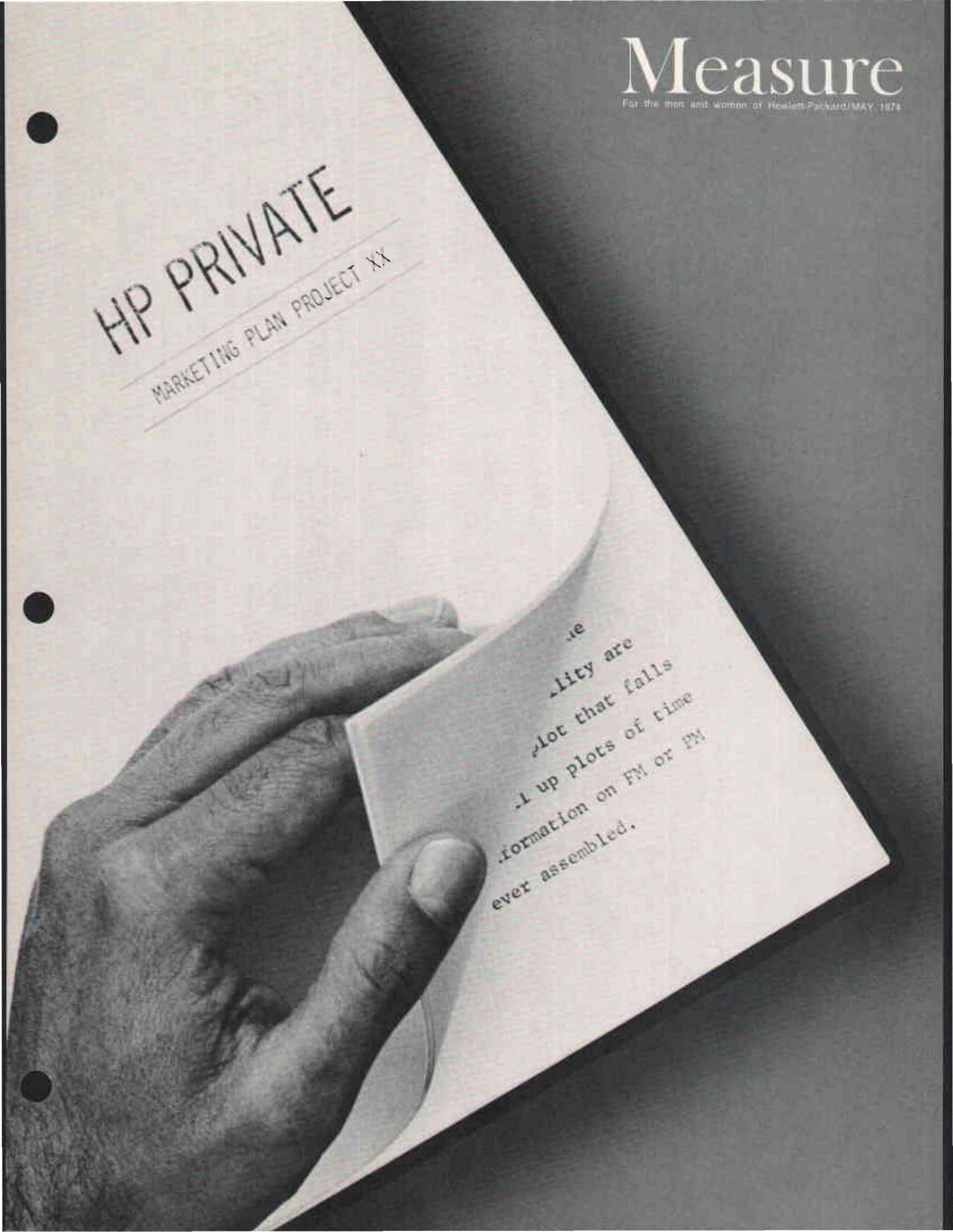
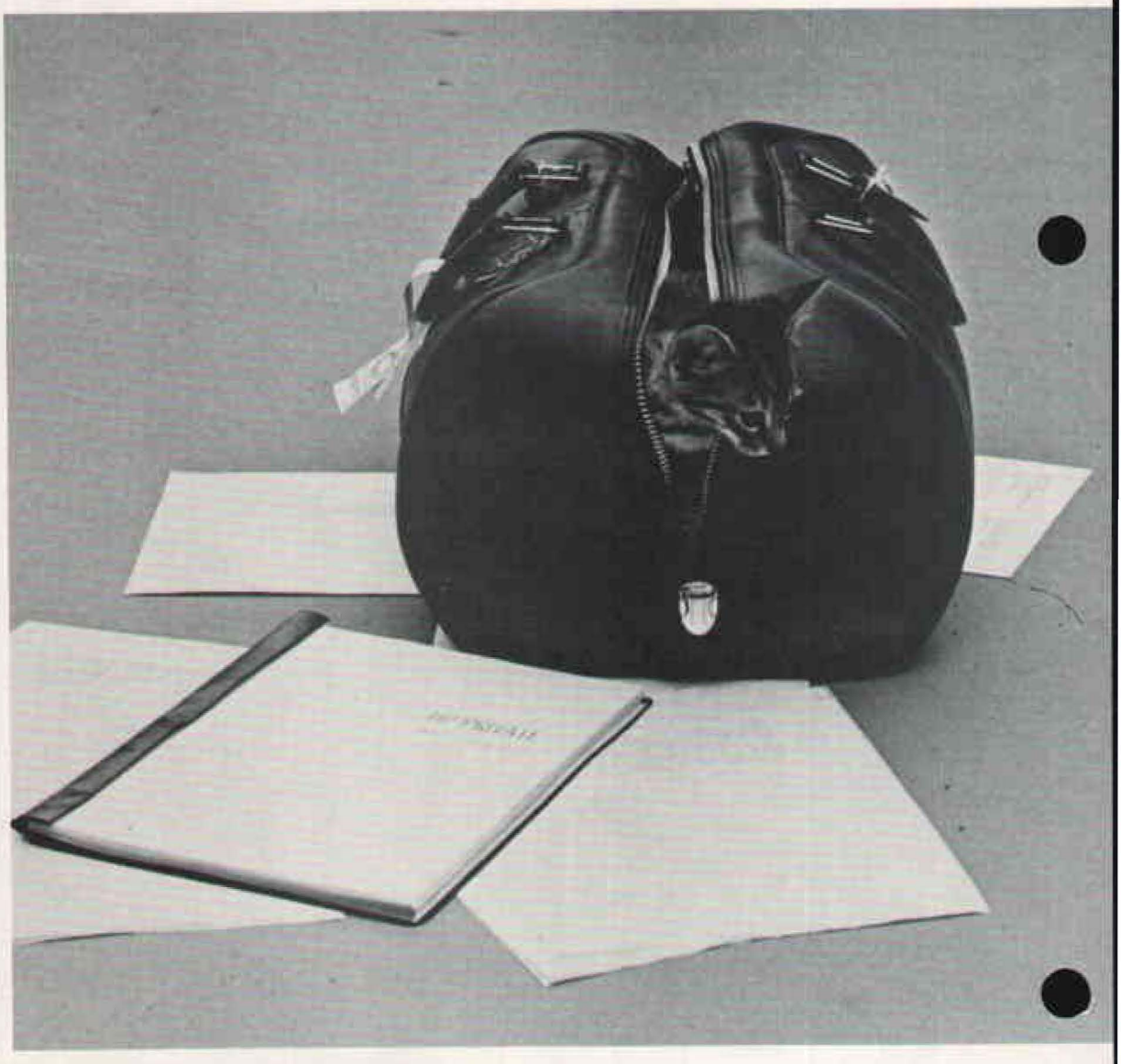
Measure
For the men and women of Hewlett-Packard/MAY 1974



Who let the cat out of the bag?



"Loose as a goose!"

"Leaky as a sieve!"

"What secrets? Are there any left around here?"

Those comments may sound flippant, but actually they represent serious appraisals of the manner in which some HP people keep company information "HP PRIVATE." They were uttered by HP people who have been actively involved in the process of introducing our new products or of putting new marketing programs into effect. Almost unanimously, these people conclude that when it comes to preserving the confidentiality of such projects—of keeping our products and strategy under wraps until we really are ready to reveal them—many of us are rather casual and careless.

The main problem is—we talk. We talk about confidential projects not only to people who need to know but also to some who don't. We talk about our plans in public places—to impress other company people with how much we know or outsiders of how on-the-ball HP is. And we naïvely assume it will go no further.

Part of the same problem, of course, is that today we are a multi-national, multi-discipline, highly interactive organization. Overall, our size, complexity and success make our activities increasingly newsworthy—whether we want that or not.

To see how it works, put yourself in the place of a division marketing manager:

Through a combination of marketing tactics, including news releases, press conferences, industry showings and advertising programs, plus product availability and sales force briefiings, you have plotted a strategy that you expect will enable your product to hit the market with maximum impact. Your goal is to have the world of customers all of a sudden buzzing with the news, clamoring to see and buy—and getting a big jump on the competition.

Instead, a number of weeks prior to the grand unveiling, Corporate Public Relations calls you with news that a trade-press reporter is onto the story, and has called with a request for confirmation and more details.

There is no one way to handle such situations, except the reporter will not be told any lies. You hope that it will end up with no premature report, or at worst that such rumors will be published as speculation only. Your well-founded fear is that the cat is out of the bag, and that other publications will pick up the story and dribble it out in bits and pieces or in distorted fashion.

Assume that the worst happens: The leak becomes a flood of rumors and prematurely published descriptions. You begin to see the steam going quickly out of your introduction. But you have more than publicity to worry about. Customers and salesmen begin to call wanting to place orders for the rumored product—or perhaps to cancel orders for an existing product that will be replaced. Competitors have been given extra time to rethink and execute their strategy. Your field sales people quickly sense the situation and begin to concentrate on other products. And you may even have legal problems. All in all it's going to cost a bundle—in loss of sales, of company reputation and of sense of achievement.

Such potential consequences are by no means limited to product introductions. The subject may concern new orders, dollar volume of sales, negotiations of various kinds, price changes, expansion plans, important contracts, and technical developments. Leaks of this kind of information can be of great interest to the press—and very beneficial and instructive to competitors.

In all cases, the question is: How does it happen? And what can we do to stop it happening over and over again?

Ray King, general manager of Advanced Products Division, acknowledges that products such as the HP hand-held calculators represent a particularly difficult challenge to the system of personal employee trust on which HP security traditionally has been based:

"In developing and introducing new models of these machines," said Ray, "we depend on a considerable number of sources both inside the company and outside, for parts and services. Advertising, public relations, and key field sales people need advance information so they can make their plans. And production people also have a need to know.

"So there are all kinds of opportunities for information to leak out. The result is that we've had to tighten up security around here. Product development activities have been isolated from visitor traffic

(continued)

HP private

A very well kept "secret" was unveiled by the Analytical Products Group at the chemical-analytical industry show in Cleveland, Ohio, earlier this year. The 5830A gas chromatograph scored heavily with visitors, and competitors acknowledged its impact on the market. In keeping the project inconspicuous, one of the approaches taken by the Avondale Division was to locate the R&D activity away from heavy traffic areas of the plant. In the main, however, people were made aware of the importance of the project—and responded accordingly.

areas, and more and more we are reluctant to offer tours to visiting groups."

Ray Deméré, vice president and EPG operations manager, said, "The most important thing that can be done is to make HP people aware of the problem of security, and to ask them to keep information to themselves or only to those who have to have it for the sake of their work.

"Loveland Division was quite successful with that approach last year in introducing the new hand-held probe voltmeter. As a result of making the situation known to everyone concerned, and asking them to contain their enthusiasm and information, the 970A announcement had real punch."

Jack Lieberman, marketing manager at Santa Clara Division, said the security problem for his division is probably not as severe a challenge as for those with highly conspicuous competitors: "But I feel very strongly about the total image of HP. Leaks affect all of us, and if they happen too often they will quickly erode the overall credibility we have built with the media."

Bill Harmsen, business manager at Advanced Products Division, pointed out some other penalties that flow from premature disclosures: "As soon as there is wind of a new product or product price change, the phones start ringing. This places a double burden on the staff who should be taking care of existing business. But now they have to fence verbally with people who are friends of the company—salesmen and customers. They have to fence because to take an order or to demonstrate the product in any way constitutes a legal announcement of availability."

Commenting on that point, HP's general counsel Jean Chognard said that a premature product announcement can have expensive legal consequences. In one instance, it enabled one of our competitors to refile a patent application so as to cover our new product, resulting in a liability of over half a million dollars. In other instances, a premature product announcement could render HP's own patent invalid as a result of being shown prior to the filing date of HP's own patent application.

Enough said.

□

They have the will...

Rick Joy

Rick Joy's employment records might read much like those of many other people at HP: He's in his early thirties, for example, and an assembler at the Santa Rosa, California, plant. Off the job, he enjoys amateur radio and Eagle Scouting. Nothing extraordinary—except that Rick happens to be both blind and deaf. "He's brilliant," says his supervisor, explaining that Rick does highly complex wiring and soldering jobs only slightly slower than a skilled assembler with no handicaps. He uses a special tip-touch soldering iron, and reads with the aid of an Optacon.

Among the thousands of people at HP, there are many with physical handicaps. They don't ask for special treatment or to be singled out from other employees. Instead, they find ways—often remarkably inventive—of coping with a work environment that usually demands full physical faculties.

People around them are often amazed at the skills the handicapped can master. It seems inconceivable that a blind person or one with the use of a single arm could do assembly work at all—let alone wire the compact, intricate circuitry that goes into our modern product lines. How does someone in a wheelchair get around well enough to function as a production supervisor or a secretary? The answer is, simply, that it's a person's *ability*—not his or her *disability*—that counts.

(continued)

the will...

Mark Hantusch

Before coming to HP over two years ago, twenty-three-year-old **Mark Hantusch** had one year of business law at West Valley College and some job training in several skills at Goodwill Industries. Having also had some high school experience with machine tools, he accepted HP's offer to work in the machine shop at Mountain View.

Mark's crippling disability resulted from a spinal birth defect. He will never be able to walk without the aid of crutches and leg braces, but he drives his own car with standard foot controls.

Mark's supervisor and fellow workers admire his attitude on the job. At the "deburring" bench, he smooths the rough edges on machined metal components for Data Systems products. It may not be what he had in mind when he studied business law, but he's glad to be earning his own living at something he enjoys doing.

Paul Reid

Gloom descended over the Stanford Park complex last December when **Paul Reid**'s faithful guide dog, Argus, died suddenly. The dog had endeared himself to hundreds of Paul's fellow workers over the past seven years, and they were nearly as grieved as Paul at losing the loyal canine. In memory of Argus, Paul's friends in Manufacturing Division raised over $1,600 and donated it to Guide Dogs For the Blind in San Rafael where Argus was trained.

In February, Paul returned to San Rafael to train with a replacement dog. He was paired with a handsome yellow Labrador named Hogan, and the man-dog team trained together for three weeks. "It will be a while before we work together as well as Argus and I did," Paul remarked. But they seem to have established a good rapport, and Hogan is adapting well to the environment of the machine shop where Paul works.

Extremely deft with machine tools, Paul is a metal heat-treat assembler, and his proficiency is common knowledge around the plant. He is a source of amazement as well as inspiration to his co-workers.

Gerd Laner and **Hermann Bruckner** have several things in common. They work at HP GmbH in Boeblingen, are Olympic gold medal winners, and both are paraplegics confined to wheelchairs. In spite of their handicaps, Hermann is a champion archer and Gerd is a table-tennis star. The medals they won were for their performances in the 1972 Olympic games for handicapped people.

Gerd is a 26-year-old bachelor, crippled at the age of eleven by a leg infection. He learned assembly work in a boarding school, and attended evening classes in electronics after joining HP. He has been such a successful student that he has been offered participation in a six-month HP educational program that will qualify him and other assemblers to become test technicians.

Hermann Bruckner, a tester in the winding department, worked as a mason in his family's business until a crippling accident in 1956 forced him to learn a new craft. His wife also works at HP, and does the driving to the Boeblingen plant about 24 kilometers from home. As in other HP locations, Boeblingen has reserved parking places and other special provisions for its handicapped employees.

Hermann Bruckner

Verona Barlow

Verona Barlow is an assembler at HPA, and a deaf mute. Forgetting how limiting such a handicap can be, one could almost be envious of her as she works in her silent world amidst the noise "pollution" we've grown accustomed to. She's very willing, cheerful, and efficient, according to her supervisor Nadine Thaute. Verona has been with HP for seven years, and can now do almost any job in her department with very little verbal instruction. When it's necessary to communicate, Nadine and Verona write their dialogue on a pad, or Verona lip-reads and writes her responses.

Three other members of Verona's family are also deaf—husband Floyd and two adopted sons, ages twelve and seven. Sixteen-year-old daughter Liana has normal hearing, but knows sign language and often serves as an interpreter.

At home, life for the Barlows is as happy and varied as that of any family. Many of the obvious inconveniences have been overcome with a little ingenuity. A system of blinking lights in each room tells them that someone is ringing the doorbell or trying to reach them on the telephone.

When it's the phone ringing, it may be for Liana—but it could also be a deaf friend who, like the Barlow family, has what is called an "acoustical converter." The converter makes it possible to exchange teletype signals through an ordinary telephone, so a standard Western Union-style teletype machine stands unobtrusively between their living and dining rooms. The telephone receiver is placed in the converter and the Barlows "talk" to the other party in typewritten words. They also have a portable model with a self-contained keyboard, which they can use to call from any telephone.

Like other deaf people, Verona has adjusted remarkably well to her handicap. She enjoys her work and her family, and doesn't seem to be missing much in life.

Marvin Estes

Marvin Estes, a highly educated design engineer in the R&D lab at Colorado Springs, has found a way of doing what, to most of us, seems elementary—soldering a simple connection. Marvin has only one arm, and this has required some clever improvising on his part to be able to work independently at his lab bench. His technique is to push the solder wire through a plastic syringe, so that he can hold it in his teeth while he operates a soldering iron with his one good hand.

Marvin had a stroke at the age of 16, leaving the entire right side of his body affected—his right arm permanently useless and his right leg partially paralyzed. He also lost and had to relearn the ability to speak. Years later, he chose to have his unusable right arm amputated.

Marvin received his bachelor's degree from Purdue, his master's from Clarkson University, and has earned credits from several other institutions.

He feels that anyone, disabled or otherwise, should try to make as much of his or her life as possible—and he's certainly setting the example.

Marvin Hawks

Most of us recall our teen-age years as the happiest, most carefree time of our lives. But **Marvin Hawks**, a young man barely out of his teens, wishes that he could have skipped those years—which for him meant a succession of operations, physical therapy and confinement to a wheelchair as a result of a spinal injury at the age of ten.

Marvin's association with HP began when the Vocational Rehabilitation Center in Rosemont, Pennsylvania, contacted HP's Avondale Division more than three years ago. HP supplied Marvin with the tools, equipment and job training he needed to work at home, assembling and wiring electronic cables and small subassemblies.

It hasn't been a bed of roses by any means. Becoming financially independent for the first time, Marvin decided to rent an apartment of his own. It turned out to be a mistake—he soon developed anemia and low blood pressure from not eating properly, and wound up back in the hospital for six months.

Now, with his health regained, Marvin even drives his own specially equipped car to the Avondale plant to deliver the finished assemblies. His production supervisor, Gene Niland, has nothing but praise for the work he turns out. That's all Marvin asks—to be able to do a good job and support himself financially. With his severe affliction, it takes a concentrated effort.

(continued)

the will...

Mike Keithley

Despite his life-long blindness, **Mike Keithley** has a lot going for him: an Associate of Arts degree from College of San Mateo, a bachelor's in psychology from the University of Santa Clara, the ability to "visualize" electronic circuits, and large measures of determination. An assembler in the Santa Clara Division, his ultimate goal is engineering–but, taking it one step at a time, his immediate objective is to man a testing station. He hopes to be able to show he can do it with the aid of an Optacon that HP is helping him purchase.

Without the Optacon, Mike could never hope to be able to read a tester's instruments, and even with the device there will be many obstacles to overcome. He will need special training, a way of attaching the Optacon to the instruments, and some help in setting up the testing station to suit his needs. Mike is well aware of the problems, but he's optimistic. "Given the chance, I can do this."

To know Mike is to know that he probably will. He was interested in electronics at an early age and became a licensed amateur radio operator at the age of 16.

For the present, Mike is doing an excellent job at the assembly bench where his guide dog, Kola, patiently waits at his side. He'll have the Optacon soon–and be a step closer to eventually becoming an engineer.

Maxie Whittington, a victim of crippling polio as a teenager, has been an order coordinator in the Richardson office of the Southern Sales Region since 1968. She usually gets around so well with a cane that her friends take virtually no notice of her handicap. But when she needs help–as she did recently when she was confined to a wheelchair with a broken foot–they always come through for her. They've also installed a rail to make it easier for her to get around in her work. As a result, Maxie thinks HP people are the greatest, and they in turn enjoy her sparkling personality and sense of humor.

Maxie is married, has two grown children and leads a very active life. She has a way of getting the most out of her work and her many activities, and has little time to think about the things she can't do.

Maxie Whittington

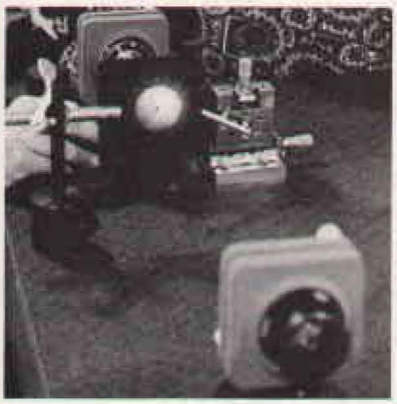
New Eyes for the Blind

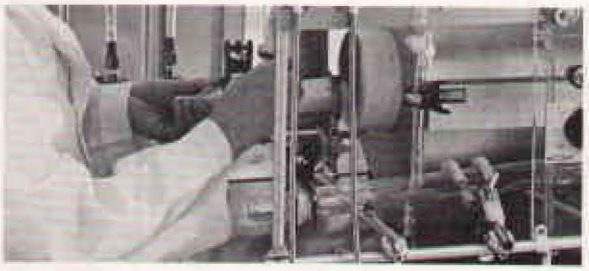
Art Lange shows how a blind person would read with his hands using the Optacon. The "ASCII to Optacon Interface" (center) connects to the test instruments at right.

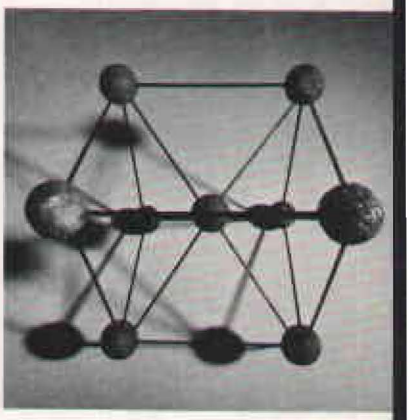
Rick Joy and Mike Keithley feel fortunate to be among the beneficiaries of years of Stanford University research that produced the Optacon (OPtical-to-TActile-CONverter). This compact, portable instrument has opened up the whole world of written materials to blind people–not in Braille or on records but in the books, magazines, letters, directories and other information sources that sighted people take for granted. In 1971, Telesensory Systems, Inc. marketed the first Optacons–followed by a complete line of accessories, including an attachment designed for reading the HP pocket-sized calculators.

The Optacon consists of a miniature camera (about the size of a pocket knife), the electronic circuitry for translating the images, and a "tactile stimulator array" where the letters and symbols can be "read" with the touch of a finger.

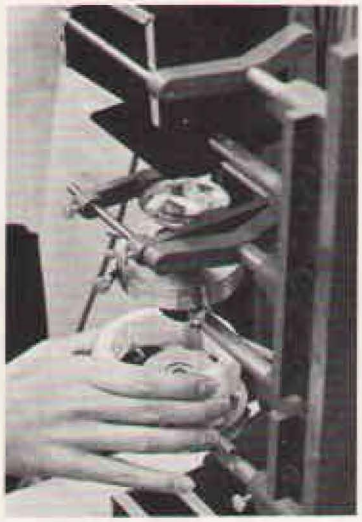
The increasing use of the Optacon by HP's blind employees prompted several Santa Clara people to embark on a development project to expand its capabilities. At the urging of engineering section manager Charlie Trimble and Mike Keithley's supervisor, Don Larke, engineers Art Lange and Dave Ricci designed a unit for connecting HP test instruments directly to the Optacon. The resulting "ASCII to Optacon Interface" uses the HP-developed ASCII bus, bypassing the Optacon's camera to feed the signals directly into the circuitry. It's still in the testing stage, but Art and Dave hope to have it perfected soon.

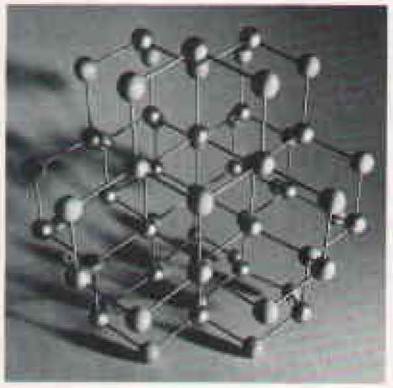






Inside HP Labs...





☐ Dolores Hall fashions an array of light-emitting-diodes at the HPA Division in Palo Alto. In Loveland, Pat Thompson adroitly loads components on a printed circuit board to be used in an HP desktop calculator. Bob Loftin completes final QA checkout of a laser interferometer at Santa Clara before it is shipped to a customer. And, sometime in the future, another employee will assemble an HP product which contains a magnetic bubble memory.

The connection? All of these people are involved in jobs that are an outgrowth of the efforts of HP Labs, the corporate research and development organization.

"HP Labs is a part of Hewlett-Packard's product development team," explained Dan Lansdon, administrative manager. "That's our reason for being."

"We look for projects which will be broadly useful throughout the company. These generally are longer-term programs than those undertaken by the divisional R&D operations.

"And we are in the high-risk end of the R&D business. If every project we start winds up in the marketplace, then we aren't stretching far enough for ideas."

It's difficult to accurately estimate the

(continued)

inside HP Labs

Organic chemists Hsia Choong and Gene Koch . . . studying materials for liquid crystal displays.

Gus Marshall . . . optical emission spectrometer.

Reference librarian Nancy Lem . . . on literature search.

Kathy Potter . . . applications software research.

percentage of projects undertaken by HP Labs which one day become products.

"Our work falls into two major categories," Lansdon said. "First is the 'I'—or investigative—phase. The most promising of these projects advance to the 'L'—or Lab—phase. Of projects that progress into the 'L' phase, the percentage of successes is very high."

Director Paul Stoft thumbs through a faded notebook to refresh his memory of the hundreds of projects that have originated in the Electronics Research Lab:

"HP's first serious work in minicomputers was started here," Stoft recalled. "We suggested to Dave Packard that HP get into the computer business. Not for data management, but to control our instruments. The work soon outgrew The Labs and was transferred to the Dymec Division (now Data Systems), where the first 2116 minicomputer was developed."

The role played by The Labs in developing the HP-35 pocket-sized calculator is already an HP legend. More typical, probably, is the activity which led to the development of the 9100A desktop calculator, which spawned the Loveland Calculator Division.

"As is often the case in product development, teamwork among a large number of people in various disciplines was essential," Stoft said.

The concept of a small, powerful HP desktop calculator was originated in late 1965.

"The promise of a calculator that combined the computing ability of one machine with the speed and dynamic range of the other had everyone excited," Stoft said.

"Important ideas and designs came from just about everyone connected with the project. Working closely with the groups of Bob Watson and Jack Anderson in Loveland, we were able to go from a complete lab prototype in Palo Alto to a pilot run of final instruments in Loveland in only 10 months."

Today, six years after production began on the 9100, several hundred people are involved in work on the desktop calculator line in Loveland.

To keep pace with HP's broadening involvement in high technology research, a fifth department is being formed by HP Labs.

It will be known as the LSI Lab and will be responsible for conducting R&D work in complex large scale integrated circuits used in many new electronic products. In addition to its investigative research, it will be involved in limited run manufacturing of LSI circuits for use by HP divisions.

Bob Grimm, R&D program analyst, is coordinating establishment of the new lab at the Santa Clara Division. Initial setup will begin this fall, and full scale operations are scheduled to start in 1975.

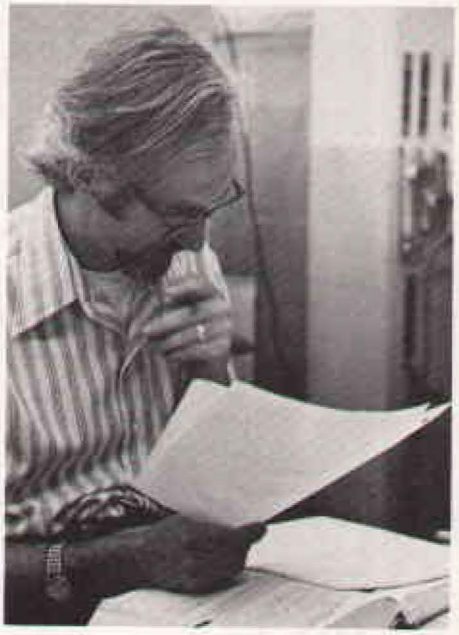
"HP Labs has six general areas of activity," Lansdon explained.

"We do theoretical analysis, generally at the request of a division for help with a project on which it is working.

"Chemical analysis also is carried out, generally at the request of divisions and organizations within HP. These tests range from routine analysis of plating solutions

Steve Muto . . . planar magnetron in thin-film project.

Dieter Knoll (HP-GmbH) . . . liquid chromatography project.



Dick Baugh . . . study of magnetics for bubble memory project.

Jim Hansen and Tom Sigmon of solid state lab . . . ion implantation research.

to highly sophisticated studies of esoteric compounds.

"We also pioneer new technology that still hasn't reached the product stage. Our work in magnetic bubble technology is an example.

"The Labs is involved in research and development of new components which can serve as the basis for new instruments, or even complete new families of products. These can range from new LED readouts for HPA to Gunn-effect oscillators for one of the microwave divisions. The more mature divisions are most interested in this type of work.

"Another important activity is to develop new products which fit into existing businesses. The mass spectrometer and ESCA, for Scientific Instruments Division, are examples. The developing divisions with perhaps smaller R&D staffs and budgets are happy to receive this kind of help.

"And finally, we help the company enter new businesses. The early computer products, pocket-sized calculators, and surveying instruments are examples."

Paul Greene's Solid-State Lab contributes in a number of these areas. Its origins actually were in the early days of HPA. Greene, Bob Archer, Bob Burmeister, Egon Loebner, and others formed the nucleus of the Solid State Lab when it separated from HPA and became a part of HP Labs as it was formed in 1966.

"Our early challenge was to learn to successfully grow gallium arsenide phosphide, the basic material in HPA's current line of light-emitting-diodes," Greene recalled. "During the four years we were doing the materials work, Bob Archer's group was fabricating the structures to be placed on the wafers, optimizing the final product for light output.

"Our early LEDs had a very low brightness level. By the time we reached the product stage with HPA, the LEDs were 10 times brighter than when we started."

Even after a successful LED product had been developed, early fabrication of wafers was done at HP Labs while HPA was installing its production equipment.

"The Labs can act as a short run manufacturing facility when necessary," Greene said.

Greene's group has recently completed the transfer of technology and people for a series of yellow-green LEDs, and the division will soon be introducing the new product line.

The Solid State Lab also contributes directly to divisions other than HPA. Examples include a gallium arsenide field effect transistor for microwave systems as well as a new high-speed switch for use in Santa Clara counters, materials work for the emerging magnetic bubble-memory technology, and charge-coupled device technology for large memories.

"We are virtually a self-sufficient operation," Greene said. "We are able to grow new materials, provide the physics and technology for activating the materials, and do the application engineering for putting new materials to practical use."

Where do the ideas come from? Who determines what is tried and what is not?

"Many ideas for new products are generated within The Labs," Lansdon said.

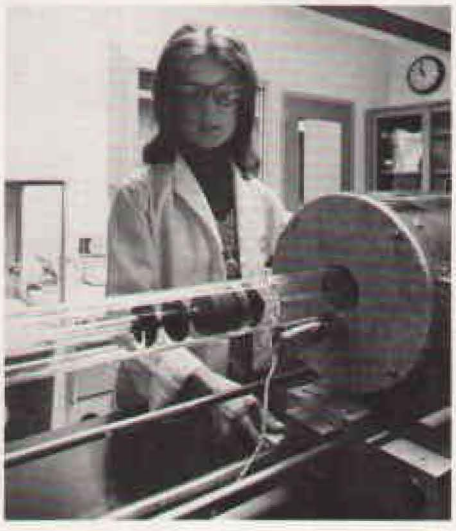
(continued)

inside HP Labs

Bill Yarbrough and Larry Hubby . . . testing materials used in laser holog[illegible].

New mask aligner permits more accurate registration, key to improved performance . . . Fran Schlotthauer.

Precision lathe work in model shop . . . Arno Hindemit.



Tina Polowyk . . . adjusting reactor used for solid state materials research.

Piezoelectric research in crystal lab . . . René Cook.

Someone will see a new way in which HP technology can be applied, or think of a better way of doing something. The project is proposed to the lab director and authorization sought to begin work. Lab directors can approve projects up to $10,000. Above that, they must be OK'd by Barney Oliver.

"Sometimes, ideas come from Barney or Bill Hewlett. Surveying instruments and calculators owe a great deal to such encouragement.

"And divisions will sometimes ask us to help them with a project or to develop a new product to fill out their line. Most requests of this type come from the emerging divisions."

One idea that resulted in a family of important products can be traced directly to Don Hammond, director of the Physical Electronic Lab.

"It occurred to me, while mulling over ideas for possible new products, that HP could make a contribution in the field of distance measuring, using lasers," Hammond said. "This was in the early 1960s.

"Two ingredients are critical in using lasers to measure wave lengths of light. They are frequency counters, in which HP had great expertise, and lasers, which was still a new technology at that time."

"There were few companies in the business, and the typical system was priced between $32,000 and $36,000. We set as our goal to build a better product than those on the market for a price under $10,000."

The challenge was met, Hammond recalled, after some fine teamwork between Labs personnel and the Santa Clara Division. One major problem was the complexity of existing systems using four laser beams. Al Bagley, Santa Clara Division manager, suggested that HP try a heterodyne system—a two-frequency laser beam —which resulted in a fundamentally new position-measuring method.

The laser interferometer prototype turned over to the division in 1968 led to a production instrument at a very attractive price which also featured instant startup (as compared to 20–30 minutes warmup required by existing machines), greater reliability, and smaller size than others on the market.

"The laser interferometer product line is an excellent example of division interactivity," Hammond said. He cited the "magic cube" development at Santa Clara, an advance in laser interferometers which permits the measuring device to actually be built into a machine tool.

The Physical Electronics Lab also was responsible for developing ESCA (Electron Spectroscopy for Chemical Analysis). ESCA systems are in the early marketing stages by the Scientific Instruments Division and could become a major tool for studying the surface chemistry of materials. Initial applications for ESCA include the surface analysis of semiconductors, catalytic materials and film.

Hammond's group also has been involved in developing quartz products for Santa Clara and SID, a high-pressure pump for HP's liquid chromatography work in Germany and pursuing the thin film aspects of integrated circuits wh[illegible] contributed to the multimeter first ma[illegible] keted last year by Loveland Instruments.

Jim Seiferling . . . scanning-electron microscope examines LED materials.

Hank Schade and "patient" Barry Willis . . . project aimed at extension of intensive-care medical instrumentation line.

Software lab's Jim Duley (left) and electronics researcher Eric Slutz . . . programming a circuit simulation, using HP 3000 computer system.

"We have about 250 people working at Labs," Lansdon said. "More than 100 are degreed professionals, and over one-third of those have earned PhDs. I guess we are involved in some advanced phase of nearly every technology which could have an impact on HP."

One thing Lansdon and the Lab directors are quick to point out: The Labs are not staffed to carry projects beyond the Lab prototype stage. In some instances (such as the HP-35), we have gone much further toward production by drawing upon the expertise of another Lab or the skills of a division.

Len Cutler's Physical Research Lab, largely responsible for HP's leadership position in cesium beam frequency standards, also is deeply involved in a technology that hasn't yet appeared in a single product. Since shortly after its formation in late 1969, this nine-member team of scientists and technicians has been doing g-term research in magnetic bubbles.

"The first step was to begin reading literature available on the subject and doing the mathematics and physics to enable us to understand what was going on," Cutler remembered.

"Initial work actually started in the Solid State Lab to supply the orthoferrite materials needed to begin. It wasn't until the end of 1972, with the advent of the first garnet materials, that we began work in earnest.

"Right now we are in the product definition stage. We must decide exactly what needs to be built, develop an engineering prototype, then transfer the resulting product to the appropriate division for use in one of their new machines. Simultaneously, we will continue with other product developments using magnetic bubble technology."

Although in its infancy with many problems still to be overcome, bubble memory technology appears to be an attractive avenue to new products for HP.

The Physical Research Lab also played a major role in developing two new cesium beam tubes used in the atomic clocks manufactured at Santa Clara.

The HP Labs organization was formed in 1966 by pulling together three research groups in the Palo Alto complex under Barney Oliver, now an HP vice president and director. Since that time it has shared in the company's formula of allocating approximately 10 percent of its sales dollars to product research and development. Of the dollars earmarked for R&D, which topped $57 million in 1973, HP Labs spends about 10 percent; the remaining 90 percent is divided among the divisions for their product development projects.

It's a quiet place, The Labs, yet a strong undercurrent of competition exists. While quick to acknowledge the contributions of others, each lab group is proud of its role in the successful projects on which it has worked. The time for creative thought is there, but the pressure for decisive action is equally apparent. Like the rest of HP, The Labs is measured by results. And The Labs has met the challenge with a steady flow of important new technologies, components and products, the life blood of a high technology company such as HP. □

From the president's desk

Every time you pick up the paper here in the U.S. you see such comments as "cost of living up 15 percent," "no real increase in GNP," and the like. It's much the same in many other countries as well. We are indeed encountering a very different set of conditions than we have experienced in the past, and thus I thought it might be of interest to comment on some of these changing factors and how we plan to react to them.

To do this, it is necessary to review several important tenets of our corporate policy, because our actions must be measured against these positions. First, it is our policy to pay our own way—that is, to make enough profit to support our corporate growth. We've said this many times, but it is worth repeating because it is fundamental. This, however, begs the issue of our policy on growth which I think is less well understood. The policy is simply that growth is a result of doing a better job of serving our customers by making basic technical contributions in our fields of interest. Growth is not an end in itself—it is only a result of successfully fulfilling the above requirements. A third important policy is that this company is built on the quality and dedication of HP people, and it is an axiom that each person shares in the benefits that flow from a job well done.

Let me now set the stage for the economic environment in which we find ourselves today. Starting in the Fall of 1971, in an attempt to control rising inflation in the U.S., the government imposed a series of limitations on both wages and prices. It was always the plan that these controls be of limited duration, for long-term controls are not consistent with the basic principles of the U.S. economic system. As time went on, the wisdom of planning for temporary controls became increasingly evident, for these controls were beginning to create more distortion in the economy than the benefits derived. It was also evident that when the controls were lifted there would be a very sharp inflationary rise in most everything. And this is exactly what has happened.

Then, as if to compound the problem, we were faced with the petroleum crisis, and I think all of us are familiar with its direct impact. Unfortunately, its secondary impacts can, and are, resulting in even greater dislocation of the U.S. and world economies.

Given this gloomy picture, how do we proceed?

First, how do we deal with pricing? It is our usual policy to review all prices in May and November of each year, and make adjustments up or down as the case may be. This we will continue to do. In November of last year, to help cover our rising costs, we implemented an increase of three percent over U.S. controlled prices for products sold outside the U.S. In March of this year, the U.S. government decontrolled most of the products we manufacture, and we proceeded to apply the same three percent increase to U.S. sales. Additionally, there were some 20 or so critical products that were

News in Brief

Palo Alto – Price reductions on two of its pocket-sized scientific calculators were announced April 15 by Hewlett-Packard. In the U.S., the HP-35 was reduced from $295 to $225; the HP-45 from $395 to $325.

"Lower manufacturing costs achieved through specific cost reduction programs and high volume led to these new, lower prices," according to Bill Terry, HP vice president.

Since introduction of its first pocket-sized calculator, the HP-35, in January, 1972, HP has sold more than 300,000 units.

"The economics of large, continuous production runs, plus the increasing use of parts common to both the HP-35 and HP-45, have enabled us to reduce manufacturing costs on both calculators," Terry said.

"Costs of the HP-35 have been further reduced by minor changes in the packaging of the unit. These changes are largely in appearance and the capabilities and operating characteristics of the machine remain the same."

Terry said the HP-35's key legends now appear directly on the keys, rather than above them, and the keys are the same size as those used on the HP-45. Previously they were slightly smaller. Also, the soft leather carrying case has been replaced by a zippered vinyl one. A simplified shipping case replaces the hard plastic travel case that previously came with the unit.

Prices of the two other HP pocket-sized calculators are unchanged. The HP-80 financial calculator is $395 and the recently introduced HP-65 fully programmable calculator is $795. All models are available to HP employees at 30 percent discount, with a lifetime limit of one discounted purchase per product.

Palo Alto – Eberhardt (Eb) Rechtin (above) has been named chief engineer of Hewlett-Packard, it was announced on April 3 by Dave Packard, board chairman.

Rechtin previously had been HP's manager of telecommunications. In the

grossly underpriced and these received appropriate increases. Interestingly, even with these price changes, our price increase for the past four or five years has averaged less than two percent annually.

So much for pricing. It is flexible, it is reactive, and it should be able to cope with normal levels of inflation once we are caught up. (One side note—the effects of price increases are not felt at once since at any given time we have a substantial backlog of orders that must be honored at old prices.)

On the cost side, the company is caught in much the same situation as you are personally—rising costs for most everything. We recently made a study of our raw materials costs and found that they had risen 10 to 30 percent (even 100 percent in some cases) over the past six months. Of course this is only the tip of the iceberg. Most of these same materials also are used by our component suppliers, and we certainly are beginning to see an increase in the cost of their products. Fortunately, in one important area—semiconductors—prices seem to be stable, due primarily to increased efficiency in the production of these devices.

Needless to say, our labor costs will continue to rise as our employment grows and as people receive merit salary increases. Our total payroll, including taxes, is in excess of 40 percent of sales. Even though this is a significant cost factor, I want to assure you that we will continue our policy of keeping salaries at HP in line with regional and industrial norms. Our salary ranges are structured to provide maximum growth, and additionally we continually review and adjust these ranges upward to reflect current economic patterns.

The fact remains, however, that the inflationary spiral reflects climbing manufacturing costs and resulting increases in product prices. In the past we have been able to partially offset such cost increases in two ways—through better design of our products, and by improvements in our own efficiency. I see no reason why we cannot continue this pattern. In effect, we have much the same opportunity as the semiconductor industry to hold down price increases through improvements in performance. Herein lies the answer to reducing inflationary trends.

In summing up, for the past eight to ten years we have been operating in an economy that has experienced inflation at a rate of four to five percent per year. We learned how to live with this situation rather well. Our pay scales have tracked, our material costs have been continuously monitored, and, thanks to the fine job each of you has done, our price increases have been modest. We are now simply experiencing a steeper rate of inflationary rise. Due to the effect of wage and price controls in the U.S., and their sudden demise, we found ourselves in a position where we had some catching up to do. We have done this, and now we just have to make the existing structure work.

Fortunately, all of this occurs at a time when we have a very strong order picture. Based on preliminary figures at this writing, orders are ahead of first half targets and substantially above those for the same period last year. Our production has been just great, and although I do not yet know what cash profit sharing will be, even with 2,500 to 3,000 additional eligible people on the payroll, I anticipate an improvement over the second half of last year.

Keep up the good work and be assured that coping with inflation, while still providing the fullest possible protection for all HP people, is a matter of primary concern for both Dave and for me.

Bill Hewlett

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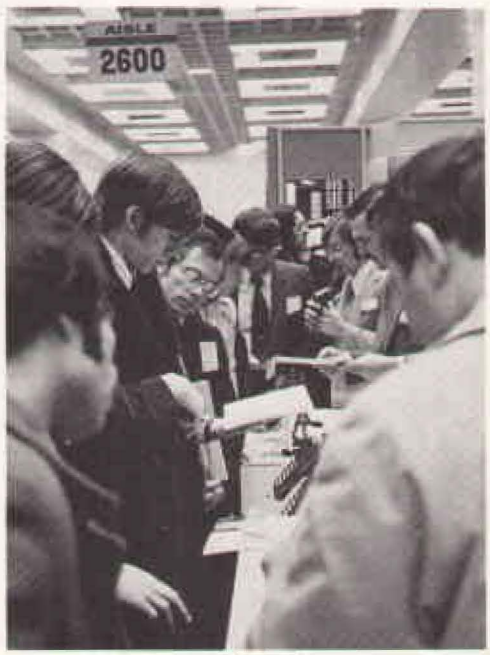
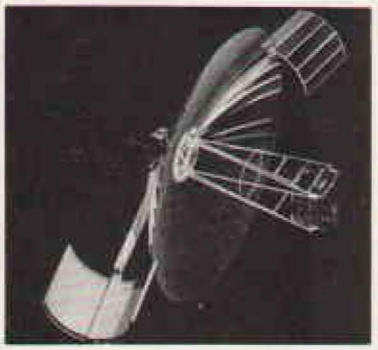
newly created position, Rechtin's responsibilities are broadened to include coordinating company-wide engineering activities in addition to managing telecommunications affairs. He continues to report to the Office of the President.

A graduate of the California Institute of Technology (BS, PhD *cum laude*), Rechtin directed technical projects for CIT, NASA and the Defense Department before joining HP last September.



Show Time: The recent IEEE exhibit in New York's Coliseum may well have been the biggest electronics show of the season—and a very successful showcase for HP products as indicated by the photo at right. Simultaneously, and almost at the very opposite point of the globe, HP was participating in another show, AMPRO '74—smaller perhaps, but equally significant for HP's sales force in Taiwan. In fact, as seen in the photo above, it served as an occasion for HP's Lok Lin (left) to greet a most notable visitor—Chiang Chin-kuo, premier of the Republic of China and son of Chiang Kai-shek.

The Great Equalizer in the sky...



Around the northern Hemisphere the youngsters will have just begun to savor the coming vacation season—except in some backcountry areas of North America where school will become an exciting new venture. In early June an experiment will be launched from Cape Kennedy, aimed at educationally helping people in more than 100 isolated communities of Appalachia, the southeastern states, and Alaska. Eventually, similar systems will be installed in India and other parts of the world. For the first test, a Titan III rocket will transport a communications spacecraft (ATS-F) into a synchronous orbit 22,300 miles out in space. Subsequently, educational TV programs will be beamed to the geostationary satellite from various propagation stations on earth. In turn, the satellite will transmit the TV signals back over a huge stretch of North America, enabling the school receiving stations to overcome many of the problems of remoteness. Each of the stations has been equipped with an antenna, receiver, video-tape recorder and TV monitor. The special receivers were designed and manufactured by HP's Communication Products team at Stanford Park. The HP receivers (built only to OEM orders of over 100 or more), serve as small ground stations that by conventional design could cost ten times as much. Shown discussing the project are three representatives of the HP design team: Rick Pering, Jim Hall and Art Fong. You can be sure they will be tuned into the upcoming launch.

Measure

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