



# Measure

For the men and women of Hewlett-Packard/AUGUST 1972

*Exposing the lung killers:*

# New challenge for HP's medical team...

□ Four months ago—on behalf of its Medical Electronics Division—HP announced the acquisition of a Burlington, Vermont, manufacturer named Vertek, Inc. Vertek's sales volume—some \$600,000—and experience—five years in business—were not of the order of magnitude that immediately impresses Wall Street analysts. But if it was little known as a company, Vertek's line of respiratory diagnostic and monitoring products was very well thought of in its market. In particular, the line was an almost exact fit when placed alongside HP's products in the cardiac field; HP medical salesmen were already calling on the “right” people.

But most important, what about the market? Where could HP go with this interesting new diversification? And what was the long-term justification for HP's investment in this new field?





Evaluation of a patient's lung functioning and determination of chronic conditions are quickly made by the new respiratory function computer. The installation shown here is in use at St. Luke's Memorial Medical Center, Phoenix, Arizona. The HP/Vertek VR6100 instrument is self-contained, and can be readily wheeled from lab to ward to clinic.

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## the new challenge

The prologue to any report on these questions is not a happy one. It begins with the fact that the people who warned us against air pollution, against cigarette smoking, and against the hazards of toxic industrial wastes were right.

Dead right.

Because respiratory disease is running rampant wherever those lung-impairing substances are loosed over the land, which is to say most of the modern industrialized areas of the world.

Consider emphysema, one of the chronic obstructive lung diseases. Once it was quite rare. All of a sudden, it seems, it is on a near epidemic climb, increasing in new cases and as a primary cause of death at a rate of 18 percent a year in the U.S. Today, in fact, emphysema is America's second leading cause of disability benefits after heart disease.

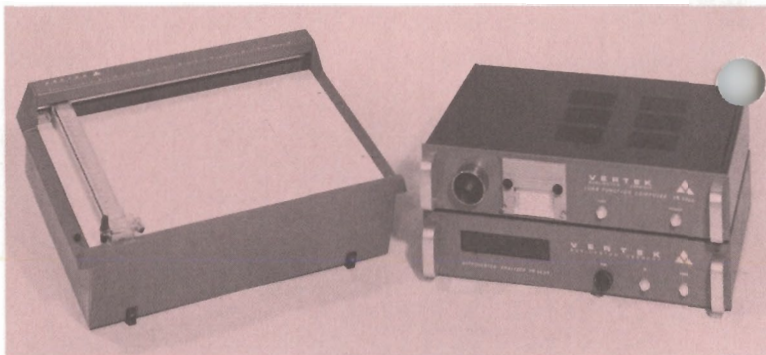
But even these alarmingly high figures for emphysema are suspect as being somewhat below the real rates. The death rate, for example, is thought to be obscured by the fact that heart disease is often given as a cause of death without recognition of the greater importance of the co-existent emphysema. In addition, many chronic lung diseases go undiagnosed until the patient is sick enough to require hospitalization.

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### The Vertek lineup . . .



*Lung function computer  
with printout*



*Lung function computer-nitroverter analyzer  
with X-Y recorder*



Because of these factors, some medical observers estimate that there may be as many as 14 million Americans suffering from some form of chronic respiratory disease—emphysema, bronchitis, or asthma—without most of them being aware of it.

Clearly, something has to be done.

For a start, it is now the general consensus of physicians that the heart and lungs are one system—the cardiopulmonary system—rather than two. In addition, the diagnosis and treatment of cardiopulmonary disorders have in one decade moved from the research stage to the clinical area.

But a great need still exists for bringing about much earlier diagnostic screening of the lung function and to develop adequate tools to perform this very vital diagnosis. Likewise, considering the relationship between heart and lung, it is essential to provide the means for monitoring the respiratory parameters of patients under intensive care as well as the cardiac functions.

HP's deep involvement in electronic instrumentation applied to the cardiovascular system provides an established base for approaching these problems. And the addition of the Vertek line goes a long way in helping to define the specific direction of that approach. At the present time, that direction is seen as leading to the following areas of interest:

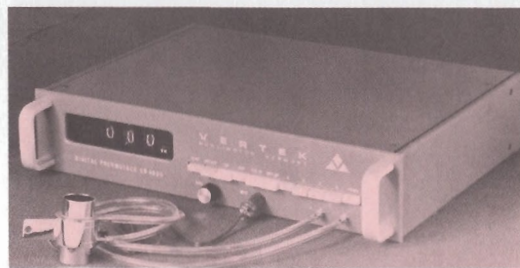
- **Monitoring:** Respiratory monitoring of patients under intensive care appears to be one of the most promising fields for HP.

- **Diagnostic screening:** This is a particularly important area because symptoms of lung disease are often not apparent to patients and because such diseases are irreversible unless detected early. The U.S. Health Service, for example, is pushing for a program of regular tests of workers exposed to coal and other dust-producing substances.

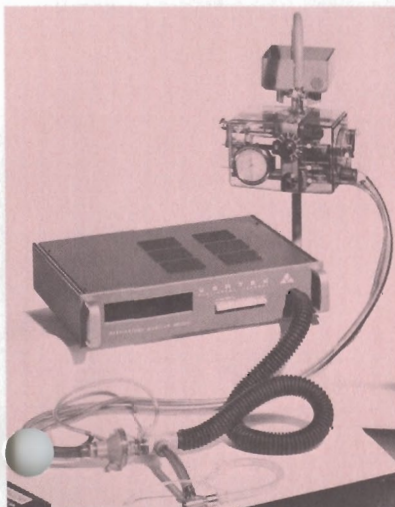
- **Pulmonary function laboratories:** Patients are referred to a pulmonary function lab when their lung function is found to be abnormal. Here the abnormality is precisely located and determined. At present, most equipment is homemade or put together by the user.

- **Exercise lab:** Physical stress and exercise are often useful means of testing respiratory functioning. This area is a natural extension of HP's present involvement in cardiography and cardiac catheterization.

As a happy conclusion, HP's Medical Division people feel the Vertek acquisition has brought them a complete product line, one that has good human engineering and clinical orientation, and that covers most of the needs in the pulmonary testing field. That's a rather good start in a wide-open new field. □



*Digital pneumotach*



*Patient  
respiratory monitor*

*CO<sub>2</sub> Analyzer*





# They're not playing games in Munich

□ Reporting on the Olympic Games of some 2,300 years ago, Phylostratus noted that athletes seemed willing to try almost anything that would improve their performance.

He didn't mention "doping." That word wasn't invented until about 2,200 years later, first appearing in an English dictionary in 1889 (derived from "dop," the native Kaffir name for a potent liquor in southeast Africa). But the connection seems clear, just as it is starting late this month in Munich, Germany. There, as far as doping is concerned, the 1972 Olympics will be the most carefully yet skillfully scrutinized games ever.

Heart of the scrutinizing process are eight HP gas chromatographs to be used for the basic screening of urine samples taken from randomly selected athletes soon after each event. Any samples that arouse suspicion as a result of the GC analysis will then be sent to a mass spectrometer for confirmation.

Dr. Manfred Donike, the chemist in charge of the Munich games lab, claims the system should operate much more quickly and positively than the one employed for the recent Winter Games in Sapporo, Japan.

Only three simple steps will be required to analyze and confirm a sample at the upcoming games, compared with the lengthy fifteen steps used to screen the winter athletes. In addition, Professor Donike has very high confidence in the process and equipment he will use, based on months of testing. As a result, the rulings of the Munich Olympic drug lab will be final, with no outside challenges possible as could be done at previous games.

Just what is it about the HP gas chromatograph that supports such confidence?

Basically, it's the fact that the automation of GC analysis has made possible the extensive research work necessary





to reliable drug analysis. For example, the presence of nitrogen-bearing organic substances in the human body can affect the detection of drugs that also contain nitrogen. It was necessary, therefore, to first undertake a wide-ranging study of the interaction of drug substances in the body. Only fully automated gas chromatographic analysis—together with improvements such as the development of highly sensitive nitrogen selective detectors—made this practicable.

The GC system in use at Munich features eight HP-7600A gas chromatographs connected to an on-line computerized system. As many as 36 samples can be injected successfully and automatically into each GC unit. When a substance containing the tell-tale nitrogen is detected, a warning is registered on a recorder.

Officials hope that signal will not be in evidence at the XXth Olympics. But if it is, they're ready to act—with record-breaking speed. □

Trailer-borne laboratory supervised by Dr. Manfred Donike will screen athletes for drug usage during upcoming XXth Olympic games at Munich. A battery of eight HP gas chromatographs linked to an HP computer will be used in the screening process. So confident is Dr. Donike of the system that the Drug Control Commission of the International Olympic Committee has agreed that no outside challenges can be made to findings.



## The touch

□ One of the great slanders against modern industry is that it has abandoned craftsmanship.

It's true, of course, that the average content of skilled labor per item produced has been drastically reduced ever since the beginning of the Industrial Revolution. But that's only because of the large numbers involved in mass production. Actually, each original prototype part is still the result of almost 100 percent hand craftsmanship. It sets the standards, the mold, or the model for the thousands of copies that follow. (If you were to buy such a prototype at cost, you'd have to pay hundreds and even thousands of times the eventual price of the factory model.)

At Hewlett-Packard, the underlayment of craft skills is very impressive. Many of these skills are heirs to the traditions of such historic masters as Benvenuto Cellini the goldsmith, Paul Revere the silversmith, Thomas Chippendale the cabinetmaker, and John Baskerville the typographer; others are new as today's newest technology.

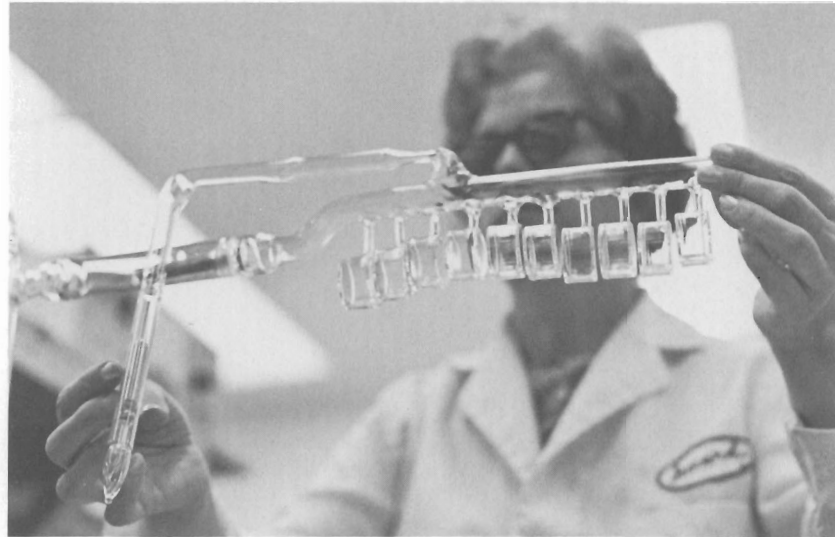
One thing they all have in common: the "touch"—the mastery of tools and materials. Of this, social philosopher John Ruskin wrote: "The moment a man can really do his work he becomes speechless about it. All words become idle to him, all theories."

Certainly, these represented in the following examples would rather show you than tell you how they apply their particular touch to the creation of the world's finest electronic measuring instruments:



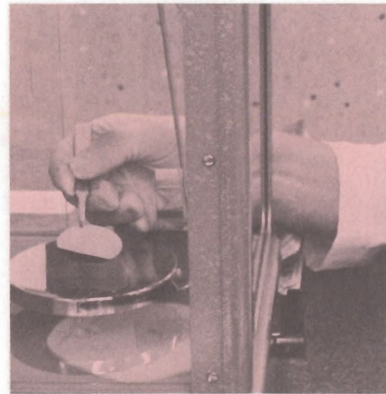
## David Eng

Applying hands to soft clay is among the most ancient of arts and crafts. However, when David Eng, industrial designer at Colorado Springs Division, employs this venerable process, the result is instant future. His clay shapes represent ideas as to the finished appearance of instruments still under development. A graduate of industrial design from USC and a protégé of one of the profession's pioneers (Henry Dreyfuss), Dave says, "I let my hands mold out what I'm thinking. Then when I have a finished model, the engineer and I can measure and test and modify freely. Clay is a great design medium, because it's much harder to change a design when it's in wood, plastic or metal. I got my start through art—through drawing. I was also very interested in creating real things. So when I heard about industrial design, it really appealed to me—applying the principles of art to industry. Essentially what I do is design and create three-dimensional models of engineering ideas. Generally, I first sketch concepts out as the engineer and I talk, then model the most feasible one in clay. It's worth at least a thousand words."



## Rosalie Amaral

As this intricate item of industrial glassware indicates, Santa Clara's Rosalie Amaral is well along in her quest for journeyman status in glassblowing. Under the tutelage of Jerry Black, the fashioning of cells to trap rubidium vapor is just one of the many precision jobs Rosalie can perform. Though much of the work at Santa Clara is done on glass lathes, some items still call for the old freehand method of glassblowing. Glass technology is also important at HP Labs, Colorado Springs and Avondale divisions. "The great thing about glass blowing," observed Jerry Black, who manages the Santa Clara operation, "is that you start with a raw material and continue on to a finished product. That can be very satisfying."



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### George Borg

It may be true in a boiler factory that welding is not one of your finer crafts. But in HP Labs, as in other R&D shops around the company, the joining of metals takes on new dimensions. Some of these arise from the many exotic materials that must be brought together. And from the specifications that often call for zero contamination. Or from the half-dozen methods of welding that must be employed from time to time. All of these dimensions are home ground to George Borg. A machinist since he came out of a World War II U.S. Army hospital, George felt himself constantly challenged to try new things. After a job that saw him put together an in-flight refueling system he came to HP, and now works as part of the Physical Electronics Lab. Some of his current work is on display in the form of the prototype hardware used by Scientific Instruments in its ESCA and mass spectrometer products. You can't miss George: still the enthusiast, still the craftsman, no matter how ordinary or exotic the job you may ask of him.

## the touch



### Victor LaFica

According to Merle Price, manager of the Escondido annex of San Diego Division, Victor LaFica has "perfect hands." They are, he says, extremely steady and very sensitive, able to detect any minute flaw in the whispy wire Victor uses in assembling some of the tiny mechanisms used in recorders. "He seems to be able to do any kind of precision assembly," Merle noted. Victor, born in Argentina, makes no bones about the fact that he would rather apply his time and talents to painting. As a matter of fact, he has had many of his works exhibited and sold. But making a living for his family is something else. As it is, his skill, like that of many other precision assembly people around the company, has an essential role in the creation of some very useful products.

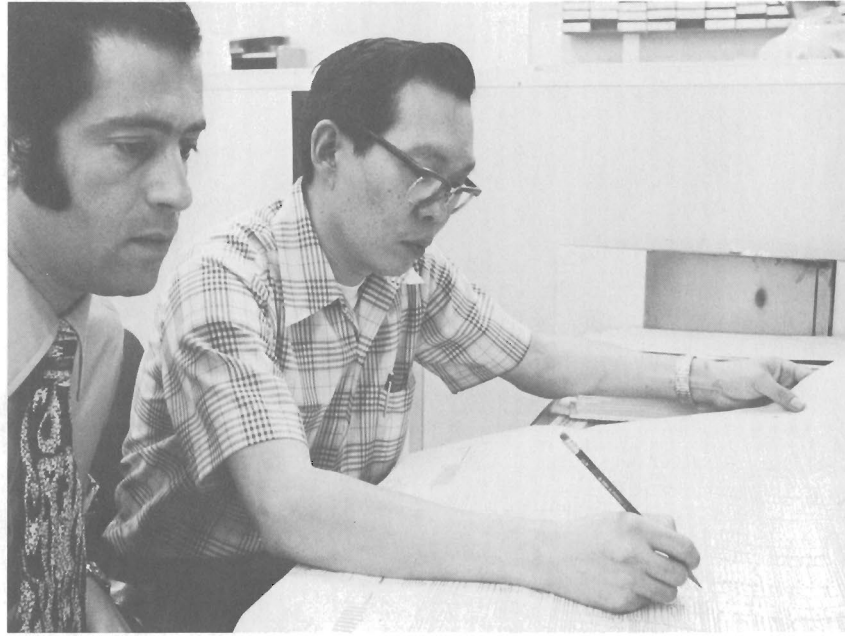






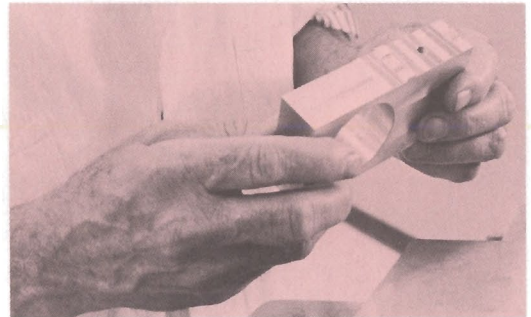
### **Peggy Mortenson**

Few people can comprehend, let alone feel comfortable, in the sub-miniature world of semi-conductor processing. It's a land of microscopes and diffusion furnaces, acids and exotic metals, fragile wafers and almost invisible products. In fact, it's hard to believe that those tiny but very complex devices—three would not crowd a pinhead—actually will perform as promised. That they do is often to the credit of the likes of Peggy Mortenson, engineering aide in HPA's processing area. Thanks to a dozen years of experience and to an intense interest in her work, Peggy can step in at any stage of production and counsel or produce with skill. As a result she now assists Greg Merten in developing new products and teaching new people. "Lots of times in this business, there are no easy answers to things," said Greg. "Someone's mistake, for example, may result in an improved product. Peggy has a way of solving situations like that. She has that kind of knowledge and feeling for the work."



### **Shig Okamoto**

When manufacturing Division's Shig Okamoto joined HP in 1964, printed circuit work was still evolving as a technology, still looking for its role. There were no master craftsmen and few teachers. So Shig set out to fill the gap. He became expert in the dozen or more areas of work—from shearing to silkscreening to plating—required to produce today's complex multi-layer boards. So now his forte is prototyping PC boards for some nine HP divisions and counseling them on manufacturing questions as he is doing here with Data Product's Tony Tomarchio. In his new PC prototype shop he expects to telescope a test run from a normal eight weeks to about four days. Shig is also interested in teaching the craft to others—sure sign of a master.



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## the touch



### June Wohlfeil

The connection between the Gutenberg Bible and an HP direct-mail piece may seem somewhat slim. But both share the concept of movable type developed by Johannes Gutenberg around 1456, and both rely heavily on the skilled use of hand and eyes to achieve a design goal. June Wohlfeil, manager of the Corporate reprotyping department, learned her particular skills on the job when she started with the company 18 years ago. But she brought to it a basic skill in typing and a sense of design plus some mathematical ability. Like other reprotypists in the major HP organizations, June puts these elements into practice on a wide variety of jobs—booklets, pamphlets, advertising items, financial statements, reports and catalog sheets—almost anything in typography destined for reproduction via the printing process.

### Hermie Allen

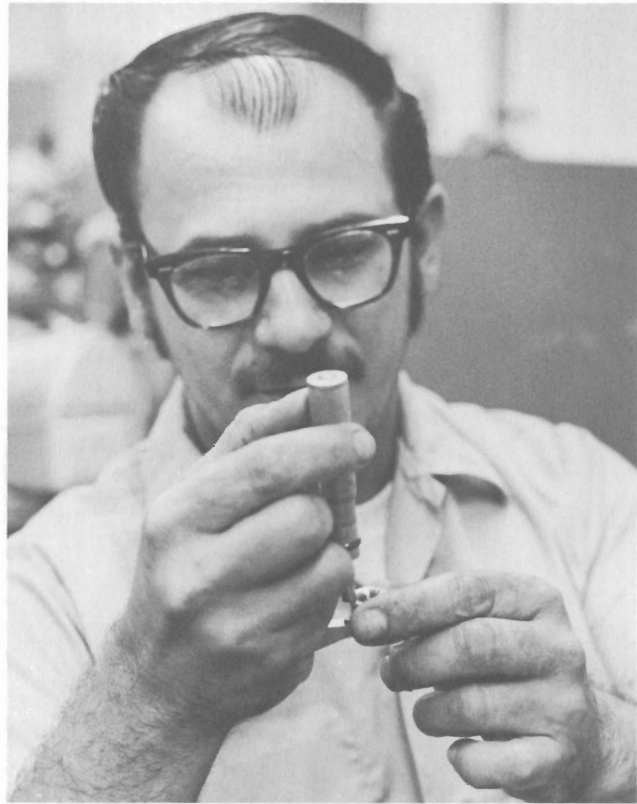
You might think that a man who chases silver would be either a miner or an ambitious money bags. Hermie Allen of HP Labs chased silver for years—until he discovered it was a dying profession. In his case, “chasing” meant the ornamental work applied by hand to sterling silver objects such as silver trays, coffee pots and tea pots—creating the design and undercutting it to raise it into lifelike relief. But dies came along that did the work much cheaper and almost as well. So Herm left Newburyport, Mass., to work in a machine shop making special dies. Eventually, this led him from Beverly, Mass., to Palo Alto where he now specializes in making one-of-a-kind parts and tools for products under development in HP Labs. A number of the small prototype parts of the HP-35 hand calculator, for example, were his work.





### Laura Malmgren

"It's funny," said Santa Clara's Laura Malmgren. "I know the engraving process so well that one time I sat down to write it out so that others could use it as a guide. But I drew a blank. I discovered I was doing it all by experience. It was in my hands, but not in my vocabulary." Laura's hands nevertheless speak very well for her. For the past 17 of 21 years with HP, she has been applying them to the art of inscribing letters, words, figures and calibration markings onto metal surfaces. A mechanical process is involved, using a pantograph to duplicate the markings. But to produce a 6" x 9" instrument panel requires the use of 8 master plates scaled up on a ratio of 4 to 1. Very special handling is also required for calibrated dials. Laura and other HP engravers are also called on to inscribe ID plates, keyboard buttons, badges, plaques and plates. And all of it takes gentleness of touch plus a good helping of ambidexterity.



### Ed Norris

One test of a master craftsman is that he has full responsibility for his efforts. He decides how a job is to be done. He selects the tools; sometimes he even makes them. He operates the equipment. Finally, he passes judgment on the acceptability of his own production. By this definition, the HP machinists operating "chucker" machines are indeed master craftsmen. Ed Norris, assistant leadman in the chucker area of Manufacturing Division, sees it as challenging work even with years of experience to go by: "It takes a lot of free thought—imagination. Say your machine has only six working stations, but the item you're working on needs eight operations. Where do you double up? What RPM are you going to use? What special tools will you need? To make the right decisions, a guy probably will have had at least four years in lathe-type work, plus credentials as a conventional journeyman machinist. The tolerances we work to are very close. In fact, we're moving into a temperature-controlled room shortly because of that."



Manufacturing operations are now underway at Microwave Division's leased interim plant in Santa Rosa, California. Located approximately 50 miles north of San Francisco, the plant initially will build solid-state sweepers and spectrum analyzers, and also handle the bonding, assembly and testing of the microelectronic products used in these instrument lines. Meanwhile, a permanent facility is being designed for a 190-acre site north of Santa Rosa.



## News in Brief

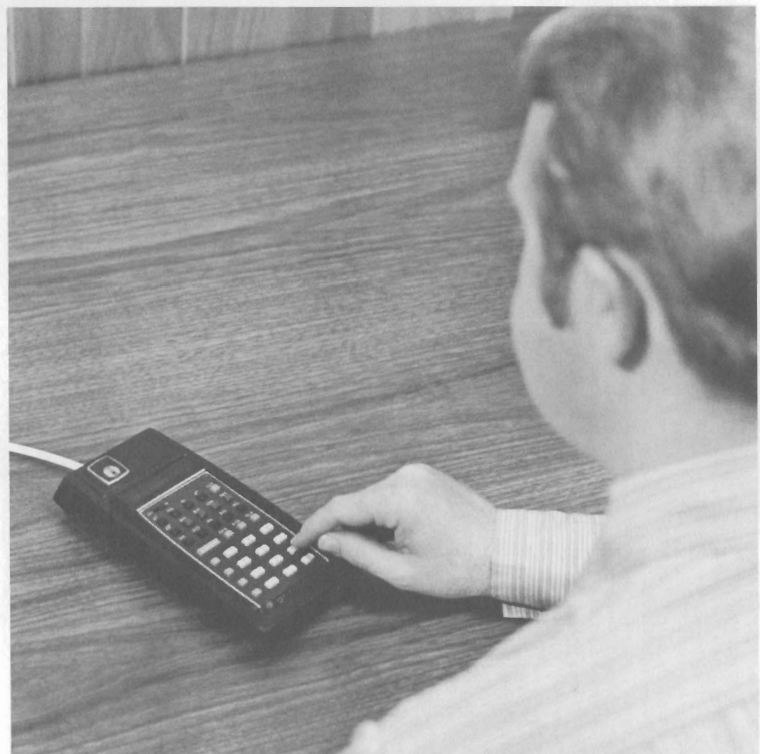
**Palo Alto** — HPA Division is appointing a series of industrial distributors to serve the American and European markets for its optoelectronic products.

These are the first HP products to command the industrial mass market, so marketing via conventional industrial channels is appropriate.

Generally, the distributors will make HPA's light-emitting diodes and other optoelectronic devices quickly available from nearby familiar sources for the many potential industrial buyers. HP's component field sales people, meanwhile, will concentrate on the larger and more technical accounts.

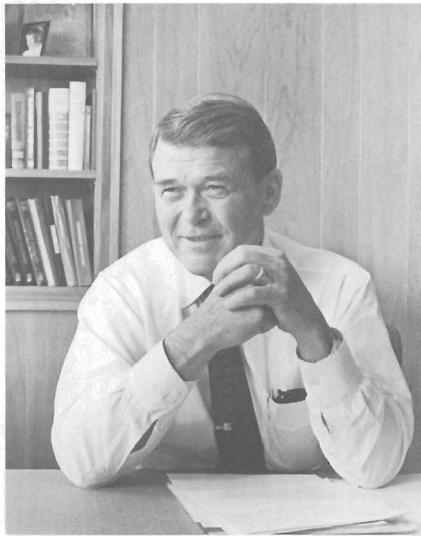
**Palo Alto** — Hewlett-Packard directors have declared a regular semi-annual dividend on the company's common stock. The dividend, 10 cents a share, is payable October 16 to stockholders of record September 25, 1972.

**Palo Alto** — Dr. Taylor L. Booth, professor of electrical engineering at the University of Connecticut, has been named winner of the 1972 Frederick Emmons Terman Award. The \$1,000 award, presented annually to an outstanding young electrical engineering educator by the Electrical Engineering Division of the American Society of Engineering Education, is sponsored by Hewlett-Packard.



Proving again that the sensational HP-35 pocket calculator is unlike anything the company has ever marketed, the Advanced Products Department at Cupertino has announced a very interesting array of accessories. These include, as shown in photo, a security cradle that comes with a sturdy, stainless-steel cable that lets users attach it almost anywhere to avoid casual theft. Next comes a holster-like field case for rugged protection. Third is a battery holder for carrying a spare battery pack.





## From the president's desk

Sometimes there are things around us that we accept as everyday occurrences and take for granted, whereas they are in fact most unusual and unique. One example that comes to mind is the HP picnic. Each year we have a series of these picnics, ranging from outings in the Black Forest of Germany to barbecues at Little Basin in California, that are attended by some 40 to 50 thousand people.

I don't know exactly when the first picnic occurred, but the first one I remember was one held the year I returned to the company right after the end of World War II. The total size of HP at that time could not have been more than a hundred or so people. As I recall, the picnic was a very simple affair with steaks, some fresh corn, a green salad, and games for the kids, both young and old. We even invited the families of some of our most important subcontractors on whom we depended heavily in those days.

Today, the picnics for most of the divisions are much more elaborate, and the question that comes to mind is how we learned to serve four to five thousand people at a time with a skill that would make a professional caterer green with envy. The answer is that many of the same people you find closely associated with the picnics today—the Ed Porters, the Dick Arms, the Frank Caviers, the Dick Weres—were around the barbecue fires in the early days of the company learning and developing the needed skills.

As the company grew, we had to find larger and larger picnic sites and at the same time perfect the art of mass feeding scores of happy but hungry people. What kind of fire pit is necessary for a thousand steaks? How do you do a good job of cooking 1,500 ears of fresh corn? What is the most effective way of serving warm buttered French bread? And most important, how do you make everything come out together at the same time with a sustained flow that will just keep up with the traffic?

We finally outgrew the commercial picnic grounds here in the Palo Alto area and after one false start wound

up on our present property in the Santa Cruz Mountains. But, even so, it wasn't too many years before we found that even there it was no longer possible to hold a "company picnic." The last such picnic I can recall we served about 7,000 people, which even for the "old gang" was stretching it. For that reason we switched to our present pattern of divisional picnics, but the idea had caught on and no longer were the picnics to be a purely Palo Alto affair.

When Loveland was started, Stan Selby quickly transplanted the picnic concept to Colorado, and with the help of a few old timers our experience from California was quickly passed on. Colorado Springs was the same story, and with Cort Van Rensselaer, Norm Schrock and Hal Edmondson there, attending their picnic almost made you feel you were back in California. Waltham, New Jersey, and Avondale now have their own variety of picnics, albeit slightly different from those in California. They are basically a blend of local and regional traditions, plus a lot of the old HP know-how. Even in Germany GmbH has its own version of a picnic, and I hear they have been most successful.

Thus, worldwide the HP picnic has become quite an event. But is it worth it? You must know my answer would be "yes," and it is for a number of reasons.

First and foremost, HP people seem to like them. We have been able to blend and maintain a great air of informality and fun at the picnics, and these characteristics have not flagged with time.

Secondly, these affairs provide a wonderful opportunity for the family of HPites to get together and have a good time. I think that, outside of my admiration for the skill of the HP people who organize and operate these functions, what I get the most satisfaction from is watching the youngsters participating in everything from the penny hunt to the baseball throw or the fishing game. (I might add, I also enjoy watching the parents enjoy the fun that their children are having.)

The third reason is that the HP picnic offers an opportunity for people at all levels of the organization to become involved and work side by side. It's this kind of interest and cooperation that I believe makes HP such a unique company. It is not uncommon at all to find a person from the line or the shops running some portion of the picnic and having several senior divisional persons working for him. That's simply because the former has skills that the others do not have.

I am proud of HP picnics, and the great many people who pitch in to make them a success. I think these functions serve a useful and important function, and I hope that they can continue to be meaningful and useful in our company life for many years to come.

*Bill Hewlett*





## You can make it happen again

For a lot of people—youngsters, elderly people, sick people, retarded people, people in trouble, and many, many ordinary people in need of help—your united way contribution last year made a great deal of difference during 1972. Your gift, which the company matches, helped support—in some cases—more than one hundred agencies and services in your community. Internationally known designer Saul Bass symbolized this united way giving in the graphic above: the hand representing man's desire to help his fellow man, the figure of man reaching out for a better tomorrow depicted by the rainbow. But, perhaps the little girl's smile says it best of all—thanks to you, it's working. United way campaigns get underway again next month in many areas of the U.S. Help keep that smile lit up with another fair-share contribution.

## Measure

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