

# Measure

For the men and women of Hewlett-Packard/JANUARY 1974



# 2001 — the new Ice Age?



□ There is no doubt about it, mankind is at last doing something about the weather—and to it.

Not all of the doings are intentional or beneficial. According to some meteorologists, for example, we may be well on the way to another ice age by the year 2000. How are we achieving that unwanted miracle? Simply by stirring up so much dust through accelerated farming and industrial activity that the polluted ionosphere will gradually filter out or reflect more and more of the warming rays of the sun.

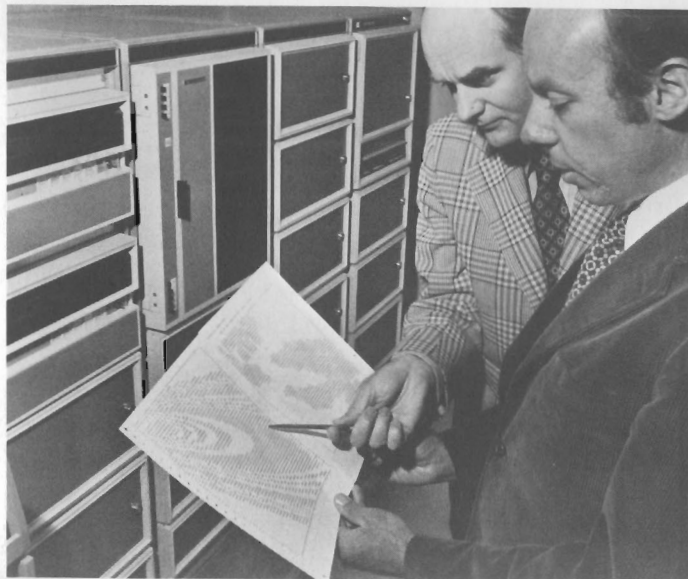
On the other hand there has been speculation that we might be doing just the opposite, specifically trapping more and more heat within the earth's atmosphere by virtue of the tremendous quantities of carbon dioxide that we now release. According to this theory, the CO<sub>2</sub> gas admits the short-wave solar radiation but impedes the escape of long-wave radiation reflected by the earth. The weather scientists call this the "greenhouse effect," and warn that it could lead to the melting of the polar ice caps, thereby turning vast areas of land into newborn oceans.



The key word in the foregoing is "speculation," because fortunately the evidence concerning either of those dire alternatives is just not very conclusive at the moment. But their cosmic scope does tell us something about the power and volatility of the forces involved in weather, about the possible consequences of altering the balance of that power, and about some of the current concerns of weather researchers.

Overall, it appears from evidence that a lay observer can readily gather that the field of atmospheric science—of weather observation and prediction—is in the midst if not the very verge of some significant breakthroughs. Consider the following items:

- Satellite observation, now about a dozen years old, will make major strides over the next few years, including world-wide geostationary coverage and uniform data.
- Weather data, already the prime example of international interchange, will become more cooperative than ever. One international project, the Global Atmospheric Research Program, hopes to develop the ability to make large-scale weather forecasts as much as two weeks in advance.
- Land-based radar may soon be able to monitor wave conditions of mid-ocean areas, and to infer wind speeds and directions. Such a system would result in much greater ability to observe conditions over wide ocean areas not now monitored. The system would bounce signals off the ionosphere and use the Doppler effect to measure wave heights, periods and direction.
- Computer and data-acquisition systems are finding a place not only in the major national and international weather research centers but also in regional and local monitoring stations, enabling them to cope with larger volumes



*Shown are staff scientists of the San Francisco Bay Area Air Pollution Control District examining a map—prepared by an HP 3000 computer—that shows how pollutants flow in the atmosphere. The sophisticated but low-cost HP system monitors and forecasts atmospheric contamination, and helps enforce air-quality standards. Among other chores, it keeps records of 40,000 pollution sources, makes available complete information inspection and compliance activity, and prepares dynamic modeling of the distribution and movements of airborne pollutants.*



*Senior scientist with NOAA's Atmospheric Physics and Chemistry Lab at Boulder, Colorado, points to strip-chart recorder, one of many HP instruments, used in airborne monitoring of surface temperatures, high-altitude water vapor, and clear-air turbulence. This particular aircraft, a NOAA Convair 990, crashed in a golf course less than a mile from HP's Mountain View complex last year. A new 990 with a full complement of new HP gear was recently placed in service.*

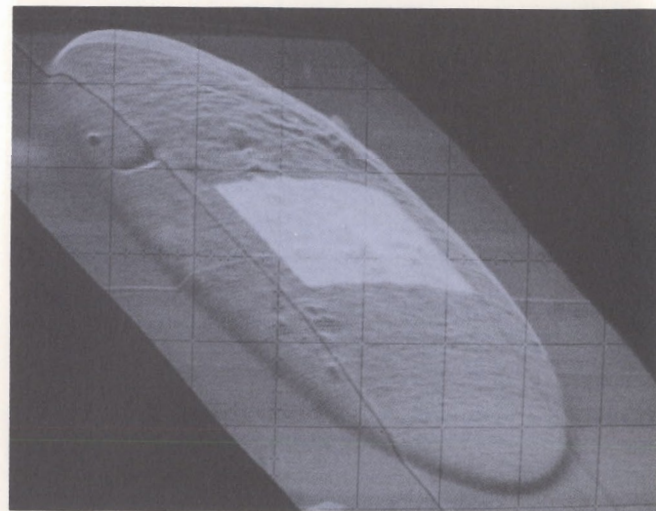
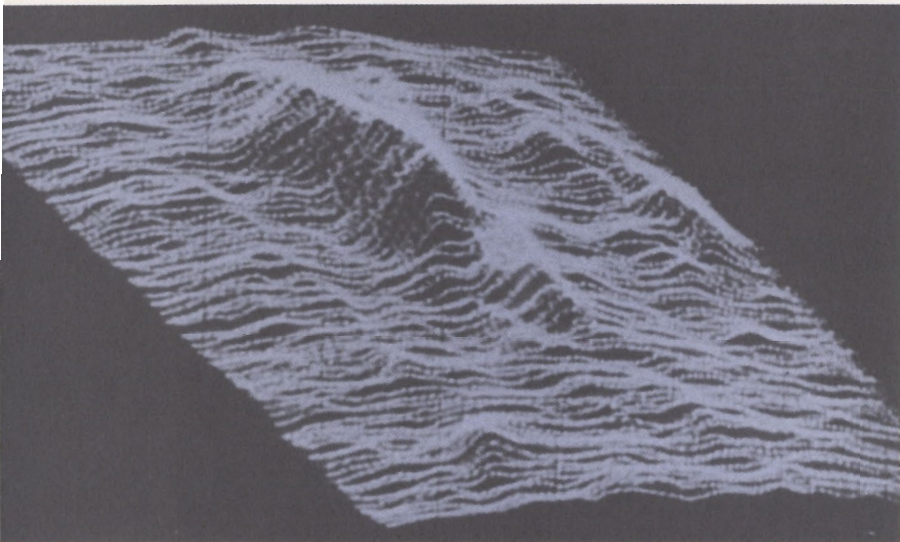
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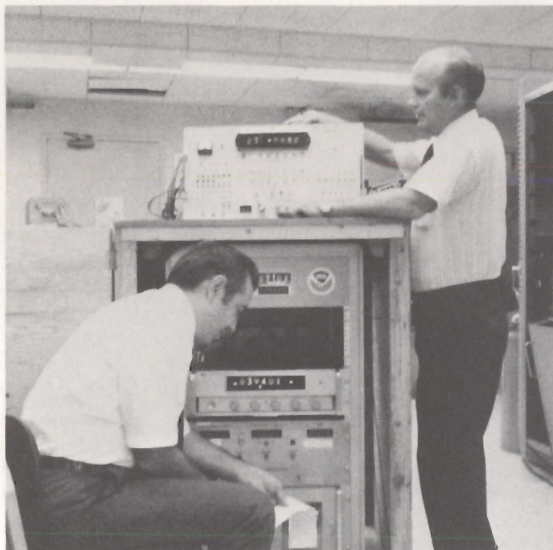
# new Ice Age?

of more varied data. This will help bring about a whole new order of sophistication and accuracy in meteorological forecasting.

Where does Hewlett-Packard fit into this picture? A traditional answer to that question is that our products participate in a great many scientific activities that concern or relate to knowledge of the atmosphere. Actually, that is a tremendous involvement when you consider how vital weather is in the fields of agriculture, aviation, shipping, communications, and so on. But now, more and more HP products are beginning to show up in applications that directly involve the monitoring, processing, analysis and communication of weather data itself. Some of that involvement is portrayed in the examples shown on these pages:



*An HP 1300 display at the Environmental Research Lab in Boulder, Colorado, is used to present a three dimensional, hydrogen-alpha photograph of the sun. The view above shows the sun's disc appearing like a spaghetti-covered loaf of French bread. The enlarged detail at left shows how the surface rises and falls as a result of solar flare activity. The significance of the flares was brought home to the world in August, 1972 when an unexpected series of sunstorms released tremendous quantities of energy that influenced our environment in some strange and powerful ways: Radio communications went all askew—sometimes enhanced, sometimes absorbed; radiation reached levels that would have imperiled astronauts had Apollo missions been in progress; northern lights lit up the skies of the northern hemisphere; homing pigeons lost their way, apparently due to the disruption of the geo-magnetic field. The sun, of course, provides the heat energy that "drives" all of earth's weather, and is studied intensively by various branches of science, including atmospheric science.*

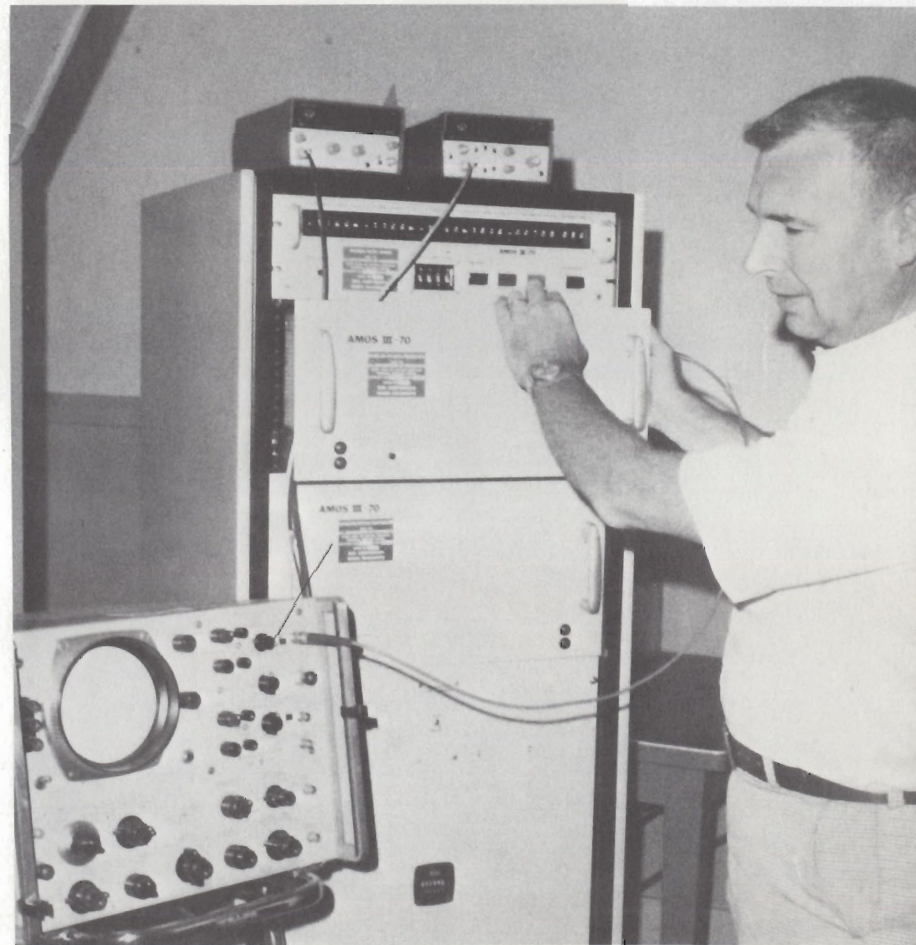


*At the National Environmental Satellite Service in Maryland, scientists check instruments used in testing infra-red equipment aboard Nimbus Satellite. The infra-red technique reveals the absorption of heat at the surface of the earth and is considered one of the most promising observational methods available to atmospheric scientists.*





*Prior to selecting an HP disc-operating computer system, mid-Canada's Prairie Weather Central relied on remote service bureaus for processing of weather data. Too often that approach had trouble when most needed—when storms disrupted communications. The leased lines were also quite expensive. The new HP system, which includes a 2100 minicomputer, solves those problems plus it has greatly accelerated Prairie Weather Central's data handling abilities. Weather data coming into the facility from more than 250 weather stations is automatically summarized and used in preparation of weather maps from which meteorologists rapidly develop their forecasts.*



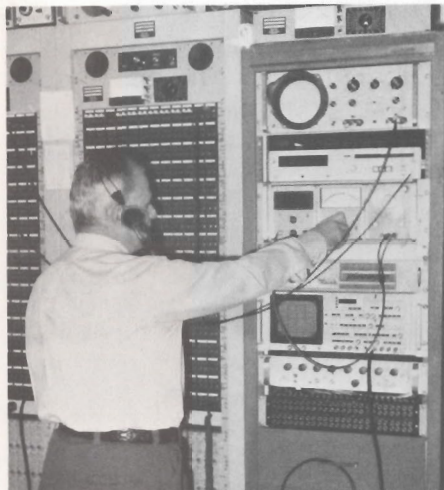
*You've heard about Noah. But how about NOAA—the U.S. Department of Commerce's National Oceanic and Atmospheric Administration? One of NOAA's roles is designing and developing equipment for the Weather Bureau, which it does at the Sterling Test and Evaluation Facility near Dulles Airport, Virginia. The project shown here involves an AMOS 3—Automatic Meteorological Observing Station—that is being checked remotely by Bob McCann, a supervisory technician, using HP equipment. AMOS and its radio-linked version, RAMOS, are designed for rugged duty in remote locations, sending back information on temperature, dew point, wind speed and direction, rainfall and barometric pressure.*

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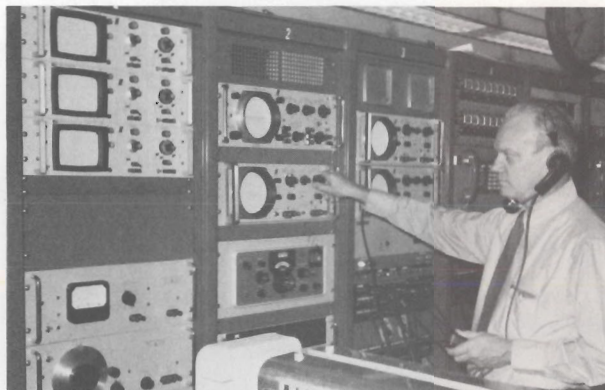


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*Environmental Science Services Administration at Boulder, Colorado used HP frequency synthesizer to determine how fast water vapor and heat are transferred from tropical oceans to upper atmosphere in the storm-making process.*



*At the U.S. National Meteorological Center in Maryland, weather data from all over the world is fed into computers which print out forecast maps for the northern hemisphere every 12 hours. Sources are national weather centers, various special aircraft, manned weather stations, AMOS and RAMOS stations, ships at sea, as well as Tiros, Nimbus and AFT satellites. The HP gear shown here is largely used in monitoring the quality and performance of the many communication lines connecting these sources to the Center.*







HP's Bill Dudley at right receives the keys to the Grumman Health Systems' ambulance he won on behalf of the New Vernon Volunteer Fire Department.

## Bill Dudley to the rescue

□ People in the New Jersey community of Harding Township figured Bill Dudley to be a winner. The HP engineer whose job it is to develop new and better ways for customers to use HP power supply products, has been very effective in the community. His volunteer work includes the role of communications officer for the New Vernon Volunteer Fire Department as well as first-aid trainer in the township.

But it came as some surprise recently when, as a result of Bill's design efforts, the town found itself winner of a \$14,000 rescue vehicle. Or rather, Dudley won it on behalf of the community, by taking first place in an ambulance-design contest sponsored by Grumman Corporation.

According to Bill, he entered the contest because it challenged his imagination and the experience gained in hundreds of hours of first-aid and emergency missions. But he had no thought of winning.

Characteristically, however, he recognized it as a challenge and so did a very thorough job of designing an idealized rescue vehicle, using lunch hours and off hours to research the project and get it on paper.

Although it's called an ambulance, the equipment and arrangements that Bill specified make it more of an all-purpose rescue unit, one able to cope to some degree with such varied disasters as flood, fires, wrecks and falls as well as a wide range of injuries. A number of HP medical instruments were included in his prize-winning design, such as a fetal heart monitor, ECG/Pulse monitor, and portable ECG.

Now that the New Vernon Volunteer Fire Department and Harding Township have their unexpected vehicle, they've discovered that what they now need is a rescue squad to man it. Very likely, Bill Dudley will have some hand in organizing that. □



## Three people

with a combined total of 100 years in the company are pictured here at the recent service-award luncheon in Palo Alto: President Bill Hewlett at left, and Chairman Dave Packard are, of course, well known for their role in founding the company 35 years ago; five years later Elaine Cook joined them and 140 other members of the young HP company. Better known to thousands of HP veterans as "Cookie," she is a story in her own right. For example, she has worked for only one person in her 30 years with the company—Frank Cavier, vice president and secretary of the corporation, who hired her as a bookkeeper. In 1947 she was appointed assistant secretary of the company and its only woman officer.



By virtue of that position she has probably signed more company checks for more money than anyone else in HP. Included are most transactions involving stock purchases, stock options, and a wide variety of loans (fewer now that a credit union has been established in Palo Alto). Describing some of this during the recent presentation of service awards, Bill Hewlett called Cookie "the Mother Confessor to a generation of HP people."

For her part, Cookie has no trouble rationalizing the fact of working for one person in one company for so many years: "The job has simply grown. I never could have worked

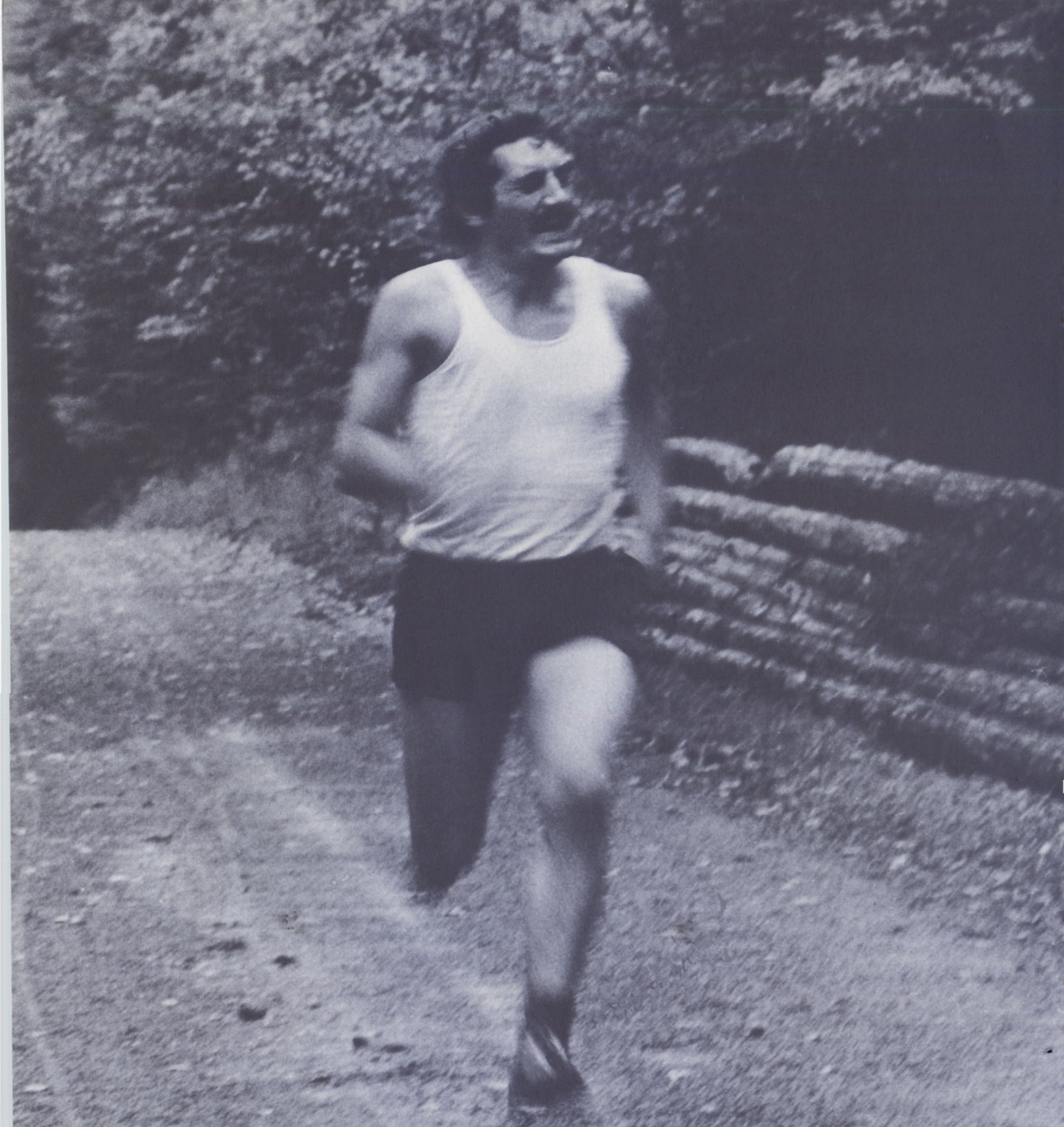




for anyone I didn't respect a great deal. There was just no reason to change.'

Cookie's off hours are filled rather quietly—some travel, some light reading, and some involvement in the Palo Alto community. This latter activity brings her to an organization named "Recording for the Blind," which records many textbooks on tape for the instruction of sightless people. Cookie monitors the tapes, comparing them against the printed text for accuracy. She doesn't understand a lot of the content because of its technical nature. But she obviously does understand its importance to some people. □





...and a healthy New Year!

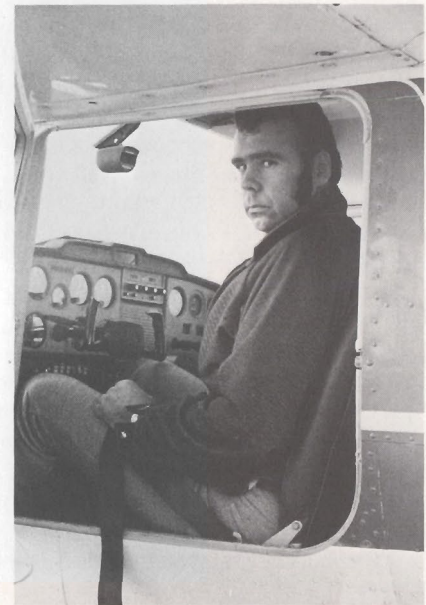




In the early 1960s, life insurance companies in Germany took alarm at the sharp rise in heart disease, particularly among men 40 to 50 years of age—a curve that seemed to match very closely the country's rising prosperity. The insurance industry thereupon adopted the idea of the "Parcours"—an exercise trail or course, generally set in parks or forests—that would be accessible to wide use by the public. Ken Miles, perinatal products promotional writer at the HP GmbH plant, reports that he and systems analyst Gordon Birt (who took the accompanying photographs) have become fans of the Parcours plan. It involves a series of warming up and stretching exercises interspersed by running. There are 15 Parcours, usually two-and-a-half miles long, within a short drive of Boeblingen, as many as 1,000 in all of Germany. Ken soon lost 22 unnecessary pounds, but more important he regained the ability to participate in rugby and to start the ski season safely.



This twosome from Colorado Springs Division were described as representative of many people there who seem to enjoy their health: John Rikken, Low Frequency engineering lab manager, has taken a total of only a few days sick leave in 13 years at HP. Plenty of vigorous exercise such as the handball he is playing here keeps him in shape—to the point where he doesn't have to worry at all about diet: "I eat all kinds of food—and lots of it." Aileen Link, a line leader in the production area, has been on sick leave for only 90 minutes during the past 12 years—because she couldn't get a doctor's appointment after work hours. Her secret, so called, is that she's "just a good old farm girl who has always led a happy, healthy life."



Terry Smith, an electronics technician in the calculator products area at Loveland, feels he has a natural defense against many of the common ailments: he keeps himself mentally and physically occupied. When Terry first came to Loveland just over five years ago he undertook to build a home by way of keeping busy and making some money. Now he is well along toward a commercial flying license. "It seems to work for me," Terry said. "I'm not an athlete or that sort of thing, but I don't get sick very often."

□ You don't have to journey to the Kashmiri province of Hunza, to Vilcabamba in Ecuador, to Abkhazia in the Caucasus Mountains—or any other "lost horizon" lands—to discover people who have a healthy and hardy attitude toward work.

For a start, take a look at the people in your own HP organization. Do you know many of them who take an extra day or so off at the expense of sick leave? Or, of those who seem to experience frequent bouts of illness, how many do you suspect of sometimes imagining their symptoms?

A few, perhaps, but not many.

In fact, HP personnel managers around the world have a very good feeling about the general attitudes of HP people toward their work. They believe (statistics do not come readily to hand) that malingerers—better known as "sick-

*(continued)*



## healthy New Year!

leave abusers" and "goof offs"—are rather rare in the company. Even in those countries where the government pays most of full sick-leave salaries for up to a full year or more, the great majority of HP people are quite restrained and responsible in their use.

Nevertheless, there are some people who are positively extraordinary in their low usage of sick leave. Though some of them do take pride in their record, they do not generally make much fuss over it, so you may have to do some research in discovering who they are.

One source of data about these healthy HP people, in the U.S. at least, is the computerized monthly record of accrued vacation and sick leave time. You're on to something if you see that a person named on the list shows 720 hours of sick leave coming. That means that they have accumulated sick leave for at least a full nine years on the job, and have reached the maximum. (In the U.S., our insurance program covers long-term disability, beginning payments after the first 90 days absence from the job.)

Further checking reveals a surprising number of cases of people who seem almost never to become ill. Their use of sick leave ranges from zero to only a few hours off during the year, and in some cases those hours were taken by medical checkups that couldn't be scheduled outside of working hours.

Is there a reward for being so conscientious? You might ask Tom Martin, *MEASURE*'s own art director. Twelve years ago Tom suffered an illness that put him out of action for four months. His misfortune was compounded by the fact that his then employer had no insurance or sick leave plan of any kind. California State Disability Insurance helped to some extent, but Tom had to refinance his home to help pay a huge bill. Then last year a heart attack again sidelined him. This time, of course, Tom had not only HP's medical coverage but also several hundred hours of accrued sick leave with pay to see him through with virtually no loss of income or accumulation of debt.

On the other hand, Tom wishes that he had not had to take advantage of the various medical benefits. To him and the many others who have put the matter to a test, the truism that "good health is its own reward" is indeed true, and most of them—like Tom—have accordingly adopted more moderate and healthful ways of living. But what about those apparently healthy specimens who have had little need to take medical time off? What are their secrets? From the following cases it would appear that the real secret—and the only one in common—is a good healthy attitude toward work and life:



When MED's Dick Dillman tried climbing a mountain a couple of years ago he came to the conclusion that something would have to go—say, 50 pounds of excess body weight. But what do you do when you consider jogging a bore, and when family activities take much of your attention? Dick's solution was to buy a bicycle and use it to come to work—rain or shine—at the Waltham plant where he is an R&D programmer. He also decided to give up heavy eating. Although Dick says it is no big deal, the routine has taken off the weight—and given him what he calls a nice way of relaxing before and after work. A good cure for the fuel crisis, too.





The well-known power of positive thinking seems to be at work in the cases of two Midwest Sales Region people: Lita Evans, the region's St. Paul, Minnesota, office manager, finds her work very absorbing and feels a commitment to be on the job if at all possible. In earlier years there was a practical purpose in saving sick leave in case her son, Danny, became ill and needed her at home. Luckily, he stayed healthy, and so did Lita, who in ten years with HP has averaged less than a day of sick leave per year. Liz Yohanan, below, secretary in the Chicago calculator office, simply says she's too busy even to think about time off.



When Vincente Capozzi joined HP Grenoble (France) in 1972 he was almost 61 years old—yet he remains one of the healthiest people on the payroll. In fact he reports that his most recent illness was a three-day flu he caught 15 years ago. Vincente, the Grenoble plant's maintenance man, offers a very simple recipe for his wellbeing: never think about your health, never complain, and do not take any drugs. He is also wise enough to have given up cigarettes when he felt they were harming his health—and to eat and drink moderately. Vive Vincente!



"If you're a leader, you have to set a good example, don't you?" That's part of the health philosophy of Vi Martinez, line leader in the cable production area of Automatic Measurement Division at Sunnyvale. Vi has lost very few hours because of illness in her seven years at HP. "I really enjoy my work here and the people. So it's no drag for me to get up in the morning and come to work. At home, if someone has a problem such as a headache or snuffle, our slogan is 'do something about it!' We don't baby anyone. And when we go camping in the summer we like to rough it with tents and campfires and that sort of thing. It's good for you."



## News in Brief

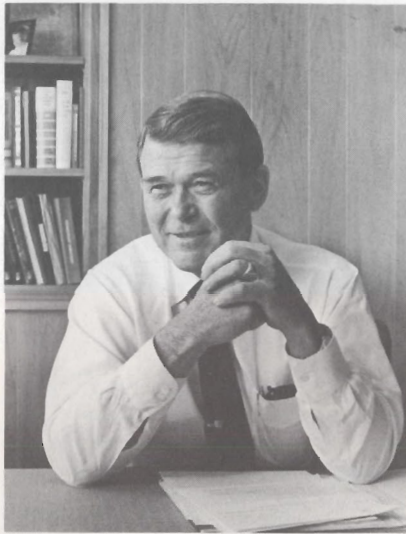
**Santa Clara** — The 5245L electronic counter, which for nearly ten years was an HP instrument sales champion, has a successor that should earn HP another decade of market leadership. A Santa Clara engineering team headed by Jim Sorden has come up with a new job that has ten times the frequency range (500 MHz versus 50), more than ten times the precision (9 digits of readout versus 8) and new abilities to analyze such hard-to-measure phenomena as very short pulses (50 billionths of a second versus 1 millionth). It's going to be especially valuable to people in the fast-growing data communications field. *Electronics* magazine found it sufficiently newsworthy to be the subject of their February 14 cover.

**Palo Alto** — Hewlett-Packard distributed \$6,791,678 to approximately 21,500 eligible employees last month under the company's world-wide cash profit sharing plan. It was the second profit sharing cash disbursement made by HP in 1973, and brought the year's total to more than \$13,300,000. Eligible employees receive profit sharing checks at midpoint and at the end of the company's fiscal year. The company has had a profit-sharing policy since its founding in 1939.

**Loveland** — This new all-electronic distance meter with a range of one mile (1600 meters) has been introduced by HP. Designated the HP 3805A, it is expected to become an important companion to the original HP 3800 which has a range of up to two miles. The 3805A features an automatic digital readout with built-in computer to check distance accuracy, and sells for \$3,395 in the U.S. Its major applications include boundary, utility and construction surveying.







## From the president's desk

In the past there have been several instances that serve to highlight company policies in action. I think it is interesting to look at these when they occur, and to report them when they have general interest to Hewlett-Packard people. We recently had a good example in connection with a problem in the San Francisco Bay area with the rapid transit system known as BART (Bay Area Rapid Transit). BART has had a wide variety of problems that have prevented it from operating at full effectiveness and which have delayed opening trans-bay service.

A little over a year ago, the State Senate appointed a "blue ribbon" panel of scientists—including Barney Oliver, HP's vice president for research and development—to look into BART and assess the safety of the automatic train control system. The panel made a number of recommendations for improving BART's safety, but one main problem remained unsolved. The train detection system would not always give warning that a dead train—one that had lost third rail power—was on a signal block ahead, particularly when that train was standing still. As the saying goes, this is no way to run a railroad.

Barney got interested in this problem and together with Len Cutler and Dave Cochran in HP Labs, decided to try out some innovative ideas. The concept was simple—mainly that trains do not merely disappear into thin air, nor do they materialize out of space. Thus, it must be self-evident that if a train entered a block it must still be there unless it came out the other side. This is a simple theory, but like most simple theories, its practical application can lead to complications. By working out specific solutions to some of these practical problems, Len and Dave ultimately devised a general theory on how to resolve the overall problem. When they finally were satisfied with their answer, they, along with people in our Corporate Industrial Design department, built a small section of circular track on a sheet

of plywood to test their system. The model included a simulation of the existing detection system, and, in parallel, their modification to make the system more effective. They then took this model to a meeting of the Board of Directors of BART and demonstrated it. The Board was greatly impressed (both by the logic and the beautiful execution of the model by the ID group), and as a result issued a change order to their contract with Westinghouse to adapt Barney, Len and Dave's ideas to the whole BART system.

One of the nicest things about their contribution was its simplicity. It used only four integrated circuit flat packs for each section of track. Thus, the electronics involved were quite modest in cost.

Outside of the intrinsic interest of this kind of approach, I feel that this is an excellent example of the application of "good citizenship." Barney and his gang spent a lot of time and personal effort on this program—one that hopefully will allow BART to go ahead. Although HP has patent rights on the idea, the full use of the concept will be made available to BART at no cost. We are content to get BART going and thereby help to reduce automotive traffic, fuel consumption, and smog.

*Bill Hewlett*



With Dave Cochran as observer, Len Cutler makes successful first test of the new train-detection system created by HP Labs team for the San Francisco Bay Area Rapid Transit District. Next day, Barney Oliver staged a demonstration of the system for the directors and engineering staff of BART, again with much success.



To: Fred Goedel, HP VGmbH, Frankfurt

Dear Fred:

Congratulations!

In your memorandum of December 21, 1973 you say that the HP European Cup soccer championship for 1973 was won by your Frankfurt team.

You tell how they beat HPSA Geneva 3 to 0, HP Grenoble 5 to 0, and the Boeblingen factory 1 to 0.

Then you go on to say that if MEASURE would publish this "little story and picture" it would boost the morale of the Frankfurt team.

But just look at them, Fred. Look closely at those confident eyes. Observe the bold and challenging stances. Surely it's clear by now, Fred,

that what these chaps really want is not more morale or publicity but rather more victories -- spelled "victims".

Sure glad they're on our HP team.

With very best wishes,

The editor.



## Measure

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