February 1964

Measure

In this issue

from our president's desk

LAST YEAR the Sanborn Company built four surgical monitoring systems for the National Institutes of Health in Bethesda, Maryland. A few weeks ago I had the opportunity to see one of these complex systems in use during open-heart surgery. I was most impressed with the operation itself, which involved the replacement of a defective valve inside the heart with an artificial mechanical valve. It is one of the most delicate and difficult operations ever attempted.

While the operating team prepared the patient and made the initial incisions to expose the heart, we discussed the Sanborn equipment with the chief surgeon. He explained how the equipment is used and what is expected of it in the way of performance.

The monitoring system performs two important functions. It acquires and instantaneously displays information on heart rate, blood pressures, temperatures, heart output, and other vital data which the surgeon needs during the operation. Some of the information is displayed in numerical form on a large panel in front of the surgeon. Other data is displayed in waveforms on the screen of a large cathode ray tube. As the operation progressed, we noticed how the surgeon was able to check many things about the patient's condition. At one point he measured the strength of the heart muscle and the pressures in various areas inside the heart.

The other important function of the system is to record on magnetic tape the same data that is being shown to the surgeon. This provides a permanent record of the patient's condition throughout the entire operation. The surgeon can later study the data and use this to develop improved procedures and techniques for future operations.

The equipment supplied by Sanborn worked very well and the operating team seemed highly pleased with it. In watching such a delicate operation, one had the feeling that the life of the patient depended not only on the skill of the surgeon but also on the proper working of this complex electronic instrumentation. In a very real sense, then, when we supply our equipment for vital jobs such as these, a great deal is at stake and quality becomes an all-important factor.

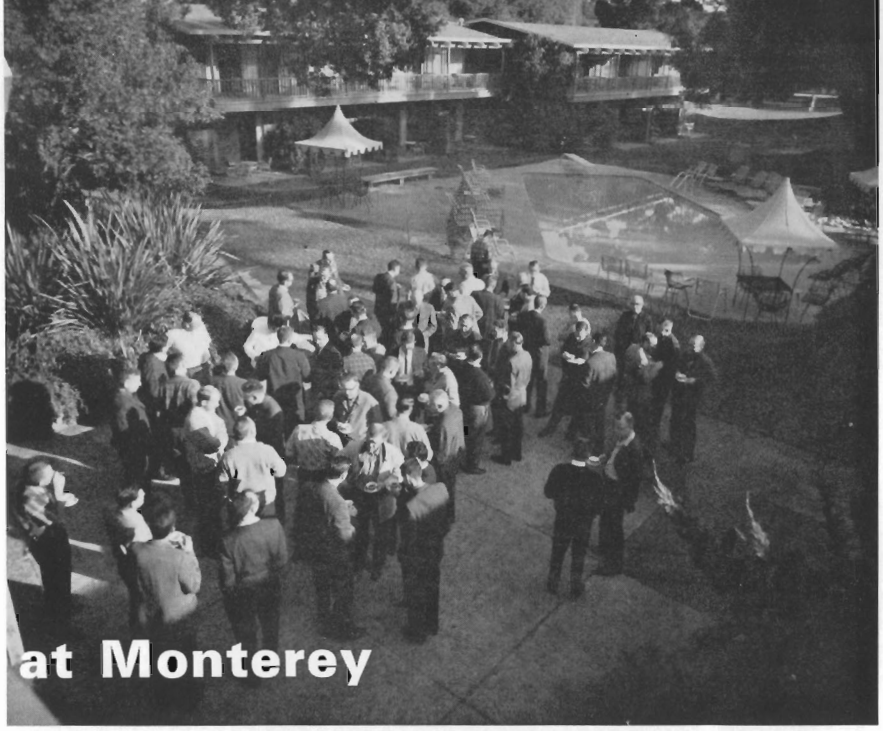
The equipment must be designed so it is capable of making a number of critical measurements with utmost speed and accuracy. Moreover, it must be reliable. One defective part, one loose wire, or one poorly soldered joint could seriously affect the outcome of the operation.

The kind of quality and reliability required in a system such as this must be built in by each workman at each stage of manufacture. Quality and reliability cannot be inspected in later. A large portion of the instruments we make are used in highly critical applications where not only vast sums of money are dependent upon the proper functioning of our equipment, but the lives of people as well.

If each of you could have seen this operation at NIH I am sure you would have recognized, as I did, that every step in the production of a complex electronic instrument, regardless of how small that step may seem, is important and demands maximum attention to detail.

We have done well in upgrading the quality of our products, but we can do even better. Let's join together this year—each division, each affiliate, each department, and especially each individual—in a firm resolution that every instrument we produce will represent the utmost in craftsmanship and quality.

David Packard



Long Look Ahead at Monterey

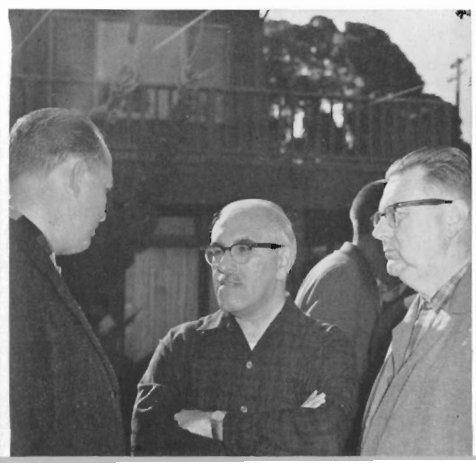
"NEW MARKETS AND PRODUCTS, 1964-1968" was the broad theme of the Eighth Annual Monterey Management Conference January 10-12. As the pictures on this page reveal, the discussions stimulated enthusiasm and intense interest in prospects for the coming years. Projections based on current known business conditions were presented, and attention was focused on the possibility of extending product lines into new areas of instrumentation. In all, 72 corporate, divisional, and subsidiary company managers attended the sessions at the Mark Thomas Inn on California's scenic coast at Monterey.

Bob Buchner, Harrison;
Jack Melchor, HP Associates

Marco Negrete, Loveland; Stan Selby, Loveland; Bob Grimm, Dymec

Bob Boniface, Neely; Bill Gross, Dymec; Bill Myers, Boonton; Bruce Wholey, Sanborn

Fred Schroeder, HP GmbH; Doc Miller, Sanborn; Matty Murtha, Sanborn



Sales seminar attracts 80 field engineers

A preview of new instrumentation such as Microwave Division's spectrum analyzer highlighted sales seminar working sessions.

EIGHTY FIELD ENGINEERS from 16 HP sales divisions and subsidiaries met in Palo Alto recently for the annual January Sales Seminar. For five days these experienced salesmen participated in a series of meetings with manufacturing division personnel and attended special sessions to hear talks by corporate management.

Bill Hewlett opened the seminar with a talk about company forecasts of market and product areas over the next five years (the Monterey conference theme). He was followed by Dave Packard, who spoke about the company's financial position, and trends and directions in the company's future.

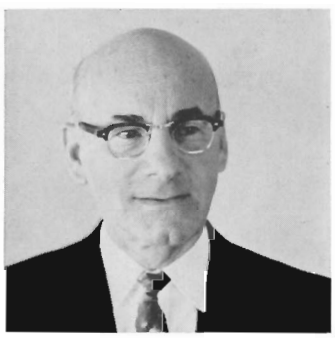
Other speakers during the week included Barney Oliver, vice president of research and engineering, who discussed time domain reflectometry; Noel Eldred, vice president of marketing, who gave the field engineers some insight into marketing problems and plans; Ed Porter, vice president of operations, who reviewed the outlook of the various manufacturing operations; and Bud Eldon, systems and procedures, who talked about the order processing TWX network.

The working sessions of the seminar were half-day meetings with manufacturing division personnel. The field engineers, in groups of 12 to 14, met with them to learn of new products and product ideas, and discuss the important matter of keeping ahead of the competition in day-to-day selling.

Breaks were provided between sessions during the week so that the visitors could discuss individual sales and service problems with engineering and manufacturing personnel, and spend time establishing important personal contacts.

Sales activities in the field didn't come to a standstill during the week-long seminar. The other half of the experienced field-selling force was still on the job—and looking ahead to the seminar they'll attend at Palo Alto in July.

Sanborn's Tony Barbera retires after 43 years



Tony Barbera, ending 43 years of service with Sanborn, plans to keep busy at home during retirement.

THE WAR was still a fresh memory—World War I, that is when young Anthony A. Barbera walked into the Sanborn "employment office" in Boston. It was 1920, and Sanborn boasted four products and just a few more employees.

Mr. Barbera's first job was as a solderer and soon he became foreman of the sheet metal department. Right in the middle of another war—WW II—Tony became building superintendent of the plant, which by then had been moved to Cambridge. Two years later in 1946 he became manager of the materials control department at Waltham, a position he held until his retirement on December 31, 1963.

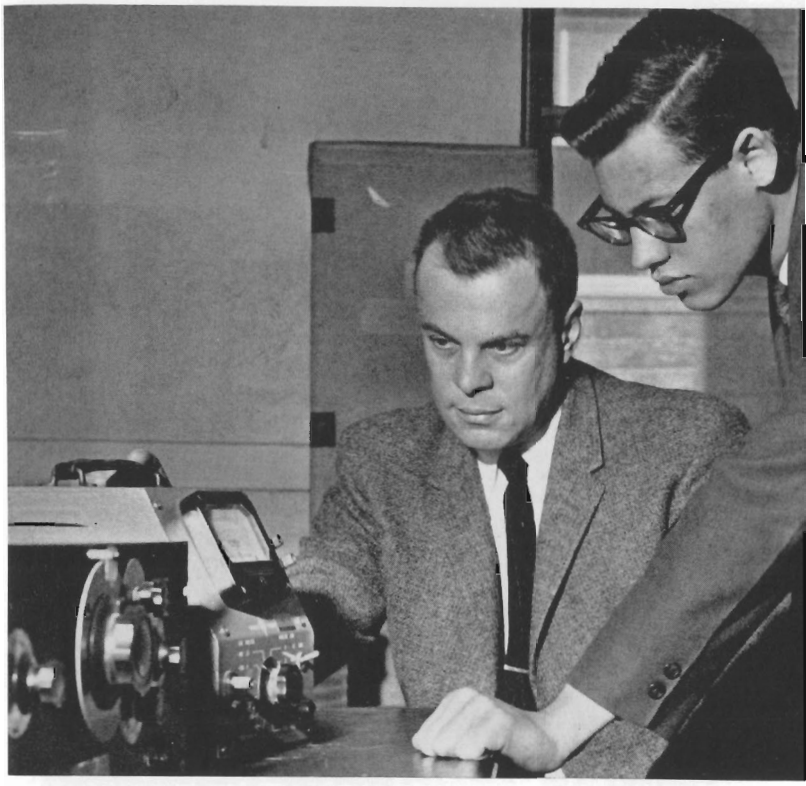
A gift keeps giving

THREE SUMMERS AGO the Robinson Sales Division presented a gift of two instruments to a bright Carlisle, Pa., high school student, John Rehr, Jr. The oscillator (200CR) and voltmeter (400C) helped the 16-year-old to do scientific research far beyond his years.

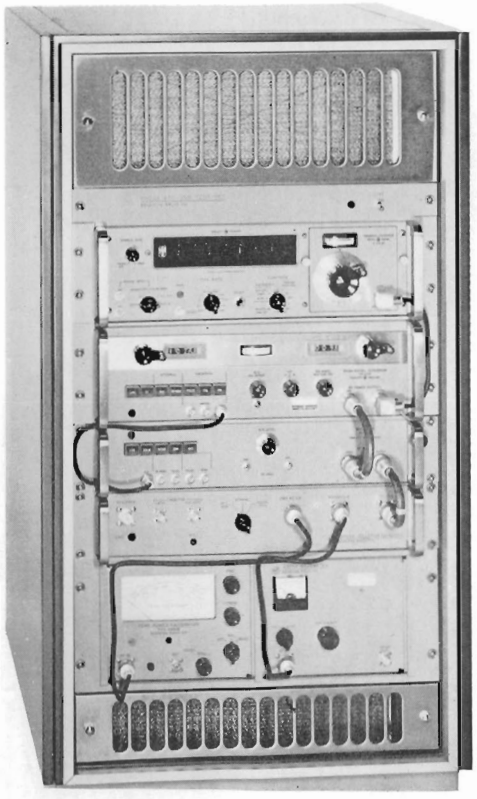
John Rehr is an unusual young man. Back at Carlisle High he became interested in rocketry and space research. He built and fired a number of small rockets and eventually drew plans for one which would be powerful enough to reach an altitude of 50 miles. He also designed and built instrumentation for studying atmospheric conditions at that height, and he assembled the ground test equipment and computing devices necessary for such a test.

When Navy officials learned of his progress, they were so impressed that they offered to "loan" him a rocket and launch it from Point Mugu in California. However, the countdown has been delayed for awhile, because in the meantime Rehr finished high school and is now deeply engrossed in college studies.

He is attending the University of Michigan, and since he has completed his research work up to the point of firing a rocket, has in turn presented the HP instruments to the university—where they can continue serving students and faculty members.



Electronic test instruments donated by Hewlett-Packard to John Rehr, Jr. (right) in 1961, have gone to college. John, now a physics major at the University of Michigan, and Dr. L. W. Jones, professor of physics, examine the instruments which John in turn has donated to the university's physics department.



Boonton's new test system for calibrating jet aircraft navigational equipment combines instruments from two other HP divisions.

A happy marriage

ALTHOUGH ITS NAME looks like the serial number on your insurance policy, the new 8925A DME/ATC test set represents an outstanding bit of teamwork between several sectors of the HP family—Boonton Radio, the Microwave Division, and the Frequency and Time Division.

This new system, design by Boonton, brings about a happy marriage of components from all three divisions. Its function is to calibrate the advanced new air traffic control (ATC) and distance measuring equipment (DME) required in high-speed jet aircraft operations.

The new test set consists of seven basic units. The actual test signals are generated by an H01-8614A signal generator and are modulated by an H03-8714A modulator, both designed by the Microwave Division. The Frequency and Time Division contributed a 5245L electronic counter and the new 5254A frequency converter. Boonton's new 8900B peak power calibrator proved to fit the system perfectly, and Boonton engineers designed a wavemeter and developed an isolator-monitor which ties the whole system together, providing all necessary connections for aircraft radios under test.

Shinto rites precede Y-HP construction

Before entering shrine, each person cleansed hands with holy water from wooden bucket.

GROUND WAS BROKEN for Yokogawa-Hewlett-Packard's new plant January 6 during a Shinto ceremony which has been a tradition in Japan for centuries.

A priest of the Shinto faith and his assistant set up a shrine at the plant site 30 miles west of downtown Tokyo, and performed an ancient and beautiful rite which made the conventional ground breaking of the Western world seem colorless by comparison.

During the 30-minute ceremony, the priest exorcised the eight-acre plot of evil spirits and called upon the local shrine god for blessings and permission to build. A sacrificial altar held apples, dried fish, leaves, sake, rice cakes, and vegetables. (A Shintoist—and there are 60 million in Asia—pays reverence to his ancestors.)

Fifty people attended, including Shozo Yokogawa, president of the Y-HP joint venture; Giichi Yokoyama, manufacturing manager; and the representatives of seven contracting firms involved in the plant's construction. The million-dollar, two-story plant will have about 63,000 square feet of engineering and manufacturing space. A variety of electronic and electrical instruments produced there for sale in many parts of the Free World, will include microwave test equipment, oscilloscopes, counters, and oscillators.

Y-HP, which was officially founded on September 20, 1963, already has 244 employees working in a leased facility of Yokogawa Electric Works in Tokyo. These people will be transferred to the new plant at suburban Hachioji-shi when it is completed this fall.

Following the ceremony, Mr. Yokogawa spoke to the group, describing the plant designed by HP, and suggested that the contractors would learn many valuable things from constructing this "new" type of building. He then poured holy sake for everyone and proposed a toast, rounding out a day of solemnity and bright hope for the future.

MEASURE'S cover: The Shinto priest is seen with a tree branch freeing the construction site of evil spirits. Starting at the shrine, he moves to the four corners of the eight-acre plot. As he waves the branch he scatters bits of colored paper, a holy symbol.

A centuries-old ceremony purges land of evil spirits and paves way for a p

Shinto priest beseeches shrine deity for safe completion of plant.

Y-HP President Shozo Yokogawa turns spade of soil to symbolize breaking of ground.

After worship ceremony, Mr. Yokogawa proposes a toast with holy sake.

Shortly after ceremony, land clearing got underway in earnest.

lant as new as tomorrow . . .

around the circuit

By Noel E. Porter, *Vice President, Operations*

ALTHOUGH WE ARE SHORT of our shipment targets for the first quarter, we are off to a fair start on fiscal year 1964. Total shipments are up about 7 percent over the same period last year. Since the parent group has shown only a slight increase, the bulk of the 7 percent rise comes from the other operations.

The outlook for the first half of the fiscal year (ending April 30) is still reasonably strong. We expect to exceed $60 million in shipments, and could possibly hit $63 million. The former would be up 8 percent and the latter up 14 percent over the first half of 1963. Our current production rate, coupled with continuing increases in production efficiency, indicates that we can handle the load with a negligible increase in manpower and a minimum of overtime.

Making jobs easier, reducing costs, and improving quality are matters with which we are continuously concerned. Here are some good examples.

We have ordered a $50,000 multiple spindle 4-station numerical (tape) control drill for printed circuit manufacturing at the Palo Alto complex. The equipment includes a programmer that will let us make tapes directly from the silk screen image used in making the printed board. We expect that the new machinery will pay for itself in a little over two years in labor savings and at the same time will produce a higher quality product.

A new method of printed circuit assembly is being pioneered by the Scope division. They are mounting two boards parallel, about an inch apart, with the components suspended between the boards. This approach provides better component cooling, a higher degree of layout flexibility, and allows for pretesting with greater ease of trouble shooting and serviceability.

A new automatic dip soldering machine, which effectively eliminates retouch time, has been installed at the Palo Alto plant (Dymec and Scope). At Sanborn, they now have in operation a novel and effective multi-station printed circuit assembly and dip soldering set-up which is making a large contribution to efficiency and quality.

Our diecasting shop at Palo Alto is also a highly efficient operation. This facility supplies many of the HP cabinet parts to all operations and represents a considerable investment in equipment. Efficiency and quality will be further enhanced by an automatic sanding and buffing machine which we are now designing for use on the cabinet end frames. This piece of equipment will be a real time saver.

We have two Milwaukeematic milling machines at the precision machine shop in the Stanford plant which cost about $200,000 each. These machines minimize the tooling required for new designs, greatly reduce the time required for getting new instruments into production, provide more accurate and consistent tolerance on parts, and greatly reduce parts costs over conventional tooling.

Because of their benefits, these machines are very popular and are presently up to capacity on three shifts. We are looking into the problem of the overload, and are considering several types of automatic and numerical control production devices.

Comparable improvements are being made in the areas of sheet metal fabrication, assembly and test procedures, metal etching, and other important production functions. These improvements lead to higher quality products and provide our engineering design people with greater flexibility and broader opportunities to apply their creative talents.

All of these efforts to upgrade our plants, equipment, and manufacturing are vital to our continued growth and progress, and to maintaining our leadership in an increasingly competitive market.

Order processing network expands to include RMC, Yewell

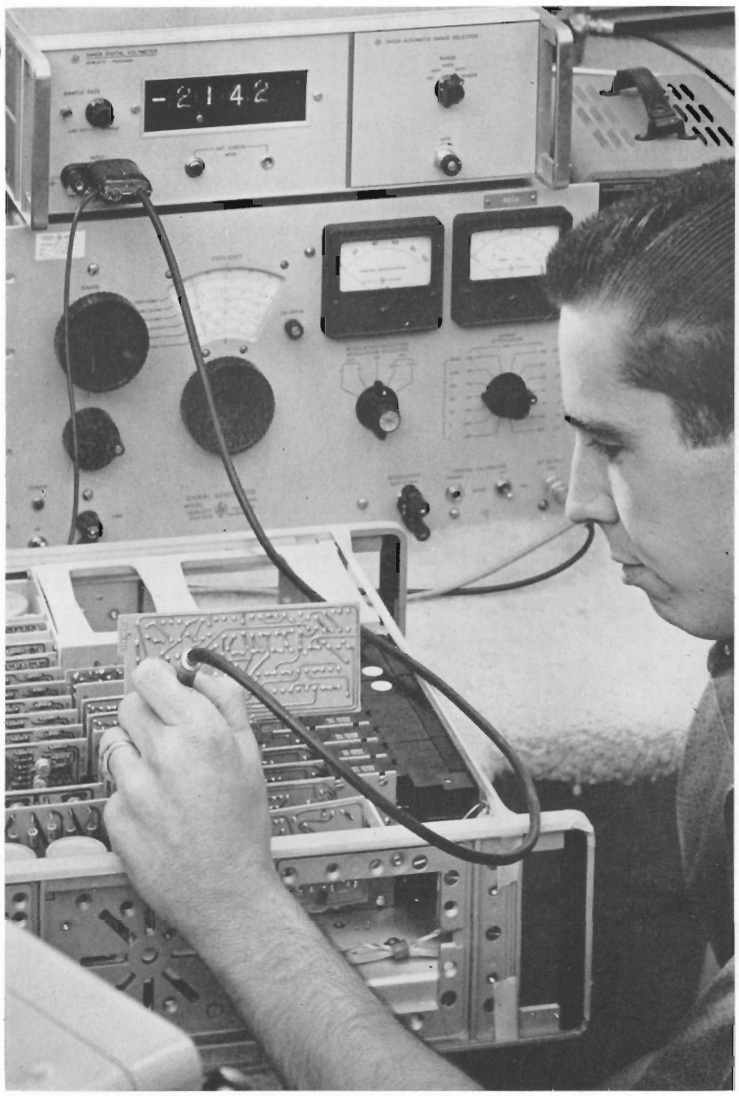
HP'S ORDER PROCESSING TWX network, less than a year old, has grown to a system of four main order processing centers, eight branch locations, and receiving stations at Palo Alto, California, and Loveland, Colorado.

Newest additions to the network include the two RMC offices (New York City, and Englewood, New Jersey) and the two Yewell offices (Burlington, Massachusetts, and Middletown, Connecticut).

Major processing centers (in addition to RMC-NYC and Yewell-Massachusetts) are Neely-North Hollywood and Neely-San Carlos. Branch units are located in the Neely offices in New Mexico, Arizona, San Diego, and Sacramento, and the RMC-New Jersey and Yewell-Connecticut offices.

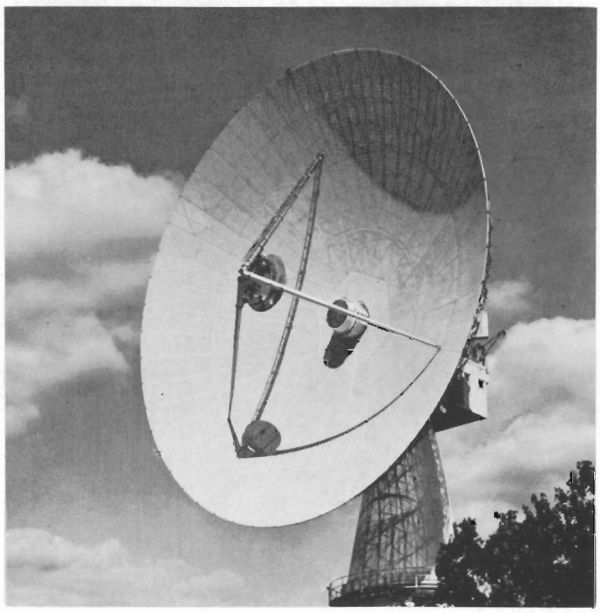
The order processing network speeds orders and invoices from the four major centers to the production facilities at Palo Alto and Loveland. Among the many advantages the system offers are better customer service and reductions in inventories and paperwork.

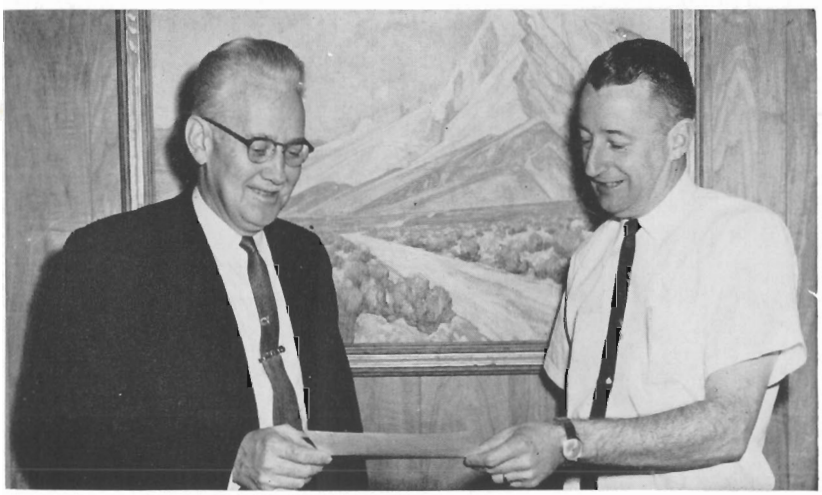
NEWS IN FOCUS



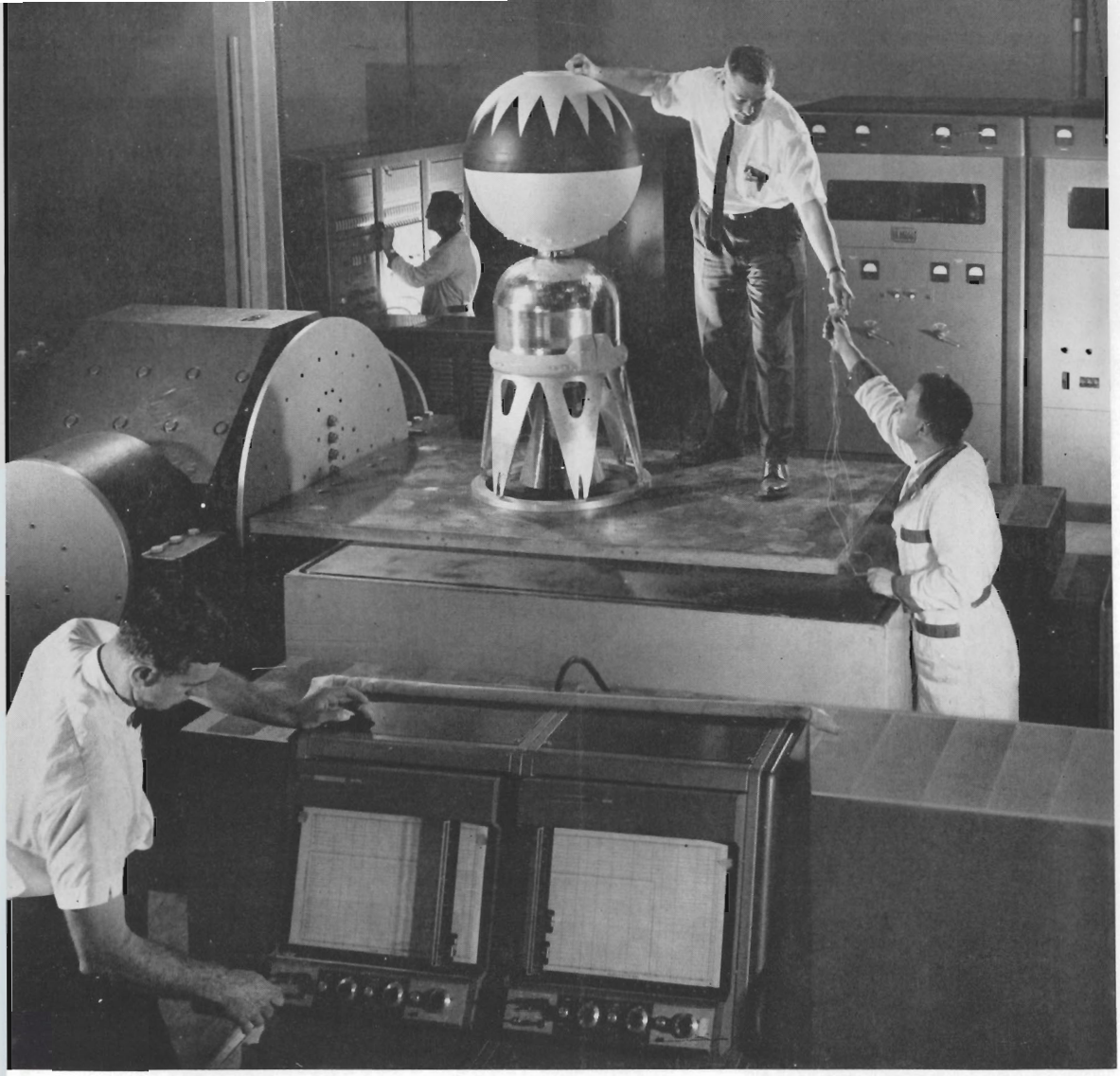
NEW DIGITAL VOLTMETER (Model 3440A) has passed all tests with flying colors, proving its positive performance and quick response. Instrument was designed in Palo Alto and built in Loveland, Colo. Bob Ponzini is shown checking out prototype at Palo Alto.

FIRST RADIO ASTRONOMY detection and measurement in interstellar space of hydrogen-oxygen matter (called OH radicals) was made recently by M.I.T. scientists of Lincoln Lab's Millstone site in Westford, Mass. This 84-foot tracking antenna used in experiment was backed up by extensive electronic computing and measuring equipment including an HP signal generator and a Dymec oscillator synchronizer.





WHATAYADO with a check for $1,785,806.45? These two gentlemen know the answer—invest it wisely. Company Treasurer Ed van Bronkhorst (right) is shown handing over a check in that amount to Herb Drake, vice president of Crocker-Citizens Bank, prominent Bay Area banking institution. The money represents the 1963 contribution of all domestic subsidiaries and divisions to the consolidated HP Profit Sharing-Retirement Fund. This brings the total fund balance to over $11 million, derived from the earnings of 21 divisions and subsidiaries, and will be allocated to the accounts of 3,551 eligible employees.



Two Moseley recorders plot vibration test results on Ranger space capsule. (Photo courtesy Ford Motor Co. and Ling-Temco-Vought Inc.)

X-Y recorders: cartesian coordinates made easy

AS A SPACE CAPSULE makes its swift exit from the earth's atmosphere, nature subjects it to a remarkable beating. The lift-off is bad enough. But that's nothing compared to the vibration later on.

Testing the influence of such vibration before the capsule leaves the launching pad helps uncover defects which might limit the performance of the capsule and its sensitive instruments. X-Y recorders are essential in these tests, and others, to chart the relationship between two or more simultaneous actions.

The plotting of data in cartesian coordinate form on graph paper is something most school children learn in seventh grade mathematics. The result is also sheer boredom for many students, because acquiring the variable data and plotting the curve point by point is tedious and subject to human error. In the serious business of science and industry, such slow-paced work and inaccuracy can be costly. Thus, in 1951 the F. L. Moseley Co., was established to develop, manufacture, and market the first commercial two-axis graphic recording instruments. Today there are over 40 models and styles of Moseley X-Y recorders, a companion line of strip chart recorders, and supplemental equipment.

The fact that the Moseley company has grown at the rate of about 20 to 25 percent a year is evidence that there was an urgent need for this kind of recording equipment. Currently, this profitable HP subsidiary produces more X-Y recorders than any other company, and there are about five major competitors in the business. X-Y recorders account for 80 percent of Moseley's total output, strip chart recorders 10 percent, and accessory equipment the remaining 10 percent.

Any industry, school, or laboratory can put X-Y recorders to use whenever it is necessary to study the relationship between two phenomena. For instance, an auto maker might want to plot gasoline consumption of an engine as running speed is increased, or a structural engineer might want to test a bridge beam and record its behavior as it is placed under increasing loads. The market for these versatile instruments is virtually without bounds.

people on the move

HP PALO ALTO

William Hawkins, special handling, Microwave Division — to engineering and special handling, Oscilloscope Division.

Frank Holbrook, manager, marketing services, Dymec—to sales analyst, International Operations.

Murray Horton, field engineer, Hewlett-Packard Harrisburg office—to sales engineer, Microwave Division.

Norm O'Neal, in-plant tool engineer, machine shop—to product designer, Oscilloscope Division.

Rudolph Stefenel, *engineering* pool —to R&D, Microwave Division.

BOONTON

Erwin Conrad, assistant service department manager, RMC Sales Division —to customer service supervisor, Boonton.

Ray Tatman, customer service supervisor—to service engineer.

HPSA

Dick Reynolds, International Operations, Palo Alto—to marketing manager, HPSA.

DYMEC

Ray Conway, logic design engineer, Link Division of General Precision, Inc. (Palo Alto)—to development engineer, digital engineering group.

Bart Kingham, systems engineer, Philco (Palo Alto)—to systems engineer, digital engineering group.

Jim Lowry, project manager, circuits group, Librascope Division of General Precision, Inc. (Los Angeles)—to development engineer, digital engineering group.

Frank Schork, supervisor, order processing — to manager, marketing services.

Frank Westley, personnel and industrial relations manager, S&W Fine Foods (Redwood City)—to personnel manager.

SANBORN

Lee Seligson, employee development coordinator, HP Palo Alto—to manager, personnel development and organization, Sanborn.

William Sullivan, manager of engineering costs—to manager, manufacturing and engineering costs.

NEELY

Rodger Fagerholm, field engineer, North Hollywood—territory expanded to include Hawaii.

Bill Nilsson, sales promotion, Dymec Division—to staff engineer, North Hollywood office.

Bruce Snyder, staff engineer—to field engineer, North Hollywood office.

Lincoln Young, engineer, Burton Manufacturing—to staff engineer, North Hollywood office.

YEWELL

Bill Colby, service manager—to staff engineer, Burlington office.

Measure

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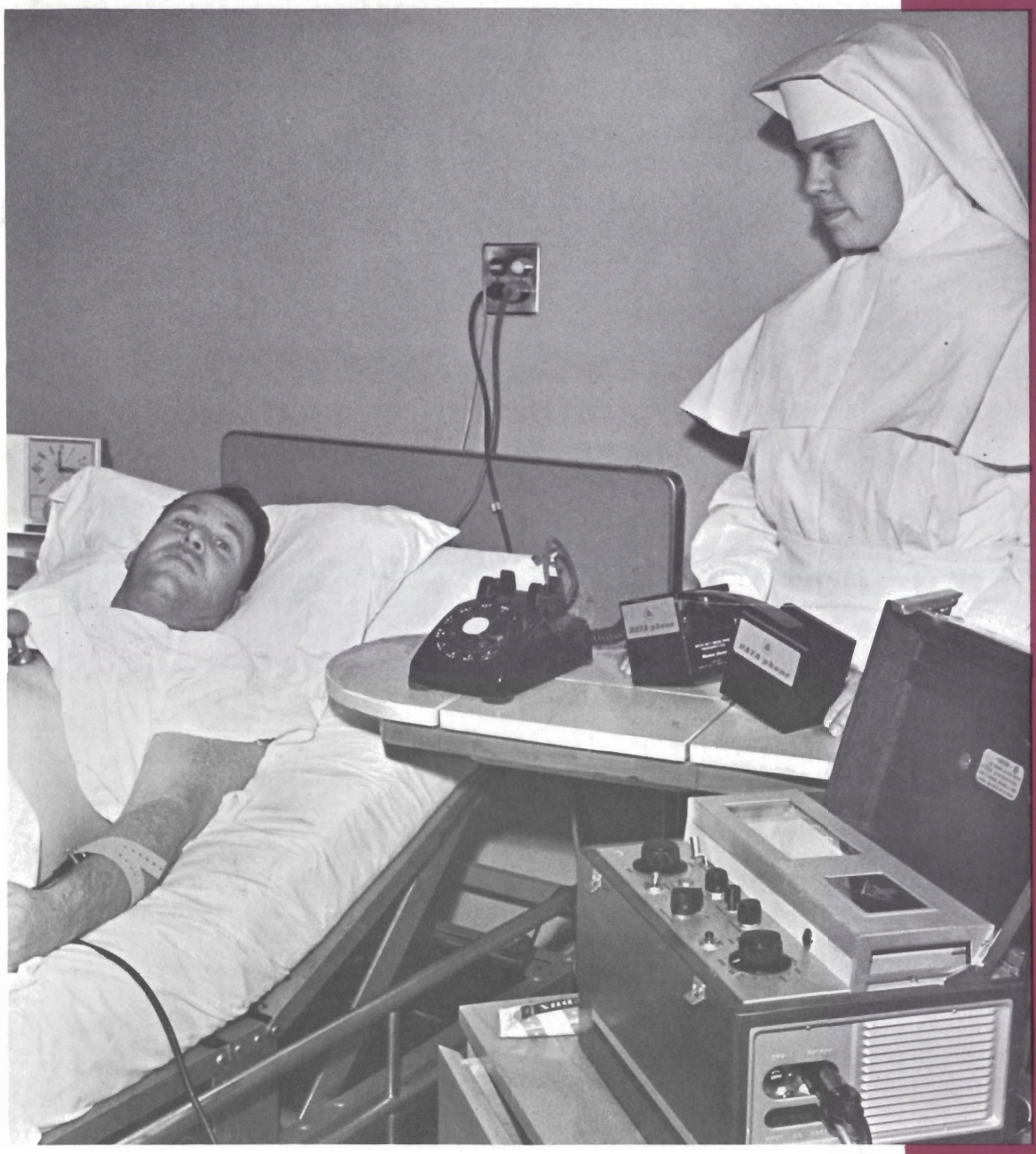
"I often say that when you can measure what you are speaking about, and express it in numbers, you know something about it; but when you cannot measure it, when you cannot express it in numbers, your knowledge is of a meager and unsatisfactory kind . . ." LORD KELVIN (1824-1907)

ELECTRONIC LIFE PRESERVER



SAVING LIVES by long distance telephone has become a reality, thanks to an electronic system currently being tested by Northwestern Bell and Creighton Memorial St. Joseph's Hospital at Omaha. Called a phonocardiogram, the system can monitor a patient's heartbeat—even if he is in a remote location—and instantaneously transmit information to the hospital for study by medical specialists. The patient shown above at Spalding, Nebraska, is having his heartbeat recorded by a Sanborn viso-cardiette (Model 100) electrocardiograph, and the two little boxes on the table relay this information by long distance telephone to the Omaha hospital 170 miles away. There, another EKG machine picks up the signal, thus giving staff physicians essential and simultaneous data on the patient's condition at all times.

Omaha World-Herald Photo