MEASURE

For the people of Hewlett-Packard

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YHP's battle for worldwide competitiveness

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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 70 countries around the world. HP employs more than 74,000 people.

ON THE COVER

In the spirit of the samurai, Japanese businesses compete most fiercely on their own home ground. YHP is Hewlett-Packard's highly successful champion in that arena, as described by staff writer Gordon Brown on pages 3 to 9. To symbolize that, Measure asked Carl Nakano to model samurai equipment from the collection of Taeko Brown of Palo Alto. Cover photo by Tom Upton.

UPFRONT

Company messages move at the speed of light from desk to desk

If Rip van Winkle had fallen asleep at HP in 1964, he probably wouldn't recognize today's speedy methods for moving messages around the company.

Gone are the clunky teletype machines and their miles and miles of punched paper tape (which, in the '60s, were much faster than the postal service). In their place are HP terminals, computers and software exchanging bits and bytes at breakneck speed.

The move toward today's fast, company message system got its start in 1970 when Corporate Marketing Services began work on what would become the backbone of the network: COMSYS, short for Communication System.

The idea was to improve the way product orders moved from sales office to factory over a patchwork of telephone connections and teletype machines. The system had a number of drawbacks. Order-processing employees had to send one message to Factory A for products 1, 2 and 3 but a separate teletype message to Factory B for products 4, 5 and 6. Orders and product descriptions were free-form and different from office to office. And because the teletype transmission system had no built-in check for errors, messages often arrived as gibberish.

The COMSYS system, using HP 2100 minicomputers, first linked sales region headquarters to factories through a central point in Palo Alto. Within a few years, the system moved out to include individual sales offices. In concert with order-processing software called HEART, the new COMSYS system conquered the problems of inconsistent formats and garbled transmissions.

COMSYS also brought a new capability to HP facilities around the world: ease in sending general messages (short memos, reminders, letters, etc.) along with sales and order information. In the beginning, these general messages accounted for only 3 percent of the total volume.

Today these general messages account for about 20 percent of all HP transmissions. "I think you'll see that volume increase in the future," says Hank Taylor, manager of Corporate communications and office systems.

HPDESK (its messages dubbed "Deskgrams") is now playing a big role in the company's internal message strategy. Employees can send messages (including charts and graphs) from their HP 3000 terminal directly to another HPDESK user.

"While typical Deskgrams are now delivered desk to desk overnight, in the next year we expect an employee in Geneva, Switzerland, will be able to send a message to an employee in North Hollywood, California, and have it arrive within an hour's time," says Hank. **M**

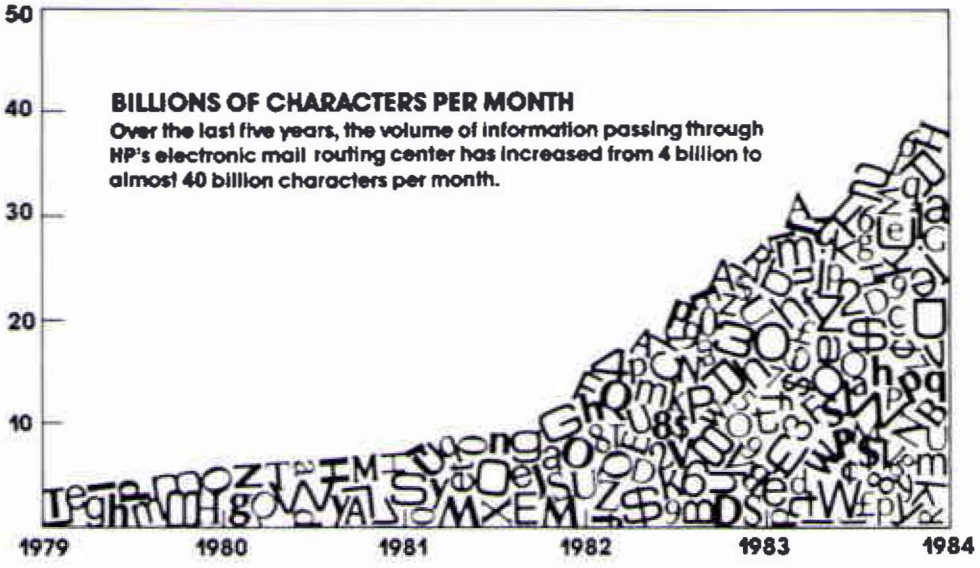


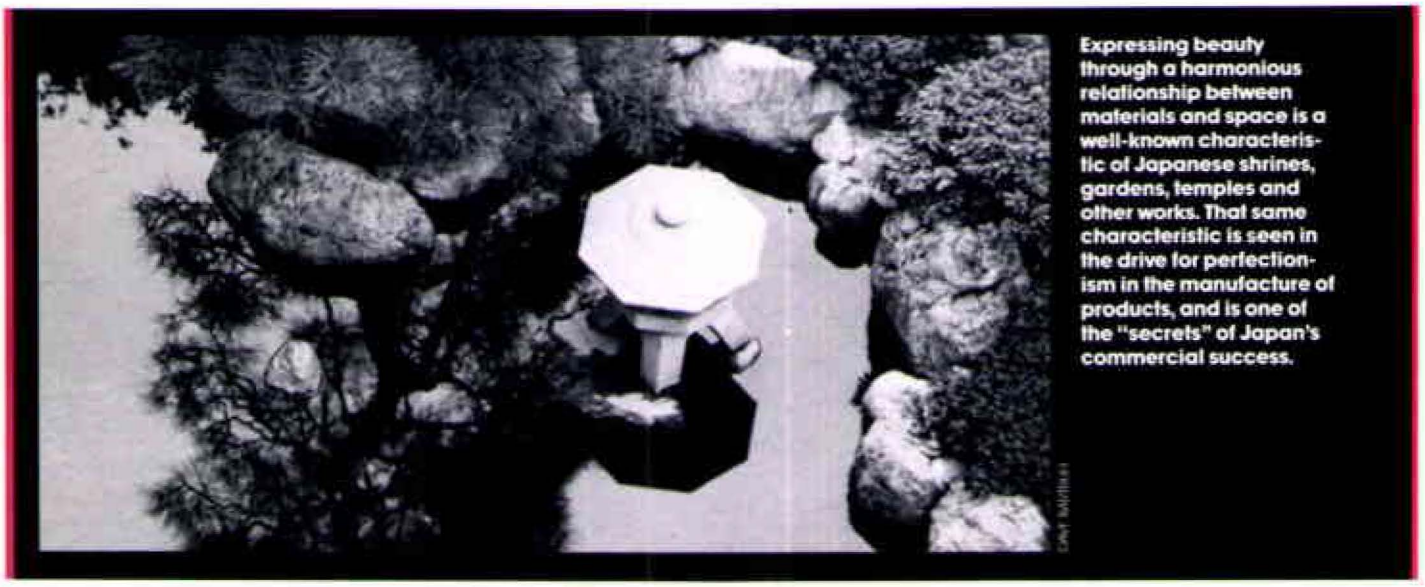
PHOTO BY TOM UPTON

THE COMPETITIVE EDGE:

YHP's quest for total quality

It comes as no surprise to the people of Yokogawa-Hewlett-Packard that they are widely quoted and consulted today in matters of quality and productivity. In 1982 YHP waged and won a momentous challenge for the Deming Prize—the award for all-around quality in Japanese industry. Immediately, a flood of news reports, invitations and requests—worldwide as well as local—transformed this "samurai" of industry into one of its "shoguns." The fact that YHP represented a mix of Japanese and American business styles added special interest to the event.

EDGE



Expressing beauty through a harmonious relationship between materials and space is a well-known characteristic of Japanese shrines, gardens, temples and other works. That same characteristic is seen in the drive for perfectionism in the manufacture of products, and is one of the "secrets" of Japan's commercial success.

How did this come about? What forces were at work to propel this jointly owned HP company (which celebrated its 20th anniversary last year) into the spotlight? Even more to the point, how did it raise itself up from a position near the bottom of the HP barrel in quality and profitability 10 years ago to one of leadership and example today?

At the start, it helps to understand that Japan is widely regarded as having become the most intensely competitive marketplace in the world for a wide range of manufactured products—both consumer and industrial. Pitted against each other are the products of many giant Japanese companies as well as entries from around the world. The competition takes place at every point of comparison—product features, performance, price, appearance, availability, service and durability. The Japanese buyer wants the best of all of these things (who doesn't?). But that buyer can pick and choose from so many competing products that it's often not necessary to compromise. In turn, the competitors drive each other to new levels of quality—or out of the marketplace.

The management of YHP began to notice the heat and flash of those competitive fires almost 10 years ago, shortly after the first oil crisis in 1973 sent fuel costs soaring.

"First of all," recalls Kenzo (Ken) Sasaoka, YHP's president since 1974, "we faced a general crisis. HP product lines had been changing fast and there also were changes in our customers—new kinds of customers and changing attitudes. We found that we were no longer doing such a good job of satisfying our customers. It was time to make a major change in our way of doing business."

"YHP can be looked on by the rest of HP as a model for testing competitiveness in a world of increasing competition."

The YHP solution, according to Ken, was to make a break with its own past. "The achievement of YHP's first 10 years was to bring together a combination of Japanese and HP management styles—to blend them. But that style was essentially one of following, not of leading. To succeed in this market we had to become leaders, setting our own ways and goals."

For one thing, YHP had to find solutions to a whole array of quality problems. Products developed by YHP's own R&D efforts were showing a high rate of defects in the field. Products shipped to Japan from other HP divisions turned up at customer sites with high DOA (defective on arrival) rates. The causes were various—shipping errors, production errors, faulty parts and incomplete designs. At bottom was the problem of falling profit margins, a problem compounded by slow growth.

In 1977 YHP discovered the vehicle for turning these problems around in its own backyard—total quality control (TQC). The spirit behind this approach was Dr. W. Edwards Deming, an American who had coached many Japanese industries in the principles of statistical quality control (SQC). In turn, a number of Japanese manufacturers had expanded SQC to an even broader concept of total quality control (see box on page 7). Their success in applying these management tools was soon dramatically evident in world markets.

Led by Ken Sasaoka himself (who was to earn the title of "Mr. Quality" at YHP), the company launched an all-out drive to adapt total quality control to all areas of its operations. This included not only its own manufacturing and sales activities but also its relationships with many other HP organizations.

A first step was to improve a basic manufacturing process, the soldering of printed circuit boards. The defect rate, though fairly typical for the indus-

try, was a source of many problems. By applying TQC, that rate was reduced more than one thousand times. And in doing that, the Hachioji factory greatly reduced direct-labor hours, lead time, inventories and floor space—the result of doing everything right the first time.

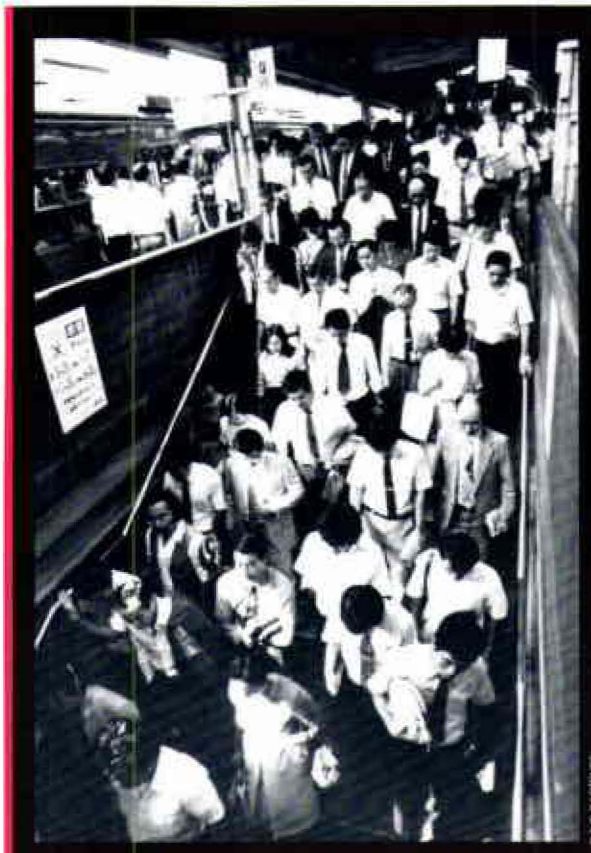
Similar results emerged in other areas. Field-failure rates of YHP-developed products were lowered by more than five times by instituting TQC programs that included the R&D, manufacturing and field service teams. Cost reductions of this kind have enabled YHP to offer a number of successful proprietary products (such as the HP 4274A) at no price increases even though consumer prices have risen an average of 8 percent per year in Japan during recent years.

The widespread influence of TQC can be readily seen at YHP's Sagamihara service and distribution center. Up to three years ago the center's functions were performed in a standard way, handling U.S. imports, consolidating shipments, taking care of customer complaints as best it could and fixing things that needed to be fixed.

Today Sagamihara is the center for a comprehensive feedback system, one that regularly reports on product quality to every product division. A failure report, for example, may include details of the investigation, analysis of possible causes, evidence in the form of photographs, description of actions taken and a request for a response regarding a permanent solution to the problem. Tsutomu Mochida, manager at Sagamihara, says there has been a steady decline in product failure rates since the program began. "We get lots of positive feedback from divisions," he adds.

Much the same kind of process is now at work in the sales organization. Tatsuya Aoi, Eastern Zone sales manager, reports that analysis of sales data has become much more rigorous than before TQC. One special study, for example, followed the activity of 30 field engineers in great detail and compared it with the sales that resulted from their efforts. Says Tatsuya: "The FEs were able to study this data and see for themselves what actions to take."

HP President John Young summarized results of YHP's five years of emphasis on total quality in a talk before



Japan's marketplace is driven by many influences, but mainly by the presence of a population (120 million) that is very large relative to the space available. The result is an intensive use of every resource and a heightening of competition among businesses serving that market. YHP is right in the thick of it, and its exposure and experience in the Japanese market offers HP a useful testing ground for competing in world markets.

WE ARE DRIVEN

Some unique influences help to fuel Japan's competitive drive. Underlying all of them are the powerful influences of a largely feudal history, a population of some 120 million people fitted very tightly within a chain of mountainous islands not quite the size of the state of Montana (which has a population of about 800,000) and with limited natural resources. From this has emerged a nation whose culture teaches the value and strength of unified attitudes and actions, and whose economic and environmental well-being demands a high degree of efficiency in the use of space, materials and energy.

Modern history has played a role, too. Akio Morita, chairman of Sony Corp., has described how lifetime employment and high income taxes were imposed by the U.S. occupation forces after World War II. Issued by U.S. General Douglas MacArthur, the regulations were intended to discourage the reestablishment of the huge industrial empires that previously dominated Japan. On the contrary, says the Sony leader, these rules forced companies to become big and aggressive in order to assure employees of adequate benefits when they retire after up to 30 years of service.

The next time you visit Japan, look at all the cars and trucks streaming along the streets and highways. All shiny and new looking. Not a junker in sight. You might assume that this is due to the strong Japanese sense of aesthetics—of joy and pride in things that function perfectly in perfect settings. On the other hand, regulations—particularly those dealing with pollution and safety—have a big impact on the cost of operating older vehicles. It makes sense to scrap them and buy new. This benefits the landscape, scrap dealers and auto firms.

In that case, it seems, a preferred practice is also a public policy. Public policies, in fact, are quite supportive of Japanese industry. Low-cost loans are one such policy. It's one of the factors that enables a Japanese firm to make an investment in productive assets without feeling required to show a profit the first year. The view is long-term, and the net effect is to make it easier for a manufacturer to consider expansion or replacement of plant and equipment—a definite stimulus to modernization.

EDGE

TQC: A WINNING STRATEGY

When you hear the title "total quality control" for the first time, it can sound a bit intimidating and chilling—as if some Big System was set to take over individual responsibilities and initiative. Whatever happened to "management by objective"?

As HP people at many locations are discovering, TQC is, in fact, a reinforcement of the traditional HP way of doing things. In essence, it is a tool or process for gathering and analyzing data and then translating the conclusions into action. It takes the form of projects—usually within a department—that employ one or more methods of statistical analysis to achieve insights that lead to measurable improvements.

YHP has formalized its approach to TQC in several important ways. One is represented by a customer assurance organization that handles customer complaints at the Takaido sales headquarters and product inspection at the Sagamihara center. Another is a quality control "facilitation" organization that operates in both the factory and field. In addition, TQC has been a major part of YHP's training programs since 1978.

an American Electronics Association seminar last year: "The product failure rate declined 60 percent, R&D cycle time improved 35 percent and manufacturing costs went down 42 percent. In addition, profit improved by 177 percent and productivity was up 90 percent. The company received the Deming Prize for quality, awarded for the first time to a joint-venture company in this industry."

In spite of that success—or perhaps because of it—the YHP team sees a new, bigger and more exciting role for itself in its third decade of business. Part of that is attributable to the fact that HP raised its ownership in YHP from 49 percent to 75 percent last year, opening the door for a closer and stronger relationship. But most of it boils down to basics: people and opportunities.

Ken Sasaoka puts these in perspective: "For many years YHP was not very successful in recruiting top students from the various top universities. We were not known. The candidates would go to the well-known companies. But last year after the Deming Prize a recruiting-agency survey gave us a very high rating—number 30 among all the big Japanese firms. Now we can compete with all of them. We can demonstrate not only the Deming Prize accomplishment but also an excellent growth record, international work opportunities for our people and a unique work style and philosophy."

One thing YHP can promise—a challenge: "Now is a time of very big opportunities for the electronics industry—a revolution in the form of the 'information society.'" Ken says. "We're right in the middle. This means that our company will have opportunities for the rest of the century. But to seize them HP must develop new competitive advantages, because our competitors—especially Japanese companies—have advanced remarkably in quality, productivity and technology. Price competition here is tough, and the local language is a major hurdle for HP products.

"Because of all this, YHP can be looked on by the rest of HP as a model for testing competitiveness in a world of increasing competition. To do this we need a business strategy that favors strong local leadership that can be flexible in dealing with local conditions. Long term, we need to emphasize leadership in technology—to assure ourselves of an absolute advantage in the world market."

YHP is investing a great amount of effort to help develop those leadership roles. One example is its "Champion Program" that puts selected YHP engineers to work at various HP R&D labs in the U.S. where they acquire new backgrounds in various technologies. Another is the "Expert Program" that brings key engineers from other HP labs to Japan. In some cases their job is to help bring YHP projects or people up to speed on certain technologies. In other cases the visitors are there to learn. Last October, for example, 17 instrument division R&D managers—headed by group engineering manager Al Bagley—spent several weeks exploring Japanese technology.

Seeing is believing: The R&D managers were preceded a few weeks earlier by the HP board of directors who also got a firsthand view of YHP and the Japanese marketplace. What impressed them was the eager determination of YHP people to be the flag bearers for a new kind of organization. That organization, as Ken Sasaoka and others envision it, would be more world-conscious, more venturesome and less bureaucratic than before. It would work closely with other units of the organization yet have a strong sense of its own mission. It would always project a one-company image. And above all it would lead through quality in everything.

Sounds a lot like TQC. **M**

POWER STRUGGLE

Although customer satisfaction was the driving force behind YHP's 1981 decision to separate the sales force into Eastern and Western zones, a curious piece of technological history had a hand in determining where the dividing line would be drawn.

According to Toshio Muraoka, executive vice president and head of YHP sales, the Fuji River flowing near Mt. Fuji was selected as the boundary because it separates two different electrical power systems. Those systems arise from events that started several hundred years ago when powerful shoguns—military rulers—from each area began fighting over imperial power. In time the British-backed eastern area installed a 50 Hz/100 volt system while the west went for 60 Hz/100 volts. And never the twain shall meet.

Tatsuya Aoi, who was a leading rugby player in the university league and is now a part-time TV sports commentator, heads Eastern Zone sales—nine offices, some 650 people and sales of about $200 million in 1983. Last year in the interest of assessing levels of customer satisfaction, Tatsuya visited more than 100 customers. "We are now in the process of adapting TQC from the Deming exercise to a practical, long-term style," he says.

In the Osaka Western Zone office, Kenichi Akasaka heads an organization of some 290 people in five offices with sales of approximately $100 million last year. "Last year was tough," he says, "especially in the computer field. But we have a young sales force that will concentrate on adding to our coverage of target accounts." Such accounts include the corporate headquarters for the Matsushita companies, better known in the U.S. as the Panasonic group.

WAY TO THE TOP

For YHP President Ken Sasaoka, getting away from it all means rising above it all—preferably from 10,000 to 15,000 feet up a mountain. Here Ken (right) shares a moment of rest and triumph on top of Mt. Fuji with Cliff Edgington, former HP employee who spent several years at YHP. Ken has climbed most of Japan's higher peaks (three times up 12,388-foot Mt. Fuji), and hiked, camped and skied extensively in the U.S., generally as a side trip to business visits. He is especially attracted to the U.S. national parks whose ruggedness and spaciousness offer "a very enjoyable experience." Ken's dream now is to scale California's Mt. Whitney (14,494 ft.) as part of a plan to take on at least one major mountain each year.

EDGE

Factory at Hachioji is also home to YHP headquarters. The two product divisions at Hachioji—Instruments and Computers—are supported by a combined R&D organization as well as shared manufacturing. Many of the elements in HP quality programs were first adapted at Hachioji.

SPRING FEVER

Each year about this time, a dozen people representing all YHP employees meet with a steering committee of top company managers for a "Shuntoh"—the "spring struggle." They will talk about salary curves, benefits and working conditions. It is time for labor negotiations, Japanese style.

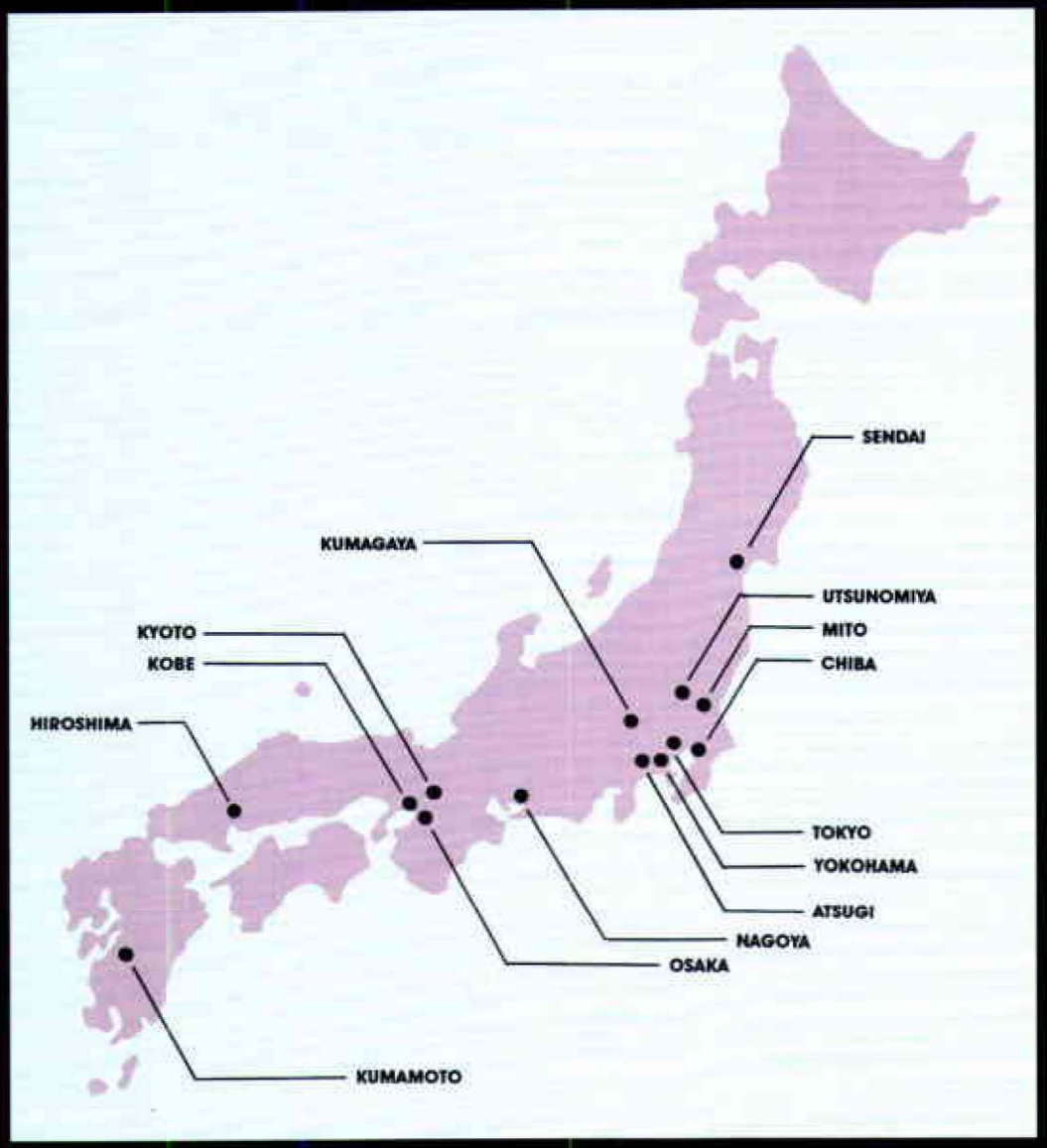
That style—actually required by law—calls for unions formed along enterprise lines rather than by crafts. One company, one union. In turn, each union is a member of one of the larger all-Japan unions that are based on certain types of industry. The national organizations provide the locals with salary and other competitive data as the basis for their negotiations.

This year the YHP union team is headed by Kasutoshi Fujita, former district sales manager for government sales in the Shinjuku office. While regular monthly meetings are scheduled between the union and management committees, it is the March-April Shuntoh that establishes the salary and bonus terms for the following year. Kasutoshi described the YHP union-management style of negotiations as firm but fair.

Among the items negotiated are home loans—the amount and terms of mortgage money made available by the company for home purchases by employees. Currently, the maximum is 10 million yen (about US $43,000) for a 25-year mortgage on a 30-million yen house—the going price for an average single-family dwelling in Japan.

YHP IN BRIEF

- Founded 1963 as joint venture of HP (49%) and Yokogawa Electric Works, Ltd. (51%). 1983 agreement raised HP share to 75%.
- 2,200 employees (1,300 in sales, 800 in manufacturing, 100 corporate).
- Sales in FY83: $300 million.
- Organization: A "country" organization that embraces both sales/service and manufacturing operations. Reports as a region through Intercontinental. The factory organization includes an instruments division (YID) and a computer division (YCD) that share a common manufacturing operation.
- Chairman: Shozo Yokogawa (president of YEW and founding president of YHP).
- President: Kenzo Sasaoka (since 1974); came to YHP as R&D manager in 1972 from YEW.
- Manufacturing: Proprietary YHP products (semiconductor test, impedence and LCR instruments); various transferred instruments and computer products. At Hachioji.
- Sales/Service: Headquarters in Tokaido supports two zones—the Eastern Zone based at Shinjuku (Tokyo) and Western Zone in Osaka. Sagamihara service and distribution center serves both.
- Japanese Union of Scientists and Engineers awards YHP the Deming Prize for quality in November 1982.



THE YHP NETWORK

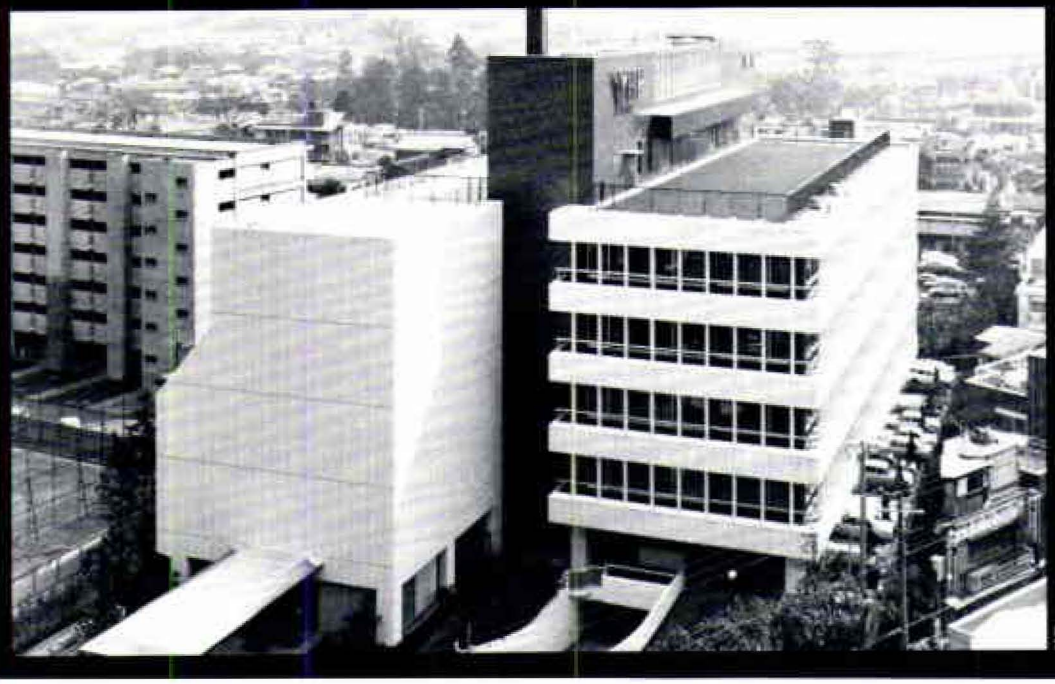
YHP HEADQUARTERS AND FACTORY: Hachioji (Tokyo)

SALES HEADQUARTERS: Takaido (Tokyo)

SERVICE AND DISTRIBUTION CENTER: Sagamihara (Tokyo)

EASTERN ZONE SALES HEADQUARTERS: Shinjuku (Tokyo)
OFFICES: Atsugi branch
Chiba branch
Kumagaya branch
Mito branch
Sendai satellite
Shinjuku office (Tokyo)
Takaido office (Tokyo)
Utsunomiya branch
Yokohama office

WESTERN ZONE SALES HEADQUARTERS: Osaka
OFFICES: Hiroshima satellite
Kobe branch
Kumamoto branch
Kyoto branch
Nagoya office
Osaka office



Sales for YHP are headquartered at Takaido, a district of Tokyo. Facilities include a large, new training building. Field sales are organized into Eastern and Western zones, divided by the Fuji River south of Tokyo.

ARDENT ADMIRERS

Independent groups of HP computer customers help keep the company on its toes.

Steve Steps, R&D project manager at HP's Data Systems Division, shows interested customers the A900 printed circuit boards in the vendor area at a recent conference for HP 1000 users.

It's hard to imagine that HP has something in common with the Beatles, Frank Sinatra, the Dallas Cowboy football team and the Model T Ford, but it does: All have their own avid "groupies" and "fan clubs."

In HP's case (as well as nearly all other computer companies), the fan clubs are called users' groups—a rather bland term which precisely defines what they are: groups of customers who get together to praise, complain and share information about the particular computer model they own.

Until recently, few people at HP even knew of the existence of HP's fan clubs. But Computer Groups managers have lately become increasingly aware of the importance of these independent groups to the success of the company.

"Our motive is largely self-serving," says Marc Hoff, worldwide field operations manager at Computer Support Division. "We need the kind of feedback that interested users can give us. It's as simple as that."

Interested users indeed. It happens that most users' group members really love HP—warts and all. Says Steve Gauss, astronomer at the U.S. Naval Observatory in Washington, D.C., and a member of the International Users Group (IUG) board of directors for more than two years, "In many cases HP has sent us updates that don't work, so implementation was impossible. We've brought this up several years in a row and while HP has made an effort to solve the problem, it's still not fixed.

"But we're active in the IUG because we *like* HP and want them to hear our concerns."

Steve and people like him get a chance to vent their concerns and needs at the conferences held for users of both the HP 1000 and HP 3000. At one such conference last fall in Fort Worth, Texas, a small knot of HP marketing and engineering people from several computer divisions gathered in a hotel room to read questions turned in by the HP 1000 users at the conference.

Some questions are pointed: "Does HP have any plans to make new-product availability dates more realistic?" This evokes a collective sigh of resignation from all the managers there. "Who wants to answer that one?" asks Peter Rosenbladt, R&D lab manager at Data Systems Division (DSD). Inevitably

someone volunteers to accept the responsibility.

The next day, at a management round table that is part of every users-group conference, there is a comfortable feeling of give-and-take. Marc Hoff describes a new phone-in consulting service called PICS that should help users get their questions answered quickly. The audience nods approval. A few minutes later, a user asks why a "don't clone" option isn't available on the new Real Time Executive subsystem. John Johnson, one of the DSD engineers who worked on the product, gets a lot of laughs when he admits, "I just forgot to put it in."

"Users group conferences are probably one of the best services we provide our members," explains Bill Crow, executive director of the IUG association. Its headquarters is in a high-rise office building in Mountain View, California, two miles east of HP's corporate offices.

Bill is in a good position to know what users want. He was one. Six years ago he set up a data-processing operation for a large New Jersey corporation. After a lot of study, the firm chose an HP 3000 computer. Recalls Bill, "It was a massive job trying to learn everything there is to know about a computer system. Fortunately I found a group of HP 3000 users in the area and started attending their meetings."

Later that year, Bill went to a users conference in Denver. "I learned more in one week than I had in the nine months I had the system. I finally understood what was going on 'under the skin.'"

Such an experience is not unusual. At every users conference the buzz is highest when people with like needs and programs find one another.

But there's far more to the users group than conferences. The IUG opened its California office in 1981 with a three-person staff, and Bill joined them in mid-1982 after serving on its volunteer board of directors.

Today 40 people provide a wide range

THE USERS' ALLIES

As HP's computer products spawned more and bigger users groups, it was only natural that the company sat up and took notice.

"We've officially supported the users groups since 1972," says Jan Stambaugh, who served as HP's liaison to the International Users Group (IUG) for about 18 months. Now training manager at the Personal Software Division, Jan is singled out by IUG Director Bill Crow as "a real friend of the users group. First Jan built up the users group and served as chairman of the IUG executive board when she was with an educational organization. Then she joined HP and built it up on that side."

"Building it up" meant making more HP people aware of what a users group is.

Today there are three HP people with IUG liaison responsibilities: manager Jo Anne Cohn, conference liaison Pam Tower and Dena Stein, who handles promotion and support activities. All three are part of the Business Development Group's Systems Marketing Center in Cupertino, California.

Their efforts are concentrated in five major areas:

- An *annual survey* of IUG members is undertaken jointly between HP and the IUG office. It provides feedback on how members like HP's hardware and software products. In the 1983 survey, for instance, 94 percent of the people who responded say they're satisfied with their HP 3000 computer and 89 percent would choose HP if they had a chance to do it again.
- *Conferences.* It's up to Pam to line up HP speakers, exhibits, equipment and managers for each gathering. For the just-completed HP 3000 IUG conference, Pam recruited

The group that serves as liaison between the International Users Group and HP's computer divisions includes manager Jo Anne Cohn (foreground), Dena Stein (left) and Pam Tower.

about 70 HP people to provide information and equipment for the conference. More than $3 million worth of HP equipment was on display for the nearly 2,000 conference-goers. "It was a terrific example of interdivisional coordination," Pam says.

- A *newsletter* called *User News* has just been published for HP's marketing and product people to tell them more about IUG activities. HP ships packets of information on how to join users groups with its computer products.
- *Articles* for IUG publications are solicited from HP managers.
- *Tours* of HP facilities are given to IUG members when they visit.

The most important aspect of the liaisons' job is keeping in close contact with the IUG headquarters so HP and IUG can continue to maintain a special—and mutually beneficial—relationship.

A group of HP marketing specialists and engineers discuss possible answers to questions that will come up at the next day's "management roundtable" at an IUG conference.

Bill Crow leads a 40-person staff at the International Users Group headquarters.

of services to members: two glossy publications aimed at HP 1000 and HP 3000 users; a library of user-contributed software (including a family of programs with fascinating names like Overlord, Son of Overlord, Bastard Son of Overlord, Grandson of Overlord and Mistress of Overlord); staff help to start local chapters; and a cooperative HP-IUG survey of HP computer users.

It's apparent that users like what the IUG staff provides because membership is booming. There are almost 7,000 members today, three-fourths in the HP 3000 group. Though 73 percent of IUG members are in the United States, 14 percent are European, 7 percent are Canadian and the remaining 6 percent are scattered throughout the rest of the world.

A big thrust this year is to establish an international users group for personal computers with some local chapters. A Series 100 contributed library is in the works and the IUG staff will be preparing articles for an upcoming magazine about HP personal computers.

Bill feels the IUG and HP have a cooperative relationship—something not all users groups have with their computer companies. "Our relationship is built on trust," he says. "We really both want the same thing: We want everyone to own HP products."

HP's Carol Scheifele, the first HP employee to spend full time as the company's liaison to the IUG, thinks HP has not yet recognized the true value of users. "From a marketing standpoint it's well worth our while to support users groups," she says. Now graphics and sales literature manager in the Business Development Group, Carol feels field sales people should "wake up to the fact that local users groups have a ripe selling potential."

With an HP internal newsletter about the users group in the works, John Young's keynote address at last month's IUG conference and growing numbers of local IUG chapters, 1984 just might be the year that HP's computer users come into their own.

A very useful idea, some might say. **M**

As this issue of Measure *went to press, the International Users Group board of directors, meeting in Anaheim, California, voted to change the group's name to INTEREX, the International Association of Hewlett-Packard Computer Users. INTEREX is not an acronym, according to Bill Crow, association executive director, "but it is an amalgam of 'international' and 'exchange.'"*

There's something special about this place.

No. It's not Camelot—"that most congenial...happily ever-aftering spot," as the song says it. Hewlett-Packard is a work place—hundreds of offices and factories around the world engaged in some highly competitive business activities. Nowhere is it guaranteed that the climate will be perfect all the year.

Still, if you can accept the myth of Camelot, then King Arthur—with the help of Guinevere and some magic—seems to have had some ideas that are quite compatible with the way HP tries to do things.

The Round Table was a pretty good idea. Everyone there got a hearing. Arthur also thought about stripping armored knights of their rights to ride around bashing peasants and foot soldiers.

And thanks to the magic of Merlin, King Arthur had a revelation about the nature of wars: Many are caused by boundaries and barriers that don't exist when viewed from the sky.

Finally, he proposed a new order based on the common good, a society with a shared sense of purpose.

There you have it: Open communication. Fair treatment of people. Teamwork in place of conflict. Objectives! (Not a bad start on the HP way.)

Yet, back in Camelot, Arthur's dreams were thwarted by the inability of his organization to deal with change—to make the changes necessary for the survival of his new society. Only the memory—or myth—lived on.

Let's face it: Some people ask whether the HP way—our culture, as it is sometimes called—can stand up to all the pressures of growth and change being applied and felt today.

Hewlett-Packard has often been described as a great place to work. Without denying that, let's set the record straight: It is not a Camelot or any other mystical place governed by mystical beliefs. HP's management style—the HP way, as it has come to be known—is based on some highly practical beliefs about how to run a successful business.

So what are these beliefs? Where did they come from? Let's look at what the founders have said:

Recalling the early days, Dave Packard said that "While thinking about how we should manage the company, I kept getting back to one concept: If we could simply get everyone to agree on what our objectives were and to understand what we were trying to do, then—starting with people who want to work, and providing them with the right conditions and resources to do it—we could turn them all loose and they would move along in a common direction."

In the same vein, Bill Hewlett gave his definition of the HP way: "I feel that in general terms it is the policies and actions that flow from the belief that men and women want to do a good job, a creative job, and that if they are provided the proper environment they will do so. But that's only part of it. Closely coupled with this is the HP tradition of treating each individual with consideration and respect, and recognizing personal achievements."

Underlying these beliefs and policies is the concept of sharing—sharing the responsibilities for defining and meeting goals, sharing ownership in the company through stock-purchase plans, sharing profits, sharing opportunities for personal and professional growth, sharing information about the company's performance, and even sharing the burdens when business turns downward.

To be effective, sharing needs an atmosphere of trust and respect for the individual. The company seeks to create such an atmosphere by maintaining a record of steady growth and good performance, one that assures both employment security and job opportunities for HP people. To enhance that atmosphere, the basic business units—called product divisions—are kept relatively small in size and given considerable authority to make decisions and put them into action. There's an emphasis on teamwork and cooperation both within and between divisions.

In turn, the company expects that its policies and practices will lead to superior performance on the job, and that everyone will give their best efforts toward that goal. Employees have rights and responsibilities under the HP way, but all of them are based on sustained job performance. As the sixth corporate objective says: "Employees must take sufficient interest in their work to want to plan it, to propose new solutions to old problems, to stick their necks out when they have something to contribute."

Indeed, for all of these HP way concepts to work as they should requires a set of agreements between individuals and the organization. That basic agreement is spelled out in the Hewlett-Packard Statement of Corporate Objectives. It provides the framework for establishing goals for every individual and level of the organization. This process is known as "management by objective," or MBO.

CORPORATE OBJECTIVES

A set of corporate objectives based on the HP founders' concepts of management was first published in 1957. While those objectives have been revised from time to time to reflect changes in the nature of our business and social environment, over the years they have retained their basic substance.

1. Profit To achieve sufficient profit to finance our company growth and to provide the resources we need to achieve our other corporate objectives.

2. Customers To provide products and services of the highest quality and the greatest possible value to our customers, thereby gaining and holding their respect and loyalty.

3. Fields of interest To build on our strengths in the company's traditional fields of interest, and to enter new fields only when it is consistent with the basic purpose of our business and when we can assure ourselves of making a needed and profitable contribution to the field.

4. Growth To let our growth be limited only by our profits and our ability to develop and produce innovative products that satisfy real customer needs.

5. Our people To help HP people share in the company's success which they make possible; to provide job security based on their performance; to insure a safe and pleasant work environment; to recognize their individual achievements; and to help them gain a sense of satisfaction and accomplishment from their work.

6. Management To foster initiative and creativity by allowing the individual great freedom of action in attaining well-defined objectives.

7. Citizenship To honor our obligations to society by being an economic, intellectual and social asset to each nation and each community in which we operate.

In King Arthur's vision, all the knights would sit at a large round table in the castle at Camelot, there to discuss things, pass laws and plan improvements. Then they would ride all over the world doing good deeds.

At HP we would call those kinds of activities MBO and MBWA—management by objective and management by wandering around.

Stripped to its fundamentals, MBO says employees, given proper support and guidance, are probably better able to make decisions about the problems they are directly concerned with than some executive.

"I don't care how smart a manager is," says Bill Hewlett. "He can't know everything that is going on. The degree to which you can disburse this decision-making responstbility throughout the organization is a measure of the quality of decisions you will get."

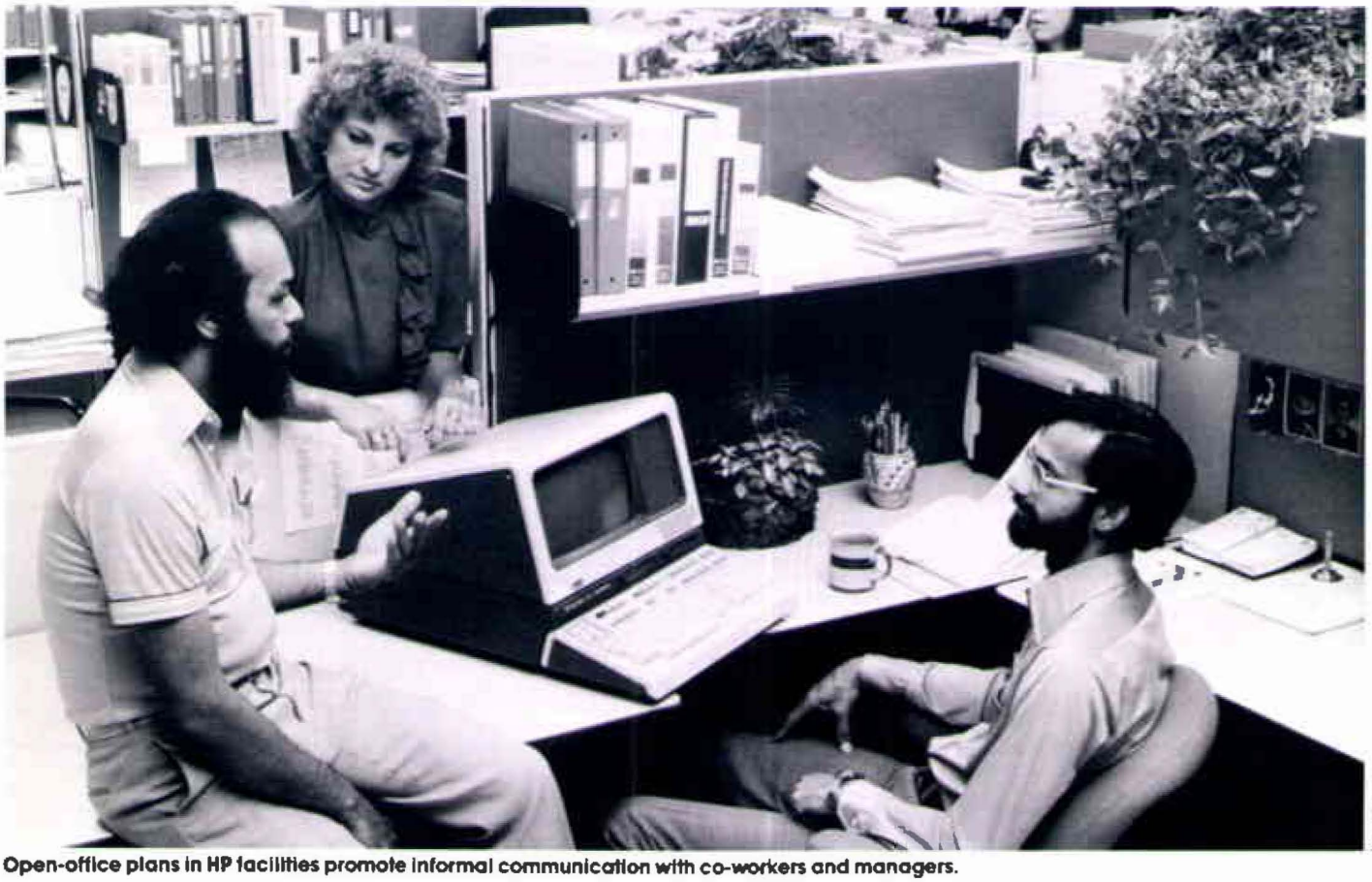
"Management by wandering around is how you find out whether you're on track and heading at the right speed in the right direction," says John Doyle, vice president of research and development. "If you don't constantly monitor how people are operating, not only will they tend to wander off track but also they will begin to believe you weren't serious about the plan in the first place.

"By wandering around I literally mean moving around and talking to people on an informal and spontaneous basis, but it's important in the course of time to cover the territory.

"You start out by being accessible and approachable, but the main thing is to realize that you're there to listen. The second is that it is vital to keep people informed about what's going on in the company, especially those things that are important to them. The third reason for doing this is because it is just plain fun," says John.

Both MBO and MBWA rely on open and honest communication. In fact, most of the ingredients that make up the HP way have communication at their roots.

Ever since someone invented the phrase "the HP way," a number of attempts have been made to describe and define all the various aspects of the company's culture.



Open-office plans in HP facilities promote informal communication with co-workers and managers.

One of the most concise definitions of the HP way was developed several years ago by Dick Hackborn and Don Harris, then general manager and personnel manager for the Disc Memory Division in Boise, Idaho. It explores three dimensions of the company: its business, people and management practices.

BUSINESS PRACTICES

Pay as we go. No long-term borrowing.

- Helps us maintain a stable financial environment during depressed business periods.
- Serves as an excellent self-regulating mechanism for HP managers.

Market expansion and leadership based on new-product contributions.

- Engineering excellence determines market recognition of our new products.
- Novel new-product ideas and implementations serve as the basis for expansion of existing markets or diversification into new markets.

Customer satisfaction second to none.

- We sell only what has been thoroughly designed, tested and specified.
- Our products have lasting value—they are highly reliable (quality) and our customers discover additional benefits while using them.
- Offer best after-sales service and support in the industry.

Honesty and integrity in all matters.

- Dishonest dealings with vendors or customers (such as bribes and kickbacks) are not tolerated.
- Open and honest communication with employees and stockholders alike. Conservative financial reporting.

PEOPLE PRACTICES

Belief in our people.

- Confidence in, and respect for, HP people as opposed to dependence on extensive rules, procedures, etc.
- Trust people to do their jobs right (individual freedom) without constant directives.
- Opportunity for meaningful participation (job dignity).
- Emphasis on working together and sharing rewards (teamwork and partnership).
- Share responsibilities; help each other; learn from each other; learn from mistakes.
- Recognition based on contribution to results—sense of achievement and self-esteem.
- Profit sharing, stock purchase plan, retirement program, etc. aimed at employees and company sharing in each other's success.
- Company financial management emphasis on protecting employment security.

A superior working environment.

- Informality. Open and honest communications, no artificial distinctions between employees (first-name basis), management by wandering around and open-door communication policy.
- Develop and promote from within. Lifetime training, education and career counseling give employees maximum opportunities to grow and develop within the company.
- Decentralization. Emphasis on keeping work groups as small as possible for maximum employee identification with our business and customers.
- Management by objective (MBO). Provides a sound basis for measuring performance of employees as well as managers; is objective, not political.

MANAGEMENT PRACTICES

A fundamental strength of the company has been the effectiveness of communication upward and downward. Two key ingredients for making this happen are:

Management by wandering around.

- To have a well-managed operation, managers and supervisors must be aware of what happens in their areas—at several levels above and below their immediate level.
- Since people are our most important resource, managers have direct responsibility for employee training, performance and general well-being. To do this, managers must move around to find out how people feel about their jobs—what they think will make their work more productive and meaningful.

Open-door policy.

- Managers and supervisors are expected to foster a work environment in which employees feel free and comfortable to seek individual counsel and express general concerns.
- Employees have the right to discuss their concerns with higher-level managers. Any effort, through intimidation or other means, to prevent an employee from going "up the line" is absolutely contrary to company policy—and will be dealt with accordingly.
- Use of the open-door policy must not in any way influence evaluations of employees or produce any other adverse consequences.
- Employees have open-door responsibilities, too. They should keep their discussions with upper-level managers to the point and focused on concerns of significance.

Is the HP way too fragile to withstand change and stress? Will it, like Camelot, Atlantis and Xanadu, live only as a fond memory?

That seems an unlikely prospect since HP's corporate culture has already survived a number of critical tests. The HP way was transported easily from its San Francisco Bay origins across the U.S. in the 1950s. It has been transplanted to Europe, Southeast Asia and other parts of the globe and has still flourished. It has continued to work well as the company reached milestones of 5,000 and 25,000 and 50,000 employees.

And, over the years, as HP has added analytical instruments, medical products, handheld calculators and computer systems to its traditional instrument line, the HP way has been applied to those business lines as well.

"You'll find some people who will tell you that you can't run a computer business the HP way," says Bill Terry, executive vice president of the Instrument Groups. "They say you can't worry so much about some of the things we concern ourselves about, such as profits, people and obligations to the community. This is a different business, they say, too big, too fast-growing and with too many tough competitors.

"I just don't believe that. I don't think the computer business is fundamentally different from any other business."

This doesn't mean there aren't differences between HP's various divisions and product segments. The implementation of the HP way may seem different because there are a variety of business strategies, organizational strategies and ways to measure performance that do vary from business to business.

On the opposite page are examples of how different those strategies and measures can be, depending upon the business you're in. But in each case, the HP way described on the previous page is still practiced.

Despite the differences within HP (or maybe because of them), most HP people feel the HP way will continue in the years ahead.

"The character of the company will live on if it is a fundamentally sound thing to do, and not just something that Dave and Bill told us to do," says Bill Terry. "But I don't worry about that. I think there are plenty of good people around who feel fundamentally dedicated to these philosophies just as strongly as Dave and Bill."

Adds Dean Morton, executive vice president, "The important thing now or in the future is the way people feel about their jobs. Do they have areas of freedom within which to work? Do they really feel responsible for what they do? Do they really feel a part of the organization, with a sense of vested interest and commitment? If we can continue to answer these questions positively, then people will continue to be involved with the company in a broad way. And HP will continue to be something special—not just another company."

HP offices and factories often feature outdoor eating spots and recreation facilities.

Several HP managers, in an attempt to enhance their employees' understanding of the HP way, developed this model to explain variations in business strategies, organizational strategies and performance measures between the company's traditional product lines and some of its newer product offerings.

INSTRUMENT MODEL

Business strategies.

- Next-bench market, with most selling to engineers in industry and government
- HP is the dominant force in the market
- Small product-development teams
- Long product life cycles
- Build-to-order manufacturing

Organizational strategies.

- Decentralized divisions with clearly defined charters and fairly independent activities
- Identical division structures
- Research and development serves as the driving force
- Overseas entities are replicas of related U.S. divisions

Performance measures.

- Pay-as-you-go funding fairly uniform for all divisions with net profit equaling about 10 percent
- Managers follow well-developed "ratio-management" formulas

COMPLEX SYSTEMS MODEL

Business strategies.

- Markets made up of companies that resemble HP, but many of their needs are outside of HP's direct lab experience (e.g., office automation)
- Not the only (and usually not the major) factor in buying decision
- Large development teams from many labs, sections and disciplines require extreme coordination
- Even longer system life cycles, though individual components change rapidly
- Build-to-order large systems manufacturing with repetitive manufacturing for small systems

Organizational strategies.

- A group of divisions with centralized marketing and application integration, tightly coupled labs and product management and a lot of effort to define division responsibilities
- Significantly different divisional structures from software to hardware divisions
- Factory marketing receives as much emphasis as research and development
- Overseas entities emphasize local software development

Performance measures.

- Profit figures most meaningful at group level since oftentimes revenues (from hardware) are not in same places as investments (in software development)
- Emphasis on funding major lab and marketing programs to account for differences between divisions and sources of revenue

HIGH-VOLUME MANUFACTURING MODEL

Business strategies.

- Limited number of internal and external customers with specific product needs. Tight coupling to lab and technical marketing
- Many vendors in fierce competition
- Small product-development teams
- Very short product-development and sales life cycles
- Repetitive manufacturing, automated where necessary

Organizational strategies.

- Decentralized divisions share major technology centers and marketing with moderate strategic effort to define division charters
- Identical division structures
- Manufacturing and R&D are equally important. Small factory marketing effort with emphasis on direct customer relationships
- Product families built in only a few places in the world. Divisions serve as major regional suppliers

Performance measures.

- Self-funding policies fairly uniform across all divisions. Pricing pressures and large discounts offset by higher capital turnover
- "Ratio management," though different from traditional instrument model, can be stable with experience

Even people who've never worked a day for Hewlett-Packard can sense many of the qualities of the HP way during a visit to a factory or a sales office. HP's culture has been the subject of many magazine articles, newspaper columns and book chapters, a few of which are quoted here.

The HP way is difficult to define, both within the company and to those outside. It includes a participative management style that supports, even demands, individual freedom and initiative while emphasizing commonness of purpose and teamwork.

—*Harvard Business Review*

The workers at HP, from clerks to computer specialists, from the plant manager to assemblers and inspectors, are not separated spatially but work together in open bays. Instead of shouting to one another over a machine clatter, they speak in normal conversational tones. Because everyone wears ordinary street clothes, there are no visible distinctions of rank or task.

—Alvin Toffler
The Third Wave

While everyone loves a winner, it's not so much for its financial performance that HP is widely admired as for its creation of a workplace environment where employees are not hassled, where they have chances to learn and grow, and where they are stimulated to reach their maximum potential. And, not incidentally, they also share in the profits.

—Milton Moskowitz
Syndicated columnist

Standing on ceremony has never been the way to get ahead at Hewlett-Packard Company of Palo Alto. Messrs. Hewlett and Packard are known to all as Bill and Dave, and president John Young's office is far less grand than those of executives in many old-line corporations. This free-and-easy style exists because the founders saw it as the best way to generate the enthusiasm needed for high productivity.

—*Savvy* magazine

In short, the most extraordinary trait at HP is uniformity of commitment, the consistency of approach and attitude. Wherever you go in the HP empire, you find people talking product quality, feeling proud of their division's achievements in that area.

—Thomas J. Peters and
Robert H. Waterman Jr.
In Search of Excellence:
Lessons from America's best-run companies

Not restrictive or constraining, the HP philosophy does not require a mystical process of brainwashing neophytes into a strange corporate culture. Instead, it represents underlying principles natural to any stable society of people but which, unless explicitly stated, can be easily lost in the short run and bureaucratic world of business.

—William G. Ouchi
Theory Z: How American business
can meet the Japanese challenge

After a week at HP, it's hard to say if the grass there really is greener. I liked the personal "family-feeling" touches—beer busts, company picnics, coffee breaks, informality and managers who walk around.

HP seems to foster a feeling of employee involvement through techniques like quality circles, stable employment, service lunches, internal training and management by objective (MBO). HP employees are enthusiastic about their company and the ideas and ethics it stands for.

—Bill Stephens
Senior writer
ArcoSpark
Atlantic Richfield Company

5955-4709 (3-84)

YOUR TURN

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

MARK HANAUER

A CASE OF MISTAKEN IDENTITY

As soon as the HP 150 television commercial was broadcast (cover story, January-February Measure*), the company received about 50 notes and phone calls from upset entomologists pointing out a casting error. This letter is typical.*

Dear Hulart Packard,
I saw your commerial and noticed that kind of catapiller does not turn into that kind of butterfly. Monarch butterflys don't have fur on them when they are catapillers.

Sencerely,
SPENCER PUMPELLY
Larton, Virginia

P.S. I'm 8 years old. Please write back and do it fast. That's an order!

Spencer's right. It's only through the magic of television that a salt marsh (woolly bear) caterpillar can become a monarch butterfly. "The monarch caterpillar looks like an ugly, hairless, green worm and it spits bile," says Jim Eaton, national advertising manager for the Personal Computer Group. "We went for the best-looking insects we could find and hoped that everyone would be willing to accept our fooling with Mother Nature."

FAN IN LOVELAND

I have just read the January-February 1984 issue of *Measure* which was loaned to me by an HP employee who works at your Fort Collins plant. I was particularly interested in this issue because I recently purchased an HP 150 computer with a considerable amount of software.

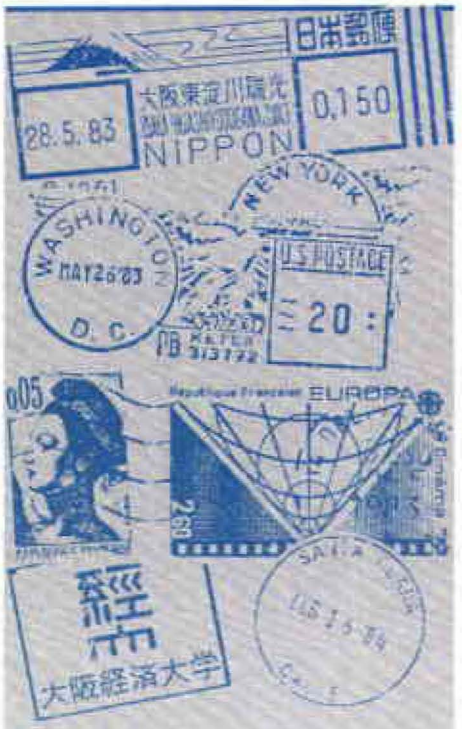
I feel that I am an associate of HP because of my interest in HP's activities ever since the Loveland plant was built many years ago. I have come to know a large number of HP employees in Loveland, Fort Collins and Greeley. And last but not least, because I own 1,200 shares of HP stock.

J. ARTHUR COULTER
Loveland

OUR AXIS SLIPPED

Thanks to the sharp-eyed Measure *readers who wrote and called to tell us that our five-year net-sales graph in the January-February issue was wrong.*

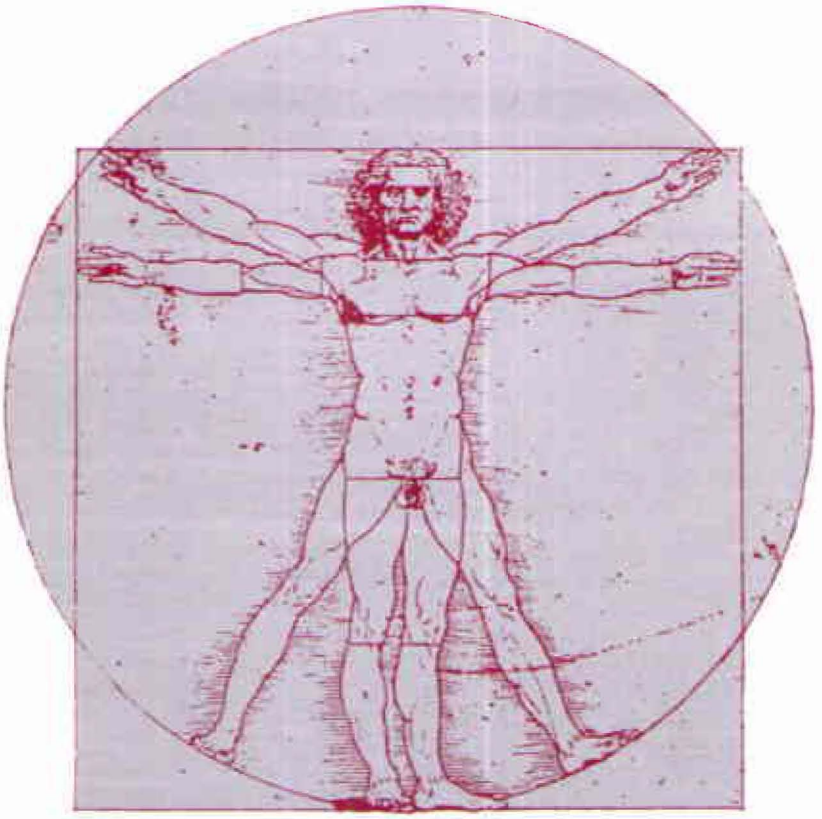
Our bars were the right height, the figures on the bars were correct, but the labels on our y-axis slipped (but only by $1 billion). You'll be glad to know that the goof didn't come from our HP plotter, but from the paste-up knife instead.



What public issues affect HP people and their jobs? Are there questions you have about company operations? Do you disagree with something you've read in a *Measure* article?

Write! We want you to share your opinions and comments with more than 74,000 other HP employees in Your Turn.

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.



Product design with people in mind

In April 1982, engineers at HP's computer division in Böblingen, West Germany, undertook an unusual design change: They sawed off the keyboard of one of HP's most popular desktop computers, the HP 9836. Satisfied with the result, they sent the slightly altered machine into production as a special option for the European market.

Unlike the computer's original designers in Fort Collins, Colorado, the German engineers were forced to take into account a new factor in the computer marketplace: government regulations for using video display units. The West German government had issued a regulation requiring display units (both terminals and computers) to have a detached keyboard except in extremely specialized applications.

Meeting government safety standards for electronic equipment is nothing new for HP. But standards for the use and design of video display units (VDUs or VDTs) have come up for serious discussion only in the last few years—chiefly in Europe, but also in some U.S. state legislatures.

The discussions center on a field known as "human factors" or "ergonomics." The latter term comes from the Greek "ergon" for "work" and "nomos" for "law." It is defined as the science of adapting the work place to the worker. It focuses on worker safety, comfort and efficiency.

Much ergonomics research has concentrated on preventing injury in manufacturing and material-handling areas, a responsibility of HP safety and health departments.

More human factors engineers are being hired at HP, but right now you can count them on one hand.

But now, office use of VDUs has exploded to the point where it is a major ergonomic concern. For HP, a supplier of VDUs, it is also a marketing concern. Analysts at International Data Corporation estimate that by 1986, 30 million terminals will be installed in the U.S. alone. Currently, there are 19,215 in HP's worldwide operations, about one terminal for every four employees.

Not only are more people using these machines, but they are using them for longer time periods. Some people fear terminals may expose them to harmful radiation, although nearly every study sponsored by government agencies or private organizations discounts this (see box on page 15). Many of these same studies, however, show that muscular aches and eye discomfort can result when inadequate attention is paid to the design of the equipment or the work environment.

Comfort at terminals depends largely on the quality and flexibility of the VDU, the furniture and the surrounding lighting (see page 17).

For many years, HP has considered user comfort and product "friendliness" in its product design equations. Past work included designing medical workstations to help nurses read a bank of computer and instrument screens in critical-care monitoring situations, developing instruments with easy-to-use front panels, and pioneering computer-workstation design with

IS YOUR TERMINAL HAZARDOUS TO YOUR HEALTH?

Have you ever wondered whether your terminal emits harmful radiation? If you have, you're not alone.

It helps to know how your terminal works. It's similar in many ways to a black-and-white TV set. A source of electrons, the cathode, bombards the back side of a thin glass screen coated with phosphor, the anode. When the electrons strike the phosphor-coated screen, they emit light and you see an image. The light emitted by the phosphor fades quickly and must be refreshed by another electron beam. In most terminals, this refreshment occurs at 60 hertz, or 60 times a second, fast enough to allow the eye to recognize information on the screen.

Fears have been raised that emissions from terminals cause cataracts or birth defects. Tests show that visual displays do emit small amounts of radiation—about as much as lightbulbs, radios, masonry walls and our own bodies. This radiation is so slight that it can hardly be distinguished from "background radiation," the radiation from all natural and man-made sources.

A 1983 study commissioned by Canada's Minister of National Health and Welfare studied emissions from 150 different models. The results: "Radiation emissions from VDTs are either non-existent or are so low that no standard in the world would classify these emissions as hazardous.... There is no reason for any person, male or female, young or old, pregnant or not, to be concerned about radiological health effects from VDTs."

A U.S. government study by the National Institute of Occupational Safety and Health, released in 1983, studied the effect of VDUs specifically on the eyes. This was the report: "Our general conclusion is that eye discomfort, blurred vision and other visual disturbances, muscular aches and stress reported among VDT workers are probably not due to anything inherent in VDT technology." Even more recent research by the International Ergonomics Association demonstrates that eye discomfort is virtually always due to a poorly designed work environment and inappropriate use of VDUs.

In practice, the proper conditions are not always easy to attain. HP is starting to include instructions on optimum VDU use with its equipment and developing training materials for customers and employees. Employees' questions about radiation from VDUs or workstation ergonomics can be directed to Kevin Grant of Corporate Industrial Hygiene.

the HP 250 console model.

Most of this work was carried out by industrial designers, the people who combine engineering with art to make sure a product's appearance is as good as its performance. Today, the increase in ergonomic expectations and government regulations has led R&D engineers and industrial designers to turn to "human-factors" engineers for help in designing VDUs.

Human-factors engineers generally have an academic background in physics, engineering, physiology, psychology, experimentation statistics, computer science and communication. They are familiar with the problems of light and heat, mechanical design, neurology, anthropometrics, vision and perception, acoustics, learning and motivation, task analysis and linguistics. In general, most traditional engineering programs do not offer the background that enables graduates to exhaustively evaluate the ergonomic aspects of hardware and software.

The world's largest computer company has nearly 200 people specializing in human factors, both in product design and in basic ergonomics research. More human factors engineers are being hired at HP, but right now you can count them on one hand. The first, Wanda Smith, hired a year and a half ago, works in the Computer Groups Industrial Design Department as human factors engineering manager. "My job is to analyze data and provide recommendations to help HP engineers and managers make better business decisions," she says.

At the moment, HP's ergonomics experts are watching the development of standards in Germany's pivotal domestic markets. Besides detached keyboards, German regulations for workstations deal with keyboard height, character size, display luminance and contrast, table height, leg room, gloss on equipment surfaces and other ergonomic considerations.

Using computer displays without these ergonomic features is not illegal in Germany until 1985, but it can make a company an immediate target for lawsuits and strikes from Germany's active unions. Other European countries are following Germany's ergonomics lead.

"The German standard has become the *de facto* yardstick for video display units," says Jack Magri, manager of HP's Computer Groups Industrial Design. "No country wants to become a dumping ground for poorly designed units. The company that outwardly elects not to sell in Germany, elects not to sell in Europe, and elects to have a change in management."

With nearly 30 percent of total HP sales generated in Europe, HP divisions are taking up the challenge. The HP 9836 itself will not be redesigned or retrofitted to include more ergonomic features, but its successors will. "It didn't seem like a good use of engineering time to go back and fix those things, but all the products on the drawing board have detached keyboards and tilt-and-swivel capability," says Jim Borchert, product marketing manager for the HP 9836.

HP's highly regarded terminal family is also undergoing ergonomic improvement. In a 1983 survey of 50 leading terminals by Data Decisions, a market research firm, the HP 2626, HP 2624, HP 2622 and HP 2645 ranked first, sec-

ond, sixth and 12th in overall performance on the strength of their reliability and data-formatting capabilities. In ergonomic qualities, they placed a little lower: ninth, 18th, 16th and 20th, respectively.

Older terminals in these lines can gain immediate swivel capability with turn-table devices that slide underneath the terminals. Newer terminals in the 2620 line have a ball-and-socket joint to allow the machine to both swivel and tilt.

A third-generation HP terminal incorporating many of these ergonomic factors is being designed in Grenoble, France, and will be manufactured both there and in Roseville, California.

The HP product on the market today with the heaviest ergonomic emphasis is the mainstream personal computer, the HP 150. Its tilt-and-swivel capability, anti-glare screen, surface colors and low-profile keyboard make it ergonomically equal to or better than other major personal computers. In addition, its touchscreen is a true ergonomic advance, especially for the person just learning to use a computer.

However, critics have pointed to its nine-inch screen (measured diagonally) as an ergonomic drawback since other companies have 12- and even 15-inch screens on their PCs. HP's smaller screen stemmed in part from a design objective that stressed a small "footprint" (the bottom dimensions of keyboard and base). Accordingly, the HP 150 was designed from the outside in, much like HP's first handheld scientific calculator, which was made to fit in a shirt pocket.

A small footprint can provide a significant ergonomic feature, since a compact machine brings more room and more flexibility to the work area. "People are really pushing footprint, but there are a lot of tradeoffs," says Wanda.

The design team for the HP 150, headed by John Lee, R&D project manager at HP's Personal Office Computer Division, compensated for the small screen size by developing a high-resolution graphics display. Forming the nine-inch display are nearly 200,000 pixels (display dots), the same number found on HP terminals with 12-inch displays.

Within HP, the HP 150's most significant feature may be its keyboard. That keyboard will now be the company standard for all terminals, desktop computers, personal computers and logic development systems.

Two years of dedicated design research and heated management debate went into its development. Two dozen different keyboards were considered. Among them: the 15 different keyboards on existing HP products. Finally, committee members agreed on a single keyboard that allows for the full range of functions currently in 19 international languages. It will enable customers to glide from one machine to another with the greatest of ease.

"In the past, all divisions considered their product the center of the universe and all the other divisions had peripherals that plugged into their product."

The choice of a single keyboard is the first step in an effort within the Computer Groups to bring greater design unity to HP's products. This will also have a ripple effect in the Instrument, Medical and Analytical groups, since many of these systems incorporate computer products. The program is nicknamed "Rosebud," for "Relating Our System Elements By Unified Design."

"In the past, all divisions considered their product the center of the universe and all the other divisions had peripherals that plugged into their product," explains Jack Magri, the leader of the program. "Now we don't just sell products, we sell systems that must be integrated aesthetically as well as technically."

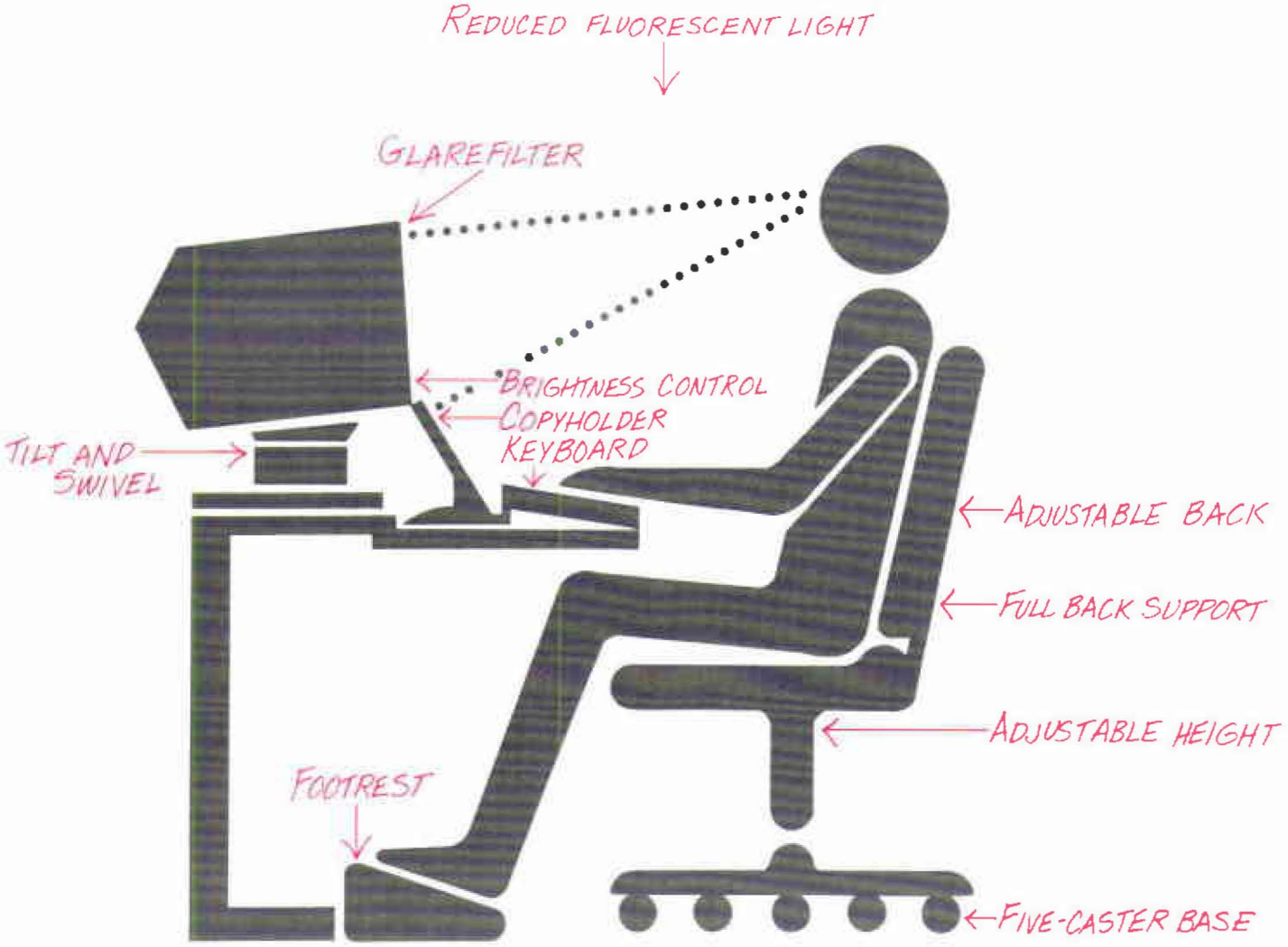
Completely integrated hardware, however, is only half the solution. "The winner of the computer wars will be the leader in software ergonomics," predicts Wanda Smith. HP is a solid supplier of menu-driven software, with options that allow customers to tailor software packages to their specific needs. But many users do not know how to exploit their software for maximum productivity. They've had little classroom training and their HP instruction manuals often focus more on commands than on tasks.

A group headed by Jan Stambaugh of the Personal Software Division aims to change all that by developing training tools and improving software ergonomics. "We're finding out how to make it really simple and less intimidating for the customer to use PCs, the terminals of the future. At the same time, we're impacting the design of the software itself during development, which is why we're at the division, not group, level," she says.

Among the issues in software design is the development of color-coded programs for applications other than engineering design, presentation graphics or process control—such as financial calculating and word processing. "Not to go with color software would be a big mistake," warns Wanda. "The office terminal is going to be like the standard TV. Multi-color will be the ubiquitous display regardless of application."

Both aesthetic and ergonomic features of HP hardware and software products may soon be measured in a self-certification lab proposed by Computer Groups Human Factors staff. If approved, the lab would ensure HP products meet or exceed any country's ergonomic standards before they go out the door. The lab would also conduct applied ergonomics research.

Such plans are evidence that HP aims to do an even better job of building machines that make people more productive and, at the same time, more comfortable. **M**



THE PERFECT SETUP

How to set up your workstation depends on how it is used and how you are shaped. Keeping these five goals in mind should help you find maximum comfort at your terminal:

Reduce glare. If you have a tilt-and-swivel feature, use it to keep the screen from reflecting overhead light or sunlight streaming in through windows. If you have a stationary terminal, place it on a desktop turntable or mobile typewriter table to enable it to swivel.

To keep overhead lights from reflecting in the screen and to ease strain on your neck, look slightly down at the display with the top no higher than eye level.

You may want to rally support for reducing room lighting altogether and obtaining desk lamps for viewing paper. Clothes can reflect light, so have a dark apron available if you like to wear white shirts.

You can attach filters to the front of the display to make it darker. Which kind you select depends on the application. Take into account that etched filters tend to blur the edges of characters, mesh filters are fragile and collect dust, and coated filters pick up fingerprints easily.

Adjust furniture. Ideally, your chair should provide full back support, from the lumbar region to the lower part of the shoulder. If you sit up straight at all times begin making adjustments by using the German standard of a keyboard 30 mm (1.14 inches) off the table at the home row and a table 720 mm high (27.4 inches). But if you are like most people and lean slightly backward to ease strain on the lower back, you may find it more comfortable to have your table and keyboard slightly higher.

A foot rest eases back strain when it raises your knees above your hips. A palm rest can ease the strain on the wrists, but it can also hamper high-speed typists. An adjustable copyholder is a must. If your desk is wide enough, put it between the keyboard and screen. VDU users, just like moviegoers, differ on their preferred screen-viewing distances. Most range from 450 mm to 720 mm (about 18 to 27 inches).

Take breaks. At least 15 minutes every two hours. If the work is stressful, turn to another task for 15 minutes every hour. Rest your eyes. Move them up, down, to the left and to the right. Look off in the distance. Stand up. Walk around. Stretch.

Maintain the machine. Wipe fingerprints from the glass and keys. Have your cathode-ray tube inspected periodically. If you suspect deterioration, have it replaced.

Have your eyes examined. Many eye prescriptions, particularly for bifocals, assume a reading distance of 300 mm (about 12 inches). Most VDU users read at 450 mm (18 inches) or more, requiring a different focal length.

Any close work such as staring at a VDU tends to reduce the eye's blink rate. This decreases eye lubrication and can cause irritation, particularly if you wear contact lenses. Various eye lubricants can minimize discomfort. Check with your eye doctor.

For help in setting up your workstation, contact your safety and health department.

CLOSEUP

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

FLYING SAUCERS

HP's Martin Schönmayr leaps high against his Finnish opponent in the Ultimate Frisbee World Championship in Gothenborg, Sweden. Martin and his Austrian teammates finished the competition in fourth place.

The commercial customer engineer from HP's sales office in Vienna spends most of his spare time jumping around. He practices with the Frisbee team three nights a week and plays in a volleyball league on the other two nights.

THERE MAY BE A COMPUTER IN THEIR FUTURE

These year-six students at Blackburn Lake Primary School in Melbourne, Australia, may be on their way to careers in the computer industry.

HP customer engineer Phillip Moon brought an HP 86 personal computer to class during a career awareness program sponsored by the school. Judging by the students' enthusiasm, HP-Australia should have no trouble meeting its college-recruiting goals in a few years.

OH, MY ACHING FEET!

There may be a mathematical reason why your feet hurt the way they do. A San Jose, California, podiatrist has used an HP 27 handheld calculator to develop mathematical models that explain bunion and forefoot deformities.

By studying radiographs of the weight-bearing surface of the forefoot (known as the traverse plane) and then comparing theoretical models with real feet, Dr. Mayer Robbins hopes someday computers will be able to predict the results of proposed foot surgery.

TOPPING OUT IN BÖBLINGEN

There'll be a new home this summer for 250 HP people in the Böblingen, West Germany, sales office when they move into this building. At the topping-out ceremony last November, a crane places the traditional garland on the roof while HP employees and municipal council members watch. HP employs more than 3,400 people in West Germany.

WHAT'S WRONG WITH THIS PICTURE?

Why is there a basketball hoop in the shipping room of HP's Fort Worth, Texas, sales office? Five-foot, five-inch-tall sales engineer Howard Fogel says the hoop was purchased "when we had taller sales reps in the office." Someone bought a basketball and the room became a noon-hour hangout.

"One day," recalls Howard, "a sales rep left the company and took the ball. No one's played since."

HP left the hoop behind when everyone moved into a new 7,000-square-foot building.

When HP's Corporate Treasury Department has more money coming in than it needs to cover expenses, it makes sure the excess funds aren't just

MONEY IN THE BANK

It is 7 a.m.

All is quiet now. But before the dust settles this morning Jean Hash will have earned $52,000 for Hewlett-Packard.

"The first day I came to HP I had to invest one million dollars. I was scared." Jean has been handling HP cash for the past 12 years.

This Tuesday morning will be a typical workday for Jean and her co-worker, Jean Brusig, who both arrived in the Corporate Treasury Department in Palo Alto before dawn.

"Today will be slower than most. I've got under $10 million to invest. Some days I have $30, $40 or $50 million," says Jean Hash.

As corporate cashier, her job is to invest HP's excess operating funds in short-term deposits. She's not out to make a killing in the market, just to find the best available investment with the highest return every business day.

The Treasury Department is responsible for insurance, taxes and licensing, internal audits, the retirement fund and cash management.

In fiscal 1983, domestic cash management earned $20.4 million in interest by investing excess funds from HP's operating cash account in the U.S. Combined with similar Intercontinental ($17.5 million) and European ($31.2 million) returns on cash investments, the company gained $69.1 million from interest income alone.

For the past half hour Jean has been scanning the early-morning bank report that gives full detail on yesterday's bank account activity. From this and other forecasts she must calculate how much money HP will take in and how much it will pay out. Whatever remains is the amount Jean will invest.

Incoming money includes such items as payments from customers, return on previous investments and intercompany overseas payments. Outgoing money includes payroll, construction and land purchases, division disbursements, intercompany payments to overseas subsidiaries and miscellaneous bills.

Though some companies need to borrow funds after their morning calculations because expenditures exceed receipts, HP has been in the enviable position of having money remaining after the day's bills have been paid. These excess operating funds become short-term deposits with banks.

In many ways, HP's method of han-

dling cash is not much different from your own.

You have periodic payments for water, phone, electricity, housing, garbage, car and insurance. You receive money from your HP paycheck and (possibly) interest from your investments to cover those bills. If you were to invest that money between the time you received it until the time you had to pay it, you could earn interest income. With the sums HP is collecting and paying each day, it could make a difference of thousands of dollars of interest.

For HP, knowing precisely when money will arrive and when expenses are due is crucial. Jean invests the excess cash for from one to 90 days, depending on the forecasts she has for future expenses. Part of the forecasting process includes relying on divisions and sales regions to give her accurate forecasts. Jean counts on two essentials to manage HP's cash effectively: coordination and communication.

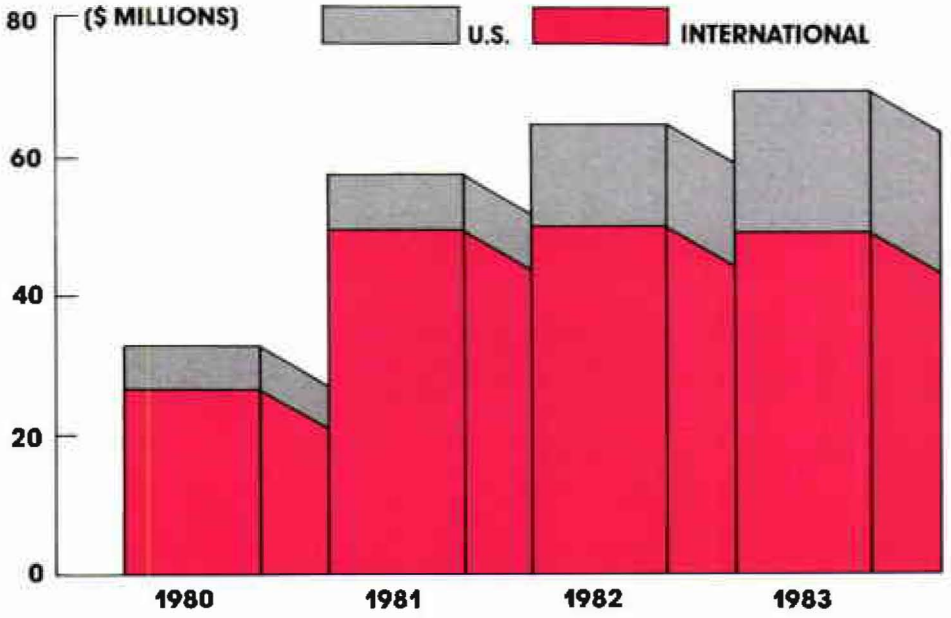
It is now 7:21 a.m.

"Forecasting is most important," the British native says. "Each division forecasts on a weekly basis for 13 weeks the expenses to be paid by their accounts payable department. This may include local taxes and payroll besides the regular payments to vendors. Other departments such as Corporate Tax, Corporate Construction and Fleet also submit forecasts. These cover large payments made on a regular basis, but not daily."

JOANNE ENGELHARDT

Jean Nash determines which banks receive short-term deposits of excess cash.

INTEREST INCOME FROM INVESTING EXCESS OPERATING FUNDS



By investing excess operating cash in short-term deposits with banks, HP creates millions of dollars of interest income each year.

Monies collected from HP customers for the sales regions are deposited in bank deposit boxes strategically located within the region. These funds are transferred daily to HP's master account. Jean forecasts the day's likely receipts by reading each sales region's monthly estimate.

Communication is important because excess funds are tied up in fixed-term deposits. Corporate Treasury has never broken a deposit agreement to get funds—and the department doesn't keep a "petty-cash drawer" for large payments.

Recently, HP needed a few million dollars for a property purchase. No problem. Jean was alerted far enough in advance to make the adjustment in funds.

"We have our own limits on investments with banks. HP isn't out to squeeze the last investment penny out of every dollar," she says. "We want primarily to get good rates on loans with secure institutions. We don't go for a 10 percent loan with a poor institution. We'll settle for a 9.4 percent loan rate and security."

Fortune magazine recently rated Hewlett-Packard third among the top 500 U.S. companies for managing assets. One reason for *Fortune's* acknowledgement is the method HP uses to select banking institutions.

HP rates banks on a four-point scale from acceptable to exceptional. Each rating carries with it a maximum amount of money HP will invest in the institution.

Banks also have to be monitored closely. Jean chuckles, "Sometimes they shortchange HP by one million dollars! But other times, they overpay us one or two million. I let them know about their errors either way."

The clock shows it is now 8 a.m.

Jean has finished her calculations and prepares to invest the day's excess operating funds. She shuffles through her slips of paper with various bank interest rates. (Banks have been calling for the past hour, but Jean has avoided the phone. Jean Brusig has written down all bank quotes on the morning's interest rates.)

"We have to get here early so we can get the best interest rates before they start to change. Sometimes they can drop a point or so in the morning," Jean says. She dials the phone and chats briefly with the banker before asking, "What are your interest rates today? Only 9.3 percent? I've got $8 million to invest. 9.4 percent? Good rate, I'll take it."

With that verbal OK, HP's $8 million is put into a certificate of deposit that will mature in 25 days. Between January 12 and February 6, this investment will have earned $52,222. The bank will take HP's $8 million and loan it to its customers at the going market rate.

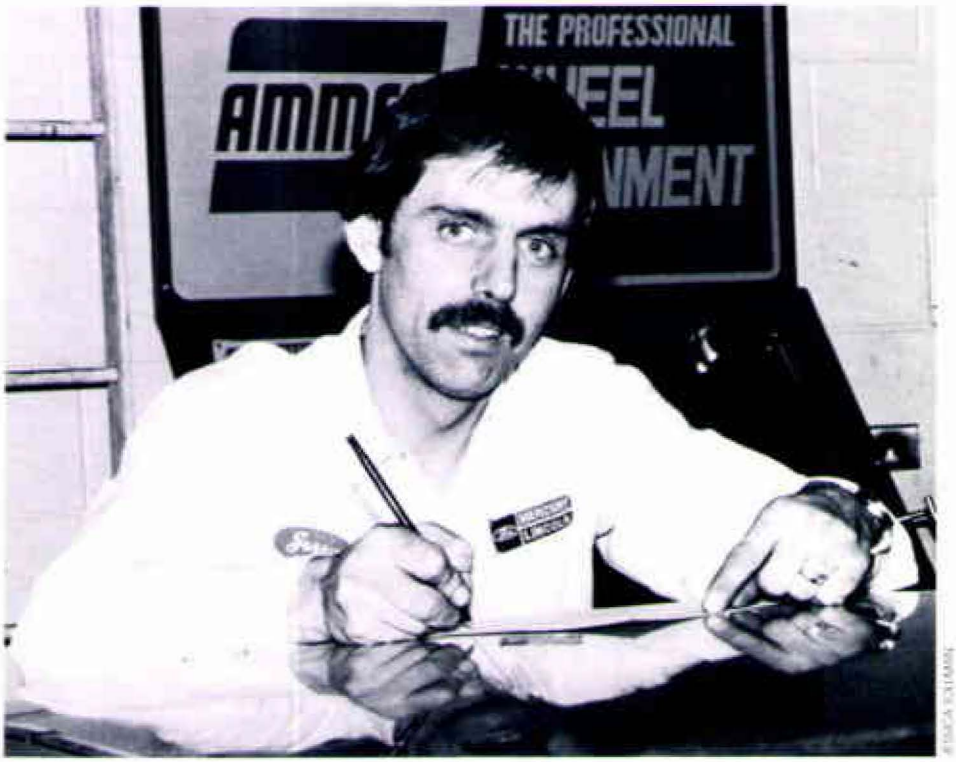
Jean is no longer in awe of such large sums of money. She handled an average of $1.2 billion per month in 1983. That figure includes incoming, outgoing, transferred and invested money.

"We had a lot of business in October, the last month of fiscal '83. I handled $2 billion. It's no big deal now."

What a difference a dozen years of experience and a few billion dollars can make. **M**

QUICK ACTION SAVES A LIFE

Emergency training pays off for HP auto mechanic



CPR hero Jerry Feager services fleet cars at HP's Midwest Sales Region headquarters.

When Jerry Feager answered an emergency call last June at the Midwest Sales Region office in Rolling Meadows, Illinois, he had no idea it would change his life.

"Frank Silver, a coordinator II in the parts inventory department, was lying back in his chair and had had an apparent heart attack," recalls Jerry, a first-aid and CPR (cardiopulmonary resuscitation) instructor. "I checked for breathing, pulse and air. He had no vital signs so I started giving him CPR. That seemed to bring him around and by that time paramedics were there."

Jerry, a senior auto mechanic at the MSR headquarters office, says this was the first time he had ever used CPR "except on mannequins. I was scared to death, but I felt really good after the paramedics gave me a lot of 'attaboys.'"

That was only the beginning. Since then, Jerry has been honored several times for his heroic act:

- He received the HP Rolling Meadows office "Good Samaritan" plaque.
- He was featured on the NBC-TV program "Inside Out" that showed how CPR can save lives.
- He received an American Red Cross certificate signed by President Ronald Reagan, one of six people so honored for saving a life using CPR.

Best of all, though, he decided to become a paramedic. After taking a rigorous 105-hour course covering everything from ambulance training to auto extraction Jerry now is a certified emergency medical technician.

"It's been," says Jerry, "the most exciting time of my life."

Frank, who had a history of heart disease, died December 23, 1983. But Frank's wife, Helen, credits Jerry with giving her husband an extra six months to live: "Jerry's quick action saved my husband's life," she says. **M**

JOHN YOUNG

HP's president reflects on the future of the company's culture.

This issue of *Measure* revisits the subject of the HP way, a blend of philosophy and practice that has made HP stand out among other employers and vendors.

Many people worry about the future of the HP way. Newspaper articles point to our entry into rapidly changing, highly competitive markets. Employees point to how much we've grown and how often we've changed the shape of our organization charts. Common to all these questions is the concern that perhaps our special culture is too fragile to withstand change and stress.

I have developed a number of thoughts on this subject, and I'd like to address the doubts that some of us feel—or, to be more precise, that all of us feel sometimes.

First, the fact that we worry about the HP way means that we recognize there's something special about our relationships with one another. We know there exists an identifiable set of philosophies about how we approach our management, our employees and even our customers. We know it's valuable, too, for if it weren't, the concern wouldn't be there.

Secondly, I'm glad we worry. That means it's less likely that we'll let our HP culture fade away, like something gone out of style. To add some perspective, however, let me note that we were asking ourselves the same questions when I joined the company more than a quarter of a century ago. A major concern at the 1960 management meeting was how the HP way would survive our growth in the sixties, and at that time we were all of 1,750 people and $30 million in sales.

I've seen a lot of change since I joined HP, and the nature of that change is the third point I'd like to make. It goes without saying that the sheer size of a 74,000-person organization makes it harder for us to keep the kinds of personal business relationships that characterized the earliest days at HP.

It's not possible for a few of us to do all the "managing by wandering around" or to keep an open door while getting the work done. However, we have 51 divisions, 13 sales regions and 34 sales companies, so there are several managers everywhere to share this key task. And it's important that we do try, because the benefits we reap from our open communications far outweigh the time drain they sometimes represent. Hallway conversations are more valuable than a dozen memos.

BETTY GERARD

At a Bay Area luncheon, HP President John Young (left) and co-founders Dave Packard and Bill Hewlett present service awards to employees. All three also received awards—John for 25 years and Bill and Dave for 45 years.

Some questions about the future viability of the HP way have stemmed not so much from growth as from the changing nature of our products and our need to organize ourselves effectively to manufacture and market those products. Our customers are asking for systems solutions to their needs. As a result, we're no longer just selling single products manufactured by a totally autonomous division. We're selling families of products that work together where several HP divisions have had a role to play.

This integration of products into systems calls for an interdependence of divisions, and some argue that divisional autonomy—and thus the HP way—is therefore at risk. I don't agree with this reasoning. The division will remain a vital part of our organization, even with some changing form. It's the idea of an independent work group with clear internal and external responsibilities that's key.

The necessary convergence of our products and divisions doesn't make the HP way obsolete. On the contrary, the need for cooperation—between divisions, between groups, between field and factory—has made preserving the HP way even more important. The fundamentals of good cooperation and communication are more necessary today than ever before. Only by using the HP way can we bridge division and function to develop and support systems solutions.

There's one last point I'd like you to carry with you. 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. Our valuable culture is not external to you. 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.

NEWSCLIPS

Recaps the newsworthy events, changes and achievements within HP.

CHART CHANGES

HP's manufacturing activities in the United Kingdom continue to expand. The Microwave and Communications Instrument Group has formed a new Queensferry Microwave Operation with **Doug Scribner** as operations manager. It will share a site outside Edinburgh, Scotland, with the Queensferry Telecommunications Division and concentrate on products in the RF frequency range tailored to fit the European marketplace. Within the Information Products Group, the former Computer Peripherals Bristol Operation has been raised to full division status under **Doug Carnahan** as general manager. ...A new Laboratory Automation System Operation has been set up within the Avondale Division. Operations manager is **Jim Serum.** ...A new Manufacturing Research Center under director **Bob Grimm** has been formed within HP Labs. **Fred Schwettmann** has become director of the Technology Research Center.

KOREAN JOINT VENTURE

Hewlett-Packard Company and Samsung Electronics Company of Seoul, Korea, announced January 16 the formation of a joint-venture company to develop and manufacture computer products and to sell and support HP products in Korea. It will be owned 55 percent by HP and 45 percent by Samsung, which has been a distributor for HP products since 1976.

FAR EAST

Colin Chin has been named to the newly created position of country sales manager for the People's Republic of China, based in Hong Kong and reporting to Far East Region GM **Malcolm Kerr. Chi-ning Liu**, China GM, remains at Intercontinental headquarters in Palo Alto with responsibility for HP's overall presence in China and longer-term projects. ...**Victor Ang** is the new GM of HP's sales subsidiary in Singapore. ...The Components Group has named **John Fischer** GM of its manufacturing operations in Penang, Malaysia.

HP'S REPUTATION

Hewlett-Packard placed third among 250 of the largest U.S. corporations included in a recent survey of corporate reputations by *Fortune* magazine in its January 9, 1984, issue. Some 7,000 executives, outside directors and financial analysts participated. Those in the office equipment and computers category gave HP highest honors in three of eight attributes: innovativeness, product quality and the ability to attract, develop and keep talented people. Top honors overall went to IBM and Dow Jones publications.

NEW HATS

In the Corporate Manufacturing organization, **Tom Lauhon** has been named to the newly created role of director of Corporate facilities. He'll provide a corporate focal point for all activities from initial planning for new sites and buildings through land acquisition, construction and operational lifetime of facilities. ...**Bill Johnston** has been appointed to the new role of director, International planning and administration. ...**Matti Hietala** is business development manager for Northern Europe. ...**Dick Watts** is Electronic Measurements Group marketing manager.

NEW PRODUCTS

The HP 8510 network analyzer system from the Network Measurements Division allows a microwave design engineer to isolate and electronically measure individual parts of a circuit. Measurement accuracies are 10 to 100 times more precise than those of other instruments on the market. ...The Manufacturing Test Division has introduced 10 significant enhancements for the HP 3065 board-test family. Included are software that allows users to develop test programs faster by automatically capturing data from CAD systems; a standard feature that provides summarized information from the test and repair process; and software to allow users to share data among a wide variety of computer systems. ...The Santa Clara Division's HP 5182A waveform recorder/generator makes it possible to record almost any waveform—including from an event that can't be easily reproduced—and replay it repeatedly for analysis. Software packages for the new recorder/generator and an earlier HP 5180A waveform recorder have also been announced.

The San Diego Division has rounded out its design-graphics product family with a new top-of-the-line drafting plotter, the HP 7586B. It can use rolls of paper to produce plots up to 40 feet long. ...A new transmission-impairment measuring set (TIMS) from the Colorado Telecommunications Division makes it simpler to test complex voice- and data-transmission circuits.

Waltham Division has announced two new low-priced products for use in monitoring critically ill patients: the microprocessor-based HP 78720A arrhythmia monitoring system and the HP 78532A monitor/ terminal.

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