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PERSONAL COMPUTERS

GROWTH THROUGH PERQS

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Three Rivers' Perq machine is designed to appeal to wealthy users as a dazzling, supercharged personal computer with the power of a mainframe.

While Apple and Tandy fight it out as the Ford and Chevrolet of the consumer computer market, a small firm in Pittsburgh is gearing up to become the Ferrari. Three Rivers Computers' $27,000 Perq machine is designed to appeal to wealthy users as a dazzling, supercharged personal computer with the power of a mainframe.

Until recently, Three Rivers led a quiet life in its old brick building located in an obscure hollow of Pittsburgh, down at the end of a cobblestone road. Now, with financing, international distribution deals, and an expansive new manufacturing facility in place, the firm says it is poised for accelerating growth.

The Perq machine has its roots in work done by Brian Rosen, the full-bearded vice president of engineering of Three Rivers. He and four other members of the nearby Carnegie-Mellon University computing community founded the company in 1974 to design custom graphics systems for large users. Rosen at one point left the company for Xerox, where he worked at the Palo Alto Research Center on the Alto and Star workstations. Rosen took many of Star's concepts, including the high-resolution crt, advanced graphics, and Ethernet compatibility, and put them into Perq upon rejoining Three Rivers after his two-year stint with Xerox.

PERQ PRIDE: Displaying their pride and joy, the Perq system, are (left to right) Jim Gay, Three Rivers president; Brian Rosen, vp of engineering for Perq; and Howard Wactler, director of research facilities at Carnegie-Mellon University.

In 1978 Perq appeared, essentially in the form it is today: a single-user, high-performance computer designed to be an alternative to timesharing. It combines a 1-MIPS processor, a 14-inch hard disk, high-resolution graphics, and up to a megabyte of main memory to provide raw computing power with which oems, systems houses, and researchers are expected to design all sorts of systems, according to Frank Williams, vice president of sales. So far, he notes, 10 oems have been signed up and the sales force has a quota to build that number to 50 by the end of next year.

Thus, Three Rivers plans to leave virtually all applications development to outsiders who have expertise in specific areas. Those applications are expected to be primarily in the scientific/technical arena, although the firm is aware of some business applications under way, according to Williams, a former ITT sales executive. The Perq system has so far found use in universities and research labs for program development and for processing experimental data. Three Rivers is also working jointly with Norden Systems, the military contracting arm of United Technologies, on a system that will be used to test and diagnose the many electronics systems found on advanced fighter aircraft. The two firms expect to find out by year-end if their bid has won, according to Williams.

Meanwhile, Perqs will be used on the *U.S.S. Carl Vincent*, a new aircraft carrier the U.S. Navy plans to launch in February 1982. Some 36 of the computers, linked by an Ethernet cable, will form a procedural control system designed to help the ship's officers manage carrier operations on a real-time basis.

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The machine's raw power in running Pascal programs and its graphics capabilities make it somewhat of a "dream machine" with which researchers can design applications that would tie up many resources on a timeshared system. That power comes from a custom-designed microprogrammed 16-bit cpu that runs Pascal p-code in native mode. Three Rivers says the cpu

can execute "in excess of 1 million" p-codes per second, a good 10 to 20 times the speed of conventional interpreted p-code machines. Moreover, the microcoded architecture will enable other high-level languages—FORTRAN, LISP, and others are planned—to be run at such high speeds. The cpu also takes care of many I/O functions in microcode, helping to speed up data transfer and reducing parts counts.

Mass storage comes in the form of a floppy disk and an integral 14-inch Shugart hard disk with up to 30 or so megabytes of capacity. Ethernet connections will be available in the near future, as will a storage module controller for extra disk capacity, according to company officials.

Input to the machine is through a standard keyboard and a graphics tablet. As with Xerox's Star, a free-roaming cursor is used to point at words, icons, or whatever the machine has been programmed to present on its full-page, 100 pixel-per-inch display. The graphics tablet, currently supplied by Summagraphics, may be replaced by a mouse like the one the Star uses, according to Franz I. Mading, national sales support manager. He explained that the display receives bit-mapped data from the cpu at a rate of about 26,000 bits-per-second, enabling the screen image to change quickly for animation, scrolling, and windowing purposes.

It is just that sort of eye-catching graphics that the company hopes will sell its machine. The company has been rushing from trade show to trade show lately, showing off its machine to industries which are rapidly becoming computerized, such as typesetting and medicine.

Three Rivers is counting on the Perq to capture the imaginations of a wide variety of systems designers who will incorporate the system into other, larger products. Already Harris, a leading typesetting firm, has ordered several of the machines, as has Reuben H. Donnelly, the yellow pages advertising agency.

But it is the university research environment that has been most eager to embrace the Three Rivers machine. Carnegie-Mellon, a big computer science research school, has ordered many of the machines. And it was through the university grapevine that ICL, the British computer company, was informed of Perq, according to Three Rivers' president, Jim Gay.

A British consortium of university researchers had heard of Perq and helped persuade the British government, which has been bailing out financially troubled ICL, to get the company to sign a joint venture deal with Three Rivers. The deal covers exclusive international marketing by ICL in many of its markets and a manufacturing license so that ICL can build the machine. The deal is expected to give a much needed boost to sales at Three Rivers and provide it with a source of technology and manufacturing know-how it will need to maintain the rapid growth it is already experiencing.

United Kingdom production of Perq will begin in Letchworth in early 1982, according to sales chief Williams. He credits Three Rivers chairman Ed Fredkin, an MIT professor known for his sharp entrepreneurial savvy, with locking up the ICL deal in the face of stiff competition from Apollo Computer, the Massachusetts startup. Fredkin has been a key factor in bringing Three Rivers through the past year, which has been one of growth and change for the fledgling firm, says Williams.

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Fredkin brought in Gay, a former associate at Information International, a firm Fredkin started in the '60s, and helped negotiate $5 million in financing from a pair of French investors, one of whom is named Paul LePercq. Currently Fredkin spends only a day or two a week at Three Rivers and teaches robotics at MIT the rest of the time. He embodies the "success spirit" of the company, according to Williams.

The firm's current plans call for the opening of the new 55,000 sq. ft. manufacturing facility, establishment of sales offices in a total of eight U.S. cities, and hustling to trade shows. An in-house service force will also be established, although Three Rivers said it has designed the computer to be basically user-serviceable.

Competition in the workstation marketplace is soon to heat up, according to Gay, who began in the computer industry with Scientific Data Systems. He sees the main competitors as Apollo, Digital Equipment, and Hewlett-Packard, although the latter two have not yet disclosed their plans publicly.

"The world has yet to grasp fully the workstation," says Gay, who claims Xerox's Star is not a strong competitor to Three Rivers' Perq because Star is more an intelligent terminal than a high-performance personal computer.

He notes that the market for such machines as Perq will not open up until prices can be brought down into the $10,000 range. He hopes to achieve that with Perq through economies of scale—the ICL connection and a potential manufacturing deal with the firm's Japanese distributor, Rikei, will help in that respect—and new technology. Already Three Rivers engineers are looking into VLSI technologies to help bring costs down. A color version of the machine is also being designed, but no introduction date has been set.

—John W. Verity