

OFFICE TECHNOLOGY:

HOW CALCULATORS COMPLEMENT COMPUTERS

Some now have more memory than PCs of just five years ago!

BY ALAN KIPUST AND PETE LAWSON

Calculators are so commonplace and so affordable, it's hard to imagine we were ever without them. They're built into our watches, given away free if we subscribe to a magazine, and tacked onto credit cards.

The first calculator, a model called the "Pocketronic," was the result of a joint effort between Texas Instruments and Canon. Introduced in 1970, it was designed to compete with mechanical adding machines. It could add, subtract, multiply, divide, and handle up to 12 digits and four decimal places. The Pocketronic was priced at just under \$400 and was considered a miracle of modern technology.

The first handheld calculator was made possible by a new development called the "integrated circuit," or IC. Instead of individual transistors soldered to a printed circuit board, the IC was a chip of silicon smaller than a fingernail on which a pattern of transistors was etched. The IC has made possible all the electronic products of which we are so fond, from personal computers to videotape recorders.

"MR. HEWLETT, MAY I SEE YOUR POCKET, PLEASE?"

Bill Hewlett, one of the founders of the Hewlett-Packard Company, saw the Pocketronic shortly after its introduction in 1970, and told his engineers to produce a low-priced, shirt-pocket-sized version of HP's desktop HP 9100 calculator, which had a list price of \$4,900. Not having worked on anything this small before, one of the engineers approached Hewlett with calipers in hand.

"Excuse me, Bill," said the engineer. "May I see your pocket, please?" The engineer measured Hewlett's shirt pocket and that became the dimensions of the HP-35 calculator.

In January 1972, the HP-35 pocket calculator was introduced with a list price of \$395. It could not only add and subtract, it also could perform trigonometric, logarithmic, and exponential functions.



Today's calculators are sophisticated, user-friendly, and inexpensive.

The impact of the HP-35 was underestimated by just about everyone. Almost overnight, the most cherished personal tool of the engineer, the slide rule, was obsolete. The HP-35 was dubbed "the electronic slide rule." Hewlett had projected the company could sell about a thousand units a month. The product sold more than 300,000 units in the first three years.

From this beginning, changes in the calculator mar-

ket came with incredible rapidity. In just four years, by 1976, the average price of a four-function calculator fell from the \$400 range of the Pocketronic to \$19.95.

The development of ICs and displays that required dramatically less power resulted in smaller batteries and shrank the calculator to credit card size. At the same time, engineers were developing ways to pack more functions and memory into the ICs. The result was an explosion of calculator performance and a continuing decrease in prices.

MODERN DAY MARVELS

Today's accountant can take advantage of a pocket-sized tool that could scarcely be dreamed of even a dozen years ago—a tool that works in a complementary way with the personal computer.

To begin with, calculators don't just display numbers anymore. They also draw graphs. For instance, enter a series of projected cash flows from an investment into a HP Business Consultant II and it will draw a graph on its four-line display showing net present value at different interest rates.

If you need a paper copy of your information, many calculators connect to printers. Some even have a space-aged infrared light link. Push a button, and they send the data via wireless, infrared signal (similar to your TV remote control) to a portable, battery-operated printer. Because the functions are built in, the calculator does all this faster than a speeding PC.

Financial calculators also display text as well as numbers. They can store addresses and phone numbers. Some even dial the phone for you. Built-in alarm clocks beep you for appointments and even display a message to remind you what the appointment is about.

Got a wealthy client from Germany you are helping to analyze an investment? There's no need for translating if you have one of the calculators that display prompts in foreign languages. Some also convert currency values.

Many of the features found on advanced calculators include time value of money (TVM), discounted cash flow analysis, statistical functions, bond calculations, and depreciation.

Most financial calculators solve TVM problems, those compound interest calculations that occur in situations from mortgage loans to lease payments to retirement fund analysis. Yet this is the same capability that amazed business professionals when it was first announced with the HP-80, price \$400, in 1973.

Today, interest rates, payments, terms, present values, and future values all can be changed interactively and calculated to analyze countless financial situations. All for under \$50.

BEYOND PROGRAMMING

Even with the hundreds of built-in functions found on advanced calculators, many people perform unique calculations that often require operations not found on a calculator. In the past, more knowledgeable users wrote programs for these complex procedures. The rest of us ground through them by hand.

In 1986, Hewlett-Packard introduced a calculator that programs itself. Using a feature called HP Solve, the HP Business Consultant takes everyday equations and translates them into programs. With HP Solve, you

enter equations just as they are written on paper. There is no programming code to learn.

It's as easy as entering Profit = Revenue - Cost. The calculator assigns each variable to a corresponding key below the display. When the known values are entered, pressing the key for the unknown variable yields the answer.

THE FUTURE

In the short term, financial calculators will focus on ease of use. This applies to both built-in functions and programming. For example, a series of cash flows can now be given a name to distinguish it from others stored in a calculator's memory. An entire series of cash flows with labels for individual items and each series can be printed for review.

There also will be more powerful and higher resolution graphics for functions such as net present value and statistical analysis.

Programming tools will be developed that make it easier for noncomputer professionals to create truly powerful programs. This advance obviously will have more importance in nontechnical markets such as accounting. As these tools are used to tailor applications and the user interface, the use of financial calculators will increase dramatically.

Financial calculators are being equipped with more memory, both for built-in functions and for storing programs. The HP Business Consultant II has 128,000 bytes of programmed memory and 6,500 bytes available for programs. That's about equal to many of the personal computers of just five years ago.

Finally, financial calculators will grow in their ability to help business professionals in noncomputing areas, such as managing a personal database of addresses and phone numbers, automatic phone dialing, and appointment management. In the long term, calculators are moving closer to link with PCs. Eventually, calculators and computers will be able to exchange data and programs with ease.

Calculators will feature larger displays with better resolution. Like laptop computers, they will hook up to color graphics monitors when users work in the office.

The difference between the calculator and the personal computer will blur as we move toward the year 2000. Calculators will become compatible with PC standards for file retrieval and storage using mass storage devices such as optical disks. Calculators also will be able to attach to larger keyboards as well as larger monitors for office work. Who knows, someday they might even accept voice input of data!

The calculator might become the handheld financial computer which an accountant loads at night with the programs he needs and tosses in his briefcase. Designed specifically for financial computations, it will always have an advantage in speed and convenience over a general purpose device such as a computer. ■

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