

# Measure

For the men and women of Hewlett-Packard / JULY 1969



FOUND: HP Jewels that do the work of giants (*page 10*)





## Visit to a small

*To get an inside look at a 'typical' small Hewlett-Packard field sales office, Measure stopped in at one of the heartland centers of middle U.S.A. — Oklahoma City.*

*It turns out that 'typical' must mean unusual people, unusual growth, and some unusual problems . . .*



When he started the Oklahoma City sales office two years ago, Glen Stotts had only himself to supervise. Building it has been a stimulating challenge . . .

## sales office

□ Oklahoma City really isn't the site of the smallest HP sales office. In Perth, where one can look in one direction to the watery vastness of the Indian Ocean or turn and look on the arid vastness of Western Australia, Ron Davis is a one-man show. Then, for two-man teams—generally a field engineer and secretary—we take you to such far-flung locations as Moldal (Sweden), Wellington (New Zealand), Winnipeg (Canada), Endicott (New York), and Nagoya (Japan). Possibly these will graduate—even as you read this—into offices on a par with Poughkeepsie, or Halifax, Adelaide, Berlin, and Portland, or Tucson, Salt Lake City, Meyrin and Edmonton. These are four-and five-man offices—going on to six.

Well, these days it's hard to keep up. So much is happening within the corporate structure, in the manufacturing organizations, in the field sales regions, and between factory and field. But sometimes just by tuning in on a remote part of the company it's possible to acquire a picture that more or less speaks for the whole.

Believe it or not, the Oklahoma City office rather clearly reflects whatever trends of importance are affecting the company as a whole. At the same time, because it is a small office

Now there are more places and people to cover, and more people to help him, including Roy Keith, the medical products specialist who's about to start a long drive into Arkansas . . .



And office help. June Oglesby, the secretary-receptionist at right, is back after a brief bout of flu. Briefing her on yesterday's activity is Rita Courtney who came in to start the order processing system early this year . . .

*(continued)*





And a real utility pinch-hitting right-hand man. That's Eddie Nesser who is performing his service function here, but who also doubles as staff engineer . . .



There's lots of territory to cover and some key customers to see, including the Federal Aviation Administration. Here Glen leaves off some test procedures with FAA purchasing man Hap Rathjen . . .

## small sales office

of five people and because it is less than two years old, it adds a few vibrations of its own to the total picture.

"I guess the big difference here," says field manager Glen Stotts, "is that I get to wear so many hats. When I opened the first office downtown, if I wanted anything I did it myself. If I wanted the floor swept, I swept it. If boxes had to be shipped, I made up the boxes, called the shipper and arranged the pickup. I bought my own stamps and licked them, too. Later I got secretarial help and that really improved things. You just don't realize the endless number of tasks a one-man operator has to do."

Professional help arrived late in 1967 with the assignment of Eddie Nesser out of the Dallas office as a combined service manager and staff engineer. In the meantime Glen added a permanent secretary, June Oglesby, a medical line representative from the Atlanta office, Roy Keith, and early this year an order process girl, Rita Courtney.

All of them look on Oklahoma City and Oklahoma as home. All but Roy were born and raised in the state. After several years of working outside the state, Glen and Eddie were pleased to return to Will Rogers country. Now Roy is converted: "That last trip home did it—the traffic, the crowds! I found myself looking forward to coming back!"

How could an office grow to five people so fast, considering that just two years ago the territory was covered by one man making one-day per week visits out of Dallas?

"Coming in here has really made a lot of difference," says Glen. "This year we're getting more than three times the business we had before we came in."

"I remember last year when Gene Stiles of the area office in Dallas came up to me and said: 'Well, it looks like you're going to have it easy next year. We're only going to raise your quota 50 percent.' Later I sat down and wrote a memo explaining my doubts about that increase. I can't really see how we could do it. Then as the year progressed we proceeded to outsell even that figure. We're over quota."

"In this selling business we all know that you have to show an increase year to year—a substantial one, otherwise you're standing still. Now, I suppose there must be times and places where it's just not possible to raise sales; it's just not available, and I'm sure HP would understand that. But it's certainly not the case here. This area is growing fast. Of course we're seeing a lot more people than ever before. But many people we were calling on have really beefed up their orders just because we are now established here."

Some noteworthy names appear regularly on the orders processed by the Oklahoma City office. Number one undoubtedly is the Federal Aviation Agency whose nationwide operations are headquartered near the airport; the gearing of instrumentation for the coming era of supersonic flight and the computerization of ground controls should mean bigger business in the years ahead.



Meanwhile Eddie is off on a medical service call to the University Family Medical Clinic. Problems with an ECG stylus are quickly solved . . .

The day nears its end in a hangar where Kerr-McGee has outfitted a DC-3 and a truck with HP systems for special field research. Units for the truck-borne system are discussed with K-M's Pierce Hewlett. Later, Glen will head back to the office to go through the day's big pile of mail, to catch up on phone calls, and plan for tomorrow.



Oil companies are good business, too. To understand this you have only to look at the state capitol grounds in the heart of Oklahoma City. Here derricks ceaselessly pump black gold from fields directly below the capitol building. However, one Oklahoma firm that started in petroleum, Kerr-McGee, now sees its role as that of a 'fuels' company concerned broadly with various kinds of energy resources. This approach has spurred research and created demands for some very sophisticated HP systems. Football fans will recognize the major universities of the area — University of Oklahoma, Oklahoma State, and University of Arkansas. These too are important customers of the Oklahoma City office for research instruments and hospital installations.

But progress has not been all that easy, according to Stotts. "We've had our problems. Just leasing good ground-level floor space was one. But I suppose the main problem is representing so many products with so few people. Until we got Roy in here to handle medical products. Eddie and I covered the whole HP line. Even now, every day I get at least a three-inch stack of mail about HP products. I'm seriously considering taking a speed-reading course just to keep up."

The Oklahoma City field men put on mileage that might shock even a Los Angeles sales manager. Their city of 600,000 people is second only to Miami in geographical size, seen from the air it spreads from horizon to horizon.

A trip to Little Rock and Hot Springs in neighboring Arkansas means a hard 370 miles each way. Tulsa, the nearest neighbor of size, is a fast 90 miles on the Will Rogers Turnpike, \$1.40 one way.

There are some real advantages in a small office, too. "There are no cliques," says Rita Courtney. "We're all just one clique together."

"Yes, and it's pretty easy to hold an office meeting," said Glen Stotts. "If I want something to go over the public address system I just talk loud!"

Roy Keith prizes the independence. "Here we're on our own almost completely!" he said. "We plan our own travel and go when we want to."

The two girls value the responsibility they are given on the job — and the fact that they work only two minutes' walk away from the apartment they share. It's one of those lively 'singles only' places complete with indoor-outdoor swimming, sauna, recreation room, etc. etc. At noon June and Rita, who became friends in high school, can usually be found lunching by the pool.

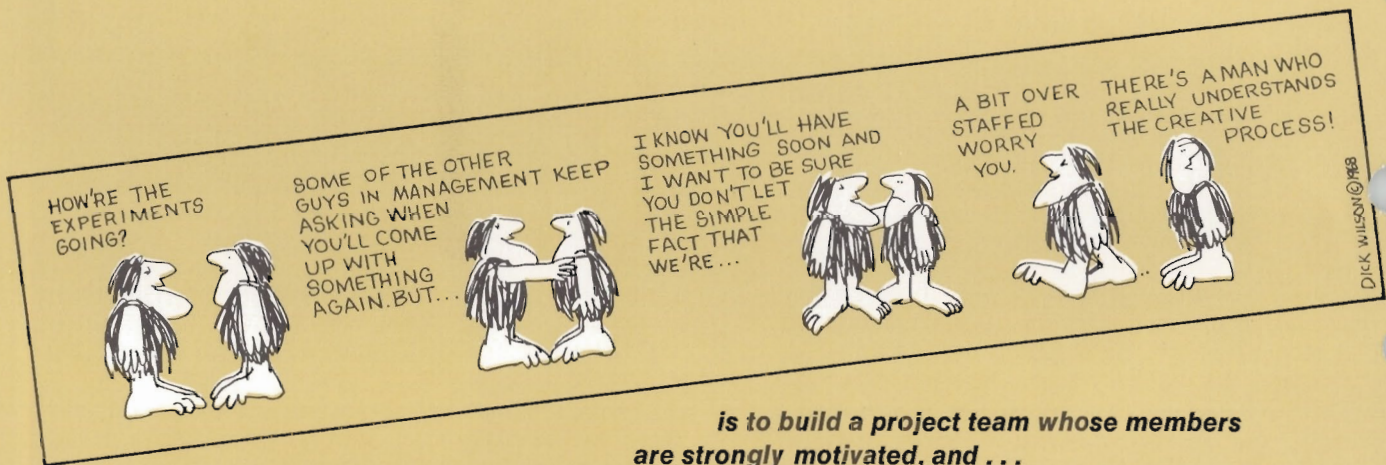
Just like the bigger sales units and divisions, the Oklahoma City office plans to hold a company picnic this year — its first. They'll have it at Will Rogers Park, for 15 people, including children and guests. And along with the barbecue and brew, they'll talk about how things were back in the good old days of 1967-68. □



# Rocks on the R&D road...



**The first step toward successful development of new products is to clearly define the goals. Next . . .**



**is to build a project team whose members are strongly motivated, and . . .**



**back them up with sophisticated market research.**





## A rounded view of our new square footage

□ The company's need for additional space has kept quite a few construction industry people busy during the past year. A couple of them can be seen in the right half of the 'fisheye' photo above, taken inside the new Santa Clara Division (formerly Frequency & Time) plant. They're putting finishing touches to a second area while HP engineering and production people conduct 'business as usual' just days after moving into the first section. When completed later this year, the current building program at the 55-acre, Santa Clara, California, site will add some 300,000 square feet of floor space. Approximately 600 persons have already occupied finished portions.

According to Phil Towle of Corporate Plant Engineering, the Company-wide total factory floor space will amount to some 60 acres when present contracts are completed. No such combined figure is readily available for the worldwide

roster of sales and service offices. A large number of them are leased. However, the company-owned buildings would, of course, substantially increase the grand total. "We are keeping pace with growth in sales pretty well," Towle said, "although exploding markets such as in Data Products can make construction forecasting somewhat difficult."

Other future plans for construction include a two-story, 260,000-square-foot building at Loveland Division to be started this month; a fourth building of 77,000 square feet for HP-GmbH to go up late this summer; and the first phase of construction of a 125,000-square-foot plant to begin in October at San Diego Division's Rancho Bernardo property. Other projects are in the early planning stage, including an addition for the South Queensferry plant. Pictured on the following pages are those HP-owned facilities that have been added recently or are in advanced stages of construction.

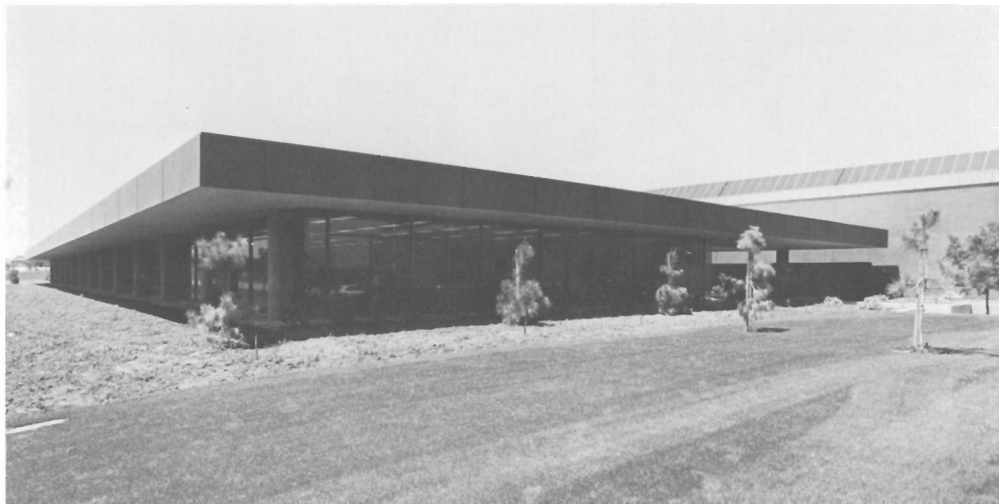
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*Just a little less than a year ago HP France moved out of Paris offices to the environs of Orsay and a new 20,000-square-foot, two-story building. It's near some important customers, including the University of Sciences, the National Nuclear Research Center, plus other government research labs. All around are cows and crops, a pleasant change for the 120 people of HP France.*



## new square footage



*Cupertino Division, as well as Data Products Group management, now are in full occupancy of new 150,000-square-foot Vallyo Park facility, Cupertino, California. The building was purchased, along with 46 acres, last year to accommodate the very fast growth in HP computer products and systems.*

*New headquarters for HPSA is at Meyrin, a few miles outside the city of Geneva. Approximately 30,000 square feet, the building brings together a number of departments that previously were located separately. The move-in was made early this year.*







*Photographed in early June, first phase of new Santa Clara Division plant still had several months to go in construction although portions were occupied and in operation by large contingent of people from former F&T. Foreground will become a large reflecting pool providing a secondary water supply for fire protection as well as an attractive setting. Eventually the roof will become a recreational patio. Exterior walls feature precast concrete panels faced with brown-hued crushed rock.*



*Though most field sales and service offices are leased, a few are owned and built by the company. Among them is the new Fullerton office recently opened to serve California's Orange County and adjacent areas. The 45 staff people, scheduled to move in late June and open the doors to business this month, formerly were headquartered at the region's North Hollywood headquarters. Closer proximity to important growing markets will result.*



*Until a few months ago this International Operations headquarters in Stanford Industrial Park represented the first half of a total building design. It was purchased that way in November, 1967 from a publishing company. Now the design is being carried out to its full size of some 25,000 square feet, to provide much needed space for International's global growth.*



# The microwaves of the future

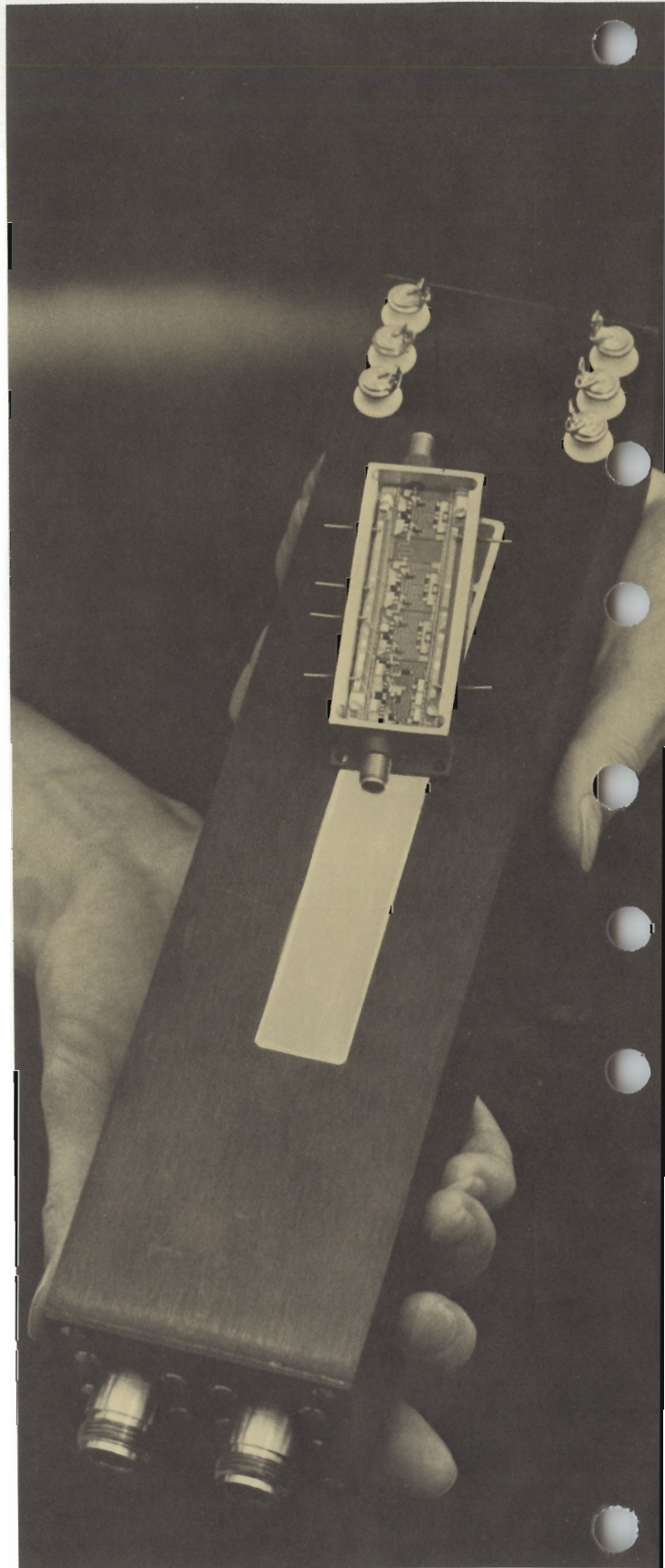
*Jewel-like microcircuits are helping to change the whole concept of instrument building. HP has a unique combination of experience and capability in this new microelectronics field . . .*

□ Imagine, if you will, the inside of an HP instrument of the future: small glittering components fashioned of sapphire and rare earths, burnished with gold, laced with gossamer gold thread and adorned with gem-like wafers bearing microscopic circuits of designs inspired by Mondrian. Don't shake your head. That jewelled kind of product package is already with us—here, today, in production. What's more important, to quite a few knowledgeable people it looks like the wave of the future for a wide range of other instruments and components.

Microwave integrated circuitry—or microelectronics for short—does in fact hold the promise of becoming a very fast-growing segment of the company's business. Today approximately 170 people are employed by Microwave Division directly in the design and manufacture of the new-style circuits which currently range in selling price from \$150 to \$1,500. In addition, a large and growing number of engineers working on next-generation instruments now are designing microcircuits for use in instruments that will be smaller, lighter and more reliable. Looking ahead, if conservative projections are fulfilled, microcircuitry will require the services of more than 1,000 people within five years.

What kinds of products are involved? The present line consists mainly of watch-size amplifiers and oscillators that become parts of complex radio frequency systems such as HP signal generators and spectrum analyzers, or microwave telephone links and community-antenna television networks.

It's a David-versus-Goliath mismatch: HP's tiny 35005A microcircuited wideband amplifier easily outperforms its much bigger competitor. Front-cover photograph shows a variety of the new jewel-like microelectronic products now being produced by Microwave Division.







Microcircuit manufacturing at HP begins with a complex process of depositing thin layers of vaporized materials on a base of sapphire substrates. Special high-performance transistors are produced in nearby lab and later joined to the basic circuit to form a hybrid. Integrated circuitry for microwave applications requires extremely precise manufacturing technology.

Building the packages for microelectronic devices requires a blend of artistry and engineering. At left, 'boat' load of package frames is prepared, using wide variety of mechanical devices that will help create glass-to-metal sealing of openings.



The need here was to simplify such components as amplifiers and oscillators—improve their performance, make them less expensive as well as more reliable, and offer some new functions never achieved before. Among the first products developed by the team, for example, was the 35005 amplifier which weighs in at about 3 ounces. In contrast, the type of product it replaces (not produced by HP) typically weighs more than a hefty 7 pounds. Not only is the HP amplifier one-fortieth the weight but functionally it has almost double the bandwidth and is much more versatile because of small size and light weight. Moreover, the original product—a type of traveling-wave tube—has a limited life span considerably shorter than the overall system that depends on it. The 35005, on the other hand, should endure indefinitely.

Three years ago the technology as practiced now by the Microwave Division team under George Bodway didn't even

exist. There were no devices suitable for use in building microcircuits. There were no techniques for measuring the performance of devices that might be used. There was no design technique that could be applied for general-purpose microwave solid state devices. And there were no techniques for fabricating the circuits.

Each of those four gaps had to be filled almost "from scratch," as they say. In the process, the team created a technology that is unique in the field. For example, special transistors had to be developed to handle the higher frequencies required in microwave components. This was true also of the processes by which conductive and nonconductive materials are vacuum deposited onto sapphire substrates to form the basic microcircuit patterns.

The team had to develop its own techniques for testing the devices it invented, and came up with computerized test

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## microwaves of the future

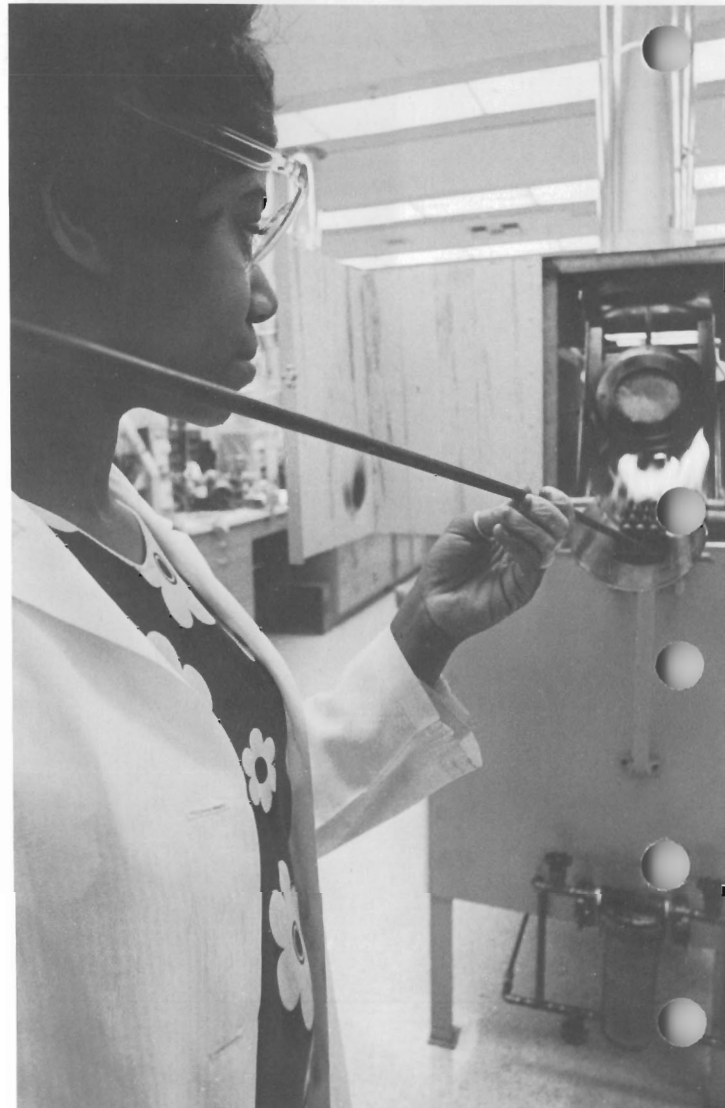
stands as well as some unique methods for non-destructive testing.

"In the last four months," said Bodway, a solid-state physicist who came to HP from the University of California, "we have changed from being a highly competent laboratory team to where we are converting these advances to volume production. Along with very dramatic increases in volume have come important improvements in quality, reliability and yield.

"We are looking at sizable markets both inside the company and outside. About half of our production is planned for use in our own instruments. Microwave instruments now being designed will all have microcircuits, generally in replacement of larger, short-lived microwave tubes. Other divisions are also planning to use them in critical lower frequency applications. In addition, the microcircuit technology is being applied increasingly to those former HPA and F&T products that are now part of Microwave Division. This is expected to result in further refinements to these already-successful products. Outside, one of the larger commercial markets could be the community antenna television field.

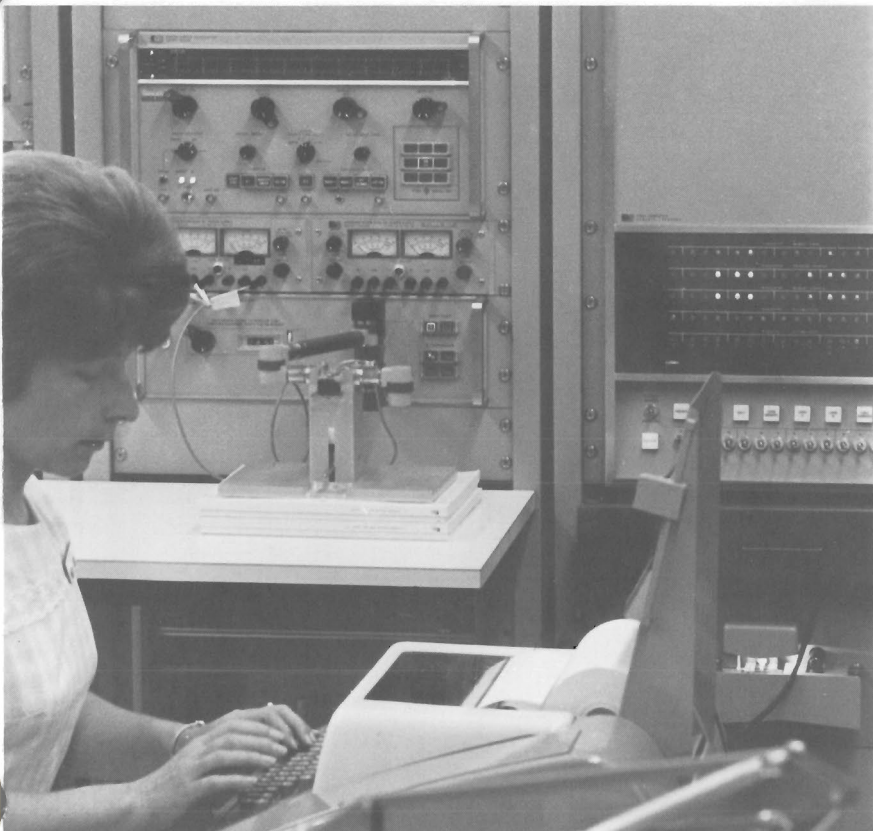
"We presently have a very big advantage in microcircuitry over competitors in the instrumentation field. Some of them have parts of the technology, but no one has it in combination as we do.

"To maintain our position we plan to emphasize the development of our own manufacturing process techniques, the very special engineering and tooling needed to produce these very complex products in volume at lower cost. That's really the key to this whole business, and it's going to help change the whole concept of instrument building in this company!" □



Object of glass-to-metal bonding process is to create hermetic sealing that will contribute to the very long life expectancy of HF microcircuits. Here Paula Clarin loads a completed 'boat' of amplifier frames into furnace for sealing. Later each package frame will be combined with other package elements plus a microcircuit to form the completed component.

In the scaled-down world of micro-circuitry, "wiring" is a matter of high-powered microscopes, ultrasonic bonding and almost invisible gold thread and skilled operation as practiced here by Eileen Hartley. HP process engineers have developed most of their own highly sophisticated techniques and tools.



HP's advanced measurement capability was essential in getting microcircuitry off the ground. Automated testing systems had to be devised both for in-process materials and finished devices. Here Karen Morano tests amplifier substrates.



# News in brief

**Palo Alto**—Almost \$3-million was distributed in June to more than 10,000 eligible HP employees under the company's cash profit-sharing plan. HP employees eligible to participate receive profit-sharing checks twice annually.

**Palo Alto**—A total of 47 scholarships have been awarded this year to sons and daughters of HP employees through the HP Employees' Scholarship Fund. This year the value of scholarships was raised to \$750 each from the previous \$500 award. The 1969 awards bring to 216 the total number of college scholarships awarded since 1951.

**Stockholm**—Hewlett-Packard has been awarded a \$3.6-million contract from the Royal Swedish Air Force for 16 model 9201H avionics autotesters. The autotesters are com-

plex, computerized instrumentation systems that automatically test electronic equipment aboard jet fighter aircraft. Engineered especially for the RSAF by HP's Systems Division, the autotesters incorporate standard and custom Hewlett-Packard instruments, plus electronic instruments of other manufacturers, into a compact, four-bay system.

**Loveland**—The Loveland Division has awarded a \$3,500,000 contract for construction of a 268,000-square-foot, two-story building adjacent to the company's existing facility in Big Thompson Industrial Park. Construction will begin immediately and is expected to be completed in the summer of 1970. When this third building is completed the division will have a total of nearly 600,000 square feet of floor space.

**Sacramento**—A battery of 37 new HP computers will help to control water flow in a major link in California's \$2.8-billion State Water Project. The installation involves the aqueduct system in central California. The system will be capable of unattended automatic operation of as many as 19 separate water control gate sites and four pumping plant sites for extended periods.

**Boston**—The International Council of Industrial Editors has selected Hewlett-Packard's corporate employee publication, MEASURE, for a top merit award. The award was made on the basis of "journalistic excellence" among magazines circulated internally to audiences of under 15,000 people. MEASURE was the only publication selected for recognition in this category.

## People on the move

**Corporate**—Chick Alexander, to compensation and benefits manager, from Palo Alto area personnel manager; George Climo, to peninsula personnel coordinator, from professional recruiting manager; Marialis Collins, to government security, from general assignment-training; Dorothy Durham, to peninsula compensation, from personnel records supervisor; Dennis King, to advertising and sales promotion, corporate Marketing, from R&D Microwave; Norm Williams, to professional staffing manager, from development and training manager.

### Data Products Group

**Group**—Roy Clay, to software manager, in addition to manager of software engineering for Cupertino Div.; Bill Davidow, to marketing manager, from sales manager; Marco Negrete, to engineering manager, in addition to engineering manager at Loveland; Ed Smith, to applications and support manager from staff.

**Cupertino**—Bill Ansley, to software development staff, from technical staff, electronics research labs, HP Labs; George Bender, to supervisor of general and technical maintenance, from maintenance foreman, Mountain View; Bob Rabin, to manufacturing systems analyst, from information system analyst, Manufacturing.

### Palo Alto Electronics Products Group

**Group**—Hilde Harris, to records and insurance, from insurance, corporate Personnel.

**Manufacturing**—John Bogren, to process engineering staff, from tool engineering; Jim Ferrell, to manufacturing manager, from manufacturing engineering manager; Charles Fikes, to production control liaison, from model shop; Mike Fuentes, to foreman, machining, from leadman; Jack George, to manufacturing engineering manager, from manufacturing services manager; George Langford, to accounting staff, from building services staff; Yoav Orni, to Santa Clara manufacturing engineering manager, from section manufacturing engineer; Yukio Shimomura, to machine shop production control manager, from process engineering.

**Microwave**—Rich Bauhaus, to manufacturing supervisor, Level IV, from technical staff; Jerry Burgess, to micro-circuit bonding manufacturing supervisor, from technician, Level VI; Jerry Chamberlain, to production section manager, from production engineer; Bob Johnston, to engineering services manager, from manufacturing supervisor; Ken Newton, to production control manager, from engineering services manager; Frank Wilcock, to manufacturing supervisor, from tool engineer.

**Systems**—Carl Davidson, to technical writer, from same position, Santa Clara; Jesse Pipkin, to project engineer, from applications engineer, Microwave marketing.

**International**—Carl Anderson, to marketing services, HPSA, from sales promotion, corporate Marketing; Marc Brun, to data products specialist, HPSA, from marketing staff, International Operations; Don Wolf, to prod-

uct manager, import marketing, from parts center manager, Customer Service Center.

**Eastern Sales**—Jim Barbera, to systems analyst, from service supervisor (Paramus); Paul Barrella, to sales representative/medical, from service representative/medical (Paramus); John Haltiwanger, to regional sales manager, PAEPG (Paramus) from district manager (Rockville).

**Neely Sales**—Frank Jackson, to staff engineer (Palo Alto), from trade sales, Paeco.

**Southern Sales**—Ken Ferguson, to data products field engineer, from engineer (Richmond); Neil Fisk, to data products sales manager (Atlanta), from computer specialist (Richardson); Ralph Godfrey, to field engineer, from staff engineer (Huntsville); Del Kitten-dorf, to data products field engineer, from computer/calculator specialist (Orlando); Bill Leavelle, to field engineer, from staff engineer (Richardson); Bob Luman, to calculator specialist, from service technician (Orlando); Don Lutz, to regional customer service manager (Atlanta), from new product support manager, Customer Service Center (Mountain View); Bruce Myers, to analytical-medical sales manager, from regional customer service manager (Atlanta); Boyd Orr, to electronic group "A" sales manager (Atlanta), from senior field engineer (Richardson); Wendell Roberts to field engineer, from staff engineer (Orlando); Bob Rogers, to electronic group "B" sales manager (Atlanta), from senior field engineer (Orlando); Paul Stein, Jr., to field engineer, from digital analysis specialist (Richardson).



## From the president's desk

Last month all of our key managers from around the world, and a number of our outside directors, attended a two-day meeting in Palo Alto. The purpose was to review our performance for the first half of the fiscal year, to exchange ideas on a number of different subjects affecting our operations—both short- and long-range—and to review and modify our corporate objectives.

As most of you know, we make every attempt to run the company on the basis of "management by objective," which simply means that once we agree on a set of objectives we want to get out of the way and let the operating people carry out their business using the objectives as general guidelines. Incidentally, this philosophy of management by objective is just as applicable to the various organizational levels within a division, as it is to the divisions themselves.

One important characteristic of this type of management philosophy is that there must be a clear understanding of what the goals of the organization are and how one proposes to reach them. It is exactly for this reason that we hold our Spring and Winter management meetings. They provide an opportunity for the people most intimately involved in determining the company's future course to sit down and talk about where we are going and how we expect to get there.

Obviously there must be a structure for these discussions, and at our recent meeting we zeroed in on several specific topics. One of these dealt with the changing financial needs of the company. It is apparent that the assets needed to produce a dollar of sales today are very different than those required 20 years ago. We need much more complicated equipment to produce an instrument today than we did in the 1940s, and we also have to consider the increased costs of this equipment as well as that for land and buildings. Improvements in manufacturing efficiencies have helped compensate for a portion of these increased costs of doing business, but the fact remains that we need more capital dollars to produce a dollar of sales today than we did in the past. One way or another we must cover our increasing needs for capital through improved profits.

A second major topic, also relating to the financial area, was how to best use and account for the assets that are the responsibility of each of the divisions. Because of the importance of this subject, I appointed a committee to conduct some advance study and give a report at the management meeting. The report was well prepared, and served as an excellent base for the full meeting discussion that followed.

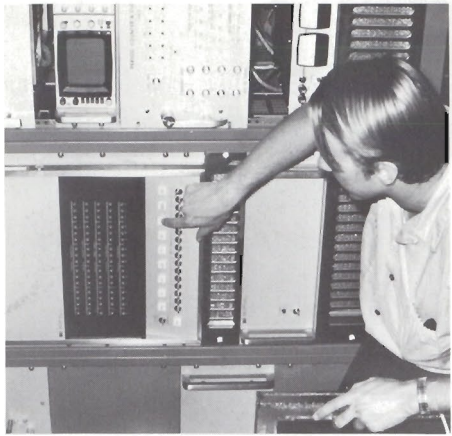
In addition to the above items, considerable attention was also given to the areas of marketing, where we are trying to develop the most efficient possible network to handle our ever-growing and diversifying product line; personnel, from the standpoint of attracting, training, and holding qualified people; and the broad and important subject of our social responsibilities both as a company and as individuals.

As our company grows larger, these semiannual management meetings take on more and more importance. They are particularly useful in improving communications, in generating fresh approaches to problems, and in developing common goals and objectives that will serve as guidelines for each one of us.

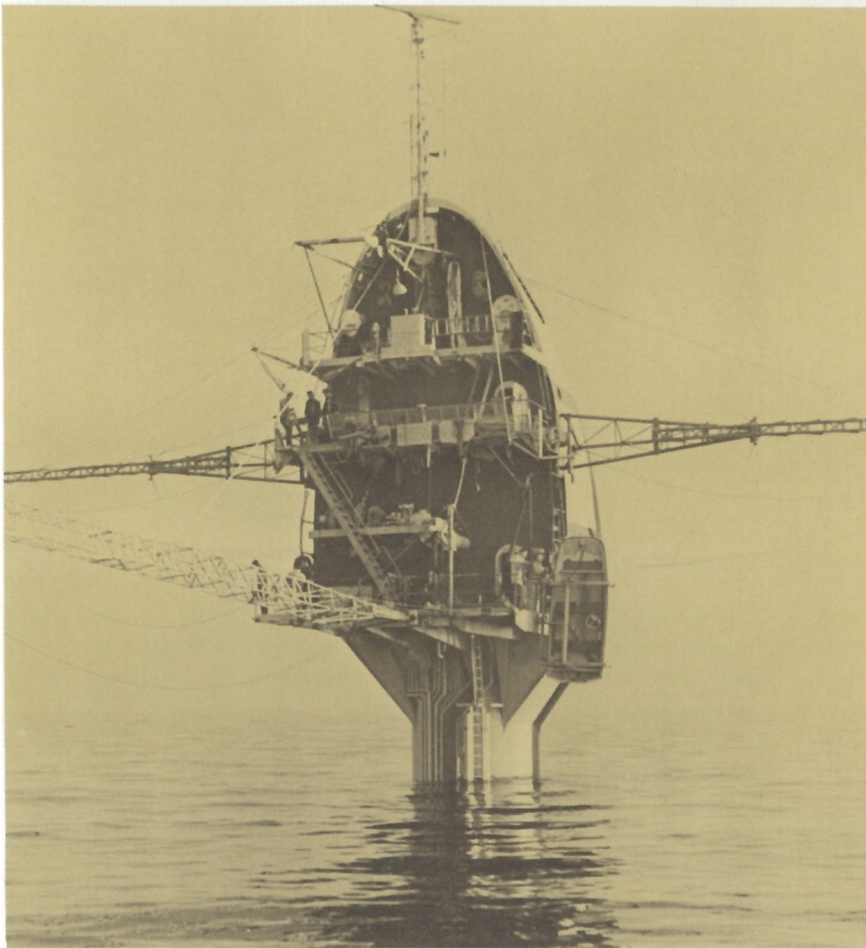


*Bill Hewlett*





**HP**  
**computer system**  
**measures**  
**blips aboard**  
**Scripps'**  
**FLIP ship**



FLIP, the Floating Instrument Platform launched by Scripps Institution of Oceanography in 1962, is either 355 feet long—or high. The latter occurs when the skipper orders the ballast tanks filled. This tips FLIP on end where she becomes steady as a fencepost even in raging storms—an essential condition of the acoustical research done. It also turns the recently installed HP 2005A real-time executive system right side up. The Scripps oceanographers told Neely engineers that the HP system, which was taken aboard in March to control FLIP's acoustical experiments, was selected because of its reliability under rugged conditions at sea. Actually, the system doesn't care which side is up; it will perform standing on its head if necessary.

**Measure**

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