



New graphic plotter performs in four colors and cuts data communications costs dramatically.

The first thing you're likely to notice as the HP 7221 plotter zips into action is the very high quality and clarity of the plot it is producing. But what you don't see is perhaps even more impressive: the microprocessor control and built-in buffer memory by which the HP 7221 reduces time-share and data transmission costs.

Over the past few years, Hewlett-Packard designers have succeeded in introducing microprocessor control into a variety of instruments—a small investment that leads to big performance advances. With the HP 7221 remote terminal plotter, advances are obvious in two broad areas:

First, the new plotter operates with such speed and efficiency that the computer system need spend little of its precious time waiting while the plotter executes instructions. The reduction thus realized in on-line charges and transmission tolls often exceeds 50 percent. How does the HP 7221 do it?

- It receives computer instructions at any of eight speeds from 75 to 2400 baud, half or full duplex.
- It stores data and commands in a built-in buffer memory of 1156 characters, expandable to 3086—and plots the data off-line.

- It has 41 built-in instructions that simplify programming and increase its communications efficiency: e.g., for point digitizing and single-command arc and circle plotting.
- It allows the operator to define a sequence of instructions as a macroinstruction, to store as many as 64 macroinstructions at one time, and to recall any one of them at any time by a single command.
- It plots at any pen speed from 1 to 36 cm per second and typically at 3 characters per second.

Microprocessor control also makes possible a new level of plotting quality, and incorporates features that are especially useful in distinguishing the multiple traces of complex plots:

- programmable selection of four color pens.
- unlimited range of dash-line styles.
- internal character generation from six fonts with programmable control of size, slant, and direction.
- addressable pen moves as small as 0.025 mm for exceptional line quality and precision, even on mylar or acetate.
- programmable graph limits with error-free off-scale data handling.

At a base price of \$4600*, the HP 7221 costs little more than remote terminal plotters that do not offer such signal advantages.



The first hand-held programmable calculator with a built-in printer and a memory that doesn't forget.

The new HP-19C combines HP's efficient logic system with advanced keystroke programming, a powerful range of functions, continuous memory that saves programs for reuse, and a thermal printer to record long calculations and to help you edit programs.

For its size—a convenient 165 by 88 by 40 mm—the HP-19C has a powerful array of capabilities:

- You can build and run programs up to 98 steps long, incorporating as many as four keystrokes per step (all multiple keystroke operations are fully merged into single program steps).
- Your programs can incorporate such advanced programming features as conditional branching, three levels of subroutines, and indirect and relative

addressing. Editing keys let you correct or change your program with minimal effort.

- Preprogrammed functions include log, trig, mean and standard deviation, statistical summation, and rectangular/polar and angle conversions.
- Continuous memory saves programs and data even when you turn the calculator off—and so saves you the time and bother of reentering.
- The built-in thermal printer lets you see each calculation step clearly and conveniently, on paper tape, as it operates in one of its three modes:

MANUAL. Push the appropriate key and the printer will list the contents of program memory—or 30 storage registers, or 6 statistical registers, or the X register or stack registers. It will list any program in memory, for example, fully identifying it by step number, mnemonic code, and key code.

NORMAL. In this switch position, the printer will automatically produce a record of all keyed-in numbers and their functions.

TRACE. The printer will also automatically record each step of an executing program by step number and result—as shown on the tape generated by the HP-19C in the photograph.

And, during manual calculations, it will automatically print out the keyed-in numbers, functions, and results as shown at left.

The HP-19C costs \$345* including battery pack and recharger/AC adapter, two rolls of thermal paper, soft carrying case, comprehensive owners handbook/programming guide, and applications book. It's available at quality department stores, campus bookstores, or from HP. Call 800-948-4711 in the U.S.A. (in Nevada, call 323-2704 collect) for the name of the nearest retailer.



1505 Page Mill Road, Palo Alto, California 94304

For assistance call: Washington (301) 948-6370, Chicago (312) 255-9800, Atlanta (404) 955-1500, Los Angeles (213) 877-1282.

Mail to: Hewlett-Packard, 1505 Page Mill Road, Palo Alto, CA 94304. Please send me further information on

- HP-19C advanced printing programmable
- HP 7221 remote terminal plotter

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*Domestic U.S. prices only.

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