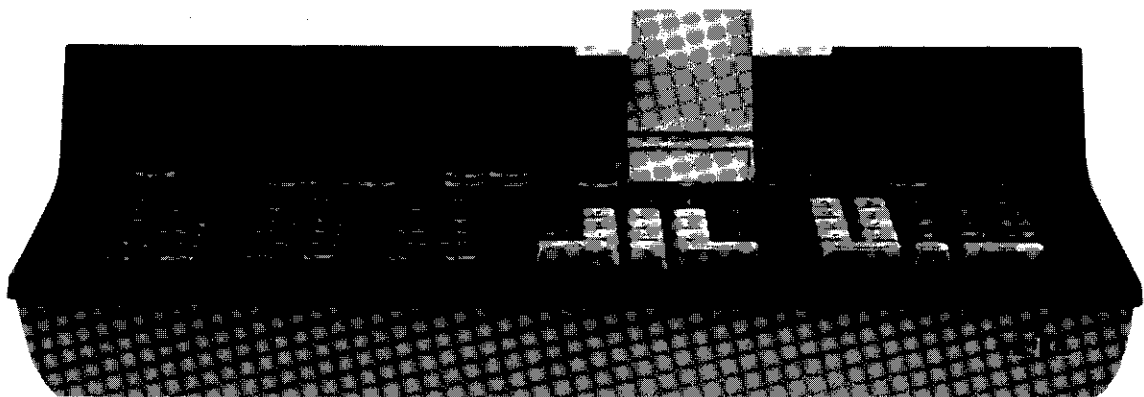




SERIES 9800



**HP 9820A**

HEWLETT  PACKARD

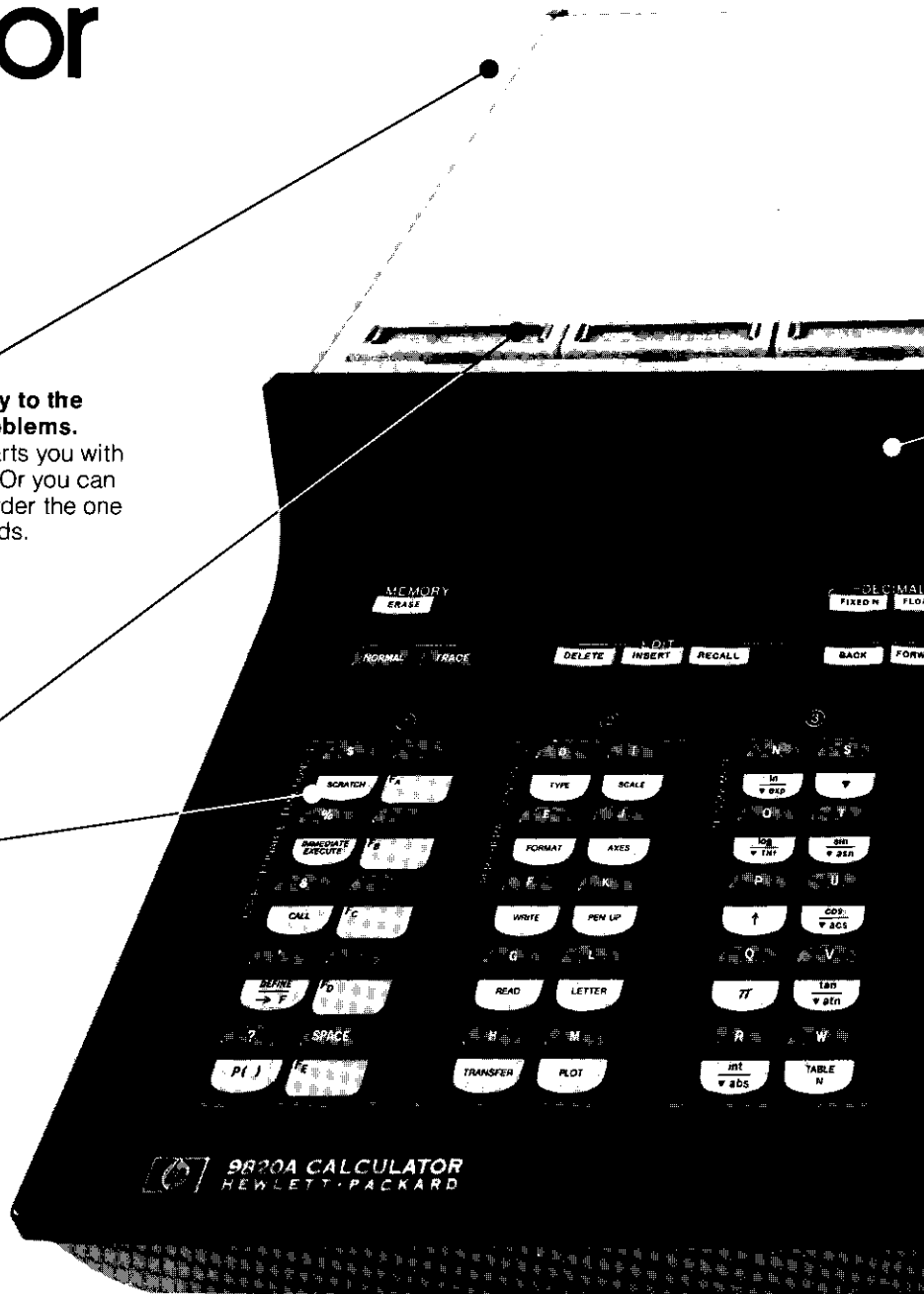
# Meet the Conversational Calculator

**Match internal memory to the complexity of your problems.**

The basic HP 9820A starts you with a 173-register memory. Or you can specify 429 or 1,453. Order the one that best suits your needs.

**Design your keyboard with the functions you use most.**

Plug-in function blocks enable you to solve your important functions with a single keystroke.



**HP 9820A: The programmable calculator that puts programs ... solutions ... data at your fingertips.** The key word for the 9820 is convenience. Cassette memory, algebraic programming language, definable key blocks — are just some of

the important features of the 9820 that were designed with the user in mind. Plus, you end up with a personal computing system that is still desk-top in terms of space and power requirements.

**Already proven in terms of hardware and software.** As a part of our popular 9800 Series, the 9820 benefits from the



**Choose peripherals to match your operating procedures.** The versatile I/O structure of the 9820 lets you choose the combination of input, output, and control peripherals to handle data in the most convenient form for you.

**Receive instructions and listings in English and algebraic symbols.** The printout and alphanumeric display let you see your formulas and solutions in notation with which you are familiar.

**Store and retrieve programs and data quickly and conveniently.** The built-in magnetic card reader lets you store programs and data on magnetic cards. When you need your information again, simply load the card into the calculator card reader.

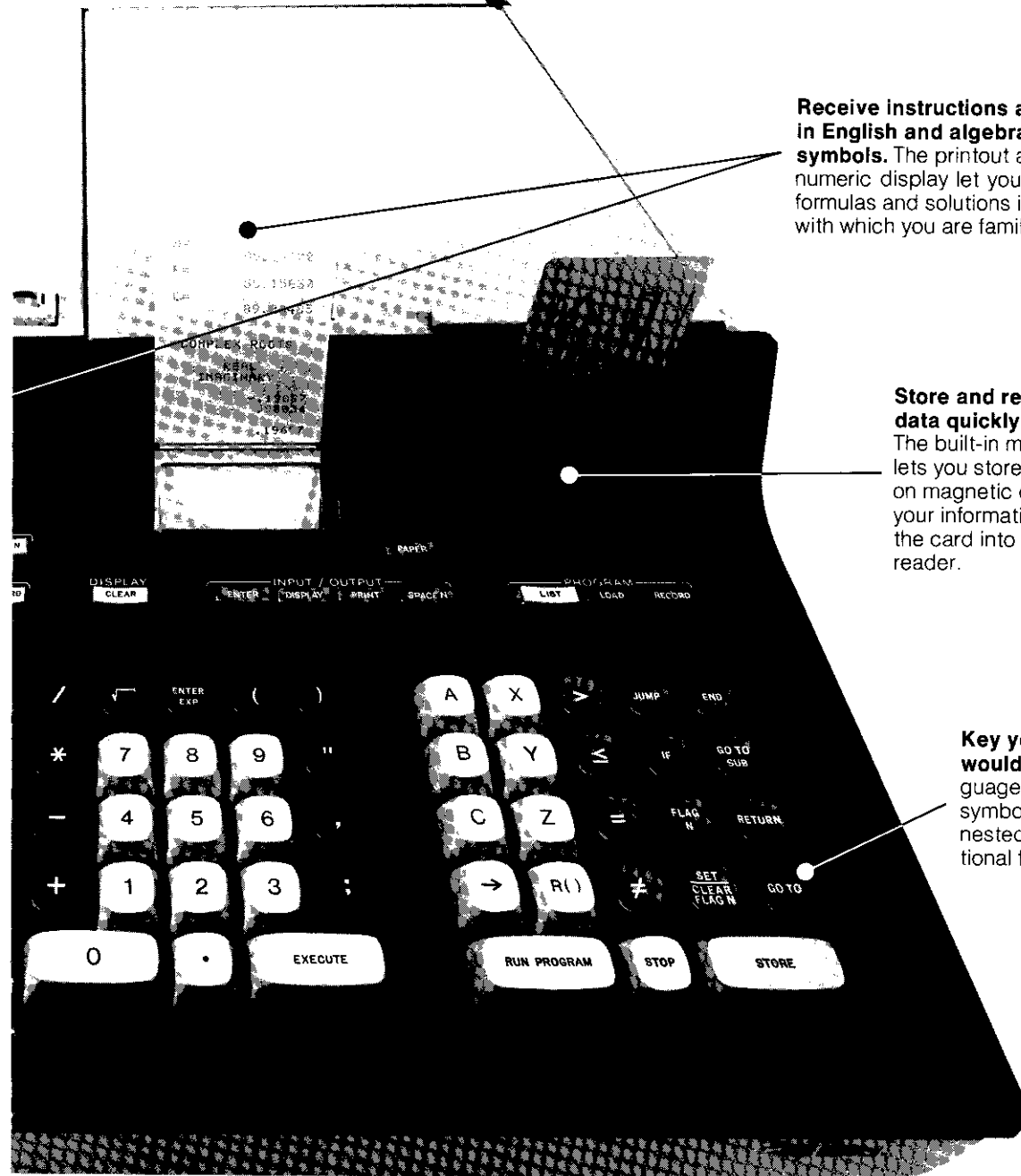
**Key your problem exactly as you would write it.** The algebraic language of the 9820 lets you use symbols, implied multiplication, nested parentheses — all the traditional formulas you are used to.

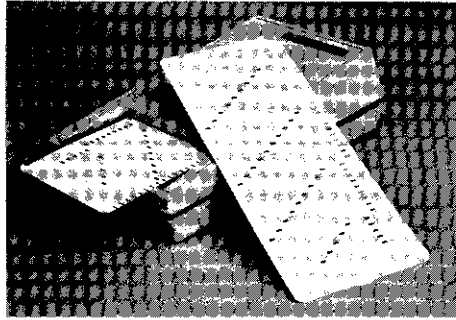
technology of its predecessors. What this means is an established record of outstanding reliability. What's more, you can benefit from the library of programs available for the 9820 — these include both general as well as specific solutions to a variety of application problems.

The same is true for peripherals. You have a broad selection of peripherals that you can match to your needs. And

many satisfied users have already proven their performance with 9820 systems.

**Designed to solve your problems.** The 9820 was designed for people like you — engineers, scientists, problem solvers. Algebraic language, cassette memory, definable keys, labeled printout ... features that let you conveniently transform problems into answers without leaving your desk.





## A Choice of Inputs

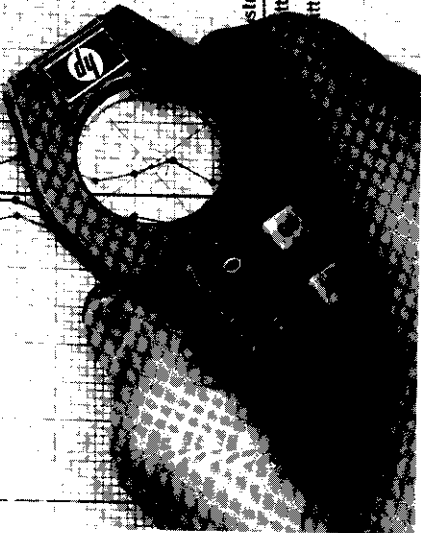
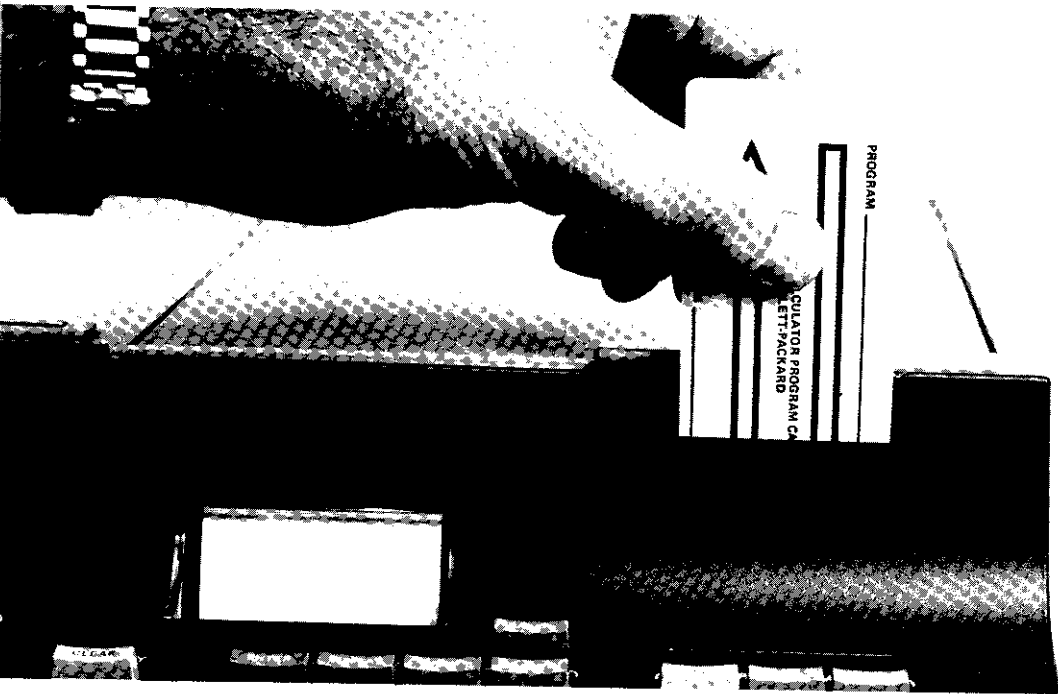
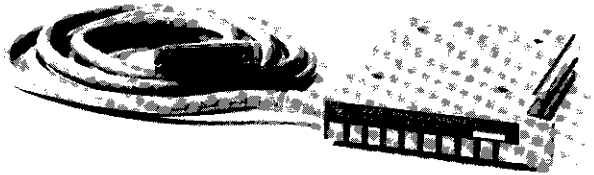
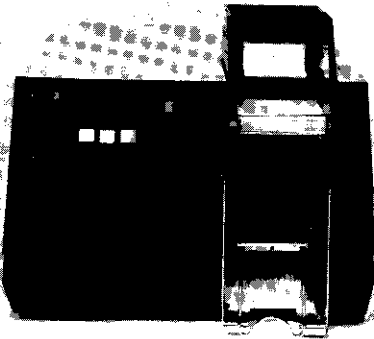
**The most effective way.** Programs, data, both... from cards, tape, diagrams... the flexible input structure of the 9820 lets you access its processor in the way most convenient for you. The result is good use of your time and your money.

**With a minimum of keystrokes.** Whether composing programs or directly entering data, the built-in keyboard simplifies your job. We human-engineered this keyboard to efficiently use the computing power of the 9820 while making it as easy to use as possible. Take a look at our keyboard. Note the number of control and program functions that can be performed with a single keystroke. What we are saying is that the 9820 puts a lot of power at your fingertips without sacrificing versatility or simplicity.

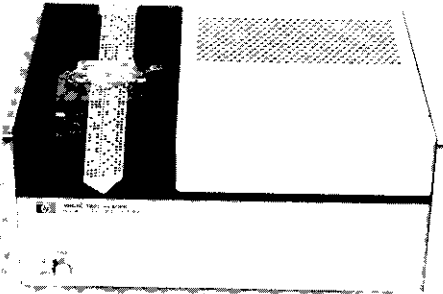


**Or fast, automated read-in.** For storage of data and program, there is the external cassette memory. But supposing your data is available on punched cards, mark-sense cards, punched tape, or even diagrams? The 9820 has a peripheral to handle your data input needs. You're probably familiar with tape and card readers, but what about a digitizer? This fascinating device lets you "read" graphics, such as, diagrams or strip charts, directly into the calculator for analysis.

**In real time, too.** Do you deal with data from test instruments? Why risk conversion errors? You can order a controller that lets you "design" an instrumentation system based on your 9820 for on-line data input and analysis.



stments Made:  
tted First Dev. Rr  
tted First Dev. Rr



# A Language YOU Understand

**For natural communication.** The language of the 9820 is simple to learn and simple to use. Your 9820 speaks and understands a language designed for problem solving. It is a combination of algebraic

notation and English that lets you write programs with the same symbols and notation you use in your work.



**Yet providing programming power.** Even though simple, the programming language of the 9820 offers you many computer-like features.

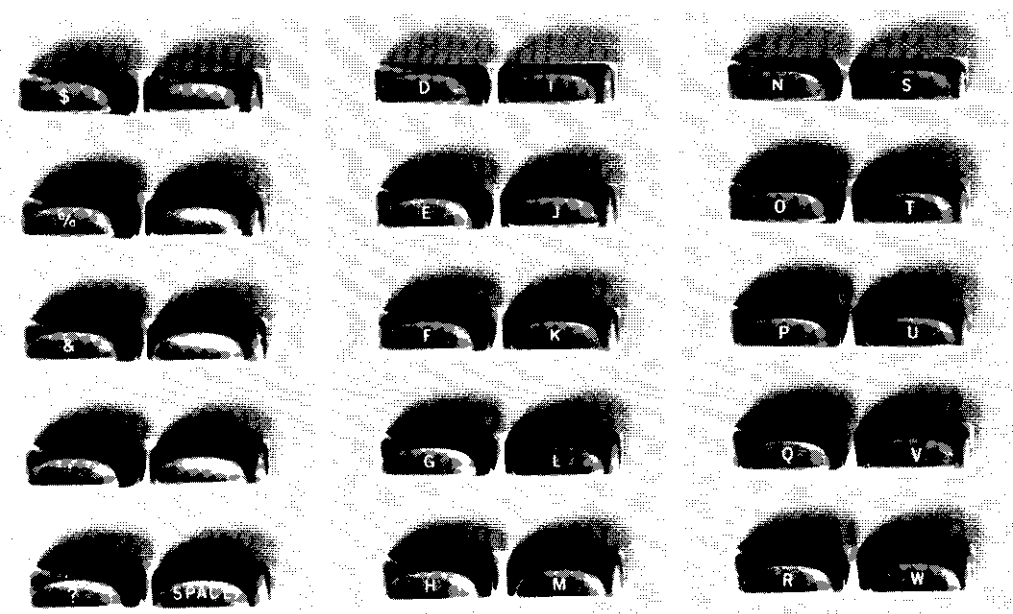
- Both conditional and unconditional branching.
- Boolean capability.
- Nesting of subroutines up to 30 deep.
- Use of up to 16 flags.
- Computed or indirect addressing.

Even though it sits conveniently on your desk, the 9820 has enough power to handle the majority of computing problems you encounter each day.

## MEMORY



## DECIMAL



**That facilitates editing.** Every entry is checked as it is entered. When you make an error, you know it and correct then rather than having to hunt for it later. When you make an error, the display lights up with a note that tells you the error type. Whether correcting errors or rewriting sections of your programs, the group of five edit keys lets you make changes with a minimum of keystrokes. When inserting or deleting a line, the 9820 automatically fits the program to the required memory and renumbers the remaining lines.

**And conversational operation.** The simple language, plus the display and printer, let you write programs that "talk" you through their execution. Pretty convenient for a program that you do not run regularly or that you want any of your co-workers to be able to run. For example, the display could request each entry as it is required and then display the results.

```

0: ENT "ENTER A",A+
1: PRT "A=",A+
2: ENT "ENTER B",B+
3: PRT "B=",B+
4: ENT "ENTER C",C+
5: PRT "C=",C;SPC 2+
6: IF 0>BB-4AC;GTO "IMAG"+
7: PRT "REAL ROOTS" ;SPC 1+
8: PRT (-B+r(BB-4AC ))/2A;SPC 1+

```

```

9: PRT (-B-r(BB-4AC ))/2A;SPC 1+
10: GTO 0+
11: "IMAG"+
12: PRT "COMPLEX ROO -TS";SPC 1;PRT " REAL"," IM AGINARY";SPC 2+
13: PRT -B/2A,r(4AC-BB)/2A;SPC 1+
14: PRT -B/2A,-r(4AC-BB)/2A+
15: GTO 0+
16: END +

```



**DISPLAY**

CLEAR

**INPUT / OUTPUT**

ENTER

DISPLA

PRIN

SPACE

**PROGRAM**

LIST

LOAD

RECORD

Calculator keypad section 1: /, √, ENTER EXP, (, )  
 \*, 7, 8, 9, "  
 -, 4, 5, 6, ,  
 +, 1, 2, 3, ;  
 0, ., EXECUTE

Calculator keypad section 2: A, X  
 B, Y  
 C, Z  
 →, R()  
 RUN PROGRAM

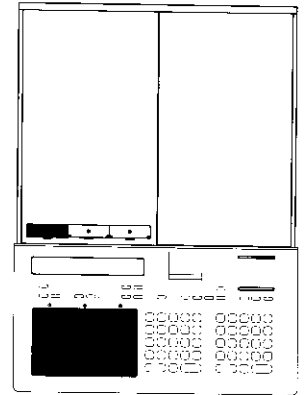
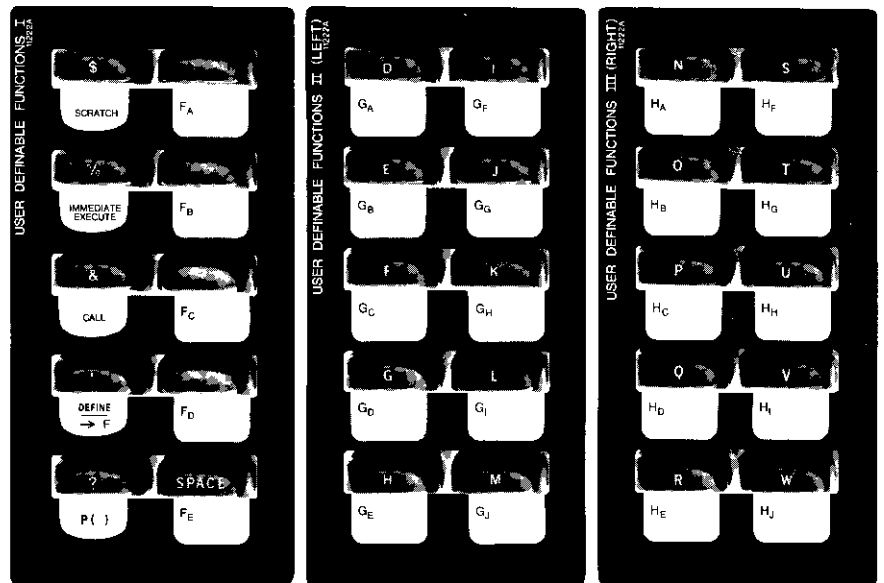
Calculator keypad section 3: >, JUMP, END  
 ≤, IF, GO TO SUB  
 =, FLAG N, RETURN  
 ≠, SET CLEAR FLAG N, GO TO  
 STOP, STORE

# The keyboard You Design

**For any discipline.** Whatever your field, you can literally design the keyboard of the 9820 to execute the functions you use most with the touch of a single key. You can customize the three left-hand key banks by specifying individual keys, an entire bank, or a group of banks. Insert a plug-in block, overlay the associated templates, and you're ready to start solving your problem.



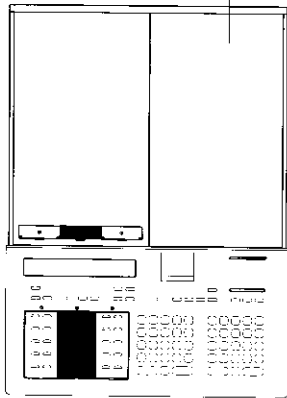
**With a choice of modules.** One, three different, or ... you can use any combination of three modules at the same time. Each gives you special functions, plus more memory. Each block contains its own read-only-memory (ROM). Here are the blocks currently available.



## DEFINABLE

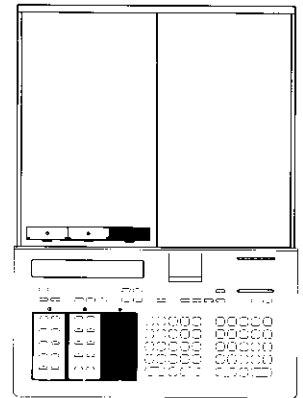
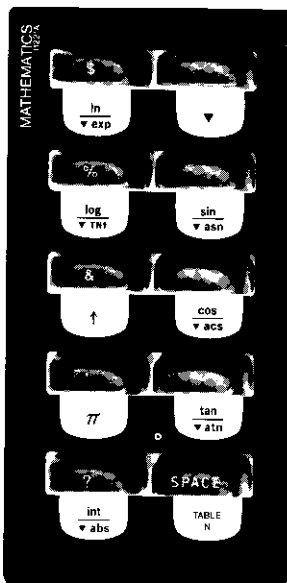
With the User Definable Function Block, you can customize individual keys for the operations uniquely important to you. For example, the electrical engineer will probably want voltage, impedance, capacitance, and true RMS functions; the physicist, his mass, velocity, and acceleration functions; the chemical engineer, his fluid flow and heat transfer functions. With one definable block, you can specify 5, 15, or 25 keys depending upon whether the remaining banks are being occupied by other ROM's.





# MATHEMATICS

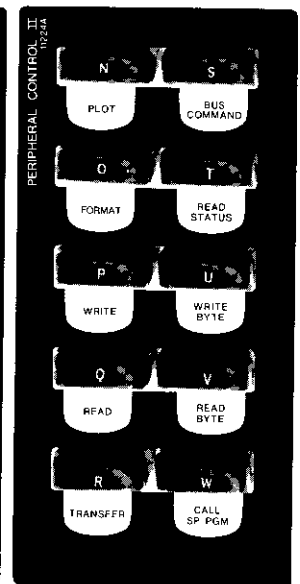
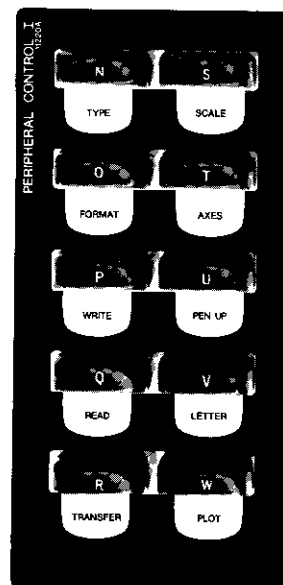
With the Mathematics Block, you get more than just keys and symbols — you get extra memory that has been permanently programmed to solve math problems. Under single-key command are sine, cosine, tangent, pi, log, natural log, integer value, and raising a number to a non-integer power. Plus you get a shift key that lets you compute the inverse of the preceding functions. Also, a key that allows you to set your arguments in degrees, radians, or grads.



# PERIPHERAL

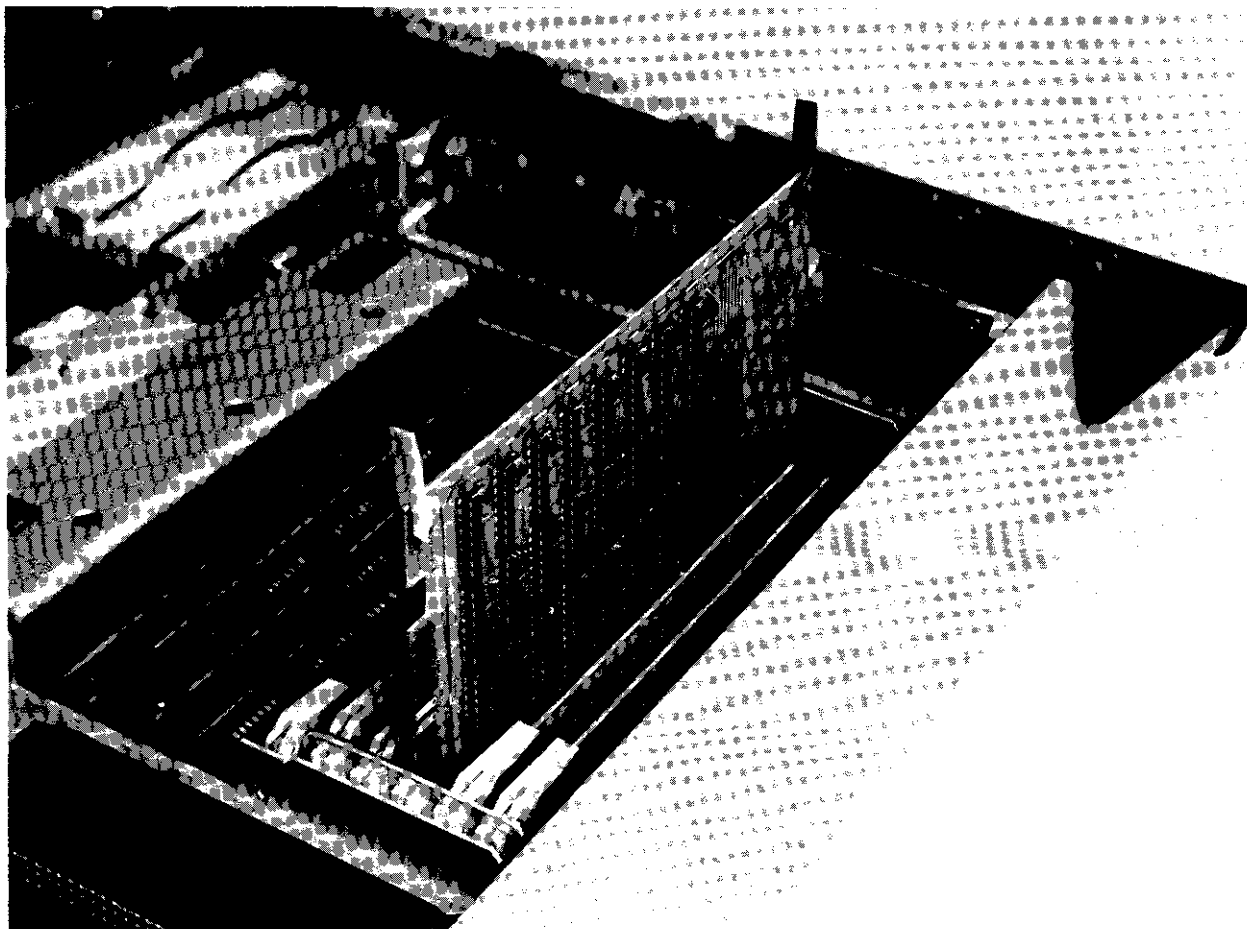
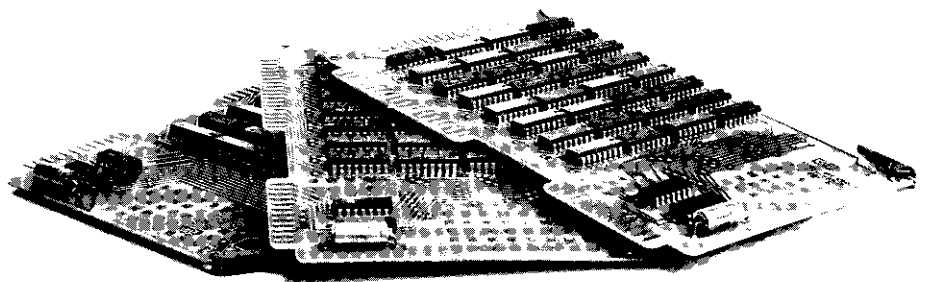
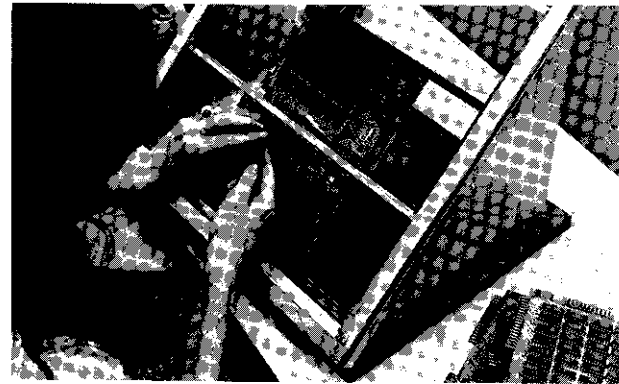
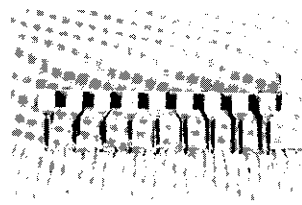
Two Peripheral Control Blocks provide simple direct control over the various peripherals you can add to your 9820. **Peripheral Control I Block** has three groups of functions: plotter, typewriter, and systems. The latter facilitates program and data transfers between the various elements of your system; such as, calculator to peripheral or peripheral to peripheral.

**Peripheral Control II Block** provides enhanced general interface capabilities. Special features include tape translation, general instrument control (via a HP Interface Bus), formatted read/write, and calling special internal code programs.



# Memory

that grows  
with you





**An expandable internal memory for speed.**

Using advanced MOS/LSI technology, the 9820 has a fast read/write memory for you to use. Basic capacity is 173 registers, but you can expand to 429 or a maximum of 1,447. These numbers translate into the capability to solve 71 simultaneous equations.

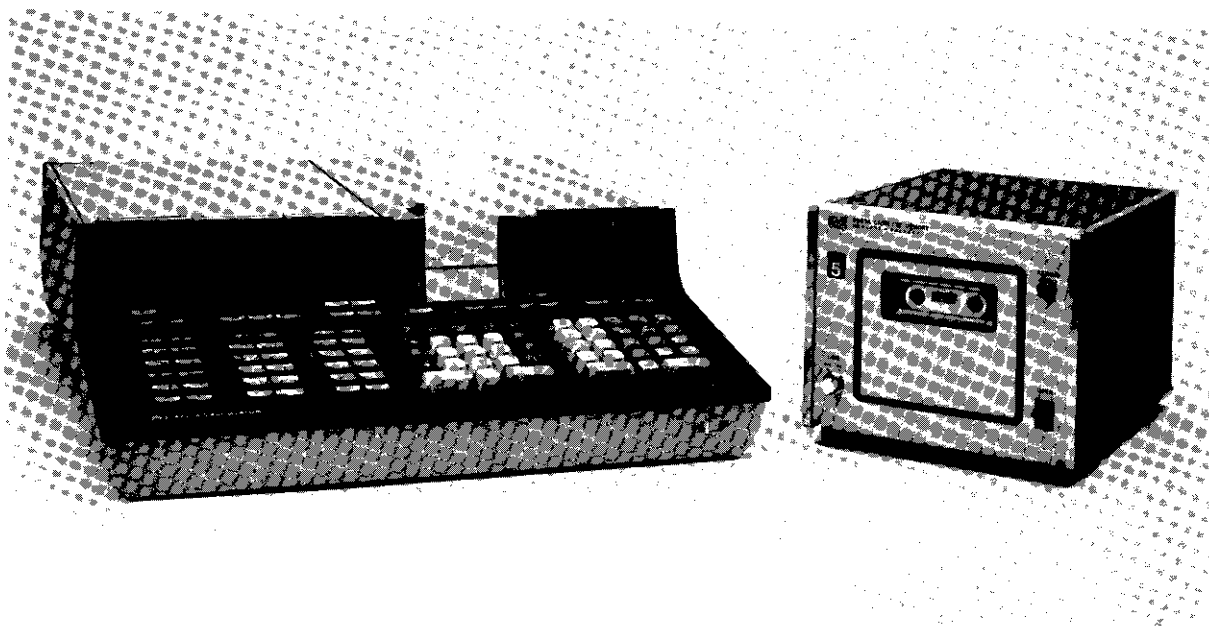
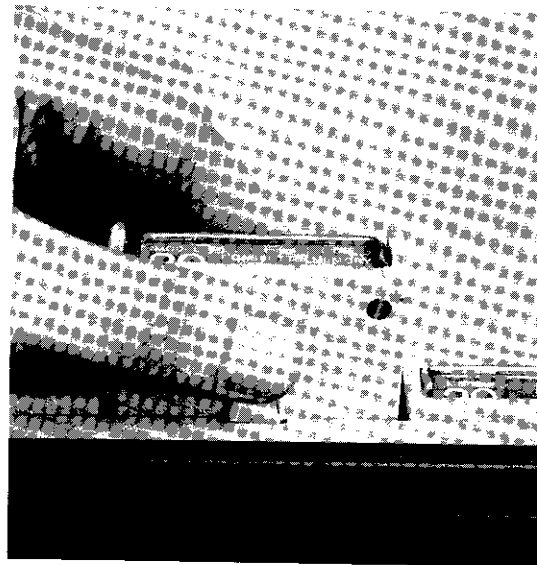
**Plus unlimited off-line storage.**

An external cassette memory offers you greater convenience and capacity. A cassette control ROM takes care of bothersome tasks like program linkage so you can easily handle any size program. One cassette gives a bulk storage capacity for roughly 40 times as much data and programs as the basic internal memory of the 9820.

**Offering efficient usage of all memory.**

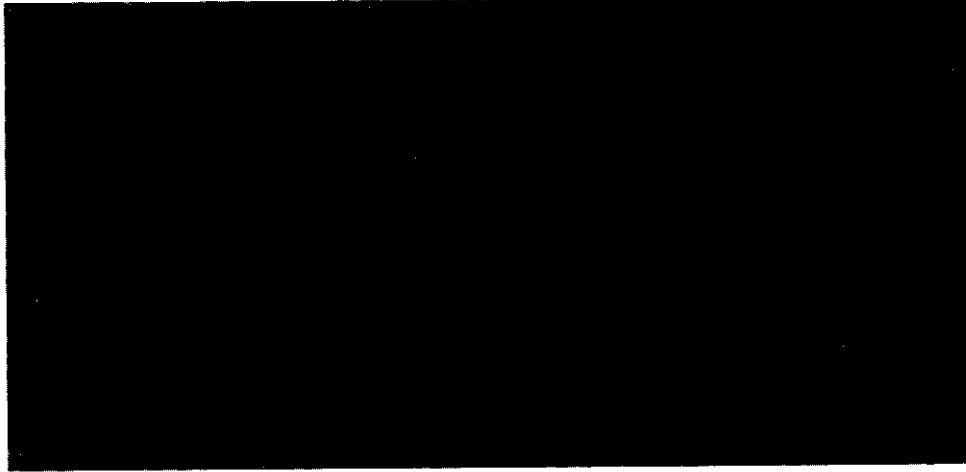
Memory structure, language, addressing ... all these things were designed to ensure efficient use of internal memory. The idea is to provide you with the most memory power possible no matter which size you order. Consider the following:

- **No artificial partitioning** — programs and data share the same storage.
- **No waste** — after program entry, all unused memory is available for data.
- **Editing leaves no gaps** — the 9820 automatically repacks memory.
- **Automatic allocation** — your program is converted to machine code and efficiently fitted into storage.
- **A choice of addressing** — use any combination of direct, indirect, relative, and symbolic addressing to decrease program length and the amount of storage required.



# output

in the  
Most Usable Form



**How would you like your solutions?** The data is in. The problem solved. Ideally, you would like your answers in the final form that you need. With the 9820, you have that capability. You no longer spend minutes solving a problem, then hours putting the results into final form.

**If all you need is answers.** You require nothing extra. The basic 9820 does the job all by itself. The built-in alphanumeric display and printer can show the formula you are using, your data as entered (with labels, if you so choose), and the labeled solution.

**What about a graphic display?** By adding a HP X-Y Plotter, you can graphically display your data in whatever form you choose. Because it can draw continuous lines as well as print characters, this exciting device lets you conveniently draw histograms; pie charts; linear, log-log, semilog, or polar plots; circuit diagrams; or . . . it operates in all four quadrants, generates words and numbers, and automatically sets up both axes. In other words, with this plotter you add a visual dimension to your problem solving.

**For tabular data, too.** Extend the versatility of your 9820 with a Series 9800 Typewriter. Use it for tables, standard forms, letters, and data listings. It has full alphanumeric capability (uppercase and lowercase). And most operations are under control of the Peripheral Control Block: tab setting and clearing, ribbon color, vertical and horizontal spacing . . . Once you've set up your problem, forget it. The 9820 takes care of listing your results in the way you want them.

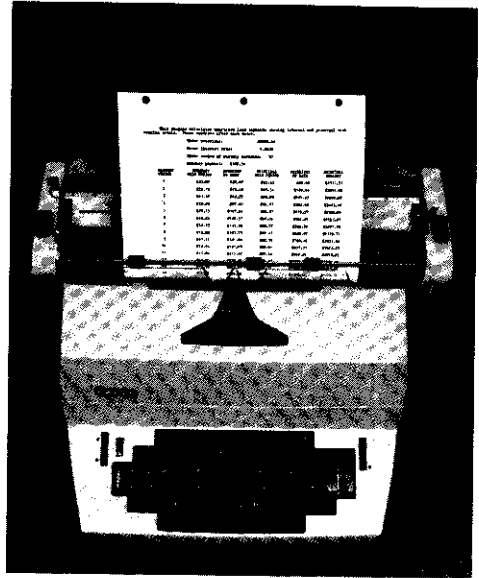
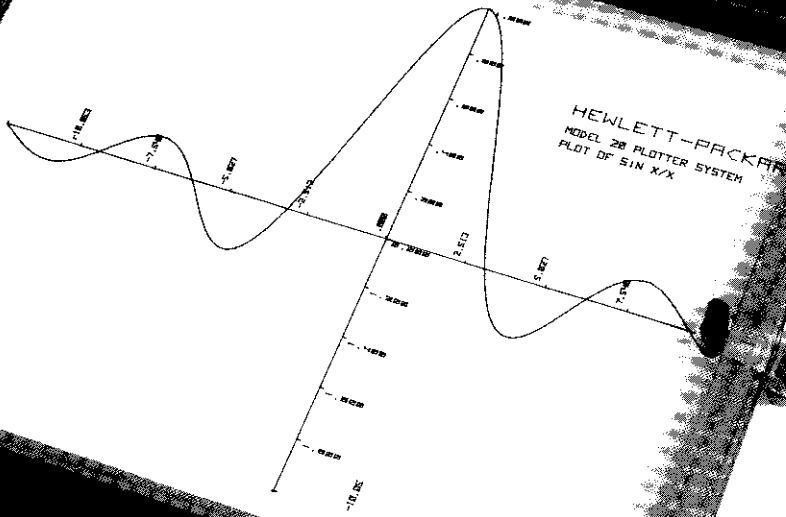
**As paper tapes, too.** Do you need a copy of your results for automatic processing elsewhere? We offer a paper tape punch that gives you this capability.

X  
SIN X/X

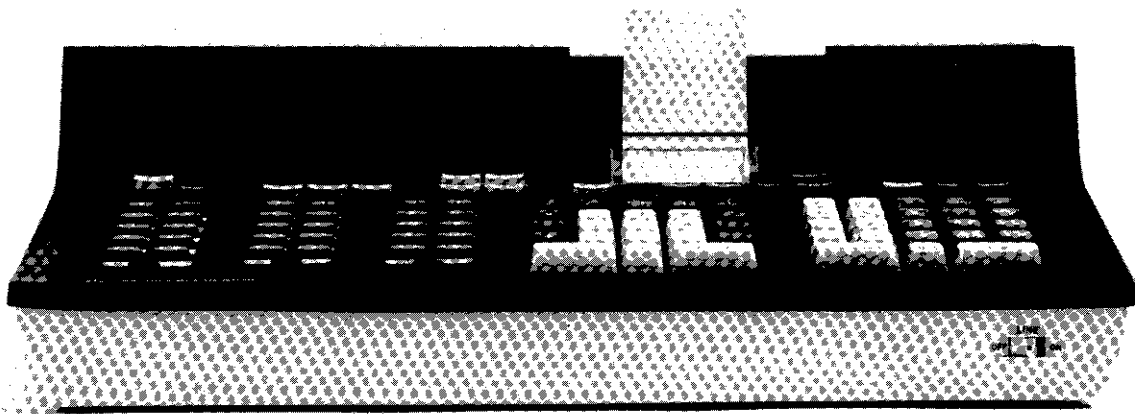
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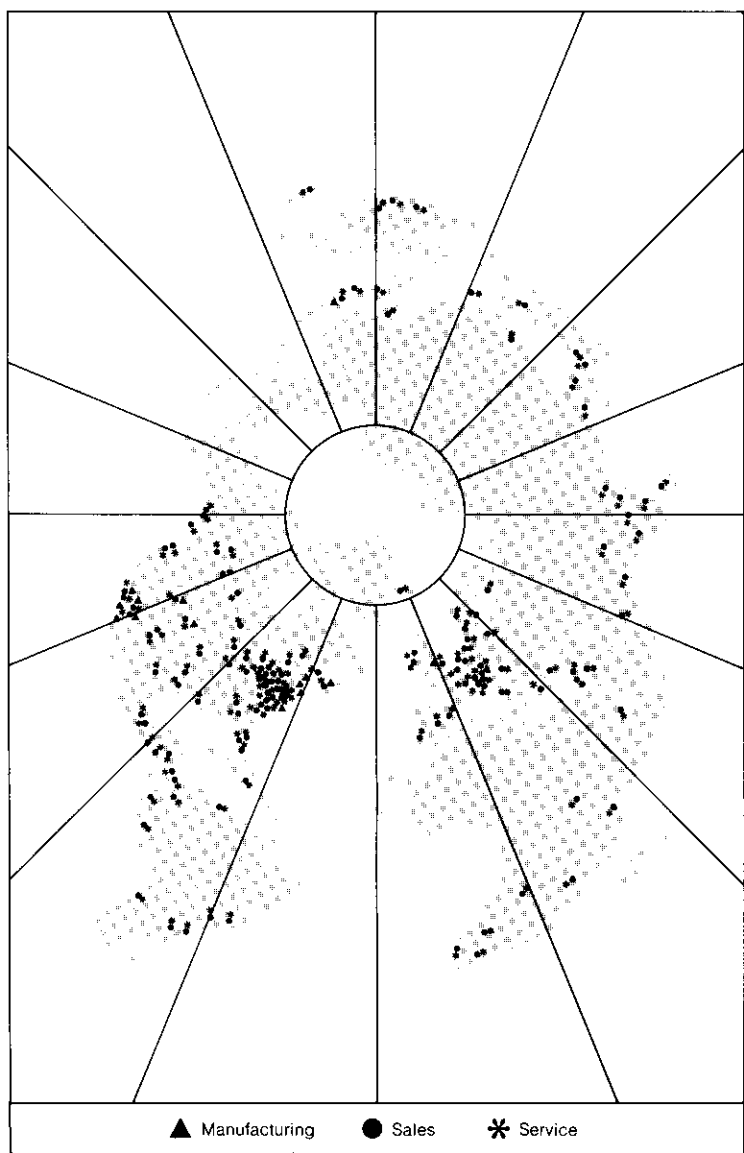
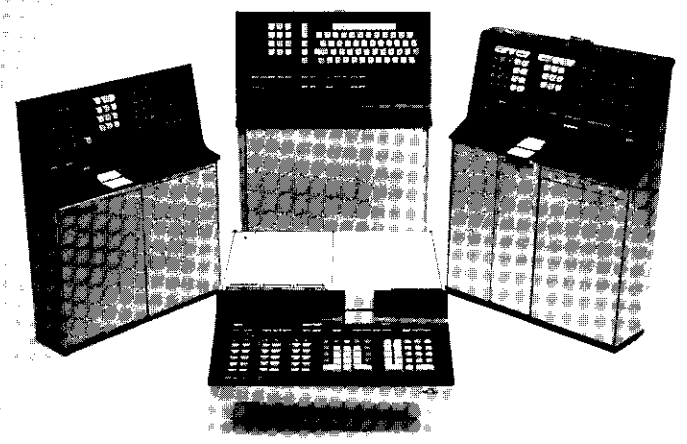


# Why a hp 9820

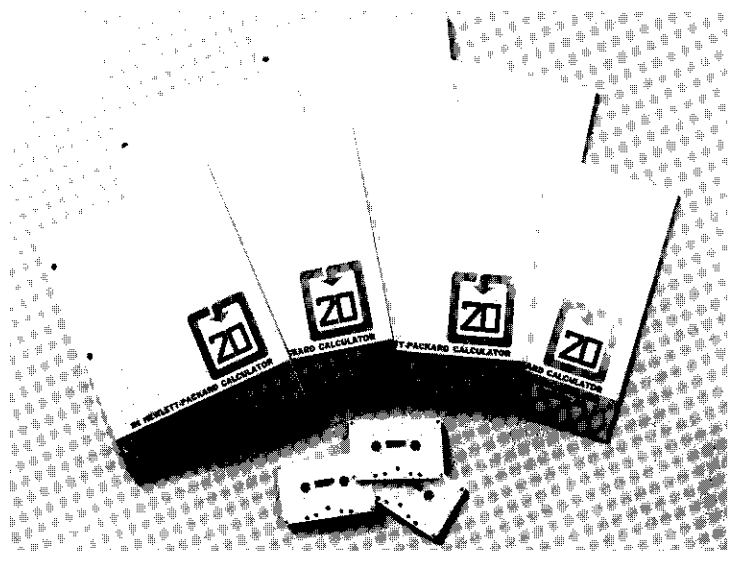


- Another advanced product for measurement/computation from Hewlett-Packard.
- Based on the proven technology of our Series 9800.
- Available with ready-to-use applications software (developed for the 9820) on magnetic cards.
- Supported, as are all HP products, worldwide.
- Offering you a choice of options and peripherals to match your needs.
- Conversing naturally with you.

In other words, this is **some** calculator. Your first hands-on demonstration should convince you of the convenience and power of this versatile desk-top calculator. Call or write your local HP calculator specialist. He will show you what the 9820 can do for you.



▲ Manufacturing   ● Sales   \* Service





Sales and service from 172 offices in 65 countries.  
Loveland, Colorado 80537.