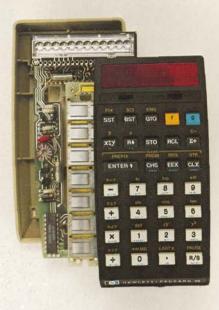
### Uncompromising Christmas gifts from Hewlett-Packard





### All Hewlett-Packard pocket calculators offer uncompromising quality.



- Every key on every HP calculator is checked at least twice.
- Every lettered key has a positive click action, so you know for sure a function has registered when you press one.
- It's no accident that the OFF-ON switch operates as smoothly as it does. We greased it with silicon when we installed it. It's also no accident that it moves in a horizontal plane. That's to prevent it from moving when you put the calculator into its carrying case or your shirt pocket.
- The numbers in the display are tipped forward, so you can view them clearly and without distortion at wide angles.\*
- There's a moisture barrier under the keyboard to protect the calculator's innards from spilt coffee, tea, milk, what-have-you.
- The rechargeable battery pack (included with all HP calculators) is a single unit, easy to replace.
- \*Because of the nature of their size the HP-21, HP-22, and HP-25 have a recessed display.

- There are no exposed wires, seams or electronic components in the battery compartment, just two contacts. This compartment is also sealed to protect the calculator's vital parts.
- The battery compartment door opens easily, without a prying coin or key.
- The recharger plug is recessed to ensure a positive connection; it's also designed so there's no way you can enter the wrong plug by mistake.
- The heavy gauge plastic case is designed to withstand a long tumble to a hard floor.

All HP calculators are designed to meet the particular needs, present and anticipated, of particular professions.

## Hewlett-Packard pocket calculators also offer incredible problem solving power, using the most efficient logic system ever devised.

- Our unique RPN logic system lets you evaluate virtually any expression without copying and remembering parentheses or restructuring. The calculator remembers what's where, so you don't have to.
- RPN lets you solve problems your way—the way you first learned in beginning algebra, the way you now use when you use pencil and paper or slide rule.
- RPN lets you solve problems one step at a time. You never work with more than two numbers at once.
- RPN gives you continuous and immediate feedback. You see all intermediate answers because the calculator executes each function immediately after you press the function key.
- RPN makes it easy to recover from errors.
   You can backtrack when you goof because the calculator performs operations sequentially.
- RPN lets you re-use numbers without re-entering them. Your calculator becomes your scratch pad. This is a real time-saver when you're working with large numbers or making long chain calculations.

Each of the calculators you'll read about on the following pages offers RPN. It's one reason so many scientists, engineers, businessmen and students of science, engineering and business rely on them for fast, accurate answers to their problems.

The uncompromising HP-21 packs more power into a smaller case.

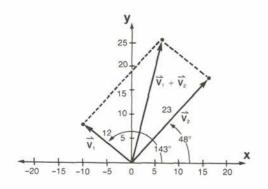
The HP-21 performs all trig calculations, in radians or degrees, all log calculations, and is the only calculator in its price range that lets you:

- Convert polar to rectangular coordinates and back again (→P, →R);
- Calculate a common antilog (10<sup>x</sup>) with two keystrokes;
- Do register arithmetic (M+, M-, M $\times$ , M $\div$ ).

The HP-21 also performs all basic manipulations  $(1/\times, y^x, \sqrt{\times}, \pi)$  and executes all built-in functions in **one second or less.** 

The Display key (DSP) allows you to choose between fixed decimal and scientific notation and lets you control the number of places displayed.

The HP-21 is ideal for vector arithmetic problems. Once the sums of the  $\mathbf{x}$  and  $\mathbf{y}$  coordinates of all vectors are accumulated, they can be converted back to the equivalent polar form using the rectangular to polar function. Below is an example vector problem. Vector one  $(V_1)$  is to be added to vector two  $(\vec{V}_2)$  yielding  $\vec{V}_1 + \vec{V}_2$ .

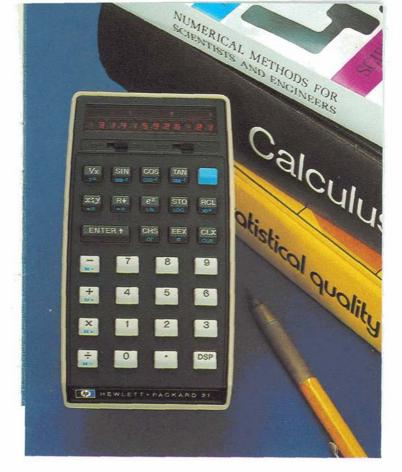


#### Instructions

Display

- 1. Set calculator to degrees mode DEG RAD
- 2. Convert  $\overline{V}_1$  to rectangular coordinates and store  ${\bf x}$

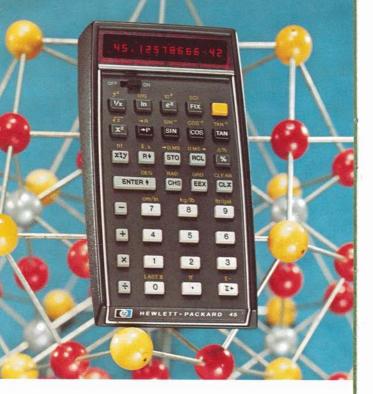
143	ENTER+	12	+R S	ro CLX	<del></del>	0.00	
-----	--------	----	------	--------	-------------	------	--



Instructions	Display
3. Convert $\overrightarrow{V}_2$ to rectangular coordin	nates
48 ENTER+ 23 -R	15.39
4. Sum x components	→ 15.39
5. Sum y components B +	→ 24.31
<ul><li>6. Recall sum of x components</li><li>7. Convert x and y components of the resulting sum to polar</li></ul>	5.81
coordinates P	25.00 (mag) 76.57° (angle)

Finally, whenever you give the HP-21 an impossible instruction, its display spells "Error." Combine the HP-21's capability with its \$100.00\* price, and you have a price—performance ratio that's simply unbeatable.

<sup>\*</sup>Suggested retail price excluding applicable state and local taxes—Continental U.S.A., Alaska & Hawaii.



Our uncompromising HP-45 advanced scientific calculator remains the industry standard.

The HP-45 performs trig functions in decimal degrees, radians or grads and converts answers to degrees-minutes-seconds and back again. It also converts polar coordinates to rectangular coordinates, and vice versa.

It has nine addressable memories and a special "LAST x" memory that automatically stores the last number you key in for easy error correction and multiple operations on the same number.

And you can order the HP-45 Math Pac, priced at just \$10.00\*, to obtain fully documented routines for scores of complex but commonly encountered problems.

What could be simpler?

The \$195.00\* HP-45 helps scientists in their labs, engineers at their drawing boards, surveyors in the field. And it can help you.

\*Suggested retail price excluding applicable state and local taxes—Continental U.S.A., Alaska & Hawaii.

Now almost anyone can enjoy the speed, accuracy, and computational power of programmability with an uncompromising Hewlett-Packard calculator.

Programming is simply the ability of a calculator to learn, remember, and execute automatically a series of steps necessary to solve a particular problem.

Once you've taught the calculator the formula for your problem, all you do is supply the known variables and start the program running. But Hewlett-Packard programmable calculators give you much more.

- Full editing capability. You can add or change steps at will.
- Direct branching. You can solve problems requiring iterative routines.
- Conditional testing. You can program the calculator to make decisions for you based on the data.
- An easy-to-understand keystroke programming language.

Before you buy a calculator, take a look at the programmable calculators from Hewlett-Packard:

The HP-25 scientific programmable pocket calculator offers eight addressable memories, full editing, and branching and conditional test capability. Only \$195.00\*.

The HP-55 advanced scientific programmable calculator provides 20 addressable memories, editing, branching and conditional test capability, and even a 100-hour digital timer. All for only \$335.00\*

The HP-65 **fully** programmable pocket calculator for scientists or business executives lets you record your programs on magnetic cards for future use. The HP-65 also has nine addressable memories, full editing, and nine conditional tests. In addition, Application Pacs containing pre-recorded magnetic cards for specific disciplines are available which save you time and effort. Attractively priced at \$795.00\*.

Programmable calculators take most of the repetition out of your repetitive problems. If you want to save yourself some time, take time to read about the HP-25, the HP-55, and the HP-65 on the following pages.

<sup>\*</sup>Suggested retail price excluding applicable state and local taxes—Continental U.S.A., Alaska & Hawaii.

Our uncompromising HP-25 scientific programmable calculator gives you keystroke programmability at a remarkable price/performance ratio.

The HP-25's keystroke programmability makes programming as simple as pressing the keys you would manually press to solve your problem. And once you have determined the keystroke procedure for solving a problem and stored it in the calculator, you don't have to pay attention to the individual keystrokes that make up the procedure. You can let the calculator perform the drudgery and leave your mind free for more creative work.

The HP-25 has 49 steps of program memory, coupled with merged keycodes that conserve steps to effectively expand memory capacity.

And you can do more! The powerful branching and conditional test capability in the HP-25 enable you to solve complex real-life problems. You can compare data values automatically and execute different sections of your program based on the results. And you have eight comparisons to choose from.

If you make a mistake when entering your program, relax. The HP-25 makes it easy to change or add steps to your program with its unique editing capabilities. Using the single step and back step keys you can display each program step as well as each function. You don't have to start over.

The HP-25 also features 72 functions and operations including log and trig functions (the latter in degrees, radians or grads), rectangular/polar and decimal hours/hours-minutes-seconds conversions, mean and standard deviation, and summations.

And if you're looking for memory power, the HP-25 offers eight addressable memories, an automatic four-memory stack, a LAST x memory for easy error recovery, and (don't forget) a 49-step program memory.

HP's RPN logic system combined with the automatic stack is the reason the HP-25 slides so easily through the most complex equations. You solve problems your way, without copying parentheses, worrying about hierarchies, or restructuring problems beforehand. You save keystrokes, time, headaches, and reduce the chance of error.



All of these functions and features combine to give you maximum calculating power. And that power is clearly explained in the remarkable HP-25 Owner's Handbook. It explains the RPN logic system that makes simple answers out of complex problems and the features that make programming your HP-25 painless.

But that's not all you get! You also receive an Applications Programs book that details commonly encountered problems in math, statistics, finance, surveying, and navigation. You completely eliminate the time and energy you'd otherwise spend creating programs to solve these problems—because the handbook gives you short, efficient routines.

If cost has kept you from this kind of calculating power, you've lost your last excuse. The HP-25 sells for just \$195.00\*.

<sup>\*</sup>Suggested retail price excluding applicable state and local taxes—Continental U.S.A., Alaska & Hawaii.

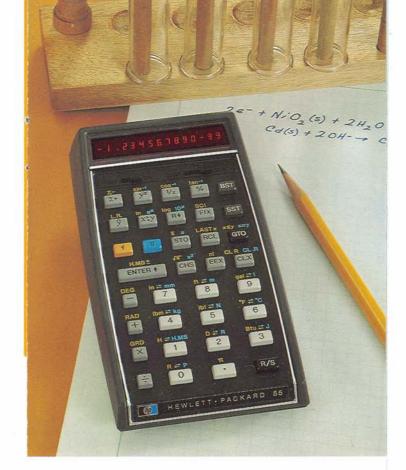
Our uncompromising HP-55 advanced scientific programmable calculator offers a unique combination of power and versatility.

A 49-step program memory lets you program this calculator yourself to automatically solve repetitive problems you now step through manually. It's marvelously simple. You key in your formula only once. From then on, you just enter the new variables for each computation and press (Run/Stop) for an answer that's accurate to 10 digits. It's equally easy to edit your programs, simply by overwriting the part you wish to change. The HP-55's SSI (single step) key lets you walk through program memory one step at a time.

The HP-55 also performs automatically all sorts of trig and log functions, two variable linear regression, linear estimate, mean and standard deviation, and 10 helpful conversions. We've built it to handle 86 different calculations and data manipulations. And 20 addressable memories let you store away data for future use.

Another most unusual feature of the HP-55 is its 100-hour digital timer. It's accurate to  $\pm 0.01\%$  and measures time in hours, minutes, seconds, and even hundredths of a second. And you can store up to 10 different points in time while it is running. The HP-55 is easy to use on a variety of problems. For example to program the HP-55 to calculate the areas of circles, simply follow the instructions shown below.

Instructions	Display	
1. Switch ON calculator —	→ 0.00	
2. Switch to PRGM mode	<b>→</b> 00.	
3. Press 9 —	<b>→</b> 01.	32
4. Press x²	<b>→</b> 02.	42
5. Press f	<b>→</b> 03.	31



Instructions	Display		
6. Press <sup>▼</sup>	<b>→</b> 04. 83		
7. Press 💌 —	<b>→</b> 05. 71		

In order to run the program, switch back to RUN and press ST. Then key in the radius and press (run/stop). For each additional circle area, simply key in the new radius and press Again. Two optional handbooks, the HP-55 Math Pac and the HP-55 Stat Pac document the most efficient routines for solving hundreds of common but complicated math and stat problems. At \$10.00\* each, they're a sensible investment that can save you time and effort in writing programs.

The HP-55 at \$335.00\* brings advanced but very practical calculating capabilities within reach.

<sup>\*</sup>Suggested retail price excluding applicable state and local taxes—Continental U.S.A., Alaska & Hawaii.

# Hewlett-Packard presents a small miracle: the uncompromising HP-65 fully programmable pocket calculator.

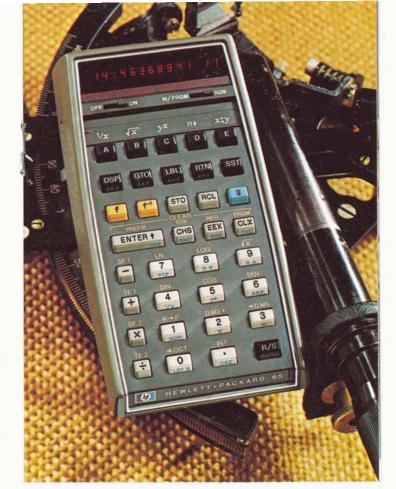
The HP-65, with full programmability, is really three calculators in one:

First of all, the HP-65 can be used with prerecorded magnetic program cards. The Standard Pac, which you receive free with the calculator, offers a selection of pre-recorded programs that demonstrate the versatility of the calculator. Also available are fifteen Application Pacs (listed on pages 14 and 15). Each Pac contains as many as 40 programs for solving many common but complicated problems in your field of interest. You completely eliminate the time and energy you'd otherwise spend creating your own programs to solve these same problems.

To use a pre-recorded program, you simply insert a card into the lower slot on the right side of the calculator. The instructions on the card are automatically transferred to the HP-65's program memory in just 2 seconds. Next, key in your data and run the program as described in the easy-to-follow instructions that come with each Pac.

Individual Application Pac programs, and programs contributed by HP-65 owners, are available through the HP-65 Users' Library—now offering over 4000 programs. All of the programs are listed and described in the Catalog of Contributed Programs, which is periodically updated. Secondly, the HP-65 can be used to write your own programs. Simply set the switch to Write Program and key in the same keystrokes you would use to solve your problem manually. Once your program is in the machine, you can record it on a magnetic card for future use anytime, anywhere. You'll never have to rethink and verify that solution.

To run your program, set the switch to Run, key in your known data and press one key. The HP-65 will automatically execute your entire calculation in seconds—as often as you need it. Program memory is 100 steps long and RPN logic effectively expands that memory by giving you the shortest keystroke list for complex problems. In addition, the HP-65 provides logic tests, conditional branches, and full editing capability. And you can easily chain programs for those unusually long problems that cannot be solved in 100 steps.



The third way to use your HP-65 is as an advanced scientific pocket calculator. Its 51 built-in functions and data manipulation operations let you solve almost any problem quickly, simply, confidently. Just press the keys.

The HP-65 also comes with an illustrated Owner's Handbook, a Quick Reference Guide and a pad of program forms for writing your programs. In addition, you are entitled to receive a free one-year subscription to Key Note, the HP-65 newsletter that describes new HP-65 accessories, passes along programming hints, and carries other news and information of interest to HP-65 users.

No matter how you use it, the HP-65 gives you more than any other pocket calculator. At \$795.00\*, it's truly a "small miracle."

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<sup>\*</sup>Suggested retail price excluding applicable state and local taxes—Continental U.S.A., Alaska & Hawaii.

HP-65 Application Pacs turn your complex, lengthy, or repetitive problems into a few simple steps that anyone can do quickly, confidently.

To concentrate the capabilities of the HP-65 in your field of interest, you can select from 15 Application Pacs. These Pacs provide efficient programs for solving many common but complicated problems in your specific field of interest. You completely eliminate the time and energy you'd otherwise spend creating your own programs to solve these same problems.

Each Pac contains cards for up to 40 programs and a detailed manual that provides a description, operating instructions, examples, and a program listing for each program. All are available through your HP dealer for \$45.00\* each. Any would make a welcome gift for a HP-65 owner.

**EE Pac 1:** 35 programs selected from the following application areas: impedance matching, filter design, transmission line calculations, parameter conversion, power supply design, transistor biasing, control system and waveform analysis.

EE Pac 2: 27 programs assist the microwave circuit designer in making microwave measurements, designing transistor amplifiers, computing transmission line properties and certain system properties, and related mathematical operations.

Finance Pac 1: 38 programs address the frequently encountered problems in investment analysis, loans, savings annuities, leases, depreciation, business statistics, and other business applications.

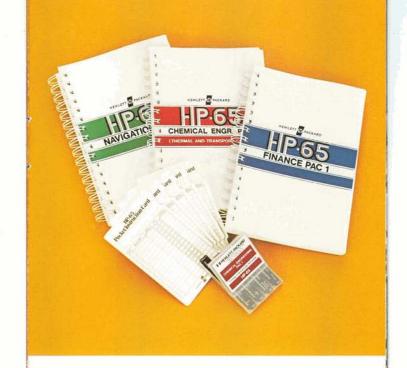
Math Pac 1: 40 programs from the areas of algebra, trigonometry, geometry and numerical analysis.

Math Pac 2: 37 additional programs for number theory, complex analysis, numerical analysis and miscellaneous higher mathematical functions.

**Stat Pac 1:** 37 programs for calculations involving general statistics, distribution functions, curve fitting and test statistics.

**Stat Pac 2:** 31 programs supplement the capabilities provided in Stat Pac 1 **plus** solve problems involving analysis of variance, probability, quality control and queuing theory.

Medical Pac 1: 27 programs applicable to these types of medical calculations and conversions: ventilator set-up and calibration; analysis of cardiopulmonary function, acid-base balance, blood gases and respiratory status.



**Navigation Pac 1:** 26 programs to assist the marine navigator in piloting and dead reckoning, celestial navigation and relative motion problems.

**Aviation Pac 1:** 29 programs devoted to preflight planning, flight management and in-flight navigation.

**Surveying Pac 1:** 34 programs grouped into these common problem areas: traversing, curves, triangles and intersections, predetermined area and earthwork.

Machine Design Pac 1: 35 programs aid the machine designer in dynamics, vibrations, linkages, cams, gears, springs, power transmission, and machine geometry.

Stress Analysis Pac 1: 25 programs to aid the engineer with vector statics, section properties, fatigue, interference fits, Mohr circle, flat plates, beams and columns, and pressure vessels.

Chemical Engineering Pac 1: 18 programs to help in thermal and transport science calculations such as: equations of state, compressible flow, incompressible flow, heat exchanger analysis, natural convection, black body thermal radiation, curve fitting and unit conversions.

<sup>\*</sup>Suggested retail price excluding applicable state and local taxes—Continental U.S.A., Alaska & Hawaii.

# Our uncompromising HP-22 is a new pocket calculator specifically designed for complete business management.

The HP-22 puts ideal combinations of financial, mathematical and statistical functions right at your fingertips. With it, you can handle everything from simple arithmetic to complex time-value-of-money computations. You can even handle planning, forecasting, and decision analysis. And you can approach business problems in a variety of ways to arrive at intelligent decisions and recommendations based on facts.

A special feature of the HP-22 is its "random entry system" that lets you enter numbers in any order and change any one of them anytime. For example, say you're about to purchase a \$39,000 house. Your realtor says you could resell it in four years for \$52,000. To find the annual rate of appreciation, here's all you do:

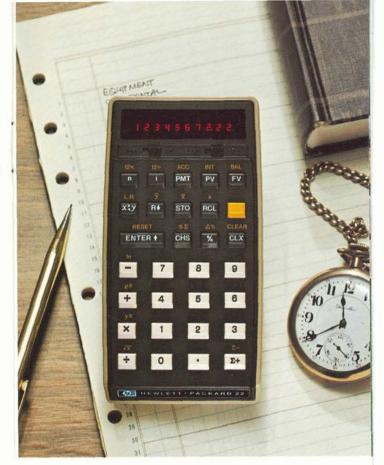
- Key in 39,000 and press the PV key.
   ( PV = present value)
- 2. Key in 4 and press the key.

  ( = number of periods)
- 3. Key in 52,000 and press the **FV** key. ( **FV** = future value)
- 4. Press the key for your answer, 7.46%. ( = periodic interest rate)

Thanks to "random entry", you can enter the known factors in any order. Also thanks to random entry, you can quickly recalculate your rate-of-return if the house sold for \$60,000.

Simply key in 60,000 and press the wey. Then press again. In seconds you get your new answer, 11.37%, without redoing the entire calculation. The new HP-22 also automatically calculates discounted cash flows; percentages; ratios; proportions; compound interest; remaining balance; annuities; depreciation; mean and standard deviation; trend lines (linear regressions); linear estimates; accumulated interest; rate of return; amortization; and more.

You also receive with the calculator the remarkable HP-22 Owner's Handbook, a clearly-written survey course in modern management problemsolving, analysis and planning—with procedures



for more than 50 different calculations in real estate, investments, loans, merchandising, rents or leases, insurance, accounting, and savings.

The HP-22 also has 19 memories: 5 financial memories, automatic four-memory stack, plus 10 addressable memories for data storage, statistics, and register arithmetic.

And HP's RPN logic system and automatic fourmemory stack let you solve problems with the HP-22 your way, without copying parentheses, worrying about hierarchies, or restructuring the problem beforehand. You save keystrokes, time, headaches, and you reduce the chance of error.

At \$165.00\* the HP-22 gives today's business manager the calculating power he needs at a price he can afford.

<sup>\*</sup>Suggested retail price excluding applicable state and local taxes—Continental U.S.A., Alaska & Hawaii.

The uncompromising HP-80 may be the most revolutionary financial device of our time.

The HP-80 performs automatically virtually all calculations involving the relationship between time and money. And it does them in seconds. All you do is press a few keys to perform any of these calculations:

- Bond prices and yields, both yields-to-maturity and to-call.
- Conversions from add-on interest to APR.
- Sum-of-the-years' digits depreciation schedule and Rule of 78's interest rebates.
- Trend line analysis, using linear regression.
- Accumulated interest between two points in time.
- Daily interest using either 360- or 365-day years.

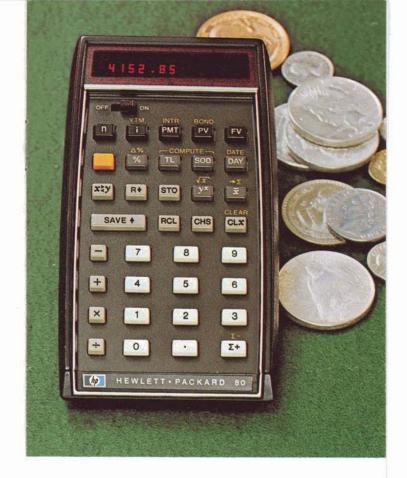
It also has a 200-year calendar (1900 to 2099). You can quickly figure the exact number of days in a bond or loan calculation or what day of the week a date falls on.

What's more, you can put an HP-80 to work at once. The know-how is in the calculator. All you have to know is when to press which button, and the "plain English" Owner's Handbook spells that out. Also included with the HP-80 is a 101-page financial applications book to simplify real estate, financial, and investment decisions and help you get the most from your calculator. It even shows you how to "stretch" the power of your calculator for more difficult problems.

Suppose, for example, an engineering firm is considering purchase of rights to a production process for \$800,000. They expect this process to net them \$138,000 each year for the next ten years, at which time they will sell the process rights for \$320,000. What annual yield would this investment represent to the firm?

Here are the keystrokes shown in the financial applications book:

Press	Display
320,000 SAVE + 100 ÷ STO	→ 3200.00
10 SAVE ↑ 365 × 2 ÷ n	→ 1825.00



Press	Display
138000 RCL ⇌ 2 🗶 PMT —————	▶ 86.25
800000 🖭 🗗 🖭 ——————————————————————————————	250.00
2 = -	<b>→</b> 14.17%

Can you imagine how long this would take on any other calculator?

The HP-80 is a time-and-money instrument—one that's been designed to save today's businessman his time and money by helping him to make a wider variety of important calculations very quickly, very precisely, and very easily.

Invest in one at \$295.00\* and you gain an instrument that should meet your needs through many promotions.

<sup>\*</sup>Suggested retail price excluding applicable state and local taxes—Continental U.S.A., Alaska & Hawaii.



### When you buy an HP calculator, you get more than just a calculator.

Every HP pocket calculator comes with these standard accessories:

- A rechargeable battery pack that provides up to 5 hours of continuous calculating power.
- An adaptor-recharger that lets you charge the battery pack while you're using the calculator.
- A carrying case with belt loop.
- An illustrated owner's manual.

In addition these optional accessories are available through your HP dealer:

- A security cradle that locks the calculator in place.
- A hard leather field case that protects the calculator when you're on the road or in the field.\*
- Reserve power packs—for those rare instances when you'll need more than 3 to 5 hours of continuous calculating power.

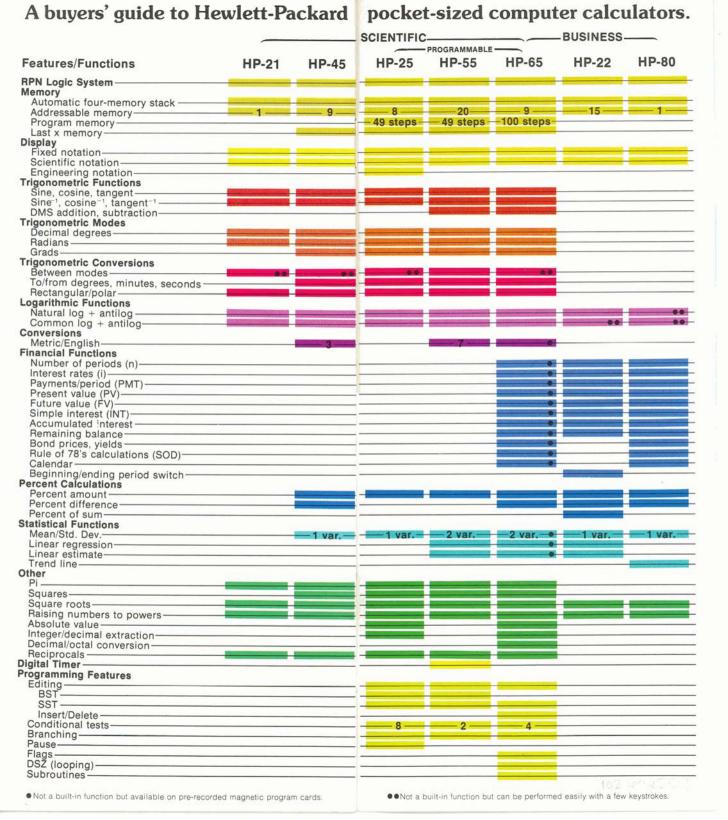
\*Not available for the HP-21, HP-22, or HP-25.



Our new display offers a fascinating way to get acquainted with our calculators. It lets you challenge them with your problems. Look for it at leading department stores and college bookstores across the country.

Incidentally, when you buy an HP calculator from one of these stores, you can be confident of our full back-up support.

Call 800-538-7922 (in Calif. 800-662-9862) for the name of a Hewlett-Packard dealer near you. Then pay him a visit.





Donald G. McBrien