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A computer that grows with you

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Latest machine is designed to serve 128 terminals at once, and to have subsystems added as required. Called the PDP-6, it's made by company that serves mainly scientists



Designer Gordon Bell and Richard Best, chief engineer of Digital Equipment Corp., believe the PDP-6 can outperform computers that cost twice as much.

A very small company this week unveiled a computer that, in some respects, is the biggest ever.

Digital Equipment Corp., of Maynard, Mass., put the machine together. It's called the PDP-6, and it costs \$2-million if you want all the available bells and whistles. And these are considerable, particularly its outsized central memory with a capacity of 262,000 words (compared with 64,000 in the larger IBM scientific computers), which, among other things, allows the PDP-6 to serve up to 128 input-output stations simultaneously.

Most computers are designed to work one problem after another, very fast. What's unusual about the PDP-6 is that it is designed to work on a whole lot of problems at once, though at moderate speed. Digital Equipment believes it is the first commercially available computer to offer time-sharing and multi-processing as standard features—a concept that for years has fascinated computer experts at MIT [*BW* Feb. 1'64,54], as well as DEC's scientist executives.

Maverick. DEC is a maverick of a company that's virtually unknown in business data-processing circles, though its products are about as familiar as Hershey bars to scientists and engineers involved in computer and electronic research and development.

The company was set up seven years ago on a \$70,000 shoestring provided by Boston's venture capital group, American Research & Development Corp. DEC turned out to be one of ARDC's more successful investments—it was running in the black within a year, and on net sales of nearly \$10-million in the fiscal year ending last June 30, reported net earnings after taxes of \$1.1-million.

DEC does about half its business by mail order, selling hundreds of different electronic circuit modules—little grey boxes packed with transistors—that count, switch, amplify, or mix electrical signals. It's hard to walk through a computer or elec-

tronics laboratory without running into the DEC trademark. Since DEC modules are used primarily in designing and testing computers, it was almost inevitable that the company eventually would build computers, too.

By the dozen. Eschewing complicated acronyms like WHIRLWIND or MANIAC, DEC calls its computers "Programmed Data Processors," and they are known as PDP-1 through PDP-6. The PDP-1, introduced in 1960, is a relatively fast machine. It caught on with scientific laboratories in the Boston area due to its low price—\$120,000—and because it's relatively simple to add on to it and attach such special devices as cathode-ray tubes that handle graphic as well as numerical information.

Last year, the company brought out the PDP-5, a small-scale computer selling for \$27,000. At the Fall Joint Computer Conference, in Las Vegas, the computer was programmed so visitors could try their hand at shooting down a simulated satellite—a moving circle displayed on the computer's display tube. Successful shots were rewarded by a croaking rendition of Taps played by the computer's memory circuits. Inside one cabinet was a hand-lettered sign reading "\$218,880 a dozen." The company's quantity discounts start with six units.

The PDP-5 has been selling briskly—by the half dozen—ever since. So has an important accessory that DEC developed to go with it—a very small magnetic tape unit with 5-in. reels called the Micro Tape. This device fills the gap between relatively slow punched paper tape readers and printers and regular high-speed tape units.

No super service. DEC breaks with other computer industry practices. It doesn't lease its equipment. Nor is it anxious to maintain it. It prefers to have customers send their own employees to a computer maintenance training course that DEC offers.

In an industry known for super service, DEC's take-it-or-leave-it approach comes as a breath of fresh air. So does the attitude of the company's two top executives, Pres. Kenneth Olsen and Vice-Pres. Harlan Anderson: After due consideration they decided they wouldn't have their picture taken with their new computer because they don't believe in personal aggrandisement.

Nor do they believe in pell-mell growth: "Our biggest problem is restraint," says Olsen. The company has never needed new equity capital, and Olsen doesn't think he will need it in the future, since he wants DEC to grow slowly enough to maintain his employees' "spirit of camaraderie."

Intimate approach. So far, DEC's customers have been largely scientific laboratories and universities. To some extent, these clients form a loose fraternity that traces its origins back to MIT and Lincoln Laboratory, where Olsen and Anderson also learned their computer savvy.

The company encourages the intimate approach to sales, keeps track of every inquiry, letter, and order on a computer tape, and refers to the name file each time correspondence comes in. DEC does almost no advertising, but puts much effort into its mail-order operation, doing all its own technical writing, printing, and art work in a big print shop. Its entire plant is in part of the former American Woolen Co. textile

mill—a century-old, rambling brick complex that's now a rabbit-warren of small companies.

Computer-man's computer. Olsen and Anderson are confident that the PDP-6 will find a market. Says designer Gordon Bell: "We tried to think out what a computer should be, then designed a system that could grow gracefully and easily." He believes the PDP-6 systems will outperform systems that cost twice as much.

The elements of the computer system are built on a modular basis, and are interconnected by a network of high-speed circuits called busses. The design is such that subsystems added to the network do not have to work synchronously; that makes it easier to add other elements as the system grows.

Obviously, the machine is a computer-man's computer, and is aimed at the relatively few customers who feel themselves limited by present commercial equipment. Since the machine was just introduced, DEC claims no sales. All Olsen will say is: "There has been considerable interest on the part of people who are interested in buying more than one."

Wider market. Scientific users make up most of DEC's clients, but this, says Olsen, may not always be so. "As business applications get more sophisticated, the machine that's required differs less from the scientific machines. This way, we might get into business applications."

And perhaps by the time DEC gets big enough to supply a lot more customers, there may be lots more customers sophisticated enough to buy low-cost, highly advanced equipment that comes without much service or software.