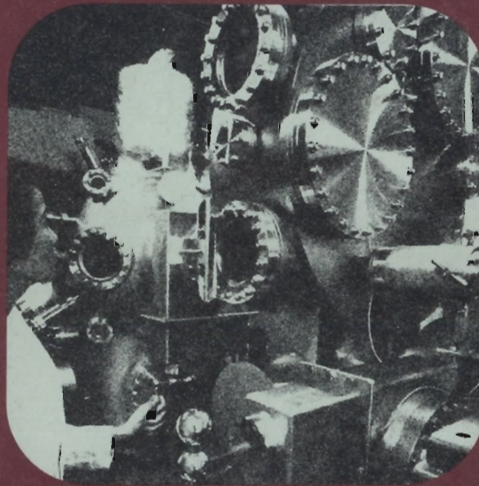


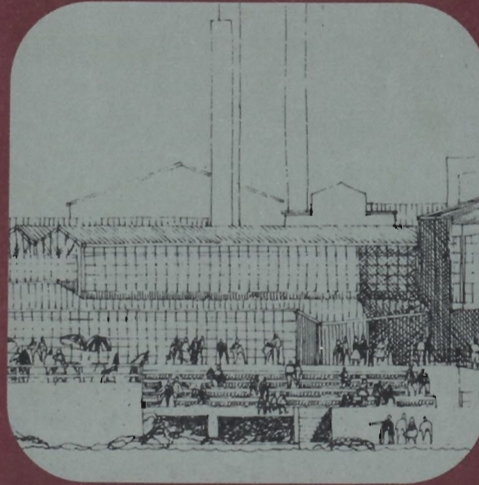
MEASURE

For the people of Hewlett-Packard

November-December 1980



in this issue:
working
handicapped
lu packard
hp labs' mission
toffler sees hp



UP FRONT

Comments on the changing HP scene—
and the people behind it.

Shortly after the Sept.-Oct. issue of **Measure** was received by HP people, the phone in President John Young's office began to ring. The caller said he was interested in exercising his right to use the "Open Door" policy. This policy says that when employees feel it necessary to take their problems, ideas and grievances "up the line" they can do so without hindrance or fear of reprisal on the part of their supervisor. The caller had been reminded of that policy by the HP president's written message in the magazine. In this and other cases that followed, an appropriate hearing was arranged (John was out of town) with someone else "up the line."

What's notable about this flurry of activity, which presumably was repeated at other levels and locations of the company, is how clearly it reflects that coach's maxim of "getting back to basics" when you want to improve a golf swing, a tennis stroke or a management style. The Open Line process had shown that some HP people didn't understand the meaning of Open Door, and some others didn't feel it would work for them. It was important to try to change such attitudes, some of them based on lack of communication and some of it on real experience.

A number of HP organizations tackled the task of improving Open Door understanding and acceptance through communications. Meetings of supervisors were held with Open Door as the major topic. Several gave Open Door new emphasis in training programs. Others, including the Southern Sales Region, made it clear in print that attempts to frustrate the Open Door process would not be tolerated. Finally, the president's message provided an overall definition and interpretation of the Open Door principle.

Another important plank in HP's platform—Management by Wandering Around—is included in John Young's message in this issue of **Measure**. This, too, is another outflow from Open Line findings. Open Line indicated that people wanted more opportunities to meet local and corporate managers person to person. They wanted their work to be recognized, to ask questions and present viewpoints, and to gain a broader perspective of their working world.

As a part of the overall process of Open Line expression and response, the MBWA message on page 23 represents a clear reaffirmation of a basic company philosophy. That seems a highly appropriate subject

on which to close 1980, the first year of the company's fifth decade.

Why would Hewlett-Packard produce a videotape program about people with physical disabilities?

Perhaps the best answer is contained in the program itself which **Measure** summarizes on pages three to six. The handicapped people are HP employees who demonstrate what surely seems to be an extraordinary ability to adapt to the conditions of everyday living. We see three such people—on the job and in their homes. We learn that—no matter what their particular disability—they share one further handicap: the initial reluctance of some other people to accept them as ordinary beings able to learn, to work, to feel and even to teach. We hear them describe some of the ways they overcame such attitudes. And from supervisors and co-workers we discover that disabled people can indeed do a day's work, bringing a special spirit to the task.

That's what the program is about.

The videotape is now being edited as part of a revised Affirmative Action Workshop for release in April by Corporate Training and Development. Its developers are Beth Giandana, of the Corporate Affirmative Action department, and Riley McLaughlin of HP-TV. Beth is a former teacher of deaf and disabled people, and serves as liaison to other HP organizations in helping them recruit, hire and accommodate handicapped employees. Riley is an experienced television producer/director. Together with a lighting director, George Parrish, they filmed "Just Three People" on location at HP divisions in New Jersey, San Diego and Santa Rosa. Brought in as a consultant was Dick Farr, a television producer and former doctoral candidate in communications at Stanford who wryly says that instead of a Ph.D. he got an MS (multiple sclerosis). Dick recently became editor of the Cupertino IC Operations employee magazine. **M**



Beth Giandana and Riley McLaughlin work on the videotape.

THE SCRIPT THAT WROTE ITSELF

*...a glimpse into the lives
of Barbara, George and Rick—
three of the many HP people
who don't let their disabilities stop them.*

On screen in a new HP videotape, a supervisor speaks candidly about the first uneasy days after an employee with cerebral palsy was hired.

"When Barbara first came to our department, it was very difficult. None of the people here had dealt with a person with a handicap of this type. The group did not accept her in the beginning. They felt I shouldn't have hired a person with such a severe handicap and they didn't believe they could adjust to her in her condition. But after she was with us for about six weeks, they got to know her. They knew they could kid with her, and that she was the same as they were. And then they accepted her."

The scene is the manufacturing specifications department of the San Diego Division. Barbara Claubes was hired as a clerk there in August 1979, a year after the death of her husband Kim. He also was a victim of cerebral palsy and one of the first with that disability hired at that division. Barbara remembers her first days on the job:

"I felt they were scared to talk to me. They kept shying away from me. They wouldn't joke with me because they didn't know how I would take it.... The first



San Diego's Barbara Claubes and co-workers

weeks here I was very nervous trying to get used to people staring at me and looking at me down the hallways and around corners without really trying to embarrass me. But I knew what they were doing. I knew when I came to HP that it would take a while for people to realize I'm just like everyone else."

It is frankness like this which underlines the honesty of the videotape about HP people with handicaps that has been produced by the Corporate TV facility in cooperation with Corporate Equal Opportunity (see *Upfront*, opposite).

The stars of the show are a trio of HP employees who represent hundreds of other HP people with physical limitations that are an accepted part of their lives, on and off the job. Their feelings, and those of the people with whom they come in daily contact, shine through in spontaneous comments which are more eloquent than any prepared script, as the following pages show.

The videotape originally was intended as part of a revised Affirmative Action Workshop for supervisors throughout the United States. However, it speaks so directly about the need for dealing honestly with the subject of physical disability that it will receive wider use within HP.

When Barbara came to HP we didn't really know what we had to do for her. Should we push her around all day or take her to the cafeteria and feed her? Then our supervisor told us we weren't supposed to treat her any different from anyone else in the place.

A co-worker

Barbara Claubes beeps the horn on her electric wheelchair in cheerful response to the waves she gets as she wheels along the corridors of the San Diego Division to expedite paperwork.

Her wheelchair, and the facility's electric car which transports her from the front gate to her department and back each day, are accommodations which Barbara uses only on the job.

At home she walks unassisted with the uncertain tilt characteristic of cerebral palsy, a neuromuscular disease which causes spastic movement. Barbara serves as a model of independence for other severely handicapped adults—teaching a class for them at a local college and opening her own home to demonstrate ways to handle practical problems. Here she watches as a friend who is disabled learns to peel a potato by herself.





When our project in the lab grew large enough to need project leaders, I felt that it was pretty clear that if it were not for the fact that George was deaf, he would be the person to supervise the group.

Jim Stanko

When George Kononenko, who has been deaf since birth, applied for a job as a co-op student at the New Jersey Division in 1974, both he and his interviewers were concerned whether his deafness would be a problem in the give-and-take communication necessary among project engineers. That obstacle was quickly knocked down through written notes and sign language which George began teaching to interested people.

He joined the division full-time the next year after receiving his bachelor's in mechanical engineering. Now he supervises a mechanical packaging group developing new OEM power supplies in the engineering lab.

Co-starring with George in the new HP videotape are his wife Linda, who is also deaf, and 4-year-old Jennifer who has impaired hearing. Jennifer's bedtime stories and all family conversations are handled in sign language. George also turns his talented hands to such leisure-time projects as woodworking, building a rock garden, watercolor painting and home improvement projects.

We have a lady on the line who told me that when she has a hard time and thinks she can't make it and is ready to quit her job, she thinks about Rick and the fact that he doesn't quit—he never gives up. And if he can, we all can. That's one of the strengths I've gotten from working with Rick: a sense of his courage that I use myself.

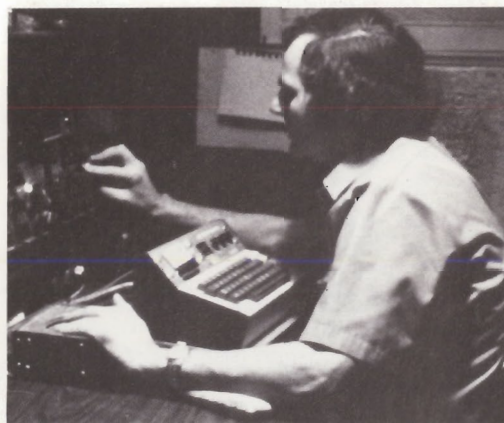
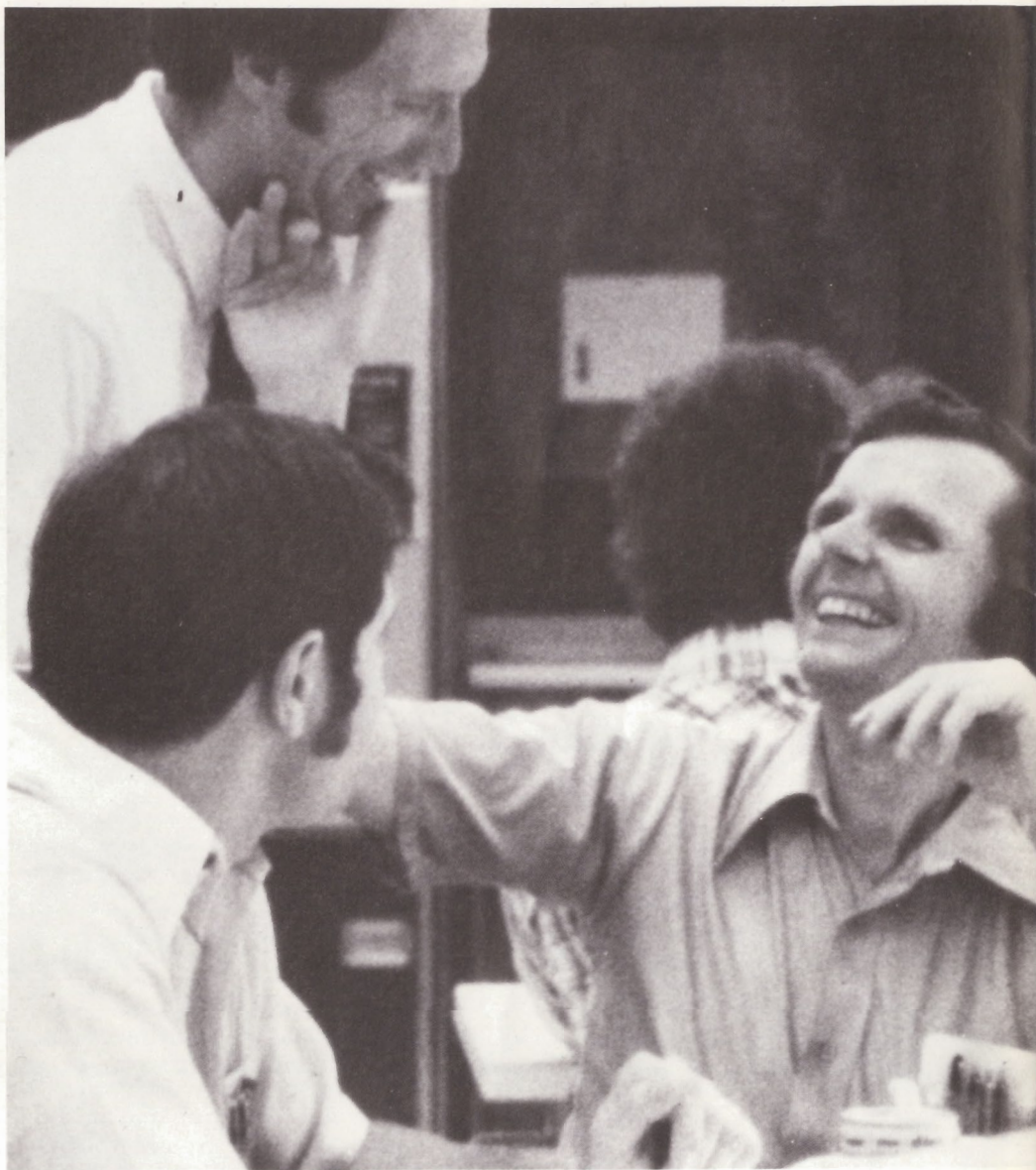
A co-worker

The ways Rick Joy makes contact with others are many and varied: putting his hand on the mouth and throat of a person to sense the vibrations of speech; touching hands for finger spelling and sign language; using written and typed Braille and the Optacon electronic reading machine for blind people; and communicating with a rapid tattoo of Morse Code for both conversation and ham radio (he's shown here at his home transmitter).

Rick lost his hearing and speech as the result of a childhood attack of meningitis that left his sight severely impaired—he lost all remaining sight when he was 19. But he has fully accepted the challenge of taking part in a world of school, work, sports, hobbies and social activities.

At home he has almost as much test equipment as the typical HP test bench for his electronic projects, along with a garage workshop with power saws and drills adapted for his safe usage.

It was Rick's accomplishment in electronics which qualified him for a job as an electronic assembler at the former Santa Rosa Division in 1973. In his work on the line he far exceeds the standards in assembly speed and accuracy, slowing down a little for soldering tasks. One of his



personal projects after coming to HP was building a typewriter that produces a message in Braille so he could communicate more easily with fellow employees. **M.**

The photos for this story come from the soon-to-be-released HP videotape:

IT'S A LARGE ORDER

But Waltham Division can handle every detail from order clearing to custom cabling on the road.

Felicita Madden has worked for more than 15 years for Waltham Division's systems cabling department at a job that normally requires only a daily commute from home and back. Recently, however, she has been showing up for work in Arizona, Nevada, South Carolina, Georgia, Michigan and Maryland. That's because she's part of the division's factory installation team which now takes its act on the road in the interest of saving time and money when large orders are installed at customer sites.

Teams of assemblers and test technicians arrive at a hospital installation site along with bedside monitors, central stations, arrhythmia monitoring, patient data management systems and raw cabling. Production and systems cabling tailors the necessary cables on site—a less expensive process than shipping finished cables to be installed by customer engineers.

These on-site teams are one part of the large-order management concept that Waltham Division has used since 1977. The idea evolved when HP received a \$2.5 million order from Walter Reed Army Medical Center, considered to be the largest



single order for patient monitoring equipment in the U.S. at the time.

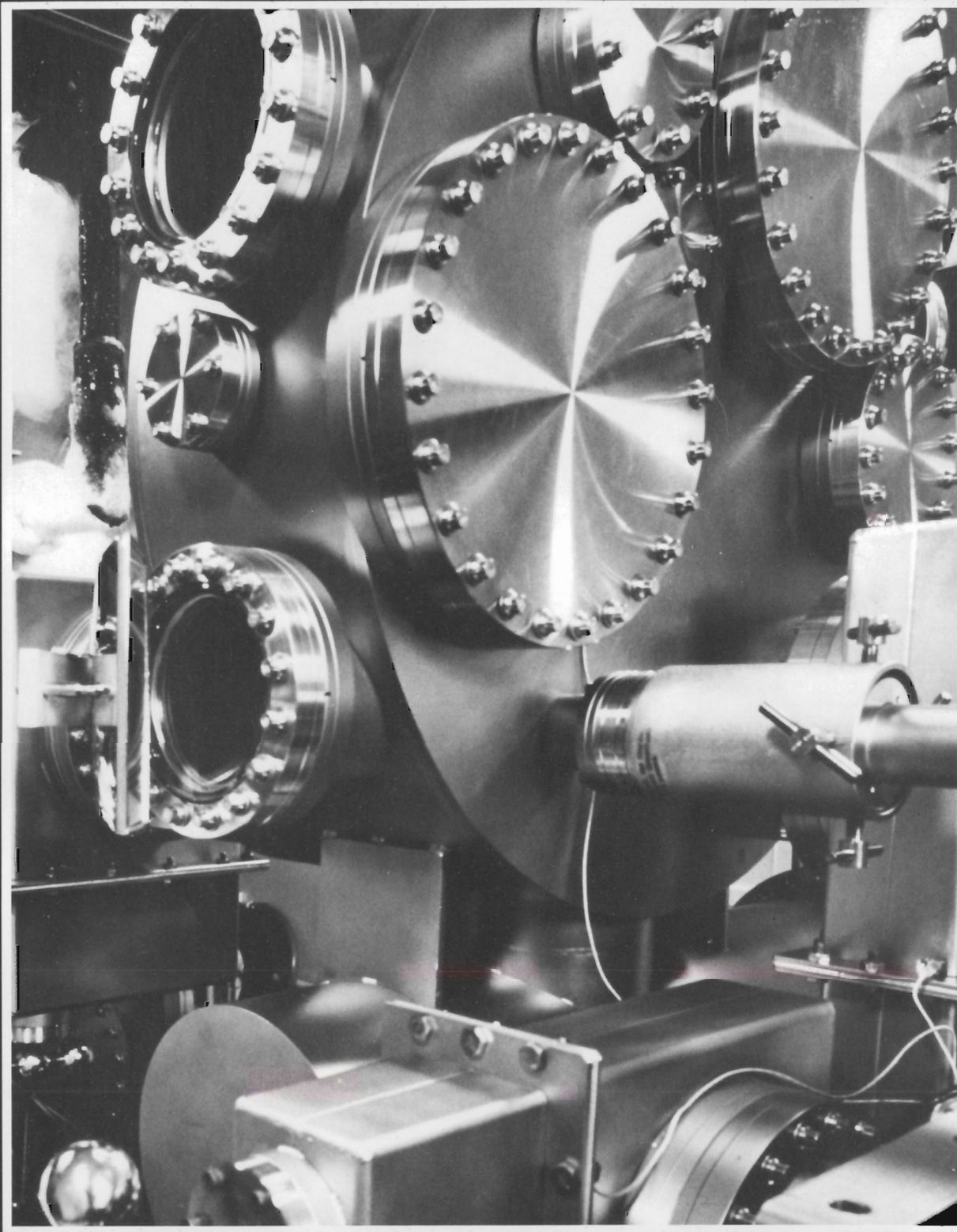
When a large order is received (generally for more than \$500,000), a team of representatives from order processing, order clearing, specials, scheduling, finished goods and quality assurance move into action under the watchful eye of a large-order specialist. It's that person's responsibility to move the order smoothly from quotation to installation. Periodic check point meetings are held to coordinate the processing, building and shipping efforts.

The division team is paralleled by a field large-order team at the sales office which includes a site manager (usually a customer engineer or district service manager), a sales engineer and a systems engineer.

As a result of the large-order management teams, complex sys-

Production cabler Julie Currie puts the finishing touches on an ECG cable at the National Navy Medical Center in Bethesda, Maryland.

tems of HP medical equipment are now being installed well below previous installation costs. And people in the cabling departments hear a lot of interesting travel stories these days. **M**



INSIDE HP LABS
Redefining the corporate R&D mission

In 1965 Hewlett-Packard was the workplace for 9,000 employees, had \$163 million in sales and was ranked 365th in the Fortune magazine top 500 industrial firms.

It was also the year that the HP Labs organization was formed after the division labs left Palo Alto. The new group was made up of portions of the original lab and the HP Associates lab, all under the direction of Barney Oliver, now HP's vice president—Research and Development.

Fifteen years later the company has exploded to an employment of more than 57,000 people, has annual sales in excess of \$3 billion, and is 150th in the Fortune 500.

During the last 15 years HP Labs, the centralized corporate research and development organization, has undertaken hundreds of projects large and small. In the '50s and early '60s, when HP Labs was "the lab," these were aimed mostly at developing specific new products out of existing components. The need to engage in research-oriented projects grew with the emergence of new technologies such as solid-state electronics and atomic standards.

With the changes in HP's top management this year it seemed appropriate to get consensus on the role of HP Labs.



Flexible capillary columns for gas chromatography are the result of cooperation between HP Labs and Avondale Division.

"Our objectives were first established in the mid-'60s when Hewlett-Packard was a smaller company," said Barney Oliver. "We felt it was time to redefine our role officially because both the Labs and the company have grown larger and more complex."

The changes in the role of HP Labs reflect trends that have been taking place over the years, according to Barney. "We've been doing some research in certain areas all along, but we'll be placing greater emphasis on scientific-oriented research and less on engineering-oriented."

"With engineering-oriented, you conduct your research, find the best solution and run with it. In scientific-oriented, you conduct your research, find the best solution and then find a better solution."

HP Labs used to have a charter to develop new products and take them all the way from concept to production prototype. HP's first handheld scientific calculator, the HP-35, was a perfect example (see accompanying story).

Today that has changed. "It's going to get harder to field a new product line, mount a new sales force and make a dent in the market at the same time," said Barney.

"We don't want to close the door on new fields, but we'll look very closely before we commit company resources to new product lines."

Specifically, the redefined role of HP Labs is:

- To conduct research in areas of present or probable future interest to HP. These areas include new materials, processes, devices and techniques that will extend the technology base necessary for HP leadership.
- To enhance the efforts of the divisions in advancing product lines in existing businesses. Frequently this will mean "leap-frogging" developments that are currently in progress in the divisions. Products that put the company into new businesses require corporate endorsement before proceeding beyond the feasibility stage.
- To coordinate and establish leadership in key technologies, such as VLSI (Very Large Scale Integration), that impact many or all divisions, and to develop corporate strategies for these.
- To develop superior hardware and software tools that will improve the efficiency of the engineering process at HP.
- To serve as a scientific resource for the divisions, providing knowl-

edge, experience, experimental devices and special services on request, and, when appropriate, by organizing symposia in areas of growing interest.

Instead of leap-frogging products, Barney expects there will be more leap-frogging of technologies. "We want to look three to nine years ahead, researching and developing the technologies of the years ahead. At the divisions there is a great sense of urgency to meet the challenge of the competition right now. That sense of immediacy often conflicts with a long-term look at technologies and strategies. That's where HP Labs will focus its effort."

How then does the corporate R&D effort complement the research efforts at HP divisions around the world? A good example was the development that changed the gas chromatography industry in less than a year. The team effort between HP Labs and Avondale Division produced a revolutionary flexible capillary column for gas chromatographs.

Older GCs used a glass column that was prone to breakage and would occasionally react with the samples being tested. During a division review in late 1978 Barney Oliver suggested the division might look at some of the fiber optics technology that the Labs and the Optoelectronics Division had been using.

Ivan Crockett, R&D manager at Avondale, had a prototype column from HP Labs in his hands before the year was out. "We were amazed when we took it back to Avondale and hooked it up. We were able to run tests with the new column that we had never been able to run before," said Ivan. "The flexible silica column was more inert—less reactive—than anything we'd used."

During the next six months Labs and Avondale produced more prototypes and test columns that led to the introduction of the flexible capillary columns in October 1979. Before the year was out, one of HP's major competitors in the field held a "dinosaur sale" on the older glass columns. HP's new fused silica column had "turned the world of chromatography upside down," according to Ivan.

A number of HP divisions can trace their roots to HP Labs projects, including Scientific Instruments, Optoelectronics and all the computer and calculator divisions.

Is the Labs' R&D effort worth the money invested every year? Yes, according to Bill Hewlett. "Like advertising, advance R&D such as the Labs engages in is hard to evaluate on a direct dollars and sense basis. However, there is no doubt in my mind that this group of engineers and scientists is one of our major corporate assets." **M**

THE HP-35 LEGEND

Is it possible to squeeze all the desired features of a super-slide rule calculator into a neat case that would fit in a shirt pocket and sell for less than \$400?

The 1972 introduction of the HP-35 handheld scientific calculator ended any doubt about whether it was feasible. But looking at the finished product doesn't tell the story of the massive team effort that took the product from dream to reality.

It's easy to lose perspective of the importance of this achievement in today's world of shrinking electronics. But before the HP-35 there were no calculators with mathematical function capability smaller than desktop machines.

HP Labs' Electronics Research Labs under Paul Stoff had been working on a miniature calculator solving problems in designing and building an inexpensive and reliable display and keyboard in the small size. A February date was set to determine whether HP could manufacture the pocket-sized electronic slide rule.

By February all the pieces were coming together—for the CPU, the ROMs, displays, the floating decimal point and other algorithms.

On February 2 the product got a provisional go-ahead, pending the outcome of a marketing study.

The study indicated the calculator would sell, but the research firm recommended it be produced as an adding-machine sized machine. "The researchers said there was only a small market for a pocket-sized calculator with scientific and mathematical functions," said Paul. "But we knew, because of our own needs, that our original slide rule concept was a good one, so we went ahead as planned. Furthermore, we had already ordered the dies for the case!"

Teams from HP Labs, Corporate Design, HPA, Santa Clara and Manufacturing divisions went to work. In seven months the first working production models were computing their integrated hearts out, and five months later the 35 went to market.

Since the introduction of the HP-35 lots of other companies have joined HP in developing sophisticated and powerful electronic calculators. But for those who took part in the speedy development of the first handheld scientific calculator, the story of the HP-35 will always be a legend. **M**



"Looks like R&D is on to something big."

Drawing by Chas. Addams.
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From the very start of the company, she has quietly and effectively fostered the HP belief in people, the well-being of the community, and the success of her family...

by Virginia Brunner



The start of Hewlett-Packard's first manufacturing operation in a now-famous Palo Alto garage is fairly well known and widely recorded. That record speaks of Dave Packard and Bill Hewlett as co-founders, of a capital investment of \$538 and a design for an audio oscillator. Occasionally there is some reference to Mrs. Packard using her oven to bake painted metal panels to arrive at a certain color for the first products.

Yes, she baked those panels. She also helped establish the young company by serving as administrator of its first office and as its first secretary (meanwhile working full time as a secretary at Stanford University).

But full recognition of Lucile Packard's contributions to the company in its early and continuing development is little known—and long overdue.

According to people who have known Lu Packard and the company over the years, her most significant contribution has been the quiet

but effective way she has helped to reinforce the company's philosophy, and particularly to reflect that philosophy in service to the community. In that role she was joined and strongly supported by Flora Hewlett as a friend and associate until Flora's death in 1978.

Today, from her unique perspective, Lu Packard recalls some of the special circumstances that helped to create the company and shape the lives of its principals and their families:

Today Lucile Packard's calendar shows that a meeting of the board of directors, Monterey Bay Aquarium, is scheduled.

Julie, the youngest of the Packard children, is a phycologist (specialist in algae studies) and project director for the aquarium. Nancy, the oldest Packard daughter, and her husband are marine biologists. Together these three are helping to design and create an aquarium

and marine exploratorium. Monterey Bay Aquarium Foundation was established to fund this major undertaking which Julie describes as "a marriage between an innovative science museum and a valuable research facility."

Planned are arrangements where one can make an eye-to-eye acquaintance with sharks, touch and feel sea anemones or starfish in a tidepool, see frolicking sea otters, view an exhibit of bioluminescence (sea creatures emitting light), mariculture (sea-water farming) or a unique display of giant sea kelp, to name a few. The planners hope this project will become self-supporting from admissions and income from an adjoining restaurant and shops. Built on the site of the Hovden Cannery which closed its doors in 1970, the aquarium will cost \$25 million. It promises to be an innovative contribution to the area which will offer a stimulating experience to visitors when it opens its doors in 1984. Lu Packard takes great interest and pride in the aquarium project, rep-

resenting as it does a creative involvement in community and family.

Lucile Salter, a third generation Californian and San Franciscan, was born of parents with an entrepreneurial bent. Her father, a photo-engraver, was a sensitive man and an intellectual. Her mother did the bookkeeping for the family business, made financial investments in a small way and raised two daughters.

Lu's childhood dream was to attend Stanford, but the admission ratio at that time was 500 females to 2,500 males. She was turned down the first time she applied, but was later accepted. In time she became a counselor of incoming students based on the leadership she showed in campus life. During the autumn of 1933 a student named David Packard met Lu in the kitchen of her sorority house. He was washing dishes.

Dave Packard graduated from Stanford with a B.A. in 1934, then did graduate work at the University of Colorado until his job with General Electric in Schenectady, N.Y. began in February 1935. Lucile completed

her English degree in 1935, attended secretarial school and returned to Stanford as a secretary. She accepted David's engagement ring in December 1937.

In April 1938, Lucile took the Overland Express to Chicago, changing trains there to reach Schenectady. It was quite an adventure to take such a long journey—four to five days—alone. In Schenectady Dave met Lu at the train station and then they were married.

Plans were underway in Palo Alto. Dave Packard remembers "...Fred Terman arranged an opportunity for me to come back here with the express purpose of getting together with Bill (Hewlett) to see if we could get something started. So Bill found this house on Addison Avenue..."

In September the Packards returned to Palo Alto and moved into the brown shingle house Bill had found. The Packards occupied the first floor, the landlady the second, and Bill Hewlett housed himself in a small building in the back. The

garage served as workshop.

As Lu Packard recalls, "The first Hewlett-Packard office was the dining table. It was a nice table, but fairly heavy. I know that because we had to move it every time before we could let down the wall bed, since the wall bed was in the dining room.

"The dining room is where everything happened. Everything about the business was discussed and decided here. My role was typing the letters, keeping the records and heating up the coffee pot.

"David's first desk was a second-hand one given to him by my parents. It occupied the place of honor in the little house which Bill Hewlett vacated when he and Flora were married. It filled that space so completely the door would barely open. But at least this gave us an office not on the dining table—our first established office!"

Lu had returned to her former job at Stanford, working Monday through Friday and half of Saturday. At night and on Sundays, she did all of the letters and bookkeeping for



Being hostess to large groups of people is a skill Lu Packard has honed since these first HP picnics.

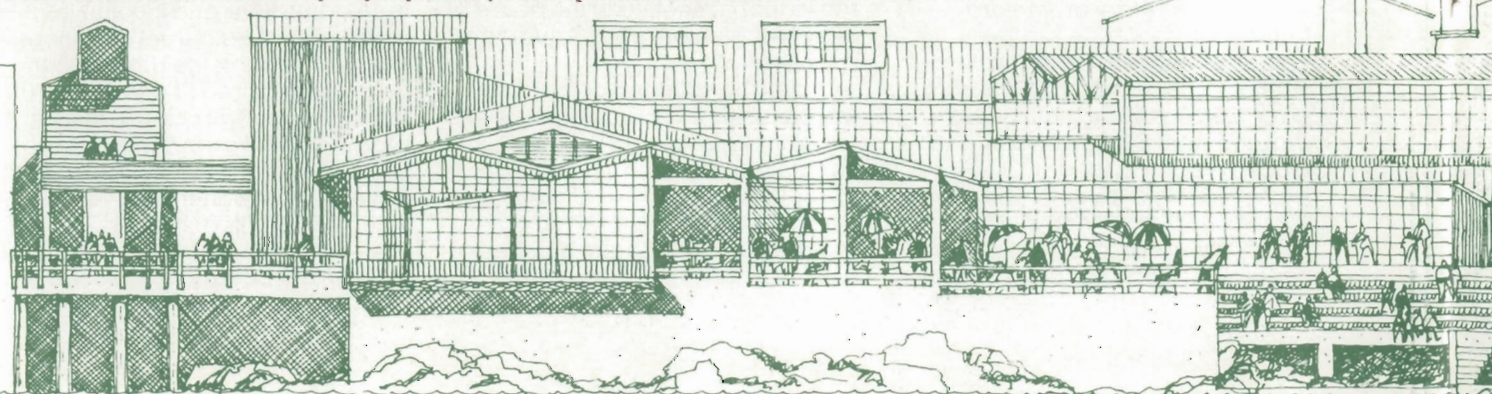


Ranching became another HP joint venture — and a family adventure — at San Felipe Ranch.



Eye on the bow, Lucile launches a new naval vessel with a clean hit — one of her Washington experiences.

Architect's sketch of Monterey Bay Aquarium, a family dream soon to become reality.



the young company. As the company grew, the work load expanded and additional help was required.

"Our first employee was Helen, a bookkeeper we hired in 1940. I can't remember her last name but I can recall her face." Lu Packard had resigned from her job at Stanford but continued to work for the company after David Woodley was born.

The scope of office duties continued to expand quickly. "I did everything from secretarial tasks to interviewing and keeping personnel records," remembers Lu. "During World War II I took on the time-consuming but necessary job of organizing carpools to get employees to work and back home."

Early, when HP was small and functioned much like a family, all employees were given gifts to mark a wedding or birth. "I selected the gift for newlyweds and the one for new parents. In early times, when the number of employees was small, I personally selected gifts for all of the children, and at the Christmas party gave them to the parents to

take home to the children. I knew the names of all the employees' children for many years until the number increased beyond possibility."

The remarkable business relationship of the Packards and the Hewletts had a family parallel. "I didn't meet Flora until after David and I were married although Flora and Bill were engaged at that time. Flora and I became close friends yet we were very different."

Lu Packard recalls that "we had the same small group of close friends, but each of us had different volunteer interests. We went in different directions when the choice came to larger community causes.

"Our families were all-important to each of us. The boys shared interests in science and music. Our Julie and Mary Hewlett both chose biology for their university studies.

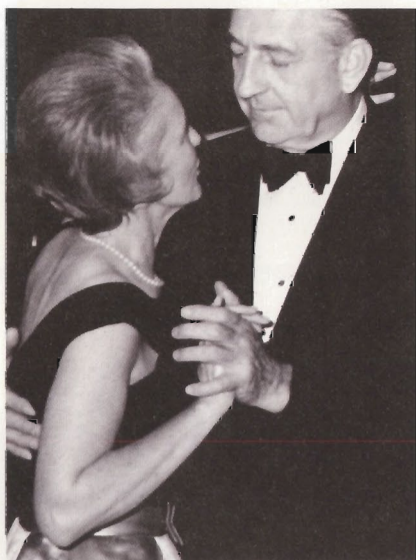
"One thing has always interested me, the spacing of our children. Our David Woodley is the eldest of the nine, but close in age to Eleanor, the Hewlett's oldest. Our Julie is the youngest, but close in age to Mary,

the Hewlett's youngest. I always envied Flora for managing to have five children while I had four.

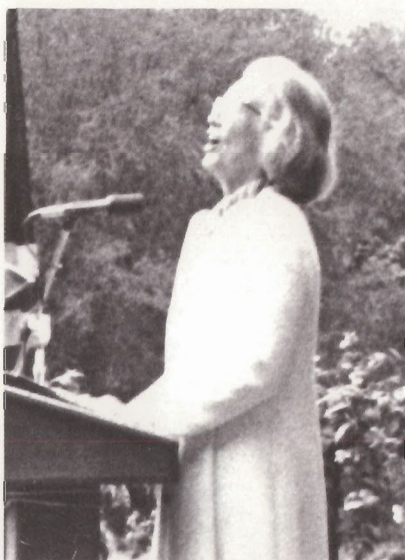
"At one point David and Bill went deer hunting at a place named San Felipe just south of San Francisco Bay. They liked the area, so when that land became available we decided to become ranchers. It was a family participation arrangement from the first. Most of the Hewlett and Packard children learned to swim in the little pool at San Felipe because neither of the families had a pool at home. The children rode horses through the hills and learned about cattle raising and the pleasures and problems involved.

"Ranching led us into all sorts of interesting avenues. The San Felipe Ranch has been a project for both Bill and David, and a joy for both families."

Ray Wilbur, now retired from HP posts as vice president of Personnel and Human Resources, was particularly impressed with the interest and concern shown by Lu and Flora for HP people. He recalls that they partic-



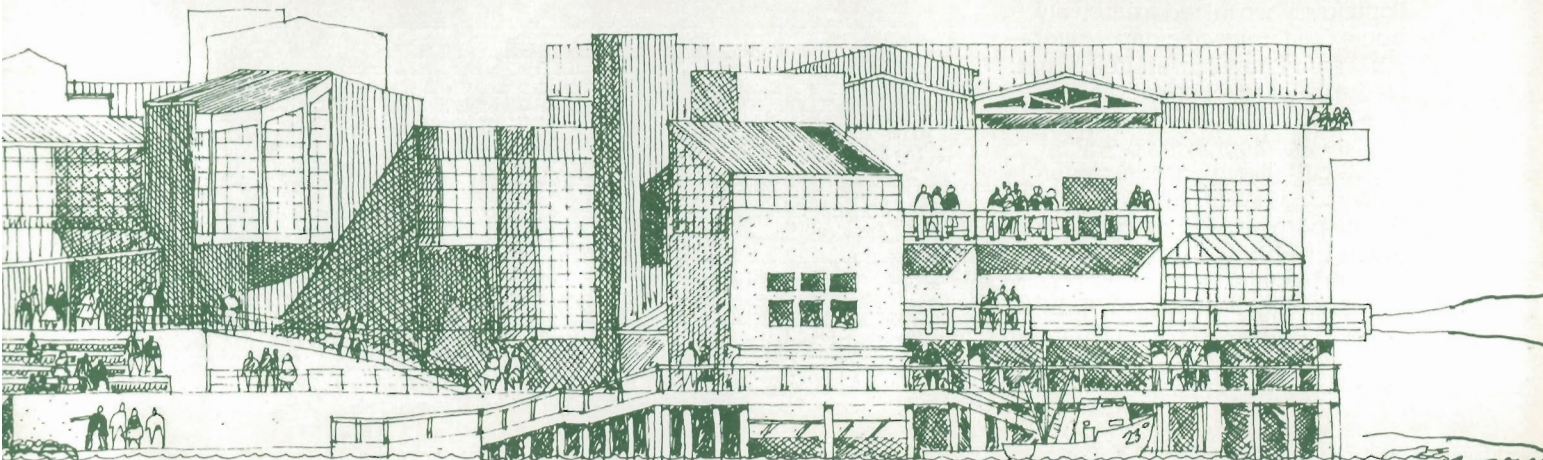
Endless opportunities for ceremony awaited the Packards in Washington. They soon learned to be selective.



A strong supporter of Children's Hospital at Stanford, Lu chaired its successful 1976 funding campaign.



The Packards continue to be very active hosts to business people from around the world.



ipated actively in company social events such as picnics, and were very available in helping people at important times and crises in their personal lives. "Through their interest in our people, policies and practices they certainly had an impact on the HP way," Ray notes.

Inevitably, the growth of Hewlett-Packard through the '50s and '60s brought changes in the way things were done. Less and less was it possible for "everyone to know everybody else."

For Lu it became a period of diminishing direct participation in the business, but with growing involvement in family and local community.

She thrived in both of these new roles. Ray Wilbur again provides some of the record of that involvement: "At times we served together on several boards, such as the Family Service Association and the Children's Hospital at Stanford. Lu was a very active participant. She offered a great source of strength in espousing and supporting the purposes of each organization. She became much sought after because any person or group that can gain her attention in her busy and committed life receives great benefit—from her friendliness, knowledge, interest and leadership." Among those receiving such support were the Family Service Post Auxiliary, the Blood Bank and Junior Red Cross.

Then came Dave's appointment as Deputy Secretary of Defense in 1969 and a move to Washington, D.C. It proved to be an exceptional experience, the more so because Lu had never lived outside of California except for those few months in Schenectady in 1938.

It began with all the aspects of setting up a new home for two, and meeting bureaucrats, politicians and diplomats.

At one dinner gathering, at a time of rather touchy relations with the USSR, Lu found herself seated next to Soviet Ambassador Dobrynin. "Across the table, David would eye me with suspicion every time I spoke to my dinner companion. Fortunately, we talked exclusively about California wine and California scenery (he enjoyed both), and his daughter's recent wedding in Moscow."

One Washington experience stands out—the Eisenhower funeral: "David and I sat on the aisle as the official party walked down the cathedral. I felt truly a part of a moment in history."

Lu and Dave returned to California at Christmas 1971, following

Dave's resignation from his government post. Once again he was elected chairman of HP's Board of Directors, while Bill Hewlett continued as president and chief executive officer. Together the Packards resumed a very busy schedule of involvement in family, business, community and charitable activities.

Currently Lu takes a strong interest and actively participates in the administration of the David and Lucile Packard Foundation. They had established the foundation in 1964 to make grants to community-centered health, education and cultural activities located primarily in the San Francisco Bay Area and the Monterey Bay Area. She peruses each request and helps select those that merit consideration by the foundation's board which includes the Packard children. All four children have grown up and have chosen careers—Julie and Nancy as marine biologists, Susan an M.B.A., and David Woodley a Ph.D. in classics. Their specialties provide a wide range of professional expertise at board meetings of the foundation.

Lu Packard finds her time being divided somewhat differently now that her husband is not as directly involved in HP day-to-day operations. "A great deal of my time is spent traveling with David as he follows his business and professional interests. Being the wife of a board member of other companies takes up a good deal of my time in a very pleasant way."

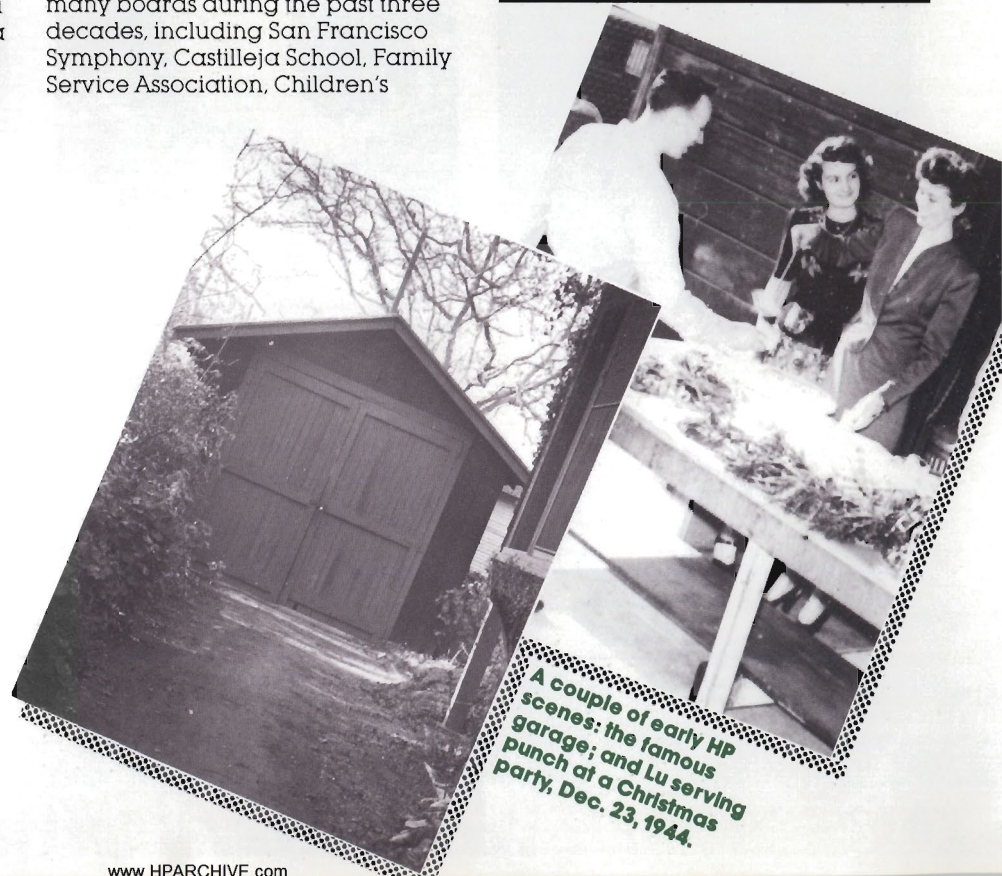
Lu Packard herself has served on many boards during the past three decades, including San Francisco Symphony, Castilleja School, Family Service Association, Children's

Health Council, Children's Hospital at Stanford and Wolf Trap National Park for Performing Arts, Virginia. Margarita Espinosa, former principal of Castilleja School, observes that "Mrs. Packard has a gentle, harmonizing influence on any group, but at the same time makes a definite contribution."

With the travel, family project of the aquarium, a new home in Big Sur, and the arrival of grandchildren (there are now six) there may be a transition from community causes to more family activities. The Packard children chose their own directions but the communication between parents, children and grandchildren speaks a harmonious equilibrium. At the heart of the matter is the original 1938 commitment. As a friend says, "With Lucile, David always comes first." **M**

"For us there was no alternative! To be on our own, to work, to produce something that would do the job right. That other people would want to buy! For David and me that was the only way."

Lu Packard was talking about motivation—the force that launched the company 41 years ago and kept it growing. "I remember the thoughts I had just before I dropped David's letter of resignation to General Electric in the mail box in June of 1939. Mailing that letter cut our financial ties, but we felt there was no alternative to being one's own boss."



A couple of early HP scenes: the famous garage; and Lu serving punch at a Christmas party, Dec. 23, 1944.

YOUR TURN

Invites you to question or comment on matters of importance to the readers of *Measure*.

CHANGES IN ASIA

It was a bittersweet experience reading the September–October *Measure* article "The Changing Fabric of Southeast Asia." One part of me was delighted in seeing other people given some of the opportunities we enjoy in the United States. However, a greater part of me was saddened by the article's inference of the influx of Western mores and folkways on a race that has a rich and deep culture of its own. In adopting the West's hedonistic lifestyle, they will undoubtedly inherit its serious consequences. The U.S. is ample proof that social and moral decay is a result of the breakdown of family ties and certain traditions in the quest for self-fulfillment.

Gauging one's living standard by the accrual of material goods and attainment of selfish pleasures is precarious. The article calls attention to the increase of consumer goods and the collapse of family cohesiveness and traditions as the workers become more independent and affluent. Hopefully they will discern the transitory nature of the Western psyche, but this is doubtful.

The enigma of third world countries entering "the twentieth century" juxtaposed to the abatement of traditional values exposes a perplexing and probably unsolvable problem. However, the question surely remains: Is this truly progress?

Keith Zellman
Eastern Sales Region
Lexington

WHERE DO YOU STASH YOUR STOCK?

Because crime everywhere is on the increase, I thought you might want to give readers a hint about Hewlett-Packard stock certificates. When thieves break into a house, apart from the obvious goodies like jewelry and silverware, they also look for books of unused checks and stock certificates. So, if you don't have a moat with crocodiles and a couple of killer dogs, at least put your stock certificates into a bank's safety deposit box.

Doreen Petersen
Computer Support Division

By all means, keep track of those certificates. If they're lost, replacing them means you must pay a "bond fee" to the insurance company equal to three percent of the current sales price of the stock for each

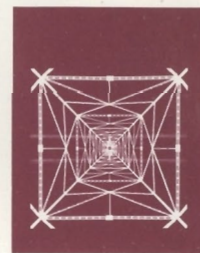
share. And it takes at least six weeks to receive replacement certificates.

In theory it would be difficult for a thief to sell stock certificates issued in your name—your signature must appear on the back and must be guaranteed by an officer of the bank. "Stop transfer" orders can also be issued much the way you stop payment on a personal check. But if you should ever lose your stock certificates for any reason, contact Jo Thomson in the Corporate Secretary's Department in Palo Alto.

WARMING UP TO MEASURE

Here's a picture of my HP energy quilt, the largest quilting project I've tackled so far. The inspiration for the center design was the cover of the February 1979 *Measure*. I've been teaching quilting, designing and sewing them for eight years, and my HP energy quilt makes a beautiful, large, warm wall hanging. Thanks for the idea.

Janet Elwin
Amesburg, Mass.



Janet Elwin's quilt *Measure*'s cover

Address letters via company mail to Editor, **Measure**, Public Relations Department, Building 28A, Palo Alto. Via regular postal service, the address is **Measure**, Hewlett-Packard Company, 1501 Page Mill Road, Palo Alto, CA 94304. Try to keep your letter under 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.

NEWS CLIPS

Recaps the newsworthy events, changes and achievements within HP.

WORLDWIDE STANDARD

The interface bus (HP-IB) which Hewlett-Packard developed in 1972 for its own needs in interconnecting instruments and controllers into systems has now been accepted as a worldwide standard.

Official announcement came during a two-week International Electrotechnical Commission (IEC) meeting which HP hosted in Palo Alto in September.

Don Loughry of the Technical Computer Group has been involved in all stages of the broadening acceptance of the interface concept, going back to the first proposal made by the U.S. delegation at a meeting of the IEC's measuring apparatus committee in Munich, Germany, eight years ago. It was adopted as the U.S. standard in 1974 and now has made its way through the meticulous international standard-setting process to become IEC Publication 625-1.

At last count, some 175 manufacturers in 14 different countries were using the interface concept that HP contributed to the world.

MAKING IT OFFICIAL

The beginning of FY 81 on Nov. 1 marked the official creation of several new HP entities (including those in the new Business Computer Group reported in the last issue).

The Santa Rosa Division split into the Signal Analysis Division, Rit Keiter, general manager; the Network Measurements Division, Bill Wurst, general manager, and the Santa Rosa Technology Center, George Bodway, manager.

Also officially in business is the Greeley Division under Tom Kelley. On the same date, Doug Spreng became general manager of the Disc Memory Division for which he had held day-to-day operating responsibility since June.

DOWN THE ROAD

HP has obtained an option to purchase 315 acres in Longmont, Colo., to accommodate long-term expansion of the Loveland Instrument Division. The company has also entered into a conditional purchase agreement to acquire 263 acres in Rohnert Park, Calif., near the present Santa Rosa facilities... Ground-breaking began Nov. 5 on excava-



At International Electrotechnical Commission meeting in Palo Alto: session chairman Ivan G. Easton, HP's Don Loughry and IEC Deputy General Secretary Leendert Van Rooij from Geneva.

tion work for the Spokane Division's first permanent facility on a 157-acre site near Liberty Lake, with completion slated in March 1982... Startup manufacturing operation of the proposed Lake Stevens Instrument Division near Everett, Wash., is scheduled by the summer of 1981 in a leased facility... Stanford Park Division is talking about relocation in the mid-1980s from Palo Alto to a site in San Jose, Calif., where the Microwave Semiconductor Division is already located.

NEW HPL CENTER

A fourth major research center has been established by HP Labs for research and development projects in the design of advanced computer architecture, hardware and software, and in advanced applications of computers. Director of the new Computer Research Center will be Joel Birnbaum, formerly director of the computer sciences department at IBM's Thomas J. Watson Research Laboratory in Yorktown Heights, N.Y.

BUSINESS COMPUTERS THRUST

At a major press conference on Dec. 4 in Cupertino, Calif., attended by editors from the U.S., Europe and Mexico, the Computer Systems Groups introduced new means for getting information from computers into the hands of managers in finished form. Combined in the single introduction:

- The new HP 3000 Series 44 computer from the Computer Systems Division which is twice as powerful as the earlier HP 3000 Series 33, yet only five percent higher in price. To back up the company's faith in its performance, purchasers are offered a money-back service agreement that specifies critical elements



Laser Printing System's page printer

of the system will stay up and running 99 percent of the time. The service guarantee against downtime is thought to be a first for the industry.

- A new 2680 computer-controlled laser printer from the Boise Division, part of a system that can store standard business forms electronically in the printer and deliver finished-looking computer reports at the rate of 45 pages a minute. Reports may be done on letter-size paper—looking as though formally typeset and illustrated with graphics if desired.

- A typewriter-quality computer printer (2601A) made by Diablo has been adopted into the HP line to augment the HP text and document processing system offered for use with HP 3000 business computers.

OTHER NEW PRODUCTS

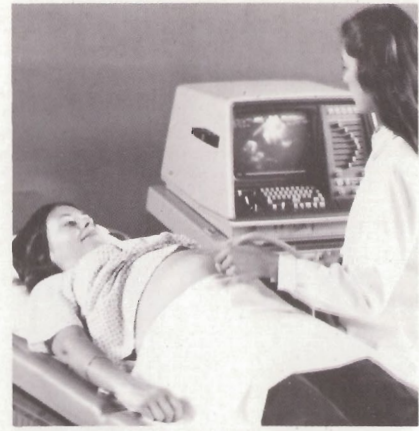
HP has entered the diagnostic imaging market with the 7702A Ultrasound Imaging System introduced by the Andover Division in November. It enables a physician to see sharp images of internal organs, such as a beating heart, without surgery or radiation.

When resuscitation is required, the McMinnville Division's new 78660A Portable Defibrillator/Monitor is not only easy to carry but also has a built-in recorder to provide complete documentation of the episode on a recorder strip. Critical data such as actual date/time and delivered energy information is thus automatically available.

A new Option 100 added to the Loveland Instrument Division's 3060A Board Test System now automates the rapid troubleshooting of complicated computer-type circuits with microprocessors. While it uses signature analysis (the technique introduced by HP in 1977 to establish a unique number or "signature" of pulses in a particular computer-type circuit), it also can test circuitry that doesn't have signature analysis.



Easy-to-carry defibrillator/monitor



Ultrasound Imaging System



HP 3000 Series 44

ENERGY SAVER

HP was one of 15 firms, organizations and individuals from throughout the United States to receive the President's Award for Energy Efficiency in ceremonies in San Francisco on October 23.

NAMES TO KNOW

Dick Love has been named to the newly created position of director of international manufacturing, reporting to VP - International Bill Doolittle, to develop a worldwide manufacturing strategy for the company. He'll continue to wear his hat as Intercontinental manufacturing operations manager... Intercon has named Malcolm Kerr to the post of Far East area manager in Hong Kong, replacing Lok Lin. Kerr has been general manager of HP Singapore and HP Malaysia sales operations. New country manager for HP Argentina is Don Rowe, formerly sales manager for the Data Systems Division.

Appointment of Rudi Speier as Controller Europe fills a key position created in a regrouping of European corporate functions last spring. Speier has been controller for HP Germany.

Jim Bell, formerly director of corporate research for Digital Equipment Corporation, has joined the Technical Computer Group with an initial assignment to assist in technical computer R&D and strategy planning, reporting to Group Manager Doug Chance.

New division marketing managers include Tom Anderson at Data Terminals Division; Scott Wright and Joe Battuso, moving up from operations marketing posts at the new Network Measurements Division and Spectrum Analysis Division respectively, and Srinu Nageshwar at the new Greeley Division.



One day not long ago I drove a rented car from the snow-swathed peaks of the Rocky Mountains down along snaky roads, then across the high plains, and down, down again until I reached the eastern foothills of that majestic mountain range. There in Colorado Springs, under a brilliant sky, I made my way to a long, low building complex that nestled along the highway, dwarfed by the peaks looming behind me.

As I entered the building I remembered again the factories in which I had once worked, with all their clatter and roar, their dirt, smoke and suppressed anger. For years, ever since leaving our manual jobs, my wife and I have been "factory voyeurs." In all our travels around the globe, instead of zeroing

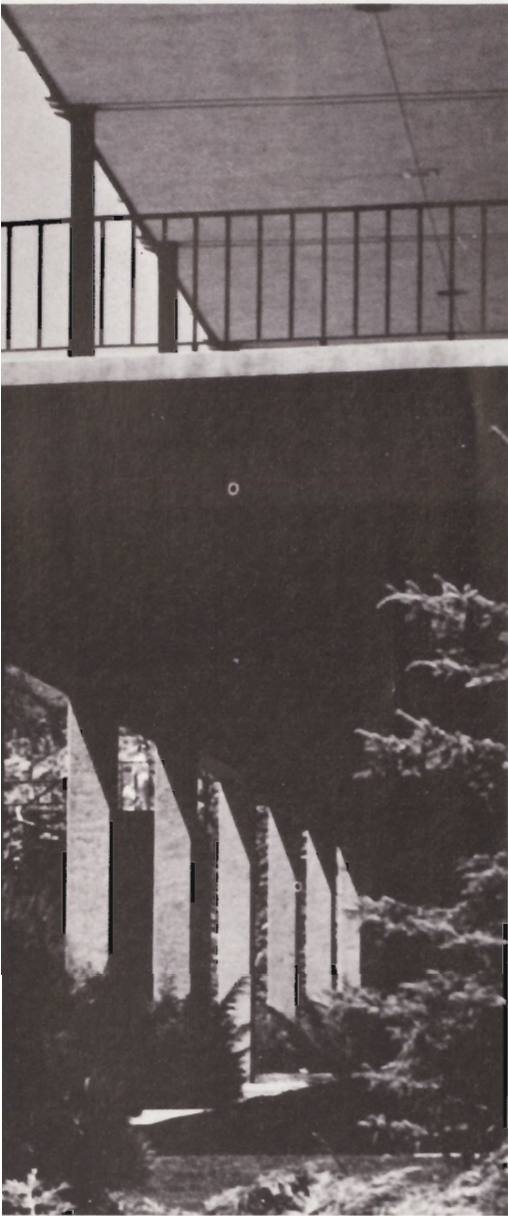
in on ruined cathedrals and tourist clip joints, we have made it our business to see how people work. For nothing tells us more about their culture. And now in Colorado Springs I was once again visiting a factory. I had been told that it was among the most advanced manufacturing facilities in the world.

It soon became clear why. For in plants like this, one glimpses the latest technology and the most advanced information systems—and the practical effects of their convergence.

This Hewlett-Packard facility turns out \$100 million worth a year of electronic apparatus: cathode-ray tubes for use in TV monitors and medical oscilloscopes, "logic analyzers" for testing and even more arcane items. Of the 1,700 people

employed here, 40 percent are engineers, programmers, technicians, clerical or managerial personnel. They work in a huge, high-ceilinged open space. One wall is a giant picture window that frames an imposing view of Pikes Peak. The other walls are painted bright yellow and white. The floors are light-colored vinyl, gleaming and hospital clean.

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. Production employees sit at their own benches or



beyond mass production

Changes in work ethic, personal life styles, and political and economic mindsets are creating a new wave that is beginning to topple today's industrial system. Author Alvin Toffler is convinced Hewlett-Packard's management style and production methods are at the cutting edge of a new era in the operation of factories and businesses. The "first wave" to transform human history was the agricultural revolution of some 10,000 years ago. The "second wave" was the industrial revolution that began 300 years ago. Today's "third wave" will provide opportunities for a better life, according to Toffler.

desks; so many of these are decorated with trailing ivy, flowers and other greenery that, from some visual angles, one has the fleeting illusion of being in a garden.

Striding through this facility I thought how poignant it would be if I could magically lift some of my old mates out of the foundry and auto assembly line, out of the racket, the dirt, the hard bruising manual labor and the rigidly authoritarian discipline that accompanied it, and transplant them into this new-style work environment.

They would stare in wonder at what they saw. I doubt very much that HP is a workers' paradise, and my blue-collar friends would not be easily fooled. They would demand to know, item by item, the pay schedules, the fringe benefits, the

grievance procedures, if any. They would ask whether the exotic new materials being handled in this plant are really safe or whether there are environmental health hazards. They would assume rightly that even under the seemingly casual relationships some people give orders and others take them.

Nevertheless, my old friends' shrewd eyes would take in much that is new and sharply different from the classical factories they knew. They would notice, for example, that instead of all the HP employees arriving at once, punching the clock and racing to their work stations, they are able, within limits, to choose their own individual working hours. Instead of being forced to stay in one work location they are able to move about as they wish. My

old friends would marvel at the freedom of the HP employees, again within limits, to set their own work pace. To talk to managers or engineers without worrying about status or hierarchy. To dress as they wish. In short, to be individuals. In fact, my old companions, in their heavy steel-tipped shoes, dirty overalls and working-men's caps would find it hard, I believe, to think of the place as a factory at all.

And if we regard the factory as the home of mass production, they would be right. For mass production is not what this facility is all about. We have moved beyond mass production. **M**

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CLOSE UP

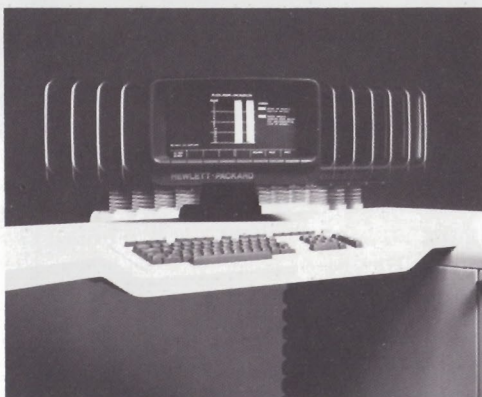
Zooms in on the ever-changing world of HP people, products and places.



Cycling's **Renaissance man** is Jobst Brandt, according to the May issue of **Bicycling** magazine. Jobst is an Optoelectronics Division development engineer who has become a legend among cyclists in the San Francisco Bay Area. He has raced, organized, taught, written and now is featured on a full-color poster and the catalog of a Palo Alto cycling shop. Obviously his interest and involvement in bicycling go beyond simply commuting to work. "I get a euphoria out of cycling a lot of people don't," admits Jobst.

Cupertino's rush-hour streets were the site of an HP safety class in October. Participants watched a film called "Bicycling Safety on the Road" during the first day of instruction, and took to the streets for on-the-road experience the second day.

San Diego Division's cycling team, "Les Escargots," was part of an 880-person field that pedaled across 125 miles of Mexican desert for "fun, health, recreation and international goodwill between Mexico and the U.S." When the 10-hour day drew to an end, "All I wanted was a hot tequila, a cold beer and a massage," said San Diego's Peggy Wyman.



One of the last places you would expect to find an HP computer is in an art gallery. But the Walnut Creek (California) Civic Arts Gallery had an HP-250 business computer sitting in the middle of the floor, near a backpacking tent, a model subway car and a typewriter.

The show was billed as "hardware arts"—objects that are first useful and

secondly attractive. The fact that an HP computer was part of the show is testimony to the 88 HP employees around the world who are called in at the early stages of product development to decide how the machine will look. As products like the HP-250 move out of computer rooms and become working parts of offices and homes, style will be even more important.

When the 10 a.m. break bell sounded at the Loveland Instrument Division on June 12, Nancy Morgan and Jack Griffith left the HP plant for the downtown courthouse. There they repeated "I do" before the judge, ran through a shower of confetti and arrived back at work by 11 a.m.

During the afternoon break, their fellow employees in the integrated circuit test department toasted the couple at a mini-wedding reception amidst the test equipment, tool boxes, streamers and balloons.



Hewlett-Packard gave \$12 million to some of its top terminals salespeople recently, but the winners couldn't spend any of it.

The money was once legal United States currency, but had been withdrawn from circulation, and shredded into green confetti. Carl Flock, sales development manager for Data Terminals Division proudly guards the million-dollar prizes.



It takes a strong commitment to community service to don an oversized Uncle Sam suit and pass out voter registration flyers. But that's what John Riggen, general manager at Colorado Springs Division, did and it paid off handsomely. In four days, 435 employees registered to vote in the November presidential election. "It was well worth it," he says. "Sometimes you have to give a little extra incentive to encourage people to do the right thing."



Chili may be a heart-burning, eye-watering dish to many, but it's a way of life for Judie King, service support manager in HP's Richardson, Texas sales office. Judie has been collecting prizes and trophies for her chili recipe and recently competed in the World Champion Chili Cook-Off in Terlingua, Texas. She enters about 25 weekend cook-offs every year, all of them staged for charity. Each chili recipe is judged for color, aroma, heat and taste. Judie's secret ingredient: Chinese peppers.

CHILI!
BEANS **ONIONS** **SALT**
BEEF **WATER** **PEPPER**
GARLIC!
TOMATO!!

A MESSAGE FROM JOHN YOUNG

The importance of wandering around; managing the business cycle.



In academic robe as a member of Stanford University's Board of Trustees, HP President John Young attends the inauguration of new Stanford President Don Kennedy on October 12.

Before reviewing our 1980 performance and looking ahead to 1981, I would like to "close the loop" on my message in the last issue of **Measure** in which I discussed our Open Door policy.

Important questions for management arising from that policy are: "How do we create an atmosphere that encourages Open Door communication in the broad definition of the subject?" and "What can we do in a pro-active way that tends to anticipate rather than react to the tensions that inevitably arise in the work place?"

Over the years at HP, we've developed a response to those questions that's most aptly described as "Management By Wandering Around

(MBWA)." As far as I'm aware, that phrase was first coined by one of our managers, John Doyle, now vice president-Personnel. Quite plainly, it urges managers at all levels to make themselves *accessible* to all the people whose work they supervise or influence and to show the interest they have in those people—their work and their lives.

Sometimes the word "wandering" is replaced by "walking" which is literally the way many HP managers put MBWA into practice. Such walking may seem random but it should be regular, creating a feeling of openness and providing informal opportunities for everyone to hear and be heard. The desired result is mutual trust and respect for both the people and the process involved. I can think of no greater responsibility for an HP manager.

Our operating results for the 1980 fiscal year ending October 31 were released to the public on November 24 and are summarized at the right of these pages. As I pointed out in my profit-sharing announcement, the company had an excellent year, one of our best ever. The hard work and team effort that made it all possible

are much appreciated.

Because electronics is a growth industry and Hewlett-Packard is a leading company in that industry, it is often assumed that we are immune to the business cycle. This is certainly far from being the case. A brief review of the nearby chart will show the cycles or trends in orders as they are affected by economic ups and downs. The chart is a very sensitive indicator of incoming order growth rates, and is prepared by comparing the percentage change of a current quarter's orders with that of the same quarter a year ago.

Looking at the chart you can see the impact of the major business cycles. In 1970 the winding down of the Vietnam war brought on a difficult time for HP, a period in which we took every other Friday off for about six months in order to bring our production capacity and orders into alignment. Also clear are the 1973-74 oil-induced recession and the still unresolved decline of 1979-80.

A key point to observe about this HP chart is the wide ranging peak-to-valley ratio: at the peaks, the growth rate is as many as 40 percentage points higher than at the

valleys To accommodate this dynamic range requires great care in management. For HP, of course, the very top priority is protecting everyone's employment continuity. We therefore tend to manage very defensively. On the upside of a business cycle, for example, we schedule more overtime to avoid hiring people we couldn't support over the long term. We also allow our backlog to build up and our deliveries to customers to stretch out. Then, as business turns downward, we draw from that backlog. By not having overhired we can keep our production capacity relatively constant throughout the business cycle.

We also have other ways of exercising great influence over our own business fortunes, ways not available to many commodity businesses. Primarily we do this through our highly productive new-product program. The fact is that \$75 out of every \$100 in sales for a given year come from products introduced during the preceding five years. This provides us with a very powerful stimulus to help offset some of the effects of recession.

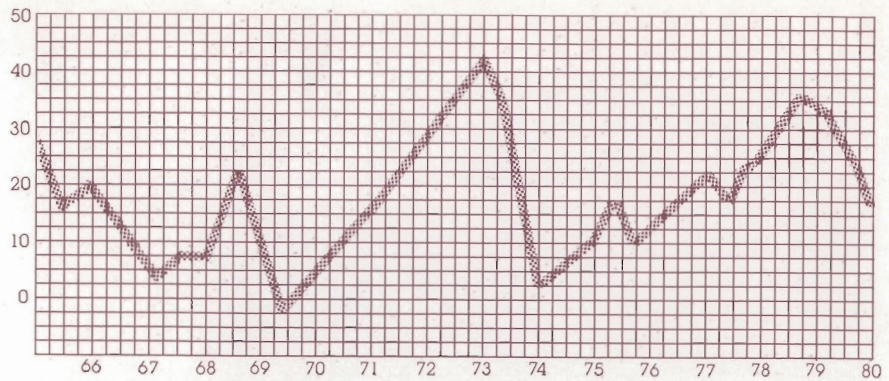
During the next few months we have our work cut out for us. First, we need to exert maximum effort in all of our order-generating capabilities around the world—to be sure that we are taking every action to raise our current order rate up to our production capacity. That capacity presently is 5 to 10 percent higher than the incoming order rate. Concurrently, we need to focus our energies on new products that can be put solidly into production now; these could well provide the most impetus to our order-generating program.

As we've seen, the growth rate in orders goes up and down. Yet, the average over any business cycle in recent years is a very solid 20 to 25 percent annual increase. This means a doubling in the size of our company every three or four years. We fully expect to return to this kind of growth trend as the current cycle works its way through the world's economies, and we remain optimistic about the long-term prospects for our company.

My sincere thanks to all of you for making HP's 41st year in business such a success.

Have a happy holiday season and a great new year.

John



HP ORDER RATE

QUARTERLY PERCENTAGE CHANGE FROM LAST YEAR

1980—AN EXCELLENT YEAR FOR HP

Eligible HP employees received cash profit sharing of \$42 million for the second half of 1980, equal to nine percent of base salary. It was the second highest semi-annual payment percentage in the last 15 years. First-half 1980 profit sharing was 8.52 percent.

Unaudited year-end results showed HP achieved a 31 percent increase in sales and a 32 percent increase in net earnings for its 1980 fiscal year ended October 31.

Sales totaled \$3.10 billion, compared with \$2.36 billion in the 1979 fiscal year. Net earnings amounted to \$269 million or \$4.47 per share on approximately 60 million shares of common stock outstanding. This compares with \$203 million, or \$3.43 a share on approximately 59 million shares outstanding in 1979. Net earnings as a percent of sales were 8.7 percent against 8.6 a year ago.

Incoming orders for the year totaled \$3.14 billion, an increase of 24 percent from the \$2.53 billion in orders booked in fiscal 1979.

In the fourth quarter, sales totaled \$871 million versus \$681 million in the year-ago quarter, an increase of 28 percent. Fourth-quarter net earnings were up 43 percent, to \$80 million, or \$1.32 a share, from \$56 million, or 93 cents a share. Incoming orders were \$775 million, an increase of 21 percent against \$638 million in last year's fourth quarter.

Domestic orders in the fourth quarter exceeded those in the third quarter by eight percent. International operations, however, continue to experience a recessionary slowdown. Fourth-quarter international orders, compared with the third quarter, were down four percent—the second straight quarter for a decline.

For the year, international orders accounted for about 52 percent of all orders, and totaled \$1.62 billion, up 30 percent from \$1.25 billion in 1979. Domestic orders increased 19 percent to \$1.52 billion from \$1.28 billion the previous year. In the fourth quarter, international orders rose 23 percent to \$376 million from \$306 million in the year-ago quarter. Domestic orders were \$399 million, up 20 percent from \$332 million in the 1979 fiscal year.

Preliminary figures show that, for the 1980 fiscal year, the company's electronic data products represented approximately 49 percent of sales. Electronic test and measurement instruments accounted for 39 percent, medical electronic products for 7 percent, and analytical instrumentation for 5 percent.

MEASURE

"Man is the measure of all things."

-Protagoras (circa 481-411 B.C.)

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Sweeping changes are improving the world's industrial community, and Alvin Toffler (of *Future Shock* fame) believes HP is helping to lead the way.

Measure is published six times a year by the Public Relations Department for employees and associates of Hewlett-Packard Company. Address any correspondence to **Measure**, Hewlett-Packard Company, 1501 Page Mill Road, Palo Alto, California 94304. Change of address should be reported to your personnel department. Material in this issue may be reprinted with written permission. Member, International Association of Business Communicators and Industrial Communication Council.

Hewlett-Packard is a major designer and manufacturer of precision electronics equipment for measurement, analysis and computation. Domestic Operations: Manufacturing facilities in: Cupertino, Mountain View, Palo Alto, Roseville, San Diego, San Jose, Santa Clara, Santa Rosa and Sunnyvale, California; Colorado Springs, Fort Collins, Greeley and Loveland, Colorado; Boise, Idaho; Andover and Waltham, Massachusetts; Rockaway, New Jersey; Corvallis and McMinnville, Oregon; Avondale, Pennsylvania; Spokane and Vancouver, Washington. Regional marketing headquarters in Atlanta, Georgia; North Hollywood, California; Rockville, Maryland; and Rolling Meadows, Illinois, with sales and service offices in more than 60 cities throughout the United States. International Operations: Manufacturing facilities in Campinas, Brazil; Grenoble, France; Boblingen and Waldbronn, German Federal Republic; Hachioji, Japan; Penang, Malaysia; Aguadilla, Puerto Rico; South Queensferry, Scotland; and Singapore. Regional marketing headquarters in Palo Alto, California, and Geneva, Switzerland, with sales and service offices in 64 countries.

Moved lately? Change of address should be reported to your personnel department.

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