

MEASURE

For the people of Hewlett-Packard

November-December 1983

Automation at HP:
will it be
a friendly fit?



UPFRONT

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MEASURE

"Man is the measure of all things."
—Protagoras (circa 481-411 B.C.)

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Hewlett-Packard Company designs and manufactures computers, electronic test equipment, handheld calculators, electronic components, medical electronic equipment and instrumentation for chemical analysis. Manufacturing facilities are located in 23 U.S. cities in eight states and in 10 cities in nine countries in the rest of the world. HP sales and service offices can be found in more than 80 U.S. cities and (including distributorships) in approximately 200 cities in 72 countries around the world.

ON THE COVER

A robotic coffee break at HP? There's no question that automation is slowly changing the way people work in offices, factories, labs and warehouses. Personal Office Computer Division's Shirley Gilbert examines the impact automation is having throughout HP and where the company is headed in the future. Cover photo by Glenn Steiner.

In Hurricane Alicia's wake, HP came to the rescue where the buffalo roam.

With the help of some friends, Dave Rickard, David Perkins and Nick Nascone saved a buffalo in August.

The threesome from HP's Houston, Texas, sales office came to the rescue of Buffalo Business Products after Hurricane Alicia ripped the roof off the firm. The office supply and printing company's HP 3000 computer had been exposed to the full brunt of the storm when it hit on Thursday, August 18.

Buffalo executives had tried desperately to save the computer by disconnecting the system and wrapping and taping the various peripherals in plastic. But when David (an HP customer engineer), Dave (district service manager) and Nick (sales rep) arrived early on Friday morning at the thoroughly soaked office, they quickly discovered they'd have to replace the entire system. Immediate action was critical to get Buffalo's order processing function back on line.

As a temporary measure, a backup data link to a friendly neighboring company's HP 3000 was available—but efforts to bring up Buffalo's system over the weekend revealed that more disc space was needed. Monday the HP Houston office took a disc drive off one of its own demonstration systems and reconfigured it. When the borrowed system became available at the end of the work day, a team of CEs began installation of the disc and helped Buffalo

bring up its application. David, joined by Houston CEs Randy Kelso and Dennis Bienski, finished at 5 a.m.

By Tuesday morning Buffalo Business Products was taking orders again.

But before Buffalo Business Products could replace its own HP 3000 system, the company had to deal with the insurance adjuster. Over the weekend David met with the adjuster and tore the water-soaked equipment apart to show the damage. Then he worked with Dave to compile the volume of information needed to settle the claim. On Monday afternoon, the insurance company agreed to pay for the damage. Nick placed the order for the replacement system, expediting action with some urgent phone calls.

Delivery was quick. The CPU and one disc drive arrived on Wednesday and the rest appeared the next day.

Buffalo Business Products' president, Brian Jones Jr., puts the episode in perspective: "A relatively small company whose total marketing effort was designed around a sophisticated computer system suffered the ultimate disaster. By the second working day we recovered to about 85 percent of capacity and one week later we were at 100 percent with new hardware.

"We always knew that we could rely on HP equipment. Now we have had firsthand experience with the reliability, dedication and professionalism of HP people." **M**



Hurricane Alicia uproots telephone poles and trees during its siege of Houston, Texas.

HOUSTON CHRONICLE

New technologies and new machines—some created at HP—are changing the way we work. What place does automation have in the company? Will high-tech robots become a



GLENN STEINER

Friend or Frankenstein?

Not too long ago, Steve Lusk, production worker in the Portable Computer Division in Corvallis, Oregon, wasn't too crazy about his job. He had to line up surface-mounted devices on a printed circuit board destined to go into an HP personal computer. He had to do this work by hand. Since the devices were mounted directly onto the board, there were no pins or holes to guide him. "We had to manually check the position of each and every device on the board. Sometimes the tiny ICs would fall off and you had to put them back with tweezers," says Steve. That was only one of the frustrations. At the end of the day, Steve's eyes were burning, his wrists ached and, despite the pain, he felt it was impossible to do a really good job.

Now a specially programmed Seiko robot—they call it Rover—does the job for Steve. Its arm reaches out and picks up a device as it comes down a chute and centers it within 1/1000 of an inch onto the board. The robot finds the target traces on each board, then "knows" where the rest are. It then presses down on the devices to fix them to the board. Rover does this all day long. "The robot frankly doesn't care," says supervisor Jim Mosier. "It will repeat the operation forever. We got it because we realized that we just couldn't ask people to do this difficult job."

Five years ago, when engineer Jean-Claude Roy and several mask engineers developed an integrated circuit, they worked at drafting tables. They would draw the network of lines on green mylar using mechanical drafting pencils.

If they made a mistake or a change, they had to erase and redraw—sometimes entire sections of a chip. It took nearly three years to develop a circuit with 12,000 devices. The artwork was big enough to cover your living room floor. "It was like the medieval monks writing books in longhand," says Jean-Claude.

Now Jean-Claude and his project team design chips with the help of an HP 3000 computer and an interactive graphics system. They can easily manipulate the network of lines and rectangles—moving, stretching and repeating patterns with the touch of a stylus. They can also share the work they've done with each other and with other design teams.

Working in the Personal Office Computer Division in Sunnyvale, California, Jean-Claude and his team designed a new IC with more than 100,000 devices in 18 months. "The amazing thing is that the chip worked the first time," says Jean-Claude. "How," he wonders, happily zooming around a tiny section of the chip with the computer's help, "did we ever manage the old way?"

A few years ago, secretary Linda Trotman in Boise, Idaho, wasn't too fond of the quarterly review process held by her boss, Dick Hackborn, vice president and general manager of the Information Products Group. Not that the review didn't yield a lot of important information for the company. But it was the time-consuming process that Linda didn't care for too much. First, she had to phone to all eight managers



GLENN STEINER

Stiffening international competition and the desire for flawless products will make automation necessary for survival.

in the group to schedule meetings. Next, she had to wait for their written quarterly reports as they dribbled in through the mail or via COMSYS. After Dick edited the reports, Linda had to cut, paste and retype the whole thing. Finally, the reports had to be sent—through the company mail if there was time; by air express if there wasn't—to top executives in Palo Alto. "Dick usually took copies with him to Palo Alto in case the reports didn't get there via express or the mails." By the time one review was done, another loomed on the horizon.

Now Linda does the whole process quite easily on the company's new computer message system called HPDESK-MANAGER (formerly HPMail). She sends out invitations via the computer to all managers to call them together for meetings and receives their summaries on the same system. Dick edits and refines them into one report on his computer terminal and sends that off to Linda for final polishing before it's sent to HP's Executive Committee—also via HPDESK. "The new system," says Linda, "saves us time, postage, photocopying charges, paper and special delivery costs." Not to mention, she adds, the wear and tear on her nerves.

What these three examples point up is that, like it or not, automation is

coming to HP, coming to the U.S., coming to all the industrialized nations in the world. New technologies, new machines—some of them created at Hewlett-Packard—will dramatically change the way we do our jobs say industrial futurists. Stiffening international competition and the desire for flawless products will make automation necessary for survival. Says a General Electric vice president: "Automate, emigrate or evaporate."

HP Labs' Egon Loebner equates what is happening today to the agricultural revolution that took place 10,000 years ago. "At that time," says the human-computer interaction researcher, "man domesticated animals and plants and invented agriculture. Now we're in the process of domesticating machines. We've already almost domesticated the car and we're going on to better things."

But many people worry about the "better" things.

Futurists tell us about machines in the factory that will drill, weld, paint, sort, stack, inspect and assemble things for us. They talk about computers that will help design, plan, move, schedule and ship products for us.

"I don't see the factory looking much different in 10 years' time than it does today."

SRI International's senior research engineer, Bill Park, ticks off some of the new technologies that will transform the factory: communication systems, computer-aided design technology and artificial intelligence. AI will make possible automatic-planning systems, machines that react to natural language and computer vision so machines can "see" things and act on the information. On the mechanical side, robots of all sizes and shapes will perform a rainbow's range of repetitive tasks. "The dumb robot arm you see today is the *australopithecus* of robots," explains Bill. "It's Early Robot... just a crude

arm. And you have to work very hard to get it to do what you want. But we have the technology to refine that arm and develop the other limbs and sense organs as well. In fact, every operation in the factory potentially could be automated to some extent."

And where do people fit into the factory of the future? "The main thing that people will be providing," says Bill, "is information on the function of the product and advice about its design."

The changes in the office, say futurists, will be just as dramatic. Almost all office people—clerks, secretaries and managers—will have some type of terminal or personal computer at their desks. One study predicts that one of three white-collar workers will have computer workstations by 1986.

Many office consultants also predict a bright future for electronic voice messaging systems using telephones that will allow you to send, retrieve and store voice messages with great ease and speed. As you read this, they say, electronic mail systems are already transforming the office into a very different place... where the old game of telephone tag may be a thing of the past.

Some office futurists predict that videotex, a two-way interactive system that allows you to retrieve information electronically from stored data, will also change the way people work in the office. This innovation will let you, for example, ask your computer to give you a choice of 10 French restaurants in the area if you have to plan a business luncheon, allow you to look at each menu, make a reservation, select courses and get an immediate notification that your appointment is confirmed.

While the specific new products that will be acceptable to office professionals are open to speculation, some things appear certain. Computers in the office will be joined together in networks for constant and easy communication. The portability of information will be superb. Everyone will use computers: clerks, secretaries and managers... although futurists squabble about whether we'll have to type or use our voices to communicate with them. "One of the important implications of this," says Leo Mall, senior SRI consultant, "is a changing role for the

secretary and manager in the office. Managers in the future will be technical leaders of their departments. And secretaries, if they can upgrade their skills, will become administrative managers for their groups."

All factory and office experts agree that radical, irreversible changes are coming. But none of them can agree on when these changes will happen. Most believe that change will take place very slowly. "I don't see the factory looking much different in 10 years' time than it does today," says Bill Park. "The capital expenditure is just too great to make a noticeable difference. In 15 or 20 years, I think you'll see some radical differences."

Because of the increasing role of automation, it's predicted that high technology will be America's largest industry by the end of the century.

There's a lot of comfort in this picture of the future. Because of the increasing role of automation, it's predicted that high technology will be America's largest industry by the end of the century. As a leader in that business, HP should do very well in the years to come. It's an exciting and promising field.

But there are also vague feelings of discomfort as well. Will this depersonalized picture that futurists paint come to the HP work place? How will it fit in with the company's culture?

One fact is clear. HP and all other companies that wish to continue to compete effectively will have to automate to stay in business.

"The question," says HP's president John Young, "is no longer, 'Should we automate or not?' We have no choice. In order to stay competitive, to stay alive as a company in the '80s and ensure the continuation of employment for

PEERING INTO THE CRYSTAL BALL

Changes in the office. Changes in the factory. What will that mean for you and me?

Listening to futurists, one hears mixed messages. The truth is simply that none of them really knows what automation will do to jobs. One predictor claims that 5.2 million jobs will be lost by the end of the century. At Carnegie-Mellon University in Pittsburgh, Pennsylvania, Professor Robert Ayres and Ph.D. student Steven Miller have estimated that, by 1990, automation could—by attrition, internal shifts and retraining—affect some three million jobs in American industry.

Nobel Laureate Wassily Leontieff, director of New York University Institute for Economic Analysis, claims automation will completely replace human labor. "Human workers," he says, "will go the way of the horse."

"Nonsense," counters a former French finance minister. "People can adjust, unless they're asses."

The crystal balls are also filled with snow when it comes to what jobs will be in demand in the future. While it seemed logical for a character in the '60s movie, *The Graduate*, to say: "Go into plastics, son," what advice can we give our kids today? If you believe the World Future Society you might say: "Go into erotic boutiques. Be a talking sign salesman. Grow truffles." Forecasting International of Arlington, Virginia, takes a more serious approach: hazardous-waste management specialists, geriatric social workers and industrial-robot technicians all will be winning occupations for the future.

In case you feel all future jobs will be in the high-tech field, Russell Rumberger, a Stanford University economics professor, adds a cautionary note. High tech, he claims, won't create a huge supply of new jobs. It's true, the high-tech industry will grow, but the field will only generate 7 percent of jobs in the

economy. Most new jobs in the next 20 years, says Russell, will come in non-technical areas. "New jobs for data-processing machine mechanics," he says, "will increase 148 percent, the fastest-growing category. But that large gain translates into an increase of less than 100,000 jobs, while 800,000 new jobs are projected for fast-food workers and kitchen helpers alone."

A chart in a recent *Time* magazine bears out this theory. The 10 best job prospects for the '90s are secretaries, nurses, janitors, sales clerks, cashiers, truck drivers, fast-food workers and waiters. No one is talking about plastics.

True, there isn't much agreement on the direction jobs will take, but there is a lot of agreement that jobs will change—as they have in the past—and that the changes are speeding up.

Kingpin of the futurists, John Naisbitt, whose book *Megatrends* outlining 10 trends for the future is a best seller, claims that we are changing very quickly from an industrial society to an information society. "The rapid change ahead," writes John, "means you cannot expect to remain in the same job or profession for life."

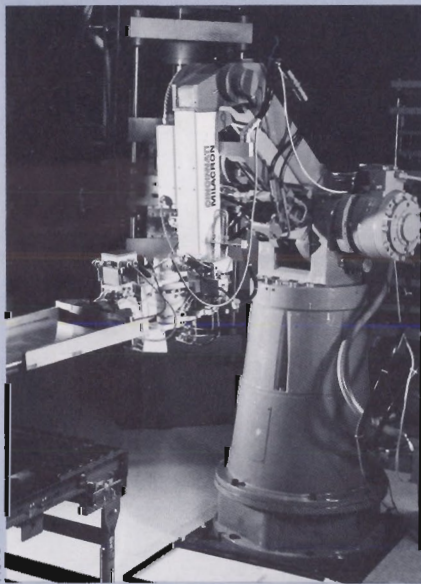
Computer Systems Division employment manager Steve Hams would agree that the statement has some relevance when it comes to HP. "We're committed at HP," says Steve, "to providing secure employment based on job performance, but we won't be providing an unchanging job. The farsighted HP employee will take time to assess what the required skills of the future will be and will begin developing those today."

WHAT'S AHEAD FOR HP

Computer Systems Division's Steve Hams and 12 other Computer Groups employment managers recently participated in a task force to identify work force issues at HP and recommend future directions. "Initially," says Steve, "the May Day Project (called that because the report was due May 1, 1983) was initiated because we were concerned about the number of excess employees we had in the Bay Area. But when we looked more closely at the problems, we realized there were much broader personnel issues we had to address: Automation, relocations and production changes were, in fact, changing things at HP."

Here are some skills that managers say are in great demand at HP and will continue to become more precious as time goes by:

- *Analytical and problem-solving skills.* Managers not only want people to identify problems, they expect them to help analyze those problems and offer solutions.



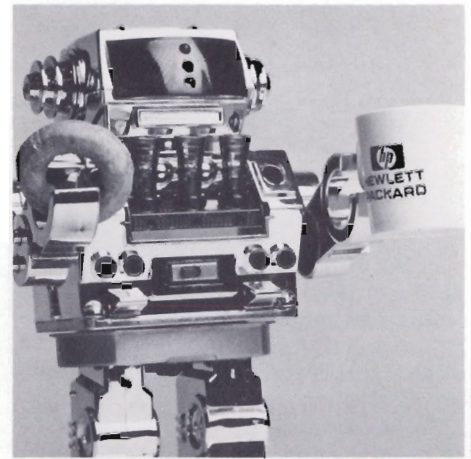
STEVE WELSH

Disc Memory Division employees named this robot with a bright yellow arm "Goldfinger." The robot lifts 95-pound "books" of laminated printed circuit boards and shoves them into hot and cold presses.

- *Software and programming skills.* There's an increasing demand in the company for the software skills to program computers.
- *Interpersonal and communication skills.* "This surprised us," says Betsy Merck who helped Steve with the report's automation section, "because we just bought that picture of the isolated computer operator. But managers said the opposite: that computers will help us communicate more effectively. They see an increasing need for those who speak, write and work well in teams."
- *Up-to-date technological knowledge.* With technology moving very rapidly in the marketplace, managers feel it is important for HP people to stay as current in their professions as possible.

Betsy also points out that the May Day project brings forth some important implications for HP people who would like to stay in step with the changes in the company's employment environment.

- *Manufacturing people.* Take as many after-hours or community-college classes as you can to become computer literate. Find out what computers are all about and how they work in a manufacturing environment. Take math classes and learn what statistical quality control is all about. Brush up on your English and enhance your communication skills. "Talking articulately to people, writing well and communicating and selling your ideas," says Betsy, "are skills that are becoming more important in the work place."
- *R&D engineers.* Re-assess what you know in your technological field of interest. Make a pact with yourself to stay current.
- *Office personnel.* Become familiar with the office automation systems at HP. Learn how to operate the latest packages being introduced into offices throughout the company. Think "How can I do my job better?" and learn how HP's office systems fit into that picture.



GLENN STEINER

"In order to stay competitive, to stay alive as a company in the '80s and ensure continued employment for everyone here, we must automate."

everyone here, we must automate."

But while automation has started at HP and will continue to happen over the years, managers don't subscribe to the futurists' scenario of the work place to come. "That futuristic vision you hear about all the time," says Dick Love, Personal Computer Group manufacturing and distribution manager, "of robots working night and day, blinking lights and a people-free factory... I don't see that happening at HP." Dave Weindorf, Corporate manufacturing support manager, agrees. "In time, yes," says Dave, "I think we'll see a higher ratio of shipment dollars per employee in the future through automated improvements in production. But I don't see us replacing legions of people. We'll automate the boring and unforgiving jobs to improve quality and productivity. But then people can go on to the more stimulating, interesting jobs."

How will automation come to HP? According to managers, it will come slowly and in keeping with our people-centered philosophy. "Automation," says John Young, "presents more opportunities than displacements for people. It's changing things for the better. There will be new avenues to learn about and explore. And HP people have been growing, developing, preparing

for new jobs for some time."

In the HP factory, automation is happening very slowly. Managers point out that the new automated machines are extremely expensive and not as flexible and easy to adapt as they would like. "In the factory," says Dave Weindorf, "everything is very decentralized in automation at HP. Some divisions have a fair amount of it; others have none. But I certainly don't think we're as highly sophisticated as the car industry. Not by a long shot."

Another reason automation hasn't taken firm hold in HP factories is because managers realize automation for automation's sake doesn't make sense. "We must automate carefully and the right way," says Dan Simin, Sunnyvale PC Shop manager. "First we have to get our processes under control. If we don't, all you do if you automate is make scrap at a faster rate."

Automation is likely to take hold fastest at HP in those areas—and there aren't too many in the company yet—that feature high-volume manufacturing. Printed circuit board manufacturing and printed circuit loading activities are automated to some extent. A more automated approach, says Dick Love, is likely to come to his sector of the business as HP's personal computer business expands. "The volume we're looking at will justify some automation," according to Dick. "We'll need to improve low-cost manufacturing to be competitive."

And what, you're probably thinking now, about the future of robots at HP?

According to John Birk, manager of HP Labs' automation technology department, there are about a dozen robots in the company. Most do unsafe or boring jobs. (Employees have given the robots names like H2P2, Rover, Robot Redford and Goldfinger.) "There's no policy at HP," says John, "to roboticize the company. Wherever robots help produce higher quality, more cost-effective products is where they belong."

Robot-like mechanisms are being used more and more in material-handling operations. They help store, retrieve and ship parts and products, saving wear and tear on employees' backs. Joe Avery, manufacturing manager at Data Systems Division, feels the 15-

foot, floor-to-ceiling, automatic storage and retrieval system in his division has changed things for the better for DSD material handlers. "We feel good about it," says Joe. "Now there's less lifting and bending; it's ergonomically better for our people. Those employees who used to pull parts have now become computer literate."

Automation is coming to the HP office faster than it's coming to the HP factory—possibly because it's less expensive and involves the use of HP products. According to Luis Hurtado-Sanchez, head of the Corporate Office Utilities Group, there are nearly 20,000 terminals in HP, 1,100 of them at corporate. His group is promoting office automation within the company, suggesting how divisions can best automate using HP products and encouraging employees to be as innovative as they can with the new packages.

"Wherever robots help produce higher quality, more cost-effective products is where they belong."

Office automation, according to Luis, is special at HP. "HP's approach is unique, very decentralized. We're all working out our own solutions to productivity in the office. We're asking, 'How can I do my job better?' and using new tools to do that. Other companies have created specialist departments for text processing and functions like that. I think HP's way is better. We leave it up to all office employees to make their own jobs more rewarding."

The new tools are allowing office people to communicate easier, lessening the burden of paper in the office, letting office employees capture and retrieve data more efficiently and, through HPDESK's electronic mail capabilities, liberating secretaries from their desks. "We'll see a different kind of interface in the office," says Luis. "Machines will take over the trivial and less important activities. Will we stop

talking to each other? Of course not. We can reserve face-to-face contacts for really important matters and let machines handle mechanical ones."

Hank Taylor, manager of Corporate communications systems and office management, feels office automation will improve all the HP way principles. "After all," says Hank, "the HP way involves good communications between people. The new tools will let us do that more effectively."

Automation is coming, albeit slowly, to the HP environment.

It doesn't frighten production's Steve Lusk of Corvallis. "Some of my co-workers were worried that robots would take our jobs away," says Steve. "But I didn't feel that way. I just figured here was a monotonous job I didn't have to do. Now I do something more interesting."

It doesn't bother IC project manager Jean-Claude Roy in Sunnyvale. "We couldn't go back to designing the old way. Once you've learned this new way, it's very natural... and it's more fun than paper and pencil."

And it doesn't concern Linda Trotman in Boise in the least. "I work differently now," admits Linda. "I'm more organized, more efficient and more productive. When I hire a temporary secretary, the first thing I ask for is systems knowledge. If you don't learn the new skills, and seize the opportunity to automate, you'll be a secretary of the past, not the future. No one should let that happen." **M**



HP's no-fuss airline

The company's fleet of airplanes speeds travel to divisions in the western United States with regularly scheduled flights.

No ticket lines, no rental cars and no fuss. Convenience is the major reason Hewlett-Packard flies a fleet of seven airplanes across the western skies from its tan hangar at San Jose (California) Municipal Airport.

The fleet takes employees from HP's aviation hangar by turbo-prop plane to nearby divisions in Roseville and Santa Rosa, California, in approximately 45 minutes. Other locations—Corvallis, Oregon; Boise, Idaho; and Loveland, Colorado—are all within three hours of San Jose by business jet. Travel would take more than twice as much time by commercial airlines through such gateway cities as Eugene, Oregon, and Denver, Colorado.

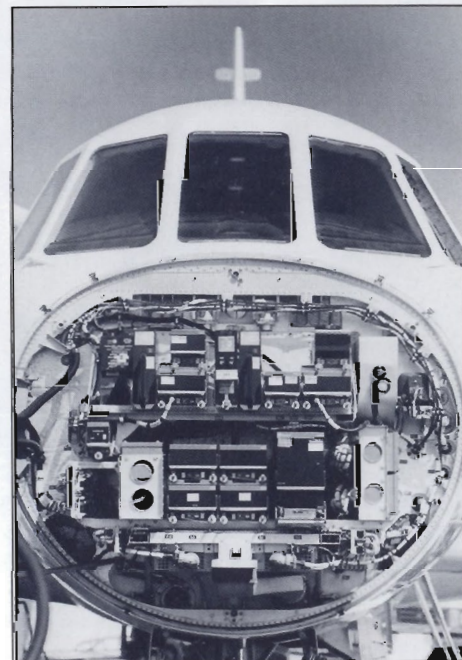
"It's simple," says John Kendall, the fleet's manager and chief pilot. "There are no direct flights into such cities as Roseville and Corvallis. If HP employees



When the HP plane lands at the Santa Rosa, California, airport, it's met by a van which carries the passengers to the division a few miles away.



Dave Engelhardt, one of 13 HP pilots, banks his airplane for final approach to the airport.



The compartment beneath the Falcon jet's nose cone holds the plane's navigational and communication equipment.

had to travel conventional routes into these cities by commercial flights, they would lose many hours."

The HP airline had very humble beginnings in 1973. Flights left sporadically on the one jet and one turbo-prop plane (officially owned by Dave Packard and Bill Hewlett and leased to the company). The flights were most often charters. Things have changed in the fleet's 10 years. As divisions sprouted up across the U.S. and more people needed quick access to those sites, the fleet grew. Today there are seven planes (see page 10) with daily flights to and from HP communities.

That's a departure from the way most corporations run their fleets. Most fly only where the company's top executive wants to go. More than half of the *Fortune* 1000 companies in the U.S. own at least one plane and most maintain a

fleet. "But most corporations limit travel in company planes only to senior executives—usually on a 'charter' basis," says John. "All HP employees are welcome to fly our service—on business, of course."

Corporate fleets have one of the best safety records in the skies, primarily because of higher maintenance standards in place for the VIP cargo they carry. HP is no exception.

"HP's superb record is due in large part to Ken Peartree, maintenance chief, and his crew," says John. "We have at least one mechanic on duty from 6 a.m. until 11 p.m. every business day. Servicing the aircraft is a crucial service."

Ken and his team of five aviation mechanics are nearly always tuning or overhauling at least one plane. But amidst all the repairs, the hangar stays

spotless. The polished tile floor rivals that of any HP factory or office.

Running an airline with seven planes, 13 pilots, six mechanics, two building service and two office support people isn't an inexpensive proposition. John notes that "we recoup most of our variable operating expenses in fare charges from our passengers. The



Lloyd Zans (left) and Eli Cotti perform routine maintenance on one of HP's two Piper T-1040s.



Eli Cotti finishes work on a turbo-prop engine. "When HP passengers walk through the hangar and see the modern planes and a clean floor, it gives them confidence in our operation," says fleet manager John Kendall.

remainder is absorbed by Corporate overhead charges."

The cost per passenger mile is higher than commercial airlines, but most HP departments are willing to pay for this service. "In terms of hours saved from not having to hassle with commercial flights, cabs or rental cars, it's money well spent," says John.

HP has plans to upgrade its fleet in the years ahead. Two new Citation jets

will replace the twin-engine Sabreliner jets in October 1984 and January 1985. There's even talk of starting fleet service between HP's European operations sometime in the future.

In the meantime, don't be surprised if you see a plane with "HP" on its tail the next time you visit your local airport. It's part of HP's no-fuss airline. **M**



DASSAULT-BREGUET FALCON 50
Maximum cruising speed: 560 mph
Maximum cruising range: 3,800 miles



ROCKWELL SABRELINER 40 AND 60s
Maximum cruising speed: 528 mph
Maximum cruising range: 3,328 miles



PIPER T-1040
Maximum cruising speed: 270 mph
Maximum cruising range: 1,100 miles



CESSNA 337
Maximum cruising speed: 185 mph
Maximum cruising range: 1,300 miles

SOARING WITH FALCONS

There's a new bird in HP's nest: a Dassault-Breguet Falcon 50. It flies higher, faster and goes farther on a full tank than the rest of the HP flock.

HP's president, John Young, and government relations' Tom Uhlman put the French jet to the test in September. Their goal was to meet with six members of President Reagan's Commission on Industrial Competitiveness that John chairs—and do so as quickly as possible.

In two business days they flew to see all six in five states: California, Texas, Illinois, New Jersey and Pennsylvania. They had time for two extra business stops in Iowa and New York.

"When you consider it would normally take about four days by commercial airline to accomplish this feat, the Falcon's versatility is truly remarkable," says Tom.

YOUR TURN

Invites Measure readers to comment on matters of importance to HP employees.

MEASURING IN KELVIN

In my first week with HP and your 20th year of publication I read *Measure* with interest, especially the correspondence about the Protagoras quote on the inside front cover. Although probably too long for the magazine, the following quote by Lord Kelvin may be of interest:

"When you can measure what you are talking about and express it in numbers, you know something about it. When you cannot express it in numbers your knowledge is of a meagre and unsatisfactory kind."

This is certainly true in my job as a staff engineer in sales support.

GORDON MESSAGE
Borehamwood, England

AN HONEST COMPARISON

As I have been dealing with quite a few of HP's systems and instrumentation, I've found out how good our products really are. Having worked on many other "good" brand-name instruments and compared them with HP, I've come to the following conclusion:

In order to make good instruments, you have to be honest.

In order to make superb instruments, you have to be honest to goodness.

Hewlett-Packard makes superb instruments.

I now know HP to be the best company to work for and certainly one to be proud of.

CARLOS MONGIELLO
Aguadilla, Puerto Rico

A ROYAL CHARGE

Following Queen Elizabeth's visit to Cupertino a number of HP publications (including *Measure*) ran photos of Dave Packard showing the royal party a CPU printed circuit assembly from an HP 1000 computer.

It appears that Dave and the Queen did not have proper electrostatic discharge (ESD) safeguards when handling the circuit board. As one of the ESD coordinators for the Computer Group, it is very hard to communicate the importance of proper handling and working from a static-safe workstation when management doesn't follow those principles.

For future visits, I hope good han-

dling procedures (wrist or heel strap, etc.) are followed when showing electronic devices.

BOB SLACK
Cupertino, California

The boards shown to Queen Elizabeth during the tour were only for demonstration purposes. Since those boards hadn't passed a quality inspection, they would never have been used inside an HP computer.—Ed.

MORE STATIC

May I congratulate you on making the 20th anniversary issue of *Measure* the best and most interesting copy I have seen in my three-year HP history.

Concerning the quality and development article in that issue I was surprised to find little reference to the expected returns from cost-saving and reliability due to the intensive static-awareness programme that has affected many of us. I would suggest that an article on this subject would be of great interest.

RICHARD IRVING
Winnersh, England

Measure covered this electrifying subject in the September-October 1980 issue, and has plans to do a return article soon.—Ed.

A YOUNG CEO

I enjoyed the excellent article on John Young in your May-June issue. I was particularly impressed by the fact that, despite the pressures of his position, John still makes time to lead a rich family life—and apparently always has. He is a real example to others throughout the corporation.

JUDY PEHRSON SQUIRES
Wellington, New Zealand

I don't know John Young at all, but he was portrayed as such a "nice guy" in your article that I couldn't help but think of him when, a day after reading the article, I found this quote: *"Surprisingly, the top people of the biggest companies are often the nicest*

ones. I'm not sure, though, if they got there because they were good guys or if they're now good guys because they can afford to be."—Malcolm Forbes.

SUSAN GRANT
Sunnyvale, California

FORTUNATE RATING

I was intrigued and happy to read that *Fortune* magazine now ranks HP 81st in its 500 list. Being a super optimist with a yen for crunching statistics advantageously, I couldn't resist looking back down memory lane to 1976 when *Fortune* had us pegged 200. Then I made a simplistic projection to see when we'll make the No. 1 spot.

YEAR	RANK	ANNUAL CHANGE	5-YEAR AVERAGE ANNUAL CHANGE
1976	200		
1977	184	16%	
1978	167	17%	
1979	150	17%	
1980	120	30%	
1981	110	10%	
1982	81	29%	20.6%
1983	60	20.6%	
1984	40	20.6%	
1985	19	20.6%	
1986	1	20.6%	

Obviously, things just won't go that easy for us, but there's no harm done except good fun, to look forward and make plans to celebrate becoming Numero Uno!

JACK BENSON
Palo Alto

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. Where a response is indicated, the best available company source will be sought.

CLOSEUP

Zooms in on the ever-changing world of HP people, products and places.



FREYTAG OF STUTTGART

I'LL GLADLY PAY YOU TUESDAY, FOR A BRATWURST TODAY

HP's cafeteria in Böblingen, West Germany, has installed an eat-now, pay-later computer system for its employees.

Three check-out stands are equipped with HP 3075 terminals, magnetic card readers and screens. Cashiers use the magnetic stripes on the back of employees' ID cards to enter personnel information and then enter the number of the selected meal. The 10 most popular items on the menu are entered using function keys. Each morning the cafeteria staff stores the day's menu and corresponding prices.

All employees' cafeteria bills are deducted from their paychecks at the end of each month. An HP 3000 computer, programmed by the Böblingen EDP staff, runs the high-tech cafeteria system.

There is also one check-out stand reserved for people paying the old-fashioned way—with cash.



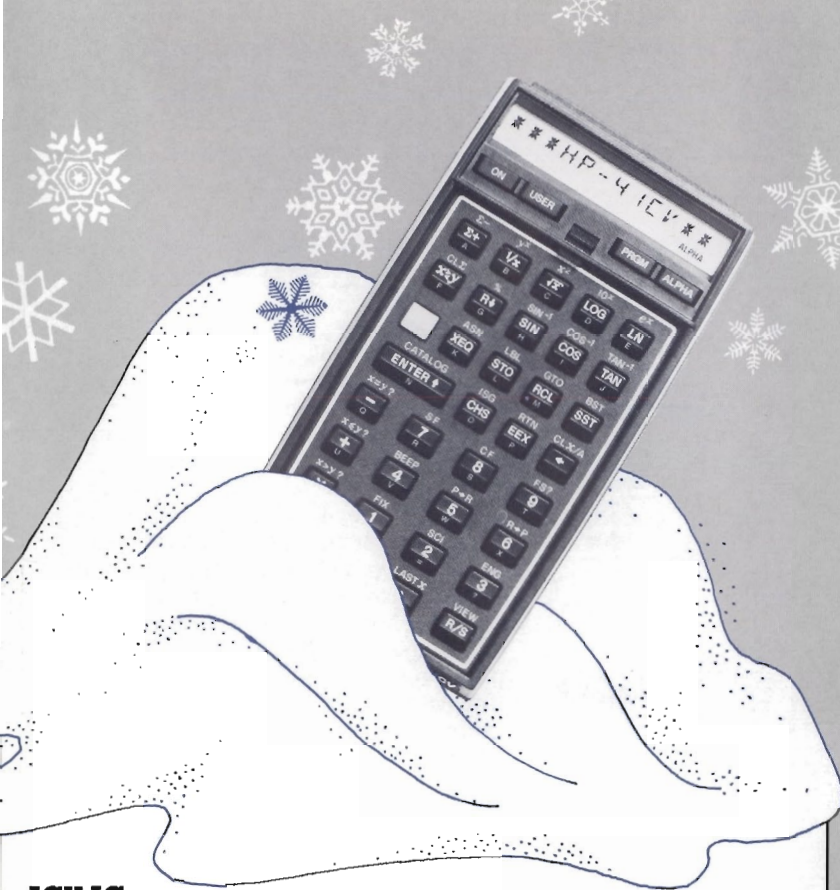
ROW, ROW, ROW YOUR BOAT

When Peter Bird started his trans-Pacific solo row in 1982, he had the help of a small group of HP employees and some HP equipment to keep him on course.

For 10 months Santa Rosa's Dick Lyon (an Olympic rowing medalist in 1964), Bob Matreci and Dan Swann tracked the Englishman's 9,000-mile trek from San Francisco to Australia's Great Barrier Reef. The three HP employees met Peter through the Sonoma County Rowing Club.

Dick helped design the sliding seat and oar locks for Peter's high-tech, 35-foot rowboat, the *Hele-On-Britannia*. Bob helped design, install and test the state-of-the-art communication and navigation system using HP spectrum and network analyzers. Dan taught Peter how to use his new HP 41C handheld computer for navigation.

"I am in great awe of Peter's accomplishments," said Dick, "and was able to feel a good measure of involvement as we tracked his progress."



ICY ICs

The first Brazilian expedition to Antarctica included an HP 41CV handheld computer made in Campinas, Brazil. The team used the HP computer to measure water salinity, nutrient indicators and dissolved oxygen in water. To mark the occasion, HP's Campinas General Manager Odmar Almeida received a commemorative medal from Navy Secretary Almirant Maximiano Da Fonseca.



COLLEEN JACKS

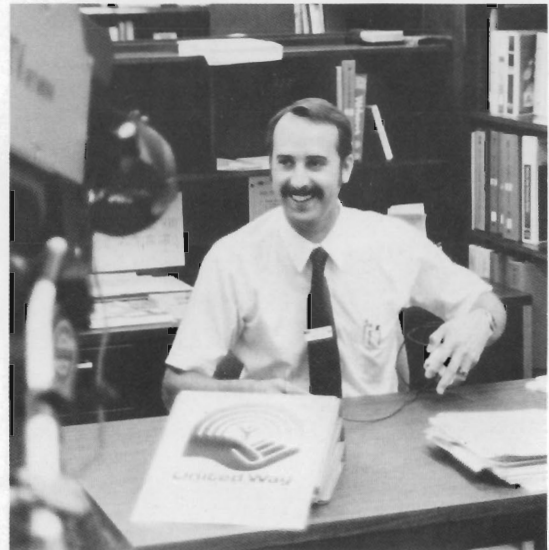
IN THE SWIM OF THINGS

Some managers will go to any lengths—or depths—to get their manufacturing lines on target. Witness Steve Tracy, photomasking section manager at Corvallis Components Operation.

When Steve looked for an incentive to offer his section to reduce its cycle time, he looked no further than Lake Stewart on HP's Corvallis, Oregon, property.

If his section could drop its cycle time, he'd take a swim. That was enough of a challenge. The section pulled together and met its goal. So Steve waded waist-high into the cold, still water to the cheers of an HP crowd.

Next for Steve: how to top this challenge without drowning?



JERRY CASHMAN

ON CAMERA FOR A GOOD CAUSE

Last winter Scientific Instrument Division's Bob Gillmore took part in Red Cross rescue and relief efforts for people flooded out in the Alviso, California, area. Bay Area television stations aired the dramatic stories nightly.

Bob, a volunteer with the San Jose chapter of the Red Cross, was far too occupied then to pay attention to television cameras. His vehicle served as the command post for health and welfare communications back to headquarters. He also helped get medicines for people forced to evacuate their homes—"anything we could do to make life a little easier for them."

This fall Bob was in front of a camera again, this time under more comfortable circumstances. He was one of eight HP Bay Area people who talked about their participation with United Way agencies for a videotape shown during the annual fund-raising campaign. The HP-TV Network produced the 11-minute program for HP's Bay Area United Way steering committee.

Playing hardball with software

There's a technological bottleneck affecting the computer industry today. It has shifted the primary focus of computer marketing efforts away from machines and onto the software that drives them. The problem: an insatiable demand for effective software.

You'd never guess there was such a problem if you stroll through a software store or browse through a catalog. You'll see such diverse programs as stress analysis, WordStar®, estate tax planning, surveying, LOTUS 1-2-3 (an integrated spreadsheet, data base and graphics package), payroll, inventory and invoicing, IMAGE/250 (a data base management system), HPDESKMANAGER, COBOL II, FOS, SPSS and acronyms ad infinitum.

During the 1960s, the importance of software was overshadowed by the cost of the computer itself—the hardware. A data-processing department stood between employees and the electronic monster in the air-conditioned room. Specialists who spoke the computer's language took care of the machine. An inexperienced user was helpless.

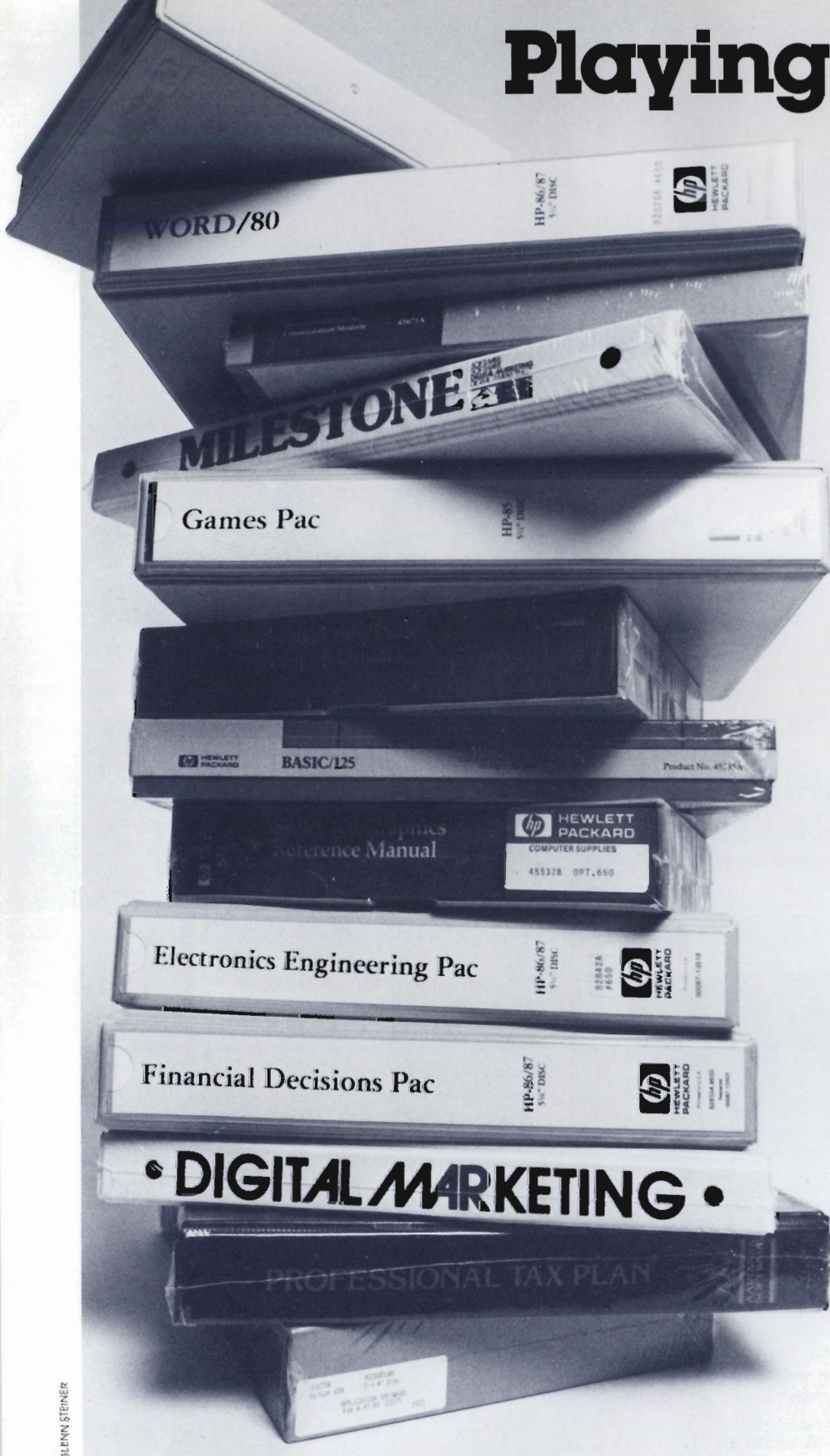
That's changed today. Hardware costs have dropped considerably and computer manufacturers have attempted to tame the monsters by making them "user friendly." The machines are sneaking out of computer rooms and seeking refuge on employees' desks in the shape of personal computers and powerful workstations.

"Unfortunately, too many computer manufacturers produce only equipment. Software applications—or the lack of them—can be the Achilles' heel of a company," says Paul Ely, executive vice president—Computer Groups.

HP has made some strong moves in the last few years to prevent such vulnerability. The solution is software. New divisions, application productivity networks, an employee software submission program, catalogs, interactive office packages, support and consulting services are all cropping up as quickly as a field of fresh wildflowers after the first spring rain.

Ed McCracken, general manager of HP's Business Development Group, was one of the first people behind the software push. Recalls Gwen Miller, now third-party marketing manager at

WordStar is a registered trademark of MicroPro International Corporation.



As computer programs stretch the capabilities of the machines on which they run, HP prepares for a huge push in the software market.

Systems Marketing Center in Cupertino, California, "About three years ago Ed wanted to make sure we had lots of software available for the HP 3000 computer. He asked me to put together an acquisition program."

The first software HP acquired from another company was RAPID/3000. Today independently written software is big business at HP and Gwen now manages HP Plus, a program which offers a large number of independently developed business applications for HP computer systems.

"Our plan was to buy a lot of software because we realized it took a long time to write our own," Gwen reflects.

"What we *learned* is that software acquisition is neither cheap nor fast. It took us almost two years—about as long as writing our own. Then we decided there's gotta be a better way."

Actually, there are a number of ways.

First, HP acquired two software development firms: Information Resources Ltd. in Denver, Colorado (now the Information Resources Operation), and Software Management Corporation in Santa Clara, California (formerly SMC Operation and now a part of the Manufacturing Productivity Division in San Jose).

These two newcomers provided HP with expertise in the design and marketing of software products for specialized industries and sales organizations.

The next step was to develop a network of divisions to work on various aspects of productivity software. These divisions are now creating software packages that can be customized for manufacturing, finance, engineering and office needs.

One of them, HP Materials Management, features preprogrammed, industry-standard part numbers. The beauty of the software is that it allows customers to add the rest of their unique part numbers to that list.

"We've received more than 1,000 orders for Manufacturers' Productivity Network software, so I guess our customers find it useful," says Paul Ely.

Another part of the productivity software strategy is the Applications Marketing Division, created this year. It operates 22 centers worldwide to help



JOANNE ENGELHARDT

Computer Support Division programmer-analyst Jeff Engle spent more than 500 hours working on personal budgeting software in his home office.

MAKING MONEY WITH MONEY MANAGEMENT

Sometimes Jeff Engle of Computer Support Division found he had too much month left at the end of his money.

He decided he needed a good budget. As a programmer-analyst, he figured the best way to budget would be to write a program for his trusty TRS-80 home computer.

That program, rewritten for the HP 86 computer and now called PIEBS (for Personal Income, Expense and Budgeting System), is the first to be accepted through the HP Employee Software Submission Program introduced last February.

When Jeff saw a demonstration of the HP 86 last year, he decided he had to have one. It arrived about the same time the submission program was announced.

Since the budgeting software "made me analyze what I was doing with my money," Jeff figured it might be useful to other people. He decided to rewrite it for his new HP computer and submit it.

Jeff spent nearly 500 hours writing PIEBS—almost 200 of the total since the software's acceptance in August. "I've been polishing it, working on documentation and freeing it of bugs," he says.

Gary Ambrosino, manager of the

Employee Software Submission Program, expects Jeff's program to sell for between \$70 and \$100. Jeff will get a 10 percent royalty for every program sold.

He also gets first crack at rewriting the software for other HP computers. (He plans to use his profit from PIEBS sales to buy an HP 150, and then revise his software for the company's new personal computer.)

Since the start of the software submission program, more than 30 employees have submitted programs. Five have been accepted. During the next few months the software will undergo a number of quality tests, the documentation will be edited and revised before the packages are ready to be sold by HP to the outside world.

The number of submitted programs has taken Gary by surprise. "We're already getting more marketable programs than we expected—about one or two a week," he says. Most have been written by engineers or systems analysts, but some come from field marketing people.

Will Jeff or any of the other HP software authors make a mint from their programs? "Maybe not," admits Jeff, "but the dollar sign is a very appealing incentive."

Playing hardball

install, implement and provide consultation to customers. These centers are particularly adept at knitting together HP's software with existing systems and applications.

HP formed a division to develop software for personal computers: the Personal Software Division (PSD).

This move was part of HP's overall computer strategy to strengthen the company's position as a serious contender in the personal business computer market. The culmination of these efforts was the introduction of the HP 150 personal computer in September.

"Software is a very profitable business," according to Chris Kocher of the PSD marketing department. "Whether we write our own or pay royalties for other people's software, our division will definitely make money."

The big emphasis on software, of course, isn't limited to the computer areas. It's also a factor in instruments, medical and analytical sales. But, as Brian Humphries, product marketing manager for the Instrument Groups, points out, "In the computer area, software is 100 percent interrelated with their products. In instruments, only 10 percent of our business today is software dependent. But 20 years from now it could be 90 percent."

Brian points out that "most of today's HP instruments are designed to be part of computer-based test and measurement systems."

That trend is occurring in HP's analytical and medical product lines, too.

"We're seeing a major shift in our business patterns: customers want custom or semi-custom software," says Bob Board, engineering manager of the Analytical Group.

"This is a recent trend. In the last five years we've seen our products go from rarely using a computer component to the point where we don't make an instrument that doesn't either have a built-in computer or a hookup for one."

The Medical Group is counting on such software programs as HAS (for Hospital Accounting System) 3000 to bring in orders for HP 3000 computers. The program has three modules: a hospital information system, an accounting system and a "hotel" function for admissions, discharges and transfers.

"A lot of our customers have yet to understand the real value of software," says Ed MacDonald, marketing manager of the Medical Group. "The thing that separates our products from the competition is not the equipment, but the software."

Yet the software saga is not without its problems. "The computer industry has been able to make dramatic improvements in hardware, but programmer productivity has been increasing by less than 5 percent a year," says Paul Ely. "The number of people available to write software applications hasn't grown much either."

"At HP, we've found ways around this bottleneck. First, we are creating tools to help our customers' programmers increase their own productivity. In other words, we're providing software to write software. Some of our customers have reported a five-to-one improvement in productivity."

"Second are those software packages we call productivity networks (described above). The important point to remember is that the end-user can customize these packages to fit his needs *without* expertise in programming."

"We're also encouraged by advances in artificial intelligence. AI eventually will make it possible for people who are not programmers to use computers directly to solve their own problems. HP Labs is hard at work on AI and we expect some good results," says Paul.

What kind of an impact does available software have on HP computer sales? "My guess would be that about 15 percent of our hardware sales are based on the available software solutions—and the percentage is growing," says Gwen.

Clearly at HP these days, if the computer business is a serious game, the name of the game is software. **M**



JOANNE ENGELHARDT

Gwen Miller, HP's third-party marketing manager, "never wants a customer to decide against buying an HP computer because of a lack of software."

COMPATIBILITY: CAN IT HAPPEN HERE?

Happiness is buying a computer software program and finding it can run on any computer equipment.

Impossible, you say? Perhaps that's true right now, but most software specialists believe it's a distant and desirable possibility.

A neophyte computer owner, for instance, gets a first taste of reality when looking for a VisiCalc spreadsheet to run on an Apple IIe. Sounds simple enough until you walk into a software store.

You quickly learn that software is not sold like record albums, cassette tapes or video discs. It's frustrating to learn that your IIe (or HP 150, IBM PC, Atari, or hundreds of others) may run only those software programs written specifically for that equipment.

Why not make software that will run on any computer?

Gwen Miller, third-party marketing manager at Systems Marketing Center, explains that computers are "built with different operating systems and configurations that discourage compatibility. There is a definite trend toward standardization, but I won't venture to guess when it will happen."

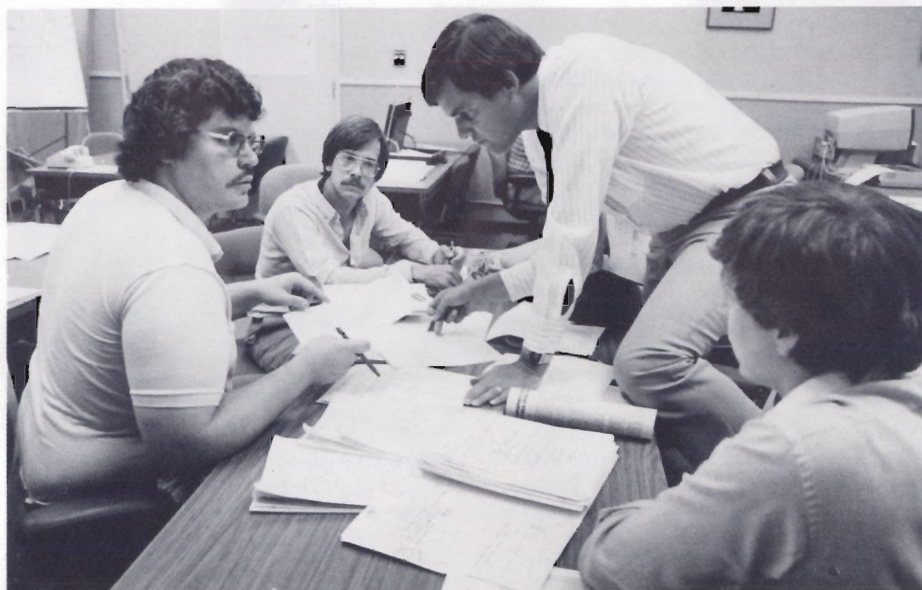
Chris Kocher, manager of HP's independent software vendor program, thinks it's because the software industry hasn't yet grown up.

"If you look at a mature industry like the recording industry, you see that any record plays on any turntable," he says.

HP's personal computer strategy calls for one or two PCs that will run all software programs. "But," predicts Chris, "that's a far piece down the road."

ONE-STOP SHOPPING

By bringing together technical and strategic computer sales support in one organization, the Systems Marketing Center in Cupertino, California, saves the sales force time and frustration. That's particularly important as HP goes after big deals.



With a potential big deal on the table, Tom Hoffer (right) of the Systems Marketing Center's technical sales center confers with Data Systems Division systems experts Chuck Morgan, Bill Jacobs and Ron Eckhardt on the hardware solution.

When HP Bellevue sales representative Steve Evans first saw an invitation last March to bid on supplying a large network of computers to the Washington Community College Computing Consortium (WCCCC), he knew that a possible big deal was brewing for Hewlett-Packard.

Increasingly these days HP is going aggressively after such big deals and winning them against heavy-duty competition. In mid-July, after an intensive effort involving more than 35 people in the Bellevue office, Steve received word that HP had indeed been selected by WCCCC to supply 50 HP 3000s and a number of personal computers to its headquarters and 28 member colleges.

One reason for HP's success in winning such big deals is the concept of "one-stop shopping" to back up field sales people with a single center providing across-the-board expertise on technical data, strategic sales counseling, customer presentations, and a full array of informational services.

This May the Systems Marketing Center (SMC) under General Manager Ed Hayes was formally established as part of the Business Development Group. Located in the company's computer complex in Cupertino, Califor-

nia, it is called a "center" rather than a division because the structure is novel for HP: an entity made up entirely of marketing people without the traditional top managers for R&D, manufacturing and other functional areas.

The establishment of SMC is "a very visible sign of HP's movement toward becoming a market-driven company," according to Ed. His organization currently has 230 people and is growing.

The idea for concentrating the sales support activity of several systems-related divisions under one roof began experimentally three years ago for the HP 3000 business computer only.

Rick Justice, now SMC marketing manager, recalls the rumblings in the field when rapid growth of HP 3000 sales led to a divisional split and splintering of the traditional factory sales-support role.

"I was one of the complainers," says Rick, then computer district field manager for the San Francisco Bay Area and Hawaii. "Can you imagine a sales rep in Honolulu trying to call six different factory people about a system?"

He transferred to Cupertino in November 1981 to manage the evolving commercial sales center, which was becoming more and more involved in the

ONE-STOP SHOPPING

selling process. The ringing phones never stopped, but there was also opportunity to help out on major deals in a variety of ways. A performance lab was set up to run "benchmark" tests so customers could see how an HP system stacked up with the competition.

As the scope of the commercial sales center job expanded, it attracted an increasing number of experienced HP people. "The sales center had become the place to be," says Rick. No one left the group for an entire year.

With the creation of the Systems Marketing Center, the *commercial sales center* became one of five key units in Ed Hayes' organization. Some on-going activities—such as international sales, the performance center, training and marketing support—were assigned to a new *marketing department*, which also brought in experts on applications and product lines. *Third-party marketing* (involving outside companies) became a separate unit for added emphasis.

"SMC is a very visible sign of HP's movement toward becoming a market-driven company."

The sales development team from Data Systems Division under Dave Yewell has transferred in as the nucleus of a *technical sales center* which parallels the commercial sales center. Serving the entire Computer Groups is a new *marketing information center* under Rich Edwards that provides marketing research, competitive analysis and order analysis.

The Fort Collins Systems Division's sales development and third-party marketing teams are now part of SMC.

Ross Hunt, who was the first employee of the commercial sales center when it began, now manages the 27 people assigned to teams which serve the U.S. sales regions. (In SMC jargon, they're the "on-line" people who take phone calls directly from the field.) Ross and Barry Klaas, whose team covers the state of Washington, were contacted early in the process of preparing



SMC's John Gibb (center) and Tommy Forssell (right) from HP Sweden give Swedish customers a Cupertino tour.

a proposal for the WCCCC.

The interaction between Cupertino and Bellevue on that bid is an illustration of the strong supporting role played by SMC in the sales process. In this case the Bellevue office decided to prepare its own bid proposal (something which SMC does on occasion). Steve phoned with a number of questions about specific requirements. He was given advance information on as-yet-unannounced products (such as the HP 150) which would figure in the sales process.

When HP was selected as one of four finalists, a group of 12 WCCCC management and technical people visited Cupertino for a week of briefings. Two benchmarks were run by the Bellevue benchmark team and SMC's performance lab to the consortium's precise requirements. In the final stage of the decision, four SMC people went to Seattle to answer additional questions from the customer. HP's upper management followed the negotiation throughout.

The jubilation in the Bellevue office when HP won the contract was echoed in Cupertino and rightly so. "The Systems Marketing Center was an important part of the team," says Steve.

Barbara Sudlow, who manages the commercial sales center's Eastern Sales Region on-line team in Cupertino, handles a number of big deals. "Because you're the focal point between the factory and the field, you really begin to feel like part of the sales team,"

she says. "When a big deal is pending, people who pass you in the hall keep asking if you've heard how it came out."

The activities meshed in the Systems Marketing Center reflect some realistic shifts in HP's thinking that have been taking place over the past decade.

Until five years ago, the company's customers looked for hardware and tools to develop their own computing programs. In 1979 they began to cross over to buying solutions, and HP geared up accordingly in recognition of the increasing importance of software in the selling process (see page 14).

Most customers today want to know HP's computer strategy.

Along the way HP has come to realize the contribution that other companies can make to its sales as the interdependence of hardware and software creates new relationships.

The marketing concept of the Manufacturer's Productivity Network (MPN), which links computerized solutions in various functional areas of a manufacturing plant, also opens the way to more complex—and hefty—sales involving all types of computers.

"More and more customers want to 'buy an MPN' when they come in," says Dave Yewell, technical sales center manager. "A single vendor for a company is becoming more important."

As the total price tag goes up and more far-reaching effects on a customer's operations are involved in a sale, the decision-making process in a sale has changed.

"Customer visits have a different connotation now than they did 10 years ago," says Barry Klaas. While some visitors are still focused on technical matters, most customers today want to know HP's computer strategy. It's not unusual for a division manager or HP officer to be brought in to articulate where the company is going.

"By the time customers get to a factory visit they have a good understanding of our system," explains Barry. "They really want to know what HP will



SHARON HALL

Russ Connors-Smith and Dave Werthem of SMC's performance center run a test to provide data on how an HP system will handle a particular application. Taking part are systems engineers from the field office going after the order.

do to solve their problems in the next few years." Even long-time customers expect a periodic update.

As Hewlett-Packard's own visibility increases, Eric Isacson of the technical sales center has noted a new type of caller: one who has heard HP is doing interesting things in automating its own manufacturing operations and wants a look.

In turn, HP hears customers' thoughts on what is happening in the computer industry and what seems to be needed—useful feedback for HP's research and development departments.

Ten years ago HP sales engineers wouldn't talk about new products in the pipeline until they had been announced and were on the price list. That attitude has softened in the case of major customers who bet their companies on HP computers.

HP's outside software suppliers also get confidential product information well ahead of new computer introductions. "We balance their need for lead time against the risk of exposure to HP," says Gwen Miller, manager of third-party marketing at SMC.

One main mission of SMC is to go after increased business from so-called "third parties:" original equipment manufacturers (OEMs) who buy HP systems to combine with their own software as a package, outside companies who write software for HP computers, independent software vendors (ISVs), and consultants in a good posi-

tion to recommend HP products. Managing the OEM program is Vince Mancuso, formerly country manager for HP Hong Kong with 14 years in the field.

As part of one-stop shopping, SMC has several types of "off-line" experts:

- The performance center, one of the first special services established, is now being expanded. In addition to testing the HP 3000, it will regularly run benchmarks on the HP 1000 and HP 9000, along with other new services. During fiscal year 1983 it supplied benchmarks for proposals that brought in \$41 million in sales to HP.

Says Steve Wilk, who manages the center, "There's typically a time crunch on big deals. Somehow the proposal always seems to have a short fuse of 30 or 40 days for completion, and it takes a week or so of that time for the sales office to evaluate whether to bid on it."

- Now that the computer divisions have phased out the sales development role as of November 1, SMC is relying even more on product specialists for accurate information about particular product lines. The Information Products Group (IPG) headquartered in Idaho was the first of several off-site computer groups to send a representative there.

IPG's first product specialist was Mary Boles from the Disc Memory Division, who knows DMD products and Greeley Division's tape products. She visits both divisions monthly for updating. Her boss Steve Richardson, for-

merly Boise Division product marketing manager, now has six IPG product specialists in his group in Cupertino. All product specialists now report directly to SMC.

In addition to the product specialists, each of the on-line people in the commercial and technical centers is expected to become a "product champion" for one or more product lines. In Mary's area of expertise, for instance, Glenn Osaka has chosen to learn about data communications products in addition to his own on-line duties in the commercial sales center.

- Also within SMC are application experts under Dick Knudtsen, bringing broad business knowledge that ranges from factory automation to finance. (Engineering and distribution experts will be added in 1984.)

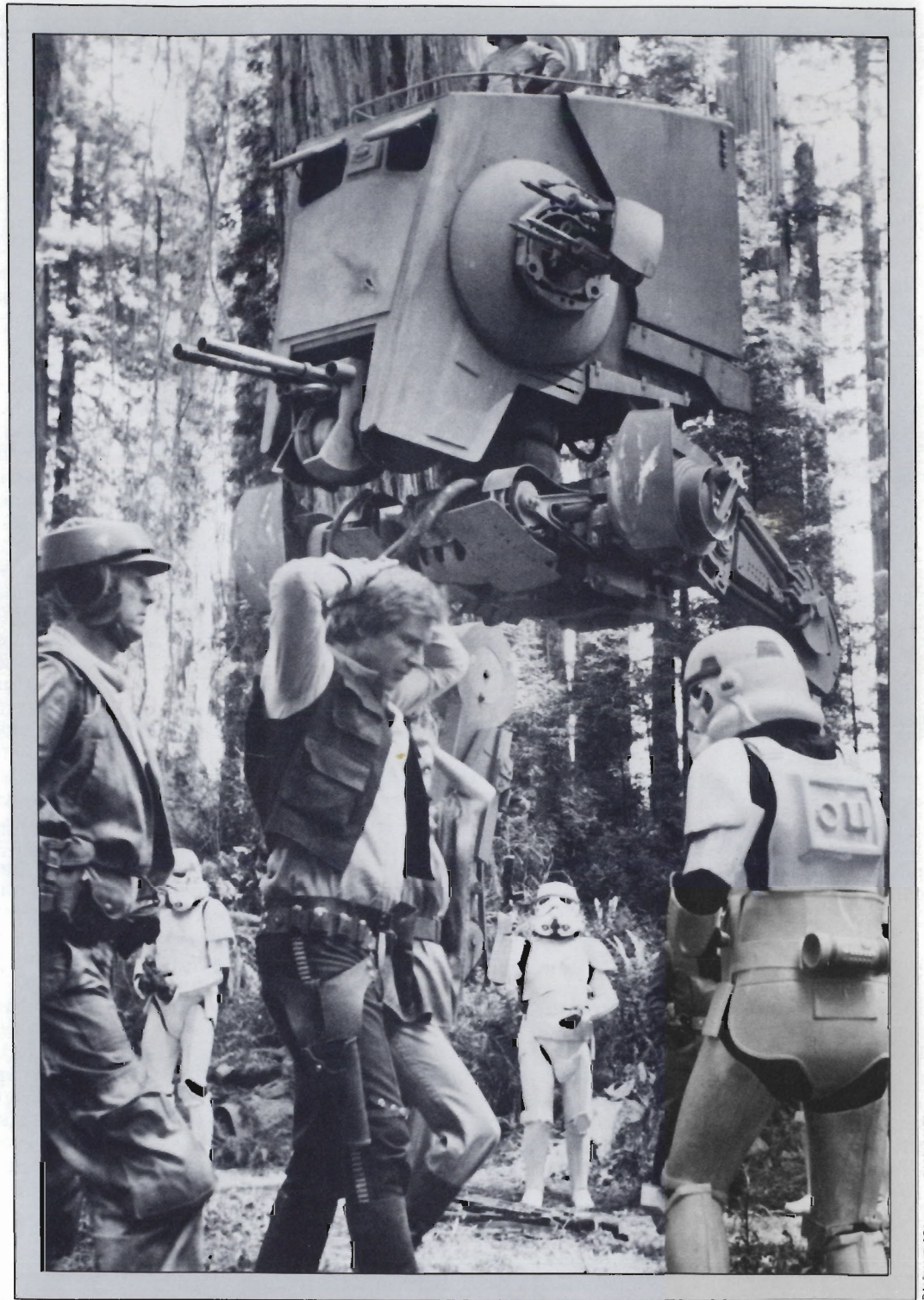
They act as consultants within SMC and work closely with HP's software divisions and the Applications Marketing Division, spending up to one-third of their time in the field selling applications. "The most significant transition that HP is making is going after vertical (specialized) markets," Dick believes.

Unquestionably, Hewlett-Packard is becoming more flexible as it goes after big deals—willing to consider customizing hardware and software going into solutions and willing to negotiate.

The electricity from the big deals now moving regularly through the Systems Marketing Center is easy to sense. "It's a high-stakes poker game," says Ross Hunt. "You play a card and see what it takes to get an order in a way that will satisfy the customer and make a profit."

Among the dozen or so big deals won in recent months by the combined efforts of the field and SMC are 120 HP 3000s sold to the Linde Gas Division of Union Carbide, 490 HP 3000s to State Farm Insurance, 37 HP 3000s and 55 HP 9000s to Continental Insurance Company, 200 HP 3000s to Longs Drug Stores, 220 HP 1000s to General Electric, 29 HP 1000s to Intelsat VI, and 63 HP 9000/500s to the U.S. Forest Service, along with the WCCC sale. **M**

At press time, HP won the contract under discussion in the photo on page 17 to supply a major automotive manufacturer with a network of dozens of HP 1000 computers.



DALPH NELSON JR. - LUCASFILM LTD.

Imperial stormtroopers capture the Rebel strike team led by Han Solo in *Return of the Jedi*.

A STARRING ROLE

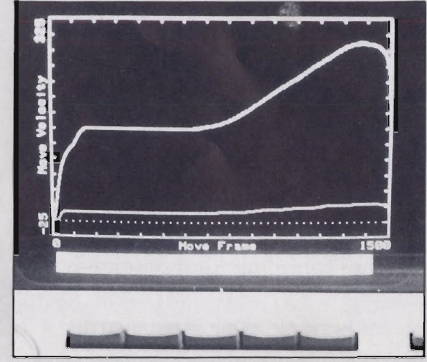
If HP equipment hadn't been used during the filming of Return of the Jedi, a lot of special effects would never have gotten off the ground.



A two-foot scale model of an Imperial stormtrooper sits astride a speederbike for a special-effects shot at Lucasfilm's studio.



Kris Brown and Jerry Jeffress probe the computer-controlled side of an optical film printer using an HP logic development system.



The movement of a motion picture camera past a scaled-down model of a spaceship is displayed graphically on this HP computer.

You won't find an HP desktop computer on the flight deck of Han Solo's *Millennium Falcon*.

And the Rebel forces didn't use an HP logic development system to locate the weaknesses in the Imperial Death Star.

But Hewlett-Packard played a crucial part in bringing George Lucas' science fiction adventure trilogy (*Star Wars*, *The Empire Strikes Back*, and *Return of the Jedi*) to the movie screen.

An HP 9826 desktop computer helped program special-effects shots of miniature spacecraft.

An HP 64000 logic development system probed the inner workings of motion picture cameras, optical printers and motion-control systems in Lucas' R&D department.

And HP LEDs displayed information on the back of a sleek, black sound camera developed at the studio. The state-of-the-art camera won an Academy Award for its inventors.

The special effects footage of spaceships streaking past fleets of enemy fighters and stormtroopers riding airborne cycles through forests is computer-controlled magic at its best.

"Before the crew started using the desktop computer to plan models' 'flights,' they'd been completing an average of two special-effects shots a night," explains Kris Brown, a computer software specialist at the studio. "They found they could get so much done with the 9826 that they were able

to finish six to eight shots a night, saving film costs and time."

Camera operators use handheld joysticks to maneuver their motor-driven cameras past stationary scale models. Those camera movements (tilts, pans, zooms, etc.) are recorded on magnetic tape so the motion-control cameras can flawlessly repeat the maneuver time and time again. After black-and-white test shots, operators load color film for the final shooting.

When the finished film is projected, the camera's vantage point appears stationary and the model seems to zoom through space.

"It used to be that when a cameraman planned a shot, he had to get it exactly right," says Kris. "He'd move the camera to the right position in just the right amount of time.

"Now all he needs to work on is the rough shape of the move—where it accelerates, decelerates and how much acceleration is involved. By looking at that computer file graphically on the desktop, an operator can modify the motion using a digitizing pad. He can make the shot cover a longer distance or make it cover the same amount of ground in a different period of time."

By recording the files on magnetic tape, the camera operator can make a fleet of spacecraft move in perfect synchronization. Each spaceship is shot on a separate piece of film, but all are brought together for the final image us-

ing an optical printer.

The HP logic development system helped Kris and electronics designer Jerry Jeffress create a modern, electronic marvel from an old optical printer used for the 1952 film *The Ten Commandments*.

The controller that drives the printer was developed by Lucas' in-house electronics staff using the HP 64000. "The system has made it possible for us to determine if an electronics problem we're looking at lies in the machine we're building or in the software code used to run the machine," says Jerry. "I've worked with other companies' logic systems where we've spent weeks trying to figure out if the problem were part of the new machine or the test equipment. With the 64000, we rely completely on what we see on the screen. We trust it."

The HP 64000 also helped test the electronic controller in the state-of-the-art sound camera. The high-speed camera's works are housed in a rugged, black carbon-fiber case. The housing survived the cold of Norway's snows during the filming of *Empire* and emerged unscathed when burning debris from a special-effects explosion landed on its top surface.

The camera is so solidly designed that it should stand the test of time. So should the three *Star Wars* films and the HP equipment that helped bring them to the screen. **M**

Hamburg stages a happening

How do you educate your community about Hewlett-Packard?

At HP's sales and service office in Hamburg, West Germany, the answer is to get everyone involved in a year-long public relations effort—regarded as a pilot project for HP in Europe.

Hamburg is a natural choice for such a pilot sales office campaign. It is the site for both city and county government, with a good cross-section of customers. Its 200 employees are outgoing and willing to take part in special activities.

One problem: the HP Hamburg office is located on two floors of a building in a new commercial development outside of town. Could new target groups of customers and other visitors be attracted to events staged there?

To spearhead the campaign, Margarethe Schmidt Sonntag from the sales headquarters' public relations office at HP Frankfurt visited Hamburg regularly. Local HP management paid get-acquainted calls on government officials. A survey of 150 potential customers was made as a pre-test of their attitudes about HP and the computer industry. Brainstorming sessions for the staff resulted in good ideas for reaching the public.

The first major "Hamburg happening" to step up HP's visibility was a series of events at the office last May 18 and 19. Most of the activity took place in a newly remodeled customer center, renamed the "HP Forum." Included was an inauguration ceremony attended by local dignitaries, panel discussions for customers, and an open house—with a jazz band and friendly product exhibits—that drew 600 people.

Coincidentally, HP Hamburg could show off its own newly refurbished work space (not usually on view to visitors) on the floor below the customer center. Dubbed "Office 2000," it is HP's first installation of curved island desks (each designed for a team of five people)



Not a single piece of the old furniture remained when the Hamburg, West Germany, sales and service office was refurbished as the first "Office 2000" in Europe. It was open to visitors during the office's public relations events in May. Each desk is for a team of five people.



John Clavel (center), communications manager for Europe, and Piff Schulthoff, Northern Region area business manager who headed the Office 2000 project, star in a videotape made at Hamburg's open house.

and data processing equipment integrated into the furniture.

The "Hamburg happening" isn't over yet, by any means. A series of informal luncheon gatherings with cultural programs in the HP Forum is already underway. A computer literacy contest for local high school students is being run in cooperation with a local newspaper—the winner will fly to California to visit HP. Posters and HP computer literature are posted in the local subway and first-class trains between Hamburg and major cities.

By next May, when a post-test will be made to learn the results of the local campaign, everyone in the Hamburg office should be a public relations pro. **M**



Many HP customers have offices in the oldest section of Hamburg near the harbor.

JOHN YOUNG

HP's president explains the establishment of the Management Council.

This past June we announced rather significant changes in HP's Operations Council, one of our principal management mechanisms. You've probably not yet felt any direct effect from the restructuring, but I think you'll be interested in why we've made the changes and what we might expect from them.

Before I discuss what has changed, I think I should say a few words about how our top management functions. As the chief executive officer of Hewlett-Packard Company, I am responsible to the board of directors for all our activities and operations. This is a far-reaching assignment, but fortunately, I have some help.

The Executive Committee of the Board of Directors is the main policy body and, as such, addresses strategic questions and makes policy decisions that affect the company's future directions. I act as chairman of the Executive Committee, which consists of HP's four executive vice presidents: Bob Boniface, Dean Morton, Paul Ely and Bill Terry.

We first formed the Operations Council in 1975, when we also established our current group structure. The Council's function was to coordinate the extensive and diverse nature of our operations and ensure that we operated as one company, met our performance commitments and had common operating policies, teamwork between our activities, and a common focus on our customers.

This organizational structure worked quite well for us, but over the years we found the Executive Committee became increasingly enmeshed in administrative details which detracted from the time needed for critical strategic issues. Further, the increasing complexity of our company required more and more specialized knowledge for good decision-making.

In analyzing the time spent by Executive Committee and Operations Council members, we found that it was devoted in almost equal proportions to questions about divisional operations, our field marketing activities, and the all-important personnel issues. We decided to reshape the Operations Council by incorporating its membership into a new Management Council with

three standing committees focused on these subject areas. Dean Morton, who chaired the former Operations Council, heads up the new Management Council. Subcommittee chairmen are Doug Chance for the Operations Committee, Dick Alberding for Field Marketing and Lew Platt for Personnel.

This new organization provides several advantages. First, it allows us to focus more attention on some key areas. For example, I've asked Doug Chance and his committee to look at some of our performance measures to make sure that new organizational elements such as software divisions have appropriate reports.

Dick Alberding's committee will take a comprehensive look at our field sales and support organizations. Here, we must be effective in selling entire systems solutions to our customers—a sales activity that often crosses divisional and group product lines.

Lew Platt's committee has a full agenda of issues that can best be characterized under the heading of making sure we continue to attract, motivate, maintain and reward talented people around the globe.

In addition to providing greater depth of focus on the key areas I've outlined above, our new Management Council structure broadens the representation in our decision-making process. By adding new members from R&D, manufacturing and personnel, the expertise we need is in place.

Finally, our new organization will free up the Executive Committee to spend more time on key strategic operating issues and long-range planning, which are activities that are uniquely its own. I believe we will all feel the positive effects of our increased ability to devote attention to issues that so directly affect the future of all of us at HP.



John Young, who became national Junior Achievement volunteer chairman in July, talks to members of student-run companies at the national JA conference in Iowa.

DAVE REPP—JUNIOR ACHIEVEMENT

NEWSCLIPS

Recaps the newsworthy events, changes and achievements within HP.

CHART CHANGES

A new Manufacturing Test Division has been established within the Electronic Measurements Group with responsibility for circuit test products. It is located on the Loveland Instrument Division site. GM is Larry Potter. . . . The Personal Computer Group has formed a Personal Computer Distribution Operation under Rich Zalisk to manage worldwide distribution of HP personal computers and related peripherals, software, supplies and accessories. It will have a network of centers in the U.S. and Europe.

BOARD OF DIRECTORS

Shozo Yokogawa, president of Yokogawa-Hokushin Electric Corp. in Tokyo, Japan, was elected to the Hewlett-Packard Company board of directors at the regular meeting of the board on September 23, held in Beijing, People's Republic of China. Yokogawa was formerly president of Yokogawa-Hewlett-Packard in Japan.

NAMES IN MARKETING

Art Dauer has been named Instrument Groups marketing manager, succeeding Bob Brunner who retires from HP in January after 33 years with the company. . . . J.C. Dennis has been named director of marketing communications for the Computer Groups, reporting to Ed McCracken, GM of the Business Development Group. . . . Bill Murphy has been named to the new post of personal computer field operations manager in the Computer Marketing Group (CMG). Replacing him as Information Products Group marketing manager is Chuck Jepson. Mary Chin is CMG field marketing manager. . . . Srini Nageshwar is Personal Computer Group (PCG) marketing manager.

Other new marketing assignments in recent months: Bill Kampe to the New Jersey Division, Roger Youngberg to the Loveland Instrument Division, Bob Moore to the Engineering Productivity Division, Brigitte Almaschi to the Böblingen Computer Products Division, Alan Nonnenberg to manager of retail marketing in PCG marketing, Jim Carlson to the Personal Office Computer Division, Bert Desmond to the Vancouver Division, Bruce Woolpert to the Personal Software Division, John Kemper to the Personal Computer Distribution Operation, Chuck Ulfers to the Boise Division, John Boose to the Greeley Division, Manfred Sailer to Business Development Europe, Dave Bylund to the Application Marketing Division, Al Kyle to the Andover Division, and Gerhard Krammer to the Böblingen Medical Division.

JOINT VENTURE CHANGE

Hewlett-Packard and Yokogawa-Hokushin Electric Corp. (YEW) on September 14 jointly announced an agreement that will increase HP's percentage of ownership in Yokogawa-Hewlett-Packard from 49 percent to 75 percent through purchase of 1,467,532 newly issued shares of stock. The Japanese joint-venture company was established in 1963 by HP and YEW's predecessor company, Yokogawa Electric Works.

NEW PRODUCTS

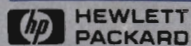
Stanford Park Division has introduced four new microwave signal generators. The HP 8673C and 8673D are broadband synthesizers that incorporate tracking filters to reduce unwanted output signals. HP 8683D and 8684D are extended frequency-range versions of earlier models. They are rugged and portable for use in the field. . . . The New

Jersey Division's HP 6901S data-acquisition and control system is a fully integrated, high-speed analog scanning system that can be easily customized for measuring factory automation systems as well as computer-aided test applications. . . . Introduction of the Personal Office Computer Division's HP 150 on September 19 made a media splash. The personal computer carries a \$3,995 list price (U.S.) and can be operated by touching its screen.

HP has made a major thrust into the office automation market with 13 new products introduced September 13. Included are two new Roseville Terminals Division workstations which offer IBM compatibility: the HP 2625A dual-system display terminal and the HP 2628A word-processing workstation. The Boise Division has two new office-scaled laser printers, the HP 2687A and HP 2688A. Also new: five office software packages from the Personal Software Division and Pinewood Office Products Division, and HP Office-Assist—a new consulting service put together by the Applications Marketing Division to take an HP 3000 customer through the steps of needs analysis and system implementation.

November 1 marked the debut of three Avondale Division products. The HP 5890A gas chromatograph has such advances in quality that a service contract will guarantee customers "uptime" of more than 99 percent for an entire year. The HP 3392A integrator plots and measures peaks of chromatographic information and has two-way communications with a GC for exchange of data. It also communicates with computers. The new HP Series 530 μ column can be used in both packed and capillary applications.

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