



Measure

For the men and women of Hewlett Packard/JANUARY 1975

Golden treasure of the



Sections of the frames used for holding printed circuits at the highly automated new Manufacturing Division PC facility in Palo Alto become thinly covered time after time with gold coatings following repeated cycles through the gold cyanide dip. Here plating-line leader Steve Osinek inspects the disassembled frames from which the gold will be removed. Improvements in the holding frames are being made to reduce unnecessary gold plating. As the cover photo shows, quite a few gold scraps also end up on the floor of the PC building; all are carefully swept up for reclaiming by commercial refiners. HP no longer sells such precious metal scrap but gets credit for it, thereby saving on sales taxes and brokerage fees.

trash barrel

□ In those fondly remembered years before 1971, when gold was priced at \$35 (U.S.) per troy ounce, there didn't seem to be too much need to worry about those barrels of scrap and trim or those drums of plating rinse. They were simply part of the waste resulting from the production of printed circuits as well as to a lesser extent from microcircuits and integrated circuits.



A leader and pioneer in the development of methods for recovering precious metals at Loveland Division has been process engineer Derl Pratt. He was inspired to do this, he said, by a study of gold recovery techniques initiated in the Loveland PC area late in 1973. Looking beyond his own immediate projects and area, Derl began tracking down the many ways in which gold can be lost via scrap, waste rinse, dust and machinery. These investigations have led to significant additional savings at Loveland.

If such materials could be gathered and shipped to refiners with little fuss then any payments received back for the precious metals recovered were all to the good. It was seldom that anyone bothered to weigh the scrap accurately or to count the exact number of barrels picked up by the scrap refinery trucks, or even to record the number of pickups. In other cases, the drums of rinse were simply hauled away to a dump. The economic incentives for doing otherwise were just not strong enough at that time.

It turns out, of course, that these materials really are mother lodes of gold, albeit in very small quantities per pound of waste. In the case of printed circuits, a thin coating of gold is deposited on the surface of the metal circuitry. Basically this provides "solderability"—that is, a good base on which to solder the other electronic elements that eventually will be loaded onto the board. Other benefits are good electrical contact, corrosion resistance, and attractive appearance. The printed circuit rinse accumulated its gold in the form of drippings from the gold cyanide solution carried from the gold plating tanks. Quite a bit of gold also is sidetracked by the equipment used for holding the PC boards during the plating process; layer after layer of gold builds up on the holding frames to the point where they look almost like solid gold. In point of fact the gold coatings are only five millionths of an inch thick each.

At current prices for gold the value of those seemingly small quantities has been magnified about five times since 1971. HP's PC, MC and IC production people, however, have not been waiting for it to hit \$200 an ounce. They've plugged many of the obvious gaps in the recovery process, started some extraordinary searches for answers to more elusive recovery problems, and—finally—are in hot pursuit of less costly substitutes:

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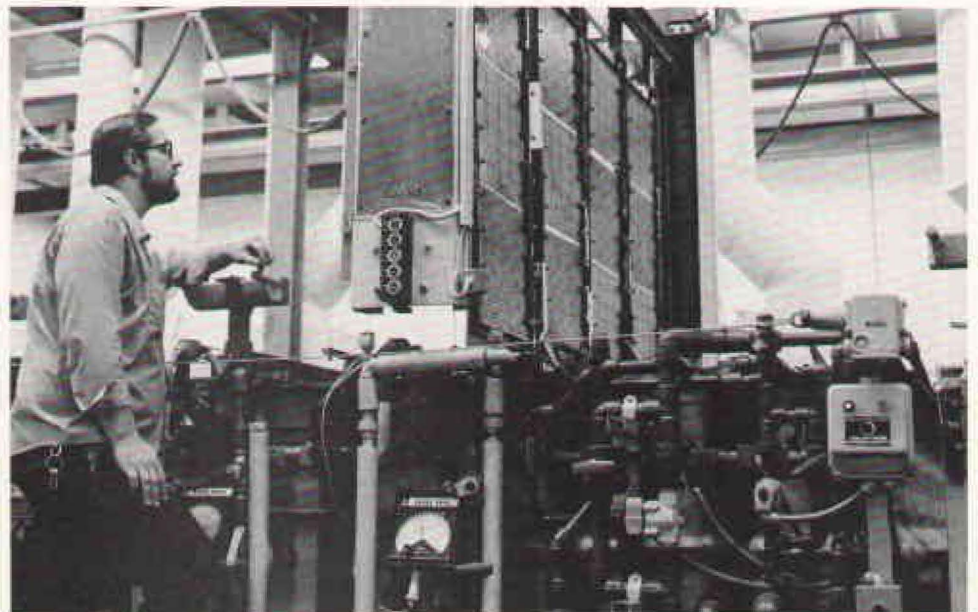
golden treasure



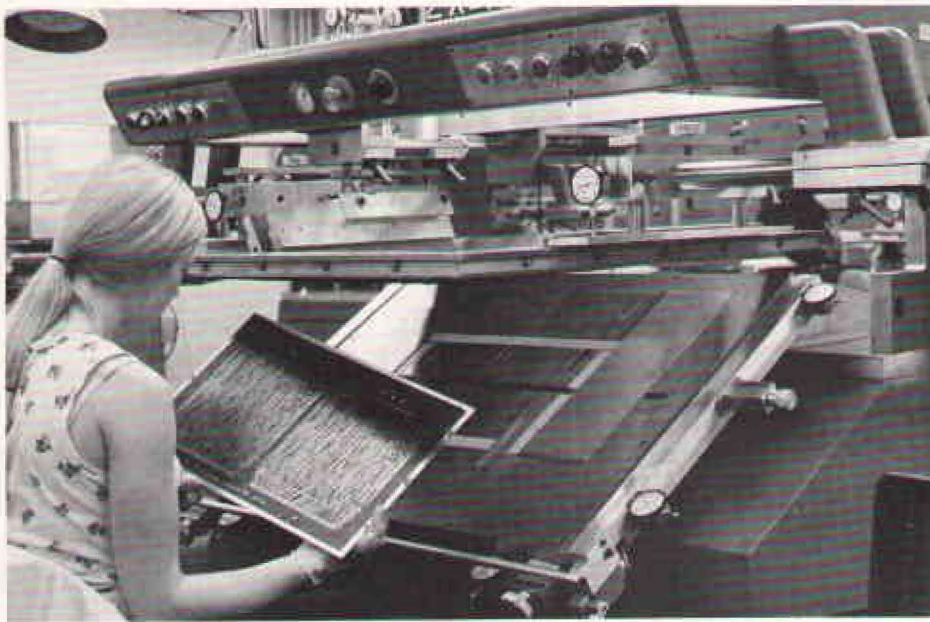
A principal source of recovered gold is the trimmings of printed circuit boards. In the course of a busy day at Building 15, Mike Szczerba may fill up to three barrels of such trim, each having a total of three to four troy ounces of gold — and each ounce worth in the neighborhood of \$180. The gold comes back to HP in the form of soluble gold salts.



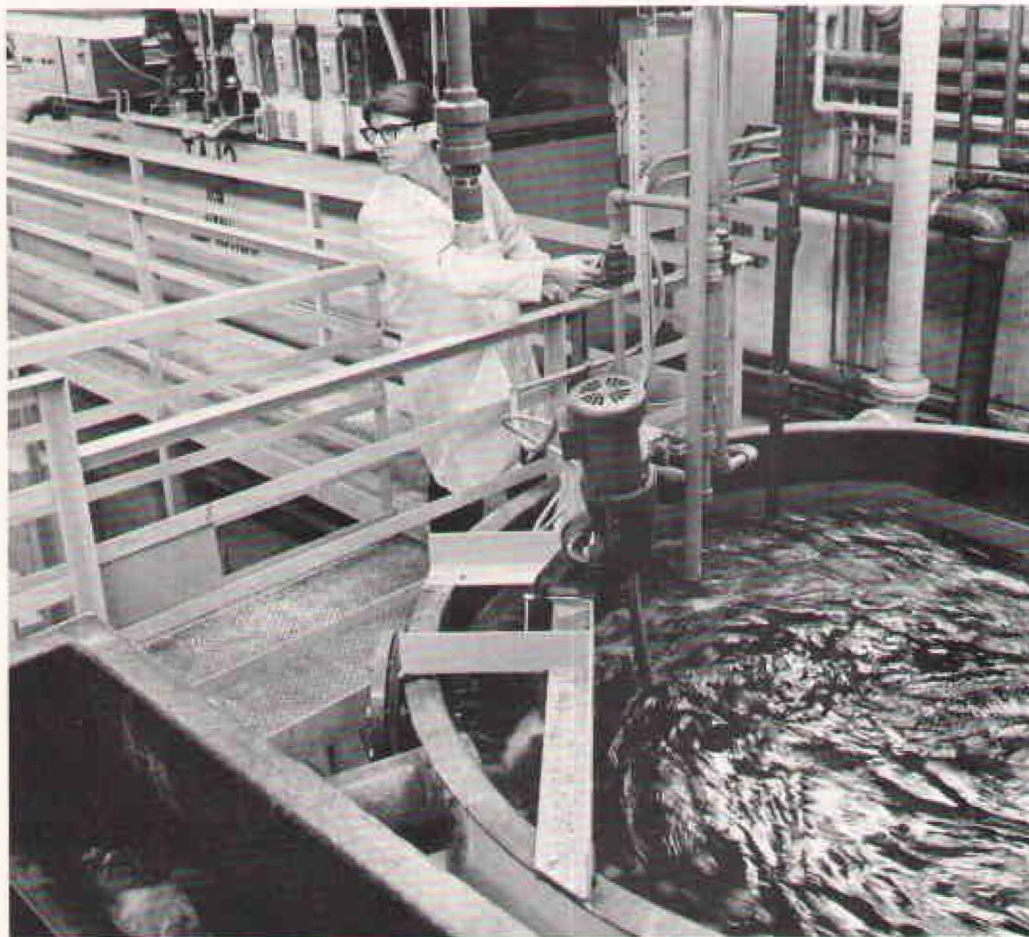
Gold cyanide solution used in the PC plating process is siphoned into 55-gallon drum by Ron Sipes for transfer to backup production line at new Palo Alto facility. The solution holds approximately one ounce per gallon, and plated PC boards carry a considerable quantity of the solution over into the adjoining rinse tank. At one time the favored recovery process was to use an ion-exchange resin, but recently the Palo Alto printed circuit shop has instituted a plating method which PC manufacturing manager Gaylan Larson claims is more efficient.



Microcircuits produced by HP's Technology Center, and integrated circuits produced at various HP locations, all use gold coatings to some extent. While the quantities involved in these applications are lower in comparison with printed circuits, efforts are being made to recover them where feasible and economical.



Meanwhile the search goes on for new methods of plating PC boards such as those being silkscreened here by Vickie Kudrna in Building 15. A first approach was to drastically reduce the thickness of the gold coatings. Now bright tin is being used for the inner surfaces of boards, but gold is still favored for edge connectors because of superior electrical contact.



Gold is far from being the only material recovered from the waste of printed-circuit production. Shown here is an inside view of the industrial wastewater treatment system located behind Building 15 at Stanford Park. Representing an outlay of \$500,000, the facility treats the various acid and alkaline effluents, removing the contaminants from the process water. Larry Ingraham, HP pollution control specialist, checks the chemical balance of the water prior to its release into the Palo Alto system.

□



Egon Loebner (left), now on a special U.S. science and technological mission in Moscow, is seen with Arthur C. Clarke, famed science and science-fiction writer, during the latter's visit to HP in 1970.

Lab man's Moscow mission

□ You may be sure that America's scientific and technological interests will be expertly represented in the Soviet Union for at least the next two years; HP's Egon Loebner is now on leave there where he will serve as counselor for science and technological affairs at the U.S. Embassy.

To his many friends and colleagues in science and engineering, Egon is widely known as a kind of "inventor's inventor." With several dozen patents of his own, chiefly in the field of optoelectronics, he has taught a special course at Stanford University on "how to invent and discover," and has championed the cause of inventors in articles, legislative ideas, and professional associations. Far-ranging in his inquiries, Egon also once developed a concept of regional government based on observations as to the size of a community

that any one politician can properly represent (25,000 maximum).

Born in Czechoslovakia in 1924, Egon came to the U.S. in 1947 on a Hillel scholarship to the University of Buffalo in New York. He continued there through 1955 when he received his Ph.D. in physics. His thesis was the first to describe his field of interest as "optoelectronics."

Egon has been a significant contributor to HP's involvement in optoelectronics since joining the company in 1961, most recently as a research adviser in the solid state lab of HP Labs.

In his new assignment he brings not only the technical credentials but also an ability to speak the Russian language. Egon put this to use recently in conducting a team of Soviet scientists on a tour of technical centers of the U.S.

Besides helping to coordinate U.S.-Soviet joint technological programs involved in atomic energy, energy, transportation, health and housing, he will soon be a key coordinator in the planned space rendezvous between an Apollo and a Soyuz spacecraft on July 15.

Obviously—and regardless of the extremes of Moscow weather—Egon is in his element.

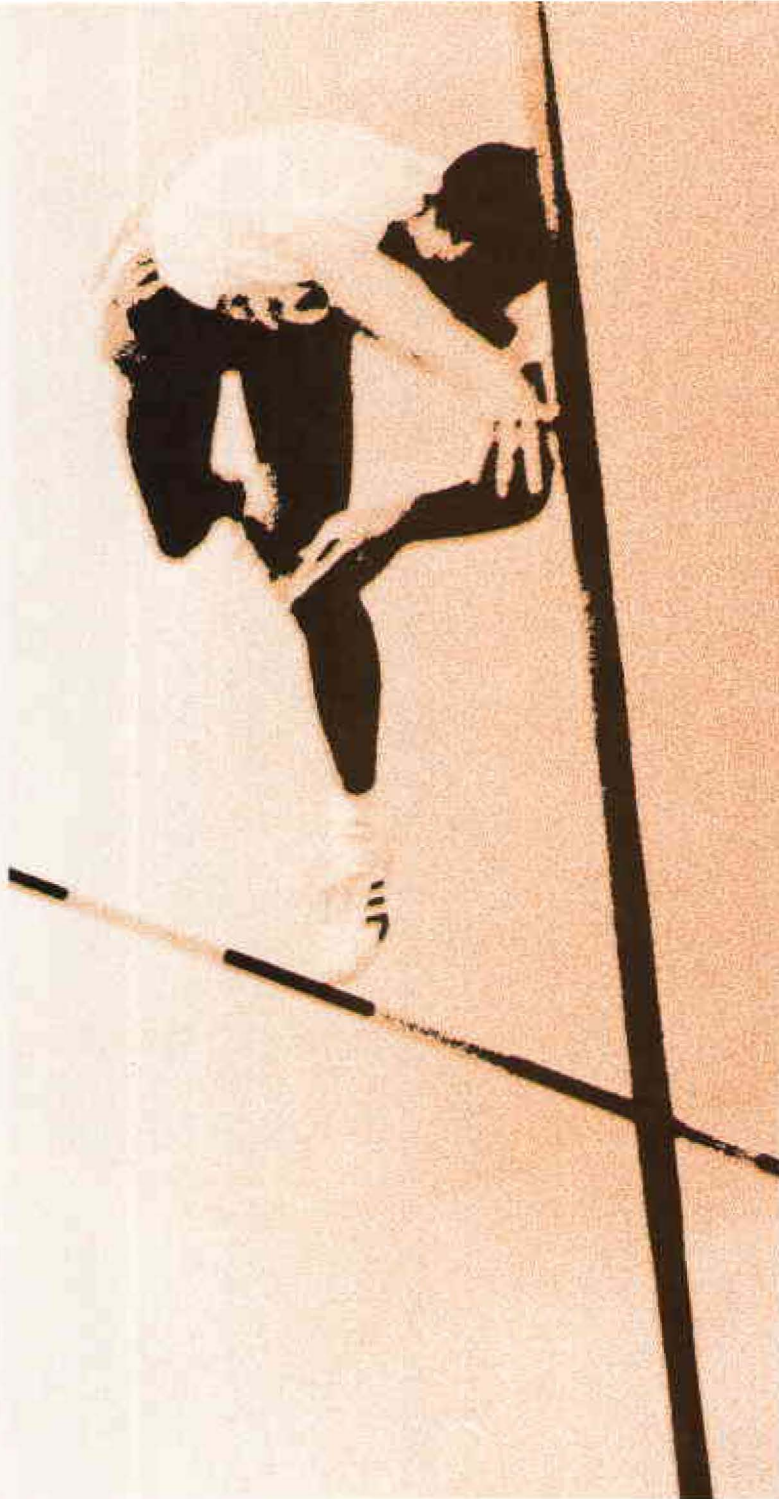
New team at YHP

□ If the three fellows in the photo at right can ever untangle those hands they will be able to go about their new assignments as the top managers of YHP, Hewlett-Packard's joint venture organization in Japan. In the center is Kenzo Sasaoka, the new president and chief executive officer; Kenzo formerly served as facility manager and R&D manager. At left is Toshio Muraoka, elected as vice president; he will continue to have primary responsibility for field marketing. At right is John Brown, also elected a YHP vice president, serving in a general advisory capacity to the president; John is the former general manager of San Diego Division.

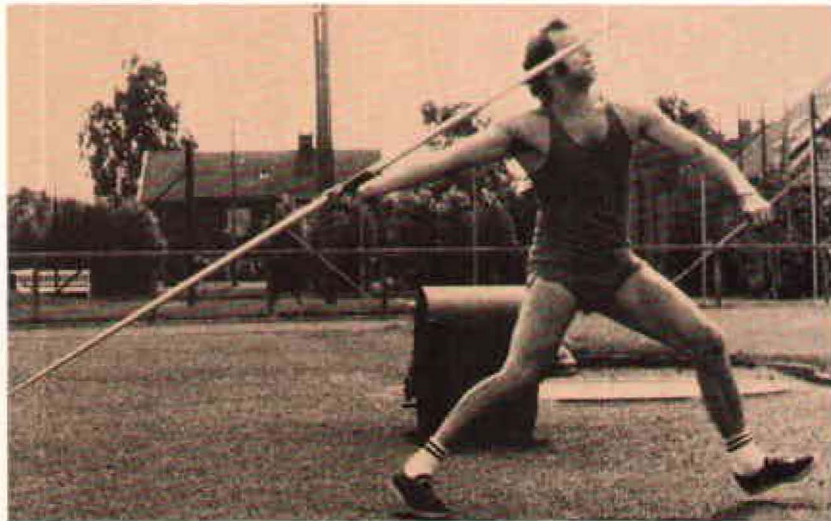
The occasion for the changes, announced at YHP's 12th Shareholders' meeting in December, was the election of Shozo Yokogawa, YHP president since its founding in 1963, to the presidency of Yokogawa Electric Works, HP's joint venture partner in YHP; Shozo will continue as chairman of the YHP board of directors. Members of that board are seen below, from left: Jack Dunn, special field-marketing assistant; Katsuto Kohtani, administrative manager; Toshio Muraoka, field marketing manager and new vice president; Bill Doolittle, HP International vice president; Shozo Yokogawa, chairman; John Brown, special assistant and new vice president; Kenzo Sasaoka, president; Alan Bickell, general manager of Intercontinental Region. □



On the right track



□ What at first glance appears to be the whole Royal Danish Athletic Association's Olympic track and field team turns out to be something quite otherwise. It becomes, in fact, an Englishman named Bill Cox, but he does happen to perform more or less like a one-man team, and he does it in Denmark.



Bill joined HP Denmark last April as a medical products field engineer in the Copenhagen office. In doing so he brought with him an interesting blend of extroversion in athletics and dedication in medical engineering.

Newspaper clippings indicate that Bill got off to a winning start in 1960 as a 13-year-old East London schoolboy, running the mile and then branching into other events. In time he became the London and England pole-vault champion, and competed successfully throughout Europe in that and other events including javelin and broad jump. Clearly, he had the makings of a decathlon performer, and that in fact is what he has been for the past ten years. At his best in this ten-event competition, he scored 8,112 points (the world record is 8,454 points set in 1972 by USSR's Nicholay Avilov). Special circumstances denied him a highly likely place on the U.K. Olympic team

of 1972, but Bill today is content just to compete for the sake of competition. Actually, he says, his performances in 1974 were his best ever, and he plans to work even harder in 1975.

Bill's love of track and field goes beyond his own participation in events. A good amount of his time is spent in coaching other members of the FIF Hillerod team, and in writing training papers for various Danish athletic associations.

Along with athletics young Cox had become very interested in medicine. At first he aimed at becoming a physician, but soon saw that he probably would be better attuned to more individualistic activity, but still related to medicine. This led to a degree in science and employment with an international firm that was developing artificial organs and implantable devices. In the course of work on this project, Bill traveled the world

consulting with and training urologists and surgeons, met and married a Danish girl in Africa, and returned with her to Denmark when an opportunity opened up there to represent the firm.

A special project involving the blood dialysis of children caught his interest, and Bill is now working on his thesis for a doctorate in science which will be on the biomedical aspects of blood dialysis.

How did all of this lead to HP? Bill said he began learning about HP instrumentation quite soon in his former work, became increasingly interested in the application of electronics to medicine, and then later discovered some things about the company itself which he very much liked. In particular, he liked the informality inside the company in combination with the highly organized support it offered its customers. An all-around performer just naturally takes note of such things. □

The wide wide world of HP video...



Egg-like sound shells enable customers and field marketing people to concentrate on new-product or service videotapes with great individual privacy in the busy training room at Eastern Sales Region's Rockville, Maryland, headquarters.

□ How much do you know about Hewlett-Packard television?

Oh, you're not even sure we make one? But you think it's not a bad idea!

Well, to set the record straight, HP does not make television sets. Repeat: HP does not manufacture TV receivers (or Packard automobiles).

But it does produce—and even sell—videotape programs.

In fact, it may surprise you to learn that HP is thought of as one of the leading producers of videotape programs in all

of industry. That's no small claim, but production figures bear it out: no other known industrial organization produces the 200 or more major videotape programs per year that HP television has averaged over the past six years. About half of that figure is produced by the manufacturing divisions; the balance—including all full-color programs—by the Corporate studio (HP-TV) in Palo Alto.

HP is also a major user of television. Again, few firms can match the number of playback units the company employs

in its own training and selling activities. For example, virtually every one of the sales offices located around the world has playback equipment. All manufacturing and corporate facilities also use videotape as a communications medium.

There must be some compelling reasons behind these figures:

First is the large number of people (28,000 employees) working in highly decentralized organizations widely dispersed around the world. Second is the large number (scores!) of very technical prod-

ucts that HP introduces each year. In each case videotape is highly efficient not only in its ability to reach the farthest points of the organization and its customers but also in communicating a message in a carefully edited visual-verbal way that greatly compresses the time required to absorb it.

In addition to producing the 500 or more videotapes currently used in sales supporting roles, HP's television people have put their considerable talents to work on other forms of corporate communications. Some of these include very simple "video memos" between managers or technical people at long distances from one another. More recently, a series of four video productions for employee orientation programs are nearing the finish line, and a short end-of-the-year video message



Use of videotapes in divisional and sales office viewing rooms is growing rapidly, and new emphasis is being made on letting HP people know what programs are available and what's coming up next. Tapes have proved an excellent and economical substitute for actual product demonstrations. Another popular use internally is the "video memo" used to communicate a specific answer to a specific problem.

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What some users say...

On the Boulevard St. Germain, Paris, a small college bookstore named "La Regle A Calcul" (the slide rule) catches the eyes of students and professors by displaying videotapes of HP pocket calculators. At last count, according to Paul Brault, TV coordinator for HP France, the shop has sold more than 1,000 HP calculators, and the owner was more than moderately impressed by the sales impact of videotape.

- Stanford Park Division's Charlie Marshall reports that "We have been experimenting with the production of videotapes for microcircuit assembly training. Our last tape, although rough, demonstrates the ability to capture on tape scenes that normally could be viewed only through high-power microscopes. These visual images become powerful teaching tools, we feel!"

- Chuck Ferguson, field engineer at the Englewood, Colorado, sales office, reports that some customers "really went 'wild' with ideas as to how they could use the 3050B after seeing a presentation of the data acquisition system on videotape. The Loveland Division's videotape really helped unleash their imaginations. And since they are just in the pilot plant stage, I'm very excited about our sales prospects with this system." (In addition to the black-and-white studio at Loveland, HP has active video studios at Colorado Springs; AMD, Sunnyvale, California; and South Queensferry, Scotland.)

- Selected at random, three people in the Richmond, Virginia, sales office responded as follows to questions about their use of videotape:

Clay Smith, district manager, endorsed videotape as "an excellent way to present a variety of things—new products, service information and the like. But I think we may

be missing the boat in not using it more informally—for 'video memos' or for communicating to the field things such as technical sessions that are held in the factories. They don't have to be polished to be useful. Just tape it!"

Dick Jones, Instruments senior field engineer, said, "All of us use it. I mainly use it for personal training, and I think that is what most of the field sales people do, too. On the average, I'd say I look at an HP tape about every week or two. I try to see most of the Instrument tapes, but of course I concentrate on those subjects that have most interest to our particular customers!"

Norm Eby, Medical service specialist, confessed that "I probably don't use it enough! I spent a lot of time looking at the tapes when I first started two years ago. It was excellent training material. As far as showing maintenance tapes to customers, most medical customers really aren't interested in learning how to service their equipment. They leave that up to us!"

- "Videotape will be emphasized in a number of ways throughout Europe during 1975," said Doug Herdt, manager of HPSA's Southern Region. "Playback facilities will be available in many more outlying offices including Saudi Arabia and Moscow. There will also be a gradual shift to more color outlets. Many sales have been closed on the basis of videotape presentations—that is, without the benefit of a real instrument demo, although usually with a field engineer on hand. In some cases medical students have come in not only for tapes on intensive-care training, but also for tapes that teach computer techniques potentially useful in medicine!"

HP video

from Bill Hewlett and Dave Packard was taped for viewing by all HP people. Management training and professional development are other areas that have made extensive use of TV. That this will continue and even grow seems likely in view of the recent merger of Corporate Training and Personnel Development into a new Corporate Training and Management Development department of Corporate Personnel under Bill Nilsson. HP-TV will be an important member of this new team (see News in Brief, page 14).

Now, because we are talking about a visual medium, let's see if some pictures can help tell the story . . .

Network-quality studios in Palo Alto are used for production of all HP's color videotapes as well as many black-and-white tapes. Shown here is a scene in the taping of an eight-part management development program titled "Managing Management Time," featuring management consultant William Oncken.



Looking a bit like CBS's Walter Cronkite, HP-TV's anchorman Walt Robson in foreground and associate Tim Wheeler direct the Oncken tape's production. The professionalism of HP's videotapes has gained wide recognition and many top international awards.

HP-TV's dubbing and distribution team in Palo Alto tries to give overnight service to field and factory orders for videotapes. Several dubbing machines are seen to the left of Cindy Elledge. Users are encouraged to return the tapes which can be used repeatedly as old programs are erased and new ones recorded on the "recycled" tapes.



Many thousands of HP people around the world also can get a personal closeup of Bill Hewlett or Dave Packard via their taped messages produced and distributed by HP-TV. Internal communications represent a growing role for television.



A big seller ever since it was first published in book form, George Stanley's "Practical Transistors" is still a hit in its serialized HP videotape version. Although HP sees videotape primarily as a sales communication tool, in a good many instances it can also become a product for sale. In fact, of the 500 HP tapes considered as current, 175 are available for sale to customers. Revenues from such sales have grown significantly.



As a part of the newly integrated Corporate Training and Management Development department, studio facilities on Page Mill Hill will increasingly serve as a center for training seminars, conferences and management meetings. Shown here is a gathering of R&D managers.

□

News in Brief

Palo Alto—Hewlett-Packard's largest ever semi-annual cash profit sharing—\$10,847,190—was distributed last month to more than 24,400 HP people around the world. In all, more than \$20,560,000 was distributed to HP people under the company's profit-sharing plan during 1974. In 1973, about 21,500 employees received more than \$13,300,000.

The amount of profit sharing received by each employee is determined by the

individual's base wages. Employees are eligible to participate in the program after six months employment. The company has had a profit-sharing policy since its founding in 1939.

Palo Alto — A new Corporate Training and Management Development team has been formed through the merger of the former Corporate Training and Management and Personnel Development departments. Heading the new department will be Bill Nilsson, reporting directly to Ray Wilbur, vice president-Personnel. Announcing the change, Bob Boniface, vice president-Administration, said: "The rapid growth of HP over the last two years has accentuated the importance and need for an aggressive training and management development program. The new team will enable us to take better advantage of our resources."

Activities of the two merged departments are all located in Building 18, at 1801 Page Mill Road, where they share the use of such facilities as the TV studio and seminar rooms.

Palo Alto — A new programmable scientific pocket calculator with significantly more keyboard functions and addressable memories than any previous pocket model has been introduced by Hewlett-Packard.

The new HP-55 is also the first pocket calculator with a built-in digital timer, valuable for short, timed experiments.

The nine-ounce HP-55 features simplified, keystroke programming; 20 addressable memories (twice as many as any other pocket model has); a total of 86 keyboard functions, operations and conversions; and a digital timer with 100-hour capacity and the ability to store and recall as many as 10 splits (elapsed time readings within an event).

Price of the HP-55 is \$395.00 (domestic U.S.). Deliveries will begin this month. Sales to employees are available at the standard employment discount of 30 percent, with a lifetime limit of one per employee.

Geneva — Max Gamper, one of the founding directors of HPSA, passed away December 6 in his native Switzerland at the age of 63. He is survived by his wife and three children.

Gamper studied law at the University of Geneva and went into banking in the late thirties. He became deputy director of the Banque Federale S.A., Geneva, and later the director of Credit Suisse. He also held important positions with several national and international societies, and was a captain in the Swiss Army.

Gamper's advice and counsel when HP began European operations helped solve many of the problems of establishing HPSA in 1959, and he served on its board of directors for 15 years.



From the president's desk

In recent months a number of HP people have asked me about our Profit Sharing Retirement Trust Fund for U.S. employees. This interest has been generated partly because many of these people are approaching retirement, and partly because of the very poor performance of the stock and bond markets in 1974.

Let me say a little about the Plan itself. HP started a pension program in 1948 with an insurance company, but in 1956 we modified the program so that it became a Profit Sharing Retirement Plan, financed by HP through contribution of ten percent of its pre-tax U.S. earnings annually. A local national bank acts as trustee of the Fund, and professional investment groups manage the day-to-day operations with policy advice provided by the company.

Employees become eligible for participation after completing three years with the company, and currently more than 10,000 HP people in the U.S. are covered by the Plan. (There are separate pension plans for HP people outside the U.S.) Since the Plan was started, the average HP contribution has amounted to 7.4 percent of the base wage of the participants.

How well has HP done in the 18 years since it has taken over responsibility for fund investment? There are all kinds of comparisons that may be made, but certainly one would be to see how the Fund matches the performance of the Dow Jones Industrial Average. If one assumes that all of the dividends from the companies that make up the Dow Jones were reinvested, then that Index would have shown an average growth of about 5 percent per year from 1956 through 1974. This compares with an approximate 8 percent growth of the HP Retirement Fund. Thus, at least by this method we have not done so badly. Other tests provide similarly favorable comparisons. It might interest you to know that the current value of the Fund at the end of last year was approximately \$49,500,000, and that this will be increased by about \$10,500,000 when the company makes its contribution for 1974, in the middle of this month.

Despite this relatively good performance, a few problems with the Fund have become evident as more and more of our people approach retirement age. The principal of these is simply that a participant's fund balance is directly related to the state of the financial market. Thus, if a person retired a year or so ago, his or her interest in the fund would be substantially larger than if that same individual retired at the end of 1974. Dave and I have been very much concerned about this problem, and made recommendations to the Board of Directors for certain changes that would tend to minimize the effect of market fluctuations on the amount of money that an employee would receive on retirement. The Board accepted our recommendations, and an amendment to the existing plan has been approved.

Under this modified plan a second Trust Fund (called Fund B, or the "Over 55 Fixed Income Fund") has been established. Funds in Fund B will be invested with preservation of value, rather than growth, as the objective. When employees reach the age of 55 their interest in the original Fund A will be transferred gradually to Fund B, so that by age 64 their accounts will be fully invested in Fund B. The net result is that the amount available on retirement will represent the average performance of the fund value over the previous ten years. This arrangement allows the full effect of market growth to be realized during the early years of employment, but the salting away of this growth during the final ten years.

Participants who are presently 55 years or older will have their balances in Fund A transferred to Fund B on a schedule based on age, or on a percentage arrangement to be selected by each person individually.

In addition to this modification, Dave and I also looked at a list of longer service HP people who will be retiring within the next five years. This survey indicated that even with the relatively adverse market situation of last year, the fund will provide a reasonable retirement base when coupled with Social Security for the vast majority of the people reviewed.

I have also found that there is some confusion as to the form in which HP people can receive retirement benefits. In general, a participant's balance can be made available in a lump sum should the individual so desire, and the bulk of payments to date have been in this form. There is, however, a Retirement Committee composed exclusively of HP employees which is empowered to make a decision as to whether a retiree should receive funds in a lump value, or whether it might be wiser to distribute the amount out over a period of time. There is nothing, however, that prevents an individual from requesting that his or her pension balance be used to purchase some form of annuity, and a number of our employees have selected this option.

These are difficult times for all retirement funds, and I just wanted to take this opportunity to report to you on the status of our own Fund.

Bill Hewlett

The HP haul of fame...



Porters frown, children shout and fellow travelers stare, but HP's Dick Gasperini takes it all in easy stride—which is a good trick considering that he is hauling 400 pounds of HP equipment behind him.

The trick, of course, was to put wheels on the equipment cases and then to link them up—not an original idea but one that still gets lots of attention whenever Dick tows his wagon train through an airport lobby. He's been doing that with increasing frequency due to the popularity of his mission on behalf of George Stanley's Instrument training department, namely, teaching two-day seminars on "Digital Troubleshoot-

ing Techniques" to customers around the U.S. Made up mainly of service and repair technicians from all branches of the electronics industry, the paying customers attend the Gasperini course in groups of thirty. The course makes extensive use of the HP Logic Lab and digital troubleshooting equipment that Dick transports to class. Asked to name three good reasons for doing all this, he quickly spells out: Goodwill to HP for providing a much-needed service; exposure of new customers to HP products; and—speaking of things logical—it has proved to be financially profitable.

Measure

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