MEASURE

For the people of Hewlett-Packard

July–August 1980

RADICAL CHANGE?

Maybe not, but getting there from here is going to take more than tradition.

If it isn't HP, Phil Engelhardt isn't interested

Things you auto know about GM & HP

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MEASURE

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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 84,000 people worldwide.

CHANGES?

Flexibility is a word you're going to hear a lot about. Promise.

Hewlett-Packard has a problem.

The work force is out of balance. In some divisions, the company has too many employees in particular job categories. In others, there is a need for more employees to keep up with orders. And overall, the company has too many people with certain job skills and not enough with skills that are becoming increasingly important.

People, such as Bob Schaak, are helping to solve the problem. Bob used to be production supervisor in wafer fabrication at the Cupertino Integrated Circuit Division (CID). Since May 1985, when it was announced that CID production was to be consolidated with other IC production in the company, Bob has worked in Cupertino site administrative services.

He says his initial options were to relocate from the Bay Area to another production job, to quickly become an engineer or to switch careers entirely.

Choosing the last option, he started his new career as mail room supervisor. In the year since, he's received many additional responsibilities and now works as Cupertino site services materials distribution manager. In this capacity, he is responsible for the mail room, site services receiving, the office supply stock room, office supply desk-top delivery and off-site building support.

In the past year, Bob has added many former CID production workers to his staff. "Production people generally have skills that fit nicely into administrative services. They're skilled at data entry and have excellent attendance records. They're organized and focused about their work. As production people, they didn't spend a lot of time in meetings or discussing how things would get done. They're used to tight schedules and

working as part of the team to get the job done.

"Moving to administrative services is a real natural move," Bob says. "With skills like that, no special training is needed. The success I've had this year is because of these people.

"There have been lots of changes this year for me, but I'd have to say I feel happy about them. I feel like my opportunities are wide open. Like most people, once I landed in this new job, I was happy. The service industry is *the* growing industry."

Lending a hand

Loveland's Barbara Stolz went to even greater lengths—literally. She took a temporary assignment in Roseville, California, leaving her Loveland, Colorado, home for two months.

She's worked for seven years in the clean room at Loveland Tech Center, in the fine-line area in masking. She has also been cross-trained to work in ceramics.

In Roseville, she loaded circuit boards, picking up new skills and learning to work with new equipment in the process. Barbara volunteered for the California tour of duty when her supervisor made the offer.

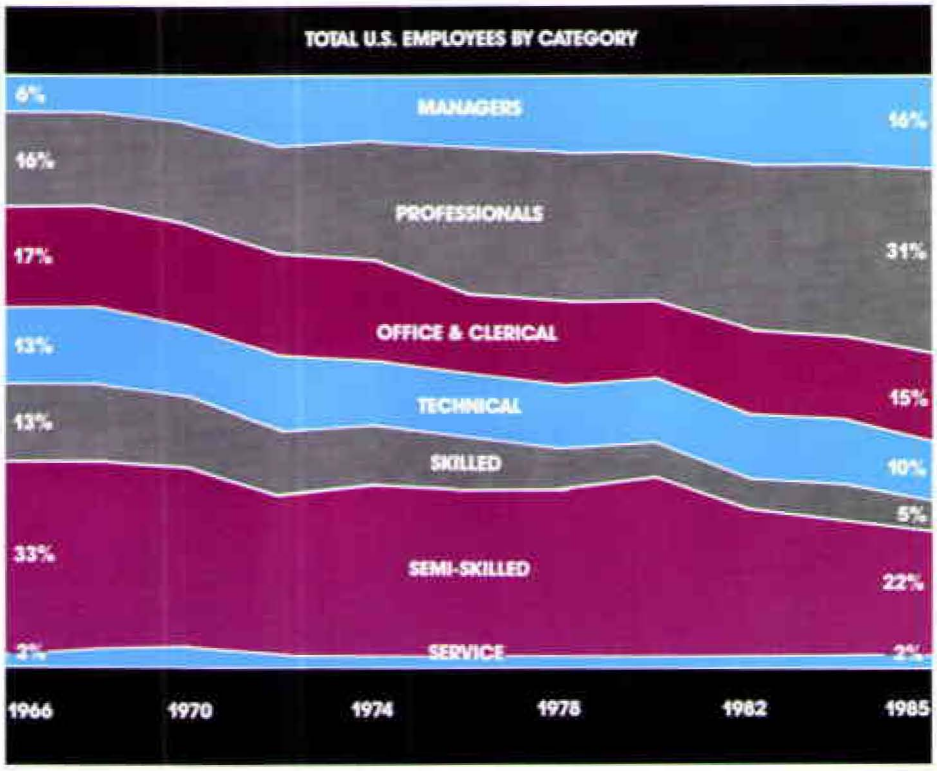
She says she enjoyed the experience and was glad to be able to help out. The company provided transportation, a furnished apartment and some money for food during the two-month stay.

"I feel I was fortunate to go. The people in Roseville were absolutely wonderful and made us feel so welcome when we got there. They were very helpful. I didn't once think 'Oh, why did I decide to do this? What am I doing out here?' It was a good experience for me."

Silkscreener Steve Shin is another employee who has helped to solve the problem. Steve, who works in the Spokane Division fab shop, has taken temporary assignments in other areas of the division, such as stores, incoming inspections, facilities and other areas of the fab shop.

"I need a job so it doesn't matter much what it is," says Steve. "Each job is a little different, each day is different. I enjoy the experience, but I would prefer to work longer in each job."

He admits he's anxious about his future. "I think, 'This morning, what kind of job? Today? Tomorrow? What kind of job?' Sometimes I'm feeling bad. But I'm a hard worker and if a supervisor wants me, I'm going."



The number of U.S. employees in each HP job category changed dramatically between 1966 and 1985 (except for the number of service employees, which has remained constant).

The Personal Computer Distribution Operation (PCDO) experienced a different situation. Hiring controls and mandatory time-off last fall were making it difficult to fill orders coming in. In a true HP spirit of teamwork, PCDO employees pitched in to learn new jobs to help meet the highest-ever shipping goals.

Steve Hams, then-personnel manager, lent a hand in data entry and shipping. Ana Clark, secretary to the operations manager, worked in the warehouse.

In addition, employees arrived from other divisions. The Santa Clara Division loaned Nilza Velasquez, who loads printed circuit boards. "In my time at PCDO," says Nilza, "I learned four new jobs. I am now 'superwoman.'"

Material handler and journeyman painter Steve Linebaugh stayed at PCDO, after transferring in from Data Systems Division to help out during the crunch.

On the move

These are just a very few examples of many hundreds of stories that have unfolded within the company the past year. Some Stanford Park Division employees bus daily to help out at Rohnert Park. About 95 Loveland Instrument Division employees have accepted temporary or permanent jobs in Roseville, Boise, Lake Stevens, San Diego and Colorado Springs. Some employees from the Santa Clara Division are working in Cupertino. A whole line from the Vancouver Division moved to the San Diego Division for six months.

All of these employees have become flexible about their jobs, working where needed and learning new skills along the way. They may not be wildly enthusiastic about the changes, but they understand the necessity.

Rebalancing HP's human resources is one of the most significant issues the company now faces, says Pete Peterson, manager of corporate personnel operations. And it may remain so through the rest of the decade.

The imbalance is not a cyclical, short-term problem that will disappear by riding it out with controls such as hiring freezes or mandatory time off, says Pete.

It's more serious this time.

Human resource balancing problems are not unique to Hewlett-Packard or the electronics industry. Indeed, many industries face the same situation.

What *does* differ from many companies is how HP is addressing such problems.

Some companies pass out layoff notices, close unprofitable operations and then consider the problem solved. HP is going about it differently by

SHARON HALL

Ana Clark, secretary to the operations manager in the Personal Computer Distribution Operation, learned warehouse duties to help PCDO meet shipping goals last fall.

placing the emphasis on people and working toward long-term solutions, not quick fixes.

Immediately following this year's management meeting in Silverado, California, Pete Peterson and Jennifer Koneeny, human resource planning manager, began coordinating the many retraining and rebalancing efforts and studies that were already going on throughout the company. Countless hours have gone into pulling this information together and providing an overall direction for the company.

These work-force studies resulted in two programs announced June 12. The first offers the opportunity to retire early, with a cash incentive for doing so, for those employees age 55 and older with at least 15 years of service. About 1,800 employees are eligible for this one-time incentive.

At the same time, 21 U.S. entities will be permitted to offer a voluntary severance incentive to employees in specified job categories. This offer will be made only in places where there are more people than needed for current and long-term staffing requirements—and where other alternatives, such as short-term loans of employees to other divisions, will not solve the problem.

The emphasis in both of these programs is "voluntary." Dean Morton, executive vice president and chief operating officer, says, "We want to give the HP people who are eligible the chance to decide for themselves whether to take part. We've been trying to solve this problem with a lot of help from HP people who have willingly shifted jobs and made other accommodations. But the time has come to take additional steps that we believe are necessary.

The reasons for change

The environment HP operates in has changed in many fundamental and profound ways, including:

- Customer needs have changed. An increasing part of the value we provide is software rather than hardware. Service, support and training now represent one-sixth of our total revenues. Electronic products now are so commonplace that many of them have taken on the characteristics of consumer products, where price is an overriding factor in buying decisions.
- There's an overcapacity in the electronics industry. When sales boomed in 1984, many companies added capacity—each firm expecting to gain a share of the market. Their aggregate expectations added up to more than 100 percent of the market—more capacity than actual or likely demand.
- Almost every country in the world would love its own electronics industry. To encourage such growth, governments often write procurement legislation that urges firms to buy from local electronics companies. Besides adding to worldwide overcapacity, non-U.S. firms—including new powerhouses such as Korea and China—often receive cost breaks from tax and export incentives. They also have the advantages of lower wage rates and capital costs. So, HP faces competitors who can sell at lower prices.
- HP is strongly affected by fluctuations in currency values. For example, the rise in the dollar's strength raised HP prices in Europe about 50 percent from 1980 to 1986. By shifting more of our value added (manufacturing, R&D and procurement) to our international markets, we make ourselves less vulnerable to such changes in currency values.
- Excellent technology—subassemblies, IC, printed circuit boards—is increasingly available outside of HP, often at lower costs than within HP because of the growing importance of scale economies in every area. For example, we can serve customers better by purchasing preformed plastic moldings for some of our products instead of fabricating our own metal containers.
- Low-cost, high-volume production methods are essential. The company has to constantly try to leverage our investments in expensive production equipment and to reap the economies of scale.
- The electronics industry now is a major part of capital spending by other industries in the U.S. When growth slows in those other industries, be it automobiles, oil or refrigerators, electronics companies feel the same pinch.

Spokane Division silkscreener Steve Shin has been assigned jobs in a variety of areas, including stores, incoming inspection, facilities and several parts of the fab shop.

but also entirely voluntary, providing attractive benefits to those who wish to participate."

HP will provide a financial counseling benefit for those who choose early retirement and make available counseling in interviewing skills and resume writing for those who choose voluntary severance.

Employees who volunteer for these programs will leave HP between July 10 and October 31 of this year.

Apart from these two options, the company will step up efforts to retrain employees for new careers within the company. And programs such as the Temporary Employee Move Project (TEMP) and Distribution of Work Force (DOWF) will be offered as needed.

Teresa Roche, in corporate personnel's human resource planning group, has pulled together a pilot employee retraining program for the Bay Area, which will be applicable companywide if successful.

The program is available to nonexempt employees and allows them to be retrained for much-needed jobs such as EDP support, computer operators, administrative and telemarketing support, secretaries and coordinators in the field and factories.

Employees chosen will enroll in a three-month program, with classes at HP and a local community college.

"This is a new environment," says Pete Peterson. "Even though our record at HP is excellent, no company can guarantee job security. People can't expect to be hired to do one job for their entire career. It's a cliché, but a true one: The only thing constant is change."

One thing is clear. Job flexibility is tied to job stability. While employment security was and is one of HP's corporate objectives, it does not mean an employee signs on for life at HP at one job or in one geographic location.

Profound change

Many employees will be expected to change skill sets during their HP careers. There is a shift toward professional, administrative and managerial jobs, and away from skilled and semiskilled job classes. More software skills are needed (see story page 12).

Lew Platt, senior vice president of the Manufacturing, Medical and Analytical Systems sector, recently told a group of personnel managers, "This is scary to people because this is the most profound change the company has experienced during its existence."

One thing these changes mean, Lew said, is that people policies and business policies must be weighed equally in the decision-making process. "And that makes people around here uneasy. People have this idea that the HP way is something set in concrete, something you can easily define. I don't believe Bill and Dave ever meant it to be that way. When they retired, everyone rushed to set it down in writing, afraid that it would walk out the door with them. But if you asked them, they'd tell you it was meant to be constantly growing and changing."

This certainly isn't the first time the company has faced serious problems. But previously, problems were directly related to order rates declining. In early 1970, ability to produce exceeded order rates by 10 percent. Instead of laying off 10 percent of the work force, employees were asked to take every other Friday off without pay. Using that program, along with attrition and internal transfers, production and orders were balanced by the end of the year.

That approach worked then to balance the work force to combat a surprise recession. The company used a similar approach again last year and it helped HP survive the most recent high-tech slump.

But it wasn't enough.

Achieving HP's strategic goals will mean changing the way we have comfortably done business. But it will also move the company into the future in a good, competitive position.

John Young addresses how these changes will affect HP employees in his message on page 18 of this issue. As a prelude, it's interesting to look back at one of his messages from 1984.

In his March-April 1984 *Measure* message, John said, "A major concern at the 1960 management meeting was how the HP way would survive our growth in the sixties." At that time HP employed 2,378 people and had $66.5 million in sales.

John concluded that message with these words: "The HP way is not something created by a few, but is the aggregate result of countless individual actions and attitudes of each and every member of this organization. . . . You're part of it. So, in response to the question of whether the HP way will survive in the years ahead, my response is this: It depends. It depends on all of us. It's a responsibility to be shared by all." **M**

—Jean Burke

YOURTURN

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

Do you "c" the logic?

I am intrigued by HP's spelling of the word "disc" with a "c" when other companies and organizations use "disk."

Perhaps there is an interesting piece of HP history related to our choice to be different (maybe even right!) in this word spelling and to stay that way. Can *Measure* find a rhyme or reason for HP's usage?

NORM HALL
Colorado Springs

The folks at Boise's Disc Memory Division referred us to a 1977 article in Computerworld *magazine that addresses your question. It says the story goes much further back than HP history, to the time of the Roman empire. The Romans, in adapting the Greek alphabet for their use, created the "K-C" controversy. Since English borrows freely from both Greek and Latin, we've got the same quandary. "Sometimes we use them interchangeably, as in disc and disk. More often we're so indecisive that we play it safe and combine them, such as in pick, trick, lick and kick," the article states.*

Since the definition of disc is a phonograph record, which connotes storage of information, this seems to be the preferred spelling for the computer industry. The article stated, "Computer-oriented magazines, glossaries, standards and dictionaries evidently prefer 'disc;' more general technological sources, including computer-oriented companies, prefer 'disk.'"

What if we showed them our solutions?

I applaud *Measure's* coverage of both the solutions provided by HP's products on one hand and the diverse personal avocations of HP's employees on the other. HP's advertisers, however, confuse these two ideas, selling HP products by showing a bit of yuppie leg and hiding the solutions under nebulous and unresolved claims of "What if?" Why not create ads describing teddy bear inventory control, the Oakland Fire Department, the scientist with the penguins and the HP PORTABLE applications from the Grateful Dead to the Serengeti? Anybody can claim to have solutions. HP has them to show.

SUSAN CARDWELL
Waltham

Creativity, initiative: the wrong message?

Your article on creativity in the March-April issue was thought-provoking and well done. It was also very relevant to our environment because HP depends so much on the creative juices of its people. The article posed a good question: "Can creativity be inspired in the corporate environment?" However, citing Roger von Oech's recommendation was poor timing because he suggests doing what we have just undone, namely adding creativity requirements to job descriptions.

Where creativity once warranted a spot on HP's performance evaluation form all by itself, it now is hidden in the "initiative" category. I think this gives people the wrong message. Too bad the performance evaluation task force didn't have the opportunity to read your excellent article before making this change.

FRANK BARSOTTI
Everett, Washington

The new performance evaluation forms resulted from many months of discussion with managers from all functions and all levels of the organization, every one of whom had individual preferences on what performance factors should be included. Emphasis was given to factors that were measurable, would apply to the broadest base of employees and were easily interpreted by all evaluating managers.

This task force felt that creativity, rather than a stand-alone performance criterion, would be better recognized by an evaluating manager wherever it applied. . . in terms of results. Creativity is more a means than an end. For example, a manager could recognize creativity by mentioning it in performance factors such as quality, productivity and customer satisfaction. In particular, it could be mentioned in comments under the "performance summary" narrative. Moreover, this method of handling creativity is an important element in the performance evaluation workshop that all managers attend.

We continue to value creativity very highly at HP and there was no intention to discount this attribute.

The current performance evaluation program is designed to meet present needs. Review and change is the natural process we use to keep these programs current and up to date. The comments we've received regarding the new forms will be used when the present program is reviewed in the future.

JOHN FLAHERTY
Manager, Human Resource Programs
Corporate Personnel
Palo Alto

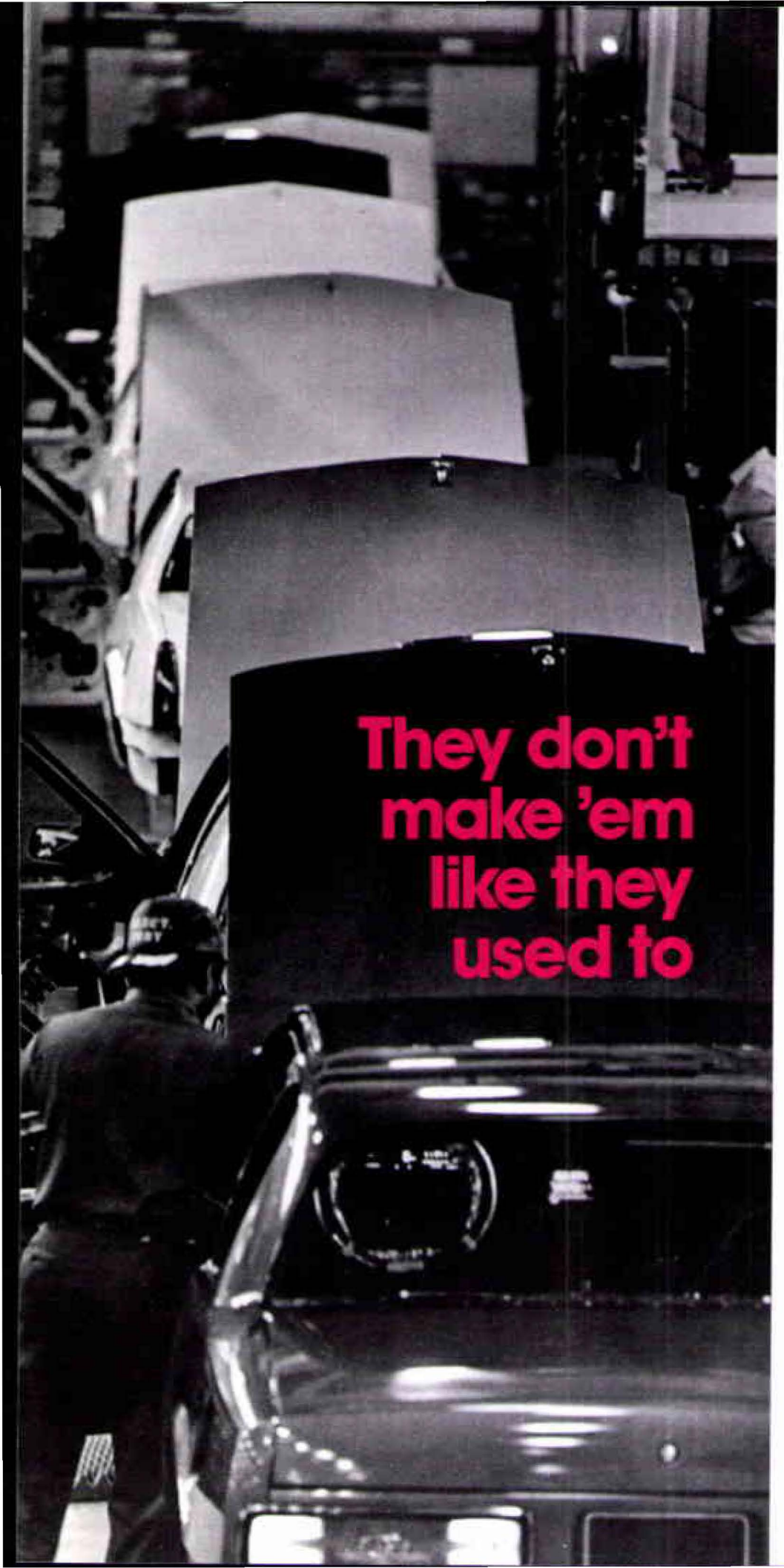
Please send mail

What public issues affect HP people and their jobs? Do you disagree with something you've read in *Measure*?

Send us your thoughts. We want to share your opinions and comments with more than 84,000 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 extra-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 10301, Palo Alto, CA 94303-0890. Try to limit your letter to 200 words. Please sign your letter and give your location. Names will be withheld on request.



They don't make 'em like they used to

A short distance from the Highland Park plant where Henry Ford built his first movable assembly line, General Motors automotive engineers still tinker with new ways to install rear axle bushings. Only now, they "tweak" these rear axle fittings by pounding on a computer keyboard instead of clubbing them with a rubber mallet.

GM designed Hamtramck (pronounced Ham-TRAM-ick), the first automobile plant built in the Motor City since 1928, as a showplace for industrial technology. The $500 million assembly plant is on Detroit's east side.

The assembly plant, miles of aisles under 77 acres of ribbon steel, contains 260 robots for welding, painting and assembling automobiles, hundreds of high-tech cameras for measuring the fit of body panels, and 50 automated pallets for moving parts from the storage area to the production line.

Computer screens illuminate nearly every work station along Hamtramck's 21-mile production line.

An HP 1000 computer in the body shop measures the fit of an automobile frame to four-hundreths of an inch.

Scores of HP 1000 computers in the assembly area control an electrical test system that checks the on-board computers and electrical wiring of each Buick Riviera, Oldsmobile Toronado, Cadillac Eldorado and Seville that moves down the production line.

GM, a leader in computer integrated manufacturing (CIM), is gearing up the Hamtramck assembly plant to weld, paint and assemble these four luxury automobiles on the same production line at mass-production speeds. Currently, Hamtramck produces a total of 40 Rivieras, Toronados, Sevilles and Eldorados per hour. Lynn Minger, plant manager, hoped to boost line-speed to full production—60 cars per hour—by July.

"The Buick, Oldsmobile, Cadillac-Hamtramck Assembly Center is involved in a technology leap of considerable significance," says Lynn. "Our achievements and the success of computer integrated manufacturing are keyed to the long-term success of the American automobile industry."

Thirty IBM and DEC mainframe computers direct production at Hamtramck. These computers store all the

PHOTOS BY JOHN FERMANIS

An HP 1000 computer controls a coordinate measuring machine that fits a car door to its frame. The electronic equipment helps keep tolerances within a millimeter of perfection.

A computer-controlled robot arm applies sealant to a Buick Riviera's window.

information that 4,900 hourly workers and their high-tech automatons need to build GM luxury automobiles.

"When a mainframe computer at Hamtramck receives an order for a Riviera, the computer sends the Buick's design specifications to the body shop, the paint shop and the assembly line," says Rick Brown, HP customer engineer for the project at Hamtramck.

"Before the Riviera frame enters Robotgate," Rick says, "a small black transponder is placed on the frame's front end. The transponder sends out a radio signal that is picked up by electronic receivers located on the factory floor. The receiver transmits a message to a mainframe computer, which relays the information back to a robot."

At Robotgate, where 10 robots apply 80 welds in 27 seconds, the essential information is the make of the car. Farther down the production line, a robot asks where to apply body sealant and another robot asks what color to paint the frame.

"A frame with a door panel 'out of spec' goes to a room where it is matched up against the Master Cube, a perfectly fitted frame of one of the four models made at Hamtramck," says Rick. Here, an HP 1000 computer compares dimensions of the Riviera, for example, to the master frame.

At the paint shop, the production line splits, directing the Riviera frame into an unmanned booth. There, robots apply two coats of base paint and two coats of clear enamel.

The body and paint shops at Hamtramck are almost fully automated.

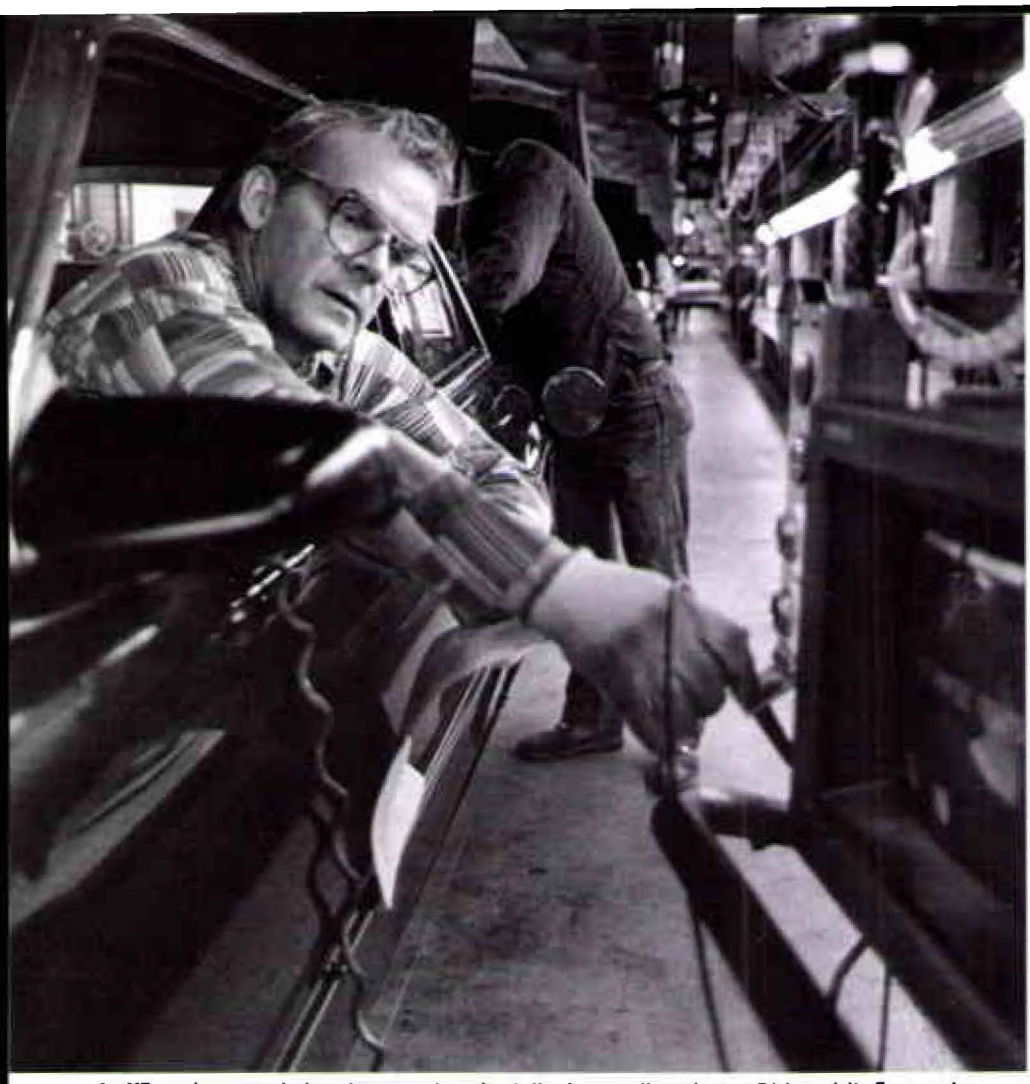
David Little, staff engineer at the General Motors Design Center in Warren, Michigan, estimates that 20 percent of the cost of manufacturing a GM automobile in 1990 will be electronic parts. "Luxury cars with more options will have a greater percentage of electronic parts," he says.

GM placed its first computer-controlled engine in 1978 Oldsmobiles to comply with the federal clean-air standards. The 1987 Oldsmobiles, Cadillacs and Buicks manufactured at Hamtramck have five or six on-board computers. These computers control everything from fuel injection to options such as air conditioning and engine diagnostics that appear on the Riviera's on-board computer screen.

HP's Advanced Manufacturing Systems Operation (AMSO) designed, built and now supports the electrical test system that checks the on-board computers and wiring of these luxury autos at nearly every step in their assembly. "HP 1000 Series A600 computers gathered in eight locations along the assembly line help workers inspect and install the instrument panel, steering column, engine and wiring of automobiles," says HP's Dan Meitus, plant supervisor for the GM30 project.

"An A600 also controls the electronic treadmill that tests cars as they roll off the production line," says Dan. "HP's test system measures everything from the number of amps drawn from the battery when an assembler 'rolls up' the window to the accuracy of instrument gauges during the 'test spin.' "

When the automobile frame emerges from the paint shop, Dan says, an assembler attaches a sheet of paper with a data processing number on it. The number identifies each automobile part to the line workers and a plant mainframe computer. Each part has a bar-code number which also identifies



An HP custom-made touchscreen terminal displays options for an Oldsmobile Toronado being built at GM's ultra-modern Hamtramck assembly plant on Detroit's east side.

Power trains meet auto frames under the watchful eye of a General Motors worker.

it to the computer.

The assembly worker can either match up the numbers or read the bar code with a bar code reader developed by HP's calculator division in Corvallis. When the number or bar code for a part and the frame agree, the assembler touches "OK" on a CRT screen supplied to GM by HP's Roseville Terminals Division. When the number or bar code do not agree, the worker alerts the mainframe computer that controls production and a new set of options appears on the screen.

Farther down the line, assembly workers install the computer that controls the Riviera's on-board computer screen. Once installed, the mainframe sends data that describes one of six optional radios available on that model to the HP 1000. The HP 1000 computer loads the optional equipment data into a computer chip that controls the Riviera's screen displaying the features of the options selected. Similarly, the HP 1000 computer passes the whole range of electronic features to each model made at Hamtramck.

"The 52 HP 1000 computers on the plant floor are linked to two A600 computers in a data center and an A900 on the plant mezzanine with 30 miles of fiber-optic cable supplied by HP's Optoelectronics Division in San Jose," says Don Walterman, another HP customer engineer at GM. "GM plans to use the A900 to track the quality of each part that goes into the automobile."

The A600 relays the test information to the other HP 1000 computers on the plant floor.

John Wilson, a senior tooling engineer for GM at Hamtramck, says, "The electrical test system locates faulty electronic equipment before the assembly worker installs it in the automobile.

"The test system also allows us to tune the production line," John says. "As we collect data on all automobiles that we produce here, we can demand parts from our suppliers that meet tighter and tighter design specifications.

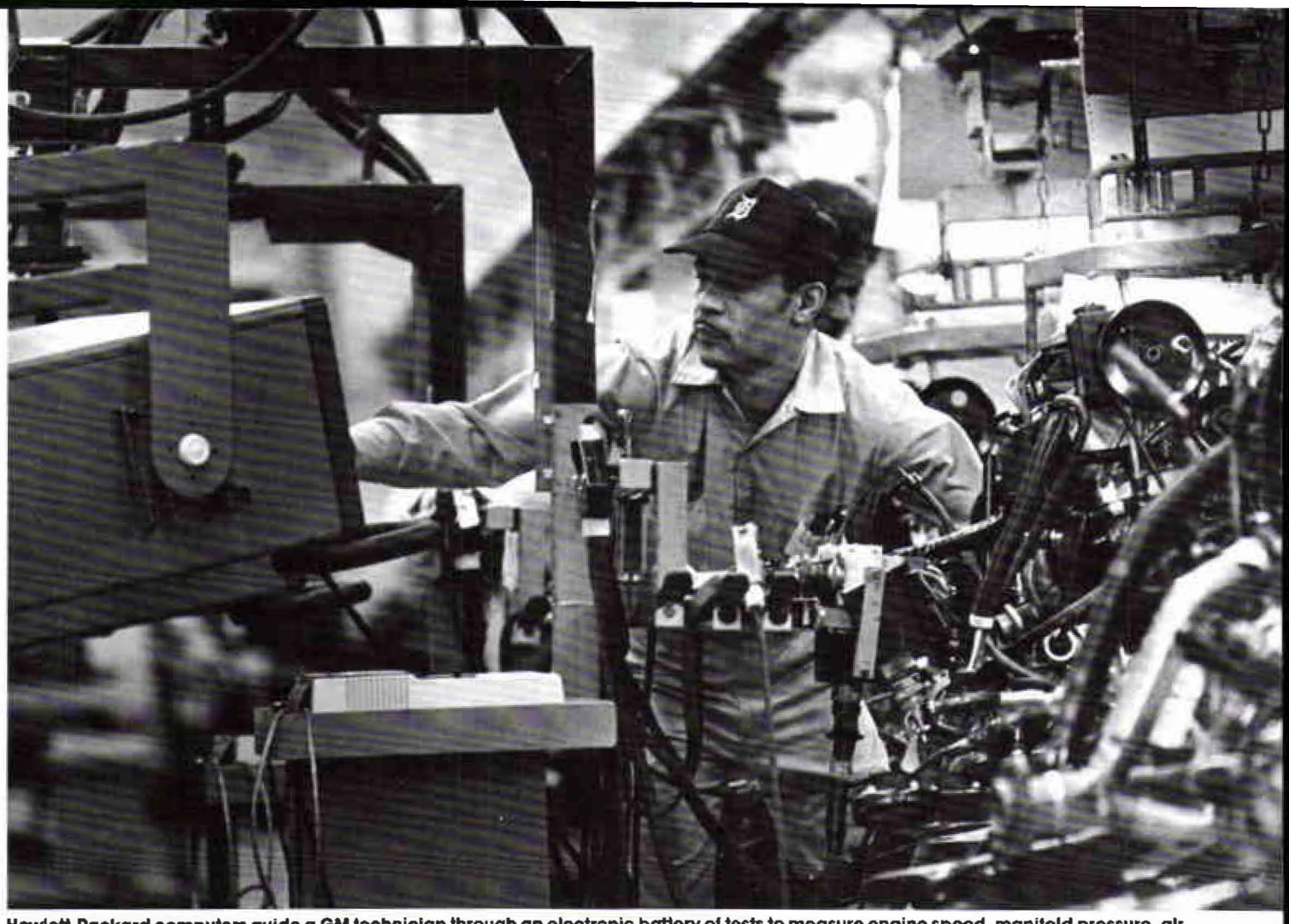
"One day," John adds, "a tooling engineer will make model changes by tapping out a new set of design specifications at a computer terminal. Instead of taking two weeks to retool an assembly plant, it will take minutes."

Hamtramck is a first step toward GM's highly-touted $3.5 billion Saturn Project in Spring Hill, Tennessee. Saturn will make revolutionary changes in the way automobiles are manufactured.

GM and AMSO are taking the second step toward Saturn at GM's two light truck assembly plants in Fort Wayne, Indiana, and Pontiac, Michigan.

"AMSO drew on resources inside and outside the company to build a computer system that could coordinate the factory floor and pass data along to a network of larger computers," says Madeleine Fackler, an HP R&D project manager for GMT-400 in Pontiac. "The computer system contains an HP 1000 and cabinet from HP's Data Systems Division, disc drives from HP's Disc Memory Division and additional hardware from Ungermann-Bass and Allen-Bradley."

"Each truck order starts down the line as an empty carrier identified by a bar code," says Vern McGeorge, another HP R&D project manager for GMT-400. "The plant mainframes send the model, color and equipment information for a large number of trucks to HP 1000 computers on the factory floor. Electronic scanners read the bar code all along the assembly line, passing the



Hewlett-Packard computers guide a GM technician through an electronic battery of tests to measure engine speed, manifold pressure, air flow and temperature settings for a 3-liter Cadillac engine. A finished 1987 Cadillac from Hamtramck has five on-board computers.

information back to the HP 1000 computer. These computers select the option information for a specific truck associated with each bar code. They tell the robots how to build each truck and flash information on display monitors telling workers which parts to add by hand."

Twenty-five HP 1000 computers talk to 400 programmable controllers, says Dave Kuykendall, support manager for GMT-400. Each programmable controller manages a single repetitive action of a robot. A network of larger computers manages groups of robots and coordinates the flow of information throughout the plant. "The robot acts as an assembly person, the HP 1000 acts as a line foreman, and the larger computers act as the manufacturing and plant managers," says Dave.

At Pontiac, HP 1000 computers will be the last in a chain of command that one day will reach all the way back to a dealer's showroom. If you order a light-duty truck with a blue racing stripe from a GM dealership in Montezuma, Arizona, that message would go to a mainframe in GM headquarters in Detroit. The mainframe decides which one of GM's 65 plants worldwide would manufacture your truck.

If you specified a GMT-400 truck, chances are GM's Pontiac plant would get the request with your list of options. A mainframe computer in Pontiac would send the information along to a mini-computer on the factory floor, which would pass all optional information to the HP 1000 computers that control the fabrication, painting and assembly robots.

In this example, the HP 1000 computer would send a message to a robot in an unmanned paint booth. The robot would spray a blue racing stripe down the body of your light-duty truck.

The mainframe computer would follow your truck to the end of the production line and then report back to the dealership in Montezuma that your truck is ready to ship.

"For the past two and a half years, AMSO has been driven by GM's needs to automate the factory floor," says Dennis McGinn, AMSO's operations manager. "The demands of the assembly plants at Hamtramck, Pontiac and Flint have shaped AMSO. We've had to deliver, in record time, custom products that communicate with equipment already on the plant floor. To do this, we've drawn on resources from all over HP.

"Through our experience at GM, we can apply HP's problem-solving skills and tools to other large manufacturing companies in the growing factory automation market." **M** —*Tom Ulrich*

(Tom Ulrich, a writer in Cupertino's AMSO, says his heart belongs to his 1970 Chevy Malibu with 176,000 miles and its original engine.)

Stepp
towar

TIM HOLT

"We have a tremendous opportunity to be an industry leader because we have the people and the know-how."
—Ilene Birkwood

ing softly
d success

HP has changed from instrument company to systems corporation, with software-related activities accounting for 70 percent of the company's projects. Yet, as John Young pointed out in the last issue of *Measure*, too often software developers work without benefit of a systematic process, the best tools, effective measurement techniques, and total quality control.

Why? Walter Utz, Corporate Engineering's Software Engineering Lab (SEL) manager, offers this assessment: "Once upon a time HP had its wagons going in several different directions—computers, instruments, oscilloscopes. And it was successful. With customers requiring systems, we have to get the wagons all moving the same direction. How? Do you impose a universal process you're not sure will work? Or do you leave everyone alone, and risk nothing working together? We're experiencing culture shock, and nobody ever got out of an old pattern without pain."

Painful or not, we have to move quickly, insists Ilene Birkwood, Corporate Engineering's director of software engineering. "In a systems environment like ours, the software process becomes increasingly important. We have a tremendous opportunity to be an industry leader because we have the people and the know-how. We just have to make up our minds that we are going to take the time and resources to do it. Though we've made a lot of progress in the last year, we're still not taking it seriously. But the competition is."

Indeed, it is. The Japanese are already in the act, with fully linked tools, libraries of reusable code, and complete interface standards. And both IBM and DEC have aggressive software engineering programs under way. Of course, HP has not been standing still, with HP Labs' research into artificial intelligence and expert systems, the software engineering program's training and tools research, and companywide projects in everything from tools to code reuse.

The right environment

Dynamic, but disorganized, says Joel Birnbaum, director of HP Labs. "What we need is a common-core technology for software development that's good enough that people would rather build on top of it than redesign everything on their own time."

That would be difficult, reply many software developers, because such a "common-core technology," or single software workbench, won't work in a computer world filled with different software development environments. These environments are analogous to an electronic office with all the necessary equipment for a developer's use in creating the different software for any number of uses, such as factory automation, PCs and instrumentation.

"Building on top of a common architecture within a standard environment would be a lot better than having to rewrite code every single time," agrees Personal Software Division section manager Rich Simms. "The hard part is doing it for the whole company. If you really want to unify everything, you've got to have everybody selling compatible hardware and software to the target market. And we just don't."

Many solutions are offered to simplify the problem. One is a clearing house for customizing code (the instructions used in different software languages, such as COBOL for business and Assembly languages for instruments) to connect different languages. Others propose that HP establish a small number of uniform development environments, each sharing methodologies and tools. Information Networks Division (IND) productivity manager Paul Nichols offers a model: "There are four networks divisions and we interface constantly, so in effect we have a design center for networks that could serve as a company model."

One HP group, coordinated by Corporate Engineering, wants to take another route to get to an improved development environment faster. "HP needs to set up a pilot to establish a software factory of the future where we reward people for *not* writing new code, not reinventing the wheel," Joe Podolsky, manager of quality information systems and a group member. The pilot could be achieved through classic entrepreneurial planning: market plan, prototype, and sell it to

the customer, who is the HP software developer. "Once it's successful," Joe says, "make it available to the company, but don't dictate it."

Emphasis on training

There are others, however, who say the primary problem lies elsewhere. "The root cause for HP's less-than-ideal software development process is not our distributed organization," argues SEL manager at Information Technology Group Sam Prather, "but that managers at all levels do not yet understand intimately the software development processes and how to quantitatively measure software developers on results. The primary effort in creating the disciplined freedom we need in software development must be made through training."

Such training was begun two years ago by the software engineering program, which now offers a complete curriculum. Says Ray Price, manager of software education: "We still have a tendency to rewrite every line of code, which is like hardware engineer redesigning a transistor every time they use one. We really need to focus on reuse in software of both design and code modules, through structured analysis and design."

That such training is not mandated and used by all managers disturbs Sam Prather. In fact, he urges the company to do even more. "HP must spend the dollars to create a training institute to enable us to focus in-depth on the concepts and processes involved with tools and design environment. In short, we must refocus the corporate culture around software product development, maintenance, support and marketing."

Standards. A dirty word?

One of the thorniest issues in software today is standards—agreed-upon guidelines for software, analogous to HP-IB and RS-232-C in hardware—which guarantee that all the software will be written in the same way. Some say standards are repressive, complicated, and premature. Joel Birnbaum is impatient with such talk.

"Standards is often considered a dirty word in HP, but not by me. There has to be a standards document, solid and enforced, such that, if you conform to the specifications, you're guaranteed that your modules will interconnect with those of other people." The result, Joel says, would be software standards, as useful as the HP-IB was to hardware, enabling developers to link software.

But many don't believe you can lay down standards. "You don't create a standard and make everyone achieve it at HP," says Ian Osborne, until recently Office Productivity Divison's quality assurance manager. He nevertheless agrees that standards are essential. "But you have to get people to agree on a single idea and work with them to help achieve it."

"Standards should come by consensus," says Lake Stevens Instrument Division's R&D manager Howard Hilton, "evolving through successes and presented as models to the company. Let the best win out."

However they arrive, standards are essential for reusing code, which is where you turn a profit in the software world. "Data collected in more than 70 HP projects the past three years demonstrates the benefits of reusing code," explains Bob Grady, former SEL manager at Corporate Engineering. "The productivity averaged five to six times higher than projects freshly coded."

"Once people believe that code reuse is an achievable goal, it is a natural step to agree on certain conventions," says Sally Dudley, HP's corporate software quality manager. "Standards for defining and documenting interfaces will naturally evolve because individuals will want to conform to take advantage of what is available."

PHOTO BY TIM HOLT

"There are great potential benefits to be realized by using metrics to define and understand the software development process." —Bob Grady

Using metrics and tools

Since 1983, many HP software engineers have tracked the software development process using standard measures—called software metrics—such as the number of defects, amount of code and length of project. Metrics provide an example of many divisions working together to develop a standard set of definitions. By then applying those quantitative measures to their work, many divisions are gaining a better understanding of the software development process.

One of the most exciting areas where metrics are having an impact is tracking defects before software release. Bob Grady, who has headed the Software Metrics Council since it began collecting such metrics three years ago, says: "There are great potential benefits to be realized by using metrics to more sharply define and understand the software development process and its weakest areas."

HP's software developers are still lagging behind other disciplines in automation, working with "handcrafted" tools for creating software. Part of the problem is again how much to centralize, some preferring one best tool imposed, others enjoying the present situation in which developers choose their own. "The ideal answer is something between the two," asserts programmer Ken Mintz of Corporate Engineering. "The quickest approach is to investigate the market and find tools as similar as possible which fit

your environment and discipline. Then migrate that toolset across software development environments."

"I think we ought to be driving the market, putting ourselves into the business of selling tools to software developers," says Waltham Division's Ted Schmuhl. He cites the HP 64000, used for debugging programs, as a good example. "A need was seen in the marketplace and it created the tools we could use internally as well. By finding out their needs and aggressively solving their problems, we would probably discover solutions to our own software development questions."

Some of these needs are being met now. "The problem," says software engineering's Walter Utz, "is not so much a lack of tools as the lack of an integrated set with a common user interface so that engineers do not have to undergo a long learning curve each time they move to a new tool." Consequently, the software engineering program is searching for toolsets and, in the interim, recommending the best tools available.

The challenge ahead

"We need to channel all the energy and focus it," says Joel Birnbaum. "That's partly organizational and it's partly just hard. Goal number one should be to create the premiere engineering environment in the world for our own engineers, including programming development technology. There's a lot of invention and experimentation involved in that. It's one of the hardest challenges we've ever faced, and we will all need to work together to succeed." **M**

—Michael Slack

(Michael Slack, editor of Corporate Engineering's *R&D Network*, worries that he's beginning to understand the world of software. Also contributing to this report were Judy Conlon and Brian Sakai.)

"If a hardware engineer wants a shortcut to software, I'd recommend this program."

—Paul Rygaard

Retraining for tomorrow

The sometimes rocky road to software is being paved at HP with a unique Hardware-to-Software Transition Program. For two years the software engineering program's course in computer science fundamentals has helped smooth the transition for some HP hardware engineers in just 90 class days, prompting many dubious computer science college graduates to ask: "How?"

"It's not easy," admits program coordinator Daniel Wu. "But our students already have engineering degrees, and the time spent on our course is about the same as that spent on a major in college. Besides, our engineers have a critical need to learn."

Paul Rygaard of Information Networks Division agrees. IND was fast abandoning hardware for software, so Paul had a choice: he could either find a hardware slot at another division or switch to software and stay. IND funded his HW/SW course and Paul is now a designer on low-level datacomm software for the HPE-Spectrum systems.

Dedicated computer circuitry is included in every Stanford Park Division instrument to control the measurement hardware. As customers have come to expect more sophistication, the programming requirements for user interface and internal computation have exploded. Paul Zander was finding it increasingly difficult, even with two EE degrees, without adequate software training.

"I was flying by the seat of my pants, trying to read about advanced topics, and constantly frustrated." The HW/SW program not only provided the required job training, Paul says, but also gave him the courage to propose advanced features for new products.

Sometimes the program can help entire teams. "I was looking to expand toward software," says IND project manager Toni Graham, Paul Rygaard's supervisor when he was in hardware. "But I wouldn't have done it as my next move, or as a career change." However, when IND focused mainly on software, Toni, like Paul, had to choose to retrain in software, or move on. She took the HW/SW program, subsequently became a software project manager, and once again became Paul's supervisor.

Paul sums it up: "It's an incredibly valuable program. If a hardware engineer wants a shortcut to software, I'd recommend it."

Extra ORDINARY PEOPLE

MARITA SCHNAPKA

If you wanted to establish a successful personal computer store, you'd probably rent a showroom in a busy shopping mall, set up your product displays and throw open your doors to all customers.

But not if you're Philip Engelhardt.

"The last thing I want is some kid smearing peanut butter on my keyboards playing computer games while his mom is doing her shopping," says this unconventional PC dealer. "We don't want people just wandering in."

Meet Philip Engelhardt—personal computer dealer, restaurateur, real estate developer, philosopher, marina operator, mortgage banker and, quite possibly, Hewlett-Packard's most avid fan. His Aviax Business Systems organization in south Florida is the only PC dealership in the world that sells HP products exclusively.

You won't find an Apple, an IBM or a Compaq anywhere in the Aviax showroom—a tastefully decorated complex of partitions, work stations and training rooms partially hidden beside a back entrance to a West Palm Beach high-rise office. What you will find is HP gear—Vectras, Touchscreens, plotters, LaserJets, ThinkJets, Portables, calculators, even an HP 3000 Series 37—all for sale.

"I look at personal computer dealerships much like auto dealerships," says Philip. "There are two distinct ways to sell cars. If you sell cars the way Aviax sells computer systems, you specialize in selling fleets of cars to big companies—a very select group of customers. But if you're a computer retailer like a ComputerLand, you sell cars one or two at a time to the man on the street. To do that successfully you have to offer the key chains, the TV giveaways and the free trips to Disney World.

"There's a danger if you become too retail-oriented. You obligate yourself to the whims and demands of the marketplace," says Philip.

His views of the personal computer marketplace are unusual, but so is he. Philip was born in the U.S., but his French mother saw to it that he received a degree in philosophy from the Lycée Français of New York and the University of Caen. He then studied

"The last thing I want is some kid smearing peanut butter on my keyboards. . .while mom is doing her shopping."

real estate at the University of Denver, and worked in mortgage banking and international real estate consulting.

He was leasing corporate aircraft (that's where the name Aviax comes from) in 1975 when he met Hewlett-Packard. "I bought my first HP calculator then—an HP-80. I've since owned and used a 38, a 92, an 85, an 87, a 125, a 120, a 150 and a 150B, and a Vectra. Every time I needed something for one of my businesses, HP was there.

"I display an extraordinary devotion to HP, but only because I know I can count on them," says Philip.

Philip doesn't let his loyalty to HP slip by quietly. He talks about HP with the conviction of a Bible-thumping evangelist. He takes out full-page ads in Florida business publications and in local editions of *Business Week* magazine to preach about HP and Aviax. The ads are enough to make even the most dedicated HP employee blush:

"There is no finer equipment available: there is no stricter manufacturing standard; there is no more proven performance: there is no more reliable service organization; there is no more comprehensive training program; there is no higher dedication to the customer; there is no faster response to any need: there is no greater brotherhood among employees; there is no more sincere a corporate philosophy; than those found at Hewlett-Packard. . . . At Aviax Business Systems, Hewlett-Packard is our way of life. . . . You can feel it in every carton you open, every manual you read, every product you use and every person you meet. Frankly, we couldn't live without it. Isn't it time you tried it?"

The ad copy comes straight from the mind—and the heart—of Philip Engelhardt. One of the ads he hasn't run—yet—is a picture of an HP repairman playing golf with the Maytag repairman. "I have more than 200 pieces of HP equipment out on lease, and we haven't made more than 10 service calls in the past three years," brags Philip. "You can bet I sell HP reliability to my customers."

Aviax offers its customers much more than reliable equipment. There are free loaners, fast delivery of products from a large inventory and a willingness to bend over backwards to serve. The Aviax van has traveled across town to deliver a small box of discs. "I don't ever want to lose an order for $10 worth of supplies," says Tom McCole, Aviax' business manager.

Tom's sold on HP, too. "We derive 100 percent of our living from HP." But he rationalizes the close ties to HP a bit differently than does Philip. "I'm a little closer to this planet than he is," says Tom. "There are some keen advantages to selling only HP computers. Our clients are generally more sophisticated; we do business by appointment only;

Preaching HP like a Bible-thumping evangelist, Philip Engelhardt's ads are enough to make the most dedicated HP employee blush.

and once our clients come through the door, they don't encounter hardware from the competition.

"When I tell a customer we're an exclusive HP dealer, I'm proud," says Tom. "It impresses the customer."

Is this Aviax magic working? Yes, but slowly. Philip is ready to open showrooms in nearby Fort Lauderdale and Miami and has plans for a statewide chain of showrooms where prospective customers can see HP products in a businesslike environment. The hangup?

"People. It's tough to find good sales people," confides Phil. "A lot of dealerships hire someone who was selling shoes at the mall last week. I want a staff that's got technical ability and dedication to the product line."

A perfect example is Aviax' technical wizard, Sam Collier. "Sam was the other HP fanatic in Palm Beach County," says Philip.

"When I was in the ninth grade I saved up and bought an HP 41-C calculator," says Sam. "I spent hours poring through the manuals and walked away thinking, 'This is such a powerful product.' I've been a big proponent of HP ever since. The hardware really embodies the company's philosophies."

Needless to say, such devotion to HP by the Aviax crew doesn't end at five o'clock.

When Philip and his pregnant wife Helen went to the hospital, Philip wore a baseball cap with an HP logo in the delivery room as a good-luck charm. One of the labor room nurses who saw the cap told him the hospital staff was having a meeting on Friday to pick a vendor for some new medical gear.

"She wanted to wear my cap, but instead, I sent over 100 caps so everyone in the room was wearing an HP logo. They were drinking out of HP cups and writing with HP pens," smiles Philip. "The head of obstetrics later told me I'd stacked the deck. Today, I still won't walk into that hospital without my HP cap on."

The Engelhardts have a new set of twins from that hospital (and the hospital bought some new HP equipment).

Despite a hectic schedule, Philip makes a point of seeing the twins early each morning before he sets out for one of his offices. In addition to Aviax, there's also a booming marina operation in nearby Jupiter, Florida, and a seafood restaurant under construction.

You won't find HP gear at the restaurant, but that's not because Phil didn't want some. When he bought the restaurant's cash registers, a market researcher asked him why he'd picked the NCR brand. His answer was somewhat predictable. "Because HP doesn't make cash registers." **M**

—Brad Whitworth

LETTER FROM JOHN YOUNG

HP's president discusses change and how it affects the HP way.

Much of this issue of *Measure* deals with the subject of change and how it's affecting HP and its people. So it seems appropriate for me to focus on how change affects the HP way.

What is the HP way? It is, in essence, the sum of beliefs that are expressed in our seven corporate objectives. In the next few paragraphs I'd like to talk about the HP way in the context of two of our objectives—profit and a commitment to our people.

The disappointing profit-sharing percentage we announced in May was a very visible sign that our profit margin has slipped to a level of real concern. Why is it so important to bring our margin back up to its historic level? Is profit something we pursue just to keep our shareholders happy? While that's certainly important, I'd like to suggest that everyone has a personal stake in our profitability.

As a business philosophy, the HP way means financing growth out of our own profits. This tradition of self-financing makes HP a much more stable employer because we can buffer the effects of rising interest rates or business downturns. For example, in recent months you've all read articles about thousands of people laid off by their employers. Many of those firms are forced to take such steps to pay off their debts. When times get tough, their lenders—not their employees—have first call on the company's funds.

Besides providing us with the relative stability of self-financing, profits make it possible for us to grow. That expansion gives people the chance to develop their skills and advance professionally—in short, to stretch to their maximum potential. Growth enables us to take pride in belonging to a successful and well-respected company. And it's a reinforcing cycle, because these characteristics help us attract and retain the very best people.

Perhaps most importantly, profitability is a clear indication of our contribution and competitiveness in the marketplace. When profitability declines, that's a clear indication of declining competitiveness. And that could jeopardize the entire foundation upon which we all depend. A prompt response to declining profits is the only sensible answer—as is so clear from the lessons of the troubled companies you've heard about.

But how does the profit objective square with the objective of providing HP people with long-term employment based on their performance? We've just announced an enhanced early-retirement plan and a voluntary severance incentive program, and these may call into question just what the HP way means when we talk about commitment to our people.

Employment security is—and will continue to be—an important HP objective. At our annual management meeting last January, I reaffirmed this when I described HP's corporate strategy. It identified criteria that managers should use in selecting which business opportunities to pursue. One of those guidelines was to pick businesses which are likely to provide HP people with stable employment.

"The HP way has never meant a blind adherence to the status quo. Standing still is not an option. No one can do so and survive."

But we're in a fast-changing industry, and employment stability can never mean a guarantee that you'll work at only one job—or in one location—during your HP career. That's been a difficult concept to communicate, and an even harder one to implement. As the cover story in this issue of *Measure* indicates, many of you have had to be flexible in response to our changing skill requirements. Some of you have retrained and relocated. Others of you have been on loan to entities that didn't originally hire you. This flexibility on the part of HP employees illustrates the mutual obligations that employment security requires. On the company's part, it means a commitment to the goal of long-term employment and sound business practices. On the individual employee's part, there must be a willingness to take on different jobs, learn entirely new skills and change locations if necessary. We have to strive together to reach our goal.

Even working together, it's quite a challenge to assure everyone at HP a job that matches his or her personal choice. Sometimes changes in customer needs, competitive requirements and technology can be so fundamental that we need major changes in the way we do business. And when that happens, we may be unable to retrain and reabsorb all the people whose jobs are affected. That's why some of you are being offered a cash incentive for leaving the company voluntarily.

We've offered a small early retirement program before in 1969-70, but the voluntary severance incentive program is quite new. Does either program violate the HP way? I think not, for one very important reason: The programs are entirely voluntary. That choice is something that countless people in other companies haven't had. In contrast, we've kept our commitment to our people in what I think is a creative and caring response.

I'm not dismissing the concern that many of you must feel. These changes aren't easy. I've been with HP more than a quarter of a century, and I know that our corporate culture is special to all of us. But the HP way has never meant a blind adherence to the status quo. Standing still is not an option. No one can do so and survive.

Change is nothing new for HP or the HP way. But the pace and magnitude of it all—and the urgency of responding—are new. We need everyone's support if we're to shape the kind of company that can succeed in the decades ahead. I'm confident it will continue to be one in which you can all take pride.

Extra

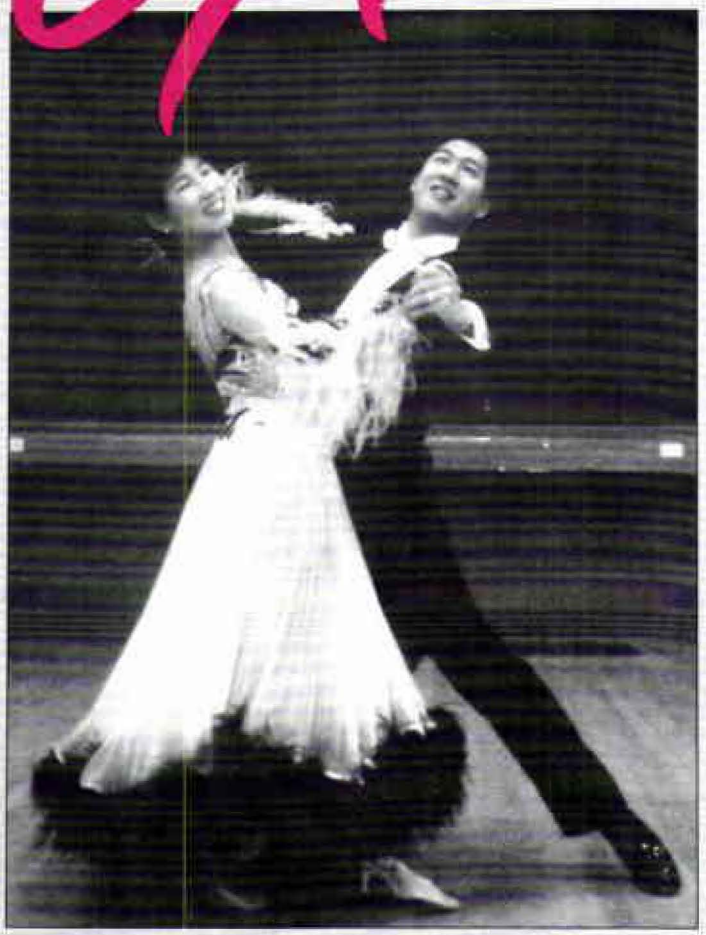


PHOTO BY LUI KIT WONG, COURTESY SAN JOSE MERCURY NEWS

They trip the light fantastic

Information Technology Group software project manager Sara Cheng and her husband Vernon are champion amateur ballroom dancers.

They trained five nights a week to prepare for the world Amateur Modern Dance Championships in Arhus, Denmark, April 27. They represented the United States at this competition after winning the U.S. championship in Glendale, California, in February. They didn't win the world title, but Sara is already making plans for next year.

Their five dance specialties are the waltz, tango, Viennese waltz, fox trot and quick step.

For competition, the Chengs dress to the nines. Vernon sports specially made tails and Sara wears ballroom dresses with 18 feet of material at the bottom of the skirt.

They've been competing for only about three years, but admit it's become an obsession. They spend 10 to 15 hours a week on the dance floor perfecting their dips and spins.

Vernon works as a senior scientist at Lockheed in Palo Alto.

World Cup event scores HP help

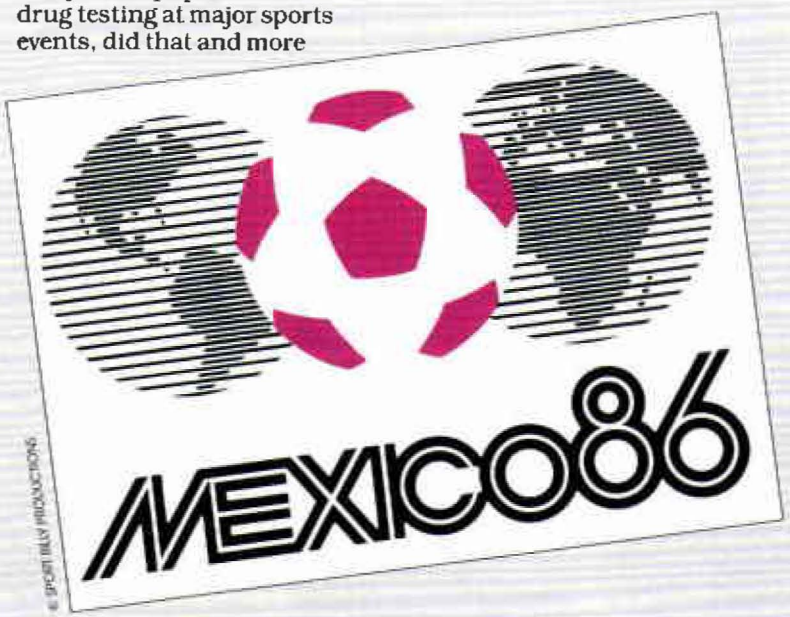
When the wonderful madness of hosting the World Cup soccer championship fell to Mexico this year, local companies were asked to help stage "the most advanced technological sports event" ever.

Hewlett-Packard de Mexico became a sponsor. So did Mexican firms representing Ford Motor, IBM, Siemens, Canon, Philips and Ericsson, among others. Through their collaboration the month-long World Cup was more thoroughly covered by the international media than even the most recent Olympic Games. Some 5,000 members of the press corps were on hand.

HP, a regular supplier of analytical equipment for drug testing at major sports events, did that and more for the 1986 World Cup. HP de Mexico backed up the central testing lab by providing a network of personal computers that linked it to 12 stadiums throughout the country where testing was conducted during games.

And for those 5,000 press people, HP de Mexico equipped press headquarters with resuscitation systems and cardiographs—just in case the excitement of the World Cup proved overwhelming. The equipment also rode along in an ambulance to Mexico City games to serve any spectator who needed care.

HP de Mexico itself received heavy press coverage for its role, including several interviews of its top management on national TV.



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Extra MEASURE

He's looking for the real macaw

Dr. Charles Munn III and his HP 110 PORTABLE computer know that it's a jungle out there. Dr. Munn is a research zoologist for Wildlife Conservation International, the conservation division of the New York Zoological Society.

The PORTABLE accompanies him to Manu, Peru, where he conducts research on scarlet macaws on the western-most rim of the Amazon River. Manu, about the size of Massachusetts, is one of the largest wildlife preserves in the world and holds unexplored rivers and lakes and hundreds of square miles of untouched jungle. The work can be dangerous for the computer, though. It survived being submerged in the Amazon River—and came up working.

The macaws—giant, brilliantly colored parrots—are hunted for food and often stolen and smuggled into the United States to be sold as pets. The birds have become rare or extinct in much of Latin America. Through Dr. Munn's work, the HP PORTABLE is helping preserve wildlife and the rain forests of the world.

BOTTOM LINE

Hewlett-Packard Company reported a 6 percent increase in net revenue and a 2 percent decrease in net earnings for the second quarter of its 1986 fiscal year that ended April 30. Net revenue totaled $1.778 billion, compared with $1.677 billion for the corresponding quarter of FY85. Net earnings totaled $127 million, equal to 49 cents per share on approximately 257 million shares of common stock outstanding; comparable figures a year ago were $129 million or 51 cents per share. Orders were up 6 percent over second quarter FY85.

For the first half, net revenue amounted to $3.375 billion, a 5 percent increase over the first half of 1985. Net earnings were $236 million (92 cents per share), down 4 percent from the year-ago $245 million (96 cents per share). First half orders totaled $3.436 billion, up 3 percent from a year ago.

CHART CHANGES

Intercontinental Operations has created the new position of director of marketing. **Malcolm Gissing** will have general management responsibility for sales activities in Intercon's five sales regions. He will be replaced as country manager for Canada.

In the Manufacturing Systems Group, the Flexible Manufacturing Systems Operation (formerly Semiconductor Productivity Network Operation) has been folded into the Data Systems Division.

(At press time, a restructuring of the Information Systems and Networks sector was announced. Details will appear in the next issue.)

NEW HATS

T. A. Wilson, chairman of the Board of Directors of The Boeing Company in Seattle, Washington, was elected June 2 to the HP Board of Directors.

Jim Horner to general manager of the Santa Clara Division.... **Chuck Walker** to president of HP Genenchem.... **Nancy Anderson** to GM, Manufacturing Productivity Division.... **Paul Goldman** adds the hat of GM of the Medical Supplies Center.... **Bruce Huibregtse** to operations manager of the Panacom Automation Operation in Canada.... Backing up: **John Cromie** is operations manager of the Australian Software Operation, part of the Design Systems Group since last November.

John Moll of HP Labs has been elected to the National Academy of Sciences.... **Tom Saponas** of the Colorado Springs Division has been named a White House Fellow for 1986-1987.

He draws a wicked cartoon

By day, he's a mechanical engineer for HP in the San Diego Division. By night, he wields a wicked pen drawing political cartoons for the *Poway News Chieftain*, *Rancho Bernardo Journal* and the *Penasquitos News* newspapers.

Dick Kemplin was recently honored by the California Newspaper Publishers Association for producing the best editorial cartoon in a weekly California newspaper with a circulation between 3,501 and 13,000.

Dick has been drawing cartoons for the papers since January 1985, and said he was surprised and pleased about the award. He gets his inspiration from local and national newspapers. He says he draws only one cartoon per week, and that each takes about two hours. "Drawing it is the easy part."

Der tale of Der Dutch Treat

For the uninitiated, the Boulder (Colorado) Kinetic Sculpture Race is a four-and-a-half-mile land and water course traversed by people in strange, homemade, human-powered vehicles. The biggest winners in the race are spectators, who are provided several laughs a minute during the actual race and the week of festivities leading up to the event.

HP's participants this year—Greeley's Joe Thomas, Brian Hastings and Marge Bagley—operated "Der Dutch Treat," a wooden shoe, complete with windmill for power.

The story of Der Dutch Treat is bittersweet. It all started with a terrible earthquake and tidal wave. The whimsical story has the threesome in a large, display-model wooden shoe, sailing out of the flood area, round and round, until they finally reach Boulder, Colorado.

The rest is history. Der Dutch Treat won the Comic Relief Award for "the highest quality smirks and chuckles for the beatification of the Kinetic spectators." That's quite an accomplishment when you consider the competition, which included a replica of the Titanic, with a front end that sunk as the vehicle launched, sending out emergency calls over the public announcement system. Then there was "Mud Shark Vacation," a huge mud shark with a station wagon perched on top of it.

The other 51 weeks of the year, Joe works in environmental testing, Brian is an engineer and Marge works in personnel. Phil Cook, who designed "Der Dutch Treat" literature and logo, works as a graphics designer in Marcom.

BETTMANN ARCHIVE

HP's exhibit was just too, too much

Buckingham Palace insists it wasn't a pregnant pause when Princess Diana fainted while touring the EXPO 86 World's Fair.

A little-reported fact was where Diana drooped—in front of the California exhibit while officials were explaining Hewlett-Packard's computerized bicycle design exhibit.

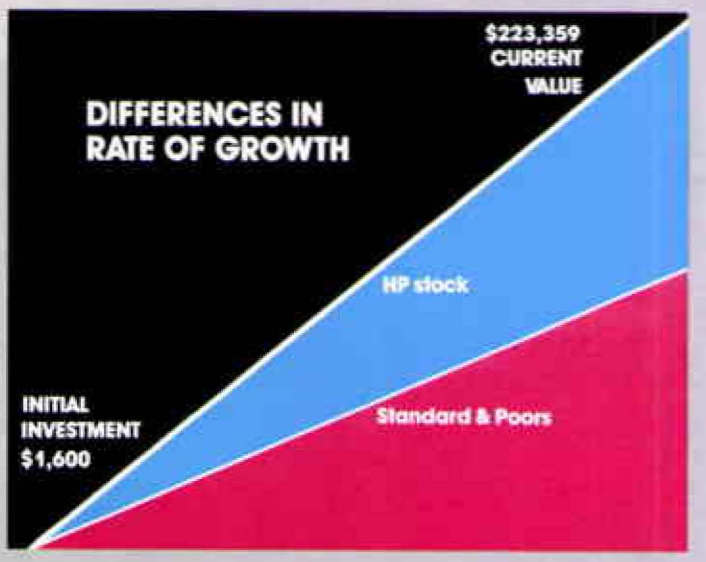
California Governor George Deukmejian said, "She fainted very gracefully."

Extra MEASURE

Paul Vallis is on a roll

While the rest of his Bay Area co-workers are snarling through rush-hour traffic on congested roads and freeways, support engineer Paul Vallis is rolling merrily along on his roller skates or above it all on his unicycle.

He started his alternate modes of commuting in January, mainly to fit exercise into his schedule. Paul lives about three and a half miles from his job at the Santa Clara Response Center. He says his only problem is garbage day, when he has to concentrate on the sidewalk obstacle course plotted out by the trash cans.



If you had bought low. . .

What if you had purchased 100 shares of HP common stock at $16 a share the day it was first issued in November of 1957?

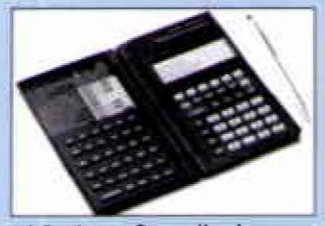
Based on that initial investment, assuming the reinvestment of all dividends distributed since then, the value today would be $223,359. (That's 5,305 shares at market value of $42.13 on April 15, 1986, plus a cash balance of $40.25.) The annual growth rate compounded over 28 years and five months is 19 percent.

The Standard & Poors Index, a measure of the general health of the stock market, yielded a compounded annual return of 10.14 percent for January 1958 through December 1985.

Five HP stock splits occurred during this period: 3:1 in September 1960 and 2:1 in June 1979, February 1980, June 1981 and August 1983.

NEW PRODUCTS

The Business Consultant from the Handheld Computer and Calculator Operation is the first in a new line of HP calculators which can solve user-defined equations without the need for programming. It has separate alphabetic and numeric keyboards.



HP Business Consultant

First technical computer system released from the company's Spectrum program is the HP 9000 Series 800 Model 840. It extends the high end of the current HP 1000 and 9000 product lines and will be marketed jointly by Data Systems Division and the Fort Collins Systems Division.

FSD has recombined and repriced components in five HP 9000 Series 300 Model 320 product bundles in an aggressive marketing move. Another new bundle is the HP 9000 Series 500 Model 560, which has three CPUs and extra memory built in.... A new CAD solution running on the Series 300 is HP Printed Circuit Design System.

A validated Ada compiler for use on the HP 9000 Series 200 and 300 was developed by the Information Software Operation using Ada software from Alsys S.A. in France. (Ada is a trademark of the U.S. government. It is a computer-programming language designed to specifications of the Department of Defense.) This is the first in a line intended to put HP in contention for federal orders.

Logic Systems Division's HP 64000 logic-development system now supports full-feature emulation and software support for the Intel 80286 microprocessor.... With the HP 9000 Model 320 as a controller, the HP 64000 can now be used by a number of microprocessor developers at the same time. A new HP 64120A instrumentation card cage and the HP64100A/64110A workstations house the HP 64000 emulators and analyzers.

The Scientific Instrument Division's new HP 5965A infrared detector designed for capillary gas chromatography is a compact, low-priced unit instead of the huge, expensive machine usually required for this technology. ...The Vancouver Division's HP QuietJet Plus offers quiet operation and quality printing.... Data from adult or neonatal monitors can be displayed on commercial video monitors with the HP 78355A digital-to-video interface from the Waltham Division....

From the Manufacturing Test Division comes the HP 3065AT advanced-technologies tester: HP's first tester to perform both in-circuit component tests and cluster tests on a production circuit board.

John Marshall
Southern Sales Region

John Marshall
Logic Systems Division

The many faces of John Marshall

Will the real John Marshall please stand up?

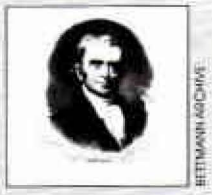
At last count, there were three—a marketing communication manager at Logic Systems Division (LSD); a district sales

John Marshall
Canadian Sales Region

manager in Toronto and a service engineer in Atlanta, Georgia.

It got confusing recently when all three John Marshalls visited LSD for a 10-day new-product training period at the Logic Design Operation. LSD's own John was surprised to receive airline tickets and hotel reservations for a service engineer training seminar which was coming up soon in Palo Alto. He hadn't planned to attend the seminar.

"We cleared that up when we located the proper John Marshall from Atlanta," said Logic's John Marshall, "but not before finding John Marshall from Canada. So we all got together, had a few laughs and exchanged name tags."



BETTMANN ARCHIVE

John Marshall
U.S. Supreme Court

JEAN BURKE

Wheeling and dealing champions

Two Bay Area HP employees—Jeff Breilh and Bob Welsh—are catching their breath after putting in a winning season as members of the wheelchair basketball team, the San Jose Golden State 76ers. The 76ers ended the season ranked third in the nation and conference champions for the fifth consecutive year.

Jeff and Bob participated in 55 games this year, traveling from San Diego and Los Angeles, California, to Dallas, Texas, and Edmonton, Canada. The team also practices twice a week between competitions and special events, such as half-time exhibitions at Golden State Warriors games.

Jeff says wheelchair basketball started after World War II, mainly as rehabilitation and recreation for disabled war veterans, but has grown into a competitive worldwide sport. Two of Jeff and Bob's teammates, as well as Paul Jackson, the 76ers' coach, traveled to Melbourne, Australia, as part of the All-American team and won the Gold Cup title, making them world champions.

Wheelchair basketball follows NCAA rules, with a few modifications. The wheelchair athletes move with great speed and agility, leaving the smell of burnt rubber in their wake as they position themselves defensively or make shots from a 20-foot distance.

Wheelchair basketball players (as well as those in other wheelchair sports such as tennis, marathons, water and snow skiing) all have physical disabilities which prohibit them from competing in the able-bodied versions of the sports.

出差

Earth-shaking news from Taipei

HP sincerely hopes its big news didn't cause the natural disaster, but operations manager Steve Ng reports from Taipei that the May 20 introduction of the Asian Vectra workstation in Taipei, Taiwan, was followed by an earthquake (6.0 on the Richter scale) two hours later.

The Asian Vectra workstation is the first product of the Asian Personal Computer Operation and it can operate in Japanese, Korean, Chinese or simplified Chinese, and English. It is currently being sold in Hong Kong, Taiwan, Japan, Korea and the People's Republic of China. It's designed specifically to meet the needs of Asian businesses.

The new dual-mode product changes languages at the flip of a switch and runs word processing, graphics, database/file management, spreadsheet and communications packages.

PARTING SHOT

HP exhibit gains EXPOsure

When the 1986 World's Exposition EXPO 86 in Vancouver, Canada, opens its gates to the public each day, a line of visitors quickly forms at the California Pavilion.

One of the hit attractions is Hewlett-Packard's exhibit, The Bicycle Company, that seems to grab kids and grown-ups alike. It offers a hands-on chance to design a bike with the help of the computer, and to make serious business decisions for a year of operation. Monitors offer close-up views of the 25-foot-long animation of a factory of the future that flashes overhead.

Doing its own thing nearby is an HP 7585 plotter that every five minutes completes the plot of a futuristic racing bicycle.

"When we installed the display, the pavilion management asked us to slow down the plotter to one plot per half hour for fear the output would wind up scattered around," says Nick Copping of the Information Technology Group, who served as technical program manager.

"But when they saw folks lined up at the door each morning to ask for the plots made the day before, we were allowed to speed up the output. It seems nobody was throwing plots away."

BOB CLARKE

Eighteen million visitors are expected during EXPO 86, which runs May 2 to October 13. A number of HP people have already gone through and passed along their suggestions on the California exhibit. As a result the colors in the pens have been changed and the HP logo made more visible.

HP also has a second exhibit in Canada Place.

The late Conway Reimer of HP Canada was the business program manager for HP's double involvement in the exhibition. The local HP Vancouver office is supporting both displays.

HP is represented behind the scenes as well. The exhibition management firm of Davson, Prichard and Downward, Ltd. bought HP 150s, a LaserJet printer and portable computers to help manage the construction, furnishing and running of the U.S., Oregon and California pavilions.

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