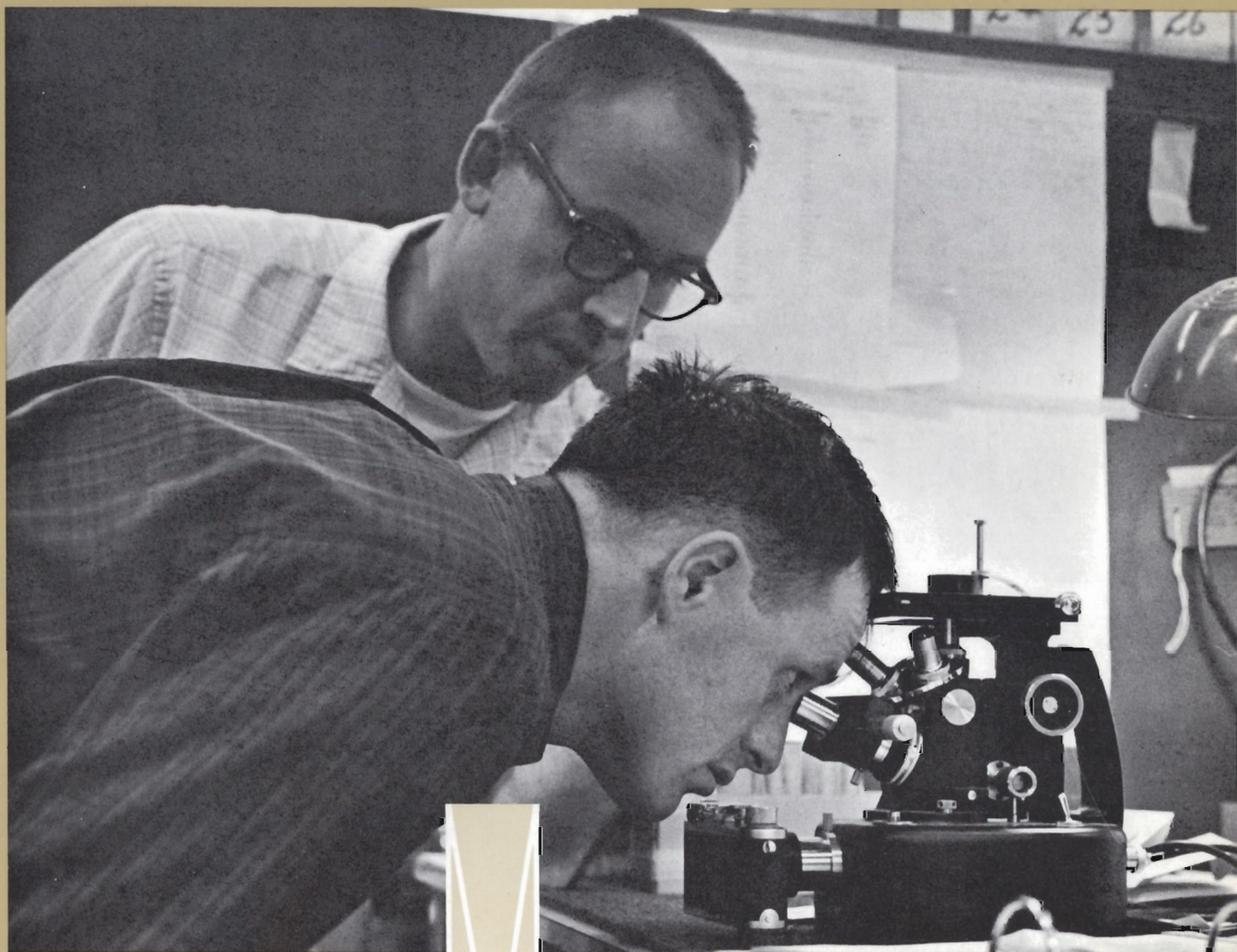


June 1964

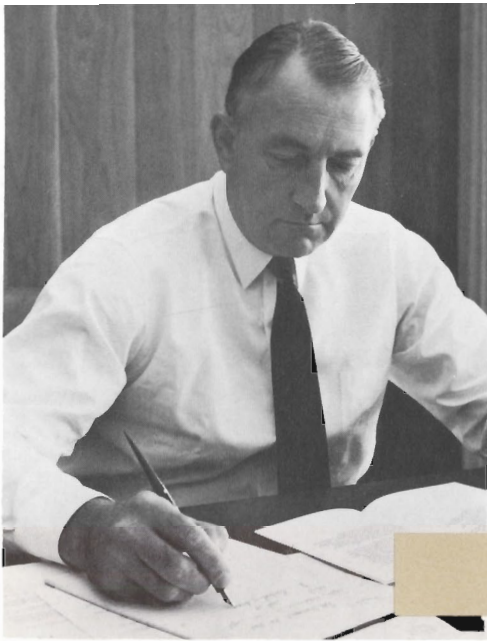


# M e a s u r e

## in this issue

*HP Quality: How It Happens*  
*Sister City Salute*





*from the chairman's desk*

**O**PERATING RESULTS for the first half of our current fiscal year were extremely gratifying. Despite a rather unfavorable business climate in the electronics industry as a whole, our company had the best first half in its 25-year history. As reported in detail elsewhere in this issue, sales were up 9 percent in comparison with the first six months of 1963, and incoming orders rose 11 percent. Even more impressive was the 25 percent gain in net profits to a level of nearly \$4,000,000.

The fact that we were able to improve our after-tax profit margin from 5.8 percent of total sales in the first half of 1963 to 6.6 percent in 1964 indicates that we are achieving greater efficiency and economy in our operations. This is largely the result of your day-to-day efforts to reduce costs and do a more effective, productive job, whether it be in engineering, manufacturing, marketing, or administration.

As an indication of how our performance compares with that of other companies in the industry, you might be interested in some recent figures compiled by the First National City Bank of New York. Each quarter, the bank analyzes the profit performance of major U.S. industries. Its summary includes a category labeled "electrical equipment and electronics" which covers 94 manufacturing firms. The bank noted that for the first quarter of calendar 1964, these firms increased their profits by an average of only 10 percent over the first quarter of 1963. Furthermore, their profits in the first quarter of '64 were down 13 percent from the last quarter of '63. So it's quite obvious that our 25 percent gain in profits represents a considerably better performance than the industry as a whole.

Looking ahead to the second half, it appears that modifications in defense programs and the government's efforts to reduce over-all Federal expenditures will continue to have an unsettling effect on the electronics industry. As you are aware, many companies in the industry, particularly those that are heavily committed to the defense effort, have suffered sharp reductions in sales and earnings. Some have had to lay off large numbers of employees and cut back expenditures for new plants and equipment.

Despite this trend, I see no reason why our second half can't be substantially better than the first. Our order rate is holding up well and we traditionally enjoy a moderate seasonal upswing in business during the summer months. Moreover, we introduced a number of important new products at the IEEE Show in March and these should begin to add significantly to our over-all sales volume during the latter part of the year.

While I am basically optimistic about the future, I think it well to point out that we are in an increasingly competitive market. The fact that several of our competitors are caught in a profit squeeze means that they will be working all the harder to take some business away from us. It also means that we can expect new competition to develop in areas where before we had little or none.

Our answer to this challenge is to increase the output of new and significant products from our laboratories, constantly improve our manufacturing and selling techniques, and, above all, to design and build superior quality into each of our instruments.

*David Packard*



Before presenting Sanborn EKG machines to two hospitals in Costa Rica, President Francisco Orlich learns how they operate from Pasos and HP rep Gallegos. L to r: Pres. Orlich; Alfredo Gallegos; San Jose, Calif., Mayor Robert Welch; Mrs. Welch; Rudy Pasos; Ambassador Raymond Telles; and San Jose, Costa Rica, Governor Guillermo Castro.

Dymec's Rudy Pasos is a project engineer.



## Sister city salute

**W**HEN RUDY PASOS came to the United States as a teenager in 1948, he left a Costa Rica which was a rich green land with one of the most beautiful capital cities in the world.

He returned last month to that country, but found it sadly changed. The people are just as he had remembered them—industrious, intelligent, freedom loving. But much of the land, including the capital, San Jose, is suffering from a strange and whimsical trick of nature. Dust is everywhere. Each day, the monster volcano, Irazu, belches forth great clouds of ash and prevailing winds carry it in a wide path across the once lush republic.

He visited San Jose, Costa Rica, with Robert Welch, mayor of San Jose, California. Rudy performed a role of interpreter for the mayor during the trip, which was organized by the mayor and several organizations, including Pacific Neighbors. The purpose of the trip was to "further weld the bonds between the sister cities," and to assist the Costa Ricans in their fight against the volcanic fallout.

Since he joined HP's Dymec Division in Palo Alto two years ago, much of Rudy's spare time has been spent assisting in the development of the San Jose-San Jose sister city program. The enthusiasm that Rudy and the others showed was

contagious, and the idea won the support of many. Station KNTV showed its interest by sending a television crew to the tiny Central American country to film a documentary. Congressman Charles Gubser made it possible for Mayor Welch to obtain a surplus street-sweeping machine for the Costa Rican sister city. HP's Sanborn Division responded with two badly needed electrocardiograph machines.

On May 3, Mr. and Mrs. Welch and Rudy Pasos arrived at El Coco airport near San Jose. They were greeted by Alfredo Gallegos, HP Costa Rican representative; Guillermo Castro, governor of San Jose; and Raymond Telles, U.S. ambassador.

In the following days, the Welches, Pasos, and Gallegos met with government officials and finally, on May 7, they visited the presidential palace where they were greeted by President Francisco Orlich. They showed President Orlich the Sanborn EKG equipment being donated to two hospitals and Pasos gave a brief talk on Hewlett-Packard.

Now back at his job at Dymec, Rudy says he will continue to help Costa Rica. "Getting rid of the ash from the monster is like trying to empty the ocean with a thimble," he says. "But the people there are great fighters."

It takes one to know one.





The official corporate manual on the subject says that Hewlett-Packard efforts to maintain high quality will “pay, not cost the company.” Shipping clerk George Westbrook, shown on the cover peering at a printed circuit board through a metallurgical microscope, found several ways quality is assured as he got a good look at . . .

## HP's CHECK AND BALANCE SYSTEM

Supplies from vendors receive careful inspection. John Mastilock (right) shows Westbrook how an item from the receiving department is put on an optical comparator to check conformance to dimensional standards.



**Q**UALITY! Bah! We don't sell quality. We sell ball bearings. Remember the motto of the J. B. Bumble Bearing Company, son: "You gotta' buck, we gotta' bearing."

*But J. B., things don't look so good. Matter of fact, we've been losing money all year and some of our old customers . . .*

Son, don't worry. I say, don't worry. I founded this company years ago and we're selling as much as we ever did.

*But J. B., the ball bearing market is ten times as big as when you started out.*

Poor old J. B. He's not long for the business world. No one is who underrates the need for quality. It's a simple law of economics in our free enterprise system.

It's a law, in fact, that Hewlett-Packard from Palo Alto to Boeblingen to Tokyo respects and enforces internally with religious zeal. Unfortunately, "quality" is one of those words that is used and misused so often in our industrial world that it tends to lose its meaning.

Within HP the key quality factor is "people." Each employee, no matter what his or her job, plays a vital role in the over-all quality of HP instruments.

George Westbrook is a shipping clerk at Palo Alto. He and his fellow workers in shipping departments throughout the company are the last HP people to handle products before the customers receive them. Quality in their area of the business means handling each instrument with the skill and thoughtfulness usually reserved for Aunt Min's best china.

But what about the earlier steps before the instrument reaches the shipping dock? To answer this question, *Measure* asked Westbrook if he would like to go back to the beginning—to the very birth of a product—and see how quality and value are built into every HP instrument.

Most of the tour that followed took place in the Frequency & Time Division, since it is conveniently located to Westbrook's location and because it is representative of care in quality and quality assurance found in all divisions.

The first stop along the route was at a section of the Design Engineering Department, where work is devoted to F&T products. Engineers there showed how a new idea for a product emerges from the drawing board after hundreds of hours of work. As one of them commented, "Quality and reliability have to be designed into a product."

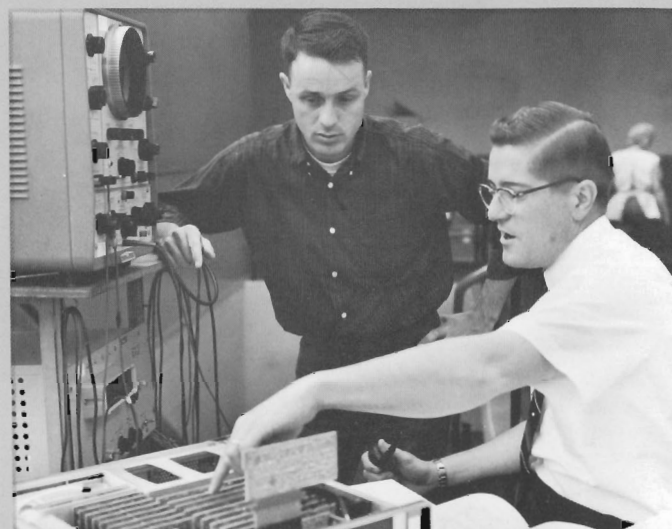
Westbrook learned that, from the drawing stage, each product under development goes through three phases: pre-prototype, prototype, and pilot run. At the Production Engineering section, he saw a counter being modified so that it would meet standards of mass production. Production Engineering is the "bridge" between the original design of a product and its adaptation to the production lines.

Fabrication of instruments was next on the agenda. In the machine shop areas, Westbrook saw parts and instrument housings being produced to very close tolerances with extreme care and attention to perfection.

He found the same attentiveness on the assembly lines where all components of an instrument are brought together



Quality originates with design. Tracy Storer (left) and Charlie Hill of Design Engineering explain points in designing a product.



Frank Kramer, Production Engineer, discusses modifications which are sometimes made to prototypes before they can be mass produced.

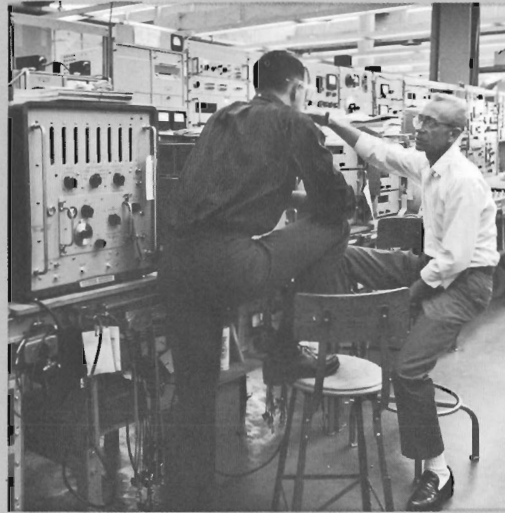


QA Inspector Clarence Patrick explains how sheet metal parts for instrument chassis and housing are fabricated to close tolerances.





Westbrook gazes at counters held in chamber at 148 degrees F. to detect "temperature-touchy" components.



Electrical inspection equipment, operated here by Gene Kups, tests the quality of wiring and components.



Luke Narciso takes component inspection lines and checks them for



Lorna Nelson explains intricate wiring of 5245L counter. After few months' experience, women memorize entire wiring procedure.



Circuits are printed by silk screen process on boards with great skill and precision by Elfriede Gmelin.

into a finished product. Westbrook watched a woman deftly wire a 5245L frequency counter and noticed that even though the assemblers have procedure sheets and wired models serve as reference, many of them memorize the entire wiring layout.

At F&T's many inspection stations (fairly typical of manufacturing and quality assurance inspection facilities throughout HP), instruments get a complete "going over" electrically and mechanically. With some lines of instruments, such as counters, each one produced is inspected here. In the case of a few lines, only sample checking is necessary.

The electrical test equipment was designed and produced by HP. If a product under test doesn't score high in all respects, it is sent back to manufacturing where the trouble will be traced.

No detail seems too small in the final mechanical inspection. Appearance is considered. All screws are checked. Lettering on the instrument's front panel must read clearly and correctly, and even tags and manuals accompanying the product are checked to make sure they are the correct versions and up to date.

Having passed its exams so far, an instrument is next ready to be packaged. Westbrook was particularly interested in this operation, since his own job is to handle the package and see that it is shipped safely. The men in packaging give the instrument a final visual inspection. Rejects are not common at this point. Packaging is so carefully designed that less than one in 5,000 instruments are damaged en route to customers—a top record in the industry.

At this point, Westbrook said the quality assurance program at HP reminded him of the "check and balance system" in our democratic form of government. Each person is





Freedom from product-mechanical imperfections.



Environmental Testing subjects instruments to severe conditions. Jerry Chamberlain explains shaker table.



Pat Morrow of Order Processing points out that administrative people must also be conscious of quality.

charged with a responsibility for quality, but plenty of additional checkpoints exist to filter out products which are less than the best.

Retracing his course a bit, Westbrook next visited the corporate environmental test department, where technicians and engineers seem intent on abusing instruments. Here they take samples from all divisions and try to detect "weak" spots. A shaker machine can vibrate an instrument at a frequency of 55 cycles per second. Instruments are also subjected to various ranges of temperature, humidity, and altitude. By simply dropping each corner on a hard surface, HP testers learn about susceptibility to shock. In fact, they do just about everything short of boiling products in oil.

His next stop was at a desk in the administration area, and he found that here, too, employees make a significant contribution to the total quality image of HP products.

Westbrook commented at this point that he was convinced HP does just about everything possible to build quality into products. "But what about materials supplied by vendors? Who checks their quality?"

He found the answer at an area near the receiving dock. There he saw an inspector checking a new shipment of resistors for electrical performance. Nearby, a man operated an optical comparator, an ingenious piece of equipment which projects on a screen a greatly enlarged image of an object under inspection.

Nearly four hours had passed during Westbrook's whirlwind tour of the F&T plant operation. Back at his post in shipping, as he placed a packaged counter on a loading pallet, he said:

"You know, the customer who bought this is getting everything he paid for, and more. He really is getting quality."



Don LaVoy (left) and Dave Bardin show how HP-designed post pack protects instruments against shock during shipment.



Back at his job, Westbrook finishes stacking pallet, confident that "quality is the responsibility of everyone in the company."

## First Y-HP exhibit at Tokyo Trade Center



Y-HP display at Tokyo Trade Center attracted over 2,000 visitors. Exhibit provided first showing of new joint venture's products.

### Students win HP scholarships

THIRTEEN STUDENTS have been awarded \$500 college scholarships from the Hewlett-Packard Employees' Scholarship Fund.

The fund was started in 1951 to assist youngsters of employees to pursue higher education at the college of their choice. Annual employee and company contributions are placed in a trust fund, and the awards are financed from earnings of the fund.

Parents of the 13 students are employed at the Palo Alto complex, the Loveland Division, Boonton Radio, and Sanborn. The eight youngsters with parents employed in Palo Alto are: Terry Adamski, son of Joseph Adamski, Technical Maintenance; Elizabeth Dunn, daughter of Fran Dunn, Customer Service; Thomas Grimm, son of Clare Grimm, F&T division; Ronald Inouye, son of Terry Inouye, HP Associates; Patricia Jo Lane, daughter of Betty Lane, Dymec; Daniel Malone, son of Jack Malone, Microwave division; Elaine Todd, daughter of John Todd, Microwave division; and Frederick Tomlins, son of Bill Tomlins, Microwave division.

Sanborn recipients are: Mary Virginia McCabe, daughter of Frank McCabe; and Thomas Murray, Jr., son of Tom Murray. Awards at Loveland went to: Karen Kauffman, daughter of Hilda Kauffman; and Gerald Taylor, son of Joyce Taylor. At Boonton, Barbara Andersen, daughter of Fred Andersen, is a 1964 scholarship recipient.

The scholarships are awarded to children of employees on the basis of their scholastic achievements, participation in outside activities, and educational objectives. Since the fund was created 13 years ago, 60 awards have been granted to graduating high school seniors.

YOKOGAWA-HEWLETT-PACKARD, LTD., held its first product exhibition April 27-28 at the Tokyo Trade Center with over 2,000 people attending. A total of 69 products manufactured by Y-HP were shown, along with 11 others produced by Yokogawa Electric Works.

Y-HP was founded last September as a joint venture between Hewlett-Packard and Yokogawa Electric Works for the purpose of manufacturing and marketing electronic measuring instruments in Japan. Since that date, the new company has been operating from leased quarters at the YEW plant in a western Tokyo suburb. A new plant (see News in Focus) is under construction and scheduled for completion this fall.

The Y-HP display at the Trade Center was a "one-company" show and its purpose was to remind instrument users that Y-HP is in business with a full line of products and a strong marketing organization.

On the first day, Shozo Yokogawa, president of Y-HP, acted as host to two visiting executives from HP in the United States—President Bill Hewlett and International Operations Vice President Bill Doolittle.

### Sales and earnings rise in HP's 'best first half'

SALES of \$59,643,000 and net earnings of \$3,944,000 were reported by HP for the six-month period ended April 30. In announcing the figures, Board Chairman Dave Packard said they represented the best first-half performance in the company's history.

Sales were up 9 percent and earnings up 25 percent over the first six months of fiscal 1963. After provision for payment of preferred dividends, earnings allocated to common stock totaled \$3,742,000. This was equivalent to 33 cents a share on 11,272,148 shares outstanding, compared with 27 cents on 11,162,314 shares for the corresponding period in 1963.

Packard noted that operating results for the first half of 1963 have been restated to give effect to the current write-off of research and development expense, thereby making them comparable to the fiscal 1964 figures. As a result, the earnings now reported for the first half of 1963 are slightly less than those previously reported.

Incoming orders for the first six months of fiscal 1964 totaled \$61,019,000, a gain of 11 percent over the corresponding period of 1963. International orders amounted to \$12,330,000, about 20 percent of the corporate total.



## Fan mail for symposium

THE FOUR-DAY symposium at HP's Palo Alto plant in late April for people representing a wide range of companies (reported in the *May Measure*) has stimulated an unusual number of thank-you letters from among the 125 people who attended. The symposium, believed to be the first of its kind ever held in the industry, was aimed at managers and supervisors of departments dealing with calibration, certification, maintenance, and repair of electronic instrumentation.

Training Department Manager Carl Mahurin, with a folder of at least two dozen letters on his desk, says: "We had a feeling as soon as the symposium was over that we had hit the target, but we frankly are amazed at the enthusiasm expressed in these letters."

As an example, Mahurin cites a letter from Raytheon's A. J. Roy, who predicted that the "free exchange of ideas . . . will be of great value to all concerned in present and future measurement and calibration programs throughout the country."

R. C. Meyer of Lockheed Missiles and Space Company pointed to the large turnout of people from all sections of the country as evidence "of the need which was filled by the symposium."

Standards Supervisor Lester LaCour of Hughes Aircraft summed it up as a "rewarding experience" and said he particularly appreciated the "helpful, patient, and eager-to-assist attitude of everyone."

Phillip Painchaud, a supervisor with a large aircraft company who attended at his own expense, wrote that "this has been the best investment in self-improvement I have made in 20 years."

## Hammond heads new advanced physics unit

AN ADVANCED R&D physics staff has been formed by the corporation with Don Hammond serving as manager. In his announcement, Barney Oliver, research and development vice president, pointed out that the new group would concern itself with the general areas of quantum electronics and electroacoustics.

Hammond was formerly head of quartz crystal engineering and manufacturing in the Frequency and Time Division. He has been with HP since 1959.

His staff engineers include Charles Adams, Len Cutler, Terry McFadden, and Reese Turner, all formerly with the F&T Division, and John Hoyte, who had been with corporate manufacturing. Keith Kelley, Ross Dozier, Darlene Watson, and Dick Mehrkens have joined the group as technicians.

Quarters for the advanced physics staff are in the quartz crystal laboratory in Building 1L at the Stanford plant in Palo Alto.

## Two at RMC make IEEE news

TWO RMC Sales Division men "moved upward" with the Institute of Electrical and Electronics Engineers recently. Division Sales Manager Milt Lichtenstein became a section officer, while Field Engineer Herb Kulik literally rose skyward in a new Boeing 727 loaded with IEEE members.

Lichtenstein has been elected vice chairman-operations of IEEE's New York Section. He joins a significant number of HP engineers who serve as local, regional, and national officers for the IEEE.

Kulik was one of 80 members of the Long Island Section who were invited by United Air Lines to be guests on a special two-hour flight aboard one of the airline's new Boeing 727 tri-engine jets (see below). The plane was of special interest to the group because of its extreme use of advanced electronic gear. All vital functions, for instance, are controlled by six computers.

After the flight, Kulik spoke over the plane's loudspeaker system, remarking that he believed "this is the highest and fastest that a whole section of the IEEE has ever gone at one time."

Kulik's activities with IEEE include editing the Section's magazine, *The Pulse of Long Island*.

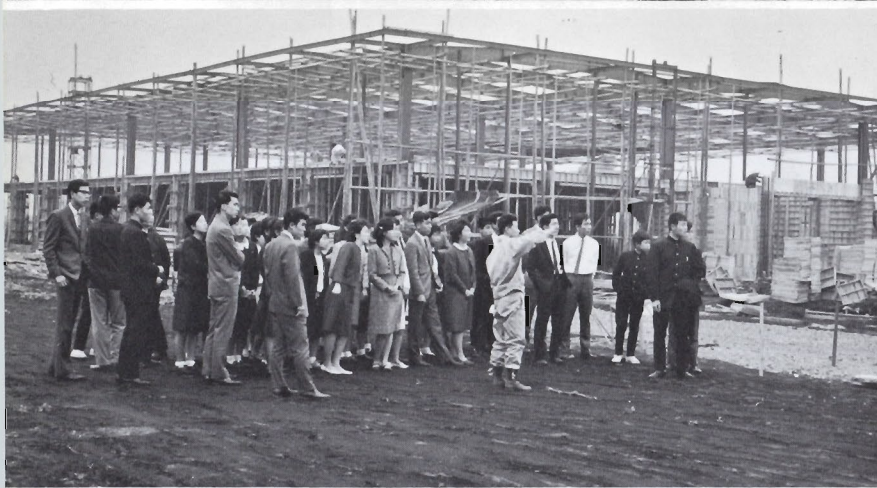


RMC's Herb Kulik (far left) was chairman of arrangements for a special flight by IEEE members in the new commercial jet.



ONE MILLION TRADING STAMPS is the prize Mrs. Rita Olivieri has just collected from the B.V.D. company—and it all came about when she bought two shirts for her husband, John. The purchase entitled her to enter her name in a nationwide contest and she subsequently won first prize. The Olivieris (John is a departmental manager with Sanborn at Waltham) plan to cash them in on a color television set, a boat, and some 30 other items. In the meantime they count stamps . . . 834,678 . . . 834,679 . . . 834,680 . . .

## NEWS IN FOCUS



NEW EMPLOYEES of Yokogawa-Hewlett-Packard in Japan are shown getting a close look at construction progress of plant and head office building at Hachioji. Completion of 63,000-square-foot structure is scheduled for September.



STILES SALES DIVISION pitched in to help make a big success of the Instrument Society of America's Southeastern Conference April 7-11 at Tampa, Fla. Stiles Branch Manager Gene Dashiell served as general host chairman and the Stiles booth shown here was well attended. L to r: Dick Gehle, Honeywell Corp.; Ed Wood, Stiles; Doug Gaines, Honeywell; and William Kushnick, ISA executive director.





## people on the move

### HP PALO ALTO

**Joe Bourdet**, special handling—to service engineering, F&T Division.

**Jim Campbell**, nuclear applications engineering, marketing staff, F&T Division—to Corporate Marketing staff.

**Jerry Hedquist**, engineer, Microwave Division—to quality assurance, Oscilloscope Division.

**Ben Helms**, R&D engineering, Oscilloscope Division—to engineering staff, Microwave Division.

**Karl Johannsmeier**, engineering lab, Microwave Division—to engineering staff, Advanced R&D.

**Bill Parsons**, process engineering, Corporate Manufacturing—to in-plant engineering, Microwave Division.

### LAHANA

**Don Thomas**, medical sales engineer, Sanborn Company—to medical field engineer, Lahana and Company.

### COLORADO SPRINGS

**John Cardon**, engineering lab, Microwave Division—to real time scope engineering, Colorado Springs.

**Ron Given**, engineering lab, Microwave Division—to real time scope engineering, Colorado Springs.

**Bob Thompson**, line supervisor, Oscilloscope Division, Palo Alto—to Colorado Springs.

### DYMEC

**Jerry Collins**, applications engineer, sales department—to supervisor, systems project engineering.

### LOVELAND

**Robert S. Price**, instrumentation development engineer, Beech Aircraft, Boulder, Colo.—to in-plant engineering, Loveland Division.

**Richard L. Sowell**, technical writer, Sundstrand, Denver—to customer service, Loveland Division.

### Smith marks 45th year



**HARRY SMITH**, traffic manager for the Sanborn Division in Waltham, Mass., recently passed a milestone which is a first for the entire HP organization. He celebrated his 45th year of service to Sanborn, making him the longest term employee in any division or affiliated company. Smith is seen above, left, receiving a 45-year pin from Bruce Wholey, Sanborn general manager, during a special luncheon April 23.

# Measure

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"I often say that when you can measure what you are speaking about, and express it in numbers, you know something about it; but when you cannot measure it, when you cannot express it in numbers, your knowledge is of a meager and unsatisfactory kind . . ." LORD KELVIN (1824-1907)



## Twenty to One



FLIGHT SAFETY depends on radio aids, and with today's crowded airwave conditions the odds are that a new Hewlett-Packard instrument will help untangle these communication threads. Taking the place of 20 earlier vintage instruments, the newly introduced HP Spectrum Analyzer can simultaneously display all radio signals at once, using only a tenth of its cathode ray screen. Then, it can add the whole 82-channel UHF television band, some radar stations, and satellite communications broadcasts—and still have half the screen available to show 1,000 megacycles of the microwave band. Art Fong, Microwave Division section leader in charge of the instrument's development, records "spectrum signatures" (shown at right) for some of the different transmissions that guide air traffic at the San Francisco International Airport. Top to bottom the signatures are of search radar, a weather communication channel, a directional radio beacon, and a group of voice channels.

