SPECTRUM'S EARLY PRECURSOR: A HISTORY OF THE PRE-CX 3000

by Sandra Hawker

Time-sharing, real-time, and batch operations. Those were the principal general features touted for the HP 3000 in 1972, the year the pre-CX machine hit the market. Today, 14 years later, the real-time capabilities called for in early HP 3000 specifications will at last be available to business-computer customers. The vehicle is the Spectrum program, which promises to integrate all applications, business and scientific, under a common architecture.

The transition from the HP 3000 to Spectrum thus provides the business machine with the full complement of general functions for which it was originally intended. The over-reaching ambitions of the early HP 3000 team are further reflected in the fact that the Omega, a precursor of the initial 3000, was to be a 32-bit machine; again, the Spectrum program will see the first fruition of that intention for business-computer customers. The advent of Spectrum, then, is a particularly appropriate juncture for examining the early evolution of the HP 3000 product line.

HP's other company

The HP 3000 has its roots in the early 1950s, in a company called Dynac, Inc. According to an HP document entitled, *A Short History of the Hewlett-Packard Computer Systems Group,* Dynac, Inc. was formed by HP after a U.S. government contract had severely stretched the research and development lab facilities and human resources. The contract called for the development of electronic test equipment for the Doppler radar missile guidance systems, and this development was incompatible with standard R & D lab functions. Consequently, Dynac, Inc., was formed in Palo Alto, California, as a wholly owned subsidiary of Hewlett-Packard Company to develop test equipment systems.

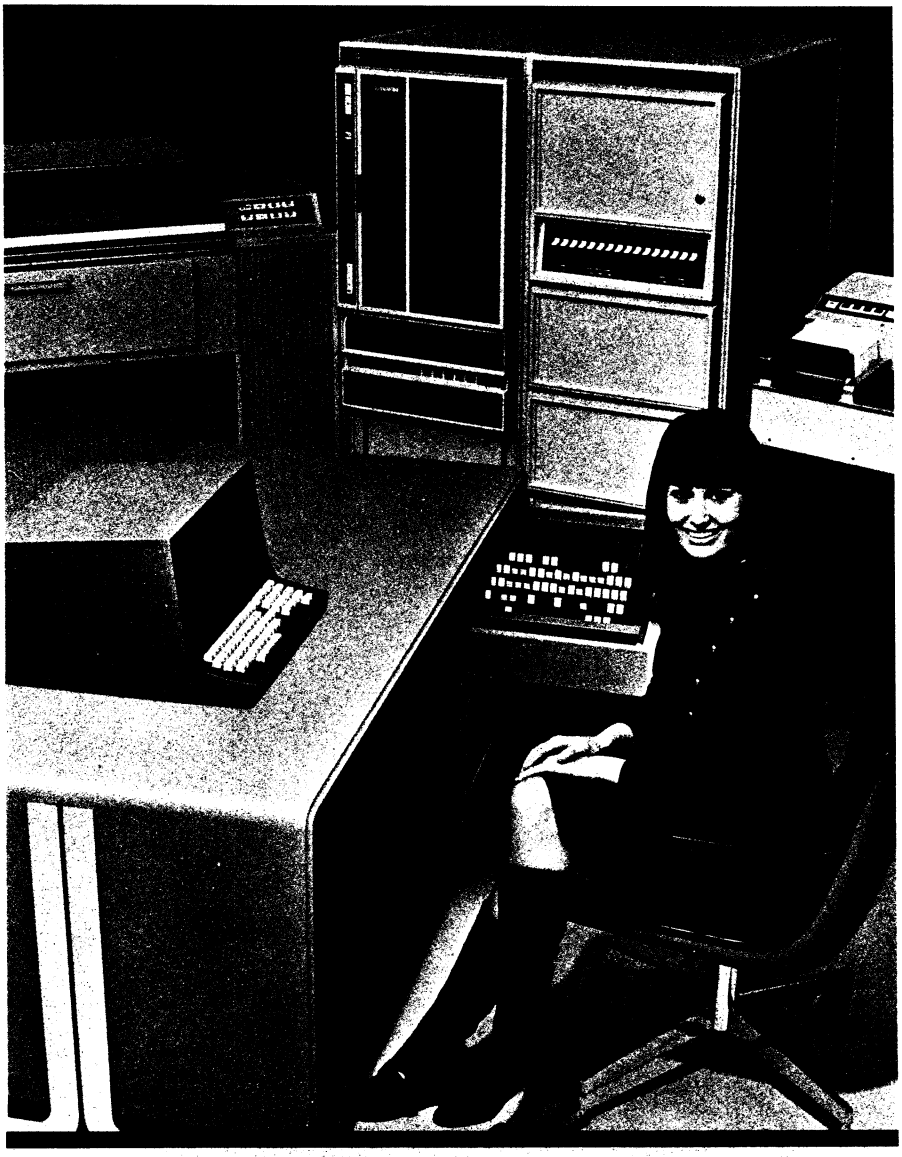
After an inauspicious beginning, the HP 3000's success is unprecedented in HP's history.

In 1958, the Dynac name was changed to Dymec because the acronym DYNAC was a registered trademark of Westinghouse Company. Finally, in 1959 Dymec, Inc. became a division of HP with a charter to continue to develop products related to data acquisition. HP made two other company acquisitions in those early years that contributed to the computer lines of today. In 1964, HP purchased Data Systems Inc. (a subsidiary of Union Carbide Company) and the rights to a computer designed by it. The following year, HP acquired Datamec Corporation, a manufacturer of magnetic tape drives, to expand computer operations.

HP's Dymec Division announced its first computer, the HP 2116A, in 1966. It contained 8K of memory and sold for $30 thousand. The Woods Hole Oceanographic Institute in Massachusetts was the first 2116A customer. The system operated reliably in the rugged maritime environment, and institute personnel could complete and compile the results of oceanographic experiments while still at sea.

In the late '60s, Dymec underwent a series of reorganizations and name changes. In 1967, to conform to a recent policy to name divisions according to physical location, it was renamed the Palo Alto Division (PAD). In conjunction with the formation of PAD, HP Systems Division was formed and staffed with PAD employees with system-building experience. The intention was to assign an entire division the task of building and testing the large and complex automatic test systems. The 9500 series Automatic Test Systems were assigned to the division; descendants of that series continue to be built today.

In 1969, the computer operations of PAD were moved south and became known as the Cupertino Division. Eventually the Cupertino Division and the Mountain View Division, originally responsible for magnetic tape drives, merged to form the Data Systems Division. This division designed and manufactured computer systems and produced the 1000, 2000, and 3000 minicomputers.



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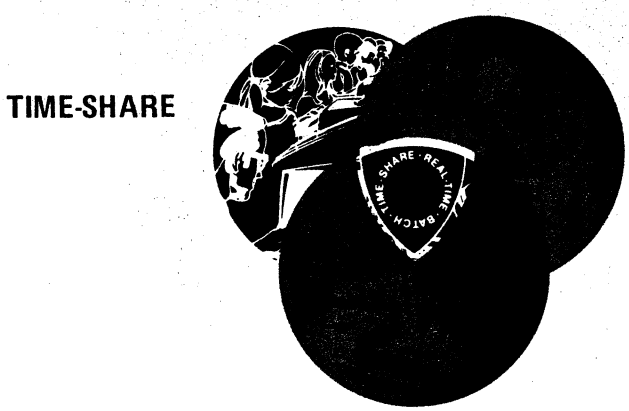


Introducing the HP 3000

The initial pre-CX HP 3000 model was by no means a hit like subsequent models. In fact, the debut was so inauspicious that cancellation was considered by upper management, according to Fred White, a key contributor to IMAGE. (He worked for HP from 1969 to 1981.)

That first model had 48 Kbytes of memory (though it was never shipped without 96 Kbytes, and had a maximum of 128 Kbytes), cost $95 thousand, and was available in four colors: sun gold, wood grain, marine blue, and red. The original model also had a kidney-shaped console table, complete with pop-up metal maintenance panels. These panels, which were dedicated to hardware and software maintenance, were strategically located on either side of the desk. In operation, with both panels deployed, the system resembled a scene from Star Trek, as hundreds of red LEDs would blink ostensibly keeping track of myriad computer operations. A series of cast aluminum doors of irregular size earned the system the nickname "pizza-oven model." Separate locks and keys on each door provided security, but the functional value of these doors was questionable since a systems manager would often have to open all of them to find the CPU or memory board he was looking for. By

Above: As the HP 3000 was on the cutting edge of technology, so was this model on the cutting edge of fashion in a 1971 brochure announcing the first 3000. Photo courtesy of Gary Anderson and HP.

Below: The first 3000 offered time-sharing, real-time, and batch operations as this logo illustrates. Courtesy of Doug Mecham.

the time the HP 3000 CX was released, the fancy desk and pop-up panels had been eliminated. In fact, the CX was very plain looking and resembled the Series III.

As noted earlier, the 3000 project grew out of the cancellation of Omega, a 32-bit machine. Jim Holl, who wrote the early 3000 disc diagnostics and more recently headed both the Series 40 and 37 projects, recalls that upper management felt the need to become more firmly entrenched in the 16-bit market before branching out into the 32-bit market. Furthermore, computer memory was an expensive commodity at that time, and a 32-bit machine would certainly require more memory.

So Alpha, the first HP 3000, was designed and produced as a 16-bit machine. At that time, the division was simply called the Cupertino Division, and the top priority for its management was to assemble a computer engineering team. Many of the engineers were moved from the 2100 series (1000) projects they had been working on. "There weren't enough resources to produce several computers at once," Holl says. "The 2100 series was put on hold for a while while we all worked on the new computer." HP also searched for new talent. "Most of the people they hired were users from shops in Silicon Valley," says Bob Green, founder of Robelle Consulting. "The majority were familiar with large systems like IBM and Burroughs mainframes." And they all shared one critical opinion: the operating systems they had been using, particularly the IBM operating systems, were too complicated. They wanted to avoid having to hire six or seven programmers just to keep the machine running.

Holl estimates that approximately 80 hardware engineers and 60 software engineers were assembled. The majority of the software effort was, of course, devoted to implementing MPE, a project headed by Ron Matsumoto. In addition, Bill Foster headed a languages group that developed SPL, FORTRAN, and BASIC for the 3000, Jim Holl was in charge of the software Q & A group, Lee Johnson headed applications and utilities, Bob Bellizzi was responsible for diagnostics, Mike Green helped to establish the architecture and filled in critical functions, and the whole team reported to Steve Vallender, head of software.

The first HP 3000 was delivered on November 1, 1972, to the Lawrence Hall of Science at the University of California at Berkeley. Lawrence Hall personnel wanted a computer to demonstrate computer science projects, but the machine reportedly never worked as expected and the customer never paid for it.

Death Valley Days

Early HP 3000 customers accepted the risks and endured the hardships of pioneers. Attracted to bold new computer features such as interactive and multi-user capabilities, an easy-to-use operating system, and multilingual support—all for an affordable price—they risked the wrath of users and bosses, and the unknowns of a new system with an unheard-of operating system. They believed in a company that had relatively little experience in the digital computer industry, and they struggled for months with daily system crashes, indefinite project hold-ups, and regular calls to the factory. Some gave up. At least one machine was sent back to the factory, much to the embarrassment of the engineering team. But those customers who persevered were eventually rewarded with a machine that performed well, and well ahead of its time. Among the early HP 3000 sites were the Palo Alto School District, Hughes Aircraft, Bank of Detroit, Anderson College, and McMaster University.

Tom Harbron, director of the Computer Center and chairman of the Computer Science Department at Anderson College in Indiana, signed a contract with HP in May, 1972 and took delivery of the machine in April, 1973. Says Harbron, "The hardware was ready but the software was not. I remember visiting the factory for two weeks in December, 1972. During my visit alone there were 61 revisions of MPE." HP, of course, knew that the machine was not ready. Ed McCracken, then HP's educational marketing representative, spent a morning in Harbron's office trying to talk him out of buying it. Harbron held fast, however, since Anderson College had already invested two man-years in system design and software development. (The Anderson Computer Center staff had written software to simulate their IBM 1620, so that

THE MAKING OF THE USERS GROUP

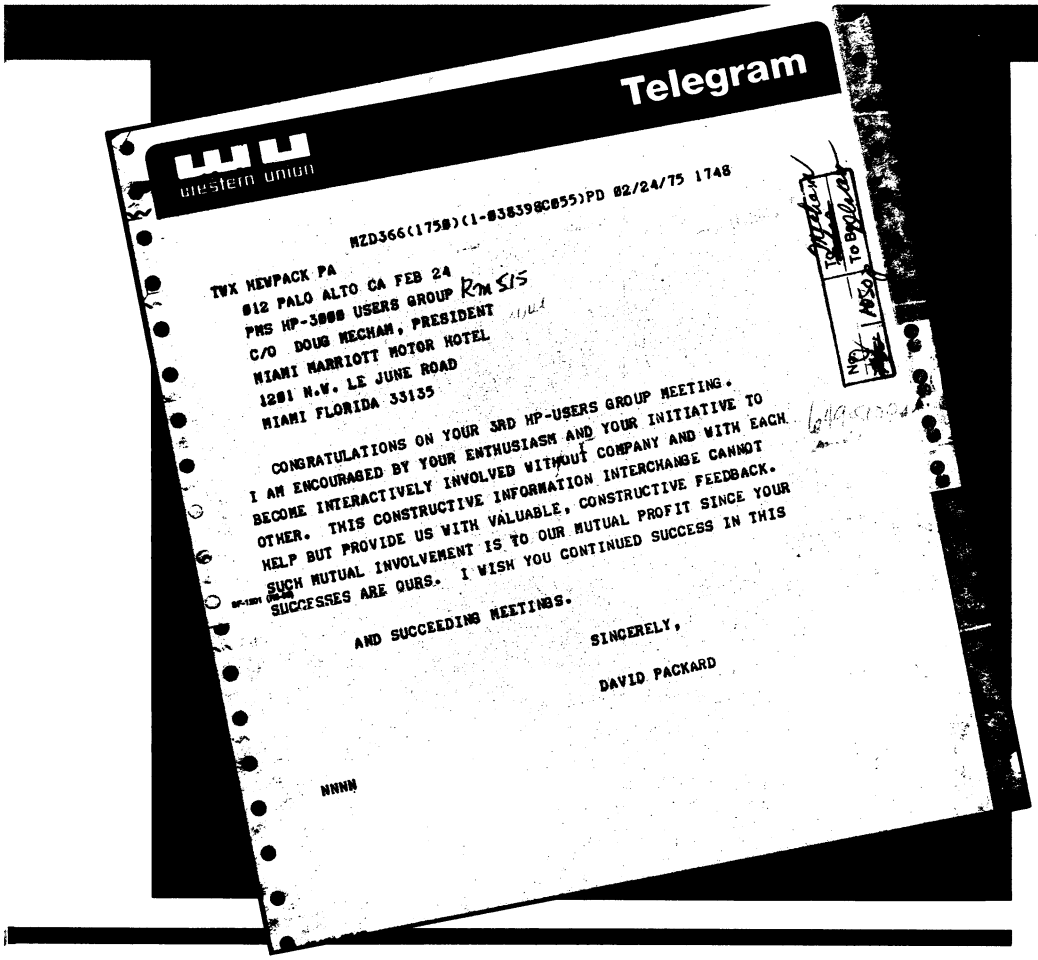
The HP 3000 has become such an established product that we tend to take the users group for granted. However, the formation of the group required considerable initiative on the part of users during the pre-CX history of the 3000. Confronted with daily system crashes and a host of other problems, users banded together out of necessity to exchange technical information, share workarounds, and distribute software.

The early members made some decisions that significantly affect the operation of the users group today. "The relationship with HP is unique—no other users group has it," says Doug Mecham, the founder of the organization. Mecham's personal goal was to establish an organization that would be independent but would nevertheless remain on good terms with HP. Many of the early members had experience in the IBM users group; that group was part of IBM, and the 3000 users group founders felt it would have been more effective had it been independent.

Given the IBM precedent, it is perhaps not surprising that, according to Jan Stambaugh, an early chairman and longtime supporter of the users group, "At first, HP saw the [independent] users group as adversarial. Consequently, it was important to keep communication open and establish a good rapport."

Mecham kicked off the initial membership drive by sending a proposal letter and a statement of purpose to all current users of the 3000. In the statement, Mecham planted the first seeds of such users group staples as special interest groups, various system improvement and planning committees, the CSL, and regular international meetings. Sufficient interest was generated to warrant holding a users group meeting in Palo Alto, California in January, 1973. Alan Mitchell, HP worldwide C.E. manager, helped Mecham organize the meeting, which 27 users attended, one from as far as Sao Paulo, Brazil.

Since that initial gathering, 13 North American and 7 European conferences have been organized by the users group. Attendance at the North American conferences doubled every year through 1980 and has increased more modestly since.



Telegram

western union

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TVX NEWPACK PA
912 PALO ALTO CA FEB 24
PMS HP-3000 USERS GROUP
C/O DOUG MECHAM, PRESIDENT
MIAMI MARRIOTT MOTOR HOTEL
1201 N.W. LE JUNE ROAD
MIAMI FLORIDA 33135

CONGRATULATIONS ON YOUR 3RD HP-USERS GROUP MEETING.
I AM ENCOURAGED BY YOUR ENTHUSIASM AND YOUR INITIATIVE TO
BECOME INTERACTIVELY INVOLVED WITHOUT COMPANY AND WITH EACH
OTHER. THIS CONSTRUCTIVE INFORMATION INTERCHANGE CANNOT
HELP BUT PROVIDE US WITH VALUABLE, CONSTRUCTIVE FEEDBACK.
SUCH MUTUAL INVOLVEMENT IS TO OUR MUTUAL PROFIT SINCE YOUR
SUCCESSES ARE OURS. I WISH YOU CONTINUED SUCCESS IN THIS
AND SUCCEEDING MEETINGS.

SINCERELY,

DAVID PACKARD

NNNN

This telegram was forwarded to Doug Mecham, users group founder, at the third users group meeting in Miami, Florida.

By 1975, the group had organized into volunteer committees to carry out administrative duties. A full membership, including voting privileges, was only $25, but did not include the CSL; a U.S. individual membership entitled the user to a newsletter (also started by Doug Mecham) and distributed publications.

Ralph Manies of HP oversaw the first three releases of the CSL, which were more like swap tapes than an organized library. Gary Anderson of McMaster University, who was then a board member, asked Wayne Holt, director of Computer Services at Whitman College in Walla Walla, Washington, to become chairman of the CSL. Holt conceived the idea of a consolidated library, one that had a database of information, formal abstracts, formal documentation, printed guides generated by utilities, and also a software clearinghouse that listed available third-party software for sale. Holt ran the operation from Whitman College with student labor. Releases 4 through 7 of the CSL were produced by the Whitman team during 1978 through 1980.

By the time Release 7 was distributed, the number of users in the group had grown so greatly that Holt and his staff simply couldn't accommodate their requests. From September, 1977 to February, 1980, the Whitman College staff logged 1,637 calls, of which 45 percent were from HP employees. In February of 1980, an average of 21 calls per day were received. The college administration eventually decided that Whitman could no longer support the CSL. Mark Wysoski was hired as the full-time manager of the CSL in February, 1981, shortly after the users group had been given six months to move the CSL operations out of Whitman.

In June of 1981, Holt loaded up his pickup truck with hardware, tapes, and multiple filing cabinets, and drove to Los Altos, California, with Randy Marchand, then Whitman student project leader. The board had recently moved the office from the East coast to Los Altos, and with the delivery of the CSL materials from Whitman, all services were for the first time centralized in a single office.

—S.H.

they could transfer all its applications to the HP.) Moreover, at that time, no other computer could meet Anderson College's needs. "At one point my immediate supervisor asked me, with some wonder, 'Who else has one of these?'" remembers Harbron. "I sent him a poster that was distributed when HP celebrated selling 10,000 machines in 1982."

The first HP 3000 to cross the Canadian border was purchased by McMaster University in 1972. Gary Anderson, then faculty member and Chairman of the Computer Recommendations Committee and now president of SSG in Ontario, Canada, began negotiating with HP in late 1971. The university had decided to replace an IBM 1130 system that had been used in McMaster Health Sciences since 1969. An initial proposal sent to McMaster in February detailed a system with 48 Kbytes core memory and a 2 Mbyte fixed-head disc for a swapping medium. The cost of the proposed system was $267 thousand. Just over a year later, on February 10, 1973, three months after the November 30, 1972 date promised in the initial proposal, the system was delivered—and actually contained 128 Kbytes of core memory with a 4 Mbyte swapping disc. HP had a policy that an HP 3000 could not be installed at a customer site in a region that did not have a 3000 installed in its regional data center. The original plans called for a 3000 to be installed in the Toronto data center in October 1972.

However, the HP 3000 project took much longer than expected to progress from the alpha test stage to working well enough to be delivered to a customer site. Jeremy Beaty, the Canadian Data Systems sales manager at that time, and now area manager for HP's Eastern region, had numerous meetings at McMaster about slipped schedules and the university's requirements for the final system. At one point, William Terry, head of the HP 3000 program, spent an afternoon at McMaster assuring Anderson and top faculty and administrative staff that the 3000 program was receiving top priority at HP. This visit played a key role in restoring the McMaster staff's faith in the 3000. By the end of 1972, the schedule for McMaster's system had slipped so much that Beaty agreed to install in McMaster's Computation Services Center the system originally intended for the data center in Toronto.

Like Anderson College, McMaster had an IBM computer that its staff planned to run in parallel with the 3000, and eventually to phase out. This meant that, fortunately, the 3000 was initially used only by McMaster's systems staff. The hardware was quite stable, but the inability of MPE A to accommodate multiple users led to daily system crashes. Consequently, McMaster staff began to schedule program conversion and development in shifts to reduce the number of programmers using the system simultaneously. Terminals were kept in the same room so that programmers could verbally schedule FORTRAN compiles, since more than one compile at a time crashed the system. Nevertheless, says Anderson, "I saw immediately that MPE was a very exciting operating system. I could see that it was ahead of anything else available, and that if HP stayed with it . . . they (HP) had a winner among minicomputer systems."

In April of 1973 Anderson had the chance to express his views to HP directly. A major reorganization of the Data Products Division had occurred, and Paul Ely had been moved from the Microwave Division to take charge of Data Products. A meeting was set up among Anderson, Ely, Ed McCracken, HP 3000 marketing manager; George Schapiro, applied systems marketing manager; and Dave Crockett, HP 3000 manufacturing. Anderson communicated his enthusiasm about the HP 3000 and indicated that McMaster, as an early site, needed a great deal of attention from HP. The events of subsequent months and years bore out that an effective partnership had been formed at this meeting.

Back at the factory, the problems with the HP 3000 had become increasingly apparent; moreover, an article appeared in *Computerworld* detailing many of them. According to Bob Green, "That was the catalyst that got HP alarmed. HP had a reputation for quality products and they weren't used to bad publicity." The 3000 was taken off the corporate price list for a few months, and sales of the machine stopped. By the time the 3000 was withdrawn, however, programmers, working 16 hours a day and seven days a week, had made enough progress to minimize the time that it would have to

Will history repeat itself?

remain on hold. Two more decisions contributed to getting the 3000 back on the price list quickly: the real-time features would not be implemented, and systems would have to be shipped with 128 Kbytes of memory, since MPE could not be expected to work well with only 96 Kbytes.

In retrospect, it is not particularly surprising that in rapidly making the difficult transition from fine-instrument to instrument-and-computer company HP should have encountered such problems. According to Jonathon Bale, an early engineer on the 3000, "HP was essentially an instrument company, and the 3000 was looked upon as an experiment. I attended a board meeting once and Packard referred to the 3000 as the 300. I remember thinking what a small part of the company the computer division was."

According to Green, the computer division was known throughout HP as unusually "unconservative." Ely was brought in to bring the division's operating procedures in line with those of other HP divisions. One of the first edicts he imposed, recalls Green, was to rid the factory floor of "coffee klatches." These developed because the physical assembly of an HP 3000, a long and tedious process, became prime entertainment for Data Products employees on coffee and lunch breaks. Crowds would gather daily around the assemblers to check their progress. Evidently, this was not Ely's idea of how a factory should be run.

The release of MPE-B in 1973 was the first major step in reducing HP 3000 problems. "We practically smuggled a prerelease of MPE-B out of the factory," says Don Gilchrist, then system manager at McMaster. "If we hadn't been able to do that, we'd have been in really bad shape." McMaster needed MPE-B to provide a smoother transition in turning the system over to users. For several months, the system worked relatively well. But in the Fall of 1973, and into 1974, a problem with loss of files surfaced regularly. As a result of this, user discontent reached an all-time high. In addition to sometimes daily file loss, McMaster experienced mysterious system problems. "We had a problem every three months in which we'd lose a full day of work, which we nicknamed "the moon cycle," says Gilchrist. "Our lowest point was in October of 1974 when the system was down for a full week. We still refer

HP's SMALLEST MINICOMPUTER

One of the more curious outgrowths of the integrated circuit technologic boom and HP's transition from a fine-instrument to an instrument-and-computer company was a veritable digital Swiss Army knife called the HP-01. In 1977, the 01 was touted as "a digital electronic wristwatch, a personal calculator, an alarm clock, a timer, a 200-year calendar ... and yet ... more than all of these." According to the manual, with this exotic article (equipped with six large-scale integrated circuits, "the equivalent of 38,000 transistors"!) "you can do anything from viewing the time to dynamically calculating the cost of a long-distance phone call or, if a pilot, finding the distance to your next checkpoint." Ideal for the engineer, coach, oversleeper, cook, long-distance caller, pilot, and anyone else with a 200-year lifespan, and all for only approximately $900. Probably because of this weighty pricetag, the 01 was not a big commercial hit, and was discontinued a year or so after its introduction.

Ed Sharpe, Phoenix's nonpareil collector of HP memorabilia and founder of The Forum, has recently become the proud possessor of an 01, which he says is still 100 percent functional and reliable. Ed adds that "Its unique—I haven't worn a watch since high school, but I'll wear this." —*S.H.*

HP 3000 Genealogy

MODEL(S)	DATE	MEMORY	DISTINGUISHING FEATURES	BASE PRICE
HP 3000	11/72	Min: 64 Kb Max: 96 Kb	Withdrawn in 1973 because it did not meet specifications.	$95,000
HP 3000CX Models 50, 100, 200, 300	11/74	Model 50: 96 Kb Model 300: 128 Kb	MPE-C operating system. First minicomputer with COBOL. Also supported BASIC, FORTRAN, RPG, and SPL. IMAGE database management system. QUERY language. 2780/3780 RJE emulation. SSI TTL CPU.	$129,500 (Model 50) to $203,500 (Model 300)
HP 3000, Series II Models 5, 7, 9	5/76	Models 5, 7: 128 Kb Model 9: 320 Kb Max: 512 Kb	Performance 3 to 4 times that of CX. MPE III. Data entry library (DEL/3000).	$110,000 (Model 5) $150,000 (Model 7) $190,000 (Model 9)
HP 3000, Series II Models 6, 8	2/77	Min: 128 Kb Max: 512 Kb	HP 7920 disc (50 Mb).	
HP 3000, Series I	5/77	128 Kb	Recycled CX. DS/3000 for 3000-to-3000 communication. Lowest 3000 base system price.	$75,000
HP 3000, Series III	6/78	Min: 256 Kb Max: 2 Mb	MPE III operating system. Private volumes, disc compression, HELP, UDCs, job control words.	$115,000
HP 3000, Series 33	10/78	Min: 256 Kb Max: 1 Mb	Series II performance. Silicon-on-Sapphire (SOS) technology. Desk-style packaging. Low-power requirements (230 VAC, single-phase). HP-IB peripheral interface protocol. Flexible disc support (built-in).	$70,000
HP 3000, Series 30	10/79	Min: 256 Kb Max: 1 Mb	Repackaged Series 33 with limited I/O expansion capability.	$49,750
HP 3000, Series 44	12/80	Min: 1 Mb Max: 4 Mb	Highest 3000 performance to date. MPE IV. Interprocess communication (IPC). High-performance memory manager.	$109,000
HP 3000, Series 40	10/81	Min: 256 Kb Max: 2 Mb	Repackaged Series 44. Lowest-cost 3000 to date: twice performance of Series 30 for 30% lower price.	Less than $50,000
HP 3000, Series 64	10/81	Min: 2 Mb Max: 8 Mb	Highest 3000 performance to date: 1 MIP Class. Up to 3.2 Gb of disc storage. Advanced terminal processor (ATP) supports asynchronous communication with much less central processor overhead. Cache memory.	$164,700
HP 3000, Series 39	2/83	1 Mb	Lowest-cost 3000 to date.	$37,355
HP 3000, Series 42, 48, 68	5/83	42 Min: 1 Mb Max: 3 Mb 48 Min: 2 Mb Max: 4 Mb 68 Min: 3 Mb Max: 8 Mb	Series 40, 44, and 64 with disc caching and MPE-V.	$42,400 (S/42) $79,500 (S/48) $186,100 (S/68)
HP 3000, Series 37	9/84	37 Min: .5 Mb Max: 2 Mb XE Min: 1 Mb Max: 2 Mb	Approximately Series III performance at 1/10 the price. First HP 3000 on chip. Based upon CMOS gate array.	$12,000 (37) $20,000 (37 XE)
Series 58	8/85	8 Mb	Up to 50% greater performace than Series 48.	$94,500
Series 70	2/86	Min: 8 Mb Max: 16 Mb	20 to 35% greater performance than Series 68.	$150,000
Spectrum Model 930	2/86	Min: 16 Mb Max: 24 Mb	Up to twice as fast as a Series 68.*	$225,000
Spectrum Model 950	2/86	Min: undecided Max: 64 Mb	Up to three times as fast as a Series 68.*	$300,000 to $350,000

Prices are approximate.

**Alpha and beta tests have not yet been conducted.*

to that week as the 'Death Valley days'." The same month, Larry Birnbaum and Fred Reynolds of HP spent two weeks at the site and traced the problem to a fixed-head swapping disc. After a period of convincing users that it was safe to use the 3000, operations proceeded much more smoothly at McMaster. The introduction of spooling with MPE C in 1975 was a vast improvement and also meant the end of infuriating ERROR 55: DEVICE UNAVAILABLE.

The Business Marketplace

IMAGE was of course one of the principal contributors to the eventual success of the 3000. "IMAGE changed the market direction of the HP 3000. Prior to its release, the computer was geared to a scientific/educational market; IMAGE was an entré to the business market," says Harbron at Anderson College, which served as a beta test site for the product.

The development of a COBOL compiler was also a reflection of HP's intention to pursue a more commercial market. "Some of the engineers weren't too enthusiastic about COBOL—they were more interested in the scientific applications," says John Welsch, COBOL compiler development engineer. Nevertheless, HP recognized an interest in the machine by commercial users and began to gear the machine to that use. In a 1975 memo to HP 3000 mnagement, entitled "Impressions of 3000 Users Group Meeting," Languages Manager Bill Foster notes, "The majority of the users at the meeting were what I would classify as commercial users. They are anxious to see a greater thrust by HP into the commercial marketplace."

Fred White, the key contributor to IMAGE, was hired by HP in August of 1969 to be a project manager on Omega, the 32-bit machine destined for cancellation. During 1971–74, White worked on IMAGE chiefly with Jon Bale. At one point, the IMAGE and QUERY development teams merged, and integrating IMAGE into QUERY was considered. White and Bale, however, insisted that IMAGE remain in the system library so that it would be available to other programs. According to "The Birth of IMAGE" in *The IMAGE Handbook,* the objectives of the project were "to provide a system that was both reliable and easy to use; that had some 'critical mass' of acceptable capabilities with reasonable performance characteristics, and an extendable method of access by all HP languages; and that honored all file management privacy and security provisions and extended those provisions by providing security at the base, set and item levels."

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After many design and approval stages, in 1972 the difficult task of coding began. Lacking an editor, the team was forced to develop IMAGE completely on cards, using the computer for compiling and testing only. With the push to get the 3000 out the door at the end of 1972, machine time was greatly limited. Systems Lab management allotted "chips" to each programmer, and an auction system was devised for machine time. Every week, machine-time calendars were posted for each of the three machines available. However, the Data Management Lab where the IMAGE project resided, was not allotted any chips. This meant that the team was forced to join a daily 4:30 p.m. rush for any remaining machine time. Thus, the machine time available for IMAGE was for the most part limited to nights, weekends, and holidays.

Anderson College was the only beta test site for IMAGE, and its involvement was more a matter of necessity than anything else, according to Harbron. "We took a look at the specs for IMAGE and it was a very good fit for the applications we needed, so we began designing databases in the summer of 1972." Anderson got its first test release of IMAGE in January, 1974. "One problem we discovered early on with IMAGE was contention, having several users on the system contending for the same resources," remembers Harbron. "There was nothing in the specification about contention and how they were going to handle it. I suggested a very simple mechanism which they ended up using, and that was to lock the entire database when you did an update. It was crude, but it worked."

In the Fall of 1974, IMAGE, COBOL, and QUERY were released with the HP 3000 CX. The combination of new, much-needed products and a stable operating system was very effective in the marketplace; sales of the HP 3000 took off for the first time.

With the release of the Spectrum program, pioneering begins again with a new hardware architecture, a new operating system, and a new database management system. Will history repeat itself? Harbron doesn't think so: "After the first HP 3000 was released before it was ready, Packard laid down the law that a product can't be introduced until it can be demonstrated." Nevertheless, Anderson College won't continue its tradition of breaking in new systems. Says Harbron, "It was an interesting experience to be a pioneer, but I'm not sure I want to do it again." ❖