.

These books, available for all HP calculators, have helped thousands of owners find the fastest and best solutions to their problems. They contain all the most-used applications in the specific field.

Owner's Handbooks that are far more than handbooks.

These are among the most complete and helpful reference books ever published for personal calculators, going far beyond the usual how-to-use-it information. Detailed operational data is provided, along with many suggestions for maximum efficiency. And there is page after page of practical applications.
The Hewlett-Packard Personal Calculator

DIGEST

The HP Magazine and Product Catalog Volume Three, 1977

Features

Business Calculators: The New Blue-Chip Investment 3
Micro-Code: Electronic Building Blocks for Calculators 4
The Logical Choice 27
For Your Information 29
40 New Library Solutions Books for the HP-67/97 29

Catalog

How to Use the Catalog and Buyer’s Guide 7
Buyer’s Guide 8
The HP-92 Investor 10
The HP-27 Financial/Statistical/Scientific Calculator 12
The HP-80 Financial Calculator 13
The HP-22 Business Management Calculator 14
The HP-10 Handheld Printing Calculator 15
The HP-19C Advanced Printing Programmable Calculator with Continuous Memory 16
The HP-29C Advanced Programmable Calculator with Continuous Memory 17
The HP-21 Scientific Calculator 18
The HP-25/25C Scientific Programmable Calculators 19
The HP-67 Fully-Programmable Calculator 20
The HP-97 Fully-Programmable Printing Calculator 21
The HP-67/97 Application Pacs 22
The HP-91 Scientific Printing Calculator 24
The HP Calculator Accessories 25, 26

Departments

Letters 2
Questions and Answers 28
Beyond the Call of Duty 28
I have just received Volume 2 of the "Digest," and must congratulate you on one of the best publications of its type I have ever come across; it is an excellent example of how readability makes for understanding. Please maintain this style.

The letters in this volume make me anxious to read Volume I also, which somehow I missed out on. Have you a spare copy you can send me?

E.A. King-Smith Ph.D.
R & D Specialist
Medical Products Division
3M Company

I have received and read with great interest Volume Two of the H-P Calculator Digest. I unfortunately did not receive Volume One, and would like to get a copy if any are still around. If an entire copy is not available, I would greatly appreciate a "xerox" copy of the article discussing Thermal Printing.

Jerry L. Hautamaki
Staff Engineer
Academic Computer Center
University of Washington

EDITOR'S NOTE: We are happy to send back issues of the Digest upon request.

The "Smart" Card Reader

You have every reason to be proud of the HP Digest. Keep up the good articles.

I would appreciate your assistance in obtaining a copy of the November 1976 Hewlett-Packard Journal. The card reader article was good—now I have to learn more about the HP-67 and HP-97.

James Sterlace, Fairport, NY

EDITOR'S NOTE: The HP Journal can be obtained by writing to HEWLETT-PACKARD, 1501 Page Mill Rd., Palo Alto, CA. 94304

What did you do? You wrote 76, then 41, then multiplied. No one writes 76, multiplies, then writes 41. So there is really nothing reverse about HP’s calculator. The problem is entered exactly as written—if one intends to solve the problem. So if you want to write equations, buy the other guys—but if you want to solve problems with fewer mistakes, use an HP.

Tom Gegenheimer, Orange, Ca.

I am not an engineer much less a mathematician.

Many years ago, as a machine shop inspector in the pre-hand-held calculator era, I was regularly faced with the need to measure precise complex conical tapers and compound angles. This involved a considerable amount of trig which was quite time consuming and subject to error in numerous calculations. Much of this tedium was eliminated by self education in logarithms which made it all a piece of cake.

In 1974 I purchased an HP-45. This was a giant step forward from the simple, but then expensive, four-function calculator I owned at the time. The HP-45, too, was well beyond my mathematical capabilities.

Where logarithms had been a piece of cake, the HP-45 became the whole cake which opened up entire new mathematical vistas. My appreciation for this machine was boundless as I acquainted myself with its capabilities and in no way could I foresee surrendering ownership. Then you introduced the HP-25.

Devising new programs and intricate procedures via the conditional tests and other unending capabilities of my HP-25 is a marvelous mind-bending pleasure.

Roy C. King, Kensington, MD.

I am an advocate of the RPN logic and would like to say that of all the calculators I have seen none of them are 100% ‘algebraic’. Many of the models available are not even equipped with parenthetical keys. Some algebraic calculator owners insist that you may rest at ease with their machine since you may key the problem in exactly as you see it. This is true for moronically simple problems. When you finally have to consider problems which demand the division of unwieldy terms, there are little tricks, nonalgebraic in character, that the competitor will supply you with. With your machine (I possessed an HP-55 until it was stolen), all that was needed was to learn the rules of operation and follow them forever with no mistakes. The HP-67 is a wonderful machine. Maybe it’s not so bad that I lost my 55 after all.

Gregory Wilson, Cambria Hts, NY.

I’ve got to add my 2¢ worth to the RPN argument because only recently did I realize why I prefer it to the “algebraic” system. All along I thought I was partial only because I had always used HP’s. The argument of “entering the equation as it is written” was hard to beat down.

Get a pencil and piece of paper and multiply 76 by 41.

Contribute to Digest: The Editor would be delighted to hear of any incident or experience you may have had with an HP calculator that would be of interest to our readers. Because of space limitations, not all letters received may be used and all letters are subject to editing. Please address your contributions to Editor, HP Digest, Hewlett-Packard Company, Corvallis Division, 1000 N.E. Circle Blvd., Corvallis, OR 97330, U.S.A.
When Leibniz invented a mechanical calculator back in the 17th century, he said it was ridiculous that intelligent people “lose hours like slaves in the labor of calculation.”

Though the Leibniz device didn’t catch on, the idea did. Some 300 years later the small electronic calculator, in science at least, has freed the slaves.

And what about the modern business executive? Faced with increasingly complex financial calculations in his professional and personal life, can he be far behind? After all, with an electronic calculator on his desk, he can solve problems in minutes that would take hours of time if he waited to feed them into the big company computer.

Nevertheless, the majority of executives have gone only part way to freedom, typically relying on basic four-function calculators to add, subtract, multiply and divide. And for simple, everyday number crunching there’s nothing wrong with that.

But the inadequacies of such calculators in dealing with complex investment and management problems become immediately apparent to anyone willing to invest a few hours experimenting with an advanced professional instrument.

In fact, a major business magazine said recently that the programmable calculator has become as hot an item among some managers as the four-function pocket calculator has become in the mass market.

It is true that “some” managers have discovered the enormous advantages of programmables in decision-making. But for most, complete freedom is easily achieved with a preprogrammed calculator, such as the HP-22, HP-27, HP-80 and the powerful HP-92.

The appeal of the preprogrammed calculator is obvious. It can provide fast and accurate solutions to a wide range of financial and statistical problems, many involving complex computations. And they are extremely easy to use, even for those whose skills in math and statistics are rusty or altogether lacking.

Given these facts, why have business people (Con’t on Page 27)
Microcode: Electronic Building Blocks For Calculators.

Just as DNA can be called the building blocks of the human organism, microcode can be called the building blocks of the electronic calculator.

But, while the way the human organism works is determined by heredity, the way an electronic calculator works is determined by the highly personal—and even idiosyncratic—creative impulses of a programming specialist.

The principles of programming can be learned, of course. But anyone who has programmed his own calculator quickly discovers that techniques may vary widely from person to person.

Consider the challenge faced by the professional programmer. When you press the key labeled SIN, for example, you expect the calculator to display the sine of the value you have keyed into it—and presto, it does. But in that less-than-a-second interval between keystroke and display, the calculator has executed an internal program of about 3500 steps. And it does this according to the highly individualistic microcode that the programmer has created.

The development of microcode in Hewlett-Packard personal calculators began with the development of the microprocessor in the HP-35—and not coincidentally, since both were developed by the same Hewlett-Packard engineer.

It is the microprocessor that determines the "language" of the internal microcode. If you are familiar with computer languages such as BASIC, FORTRAN, and COBOL, you know that these languages structure the way you write your program on the computer. You can only do what the language lets you do.

The microprocessor is similar to the computer. It provides a language that a clever engineer can then build into a function on the keyboard.

The original HP-35 microprocessor has remained essentially unchanged through the years and is the heart of the new HP-19C and HP-29C. Compared with computer processors, the binary-coded-decimal microprocessor is very simple. It does not handle byte data well, but is, in fact, specially designed for 10-digit floating point numbers (See figure 1.). The resulting microcode language most closely resembles machine language, which is programming at its most basic level.

Most microprocessors use 8-bit instructions and two or three instructions are usually combined to perform one operation. The beauty of HP's calculator microcode is that 10-bit instructions are used and each usually performs a complete operation by itself.

The language's strongest point is its robust arithmetic section of 37 instructions combined with eight field-select options. The field-select options allow the program to apply the instruction to any word-select portion of the register. (See figure 2.)

The language is also designed to use very little storage; only seven registers were used in the HP-35 of which five were user registers. This is done to reduce...
costs and to save valuable space. For the design engineer it means that he must accomplish all of his miracles within the program itself.

Based on warranty card analysis and other market research, parameters regarding the desired function set and price are given to the design engineer. It is his job then to determine the specific functions for the calculator and to attempt to fit them in the allotted memory. Price is an important factor to the engineer because it directly influences the amount of memory he has to work with.

Only after several months of hard work writing and compacting microcode will he know if the function set will fit. If it is not possible, the product may be redefined at a higher price with greater performance to increase the available memory. More likely however, the engineer will be forced to pare functions until his program fits.

To give you an idea of how much memory is required, the HP-35 used three pages of 256 instructions each. Each page required a separate ROM [read-only memory]. The HP-45 originally took six pages of instructions. But about that time the quad ROM was developed, which, as its name implies, was the equivalent of four conventional ROM’S. So for the HP-45, two quad ROM’S were used. It was in the left over two pages that an enterprising designer placed the celebrated HP-45 clock. Later calculators, listed below, continued to use quad ROM’S.

| HP-80—2 quads | HP-22—2 quads |
| HP-65—3 quads | HP-91—3 quads |
| HP-70—2 quads | HP-29C—4 quads |
| HP-55—3 quads | HP-27—3 quads |
| HP-19C—5 quads | HP-25C—2 quads |
| HP-10—1½ quads | HP-67—5 quads |
| HP-21—1 quad | HP-97—6 quads |
| HP-25—2 quads | HP-92—6 quads |

Writing the microcode is where the designer’s personality is stamped indelibly on the calculator. While it is true that the fundamental algorithms for computing the complex mathematical functions found in HP personal calculators have remained essen-

![Figure 1. All numbers in registers are in scientific notation with the mantissa portion of the number left-justified in the mantissa portion of the register.](image1)

![Figure 2. Registers are 14-digits long with each digit being four bits. An additional four-bit register is used as a pointer. The programmer can set the pointer to any digit position, change that digit or all digits up to that position.](image2)
ially the same since the HP-35, the individual code is substantially different.

Some of the major routines such as those for sine, cosine, and tangent are the same from calculator to calculator. But in most cases if the code cannot be borrowed exactly as it exists in another calculator, it must be rewritten.

Some designers begin by strictly flowcharting the entire program. Others tackle the code directly and leave all but basic flowcharting till the end for documentation purposes only. The code is written originally on paper just as you would write a program on an HP programming pad. It is then either punched on cards or typed into a handy CRT.

The major task in writing the microcode is not only to have the functions produce the correct answers when a key is pressed, but to fit the code into a given amount of memory and make it execute as fast as possible. Compacting the code, that is, rewriting sections of the program to make them more space-efficient, is easy enough, but sometimes results in a loss of speed. These are tradeoffs to which the designer must be constantly attentive.

The processor executes approximately three instructions per millisecond, with each instruction taking the same amount of time. The designer takes into consideration the type of function and the necessary speed when writing the code. Straight-line code with no branches of any kind executes the fastest. For the label search function on the HP-67 and the HP-97 the designer duplicated a great deal of code to make it faster. The print instructions for the new HP-19C, on the other hand, did not need to be as fast to keep up with the printer mechanism. So the designer compacted these codes, making them very complex.

In general, programmable calculators go through more gyrations for each function than do preprogrammed calculators because they must generate an intermediate keycode. Where simple functions such as Change Sign, x exchange y, and ENTER require only 100 steps of code on a preprogrammed calculator, the same functions on a programmable calculator might take 150 steps. And a complex function such as rectangular-to-polar conversion might take over 4000 steps, depending on the argument keyed in.

The tremendous emphasis on testing of the calculators is for practical reasons as well. Incorrect programs cannot be easily discovered at this stage because of the peculiarities of simulated operation. For example, this is the first time low battery indicators can be checked since the E-ROM simulator does not work on batteries.

At long last, the revised code is ready to be sent for final chips. Although no problems are anticipated at this stage, testing continues to assure traditional Hewlett-Packard reliability.

The design engineer has spent anywhere from six months to 18 months perfecting his building-block design. And whether the end product is a high-powered financial calculator like the HP-92 or a versatile keystroke programmable like the HP-19C, it is first an expression of his personality and creativity.
The Buyer's Guide: Pages 8-9

This guide lists every feature and function found in all HP Personal Calculators. You will find the list extremely useful in determining specific features and functions on any unit and for making fast direct comparisons of two or more units.

The Catalog: Pages 10-26

The catalog provides a description of each HP Personal Calculator with emphasis on its special capabilities and applications in meeting user requirements. Also given are physical specifications and accessories furnished with each unit.

How to order from this catalog:

You may order any HP Calculator from this catalog—using the enclosed Order Form, or by calling our toll-free number —for a 15-day trial* If, after 15 days, you are not satisfied with the unit—for any reason—simply return it for a prompt refund in full (regardless of the payment method you choose) or for credit toward any other Hewlett-Packard calculator.

When ordering directly, you can speed your order, by picking up the phone. Call our Toll-Free number 800-648-4711 (in Nevada call 1-702-323-2704 collect), Extension 1000, and charge your order to your credit card. You get the same return privileges as if you'd sent the Order Form—and you'll get your new HP calculator faster.

*Prices and offer good in continental U.S.A., Alaska and Hawaii. Calculator displays in all photography simulate typical appearance.
### Features/Functions

#### RPN Logic System
- **Memory**
  - Automatic four-memory stack
  - Addressable memory
  - Financial memory
  - Last x memory
  - Program memory
  - Continuous Program Memory
  - Continuous Addressable Memory

#### Positioning Operations
- Stack roll down
- Stack roll up
- X, Y memory exchange
- X, I memory exchange

#### Display
- Fixed notation
- Scientific notation
- Engineering notation
- Automatic overflow into scientific
- Automatic underflow into scientific
- Enter exponent
- Change sign

#### Programming Features
- Program review—back step
- Program review—single step
- Insert/delete
- Overwrite
- Direct branching
- Pause
- Conditional tests
- Flags
- DSZ, ISZ (looping)
- 3 levels of subroutines
- Smart card reader:
  - Stores programs and data
  - Merges programs and data
  - Automatic prompting
- Labels
  - 10 user-definable functions
- Indirect control of:
  - Data storage and recall
  - Storage arithmetic
  - Unconditional branching
  - Subroutine branching
  - DSZ, ISZ
  - Display
- Relative addressing

#### Clearing Options
- Clear x
- Clear stack
- Clear all
- Clear addressable registers
- Clear statistical registers
- Clear prefix
- Clear program memory
- Reset financial registers

#### Printing Features
- Print x
- List stack registers
- List addressable registers
- List statistical registers
- List financial registers
- Print crosshatch separator
- Paper advance
- Three print modes
- Print space
- List program
- Trace program
This chart has been designed for your convenience in making direct comparisons of the features and functions on the HP calculators described in the following pages. For your convenience, page numbers of catalog listings are indicated alongside each calculator.

### Features/Functions

#### Built-in Statistical Functions

- Mean, standard deviation (no. of variables)
- Trend line
- Linear regression
- Linear estimate
- Factorial
- Summations:
  - \((n, \Sigma x, \Sigma x^2)\)
  - \((n, \Sigma x, \Sigma x^2, \Sigma y, \Sigma xy)\)
- Correlation coefficient
- Variance
- Normal distribution

#### Built-in Financial Functions

- Number of periods
- Interest rate/period
- Payment/period
- Present value
- Future value
- Simple interest
- Accumulated interest, Remaining Balance
- Bond prices, yield
- Rule of 78’s interest rebate
- Net present value
- Internal rate of return
- Bond/note switch
- Beginning/ending period switch
- Straight line depreciation
- Declining Balance depreciation
- Sum-of-the-year’s-digits depreciation

#### Built-in Scientific Functions/Mathematics

- **Trigonometric:**
  - Decimal degrees mode
  - Radians mode
  - Grads mode
  - Sin, Sin⁻¹, Cos, Cos⁻¹, Tan, Tan⁻¹
- **Rectangular <-> Polar coordinates**
- **Logarithmic:**
  - Log, 10^x
  - Ln, e^x
- **Metric Conversions:**
  - Inch <-> Millimeter
  - Btu <-> Joule
  - Foot <-> Meter
  - Gallon <-> Liter
  - Pound <-> Kilogram
  - Force in pounds <-> Newton
- **Other:**
  - y^x, √x
  - 1/x
  - x^2
  - π
  - Δ%
  - % Σ
  - +, -, X, +
- Repeat add or subtract
- Absolute value
- Integer/fraction truncation

#### Special Features

- 360/365-day switch
- Calendar
- Rounding
- Add Mode

*Not a built-in function, but available on pre-recorded magnetic program cards.*
Investor

Offers solutions for the professional in finance.


Invaluable printer gives you a complete record.

The quiet printer on the HP-92 gives you the answers quickly and quietly—with descriptive labels. Whether duplicating your keystrokes, printing amortization and depreciation schedules, or listing all the cash flows in an IRR problem, the HP-92 Investor gives you that indispensable hard copy for instant analysis or later perusal.

Compact and portable.

The HP-92 Investor is so small that it takes up only a corner of your desk or fits in your briefcase, ready to produce those investment answers you need—any time.

And the HP-92 is completely portable. You can operate it from its rechargeable batteries or from a convenient AC outlet.

Financial Functions That Solve Real-World Problems.

If you want to change any of the parameters of a financial problem, you merely key in a new value and press the appropriate key; then press any other financial key to see the effect of the change—without restating the entire problem each time.

And, because it can list the latest values for all financial elements at your command, the HP-92 Investor lets you print every investment alternative, whether for immediate comparison or later examination.

Discounted Cash Flow Analysis for 30 Uneven Cash Flows.

If you know n or i, you can solve any problem which can be represented by an initial value, a series of payments, and a final value—or by any two of these.

Discounted Cash Flow Analysis for 30 Uneven Cash Flows.

The HP-92 Investor calculates the net present value (NPV) and the internal rate of return (IRR) for up to 30 uneven cash flows. So you can evaluate whether to lease or buy equipment, balance the worth of an investment with uneven cash flows against desired yield, or compare investment alternatives based on their net present value. Once the cash flows have been entered into the HP-92, you can change one or any number of them without restating the complete problem.

Amortization Schedules at the Press of a Key.

Amortization Schedules at the Press of a Key.
The HP-92 Investor can print a complete amortization schedule, showing each period of a fully amortized loan with the amount paid to interest, amount to principal, and the remaining balance. Or it can print a partial schedule between any two periods. Labels identify each element of the schedule, and after the last period, the schedule shows the total amount paid to both interest and principal as well as the remaining balance on the loan.

Bond and Note Computations—Quickly and Accurately.

The HP-92 Investor calculates price, yield, or accumulated interest on bills, notes, bonds, certificates, debentures, warrants, certificates of deposit, and other interest-bearing obligations—and the HP-92 meets the standards for accuracy demanded by the Securities Industry Association.

Useful Percent Functions.

The HP-92 gives you the most useful percent functions: Percent, Percent of Sum, and Percent of Change.

Three Kinds of Depreciation Schedules.

The HP-92 Investor calculates depreciation for the entire life of an asset, or it can calculate the depreciation allowance for a specific period.

And once you've keyed in such elements as an asset's initial (book) value or its salvage value, you can examine each type of depreciation with a single keystroke—and compare all types of depreciation without reentering data.

Powerful Statistical Functions.

The HP-92 Investor contains statistical functions for research and analysis. Both linear and non-linear trends can be closely examined, and mathematical models can be generated to make forecasts.

A Built-In Calendar.

The calendar functions of the HP-92 Investor can determine a future or past date given the number of days from a known date. It also will print the day of the week for any date, and it calculates the exact number of days between dates.

30 Storage Registers For Data.

Besides the four-register operational stack used for mathematical operations, the HP-92 Investor has 30 addressable storage registers for data storage and recall with storage register arithmetic on 10 registers.

Common Math Functions.

The HP-92 Investor provides the most common mathematical functions like logarithms, square root, and exponentials.

Physical Specifications

- Calculator width: 22.9 cm (9.0"
- Calculator length: 20.3 cm (8.0"
- Calculator height: 6.35 cm (2.5"
- Calculator weight: 1.13 kg (40 oz)
- Recharger/AC adapter weight: 170 gm (6 oz)
- Shipping weight: 2.7 kg (5.9 lb)

Temperature Specifications

- Operating temperature range: 0° to 45°C (32°F to 113°F) with paper, 5% to 95% relative humidity.
- Charging temperature range: 15° to 40°C (59° to 104°F).
- Storage temperature range: -40° to +55°C (-40° to +131°F).

Power Specifications

- AC Power Requirements: 90-120V, 50 to 60 Hz.
- Battery: 5.0 Vdc nickel-cadmium rechargeable battery pack.
- Battery operating time: 3 to 7 hours.
- Battery recharging time: Calculator off, 7 to 10 hours; calculator on, 17 hours.

For a complete list of features and functions, see the Buyer's Guide on Page 8.

The HP-92 Investor comes complete with:

- Rechargeable battery pack
- Recharger/AC adapter
- Soft carrying case
- Illustrated Owner's Handbook
- Applications Book
- Two rolls of thermal paper

Order your new HP calculator today. See page 7.
HP-27

Financial/Statistical/Scientific Pocket Calculator.

Gives you everything from internal rate of return for 10 uneven cash flows to advanced statistical functions.

The HP-27 Financial/Statistical/Scientific Calculator is the most powerful preprogrammed pocket calculator Hewlett-Packard has ever built.

Its highly sophisticated design effectively integrates financial, statistical, and scientific functions — and thus eliminates the need for separate calculators.

The versatility of the HP-27 will be extremely valuable to any businessman or engineer whose responsibilities extend into such areas as: targeting, budgets, cost analysis, financial and forecasting considerations, technical calculations...

Financial and statistical functions greatly expand your calculating power.

The HP-27 gives you all the most-used financial and statistical functions, including five important functions — net present value, internal rate of return for uneven cash flows, variance, correlation coefficient, and normal distribution.

10 valuable financial functions — all preprogrammed.

All fundamental financial functions are preprogrammed into the HP-27 to eliminate the need for bulky books of equations and interest tables. Two preprogrammed functions — net present value and internal rate of return with uneven cash flows — facilitate capital budgeting and resource allocation.

15 important statistical functions — all preprogrammed.

Summations of data points are stored for easy access. Once your data is keyed in, you can calculate the means, standard deviations and variances for two variables. You can also calculate linear regression, linear estimates and the correlation coefficient for two variables. In addition, you can calculate the density function and upper-tail area under a normal distribution curve.

28 exponential, log and trig functions — all preprogrammed.

The HP-27 gives you all the most-used exponential, log and trig functions — including sines, cosines, tangents and their inverses in three angular modes; natural and common logs and anti-logs; pi; related arithmetic functions; coordinate conversions; angle conversion, addition and subtraction.

20 memories help simplify your most difficult calculations.

In addition to the 5 financial memories, the 4 operational stack memories and a last-x memory, the HP-27 provides 10 addressable memories for data storage.

Physical Specifications:

- Calculator length: 130 mm (5-1/8")
- Calculator width: 68 mm (2-11/16")
- Calculator height: 30 mm (1-3/16")
- Calculator weight: 170 g (6 oz.)
- Recharger weight: 141 g (5 oz.)
- Shipping weight: 680 g (1-1/2 lb.)
- Operating temperature range: 0°C to 45°C (32°F to 113°F)
- Charging temperature range: 15°C to 40°C (59°F to 104°F)
- Storage temperature range: -40°C to 55°C (-40°F to 131°F)

Power requirements: AC: 115V ± 10%, 50 to 60 Hz
Battery: 2.5 Vdc nickel-cadmium rechargeable battery pack

For a complete list of features and functions, see the Buyer's Guide on page 8.

The HP-27 Financial/Statistical/Scientific Pocket Calculator comes complete with:

- Battery pack that under normal use provides 3 hours of operation and fully charges in under 6 hours.
- Recharger/AC adapter that lets you operate the calculator on AC while the battery pack is recharging.
- Soft carrying case with belt loop.
- Illustrated Owner's Handbook with instruction and solved problems.

Order your new HP calculator today. See page 7.
Specialized features, including bond prices & yields, depreciation, a 200-year calendar, and a comprehensive application book.

The HP-80 Financial Pocket Calculator lets you solve business math or time-and-money problems quickly and easily.

All the interest equations and tables have been built-in. So has a 200-year calendar, used in solving for bond price and yield, or short-term interest.

It's designed to handle general business math problems.

Percentages.
The "%" and "Δ%" keys allow you to easily handle problems concerned with; percentages; net amounts (markups, discounts, chained discounts, dealer discount ratios, anticipation discounts, etc.); and percent difference.

Just press the keys to solve time-and-money problems in seconds.

At the top of the HP-80's keyboard are five keys for solving all types of business problems.

These financial keys save you time and effort when calculating:
- Amortized (direct reduction) loans (ordinary annuity);
- Sinking funds (ordinary annuity);
- Consumer loans;
- Savings functions (annuity due);
- Lease and rent functions (annuity due).

Discounted cash flow analysis.
You can quickly and easily perform a discounted cash flow analysis, and calculate the net present value of even, uneven or deferred payment streams.

The HP-80 can also be used to calculate the discounted or internal rate of return.

Equity investment analysis for income property.
You can use the calculator to solve for: equity yield rate; equity investment value and present value; and future value and overall appreciation/depreciation rate.

Bond functions.
The HP-80 has built-in function keys for bond calculations: "Yield-To-Maturity," "INTeRest," and "BOND." You can calculate bond price, yield and after-tax yield, accrued interest (between coupons) and bond amortization. You can also calculate a callable bond price and yield-to-call.

Commercial loans (short term notes).
The HP-80's "INTeRest" key lets you calculate the accrued interest amount or the discount amount and annual yield for a discounted note (for either a 360- or 365-day year).

Calendar functions.
This key puts a 200-year calendar (1900 to 2099) at your fingertips. You can find: the number of calendar days between two dates; the day of the week a date falls on; a future date, or a past date, given the number ofdays from a known date.

Depreciation functions.
The HP-80 incorporates a unique key labeled "SOD" for calculating sum-of-the-years'-digits depreciation—amount and remaining balance—on a full-year or partial-year basis.

You can also calculate the depreciation amount and remaining balance via the straight-line method, or via the declining-balance method (full year or partial year).

Statistical functions.
By using the "Trend Line" key, you can easily calculate: a trend line (time series linear regression) giving you the y-intercept (value at point 0); the number of time periods; the slope; and automatic projections.

The HP-80 can also calculate: the mean and the standard deviation, with the ability to change data points after a calculation and recalculate. The "Σ+" key provides running totals and computes the sum of the squares and the number of entries.

Discounted cash flow analysis.
The HP-80 can be used to calculate discounted cash flow analysis, and calculate the net present value of even, uneven or deferred payment streams.

Commercial loans (short term notes).
The HP-80's "INTeRest" key lets you calculate the accrued interest amount or the discount amount and annual yield for a discounted note (for either a 360- or 365-day year).

Calendar functions.
This key puts a 200-year calendar (1900 to 2099) at your fingertips. You can find: the number of calendar days between two dates; the day of the week a date falls on; a future date, or a past date, given the number of days from a known date.

Depreciation functions.
The HP-80 incorporates a unique key labeled "SOD" for calculating sum-of-the-years'-digits depreciation—amount and remaining balance—on a full-year or partial-year basis.

You can also calculate the depreciation amount and remaining balance via the straight-line method, or via the declining-balance method (full year or partial year).

Statistical functions.
By using the "Trend Line" key, you can easily calculate: a trend line (time series linear regression) giving you the y-intercept (value at point 0); the number of time periods; the slope; and automatic projections.

The HP-80 can also calculate: the mean and the standard deviation, with the ability to change data points after a calculation and recalculate. The "Σ+" key provides running totals and computes the sum of the squares and the number of entries.

Memory power.
In addition to the four-memory stack, the HP-80 has an addressable memory for storing constants or other numbers to be used later on in a calculation.

The financial application book.
With the HP-80 you get a 101-page book offering dozens of keystroke sequences—including Annual Percentage Rate calculations with balloon payments—that benefit brokers, investors, appraisers, assessors, mortgage bankers, analysts and other decision makers in investment analysis.

Specifications:
- Length: 147 mm (5.8 in)
- Width: 81 mm (3.2 in)
- Height: 18 to 33 mm (0.7 to 1.3 in)
- Weight: 255 g (9 oz.)
- Recharger: 142 g (5 oz.)
- Shipping weight: 900 g (2 lb)
- AC: 86-127V
- Battery: 3.75 Vdc nickel-cadmium rechargeable battery pack
- Operating temperature range: 0°C to 50°C (32°F to 122°F)

For a complete list of features and functions, see the Buyer's Guide on page 8.

The HP-80 Financial Pocket Calculator comes complete with:
- Rechargeable battery pack
- Recharger/AC adapter
- Soft carrying case
- Illustrated Owner's Handbook
- Quick Reference Guide
- A Guide to Profitable Investment Analysis.

Order your new HP calculator today. See page 7.
Provides an ideal combination of the financial, investment and statistical capabilities you need in modern business.

With the HP-22 pocket calculator you can handle everything from simple arithmetic to complex time-value-of-money computations including interest rates; present value/future value; ordinary and due annuities; balloon mortgage balances; long term projections; equity yields; net present value and internal rate of return; and extended percent calculations. You can even handle planning, forecasting and decision analysis.

Built-in functions for ease of use.

Financial and investment equations and statistical formulas are built into the HP-22. All you have to do is key in your data, press the appropriate keys, and see your answers displayed—in seconds.

The financial capabilities.

The five keys in the top row of the HP-22 are the basic financial keys that replace equations and interest tables. To use any of the additional functions, press the gold key first. When you enter three known values with the financial keys, you can solve for another unknown value. For example: enter amount of present value [PV]; enter number of periods involved [n]; enter future value [FV]. Then, push [i] and get interest displayed automatically.

Expanded percentages capability.

Percentage is the common standard of measurement in the business and financial world. For this reason, the HP-22 provides three separate percentage function keys. The [%] key is used to calculate a percentage. The [Δ%] key is used to compute the percentage difference (ratio of increase or decrease) between two numbers. The [%] key is used to find what percentage one number is of another number or of a total sum. The HP-22 saves the base number for multiple percentage calculations of the same base number.

The statistical capabilities.

In addition to the financial capabilities, the HP-22 gives you advanced statistical capabilities for planning, forecasting and analysis. Using the [Σ+] key, you can enter statistical data into one of the ten addressable memories, where it remains unaffected by most other calculations. What's more, using the [Σ–] key you can adjust or correct input data without having to repeat the entire calculation. To project sales, key in past performance data with the [Σ+] key. Then key in the number of the forecast period and press the [y] key to obtain sales at that future point in time. To obtain an average, key in all data, then press the [x] key to find standard deviation (a measure of statistical validity), key in your data, then press the [s] key for the answer.

The mathematical capabilities.

The HP-22 gives you virtually all the math capabilities you need in business, such as logs, antilogs, exponentiation and root extraction so you may work out your own solutions to unusual individual problems.

Expanded memory capacity.

In addition to the 5 financial memories and the 4 operational stack memories, the HP-22 provides 10 addressable memories you can use to store data. For example, to store a displayed value in the first addressable memory, press [STO] [0] and the value will be automatically stored in that memory. To recall the value, press the [RCL] recall key and the [0] key and the value will again be displayed. For added convenience, register arithmetic can be performed with all 10 memories.

The remarkable HP-22 Owner's Handbook.

Even if you lack special training in mathematics, statistics or advanced financial planning, the 148-page Owner's Handbook will make it easy for you to take full advantage of the capabilities of the HP-22. The book is a valuable survey course in modern management problem-solving, analysis and planning. It provides formulas and procedures for solving more than 50 different financial, mathematical and statistical functions on the HP-22.

Physical Specifications:

- Length: 130 mm (5-1/8")
- Width: 68 mm (2-11/16")
- Height: 30 mm (1-3/16")
- Weight: 170 g (6 oz.)
- Recharger weight: 141.8 g (5 oz.)
- Shipping weight: 680 g (1-1/2 lb.)
- Operating temperature range: 0°C to 45°C (32°F to 113°F)
- Charging temperature range: 15°C to 40°C (59°F to 104°F)
- Storage temperature range: -40°C to 55°C (—40°F to 131°F)
- Power Requirements: AC: 115V ± 10%, 50 to 60 Hz
- Battery: 2.5 Vdc nickel-cadmium rechargeable battery pack.

For a complete list of features and functions, see the Buyer's Guide on page 8.

The HP-22 Business Management Pocket Calculator comes complete with:

- Rechargeable battery pack
- Recharger/AC adapter
- Soft carrying case
- Illustrated Owner's Handbook

Take advantage of our 15-day trial offer. See page 7.
All the features of a desktop office machine—and it's pocket-sized.

Hewlett-Packard's exciting new HP-10 is up to 50% smaller and lighter than other handheld printing calculators—with all the features you'd expect to find in a desktop office machine.

Whisper-quiet thermal printer.

The HP-10 Printing Calculator gives you a printed record of all your calculations. Each function is printed with an identifying label so it's easy to see what you've done.

You can also print a display entry (to label your tapes) without including it in your total and a series of crosshatches to separate problems on the tape.

Or you can switch the printer off and use only the display.

All the functions you need.

State-of-the-art electronics and integrated circuitry have reduced the standard office machine to pocket-size—and still improved it. You get an independent memory, so a constant or separate running total is available at the press of a single key, and you don't have to reenter results in long calculations.

You also get the “add-mode” feature, which automatically positions the decimal point for keying in dollars and cents.

And you get a percent key for taxes, dividends and commissions, a total and subtotal capability, and of course, the four arithmetic keys.

Use it anywhere.

The powerful rechargeable batteries in the HP-10 let you use it anywhere—in an automobile, a taxi, or a commuter train. Stylish and unobtrusive in your office or on your desk, its small size and light weight also make it ideal for pocket or briefcase.

Office machine conveniences.

Familiar adding-machine keyboard has “click-action” keys for positive input, and is buffered so the calculator will “catch up” when you key in numbers very rapidly.

Ten clear, sharp digits are displayed for viewing in dim or bright light.

Physical Specifications:

- Length: 16.5 cm (6.5")
- Width: 8.8 cm (3.45")
- Height: 4.0 cm (1.6")
- Weight with battery pack and paper: 342 g (12.1 oz)
- Shipping weight: 1.18 kg (2.6 lb)
- Operating temperature range: 0° to 45°C (32° to 113°F)
- AC Power requirements: 90-120V, 50 to 60 Hz
- Battery: 5-volt quick-charge nickel-cadmium battery pack.

For a complete list of features and functions, see the Buyer's Guide on page 8.

The HP-10 Handheld Printing Calculator comes complete with:

- Battery pack that under normal use provides 4-7 hours operating time and fully charges in 6 to 10 hours.
- Recharger/AC adapter
- Illustrated Owner's Handbook
- Soft carrying case
- Three rolls of thermal paper (7.6m each)

Order your new HP calculator today. See page 7.
On or off, your programs are always there.

The HP-19C and HP-29C both have Continuous Memory capability so the programs you store are saved, ready for use, until you clear or overwrite them.

As a result, you can program frequently-needed calculations once, and then perform them as often as necessary—hour after hour, day after day—without bother or lost time caused by reentering your program.

The Continuous Memory of the HP-19C and HP-29C not only retains a program, it also retains the data stored in 16 of its 30 addressable registers and the display register.

Now you can record data in the field and wait to make your final calculations until convenient. The calculators become handy notebooks to save data from previous problems for later use or keep the sum of statistical data entries while taking samples on location.

Operate them on batteries or AC.

Both calculators may be operated on batteries alone or from a convenient electrical outlet while batteries are being recharged. Battery operating time is significantly extended since the calculators may be switched off between calculations without losing programs or data.

HP-19C’s quiet thermal printer lists your programs or data.

With the HP-19C, you can list a program, the contents of the 30 addressable registers, or the contents of the automatic memory stack. And you have a complete record of all your calculations.

The printer is a valuable aid in editing programs or long calculations. You don’t have to remember what you’ve done or what remains to be done. You see everything at once, clearly, on tape.

Create programs of 175 keystrokes—or more.

You can create your own time-saving programs to solve lengthy and repetitive problems because both the HP-19C and HP-29C let you merge keystrokes. Each function—one, two, three or four keystrokes—requires only one step of program memory. And you have 98 steps of program memory to work with.

The HP-19C and HP-29C are keystroke programmable. This means that when you press a key in PRGM mode, it is stored in program memory. There is no complicated programming language, no procedure to memorize.

Branching.

GTO Go To.

When followed by a label designator (0 through 9 or i) GTO branches program execution to the specified label.

Three levels of subroutines.

GSB Go Subroutine.

A GSB instruction followed by a label designator (0 through 9 or i) branches program execution to the label specified just as a GTO instruction does. But, using the GSB instruction, program execution is then “returned” automatically to the step following the GSB instruction when the next RTN (Return) instruction is executed.

Conditional Branching.

These keys allow your programs to make decisions for you by testing the values in the X- and Y-registers or by testing the value in the X-register against zero as indicated. If the data test is true, the calculator will “do” the next instruction in program memory. (Remember “Do if True”) If the data test is false, program execution branches around the next instruction.

The HP-19C and HP-29C both have Continuous Memory capability so the programs you store are saved, ready for use, until you clear or overwrite them.
Indirect Addressing.

**GTO I GSB I**

These operations depend on the number in register 0. If it is positive they perform a branch (GTO i) or a subroutine (GSB i) to the label specified.

Relative Addressing.

**GTO I GSB I**

When the number in register 0 is a negative number, these instructions perform a rapid reverse branch (GTO i) or subroutine (GSB i) the number of steps specified by the current negative number in register 0.

Indirect control of Data Register Operations.

You can also use register 0 to specify the address of a storage register for storing and recalling data or for storage register arithmetic.

Decrement or Increment and Skip on Zero.

**DSZ ISZ**

DSZ subtracts one from the contents of register 0, then tests for a non-zero value. As long as there is a non-zero value in register 0, the calculator performs the next instruction in program memory. When the content of register 0 equals zero, the calculator skips the next instruction.

ISZ works in the same way, only register 0 is incremented rather than decremented.

**PAUSE**

The PAUSE function interrupts program execution and displays current results for about 1 second.

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**Advanced Programmable Pocket Calculator.**

**Editing is fast and easy.**

The HP-19C and HP-29C make it easy for you to correct or change your programs.

**Moving to the Right Step.**

**GTO Go To.**

In order to correct or change a step in your program, you need to be able to display it quickly and easily. Pressing GTO (step number) lets you do just that, in either RUN or PRGM mode.

**SST Single Step.**

To help find mistakes in your program, you can execute one step at a time using the SST key in RUN mode. Or, in PRGM mode, you can use SST to step through each instruction and compare the keycodes with your program listing.

**BST Back Step.**

In the RUN mode, press BST to display the contents of the previous step of program memory. In PRGM mode, use BST to back up one step at a time in your program.

**Insert and Delete.**

You can easily insert operations as needed in your program. All subsequent instructions will be "bumped" down one step in program memory for each inserted operation.

**DEL Delete.**

When you press g DEL, the displayed instruction is erased from program memory and all subsequent instructions move upward one step.

**Printed tape simplifies checking programs or calculations.**

With the HP-19C you have the additional advantage of a printed tape to help you with your editing. You can list your programs and easily check them for mistakes.

**A complete range of preprogrammed functions and features.**

The HP-19C and HP-29C feature 30 addressable registers for data storage—16 with continuous memory.

Their preprogrammed functions include log and trig functions; rectangular/polar conversions; mean, standard deviation and statistical summations; and angle (time) conversions.

Both calculators also display in fixed decimal, scientific and engineering notations.

The HP-19C and HP-29C come complete with:

- Illustrated Owner’s Handbook and Programming Guide
- Quick Reference Card
- Applications Book
- Battery Pack
- Recharger/AC adapter
- Soft carrying case
- 2 rolls of thermal paper (HP-19C only)

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**HP-19C Specifications:**

- Calculator length: 165 mm (6.5”)
- Calculator width: 88 mm (3.45”)
- Calculator height: 40 mm (1.6”)
- Calculator weight: with battery pack and paper: 350 g (12.4 oz)
- Shipping weight: 1.4 kg (3.0 lbs)
- Operating temperature range: 0° to 45°C (32° to 113°F)
- With paper, 5% to 95% relative humidity.
- Charging temperature range: 15° to 40°C (59° to 104°F)
- AC Power requirements: 90-120V 50 to 60 Hz
- Battery: 5 Vdc, quick-charge nickel-cadmium battery pack
- Battery operating time: 4 to 7 hours
- Paper roll length: 7.6m (25 ft)

**HP-29C Physical Specifications:**

- Calculator length: 130 mm (5.1”)
- Calculator width: 68 mm (2.7”)
- Calculator height: 30 mm (1.2”)
- Calculator weight: 170 g (6 oz.)
- Recharger weight: 141 g (5 oz.)
- Shipping weight: 680 g (1.5 lb)
- Operating temperature range: 0°C to 45°C (32°F to 113°F)
- Charging temperature range: 15°C to 40°C (59°F to 104°F)
- Storage temperature range: −40°C to 55°C (−40°F to 131°F)
- Power requirements: AC: 115V ± 10%, 50 to 60 Hz
- Battery: 2.5 Vdc quick-charge nickel-cadmium battery pack
- Battery operating time: up to 3 hours in normal use.

For a complete list of features and functions, see the Buyer’s Guide on Page 8.

Take advantage of our 15-day trial offer. See page 7.
Extraordinary problem-solving power plus HP quality at an economical price.

The HP-21 is the lowest-priced scientific pocket calculator HP offers, yet it has all the functions and features you'd expect to find in a scientific pocket calculator.

Trigonometric capabilities.

Coordinate conversions — Convert polar coordinates to rectangular coordinates, or vice versa. This lets you do vector arithmetic quickly and easily.

Angular mode selection — Just flip a switch to perform trig operations in either of two angular modes: degrees or radians.

Standard trig functions — The HP-21 gives you all of the standard trig functions: Sin x, Arc sin x, Cos x, Arc cos x, Tan x and Arc tan x.

Logarithmic capabilities.

Standard log functions — The HP-21 also gives you all of the standard log and exponential functions: log x, ln x, e^x and 10^x.

Full register arithmetic.

Register arithmetic — The HP-21 has an addressable memory for storing constants or other data, for use later on in a calculation. Any of the four arithmetic operations may be performed directly upon this stored data.

The 120-page HP-21 Application Book. (optional)

Contains major sections on statistics, mathematics, finance, navigation, surveying, conversions. Provides 50 valuable applications to help you get the most from your HP-21 Scientific Calculator.

Physical Specifications:

- Calculator length: 130 mm (5-1/8")
- Calculator width: 68 mm (2-11/16")
- Calculator height: 30 mm (1-3/16")
- Calculator weight: 170 g (6 oz.)
- Recharger weight: 141 g (5 oz.)
- Shipping weight: 680 g (1-1/2 lb.)
- Operating temperature range: 0°C to 45°C (32°F to 113°F)
- Charging temperature range: 15°C to 40°C (59°F to 104°F)
- Storage temperature range: -40°C to 55°C (-40°F to 131°F)
- Power requirements: AC: 115 V ± 10%, 50 to 60 Hz
- Battery: 2.5 Vdc nickel-cadmium rechargeable battery pack.

For a complete list of features and functions, see the Buyer’s Guide on page 8.

The HP-21 Scientific Pocket Calculator comes complete with:

- Rechargeable battery pack
- Recharger/AC adapter
- Soft carrying case
- Illustrated Owner’s Handbook

You can order direct from this catalog. See page 7.
Retains your programs and saves your data—even when you turn it off.

The HP-25C with Continuous Memory retains all information in its 49-step program memory, and all data in the 8 addressable registers and the LAST-X register. As a result, you can program a frequently-needed calculation once, and then perform it as often as necessary—hour after hour, day after day—without the bother or lost time caused by reentering your program.

You can also use the HP-25C to store conversion constants for later use or to keep the sums of statistical data entries while taking samples in the field.

The HP-25C and the HP-25 solve repetitive problems quickly and easily.

Both the HP-25 and the HP-25C have all the advanced features described below.

To write a program simply set the HP-25/25C to PRGM mode. Then press the keys you’d normally press to solve the problem. Your program is retained in the HP-25/25C’s program memory.

To solve the problem, switch to RUN mode and enter the data. Then press the “Run/Stop” key. Your answer appears on the HP-25/25C display. To solve other problems using the same program, just enter the new data and press the “Run/Stop” key again.

Memory review.

The “BackSTep” and “Single-Step” keys let you review the entire memory one step at a time, in either direction.

If you want to change your program, simply stop it at the appropriate step and key in a new entry, which will overwrite the previous one. To test your program a step at a time, switch to RUN and press “SST” repeatedly. You will see its numeric code when you press the key and the intermediate solution when you release the key.

Decision branching.

Like a computer, the HP-25/25C can be programmed to make decisions, because they can do conditional branching.

You can program them to test the relationship between two values, by means of these tests:

- \( x < y \)
- \( x = y \)
- \( x + y \)
- \( x - y \)
- \( x \neq y \)

Depending on the outcome of the tests, the HP-25/25C will automatically skip a step of the program … or will continue through the program in sequence.

Or, by means of the “GoTO” key, you can program the HP-25/25C to branch directly to a specified step, and then continue executing the program.

Pause feature.

Another feature of the HP-25/25C is the “PAUSE” key. You can use it to momentarily interrupt (about one second per PAUSE command) the program execution and display the contents of the X register. This gives you the opportunity to review or write down intermediate results.

Absolute and Truncation functions.

The ABSolute value function allows you to take the absolute value of a number within a programmed calculation.

The INTeger/FRACT ion truncation function allows you to keep only the integer or fractional portion of a number.

Extra preprogrammed capability.

Rectangular/polar coordinate conversions.

Angle (time) conversions.

Summations: \( \Sigma x \), \( \Sigma x^2 \), \( \Sigma y \), \( \Sigma xy \)

Mean and standard deviation.

The HP-25 Scientific Programmable Pocket Calculator

The HP-25 is identical in every respect to the HP-25C except for Continuous Memory. It is the logical choice for scientists, engineers or students who do not frequently use a few long programs in their work.

HP-25/25C Physical Specifications

- **Length:** 130 mm (5-1/8”)
- **Width:** 68 mm (2-11/16”)
- **Height:** 30 mm (1-3/16”)
- **Weight:** 170 g (6 oz)
- **Recharger weight:** 141 g (5 oz)
- **Shipping weight:** 680 g (1-1/2 lb)
- **Operating temperature range:** 0°C to 45°C (32°F to 113°F)
- **Charging temperature range:** 15°C to 40°C (59°F to 104°F)
- **Storage temperature range:** -40°C to 55°C (-40°F to 131°F)
- **Power requirements:** AC: 115V ± 10%, 50 to 60 Hz
- **Battery:** 2.5 Vdc nickel-cadmium rechargeable battery pack.

For a complete list of features and functions, see the Buyer’s Guide on Page 8.

The HP-25/25C Scientific Programmable Pocket Calculators come complete with:

- Rechargeable battery pack
- Recharger/AC adapter
- Soft carrying case
- Illustrated Owner’s Handbook
- Applications Programs Book
- Quick Reference Guide
- Continuous Memory Booklet (HP-25C only)

Take advantage of our 15-day trial offer. See page 7.
A major leap forward in fully-programmable personal calculators.

These are the most powerful personal calculators Hewlett-Packard has ever made. The HP-97 combines exceptional programming power—plus a battery-operated printer—all in one self-contained unit. The HP-67 provides the identical power of the HP-97 in the classic pocket size.

Exceptional power easily handles your lengthy, repetitive problems.

The HP-97/67 lets you write programs of up to 224 steps. Every function (one, two or three key strokes) is merged to take only one step of program memory. And there are 26 data storage registers to provide the memory you need for your problems. You can record the contents of either program memory or the data storage registers on a magnetic card. Later, you can load all or part of them back into the calculator. The “smart” card reader of the HP-97/67 can handle either job. The HP-67 and HP-97 are also completely compatible. Programs recorded on one unit may be loaded and executed on the other.

So easy to use you’ll write programs the first day.

Keystroke programming makes programming the HP-97/67 as simple as pressing the keys needed to calculate answers manually. Merged operations further simplify the task (and expand memory power) by letting you see the complete operation right in the display. Because many programs require editing of some kind, we added useful features enabling you to easily review programs forward or backward, to easily jump to any step in the program, and to easily insert steps or delete them. RPN logic and the four-register automatic memory stack combine for more efficient problem solving. And RPN logic also helps when you program, because you don’t use parentheses that waste valuable program memory.

And there are no pending operations that make editing difficult. RPN lets you slide through the most complicated programs the same easy way it lets you slide through complex calculations—with complete confidence.

An unparalleled program of owner support.

You can supplement your own programs with the extensive HP program library. The Standard Application Pac, with 15 programs in various disciplines, comes free with either calculator. Also available in many disciplines are HP Application PACs, where a professionally programmed and documented solution may already exist to solve a problem. A one-year subscription to the Users’ Library and a free Newsletter to keep you abreast of current information are also available.
The HP-97 provides battery-operation and thermal printing—in one self-contained unit.

The HP-97 and HP-67 give you exceptional programming power you won’t outgrow.

“Smart” magnetic card reader.

With the magnetic card reader in both the HP-97 and the HP-67 you can load the entire program memory, or selected portions, either manually or under program control.

You can record data from all registers onto a magnetic card. You can also load every data storage register or selected registers.

When recording programs, the HP-97 and HP-67 automatically record the angular mode setting, the display setting and the status of the four flags.

10 User-definable Keys.

There are ten user-definable keys you can use for any special function you may require—such as defining portions of your program for subroutines or branches. In addition, there are ten numerical labels (LBL 0 thru LBL 9).

GTO GSB

You can perform a direct branch or subroutine to a label specified. A GSB instruction can also be used within a subroutine to a depth of three levels.

Conditional Branching.

<table>
<thead>
<tr>
<th>x=y</th>
<th>x=y</th>
<th>x-y</th>
<th>x+y</th>
<th>x=0</th>
<th>x=0</th>
<th>x=0</th>
<th>x=0</th>
</tr>
</thead>
</table>

These keys allow your program to make decisions for you by testing the values in the X- and Y-registers or by testing the value in the X-register against zero as indicated.

Flags.

You can use the four flags in the calculator for tests in your programs. They can be set, cleared, or tested.

Indirect Addressing.

GTO (i) GSB (i)

You can perform a direct branch or subroutine to a label specified by the current positive number in the I-register using these keys.

When the number in the I-register is a negative number these instructions perform a direct branch (GTO (i) ) or a subroutine (GSB (i) ) backward the number of steps specified.

STO (i) RCL (i)

You can also use the I-register to specify the address of a storage register for storing and recalling data or for storage register arithmetic.

ISZ (i) DSZ (i)

You can also increment (ISZ (i) ) or decrement (DSZ (i) ) the contents of the storage register specified by the value in the I-register and then test against zero.

HP-97 Specifications:

- Calculator weight: 298 g (10.5 oz)
- Recharger weight: 241 g (8.5 oz)
- Shipping weight: 2.3 kg (5.1 lb)
- Operating temperature range: 10°C to 40°C (50°F to 104°F)
- Charging temperature range: 10°C to 50°C (50°F to 122°F)
- Storage temperature range: —40°C to 55°C (—40°F to 131°F)
- AC Power Requirement: 85-127V 50 to 60 Hz
- Battery Power Requirement: 3.75 Vdc nickel cadmium rechargeable battery pack.

For a complete list of features and functions, see the Buyer’s Guide on Page 8.

The HP-67/97 Fully Programmable Calculators come complete with:

- Illustrated Owner’s Handbook and Programming Guide.
- Quick Reference Card.
- |Illustrated Owner’s Handbook Programmed Calculator.
- Standard Pac complete with 40 cards, card holder, and manual.
- Battery pack that under normal use provides about 3 hours of continuous operation.
- Recharger/AC adapter that lets you operate the calculator on AC while the battery pack is recharging.
- Soft carrying case.
- Standard Pac complete with 40 cards, card holder, and manual.
- Battery pack that under normal use provides about 3 hours of continuous operation.
- Recharger/AC adapter that lets you operate the calculator on AC while the battery pack is recharging.
- Soft carrying case.
- Users’ Library and subscription card.
- 2 rolls of thermal paper (HP-97 only).

Use enclosed Order Form or our Toll-free phone. See page 7.
**EE Pac**

(00097-13121)

- **Network Transfer Functions**
  This program computes various transfer functions of a ladder network composed of any number of standard elements.
- **Reactive L-Network Impedance Matching**
  This program computes networks which will match any two complex impedances.
- **Class A Transistor Amplifier Bias Optimization**
  This program simplifies the design of a class A transistor amplifier.
- **Transistor Amplifier Performance**
- **Transistor Configuration Conversion**
- **Parameter Conversion: S = Y, Z, G, H**
- **Fourier Series**
- **Active Filter Design**
- **Butterworth or Chebyshev Filter Design**
- **Bode Plot of Butterworth and Chebyshev Filters**
- **Resistive Attenuator Design**
- **Smith Chart Conversions**
- **Transmission Line Impedance**
- **Microstrip Transmission Line Calculations**
  This program computes relative phase velocity and characteristic impedance for lossless microstrip. It also computes copper loss and resistance per unit length.
- **Transmission Line Calculations**
  This program computes the input impedance of lossy transmission line terminated in Z0.
- **Unilateral Design: Figure of Merit, Maximum Unilateral Gain Circles**
  This program computes Gm, Gmax, G0, G1 max, and G2 max from a transistor’s s-parameters. It also computes r0 and p0 from G0 = G (i = 1, 2).
- **Bielastic Design: Stability Factor, Maximum Gain, Optimum Matching**
  This program computes the maximum gain available and the load and source reflection coefficients which yield the maximum gain.
- **Bielastic Design: Gain and Stability Circles, Load and Source Mapping**
  This program computes the location and radius of stability circles. It also computes the source or load reflection coefficient corresponding to a given load or source termination.

**Clinical Lab and Nuclear Medicine Pac**

(00097-13165)

**Clinical Chemistry**
- **Beer’s Law**
- **Protein Electrophoresis**
  Given integration counts of a number of protein fractions, finds percentage of each.
- **LDH isoenzymes**
  Given values for the five LDH isoenzymes, finds activity of each as a percent of total. Compares results against normal values.
- **Body Surface Area**
- **Urea Clearance**
- **Creatinine Clearance**
- **Anionic Fluid Assay Calculations**
  For the spectrophotometric estimation of bire pigments in anionic fluid.
- **Blood Acid-Base Status**
  Finds total plasma CO2, pH, and base excess from Pco2, pH, and Hgb concentration.
- **Oxygen Saturation and Content**
  Finds oxygen saturation and content in blood given P02, Pco2, pH, and body temperature.
- **Red Cell Indices**
  Given hematocrit percent, red cell count, and hemoglobin, finds mean corpuscular volume, mean corpuscular hemoglobin, and mean corpuscular hemoglobin concentration.

**Nuclear Medicine**
- **Total Blood Volume**
- **Schilling Test**
  The radioisotope determination of vitamin B12 absorption.
- **Thyroid Uptake**
- **Radioactive Decay Corrections**
- **Radioimmunoassay**
  Computes least-squares regression line of logit of net counts vs. log concentration, including regression constants, correlation coefficient, and concentration for a given count.

**Statistics**
- **Basic statistics**
  Computes mean, standard deviation, standard error, and coefficient of variation for grouped or ungrouped data.
- **Chi-square evaluation and distribution**
  Computes the chi-square statistic for goodness of fit.
- **1 Statistics**
- **1 Distribution**

**NEW CE Pac**

(00097-13195)

- **Vector Statics**
- **Section Properties (2 Cards)**
  The area, centroid, and moments of an arbitrarily complex polygon may be calculated.
- **Properties of Special Sections**
  Section properties for rectangles, triangles, ellipses, circles and concentric circles.
- **Stress on an Element**
  Reduces data from rosette strain gage measurement and performs Mohr circle analysis.
- **Bounding or Torsional Stress**
  Solves either the bending stress equation (s = M/I) or the analogous torsional shear equation (s = TR/J) interchangeably for all variables.
- **Linear or Angular Deformation**
- **Cantilever Beams**
  Calculates deflection, slope, moment and shear for point, distributed, and moment loads applied to cantilever beams.
- **Cantilever Beams—Trapezoidal Loads**
- **Beams Fixed at Both Ends**
  Calculates deflection, slope, moment and shear for point, distributed, and moment loads applied to cantilever beams.
- **Beams Fixed at Both Ends—Trapezoidal Loads**

**Surveying Pac**

(00097-13175)

- ** Traverse, Inverse and Sideshots**
  Reduction of field traverse data with closure and area calculation.
- **Traverse Adjustment**
  Adjustment of traverses by compass rule or Crandall’s rule.
- **Intersections**
  Bearing-bearing, bearing-distance and distance-distance intersection and offset from a point to a line.
- **Curve Solutions**
- **Horizontal Curve Layout**
- **Spiral Curve Layout**
- **Vertical Curves and Grades**
- **Resection**
  Solution of the “three point problem.”
- **Two Instrument Radial Survey**
- **EDM Slope Reduction**
- **Stadia Reduction/3-Wire Leveling**
- **Taping Reduction/Field Angle Check**
- **AZimuth of the Sun**
- **Predetermined Area**
  Location of one side of a land parcel to enclose a specified area.
With HP Application Pacs, the solutions you require may already exist. Application Pacs contain 15 to 26 preprinted prerecorded program cards, a program card holder and a manual of complete documentation. You save significant time because no researching, programming, debugging or documenting is needed.

**Stat Pac**  
(00097-13111)  
**General Statistics**  
- Basic Statistics for Two Variables  
- Basic statistics for two variables, grouped or ungrouped.  
- Factorial, Permutation, and Combination  
- Moments, skewness, and kurtosis (For Grouped or Ungrouped Data)  
- Random Number Generator  
- Generate up to 60,000 different numbers.  
- Histogram  
- A histogram program for 24 intervals of equal width between specified upper and lower limits.

**Math Pac**  
(00097-13121)  
**Factors and primes**  
- Computes determinant and inverse of 4 x 4 matrix, solves 4 simultaneous equations in 4 unknowns, by Gaussian elimination.  
- Solution to f(x) = 0 on an interval  
- Uses combination of bisection and secant method to guarantee rapid convergence to a root.  
- Numerical integration  
- Trapezoidal rule and Simpson's rule for discrete case; Simpson's rule for functions known explicitly.  
- Gaussian quadrature  
- Uses the six-point Gaussian-Legendre quadrature method to find integrals over finite or infinite intervals.  
- Differential equations  
- Solves first- and second-order differential equations by the fourth-order Runge-Kutta method.  
- Interpolations  
- Linear, Lagrangian, and finite difference.  
- Coordinate transformations  
- Two- and three-dimensional translation and rotation of axes.  
- Intersections  
- Line-line, line-circle, circle-circle.  
- Circles  
- Spherical triangles  
- Gamma function  
- Bessel functions, error function  
- Hyperbolics  
- Soderberg's Equation for Fatigue  
- Cantilever Beams  
- Helical Springs Design  
- Four Bar Function Generator (2 cards)  
- Four Bar Systems which will approximate an arbitrary function of one variable.  
- Progression of Four Bar System  
- Calculates angular displacement, velocity, and acceleration for the output link of a four-bar system.  
- Progression of Slider Crank  
- Calculates displacement, velocity, and acceleration of the slider and angular velocity and acceleration of the connecting rod for the progression of a slider crank system.  
- Circular Cams  
- Computes parameters necessary for design of harmonic or cycloidal, circular cams with roller, flat or point followers.  
- Gear Forces  
- Computes the reaction forces resulting from torque applied to helical, bevel, and worm gears.  
- Standard External Involute Spur Gears  
- Computes parameters necessary for design in manufacture, and testing of standard, external, involute, spur gears.  
- Belt Length  
- Computes belt length around an arbitrary set of pulleys.  
- Free Vibrations  
- Vibration Forced by F, COS wt  
- Equations of State  
- Ideal gas relation plus Redlich-Kwong model of real gas behavior.  
- Isentropic Flow for Ideal Gases  
- Replaces isentropic flow tables for ideal gases in converging-diverging passages.  
- Conduct Flow  
- Heat Exchangers (2 cards)  
- Submarine Hunt  
- Find and then sink the moving submarine with your depth charges.  
- Artillery  
- Locate and destroy the moving target before it destroys you.  
- Space War  
- Search out and annihilate the 3 evil Alglogs before time and energy are gone.  
- Super Bagels  
- Based on "Mastermind."

**ME Pac**  
(00097-13155)  
**Vector Statics**  
- Section Properties (2 cards)  
- The area, centroid, and moments of an arbitrarily complex polygon may be calculated using this program.  
- Stress on an Element  
- Reduces data from rosette strain gage measurement and performs Mohr circle analysis.

**Games Pac**  
(00097-13185)  
**Game of 21**  
- Includes the game of "Craps" as well as a dice roller.  
- Slot machine

**Standard Pac**  
(00097-13101)  
(00067-13101)  
**Moving average**  
- Tabulator  
- Curve Fitting  
- Calendar Functions  
- Annuities and Compound Amounts  
- Follow Me  
- The programmable program.

**Games Pac**  
(00097-13185)  
**Game of 21**  
- Includes the game of "Craps" as well as a dice roller.  
- Slot machine

**Submarine Hunt**  
- Find and then sink the moving submarine with your depth charges.  
**Artillery**  
- Locate and destroy the moving target before it destroys you.  
**Space War**  
- Search out and annihilate the 3 evil Alglogs before time and energy are gone.  
**Super Bagels**  
- Based on "Mastermind."
Scientific Printing Calculator.

The battery-operated scientific calculator that delivers a printed record of all your calculations—wherever you go.

The HP-91 Scientific Printing Calculator provides you with a full range of preprogrammed scientific and arithmetic functions—complete with a printed record—all in one compact calculator. And because the HP-91 prints and operates on AC or its own built-in batteries, you can use it anywhere—in the office or the remotest field locations.

Quiet thermal printer provides a complete record of your calculations.

The thermal printing system of the HP-91 records and labels your calculations on heat sensitive paper. Because the HP-91 can print all your calculations, you can print—with labels—statistical summations, contents of the operational stack, or the contents of all sixteen addressable memories.

You select from three printing modes.

With switch set to ALL, the printer will show all entered data, functions, intermediate and final answers. With the switch set to NORMAL, the printer will record entered data and functions only. With switch set to MANUAL, the printer will operate only when you press the Print X key or a list function.

You may operate on battery or AC.

The HP-91 thermal printing system allows you to operate on batteries alone for between 3 and 7 hours, depending on extent of printer use. The AC adapter/recharger lets you operate from electrical outlets while batteries are being recharged.

You can display and print in decimal, scientific or engineering notation.

The HP-91 will print and display in fixed decimal and scientific notations, common in many scientific calculators. It will also print and display in engineering notation, an exclusive HP feature that displays values with exponents that are multiples of 3. This is useful in working with many units of measure, such as kilograms (10^3), nanoseconds (10^-9), etc.

Compact design and light weight for easy portability.

Total weight of the HP-91 without AC adapter/recharger is only 2½ pounds. It will fit into a standard briefcase so you can operate it while you travel in airplanes, taxis, anywhere. A built-in metal tab lets you secure it to your desk easily with a cable or bolt. (A special cable and lock is available as an optional accessory.)

All the most-needed scientific functions—preprogrammed for speed and accuracy.

The HP-91 provides about the same preprogrammed functions found on the widely-used HP-45 pocket calculator—with the added advantage, of course, of a printed record of all your calculations. Its math capabilities include log and trig functions (the latter in degrees, radians or grads), rectangular/polar conversions and three separate percentage functions. Its statistical capabilities include summations, mean and standard deviation, linear regression, linear estimates (all for two variables) and factorial. All this, plus sixteen addressable registers, an automatic four-register stack, a Last-x register for easy error recovery and four clearing options.

Physical Specifications:
- Width: 228.6 mm (9")
- Depth: 203.2 mm (8")
- Height: 63.5 mm (2.5")
- Weight: 1.13 kg (2.5 lb)
- Recharger weight: 286 g (9.5 oz)
- Shipping weight: 3.16 kg (7 lb)
- Operating temperature range: 0°C to 45°C (32°F to 113°F)
- Charging temperature range: 15°C to 40°C (60°F to 104°F)
- Storage temperature range: –40°C to 55°C (–40°F to 131°F)
- Paper temperature range (operating & storage): 10°C to 30°C (50°F to 86°F)
- AC Power Requirements: 90-120V 50-60 Hz
- Battery: 5.0 Vdc nickel-cadmium rechargeable battery pack

For a complete list of features and functions, see the Buyer's Guide on page 8.

The HP-91 Scientific Printing Calculator comes complete with:
- Battery pack that under normal use provides 3 to 7 hours of continuous operation and fully charges in under 10 hours.
- Recharger/AC adapter that lets you operate the calculator on AC while the battery pack is recharging.
- Soft carrying case with handle.
- Illustrated Owner's Handbook with instructions and applications section.
- Thermal paper (2 rolls).

You can phone your order using our toll-free number. See page 7.
Accessories

Optional Accessories.

A. DC Adapter/Recharger
   lets you recharge your calculator in a car or boat.

   This accessory, which is most often asked for by our existing customers, operates from a 12 volt DC battery.
   - HP-21, HP-22, HP-25/25C, HP-27/82055A
   - HP-80 and HP-67/(pictured below) 82054A

B. Reserve power pack
   keeps a spare battery pack fully charged.

   You'll always have a fully-charged spare battery pack on hand when you use this reserve power pack, especially designed for Hewlett-Packard pocket calculators. It comes complete with a spare battery pack.
   - For models HP-67 and HP-80 the recharging time is between 14 and 17 hours.

Batteries for models HP-91, HP-92, HP-97/82037A

C. Security cradle/cable
   helps reduce pilferage.

   When leaving your HP calculator unattended in the office or lab, you can help guard it against "mysterious disappearance" by means of this ruggedly-constructed security cradle.
   - Battery pack and holder for models HP-80 and HP-67/82004A
   - Battery pack and holder for models HP-21, HP-22, HP-25/25C, HP-27, HP-29C (pictured below) 82028A
   - Battery pack and holder for models HP-91, HP-92, HP-97/82037A
   - Security cradle and holder for models HP-67 and HP-80/82007A

   A built-in light-emitting diode tells you that the battery pack is recharging. In six to eight hours, you'll have a fully-charged battery pack to exchange for the one in your calculator.

   A key is used to lock and unlock the cradle holding your calculator. And while your calculator is in place you have complete access to the keyboard and display, with battery pack or AC operation.

   The security cradle may be attached to your desk via: (1) four corner screws, (2) center screw attachment, allowing 360° rotation, (3) removable six-foot steel cable, or (4) extremely hard-to-remove adhesive tape. (All are supplied.)

   A security cable provides the same security for the HP-91, HP-92 and HP-97.
   - Security cradle for model HP-80/82007A
   - Security cradle for model HP-67/82015A

   The security cradle/cable may be attached to your desk via: (1) four corner screws, (2) center screw attachment, allowing 360° rotation, (3) removable six-foot steel cable, or (4) extremely hard-to-remove adhesive tape. (All are supplied.)

   A security cable provides the same security for the HP-91, HP-92 and HP-97.
   - Security cradle for model HP-80/82007A
   - Security cradle for model HP-67/82015A

D. Hard leather case
   helps protect your calculator outdoors.

   Using your HP calculator outdoors? Help protect it by carrying it in this hard leather field case. It guards your calculator against normal environmental conditions in the field—dust, dirt, rain, snow, bumps and jars. Calculator removal is easy with the snap-open flap and contoured front opening.

   - Field case for model HP-80/82006A
   - Field case for model HP-67/82016A

* Also usable on HP-35, HP-45, HP-55, HP-65, and HP-70.
** Also usable on HP-65.
*** Also usable on HP-35, HP-45, HP-55 and HP-70.
Accessories

Replacement Accessories.

Accessories to replace or replenish those received with your HP calculator.

Owner's Handbook

- HP-10/00010-90001
- HP-19C/29C/5955-2110
- HP-21/00021-90001
- HP-22/00022-90001
- HP-25/25C/00025-90001
- HP-27/00027-90001
- HP-67/00067-90001
- HP-80/00080-90001
- HP-91/00091-90001
- HP-92/00092-90002
- HP-97/00097-90001

E. Soft Case

- HP-10, HP-19C/82064A
- HP-21, HP-22, HP-25/25C, HP-27, HP-29C/82027A
- HP-80/82021A
- HP-67/82053A** (synthetic)
- HP-67/82017A** (black leather)
- HP-91, HP-92, HP-97/82035A

F. Battery Pack

- HP-10, HP-19C/82052A
- HP-21, HP-22, HP-25/25C, HP-27, HP-29C/82019A
- HP-80 and HP-67/pictured below) 82001A*
- HP-91, HP-92, and HP-97/82033A

G. Recharger/AC Adapter

- 82026A (110/220 Vac, switchable)
- HP-80 and HP-67/82002A* (110/220 Vac, switchable)
- HP-10, HP-19C, HP-91, HP-92, HP-97/82059A (110 Vac)
- 82066A (Euro 220 Vac)

Calculator Supplies

- Thermal Printing Paper for models HP-10, HP-19C/82051A (6 rolls)
- Thermal Printing Paper for models HP-91, HP-92, HP-97/pictured below) 82045A (6 rolls)
- 3 Program Card Holders for models HP-67 and HP-97/00097-13142**
- Blank Program Cards for models HP-67 and HP-97/00097-13141** 120 card pac/00097/13143**

Application Books and Pacs.

Application Books

- HP-19C/29C Applications Book/5955-2111
- HP-21 Applications Book/00021-90016
- HP-25/25C Application Programs/00025-90011
- 55 Math Programs/00055-66001
- 55 Statistics Programs/00055-66002
- HP-80 Real Estate Applications/00080-66006
- HP-92 Applications/00092-90011

HP-65 Application Pacs

- Standard Pac/00065-67008
- Aviation Pac I/00065-67042
- Chem Engr Pac I/00065-67050
- EE Pac I/00065-67007
- EE Pac II/00065-67056

HP-67/97 Application Pacs

- HP-67 Standard Pac/00067-13101
- HP-97 Standard Pac/00097-13101
- Business Decisions Pac/00097-13144
- Civil Engineering Pac/00097-13195
- Clin Lab & Med Pac/00097-13165
- EE Pac I/00097-13131
- Games Pac/00097-13185
- Math Pac I/00097-13121
- ME Pac I/00097-13155
- Navigation Pac/00097-13205
- Stat Pac I/00097-13111
- Survey Pac I/00097-13175

* Also usable on HP-35, HP-45, HP-55, HP-65, and HP-70.
** Also usable on HP-65.
*** Also usable on HP-35, HP-45, HP-55 and HP-70.
been slower than their scientific brethren in seeing the modern calculator as a powerful professional tool?

Probably there are several reasons. Unlike science types, business people have not been trained in number manipulation and take no special joy from it. But this is changing. A rapidly increasing number of business schools are now offering training in the uses of advanced calculators.

The absence of a paper tape was once a drawback for those accustomed to getting a printed record from a conventional calculator instead of a lighted display. Numbers on paper are tangible, easy to double-check, easy to discuss later with someone else. This, too, has changed. For those to whom a printed record is useful, there is now the HP-10 at the four-function level, the HP-92 at the preprogrammed level and the HP-97 at the fully-programmable level.

A Los Angeles financial advisor, who uses an HP-92 Investor, believes some executives do not yet understand the magnitude of the advanced calculator’s potential. “Some seem to think that its advantages are subtle. But that attitude changes pretty fast when they see me run up an internal rate of return calculation in two or three minutes or compare several investment alternatives in ten minutes or so.”

Like many people who have come to regard their calculators as indispensable to their work, this advisor keeps his HP-92 on his desk during the day and carries it with him in his briefcase on trips. “So many complex calculations can be made with such speed and ease that the calculator becomes a very real extension of my capabilities.”

This, of course, is the essential value of the preprogrammed financial calculator. Amortization tables, depreciation schedules, and statistical functions are built in. All the user has to do is enter the numbers involved in the problem, press the appropriate function keys and up comes the answer. And on tape, if needs be. That’s freedom, indeed.

But for the professional looking for a quantum leap in his personal capabilities, going far beyond speed and accuracy, the programmable electronic calculator is the bluest chip of all.

A New York stock analyst, who used evenings and weekends to train himself to program his HP-67, now is able to tackle investment alternatives that he may have ignored before, simply because the answers were too difficult and time-consuming to obtain. Many of the computations he routinely requires are already programmed on magnetic cards in the HP Business Decisions Pac. But now that he has learned to create programs of his own he can accommodate the special factors needed in his own theory and practice.

Yet another financial analyst uses his fully-programmable calculator as a data file on the companies in which he specializes. He maintains a magnetic card for each company, programmed with all pertinent financial data. As new data is received, the cards are updated and new analyses run automatically, allowing the analyst to deal with a variety of complex comparisons and trends in a fraction of the time required by his previous methods.

It is understandable that at the beginning of the electronic calculator era, primary emphasis was given to scientific applications. But today, there is a calculator for virtually every business requirement. And the business community is responding with accelerated interest. It is not too much to expect that the day is near at hand when the advanced calculator will be as commonplace in business as it already is in science.

Continued from page 3

The Logical Choice.

It’s no secret that the new HP-10 Handheld Printing Calculator does not use RPN logic. But don’t be concerned. The HP-10 is a basic calculator designed to solve straightforward problems. It uses a logic common to office calculators because many of its owners will already be familiar with these types of machines.

RPN remains the finest, most efficient and most versatile logic system for solving the complex problems faced by today’s professionals in science and finance.

For most calculations, RPN requires fewer keystrokes. You don’t need parenthesis keys and you don’t need to keep track of complicated hierarchies. Intermediate answers are displayed and stored automatically in an operational stack of four memories—so you never need to write them down and risk errors. And because only intermediate results are stored, the size and complexity of problems that can be handled with RPN logic are virtually unlimited.

The choice is simple. If you deal with complex scientific or financial equations, try an HP calculator with RPN logic. If you face arithmetic problems more often than not, where a percent key, memory, and printer are helpful, take a look at the new HP-10 with office calculator logic.

Hewlett-Packard wants you to have the logic system that fits your needs.
Questions and Answers.

Here are a few more questions we’ve received, along with the answers.

How can I recharge my calculator while travelling abroad?

Many of our customers travel and work abroad and would like to use their calculators while there. Special rechargers have been designed for use in most countries. There are two major differences between the various recharger versions: plug prong configuration and input voltage. Plug prong adapters are readily available, but voltage transformers are not as common. Rechargers which are compatible to the two predominate foreign voltages, 110 volt and 220 volt, are available in the U.S. [See p. 26.] These individuals will then have to purchase plug adapters for the countries they plan to visit.

Are back issues of the Digest available?

Yes. Volume 1 and Volume 2 are available in the U.S. in limited quantities free of charge. Future issues of the Digest will continue to be available around the world.

Can I recharge my calculator in my car? my boat? my plane?

A recharger that will charge off of a 9-16 volt DC power supply is now available for most of our calculators.

This recharger comes standard with two plugs: one to fit a car cigarette lighter and the other with two leads for connecting directly to the power source. For ordering information, refer to p. 25.

When does my warranty expire?

Calculators are date coded at the time they are manufactured. By date, they are under warranty for one year. If a calculator is purchased from a dealer, the warranty is good for one year from date of purchase. We recommend you keep separate records of your serial number and date of purchase.

Beyond the Call of Duty.

I want to congratulate you on the toughness of your HP-25 and carrying case.

Last night while backing my wife’s 73 FORD GRAN TORINO, I opened the door for a better look back and my HP-25 in the carrying case fell out of my coat pocket without me knowing it. Seeing that I needed to pull up and move over, I did and backed up again. This time I heard a thump. Sure enough it was my HP-25. I had run over it with the front wheel against frozen gravel. I was sure it was smashed flat but it was not hurt at all.

I am enclosing a picture of the carrying case with the tire tread mark on it.

Paul W. Aders Richland, Ind.

I was designing a set of stairs going up a tower in the plant, from the top of a scaffolding 40’ high. I was using my HP - 35 to determine the angle, etc.

I bent over to pick up a measuring tape, and I felt something slide out of my shirt pocket. I looked towards the floor and saw my HP-35 hit the concrete floor and come out of the case in several pieces. I climbed down the scaffold and picked up the pieces and put them back in the warped case in hopes some of it could be reused in another calculator. When I put the battery and all in the case I turned on the switch to find, to my surprise, it worked! The calculator works fine now after I got the case to close up.

PHIFER WIRE PRODUCTS, INC.
Donny E. Stephens
Tuscaloosa, Ala.

My son is in his first year at the Air Force Academy in Colorado Springs. Shortly after arriving, he asked us to mail his HP-21 to him, because his “issue” calculator kept breaking.

Anyway, this is an excerpt of his letter, received last week: “Yesterday I dropped my calculator coming out of Mitchell Hall and it was stepped on by at least five people. I triedit and it still works fine—HP does it again!”

Mrs. Jean Bigo Blackwood
Blackwood, N.J.

I am employed by a large environmental engineering consulting firm in Downtown Boston and commute—during good weather—about twenty miles to work by motorcycle. About a year and a half ago, I purchased an HP-25 Programmable Calculator and have been amazed with its versa-
tility, convenience and top-quality workmanship. The machine has been an indispensable time saver.

Last week, however, I became a true believer. While commuting to work on Monday morning, I noticed that my briefcase, containing my HP-25, had bounced off its rear luggage carrier. Traveling back down the road, I saw that the case had been run over by a car and its contents were scattered all over the asphalt. The calculator, in its carrying case, was lying smack-dab in the middle of the road. It's the first thing I picked up. Tentatively zipping open the case, I expected to have broken bits of plastic fall out in my hand, but the machine slipped out, surprisingly intact.

The microswitch circuit board had apparently been pushed deeper into the machine because the keys no longer sit as exposed as before; all this indicating that it had been subject to a direct hit. However, the machine and its programming facilities still function perfectly!

I'm convinced and a lifetime devotee. This is one hell of a machine.

Ira D. Cohen Norwood, MA.

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For your information.

By now, you've probably heard about the incredible new HP-01 personal information product introduced by Hewlett-Packard in early summer.

Unlike other wrist-size instruments, the HP-01 is not simply a digital watch with a calculator in the same case. The significant difference is that the HP-01 adds a new dimension of information by providing interaction among all of its basic functions.

A wide variety of applications are possible with the HP-01, utilizing six basic functions: time, alarm, timer/stopwatch, date/calendar, calculator and a continuous memory.

Among other things, the HP-01 can maintain a running checkbook balance, solve complex pricing problems, store a phone number or date, time long distance phone calls and accumulate costs on the display like a taxi meter.

The HP-01 contains six large-scale integrated circuits equivalent to 38,000 transistors. A nine-digit display is bonded to the multi-layer ceramic module which contains the circuits.

You can put the HP-01 through its paces at selected jewelry stores. It is not available directly from Hewlett-Packard or from department stores. The HP-01 is featured in gold-filled and stainless steel cases.

—

40 New Library Solutions Books for the HP-67/97

The solution you require may already exist. And now Hewlett-Packard has assembled 40 new booklets of Users' Library Solutions for you to choose from. They cover business, math, engineering, statistics, medicine, physical science, life science and other subjects ranging from astrology to games. With up to 76 pages in each booklet, you can solve an astonishing range of problems.

You save valuable time because no researching, programming, debugging or documenting is needed. Simply record the programs on blank magnetic cards [purchased separately] and you can put the full power of the HP-67 and HP-97 to work instantly.

—
The new HP-92 Investor.
Lets you calculate all your investment alternatives.

options available:

In the event of death, the named individual benefits, costs, and delay in settlement.

All of the above features in

HEWLETT PACKARD

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call Toll Free 800-648-4711, Ext. 1000
(In Nevada, call 1-702-323-2704 collect)