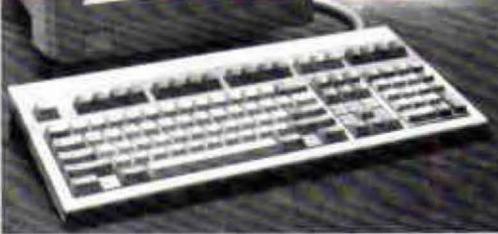
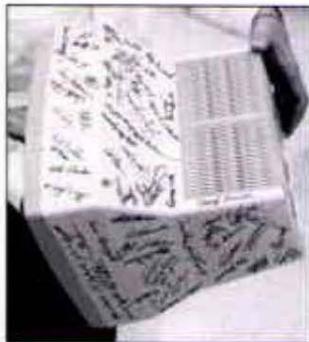


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Measure is published six times a year for employees and associates of Hewlett-Packard Company. Produced by Corporate Public Relations, Internal Communications Department, Brad Whitworth, Manager. Address correspondence to Measure, Hewlett-Packard Company, 20BR, PO Box 10301, Palo Alto, California 94303-0890 USA (415)857-4144. Report changes of address to your local personnel department.

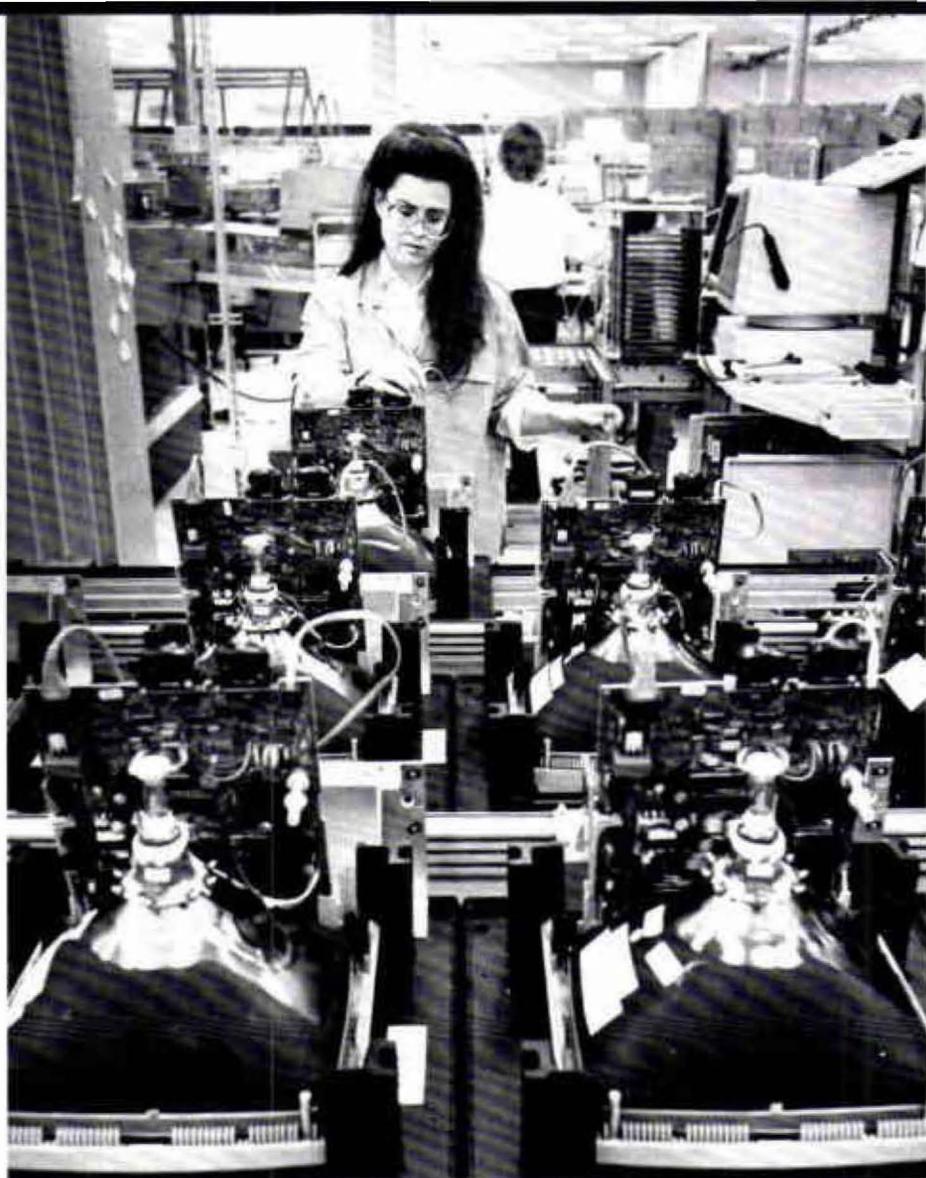
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Hewlett-Packard Company is an international manufacturer of measurement and computation products and systems used in industry, business, engineering, science, medicine and education. HP employs more than 82,000 people worldwide.

Rock star Bruce Springsteen sings the praises of being "Born in the USA." Chrysler extols the virtues of Detroit-built cars. Now HP is proving that low-cost, high-quality computer terminals don't have to come from overseas. They can be

MADE IN ROSEVILLE



Test technician Sue Conn checks out an ailing terminal in the "aging" area.

Move over, Lee Iacocca.

HP's Roseville Terminals Division is proving that "born in America" is more than just a catchy advertising slogan.

There's a new manufacturing frontier in America—Roseville, California.

Roseville became the Detroit of the West on September 1, 1987, when RTD introduced the HP 700 family of five computer terminals priced from \$375 to \$1,095—5 to 45 percent less than HP's prime competitors.

Known as the Frontier family during their development, the HP 700/92, 700/94, 700/22, 700/41 and 700/71 are innovative HP examples that American know-how can triumph over low-cost offshore labor advantages.

Consider the challenges the RTD team faced:

- A total redesign of existing computer terminal architecture—reducing the number of printed circuit boards from three to one per terminal. The theory was that fewer parts mean lower material cost and higher reliability.
- An overhaul of the manufacturing

floor where selective automation could greatly reduce assembly and test costs.

○ An entirely new market thrust to challenge terminal market leaders such as IBM and DEC with revolutionary new HP products.

And, oh by the way, do all of this in Roseville, not in Asia where labor rates are one-sixth that of California and where 90 percent of today's computer terminals are made.

Why take on those awesome goals?

"We saw more and more manufacturing being sent overseas and decided that somebody somewhere had to do something or our jobs, our industrial leadership and perhaps our high standard of living were going to go away," says Larry Mitchell, general manager of RTD and the Roseville site. "The decision to pursue manufacturing in Roseville was more a deep-rooted belief that we had to be successful as opposed to any concrete thought of how to do it."

"We hope that Roseville will make a major statement for Hewlett-Packard and possibly the electronics industry

MADE IN ROSEVILLE

that we have the ability to design low-cost products, manufacture them in the U.S. and still be highly competitive with products made offshore."

Adds program manager John Adelsbach, "The choices were to ride terminals into the sunset or regroup and establish high-volume leadership in new markets. We chose the latter."

The vision began some two years ago when Larry formed a team of about 15 managers from throughout RTD. He encouraged them to start with a clean slate: forget how HP currently designs, manufactures and sells its products and decide the best way to do each.

For perhaps the first time, R&D, manufacturing, marketing and quality

"Our approach was to involve all of the key groups right from the start."

departments all were involved from the ground floor in determining the product line's future.

"Typically, the R&D lab begins designing a new product and, about halfway through the process, manufacturing is brought in to figure out how to build it," says John Adelsbach.

"Our approach was to involve all of the key groups right from the start and examine each step of the process. We didn't jump on the automation bandwagon automatically. We did adopt some automated equipment, but visitors are always surprised to see that we don't have any robots in our factory."

Nearly 75 percent of the non-production employees at RTD worked on the program on 18 individual task teams. Like the pioneers who settled the West, the RTD team was a spirited, hard-working group.

"We were relentless," explains Vito Kapeckas, materials engineer for plastics. "The idea was to trim costs wherever possible."

During two months of brainstorming, the team considered several ways to reduce overhead costs.

The team focused on not designing any new, unnecessary features into the five new products.

"We didn't add anything that didn't



Stella Hernandez places the cathode ray tube face down onto the terminal's plastic frame. Top-down assembly means workers never have to turn the terminals around.

have to be there," explains design engineer Mike Wilson. "Designing a product for low cost is just as much an engineering challenge as designing a complex product. We didn't have the luxury of adding anything that affected the price or size."

"Anyone who suggested adding a nickel to the cost of the product had to fight for his life," adds Brad Rubenstein, computer-integrated-manufacturing engineering manager.

The concept of "design for manufacturability"—where manufacturing and R&D explore how to build the products as they were being designed—came heavily into play.

In fact, in addition to representatives from engineering and manufacturing, team members from product assurance, marketing and finance each added their perspective at each step of the design process.

"Perspective" is a mild description of what took place in the meetings.

"It was an eye-opening experience for me," notes cost accounting's Michelle Weiss. "You haven't experienced a cost-savings meeting until you've watched 20 grown men in a room screaming

about saving a dime on a component. But that's how serious they were."

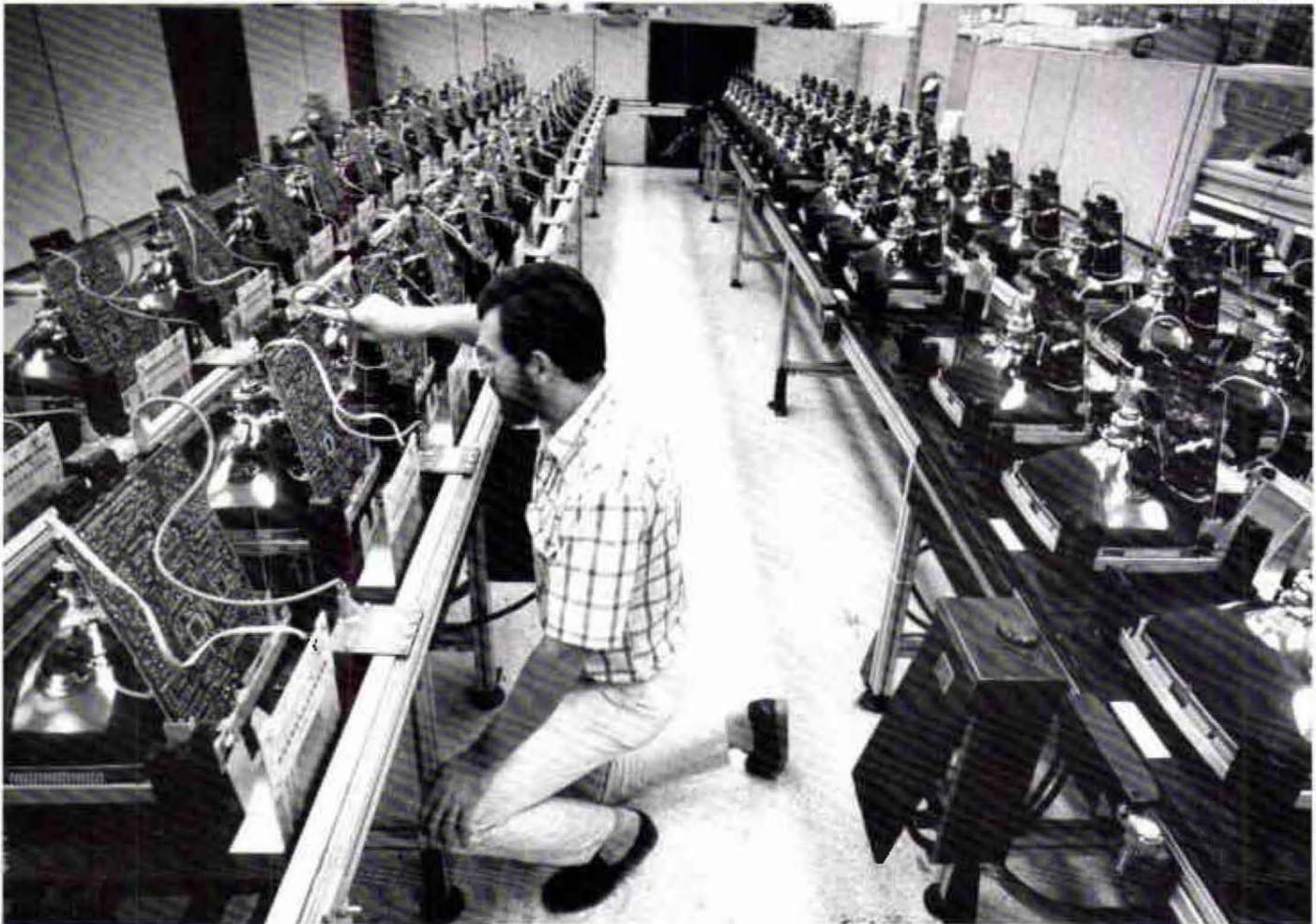
While saving cost was an ever-present issue, quality was considered just as important at every step of the process. "We established a list of 10 quality categories and all team members—not just those from the quality organization—were assigned responsibility for various items," says Byron Streitz, hardware quality manager. "We recognized early on that we couldn't afford to have overhead costs to fix quality problems."

At one point during the design phase, the team wasn't pleased with

"We were relentless. The idea was to trim costs wherever possible."

the display quality on the CRT screen. It took two months to redesign the circuitry to their satisfaction.

"Quality and reliability were key concerns because these products were going to have the HP name on them," Byron adds. "Our customers trust us because we have a proven history



Video cameras mounted near the floor monitor information on the CRT screens as the terminals wind their way through a two- to four-hour self-testing area. John Spaeth, test technician, gives the made-in-America terminal line an added visual check.

of producing quality products. We believed that if we goofed on the HP 700 series products, we might never recover our reputation."

One of the primary factors in the RTD team's ability to design, manufacture and market low-cost, high-quality terminals was HP's ability to get the best prices for all components and parts.

Because the cost of materials is about 80 percent of the total product cost, that seemed like the likely place to begin. The team started by disassembling key competitors' computer terminals—all manufactured in the Far East—to study their parts and design.

The design team spent several weeks in the Far East studying low-cost components before beginning the designs.

Once the design team developed rough specifications for the new HP products, a joint sourcing team from RTD and the Grenoble (France) Personal Computer Division (GPCD)—which also was designated to produce the HP 700 series—spent three weeks in the Far East.

The sourcing team's mission was to tour major terminal manufacturers in Taiwan, Japan and Korea and to talk

with more than 40 suppliers. They wanted to establish new relationships with overseas parts vendors and determine where to get world-class prices on common, off-the-shelf components.

During the day, the procurement/buying team evaluated the suppliers for the best prices for capacitors, resistors, diodes, connectors and so forth. At night, the HP engineering crew determined whether the parts would work in the new low-cost terminal designs.

"We had to consider the 'landed cost,' that is, how much the part costs by the time you buy it, ship it from the Far East or Europe, keep it in stock and then use it," notes Rod Martindale, RTD procurement manager. "We had a lot of assistance from people at our HP International Procurement Offices who helped us deal with all of the entities and cultures in Asia and Europe.

"This was the first opportunity for a number of suppliers to deal with Hewlett-Packard, which they very much wanted to do. Plus, we were basing our product costs on the fact that we would be producing thousands—not just hundreds—of terminals a month; that kind of volume was an attractive incen-



RTD production worker Betty Montgomery learned how to operate an automatic component insertion system as part of the major overhaul in manufacturing.

MADE IN ROSEVILLE

tive for them to offer their best prices."

"The objective for us," adds Jean Paul Moiroux, procurement manager for GPCD, "was to attain those same cost savings through volume purchases because our manufacturing costs in France are nearly identical to those in Roseville. In the end, we ended up choosing many of the same suppliers."

"We were in contact with Roseville virtually daily, including Saturdays and Sundays, by phone, Fax or HPDesk to coordinate suppliers, tool designs and other details. Our objective in Grenoble was to begin production of the new computer terminals at the same time as Roseville, using essentially the same processes at the same cost and with the same quality. It took an enormous amount of coordination."

Back in Roseville, the entire manufacturing process was being dissected to determine the best choices for factory modernization, including automation and new training programs.

A team of veteran assemblers was asked to look at their jobs closely and suggest where improvements could be made. That process, notes Larry Mitchell, general manager, sometimes meant that people suggested eliminating their own jobs to help the new program achieve some tough goals.

"It was one of the few times production workers were in close, daily contact with the R&D lab," states Pat Moore, production assembly, a 17-year

"Anyone who suggested adding a nickel to the cost of the product had to fight for his life."

HP employee. "The engineers were right down in the trenches with us and accepted quite a few of our ideas."

"I was concerned at first when I heard about all of the automation and cost savings, because I pictured an assembly plant in the Far East with no indoor plumbing and a few workers surrounded by a lot of machines," adds Betty Montgomery, an HP production worker. "But I wound up learning a new process—how to operate an auto inserter—which I wanted to learn. It's great now to see the whole thing come



Ben Seligson uses a pneumatic arm to insert a completely built HP series 700 computer terminal in its shipping box at the end of the manufacturing line.

together and to know you had a hand in deciding the process."

As the program began to take shape, the HP team members at RTD and GPCD continued to pursue their assignments with a steady fervor. "Sometimes there's a tendency in the design phase to redesign and redesign and never get the product to the factory," explains Stu Seligson, new products buyer. "But with a product life of only about three years, we couldn't afford slips in the schedule. It took extraordinary measures to get extraordinary results."

The revamped manufacturing process began to come to life in 1986 when the line produced the first of 400 prototypes—the most ever during a terminal development program. Among the \$4 million in new equipment and processes were:

- An automated vehicle which follows an electronic path on the manufacturing floor to move printed circuit boards from one workstation to another.
- A series of bar-code labels and scanners to track each PC board throughout the assembly process.
- A pneumatic arm which plucks

cathode ray tubes from packing boxes: an employee then effortlessly guides each tube face down into the terminal's plastic front panel.

- Video cameras mounted on the floor to monitor information on the CRT screen as the terminals move along a path during an automated two-to four-hour self-testing phase.
- An HP 9000/320 controls the entire manufacturing process and drives an HP Vectra computer, which operates the test area.
- A laser etches serial number, model number and other information into the terminal's back plastic panel.

The results of RTD's diligence and innovative achievements are many: the cost of raw materials has been reduced by more than 50 percent; labor content of the new terminals is less than half of earlier products; manufacturing overhead costs are lower; and, because 90 percent of the components are identical, the production line can produce any of the five models at any time.

Fewer parts in the 700 series terminals also has been a boon to HP's already high-quality, high-reliability track record.

RTD quality engineers are putting 200 terminals through a life test, including turning them on and off 18 hours a day to prove their endurance.

From a marketing standpoint, the new low-cost terminal family meant that HP had a whole new set of factors to deal with. New markets, product availability, storage, distribution and advertising were among the concerns.

HP's marketing group developed an aggressive campaign to introduce the HP 700 series, including advertisements in computer publications such as *Computer World* and *Datamation*; working with the HP sales team to promote the new terminals to current and future customers; and a direct-mail campaign designed and implemented in conjunction with HP's Direct Marketing Division (DMK).

"Before we launched the direct marketing campaign, we commissioned a market research study to answer a key question: 'Are people willing to buy through the mail—sight unseen—without a demonstration?'" explains Jean Murphy, product manager. "So far, the answer is an overwhelming 'Yes.'"

"We're not trying to turn HP's sales people into a terminal sales force," adds Evan Neptune, product line manager. "With the HP 700 family, we're giving them incremental sales opportunities and the possibility of leveraging terminal sales into future sales of other HP products. We hope they will direct small terminal purchases to DMK and pursue larger opportunities themselves."

Early indications are that the American-made, low-cost HP computer terminals are a solid success. Orders in the first two months exceeded expectations, including one order for 6,000 terminals for use in a chain of small medical clinics and doctors' offices.

If the sales volume continues its current pace, production at RTD is expected to double within a year; production at Grenoble will track closely with RTD.

"The challenge today is to manage inventory from offshore suppliers, and manage escalating exchange rates with foreign currency strengthening against the dollar," notes procurement manager Rod Martindale. "We're paying more for parts today than we did a year



An automated vehicle, which follows an electronic path in the manufacturing floor, carries printed circuit boards from one workstation to another.

ago. So after working two years to design, develop and manufacture low-cost terminals, we're already talking about how to reduce those costs."

Evan Neptune reports the following conversation with a potential customer during the annual Comdex computer trade show in Las Vegas in November:

Evan (after demonstrating the features of the HP 700/41): "...and the price is under \$400."

Shocked customer: "I don't believe it!"

Evan: "We believe it's the lowest-priced terminal available."

Customer: "How much extra for the keyboard?"

Evan: "The keyboard is included in the price."

Customer: "Where in the world do you make this terminal?"

Evan: "Roseville, California."

Customer: "Are you joking?"

Evan: "It's true."

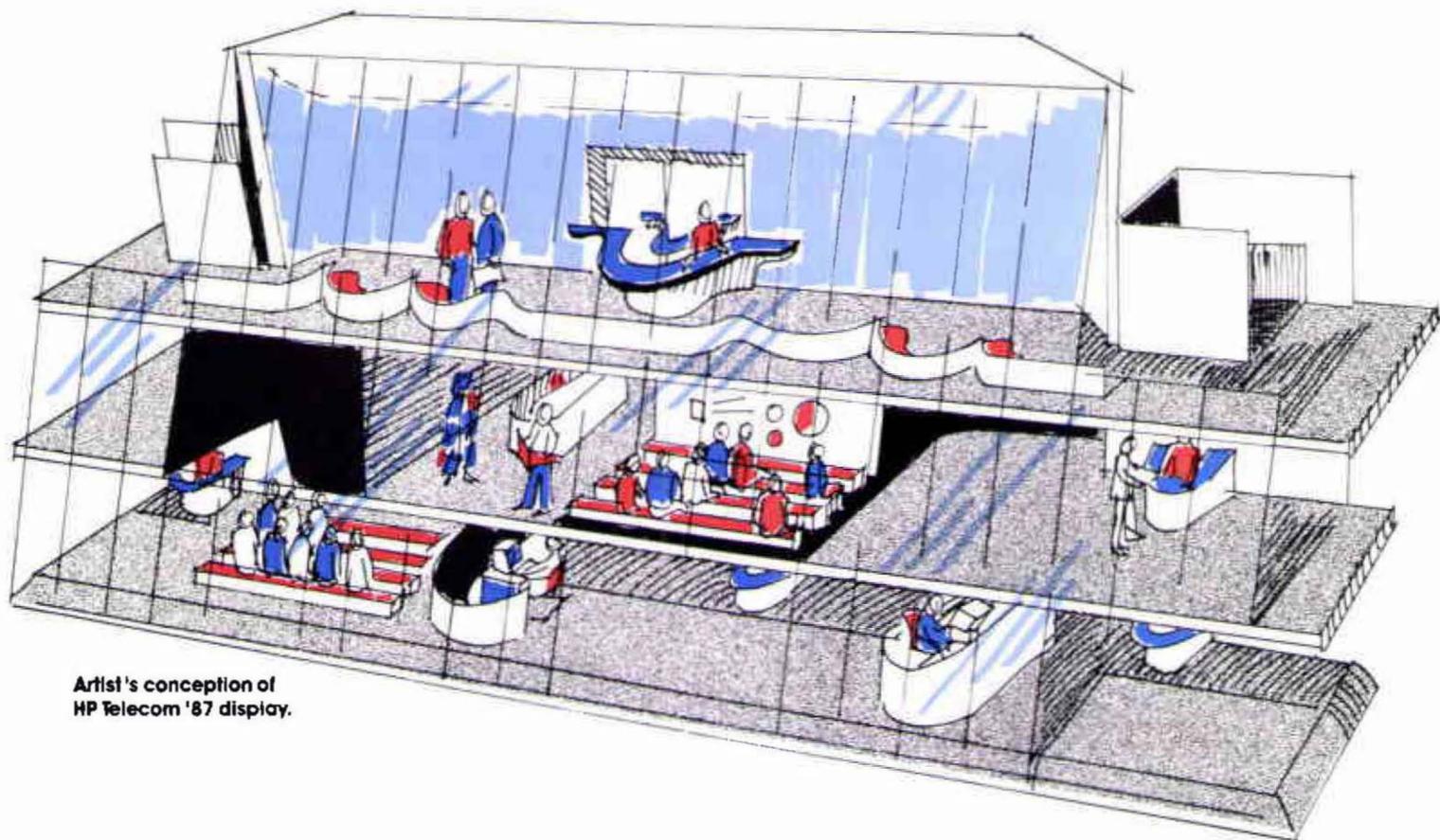
Customer: "You mean to tell me that I can buy an American-made computer terminal, including keyboard, for under \$400... and it's made by Hewlett-Packard?"

Evan: "That's right!"

Customer: "I'll take it!"—Jay Coleman



RTD manufacturing program manager Lee Wiese displays the first HP series 700 terminal produced at Roseville, a one-of-a-kind, autographed model which the entire project team signed.



Artist's conception of HP Telecom '87 display.

GOOD SHOW!

HP exhibits its best at Telecom '87

Hewlett-Packard used a two-pronged attack to reach international customers and prospects in October during the quadrennial Telecom '87 show in Geneva, Switzerland.

The first prong was a futuristic three-story booth at the world's premier telecommunications and networking show, held October 20-27.

The second area of emphasis was an extensive lineup of discussions, seminars and demonstrations at HP's European headquarters in Geneva, about 15 minutes from the Telecom display.

"Telecom is only held every four years, so it is an extremely important gathering for the telecommunications industry," explains Alfredo Zingale, European marketing manager who directed HP's participation.

"We also used the opportunity to set up a comprehensive demonstration facility with specialized presentations at the European headquarters to show HP's total capabilities to key industry, government and media leaders."

At the Telecom booth, a high-impact audio-visual presentation illustrated how HP products test, collect, process and deliver information for customers.

The presentation literally was a moving and uplifting experience for visitors. A large elevator raised a small theater full of people from one level to the next as the group watched a show called, "More than meets the eye."

More than 250 HP employees staffed the booth during the week-long show. Six thousand visitors saw demonstrations of HP products, including the HP Precision Architecture products.

The company also participated in joint displays with other manufacturers to demonstrate the progress made on ISDN—Integrated Services Digital Networks—which combines voice, data and video images. ISDN is considered the next phase in telecommunications technology.

Using ISDN, a 100-page document can be transmitted in one minute—1/60th the time it currently takes, noted John Young, HP president and CEO, in an address to executive attendees at Telecom.

"Combined with fiber optics, such speeds will represent an enormous increase in transmission capacity," said John. He added that laboratory prototypes already have transmitted the equivalent of the entire Encyclopedia Britannica—"all 32,000 pages"—in under 10 seconds.

"I think Europe should be commended—and thanked—for the leadership it has provided in the development and implementation of the Integrated Services Digital Network," John commented. "Quite simply, the Europeans are years ahead of the U.S. in this very promising area."

Hewlett-Packard joined with 21 other

companies to demonstrate the X.400 electronic mail standard. "The original version of it was developed at the HP (R&D) facility in Bristol, England," John noted.

While Telecom may have been the initial draw which attracted as many as 260,000 people to Geneva, HP capitalized on the opportunity to tailor special presentations to 2,500 individually invited customers at the European headquarters building.

The offices were converted into a symposium and exhibition center during Telecom week where visitors were invited to participate in executive roundtable discussions, technical seminars, tours of networking exhibits and product display areas.

Customers from Europe, Japan, the U.S. and elsewhere were able to learn about HP's entire capabilities and see demonstrations which simulated manufacturing and service environments. Other demonstrations featured test and measurement products and network management systems.

In all, HP spent \$2.5 million for the combined Telecom and headquarters presentations, including chartering 20 airplanes to fly customers in from several European countries, and renting the famous TGV "bullet" train to bring French customers to Geneva.

The cost was a modest amount compared with the reported amounts spent by leading competitors, which indicates the extraordinary interest and growing importance of the new markets opened by the convergence of computers and telecommunication technologies, Alfredo Zingale notes.

It was a good investment for HP, considering the specialized contact the company established with thousands of customers and prospects from around the world, says Maria-Chiara Saporiti, Telecom project manager.

Adds John Doyle, executive vice president of systems technology, "The displays were terrific and attracted much favorable attention. We were able to show customers our network measurement and support capabilities, as well as real examples of the integration of networks and computation in factory and office environments. Well done!"



POOL PHOTO

More than 2,500 customers visited HP's European headquarters where employees such as Robert Henely, center, of the Product Support Division, gave specialized presentations.



GETTY

A futuristic, three-story booth, including a moving theater, attracted thousands of customers and prospects to Hewlett-Packard's display at Telecom '87 in Geneva, Switzerland.

HP ingenuity gives disabled students a head start

Employees from around the world contributed time and ideas to help physically impaired people learn drafting techniques.



David Sacco uses a customized headset and an HP 9000 workstation to study computer-aided-design and drafting techniques under the tutelage of instructor Joe Robinson.

As David Sacco considers a menu option on his computer terminal display, he tilts his head ever so slightly. A pointer on the display follows his movement. David makes his choice, takes a quick breath and blows into a clear plastic tube. The choice is executed.

David was paralyzed in an accident several years ago, losing use of his arms and legs. Today, he's attending college and interested in drafting or engineering as a career, fields traditionally requiring use of both hands. David's instructor and HP teamwork are helping him work toward his goals.

Nearly a year ago, Joe Robinson began thinking seriously about how disabled people could work with computer-aided design (CAD). Joe, an assistant professor of mechanical engineering technology, teaches drafting with HP 9000 workstations at the County College of Morris in Randolph, New Jersey. His interest in applications for physically impaired people was inspired while watching a 10-year-old disabled girl ably draw with felt-tipped pens held in her mouth.

Why, he thought, couldn't a CAD operator do something similar? An electronic pen in the mouth was clearly too awkward, so Joe designed a bracket to hold the pen on the side of a hockey

helmet. Head movement would control the cursor.

"This showed the idea was valid, in principle," Joe acknowledges. "But it was too crude to accommodate the precise movements required in computer-aided drafting activity." He took the concept to two rehabilitation hospitals in northern New Jersey. "I wanted to get their ideas and a feel for the demand there might be for this kind of application," he says. "The feedback was good: they knew about disabled people who had an interest in drafting, but were limited by their physical circumstances."

Joe's next stop was the HP ME Series 10 software users group. Joe uses the mechanical engineering software on the HP 9000 technical workstations in his classroom.

Among those Joe spoke with at the meeting were John Zamierowski and Frank Mascarich, of the Paramus, New Jersey, sales office, and Jim Wallin, from New Jersey Division in Rockaway.

Jim, a hardware engineer, decided to post Joe's query on an HP electronic mail network used by engineers to discuss new technologies and product development ideas.

"A lot of suggestions came back, including joystick enhancements,

voice-activated systems and mounting a graphics tablet on a helmet," says Jim. "We heard from HP engineers as far away as Germany and Australia."

Someone suggested a head movement monitoring device manufactured by Personics, Inc., a company based in Concord, Massachusetts. "The 'Head Master' device translates head movement into cursor movement, which was exactly what we were looking for," says Joe. "The only problem was that it was developed for an Apple computer and would not work on the HP equipment."

Once again, Jim put out the word. Siu Wong, an electrical engineer at the New Jersey Division, volunteered to develop the interface that would allow the device to work on the 9000 workstation. He contacted HP people in Fort Collins and Böblingen to get suggestions, and finished the interface in about three days. "It was much simpler than I thought it'd be," Siu says. The headset and interface was a \$1,000 investment. New Jersey Division's donations committee picked up the cost.

As the user's head moves, the cursor follows. Blowing into a hollow plastic tube attached to the headset, in effect, "clicks the mouse," and executes a command. There was one critical limitation, however: a keyboard was still needed to enter text.

Frank, the systems engineer who supports County College of Morris' HP equipment, reprogrammed the software to display an electronic keyboard at the bottom of the screen. The user could now use the headset to "type," as well as to execute menu choices. "It's eliminated the need for a cumbersome mouthstick to manipulate a tablet or keyboard," Frank says.

Several years ago, County College purchased five HP 9000 technical workstations and HP software for its CAD courses, says Frank. Later, five more systems were purchased and the software was upgraded to ME Series 10. To make the most of the latest enhancement, Gene Morel, of Lake Stevens, Washington-based Mechanical Business Operation, arranged for the donation of a high-resolution color monitor and a Series 320 computer. John Zamirowski coordinated other donations and suggested the best equipment to use.



HP volunteers from around the world, including Frank Mascarich from the Paramus, New Jersey, office, helped devise the computer-aided design system for disabled students.

A 30-person advisory committee, whose members include Siu Wong and Bob Muggleston, New Jersey Division personnel manager, helped Joe develop the initial course. Joe worked with New Jersey hospitals and agencies to recruit his first students.

David Sacco says the end result makes it possible to pursue his interests. "The headset works well and feels comfortable. This equipment will help me work toward graduation and, I hope, a job in drafting or design, as long as I succeed in my other courses."

There are four other physically disabled students in the class, although David is the only one using the head motion device. "The other students

"Using tools like these, disabled students are doing as well as the non-disabled."

have use of at least one arm and work on standard 9000 workstations with the help of mechanical devices to clasp the digitizing pen or give additional support to their arms," Joe says.

The same flexibility of the ME Series 10 software gave Joe the means to modify Bill Greelish's workstation. Bill has muscular dystrophy and found it difficult to use the keyboard and digitizing tablet. Joe adapted Frank's on-screen-keyboard idea, and Bill now reaches only half the distance as before to execute commands.

County College of Morris is again offering the one-semester course this spring to a new group of students. "There is a significant number of disabled people interested in drafting and design as a career," Joe says. As

students finish this class, they'll be encouraged to work toward CCM's drafting certificate or one of the school's associate degree programs.

"Using tools like these, disabled students are doing as well as the non-disabled," Joe says. "There's a demand for employees who have the training these students are getting. In fact, several companies in the area have already expressed an interest in hiring our students, both on a work/study basis and full-time. This experience is a great example of how, properly applied, computers can free people from their physical limitations to make the most of their talents."

Joe hasn't rested in his pursuit of new ideas for physically impaired people interested in drafting as a career. "There are still challenges to making disabled people as independent as possible in the work place," he says. "But modern technology takes us a long way toward working out the problems." Transportation is a major obstacle for many disabled people. Joe says. "It's very expensive, and there's great demand for the limited transportation resources available. When it becomes apparent that these students can support themselves with jobs, it should become easier to arrange transportation."

Meanwhile, Joe's accomplished a great deal just in the last 10 months. "I can't take credit for all of this," he says. "A lot of people made this happen, including the HP network. Looking back, it seems incredible how well and how quickly all of the necessary pieces came together." That's teamwork for you.—Kevin O'Connor

Enhanced 911: a new emergency lifeline

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GTE's enhanced 911 emergency system, which uses an HP 3000 computer, can help emergency teams respond faster.

HP sales rep Sam Magee doesn't know if the computers he sells today could have helped save his mother's life. But he can recite scores of incidents where HP 3000 minicomputers—part of GTE Data Services' 911 enhanced emergency systems—have allowed ambulances and fire departments to reach stroke victims and panicked children who don't know their own addresses.

"My mother was having a heart attack and dialed 911, the emergency number in her town in Minnesota. She was unable to speak, so the paramedics didn't know where she was calling from. When the emergency crews got there, it was too late," says Sam. "Today, enhanced 911 service makes that all but impossible."

Hewlett-Packard's a relative newcomer to the emergency response scene through its computer systems in "enhanced" 911 systems. But the movement to provide the entire U.S. with just one emergency phone number got its start nearly 20 years ago. Phone companies throughout the country began reserving the 911 number for all-purpose emergency calling.

Today, about half the communities across the country have this service, linking a central dispatching center with local fire departments, police, poison control centers and ambulances. Although 911 service solved many problems, it was not without its own shortcomings. The biggest problem: emergency calls where the victim was too young or too ill to give an address.

In Chicago in 1974, Illinois Bell began working with the city's fire and police departments to develop a system that could automatically identify the caller's telephone number and billing address. The technology wasn't new: telephone companies have always been able to find people when they placed long-distance calls. The "enhanced" 911 system used that same technology to capture callers' information when they dialed the emergency number.

Two years later, the first part of the system was ready. It passed the caller's telephone number to computer screens at the police and fire stations. Today, that service is called ANI (pronounced "Annie," for Automatic Number Identification).



Enhanced 911 can pinpoint the caller's telephone number and address—critical factors when seconds count.

The second enhancement, added two years later, was an automatic address feature named ALI (short for Automatic Location Identification and pronounced "Ali" as in Ali McGraw) that passed the caller's service address along to the emergency agency. Computers store this information in their memory banks and display it instantly on the emergency dispatcher's console and on terminals and printers—wherever the call is routed.

Another behind-the-scenes enhancement was added a short while later in California. "Selective routing" allowed the emergency center to send the calls to the public-service agency that had responsibility for the spot where the call originated. For example, if someone

HP computers store life-saving data in telephone systems.

lived just outside the city limits (and beyond the service area of the metropolitan police), the enhanced 911 system would be programmed to route emergency calls from that particular telephone service area to the sheriff's department instead of the city police.

The first system in the U.S. to incorporate all three features—ANI, ALI and selective routing—in a wide area debuted in October 1980 in Orange County, Florida. The enhanced 911 service tied together 37 public-service agencies in the Orlando area.

But such sophisticated 911 systems weren't cheap. They ranged in price from a couple hundred thousand dollars into systems that could cost several million. So part of the battle to install enhanced 911 systems nationwide has been to get state legislatures to approve funding schemes. Most involve tacking a small monthly surcharge on customers' telephone bills. Californians, for example, pay seven cents a month for the enhanced service. More typical is

a 25- to 50-cent charge.

These systems first appeared in large metropolitan areas where economies of scale held down costs. And the phone companies that served these cities kept all the necessary customer information on their mainframe computers.

But as technology has improved and computing costs have dropped over the years, enhanced 911 service has become more affordable to smaller communities. Small towns and counties have been able to program smaller computers—even personal computers, in some instances—to process and store their own ANI and ALI data.

That's what makes the GTE system that includes the HP 3000 computer a good choice for communities with populations from 50,000 to a million people. It's a system that offers big-city features at small-town prices.

GTE's Mac McClintock, the national product manager for public safety, says HP's reliability was a key factor in the decision to include HP equipment in their system. "Every publication you read, every source that's quoted gives HP marks for extreme reliability. Because we're dealing here with the public's safety, reliability is critical."

You'll find the HP gear serving communities across the southern U.S. But the best place to look for a GTE-HP enhanced 911 set-up is in Texas. The system was developed and originally installed by GTE of the Southwest. From Plano to Irving to Wylie to San Angelo, you'll find enhanced 911 systems with HP computers. There's even a working demo for prospective customers at Dallas' InfoMart.

"The last 10 to 12 months have been very good for us," says commercial systems sales rep Paul McCarty, who calls on GTE of the Southwest from the HP office in San Antonio, Texas. "GTE got the headstart here in Texas with a test site in San Angelo. Much of our early effort is now beginning to pay off."

There's nobody happier with the sales successes than HP's Sam Magee, who calls on GTE Data Services' national headquarters in Tampa, Florida. "There's nothing more rewarding than knowing that the computer systems you're selling could help save a life." —Brad Whitworth

Extra

ORDINARY PEOPLE

All
the wonders of the
world...
are within yourself



How many people regularly see their name in headlines for a decade?

Because lawsuits are known by the name of the first plaintiff on the list, HP's Margaret Tinsley probably has one of the best-known surnames in Silicon Valley.

To her HP friends, she's known as secretary for the Information Technology Group's hardware quality department in Cupertino, California. Her boss Brian Unter calls her a "people person"—sensitive to others, able to handle every situation. She's someone you like immediately, with an open smile and quick laughter.

Margaret was the lead plaintiff in a 1976 school desegregation case, *Tinsley v. Palo Alto Unified School District*, eight additional school districts, the state and the state board of education (*Tinsley* for short) which made history when it was settled last year. It involved the right of students in a troubled educational setting to transfer to neighboring school districts for a better education.

Focal point was the Ravenswood School District, serving East Palo Alto and eastern Menlo Park at the northern edge of Silicon Valley. At that time Ravenswood was known for its poorly equipped schools with some of the lowest reading and math scores in California. For those who don't understand U.S. education, where you live determines where you go to school for free.

It's not necessarily fair to kids—resources can vary greatly in neighboring school districts, dramatically so in the case of Ravenswood and its neighbors. Surrounding school districts are prosperous, largely white and ranked among the state's best.

Most of the children in Ravenswood's four elementary schools and middle school come from the heavily minority community of East Palo Alto. Two-thirds of the 3,300 pupils are black, the other one-third Hispanic and other minorities. Fifty-five percent of the children who begin in Ravenswood schools don't get high-school diplomas.

The Tinsleys, Margaret and Bill, are longtime residents of East Palo Alto. Bill and his brother were partners in a car dealership during the early years of the suit. The Tinsleys are not social

crusaders by nature. But they care a lot about educating their four youngsters, and didn't like what they were seeing in local schools.

"When Bill Jr. reached sixth grade, I saw things weren't going too well so I stayed right behind him," Margaret says. The Tinsleys pulled their son Michael and daughter Karen out of Ravenswood primary grades and put them first in private school, then in the nearby Palo Alto school district.

It was a time when many districts were closing schools due to low enrollment. The Ravenswood school district superintendent put an open letter in the newspaper stating no new transfers would be granted. This was amended to challenge transfer requests on an individual basis. Most were denied.

"That got my dander up," Margaret says. "I felt it was wrong. If there's a chance for a choice, you should be allowed that choice." From her next-door neighbor she heard about the class-action suit that was planned on behalf of all Ravenswood school district children. The Tinsleys decided to join in as plaintiffs. That was 1976.

They were among 34 parents filing suit against eight surrounding school districts in an effort to pry doors open for their children to receive a quality education in integrated schools. "You tend to flow into things as they happen," Margaret says by way of explaining how concern for her own children's education prompted her involvement in a suit that would benefit other children.

Groundwork for the suit had been laid by the Mid-Peninsula Task Force for Integrated Education, which was

"You tend to flow into things as they happen."

concerned about the inequity of schooling in the area. Plaintiffs were a mix of white and minority parents, some from East Palo Alto like the Tinsleys and some from nearby cities.

Putting Margaret Tinsley's name first on the suit was a fairly casual decision. The lawyers wanted a minority person from East Palo Alto. Task force member Ruth O'Shea suggested Margaret.

"What a wonderful selection it was."

**Tinsley case
remains
controversial**

**Settle Tinsley
and go on with
education for all**

**Tinsley
case near
settlement**

**Tinsley
papers signed**

Ruth says. "Margaret is attractive and poised and speaks so eloquently." These were assets that would be important in the final days of the lawsuit.

But no one involved with *Tinsley* expected the legal process to grind on for 10 years. It was slowed down by uncertainty in the courts about the validity of a suit to desegregate schools across different school districts.

Margaret herself had grown up in a family that strongly supported education. Her parents were college graduates and her aunt was a school principal. She grew up in St. Louis, Missouri, before moving to Palo Alto, where she graduated from Cubberley High School.

Palo Alto—East Palo Alto's immediate neighbor—is a liberal community. The education-oriented families of Stanford University faculty members are included within a school district where four out of five students are white.

"When I married, not too long out of college, I didn't know much about local bigotry," Margaret says. "I discovered that blacks who wanted to buy a home were often taken across the freeway bridge from Palo Alto into East Palo Alto for home viewings."

As the Ravenswood schools deteriorated, a third of the youngsters within

the district left for private schools or, by using the addresses of relatives and friends, attended schools in other cities. When the Tinsleys' youngest child Valerie reached school age, she followed Michael and Karen into the Palo Alto school system.

The educational outcome of those who remained in Ravenswood was uncertain. Dolly Sacks, program officer for the David and Lucile Packard Foundation, became aware of the severe needs of Ravenswood's middle school when parents sought funding. The foundation made a grant in 1986 for \$200,000, asking parents to list priorities for its use.

"The first thing needed was a fence—to keep the drug dealers out," Dolly says. "Next came their first basketball courts and lunch tables, and a water fountain." Since then the library has been fixed up and a \$70,000 grant is creating the school's first science labs.

After years of upheaval on the school board and a rapid turnover of superintendents, the Ravenswood school district is now showing new signs of progress under a new superintendent. But overcoming its long-standing problems will take time.

"Bill and I agree with the idea of building up the Ravenswood schools, but we didn't have time to wait for improvements," Margaret says. "I felt my energy should go toward helping my children grow. Their education couldn't wait."

Before *Tinsley* was finally settled out of court in 1986, it would wind in and out of courts, get caught up in a controversial amendment to the state constitution to limit busing, have echoes in Los Angeles, and spark a bitter debate in East Palo Alto.

During the long struggle, the plaintiffs' children grew up. Most were out of high school by the time the voluntary settlement was crafted under the guidance of the San Mateo Superior Court. The Tinsleys' son Michael is now married and a material handler at HP's Network Measurements Division in Santa Rosa, California. Karen, an HP scholarship winner, is in her final year in microbiology at Long Beach State. Valerie was graduated from high school last year and is in an office-

Extra

ORDINARY PEOPLE

skills work/study program.

Meanwhile, Margaret Tinsley quietly went on with her life. In 1977, the year after the suit was filed, she resumed working at HP as an R&D lab secretary at the Stanford Park Division. She had started with the company in 1966, taking periods of time away to have children and to study court reporting full time—which she found far too impersonal an occupation.

Margaret knew that agreeing to be listed as the first plaintiff meant risking hostile attention. She says she never really thought of herself as brave, although admittedly “we didn’t know what curves would be thrown us.” She did refuse photographs until after the suit was settled. In the early years it was easy to remain out of the spotlight as the lawyers dealt with court appeals to win consideration of the suit. To her relief, she can say, “I never once received a phone call or had adverse remarks made to my face.”

In the end, school districts agreed one by one to settle out of court and thus avoid costly legal fees. For the 1987-88 school year, they would accept

“The press realized she was the Tinsley and their cameras and notebooks came out.”

among them a total of 206 Ravenswood children in kindergarten and primary grades. An additional 206 would be admitted each succeeding year, to a maximum of 1,854 (or the nine grade-levels multiplied by 206). Caps were set for individual districts. It marked the first desegregation of schools across district boundary lines and serves as a model plan.

Before each school board vote, public meetings were held to hear how people felt about the proposed plan. Margaret Tinsley went to all dozen meetings. Ruth O’Shea was disappointed when Margaret didn’t speak at the first one.

“But Margaret knew exactly what she was doing,” Ruth says. “Afterward she introduced herself to the people who had led the meeting. The press realized she was *the* Tinsley and their cameras and notebooks came out.



Margaret Tinsley, her daughter, Karen, and brother-in-law, Charles Tinsley, celebrate in the courthouse hallway after the now-famous Tinsley Plan was signed in April 1986.

She impressed everyone with her dignity and sincerity.”

Task force president Ellen Elliott also went to those sometimes stormy meetings. While many people urged settling the suit and welcoming the Ravenswood children into their schools, “there were some angry people who said angry things,” she says.

“Margaret emerged as a spokesperson in a marvelous way,” Ellen says. “And because she wasn’t angry herself, she was very effective.”

Margaret had a sensible response to her questioners that drew on her knowledge of industry. If the young people from East Palo Alto were to become a productive part of the Silicon Valley work force, they had to be well-prepared educationally, she pointed out. “Otherwise, they’ll bring their problems across the freeway.”

On April 15, 1986, officials of all the school districts signed what became known as the Tinsley Plan. However, only 87 children have asked for transfers this first year with signups equally slow for next school year. After the euphoria of the signing, it’s a letdown.

Peter Burchyns of the San Mateo County Office of Education oversees the Tinsley transfers. He understands it can be difficult to send a small child on a bus to an unfamiliar neighborhood away from playmates and family. “The success of the program will depend on word-of-mouth as parents tell friends

about their kids’ good experience in other districts. This is still a new ball game for everyone.”

Other provisions of the Tinsley Plan call for a state-conducted study of ways to improve Ravenswood schools and, perhaps, setting up a model school in the district that would attract students from nearby cities.

Education continues to claim a lot of Margaret’s attention. She recently went on the task force board to help smooth the transition for the first young Tinsley transfers. She’s active in a youth-oriented business women’s organization that sponsors frequent events for families and raises funds for scholarships for black students who might not otherwise continue their schooling.

The Tinsley behind the *Tinsley* headlines had something realistic to say

“We didn’t know what curves would be thrown at us.”

when she accepted an award for her efforts in the lawsuit.

“Bill and I are proud to have been a small part of history in the making,” Margaret said. “But the real work starts now to make sure educational opportunities are opened to all.”

—Betty Gerard

YOUR TURN

Measure readers share their views on matters of importance to employees.

Is this progress?

We have heard about the printer that has now an order of magnitude less components than the previous version. This is the success story of design-for-manufacturability.

But, remember the spark plug that could only be reached with a custom wrench? So what is happening with design-for-serviceability? And—more importantly—remember the growing pile of garbage that we have to carry into the 21st century? So where is design-for-recyclability?

To get that going, we may need a law that obligates a manufacturer to buy back each of its products at, say, 5 percent of its sale price. Who picks up the challenge?

DENNIS DE CHAMPEAUX
Palo Alto

The moral of the story

I read with interest your recent article on morals. It is really good to work for a company where the higher human values can coexist along with the more normal business values of excellence and profit.

I would caution, however, that morals must be carefully managed, as when times are tough, most of us will throw our morals out of the window. Many people would kill without hesitation if someone they loved was being seriously threatened, and there are some not-too-dissimilar situations in the workplace.

To keep a moral company, the penalties for immoral behaviour must outweigh the advantages, and management must take care not to be doubly immoral by pressurising their subordinates into immoral actions.

DAVID STRAKER
Pinewood, England



Mixed messages?

I didn't like the message conveyed on the cover of the November-December issue of *Measure*.

Hewlett-Packard is a company concerned with the well-being of people. Using a tobacco company as a symbol of our contribution to Spain doesn't seem appropriate with the image HP wants to promote.

In the future, I suggest you emphasize the many positive contributions that HP makes in Spain, especially in hospitals, in universities and in development of high technology.

ANTONIO DRUDIS
Cupertino, California

While part of Tabacalera, indeed, is involved in tobacco manufacturing, HP equipment is helping Spain's oldest company to diversify to new business areas, including establishing distribution networks for watches, perfumes and other consumer products. The cover photo was intended to emphasize HP's relationship with one of Spain's most prestigious companies, and was not meant to be an endorsement—nor indictment—of the tobacco industry.—Ed.

Measurable praise

Each time I receive *Measure* I always read it as soon as possible. The most attractive topic of the magazine is Extraordinary People. I like to see HP people enjoy their life such as the climbing Colorado Fourteeners and those who make wooden toys for needy children.

I am also impressed by the team which sang songs for the students. They (express) a lot of love.

NAI-PENG KUANG
Taipei, Taiwan



Please send mail

Do you have comments about something you've read in *Measure*? Send us your thoughts. We want to share your opinions and comments with more than 82,000 other employees.

If your letter is selected for publication, you'll receive a *Measure* T-shirt. Be sure to send us a return mailing address and indicate your T-shirt size—unisex small, medium, large or X-large.

Address letters via company mail to Editor, *Measure*, Public Relations Department, Building 20BR, Palo Alto. Via regular postal service, the address is *Measure*, Hewlett-Packard Company 20BR, PO Box 10201, Palo Alto, CA 94303-0890 USA. Try to limit your letter to 150 words. We reserve the right to edit letters. Please sign your name and give your location. Names will be withheld on request.

LETTER FROM JOHN YOUNG

HP's president discusses the company's new "Take the Offensive" campaign for 1988.

Fiscal 1987 was a year of turning the corner. I think we can all take great pride in the financial results summarized in the table below—especially that improvement in our net profit margin. It's the best single measure of our ability to satisfy customer needs in an increasingly competitive and fast-changing marketplace.

A lot of effort by HP people stands behind these results. A lot of organizational changes. A lot of hard—and risky—decisions. A lot of investments that took courage to make. A lot of scrambling to make quota. A lot of long hours of work.

And now, after years of efforts, our program has come together nicely. We have the strongest product offering that I've ever seen in my more than 25 years with HP. Our Customer Support organization is the best in the business. Our sales team has the skill—and the will—needed to win.

And now, with a strong competitive product line, it's time to do just that. So 1988 is the year to capitalize on all the progress we've made. We're in a very strong competitive position, and there are many opportunities in the marketplace. That's the message behind the "Take the Offensive" campaign that you've been hearing about. The slogan doesn't imply that we haven't been working hard—indeed, we've been running at full speed for quite some time now. But we've had an inward bias, working to get our products and programs in place. Now's the time to turn



HP President John Young makes a point while talking with Stephen Dube of Shearson Lehman Brothers prior to the December 1987 security analysts meeting in Palo Alto.

our attention outward. We need to tell people what we've accomplished in terms of real customer needs. We need to focus on customers, on markets and on winning.

HP is on the move. And while there are always uncertainties about our business environment, I think fiscal year 1988 can be a very good year for us. The field people are being given some "stretch" objectives for their selling efforts. And to make them successful, the whole HP organization needs to get behind these efforts. The program will vary from place to place. It may mean giving that extra factory tour, doing just one more demo, or returning phone calls very promptly. Universally,

it means keeping those new products on schedule and introducing them with all the documentation, merchandising and training required to get them quickly accepted in the marketplace.

So, as much as I'd like to be able to say, "Well done for 1987. Now take a well deserved rest." I won't. Instead, my message to you is this: "Well done for 1987: I'm very proud of you. Now let's get the payoff on the investments and hard work we've all put in. Let's take the offensive and build on the momentum we've created."

Best wishes for the new year.

FY 87 Financial Results

(In millions, except profit margin)

	1987	1986	Increase
U.S. orders	\$4,262	\$3,826	11%
Orders outside U.S.	\$4,117	\$3,375	22%
Total orders	\$8,379	\$7,201	16%
Net revenue	\$8,090	\$7,102	14%
Net earnings	\$ 644	\$ 516	25%
Profit margin	8%	7.3%	

Extra



Raymond Kurzweil, left, and Stevie Wonder unveil the K250.

It's no wonder: Stevie, HP make beautiful music

Four years ago, singer-songwriter Stevie Wonder challenged artificial intelligence pioneer Raymond Kurzweil to invent an instrument that could accurately reproduce the sound of any acoustic instrument. Kurzweil already was famous for inventing the Kurzweil Reading Machine for the blind, which reads printed text aloud in a synthesized voice.

But developing a digital keyboard presented a new set of challenges. The primary question was how to recreate the sounds of more than 100 orchestral instruments—including pianos, clarinets and harps—electronically.

Kurzweil's engineering team used a series of HP 64000 development workstations to design and integrate the massive amount of information necessary to produce lifelike sounds digitally.

In 1984, exactly 300 days after first uncrating the 64000s, Kurzweil unveiled his musical masterpiece—the K250 digital keyboard. Among the satisfied customers are Stevie Wonder—who uses three K250s in his concerts—and Paul Shaffer, music director of NBC's David Letterman show.

With Kurzweil engineers and HP's 64000 in harmony, the K250 became a reality. So the next time you see Stevie Wonder playing the digital synthesizer, remember: he's playing our song.

Going for "Go" gold in Taiwan

Hey, how did Dave Fotland from HP's Cupertino, California, site, find himself in Taipei, Taiwan, last November as the handler for Shogun—the battling computerized "Go" program?

Go or Wei-Ch'i is an ancient and complex board game that has been played in China for 4,000 years. It's a mental workout in analyzing and planning. Someone has said that Go is to chess as chess is to checkers.

There's a natural relationship between the computer (based on combinations of 0 and 1) and Go, in which black and white stones are moved on a grid with thousands of options available.

Dave, an R&D project

manager for the High Performance Systems Operation, didn't get serious about the game until he joined a Go club at HP.

He's been working off and on on a computerized Go program for about five years, using different HP computers. Shogun runs on the HP 9000/840, for which Dave had been a lead hardware designer.

Putting Shogun to the test in the third annual International Wei-Ch'i Congress seemed the sporting thing to do. Computerized programs slug it out in two categories: small 9 x 9 boards and full-size 19 x 19 boards. Winning computers are matched against the human brains of young 11- and 12-year-old Taiwanese Go champions.

There's a \$1.3 million grand prize waiting for a

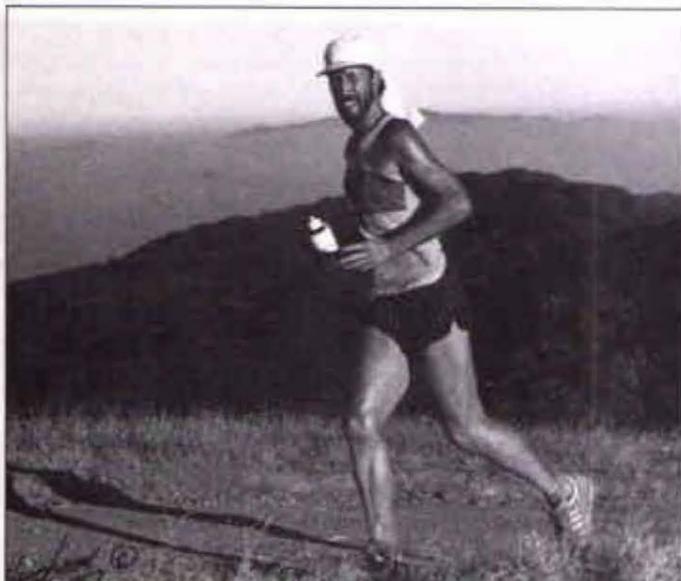


These antique shell Go stones were in use long before computers.

software program that can beat a human, but it's still unclaimed.

"The HP Taiwan sales office was great about lending me an 840 and installing it," Dave says. All other

entrants, from six countries, used PCs. Shogun tied for second place in both board categories—a strong showing for a first time in the ring.



Brian Purcell is king of the mountain among trail runners.

Running away with the title

If you think you like to run, meet Brian Purcell of the finance department at the Network Measurements Division in Santa Rosa, California.

Brian's specialty is "trail racing," a 50-mile endurance test which is roughly equivalent to running back-to-back marathon races.

He recently knocked 18 minutes off the course

record when he covered the 50-mile Ukiah, California, trail in five hours, 27 minutes—the fastest "trail 50" performance in North America in 1987.

In addition to battling 100 competitors, Brian had to conquer temperatures up to 100 degrees and mountains rising 6,000 feet from the starting line.

When it comes to trail racing, Brian has a leg up on the competition.



Computing progress in cancer care

Help for doctors treating cancer patients may be on its way. Mike Retsky, a former HP engineer in Colorado Springs, Colorado, is working on a computer program at the University of Colorado which takes in various bits of information about a specific cancer

patient's case and graphs the probable progression of the disease.

The program is based on a mathematical model of cancer that Mike is developing. If the model is proven accurate, the program could allow doctors to predict the effectiveness of different cancer treatments such as radiation or chemotherapy.

Extra

BOTTOM LINE

Hewlett-Packard reported an 18 percent increase in net revenue and a 39 percent increase in net earnings for the fourth quarter of the 1987 fiscal year which ended October 31, compared with the year-ago quarter. (See page 18 for results of 1987 compared with 1986.)

For the fourth quarter, net revenue totaled \$2.279 billion, compared with \$1.933 billion for the year-ago quarter. Net earnings amounted to \$218 million, equal to 85 cents per share on approximately 257 million shares of common stock outstanding, up from net earnings of \$157 million or 62 cents per share in the fourth quarter of 1986 on 256 million shares. Incoming orders were \$2.133 billion, up from \$1.912 billion in the year-ago quarter.

CHART CHANGES

European Field Operations has announced a new European Multi-country Region, headquartered in Geneva. It combines the former Northern European Sales Region and the South East Sales Region. General manager of the new region is **Laszlo Szegedi**.

HP Labs has reorganized its five former research centers into three: the Computer Systems Center (acting director, **Frank Carrubba**), the Measurement and Manu-

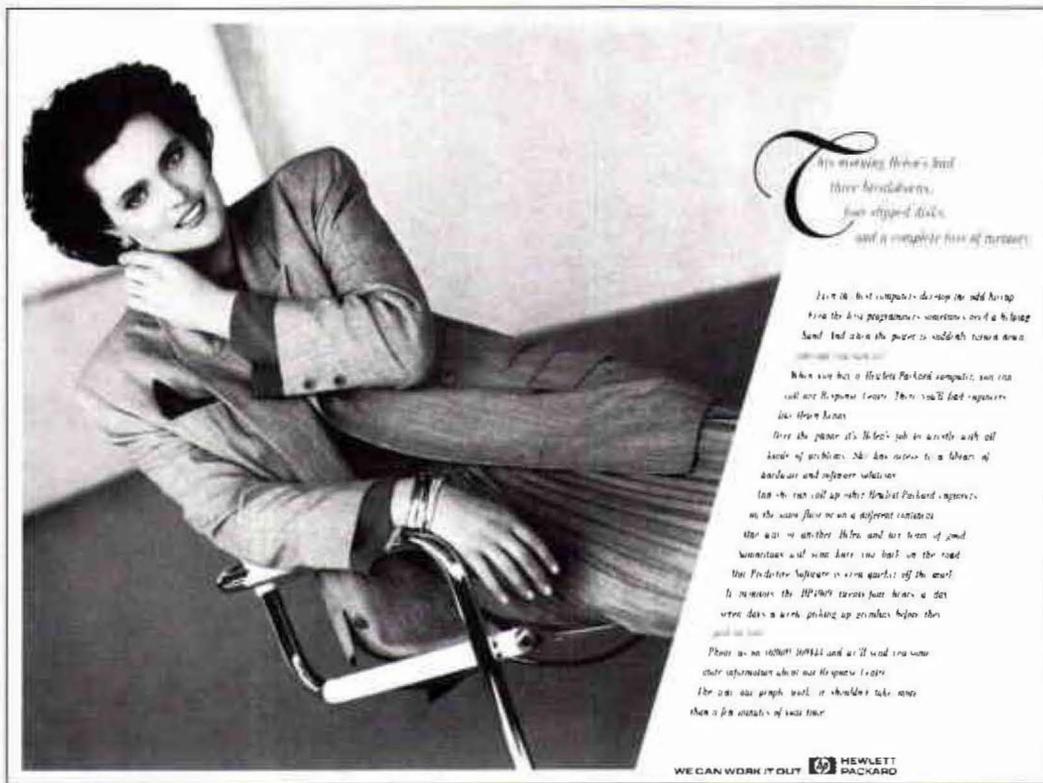
facturing Center under **Peter Will** as director, and the Information Systems Center (formerly the Bristol Research Center in England) under **John Taylor** as director.

Change in the former Major Accounts Marketing organization: Senior VP **Al Oliverio** has been named GM of Federal Systems Operations.

New entities: The Commercial Systems Division in Cupertino, California, under **Nancy Anderson** as GM (Commercial Systems Group). . . the Electronic Design Division in Fort Collins, Colorado, under **Bob Waites** as GM incorporates three former entities: the Fort Collins Engineering Operation, the Logic Design Operation and the Salt Lake City Operation (the Engineering and Manufacturing Systems Group). . . the Singapore Networks Operation under **Dominic Orr** (Information Networks Group).

The new Information Software Division under **Jay Richards** as GM has formed three new operations: the HP-UX System Operation under **Sandy Chumbley** (which absorbs the former Systems Software Operation), the MPE System Operation under **Mike Hetrick**, and the Evaluation and Architecture Operation under **Herb Blomquist** (Information Technology Group).

The Corvallis Workstation Operation is now part of the Information Systems Group.



Helen Feber, model for a day, and...

*This morning Helen's had
three breakdowns,
two slipped disks,
and a complete loss of memory.*

*Even the best computers develop the odd hiccup
from the time programmers commission one of a kind
Send. And when the power is suddenly turned down
... ..*

*When you buy a Hewlett-Packard computer, you can
call our Response Centre. There you'll find engineers
like Helen Feber.*

*Here the power it's Helen's job to wrestle with all
kinds of problems. She has access to a library of
hardware and software solutions
that she can call up when Hewlett-Packard engineers
on the same floor see in a different context
the way to another Helen and her team of good
inventors will save her the last on the road.
The Problem Solver is even quicker off the wall.
It means the HP 1000 series just here, a day
when days a week, picking up products before they
get too late.*

*Please call us 10000 109822 and as I'll send you some
clear information about our Response Centre.
The only way people feel, it shouldn't take more
than a few minutes of your time.*

WE CAN WORK IT OUT  HEWLETT
PACKARD



... computer engineer.

Model behavior

"This morning Helen's had three breakdowns, four slipped disks and a complete loss of memory," begins an HP Response Centre advertisement prepared for publications in the U.K.

After all of that, is it any wonder Helen doesn't look like herself? The truth is, the two pictures are of the same Helen Feber, an HP computer engineer at the Response Centre in Winnersh, England, who posed for the day as a photographic model.

A skeptical writer for the *London Daily Telegraph* thought Helen looked too good to be a computer whiz and visited the centre to find out for herself.

Not only does Helen know HP products and how to unravel user questions, she "spends some of her spare time lecturing schoolgirls on engineering as a career," the *Telegraph's* Margot Norman wrote.

A commercial success

It was the "What if. . ." tag line at the end of the commercial which first caught Bryan Branson's eye.

"I was thrilled because I've seen other advertisements captioned, but not HP's," says Bryan, an administrative support worker in Spokane Division's finance department, who is hearing impaired.

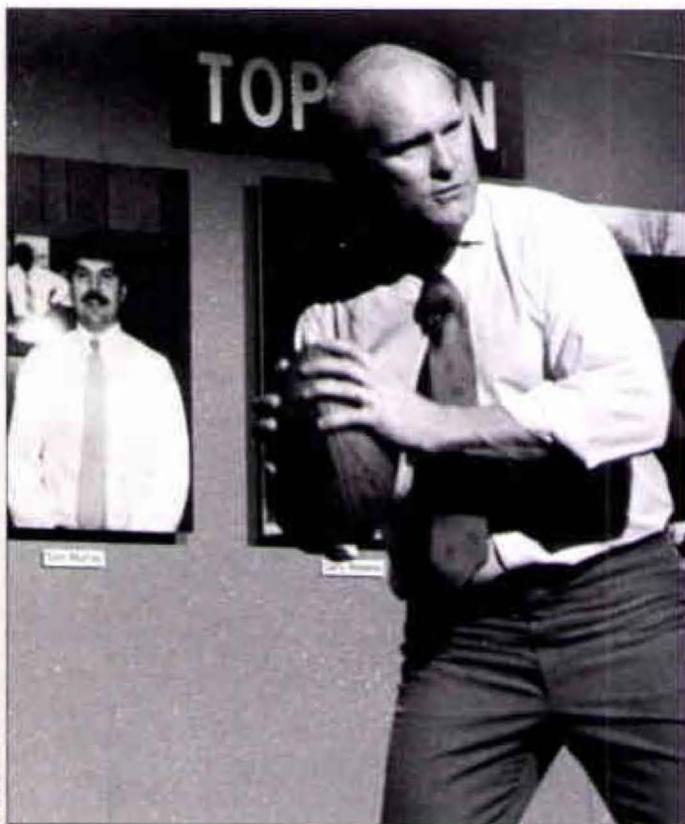
"The closed-captioned commercials gave me a sense of pride because HP recognizes the hearing impaired population," Bryan adds.

HP first began using closed captions in its commercials in 1983 and has used them since. Closed

captions are words (decoded by a black box) at the bottom of a TV screen which enable hearing-impaired people to read what is being spoken.

"I hope more hearing-impaired people will enhance their reading skills by watching more closed-captioned programming," says Bryan, "and it's a good feeling to know that my company is helping."





GERALD THORVA

Terry Bradshaw shows HP sales reps how to take the offensive.

Taking the offensive against DEC and IBM

HP kicked off an aggressive new sales strategy for 1988 when nearly 1,200 U.S. and Canadian sales reps attended a commercial sales conference in Santa Clara, California, in November.

The conference was tied to a football theme and attendees were encouraged to "Take the Offensive" against HP's competition—DEC and IBM in particular—with systems and solutions designed to beat the opponents at their own game.

HP's all-out blitz carried a clear challenge: Just try to beat HP on price, performance, reliability, easy-to-use integrated workstations and multi-vendor connectivity.

To build team unity and help get sales reps in the

football spirit, the conference included a *Monday Night Football* tailgate party, a motivational address by famed sports psychologist Dr. Tom Tutko, comments by HP President John Young and other company executives, free football movies piped in to attendees' hotel rooms and a keynote speech by Terry Bradshaw, retired quarterback from the National Football League's Pittsburgh Steelers—the only quarterback to win four Super Bowls.

HP's strong lineup for 1988 includes the HP 3000 Series 930 and 950, NewWave office application environment, PC workstations and portables, networking and peripherals.

It's a whole new ballgame in '88 as HP's sales reps "Take the Offensive" against major competitors. Here's hoping it's a championship season.

Extra

PULLING TOGETHER

In the Personal Computer Group, the Roseville Terminals Division will be the U.S. manufacturing center for all portable, desktop and desktide PCs.

The Corvallis Division (a new name for the Portable Computer Division) will now focus entirely on handheld computers and calculators. The former Handheld Computer and Calculator Operation has been folded into the division.

In France, manufacturing activities of the Lyon Manufacturing Systems Operation and the Grenoble Networks Division have been merged into a new French Manufacturing Operation (FMO) under **Jacques Ferdane**. It reports to the Computer Manufacturing Division.

NEW HATS

Philip Yu to GM of China Hewlett-Packard. . . **Pierre Patkay** to GM, Manufacturing Productivity Division. . . **Webb McKinney** to GM, Personal Software Division. . . **André Breukels** to director of Personnel, Europe.

In the French Region, **Alain Couder** adds a hat as manager for the French Industrial Sites. **Jacques Clay** to GM, Grenoble Personal Computer Division.

Jerry Harmon to operations manager of the Colorado Computer Manufacturing Operation. . . **Soo Kok Leng** to operations manager, Integrated Circuits Singapore.

NEW PRODUCTS

The HP NewWave applications environment from the Information Systems Group lets personal computer users use information from different files within a computer network to create a document. Routine reports can be automated. . . From the Advanced Manufacturing Systems Operation comes the HP ATS 2000 automatic test system which includes a mass-interconnect mechanism.

The Vancouver Division's HP RuggedWriter 480 printer is among the fastest dot-matrix printers in the 24-wire class. . . Disc Memory Division's personal disc drive (HP 9153C) and HP 19514A mass-storage cabinet with up to 4.5 Gbytes of storage in tight space.

Colorado Telecom's HP 4954A protocol analyzer joins a family of disc-based analyzers for network testing. . . The HP 4195A from YHP Instruments Division provides vector network and spectrum measurements in one unit—an HP first. . . The Santa Clara Division's HP 5371A frequency and time-interval analyzer has a high-speed time-sampling capability—believed to be a first.

Two new high-end graphics workstations (HP 9000/330 CHX and 350CHX) and an add-on HP 98556A 2D graphics accelerator, all from the Technical Computer Group, give HP a broader range of graphics systems and capabilities than any competitor.



BETTY GERARD

MRIC's David Shaw, Ted Kendall, Steve Bernstein and Theartris Ervin.

How's business in sonites and vodites?

From March through July 1987, a brainy team from HP's Market Research and Information Center (MRIC) competed in the 1987 U.S. Markstrat Competition sponsored by *The Economist* magazine. It pitted 15 teams in a marketing-operations simulation game that involves running a fictional company which makes "sonites" and "vodites."

The HP team (David Shaw, Steve Bernstein, Lindy Lopez, Dave Welch, Ted Kendall and Theartris Ervin) came in first in its category of five teams and second overall.

Players were given a "budget" to work with and a choice of allocating money to market research, R&D and the sales force. For seven periods—each representing a year of operations—they made management decisions, then learned from competition headquarters how well they did. Success showed up in getting a larger operating budget for the next period.

"In the beginning we had \$7 million to spend, which didn't give us much money to start new products," reports Steve Bernstein. "We ran it up to a \$20 million budget by the end." Naturally, the MRIC team attributes its win to market research.



RANDALL PHOTOGRAPHY

Allen Johnsen and Peggy Clark strike a championship pose.

Rock and roller skate

Combine the grace of ballroom dancing with the athletic ability of skating and you begin to appreciate the accomplishments of Allen Johnsen, a technician at the Information Technology Group's engineering services department in Cupertino, California.

Allen and partner Peggy Clark recently won the National Masters (over 45)

Dance Title in roller skating at Lincoln, Nebraska, beating two dozen teams from across the U.S.

"It was a matter of superior knowledge and skill," says Allen, a skater since he was 18. "Peggy and I practice about 10 hours a week, and the national title makes it all worthwhile."



As both of you know, bio-engineering is becoming a rather sensitive issue.

PARTING SHOT

A triple play—twice

"We felt like lottery winners," says Bill Lund, project manager at the Information Networks Division's data communications lab in Cupertino, California.

The cause for celebration? The birth of their first child. And their second child. And their third child—all on May 23, 1987.

Triplets Elisabeth, Patricia and Annemarie meant instant family for Bill and wife Eileen.

How the Lunds handled the financial adjustment of the triplets was the basis of a November 1987 story in *Money* magazine. While triplets mean three times the orthodontist's bills, three colleges and three weddings, the rarity also had its benefits. The Lunds received several hundred dollars' worth of free baby formula, vitamins and disposable diapers. The couple's co-workers chipped in with a cash gift, and friends and relatives provided enough baby clothes to carry the triplets through their first year.

The HP insurance plan covered the girls' medical costs, including \$8,000 for eye surgery on Elisabeth. Beginning with prenatal care, HP insurance has paid about \$250,000, Bill says.



Triplets Elisabeth, Patricia and Annemarie Lund leave a 2 a.m. wake-up call each morning for dad, Bill.

"It was interesting to see how much of HP's medical equipment was being used at Stanford Hospital, one of the best intensive care nurseries in the country.

"In addition to prenatal fetal monitoring instruments—which helped save Annemarie's life—the girls were surrounded by heart rate, blood pressure, breathing monitors and other HP equipment."

Although they haven't reached their first birthday, the triplets already have established personalities.

"Annemarie wants to crawl, Elisabeth wants to talk and Patricia smiles and socializes all the time," says Bill. "It's amazing."

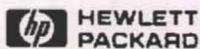
The story of the Lund triplets doesn't end there. Believe it or not, Bill and Eileen Lund's triplets are the second set of Lund

triplets in HP.

On December 27, 1985, Mark and Natalie Lund became the proud parents of Eric, Bryan and Jeffrey Mark, an R&D engineer at the Vancouver (Washington) Division, and Bill are unrelated.

"When I heard about Bill, I called him with one piece of reassurance," says Mark. "I told him that he *will* survive the first six months."

MOVED LATELY? CHANGE OF ADDRESS SHOULD BE REPORTED TO YOUR PERSONNEL DEPARTMENT.



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