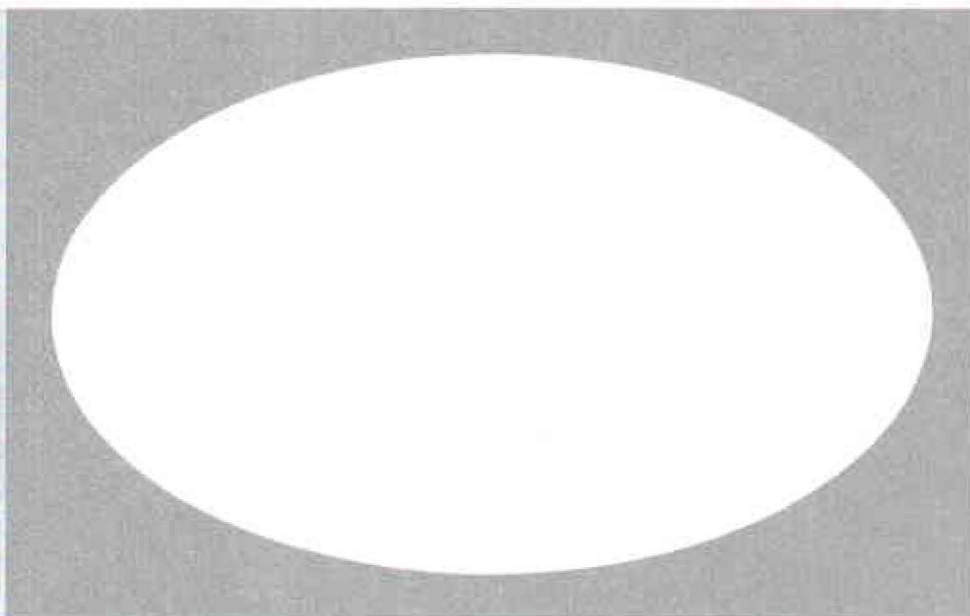
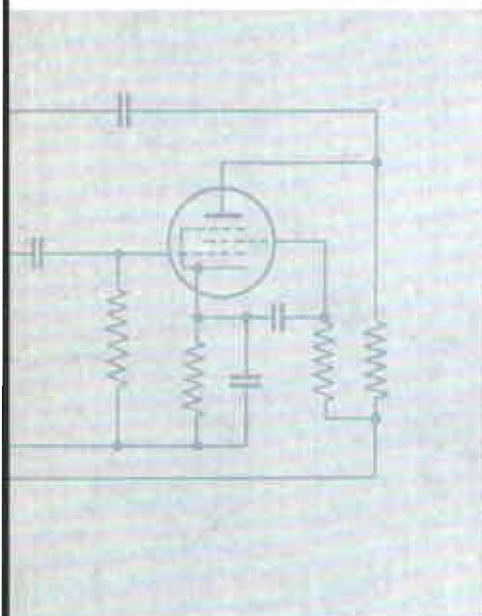


HEWLETT-PACKARD • TWENTY-FIFTH ANNIVERSARY



a special issue of **M** *measure*

THE COVER



Among the hundreds of electronic circuits designed by Hewlett-Packard engineers over the past twenty-five years, perhaps the most significant is Bill Hewlett's original audio oscillator circuit. Pictured on the cover, it is described by U.S. Patent 2,268,872, filed July 11, 1939. Since then, Hewlett-Packard has produced more than a quarter of a million units using basically similar circuitry.

Decisions for dynamic growth

Traditionally, a company's twenty-fifth anniversary is a time for reminiscing and celebration, for cutting cakes and making speeches.

But nostalgia and fanfare are a little out of character for Hewlett-Packard. For this is a restless company, one that would rather be about its business than talking of "our glorious past."

Therefore, this special issue of MEASURE is presented—not so much as an historical account—but as a picture of Hewlett-Packard here and now. It is not an easy picture to take because the company is far too busy to sit still for a definitive portrait.

HP is a vibrant, world-wide organization. Within its ranks are recently acquired electronics manufacturers who in themselves boast proud heritages. Two of these firms—Sanborn and Boonton Radio—are older than HP itself. Their stories, rich in history and interest, are told in other ways, in other places.

This anniversary issue will concern itself with the life and times of the parent corporation, tracing its growth and outlining its present position as a world leader in electronic instrumentation.

Contributing to the company's rising stature has been a multitude of events and personalities. These are varied and changing, tending to become dimmed by the passing years. Certain characteristics of Hewlett-Packard, however, have retained their clarity. These are what the editors of MEASURE have chosen to call "decisions for dynamic growth." They are decisions formulated in the early days of the company, principles by which the founders have guided HP for a quarter of a century. Because of their timelessness, they have been selected as a theme for this anniversary issue, appearing as a headline over each major section in the magazine.

Also included are comments and observations from some of the people who helped to make Hewlett-Packard history. The editors are grateful for the still-vivid memories of these individuals, and appreciative of their pride in saying, "I was there."

THE PRODUCTS

"Our efforts should be concentrated on
our energies toward

Twenty-five years may seem like little more than a fleeting moment in history, but for the electronics industry it has been long enough to change the world around us. Within this period, electronics has affected the way we live, the way we work, the way we fight our wars, the way we cure our sick, the way we search the unknown.

Hewlett-Packard grew up with the industry during these years. At first, the company was one of many small struggling enterprises intrigued with the possibilities of electronics. But soon a determination to make meaningful contributions to the state of the measuring art, to produce the best in quality, and to employ the kinds of people who could achieve these lofty goals brought the company to the forefront. Today, HP is the world's leading producer of electronic test and measuring equipment.

□ The seeds of this remarkable growth were sown two years before the actual founding of the company. On August 23, 1937, Bill Hewlett and Dave Packard got together in Palo Alto for the purpose of discussing, as the minutes of their meeting read, "tentative organization plans and a tentative work program for a proposed business venture."

The meeting fairly crackled with product ideas. "High frequency systems including receivers appeared to be a possibility," they wrote. Medical

equipment was considered a "good field," and it was felt that "we should make every attempt to keep up on television." (Television was virtually unheard of by the general public at that time.)

They even decided on a tentative name for their proposed firm—"The Engineering Service Co."

□ Hewlett was occupied with graduate work at Stanford in those days and Packard was working for General Electric in Schenectady. Some months later, Stanford Professor Fred Terman devised a plan to get Packard a leave of absence from GE and back to Palo Alto.

"Through various means we managed to dig up about \$500 to set up a research assistantship at the university," Dr. Terman recalls. "It wasn't a princely sum, but it was enough to support Dave for an academic year."

Packard and his wife returned to Palo Alto in the fall of 1938. Ensnored on the rumble seat of their car was a second-hand Sears-Roebuck drill press—HP's first piece of machine shop equipment.

The Packards rented a home on Addison Avenue, and it was in the now-legendary one-car garage adjacent to the house that Packard and Hewlett began tinkering in earnest. They built a weight reducing machine, an electronic harmonica tuner, a bowling



electronic instrumentation; making significant contributions..."

alley foul-line indicator, and a diathermy machine. The latter was purchased by the Palo Alto Clinic, thereby becoming the first device sold by the two young engineers.

□ The first electronic instrument developed for sale was a resistance capacity audio oscillator, called Model 200A because "the number sounded big." The instrument stemmed from Bill Hewlett's master's thesis research. The thesis, "A New-Type Resistance-Capacity Oscillator," now ranks as one of the important historical documents in the field of electronic instrumentation.

Hewlett took the oscillator to a regional meeting of the Institute of Radio Engineers in Portland, Oregon. An engineer from the Walt Disney Studios was impressed with the instrument's advanced design, compact size, and economy. He purchased eight for use in producing the now-classic movie, "Fantasia." (In the summer of 1964, Disney Studios reported they still had three or four of the oscillators and, despite the fact they had bounced around the lot for 25 years, were working "just fine.")

Encouraged by the Disney sale—and with some extra dollars to add to their original investment of \$538—Hewlett and Packard formed their partnership. It was early 1939 and the course for the two men was becoming increasingly clear: the young

field of electronic instrumentation needed the kind of engineering skill, imagination, and business acumen which the two men could offer in abundance.

Other instruments were developed quickly—a harmonic wave analyzer, a square wave generator. The garage was soon outgrown, and in 1940 the fledgling company moved its Sears-Roebuck drill press and other equipment into a small rented building on Page Mill Road in south Palo Alto. By mid-year there were seven employees, a production bonus, and paid vacations.

Following the attack on Pearl Harbor, Hewlett-Packard went to war. The work force was quickly expanded to mass produce the company's standard products and to continue development of such new products as the 400A voltmeter and a distortion analyzer.

□ At war's end, the company made a bold and significant decision. It branched out into the microwave field, thereby opening up what has since become one of the largest markets for HP instrumentation.

The parade of new products continued at an ever-increasing rate during the early 1950's, with 20 or more new instruments being developed yearly. In 1958, HP acquired the F. L. Moseley Co. in Pasadena, launching a series of acquisitions which has



I don't think many people realize how tough it was to start a business during and immediately after the depression. Investment capital was scarce and there was no ready-made government market for new ideas, as there is today. You really had to make a go of the business during the first year or close up shop. Since you couldn't afford to hire people, you also had to be versatile. You not only had to design your product, but fabricate it, package it, price it, sell it, keep the books, write the ads, and sweep up at the end of the day.

This versatility, to my way of thinking, was Bill and Dave's greatest asset. Even in their days at Stanford, they showed the ability to work with their hands as well as their minds. Packard had a tradition throughout his youth of tinkering and building things. Hewlett, on the other hand, didn't really have this opportunity or inclination until he got into graduate work. Then he went at it with a vengeance, spending countless hours in the lab. I must say that at the outset he had more energy than finesse, but as time went on he developed into a first-rate designer. His audio oscillator, for example, represented a beautiful solution to a perplexing design problem.

I can remember, after they had set up shop in

broadened the company's technology into countless new fields of electronic testing and measurement.

By 1960 the HP catalog—already the biggest of its kind in the industry—listed 1,000 instruments, systems, and accessories. Today the number is closer to 1,500, falling into the broad categories of oscillators, voltmeters, oscilloscopes, pulse generators, graphic recorders, data acquisition systems, waveguide test equipment, signal generators, electronic counters, frequency and time standards, impedance measuring instruments, power supplies, solid state components, medical diagnostic equipment, and instruments for chemical and nuclear measurement.

□ These devices are the basic tools of electronics. Their function is to measure various phenomena such as voltage, current, frequency, power, and resistance with laboratory precision, yet with utmost speed and simplicity. Some HP instruments are more sophisticated and more costly than others; all

Packard's garage, going over occasionally to see how they were getting along. If Packard's car was in the garage, it meant they had no orders. But if it was out on the street, they had some business and were hard at work soldering, wiring, painting—you name it. Dave's wife, who had a full-time secretarial job at Stanford during the day, spent the evenings helping with the accounting and the correspondence. It was a real do-it-yourself operation, and it enabled the young company not only to turn a profit during that first critical year, but also to build a solid foundation for the future.

People have asked me, in view of HP's immense success, whether Dave and Bill were born businessmen. I'd have to say no, but at the same time I'd point out that they had the knack—and still have it—of learning what they needed to know, of taking on a new job and tackling it with all kinds of determination and enthusiasm. This is contagious. It affects the people around them and is the true essence of leadership.

DR. FREDERICK E. TERMAN
*Vice President and Provost
Stanford University*

are designed to fulfill a vital and practical need for accurate measurement.

Hewlett-Packard's market covers a broad spectrum of science, business, and industry. From electronic development laboratories to radio and TV studios, from chemical research facilities to aircraft plants, from banks to medical laboratories, from hi-fi repair shops to space vehicle installations—HP equipment is found in a wide variety of applications.

□ The march of new and significant products emanating from Hewlett-Packard laboratories continues with no let-up in sight. Scores of new products developed by all divisions give testimony to the fact that HP recognizes its responsibilities as the leading electronic instruments manufacturer and is dedicated to the policy of contributing significantly to the industry and to the well-being of the world around us.

THE TECHNOLOGY

"Our products must represent the most advanced design and finest craftsmanship..."

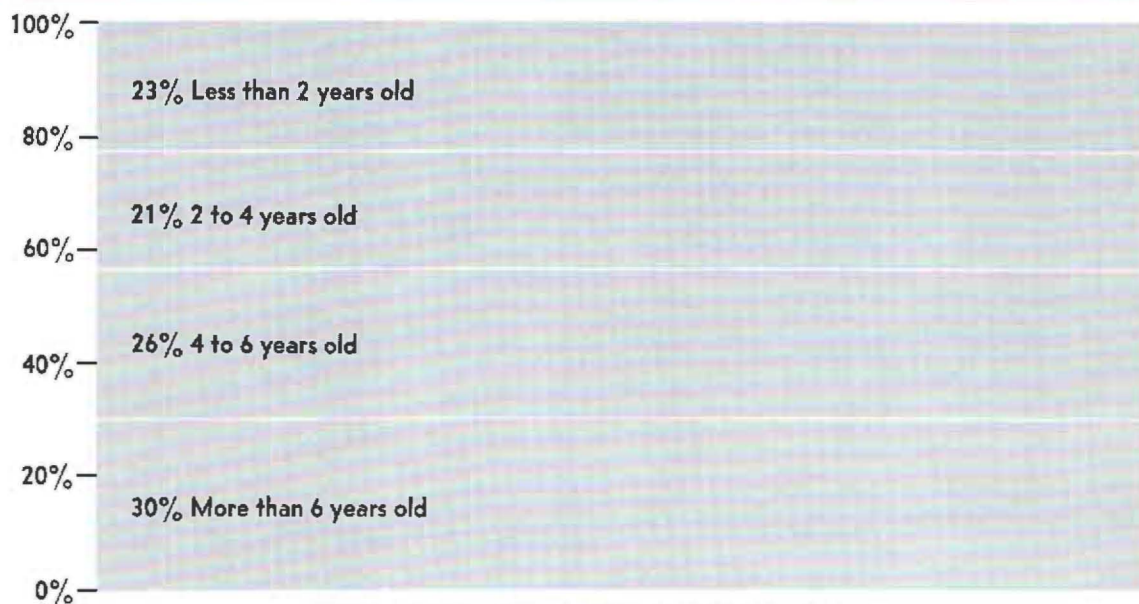
The growing complexity of our environment demands instrumentation to detect, to measure, to control. Electronics provides the nervous system for this technology. It provides the sensory receptors, the transmission paths, the computing centers, and the motor control.

□ Research and development laboratories within Hewlett-Packard, chartered to produce electronic measuring instruments that contribute to the advancement of science, industry, and human welfare, have consistently introduced revolutionary concepts.

The cost of leadership in electronics is high, but the rewards are great. Hewlett-Packard spends about eight cents out of every sales dollar for research and development. Virtually all R&D activity is company sponsored and aimed at the development of specific, proprietary products. The total expenditure in 1964

will exceed \$11,000,000. By contrast, the company spent \$865 in 1940, its second year of operation. But always, regardless of the amount, R&D money has gone toward development of instruments for which there was a real need. As one long-time customer recently commented: "Until Hewlett-Packard came along, big laboratories like ours had to design and build much of our own test equipment. HP filled the gap by providing us with useful, versatile instruments that we could order out of a catalog."

□ Hewlett-Packard's technological leadership is in the hands of 1,100 engineers and scientists at Palo Alto headquarters and at various other locations in the U.S., Germany, England, and Japan. Within this accomplished group are 22 Ph.D.'s and 203 with other advanced degrees. They work in an atmosphere where freedom of inquiry is an honored tra-



HP 1963 PRODUCT SALES BY PRODUCT AGE

New products are the lifeblood of any growth company and an effective measure of its research and development effort. As the chart above indicates, products developed by HP since 1959 accounted for nearly half the 1963 sales volume.



dition and creative engineering is applied to every problem. They have designed much of their own laboratory equipment to fit special purposes. Other research tools have been purchased, some at costs running into tens of thousands of dollars for single pieces of equipment.

Research at HP is product oriented, with efforts aimed at the application of practical ideas rather than toward pure theory. There is no shortage of these ideas. They come from the R&D people themselves, from the field sales people, from men and women in production, and often they come from customers.

□ But just having an idea is not enough. It must pass close examination before it is accepted for special development. It must be practical, it must fill a need, and it must provide an economical solution to that need. Even after passing all tests, the idea is given a priority classification, depending on an appraisal of just how significant a contribution it will make.

As an example, HP's unique frequency synthesizer, introduced in 1963, was just an idea in 1958. It was given top priority, and after 50 man-years of research and development it became a marketable new product.

Through the years, Hewlett-Packard's research and development has brought speed, accuracy, and convenience to electronic instrumentation. A random sample of R&D successes may serve to illustrate how HP has pioneered in this field. The company's first product, the 200A audio oscillator, emerging from the experimental work of Bill Hewlett, was a revolutionary development in 1939. Utilizing "negative feedback," the instrument proved to be more compact, more stable, easier to use, and less expensive than any other oscillator on the market.

□ The design principle used in the 200A (the Wien bridge circuit) was next applied to distortion measurement. From these experiments came the model 330 series of distortion analyzers, which have remained basically the same to this day with but few modifications.

Vacuum tube voltmeters, first developed during the early years of World War II, have proved to be an important contribution and Hewlett-Packard's market leadership in this product line is firmly established. Immediately following the war, the company's research efforts in the microwave equipment field resulted in the development of several high precision, moderately priced instruments, including slotted line devices and signal generators.

In the early 1950's, the R&D people concentrated on a method of obtaining frequency measurements with greater speed, accuracy, and convenience than existing methods. The result was the first electronic counter, a revolutionary device which exploited digital counting techniques and their application to frequency and time measurement.

Innovations such as the internal graticule and beam finder have resulted in vastly improved oscilloscopes, both from the standpoint of accuracy and operator convenience. HP entered the scope field midway through the 50's. The model 185, a general-purpose sampling oscilloscope, enabled the operator for the first time to view microwave signals directly.

□ Among the company's more recent contributions are such sophisticated devices as the frequency synthesizer, cesium beam standard, and spectrum analyzer. The synthesizer can be programmed to switch frequencies in less than a millisecond, and the accuracy of any synthesized frequency can be equal to the best available standard. Present applications range from automatic testing of crystal filters to studies in nuclear magnetic resonance.

The new cesium beam frequency standard is a compact, solid-state instrument which can be easily transported to wherever needed. The unit uses atomic resonance control, based on an unvarying physical characteristic of cesium atoms, to control the frequency of an electronic oscillator. Among other things, it shows great promise as a means of synchronizing time between locations around the world to within a few millionths of a second. This kind of time accuracy can be critical in aerial mapping, space research, and other scientific work.

HP's spectrum analyzer, introduced to the market only a few months ago, has twenty times the viewing capability of any such device previously offered for general sale. On a cathode ray screen, somewhat like that of a radar set, it can simultaneously display and measure the myriad radio signals which crowd today's airwaves. It is a powerful tool in untangling communication threads and is especially useful in aircraft guidance and control.

□ Further contributions have been made by Hewlett-Packard engineers and scientists which are not directly related to specific products. In the area of quality assurance, for instance, the company took the lead in subjecting instruments for industrial and commercial use to the same rigid environmental tests required for military applications. Such attention to quality has given HP instruments a reputation for reliability and for performing better than their published specifications. HP designers place a high premium on the concept of "human engineering." Instruments are styled to provide not only an attractive appearance, but to offer the user the ultimate in operating ease and convenience.

Technological contributions of the various companies which joined the parent corporation since 1958 have also been of great importance within their respective fields. F. L. Moseley Co. is the world's foremost developer and manufacturer of X-Y recorders. Sanborn has established an enviable reputation in medical diagnostic equipment. Boonton Radio's instruments for measuring electrical circuit quality and testing aircraft guidance systems are widely recognized. Dymec's pioneering "building block" approach to data acquisition systems has greatly extended their customer use. Harrison Laboratories offers superior dc power supplies in a highly competitive field. Mechrolab produces sophisticated instruments for chemical and medical analysis, and HP Associates is advancing the frontiers of solid-state physics.

The company's technological achievements have played an essential part in building the Hewlett-Packard of today and are a prelude to a promising future.

THE EXPANDING CORPORATION

"We must steadily expand into new fields

Hewlett-Packard has been moving forward for a quarter of a century . . . sometimes at a modest pace, sometimes in great leaps and bounds . . . but always forward.

As of this moment in the early fall of 1964, HP has evolved into an admirably coordinated corporation of specialized divisions and affiliates dedicated to a great variety of interests in several fields of electronic instrumentation. To an outsider it may appear remarkable that 7,100 people performing a variety of tasks in all corners of the Free World can be described as a "closely knit" organization. Especially when you consider that the corporation produces and markets nearly 1,500 products, not all of which, certainly, are manufactured or sold at any one location.

But the company is closely knit—not geographically, not by product interests or markets, perhaps—but by common commitments. There is, for example, the commitment to produce instruments of the highest quality and value. There is a commitment to enter new fields of measurement where HP can make meaningful contributions. And there is a commitment to grow physically by intelligent direction.

□ The history of HP's growth—described by *San Francisco Chronicle* business editor Sidney Allen as a "modern Arabian Nights tale"—has developed through two phases. The period from the founding until the mid-fifties was characterized by growth from within. In the second phase, a large part of the growth has been by acquisition.

From the beginning, profits were used to purchase new equipment, to finance the increasing R&D effort, and to pay for new buildings in Palo Alto. This, essentially, is the same financial policy followed today, although in recent times the profits have also enabled the parent firm to branch out into totally new fields of electronic instrumentation by founding or acquiring subsidiaries.

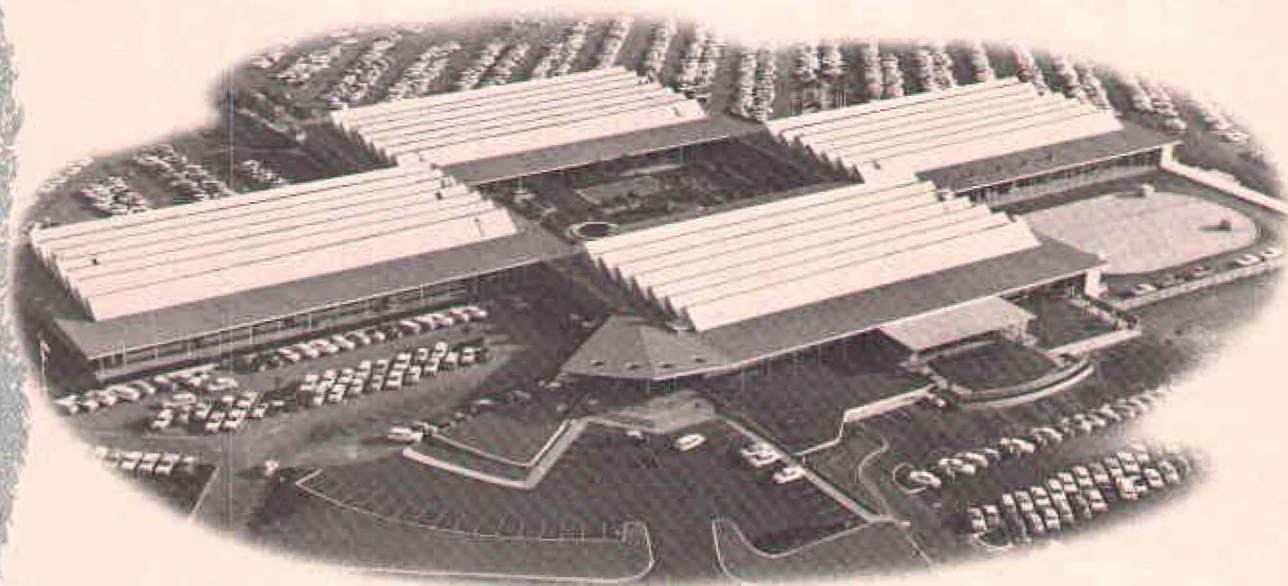
By 1954, HP had grown to 700 employees housed in four buildings, with a product line including over 225 instruments selling at the rate of \$1 million per month. The time was right for expansion, both at home and abroad. Just three years earlier, the com-



pany had provided funds and experienced people for the purpose of organizing a completely separate operation. This enterprise—called the Palo Alto Engineering Co., or more familiarly, PAECO—was established to manufacture special-purpose transformers. Early in 1956, Dymec became the second separate company founded by the parent corporation.

□ The successful formation of these two satellite organizations was the prelude to the expansion-from-without era. In the fall of 1958, HP looked beyond the city limits of Palo Alto for growth possibilities and found an ideal opportunity in Pasadena. By an exchange of common stock, an 80 percent interest was acquired in F. L. Moseley Co., a leading manufacturer of chart recorders.

of measurement...new geographic areas”



Simultaneously a major effort was made to develop the overseas market with the establishment of Hewlett-Packard S.A. in Geneva, Switzerland, to take charge of European sales. Sales on the continent formerly had been handled through export agents and brokers. Close on the heels of this move, another wholly owned subsidiary—Hewlett-Packard GmbH—was organized to manufacture instruments near Stuttgart in West Germany. This was HP's first overseas manufacturing operation.

HP again broadened its field of interests in 1959 with the acquisition of the Boonton Radio Company of Boonton, N.J., a major producer of impedance measuring equipment, signal generators, and instruments for calibrating aircraft navigation equipment. Founded in 1934, Boonton is the fourth oldest company in the United States devoted exclusively to manufacturing electronic instruments.

During these years of growth, HP had been constructing a large complex of four buildings in Palo Alto's Stanford Industrial Park to house headquarters departments and burgeoning engineering and production operations. By the fall of 1960, the new buildings were fully occupied.

□ If Hewlett-Packard had been growing on-the-double since 1956, expansion hit full stride in 1961. During the year, HP Associates was founded to research, develop, and manufacture semiconductors and other solid-state components.

Meanwhile, in Frankfurt, Germany, Hewlett-Packard VmbH was incorporated to sell instruments in West Germany, and a majority of the outstanding stock of Electronic Marketing Company S.A. of

Brussels was purchased to give HP a selling arm in the Benelux countries. In Bedford, England, Hewlett-Packard Ltd. was founded as a manufacturing operation, and Hewlett-Packard (Canada) Ltd. was established as a sales company with offices in Montreal, Ottawa, and Toronto.

The corporation's largest single expansion move occurred on August 31, 1961, with the acquisition of Sanborn Company of Waltham, Mass., one of the world's most respected producers of medical diagnostic equipment and industrial instruments. The Sanborn Division can trace its roots back to 1917.

Toward the end of 1961, there still remained time for one more move: on December 11, HP acquired all the outstanding stock of Harrison Laboratories, Inc., of Berkeley Heights, N.J. Harrison Labs, now a division, produces electronic power supplies.

In 1962, the Oscilloscope Division started production in a newly leased plant at Colorado Springs, Colo., and announced plans for a new building there; and at Loveland, Colo., the company dedicated a big new plant for the production of audio-video equipment.

In marketing, there was a need for consolidation. Ten independent sales firms which had been repre-

sented the company were acquired, giving HP, for the first time, its own field sales force.

With operations in England and Europe working successfully, the company then turned toward developing greater penetration of the fast-growing Asian market. In 1963, an agreement with Yokogawa Electric Works of Japan was formalized, clearing the way for establishment of a joint venture to be known as Yokogawa-Hewlett-Packard, Ltd. This company is now in the process of moving into a new building in Tokyo.

Mechrolab, Inc., of Mountain View, California, a manufacturer of instruments for the fields of biomedicine and chemistry, became the newest member of the corporation when it was acquired in the spring of this year.

Behind all of these acquisitions and affiliations of the past ten years there has been a well-defined objective to which Hewlett-Packard is firmly dedicated. Stated briefly, it is that "growth should be directed toward building strength for the future, limited on the one hand by the rate of growth which can be financed by conservative measures, and on the other hand by the rate at which we can build our product line and markets through customer acceptance."

Since our company was the first to merge with HP, people have often asked me just how and why the marriage occurred. Actually it was the natural culmination of a long and thoughtful courtship. We'd been in business six or seven years and were growing steadily. We had a promising instrument line and had the makings of a big situation. Nevertheless I felt that our growth was limited unless we tied up with a well-managed, broader based, and more sophisticated outfit.

HP seemed to be the best answer. I'd known Dave and Bill for some time and was impressed with their entire operation. Also, they'd been doing their homework and figured our X-Y recorders would fit in nicely with their own line. So, in 1958, we joined forces.

Somehow, in a merger, the layman always assumes that a lot of money flows from the parent into the subsidiary company. In our case it didn't work out just that way. At the first HP stockholders meeting subsequent to our merger, Packard asked me to make a few remarks, and I said, "As far as money is concerned, I understand from Dave that we can have all we want so long as we make it ourselves!"

And as a matter of fact, that's the way things turned out. Five years after we had merged with HP, our net profits had increased elevenfold, and our markets continue to expand as a result of HP's worldwide organization.

FRANCIS L. MOSELEY
Founder, F. L. Moseley Co.

Taking measure

NUMBER OF EMPLOYEES	7,100
ANNUAL PAYROLL	\$47,700,000*
NUMBER OF PLANTS	14
NUMBER OF SALES OFFICES	135
NUMBER OF PRODUCTS	1,475
ANNUAL SALES	\$125,000,000
NET WORTH	\$65,000,000
TAXES PAID	\$13,000,000
NUMBER OF STOCKHOLDERS	18,000

**All dollar figures are estimates for
the 1964 fiscal year.*

Manufacturing Operations

Boonton Radio Division
Rockaway, N.J.

Colorado Springs Division
Colorado Springs, Colo.

Dymec Division
Palo Alto, Calif.

Frequency & Time Division
Palo Alto, Calif.

Harrison Laboratories Division
Berkeley Heights, N.J.

HP Associates
Palo Alto, Calif.

Loveland Division
Loveland, Colo.

Mechrolab, Inc.
Mountain View, Calif.

Microwave Division
Palo Alto, Calif.

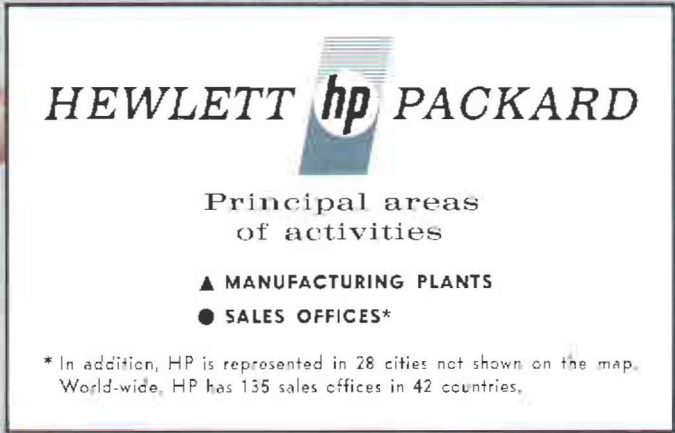
F. L. Moseley Co.
Pasadena, Calif.

Sanborn Division
Waltham, Mass.

Hewlett-Packard GmbH
Boeblingen, West Germany

Hewlett-Packard Ltd.
Bedford, England

Yokogawa-Hewlett-Packard Ltd. (A Joint Venture)
Tokyo, Japan



* In addition, HP is represented in 28 cities not shown on the map. World-wide, HP has 135 sales offices in 42 countries.



"For long-term growth, our company must be

Marketing is a big word and also a much misunderstood word. A few years ago, while addressing an industry group in San Diego, a Hewlett-Packard marketing executive came up with a classic description of what the word is all about.

"First of all," he said, "marketing is not just selling, because selling is the specific technique of getting people to reach in their wallets and part with cash in exchange for your products. Marketing, on the other hand, represents a much broader concept. *It is the entire integrated effort to discover, arouse, and satisfy customer needs.*"

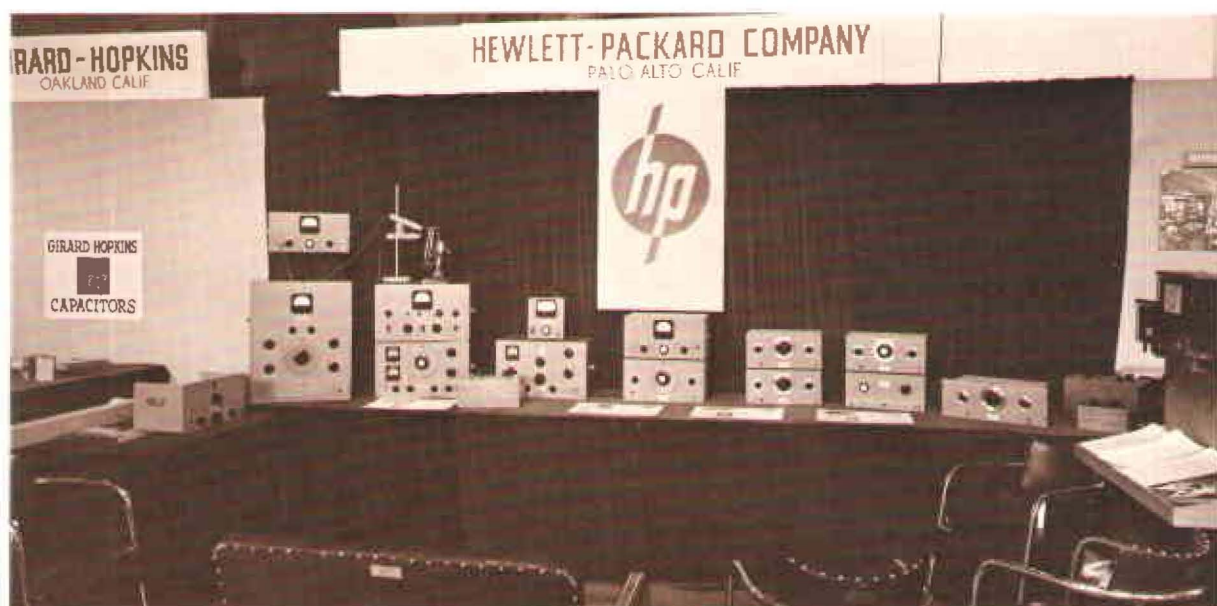
□ This emphasis on customer needs is essential to Hewlett-Packard's way of doing business. As a result, the corporation's total marketing structure has grown through the years to be a large, far-flung organization offering a wide range of customer-oriented services.

It is a common conviction among HP marketing people that "the sale doesn't end with the delivery of the product." They have created extensive back-up services and facilities to benefit customers direct-

ly. As an example, field sales offices have well-equipped maintenance and technical service facilities. In addition, there are two large regional centers providing maintenance services which the local sales offices could not be expected to perform.

□ Along the informational line, there are a number of mobile laboratories which regularly bring instrument displays and demonstrations to customers' doorsteps. Another educational service—one which is meeting with enthusiasm—is provided in the current customer training program. These seminar-type sessions are held in Palo Alto and in various sales regions to enable customers to make optimum use of equipment.

HP sales literature and advertising have traditionally been designed to convey reliable information to customers in the most usable way possible. The *Hewlett-Packard Journal*, a technical magazine with circulation exceeding 100,000, has set a standard of excellence for electronics instrumentation literature. Mailing the *Journal*, the 420-page catalog, advertising reprints, and many other types of litera-



completely attuned to customer needs..."

ture is a major project. Over five million pieces go to customers each year.

From receipt of order to billing, HP has attempted to streamline every step of the way for the customer. The company has pioneered the technique of consolidating shipments and flying them across country for delivery in hours instead of days. The processing of orders, invoicing, and billing have been virtually automated in many locations for greater speed and accuracy.

□ Even the structure of the marketing organization has been redesigned in recent years to serve the customer more effectively while providing numerous internal advantages. What was considered a bold move for an electronics company took place in 1962 when HP acquired ten independent sales firms which had been representing the company in the United States. Thus some of the biggest names in electronic sales became an integral part of HP—Neely, Crossley, RMC, Horman, Yewell, Lahana, Bivins & Caldwell, Robinson, Stiles, Lipscomb.

Worldwide, the corporation has more than 10,000 active customer accounts, and when a field sales en-

gineer makes a call, he sells from a "full wagon."

□ The total market for industrial and commercial products can be divided into three basic groups of buyers: research and development laboratories; product manufacturers; and service and maintenance people. Occasionally, a single customer falls into all three categories, as in the case of the giant American Telephone and Telegraph Company.

Another way to break down HP's total market is by industry. From this standpoint, the electronics industry continues to be of major importance with such big instrument purchasers as GE, Litton, Sperry-Rand, RCA, Collins Radio, and IBM.

HP is also a big supplier to the aerospace industry, where names like Lockheed, North American Aviation, General Dynamics, and Hughes Aircraft stand out.

Exhibition of products at leading trade shows has always been an important HP marketing activity. One of the early-day booths at a Western Electronic Show and Convention (below left) contrasts with recent HP exhibit (below right).



From the time the first order for signal generators was received from Wright Field in 1941, the government has been a steady customer. The Navy, Air Force, and Army are all major purchasers of HP instrumentation, as are such non-military government agencies as NASA, the FAA, and the National Bureau of Standards.

Aside from the industrial and commercial markets, HP sells a number of products to physicians, hospitals, medical laboratories, and related facilities.

Although HP's share of the electronic test equipment market has doubled in the United States in the past five years, the company's overseas market is growing even faster. Sales outside the U.S. at present account for 20 percent of the corporate total.

That people involved in marketing have been highly successful in their efforts "to discover, arouse, and satisfy customer needs" is dramatically pointed up by the first quarter-century's sales figures. Since 1939, Hewlett-Packard has sold nearly three quarters of a billion dollars worth of scientific instrumentation.

HP's first advertisement appeared in the November, 1939, issue of "Electronics." Today, the company advertises its products in more than 100 publications.

Resistance Tuned AUDIO OSCILLATORS



COMPACT — NO ZERO SETTING — ACCURATE
A New Principle of Operation
MODEL 200B

20-20,000 cps with Logarithmic Coverage
Distortion less than 1% above 25 cps
Output 1 Watt into 500 Ohms
Amplitude ± 1 db from 20 — 15,000 cps

\$71.50 net FOB Palo Alto

Write Dept. A for complete information about this and other models.

HEWLETT-PACKARD CO.

347 ADDISON AVENUE
PALO ALTO, CALIFORNIA

I first met Dave and Bill when they came down to close the oscillator deal with Disney Studios. I'd been in business about six years. Most of our lines were instantaneous recording and other types of sound equipment, and the movie studios and radio stations represented a major market.

Anyway, a mutual friend brought Dave and Bill by my office, and later over dinner they asked me if I would be interested in being their first sales representative. A popularly-priced audio oscillator was badly needed at that time, and with their new circuitry I was sure we could make some sales.

A few weeks later I drove up to Palo Alto and we officially closed the deal over Dave and Lu's dining room table. All our agreements were verbal, sealed with a handshake.

Selling was pretty tough back in the early days, and I felt active demonstrations were the answer. I remember staging what must have been the first road show in the electronics industry. We invited local radio station and movie studio sound engineers to a showing of the 210A square-wave generator in the auditorium of a talent school next door to our office on Hollywood Boulevard. Attendance was good and Dave and Bill put on the demonstration in person. I can still remember Dave going with me to a nearby Italian delicatessen to help select an interesting assortment of cheeses, salami, and Italian breads to serve with the cold beer we had stashed away in the office.

There are a great many episodes that stand out in my memory during these 25 very active and progressive years, but one, I believe, is particularly indicative of why it's been so gratifying as well as productive to have been associated with HP.

Shortly after starting to represent HP, I received a commission in the mail for an oscillator sold to Stanford. Since I hadn't been near the school for some time, I was puzzled. When I asked Dave about it he said that actually he had supplied the instrument, but that their agreement with me was to pay commissions on everything sold in my territory, and that was the way HP intended to do business.

NORMAN B. NEELY
President, Neely Sales Division

"We will finance growth from profits... on a pay-as-you-go basis"

Profits are the red corpuscles in the blood stream of the corporate body. They build the body, give it strength and robust health.

As Supreme Court Justice Louis D. Brandeis pointed out many years ago, the earning of profit is "something more than an incident of success. It is an essential condition of success, because the continued absence of profit itself spells failure."

Hewlett-Packard's phenomenal but sound growth through the years has been the direct result of the contributions of all its people, *financed by profits*.

In 1939, Hewlett-Packard's total sales were \$5,369. At present, the company sells this much equipment in 5½ minutes of any working day.

But if the comparison seems a bit facetious, it helps to demonstrate a serious point. In 1939 there was also a profit of \$1,653, and this money was put back into the business to hire more people, buy more equipment, develop new products, and pay for more working space. This practice of financing growth with the profits of the business has not changed fundamentally in twenty-five years.

□ Although Hewlett-Packard has borrowed money on occasion in the past—beginning with the first loan of \$1,000 from the Palo Alto National Bank in 1940—the corporation takes a conservative attitude toward going to the outside for expansion funds. As a result, the combined long- and short-term debt currently totals approximately \$1,500,000—remarkably low for a company which expects to have net sales of about \$125,000,000 for the year.

Dave Packard has explained the company's profit and expansion goals very succinctly. "We attempt to make an after-tax profit of 8 percent on every sales dollar every month and every year . . . Our customers seem willing year in and year out to give us this kind of return and with it we can finance an adequate rate of growth."

□ The next question might be, "What is an adequate rate of growth?" Mr. Packard points out that the funds available for expansion purposes from this

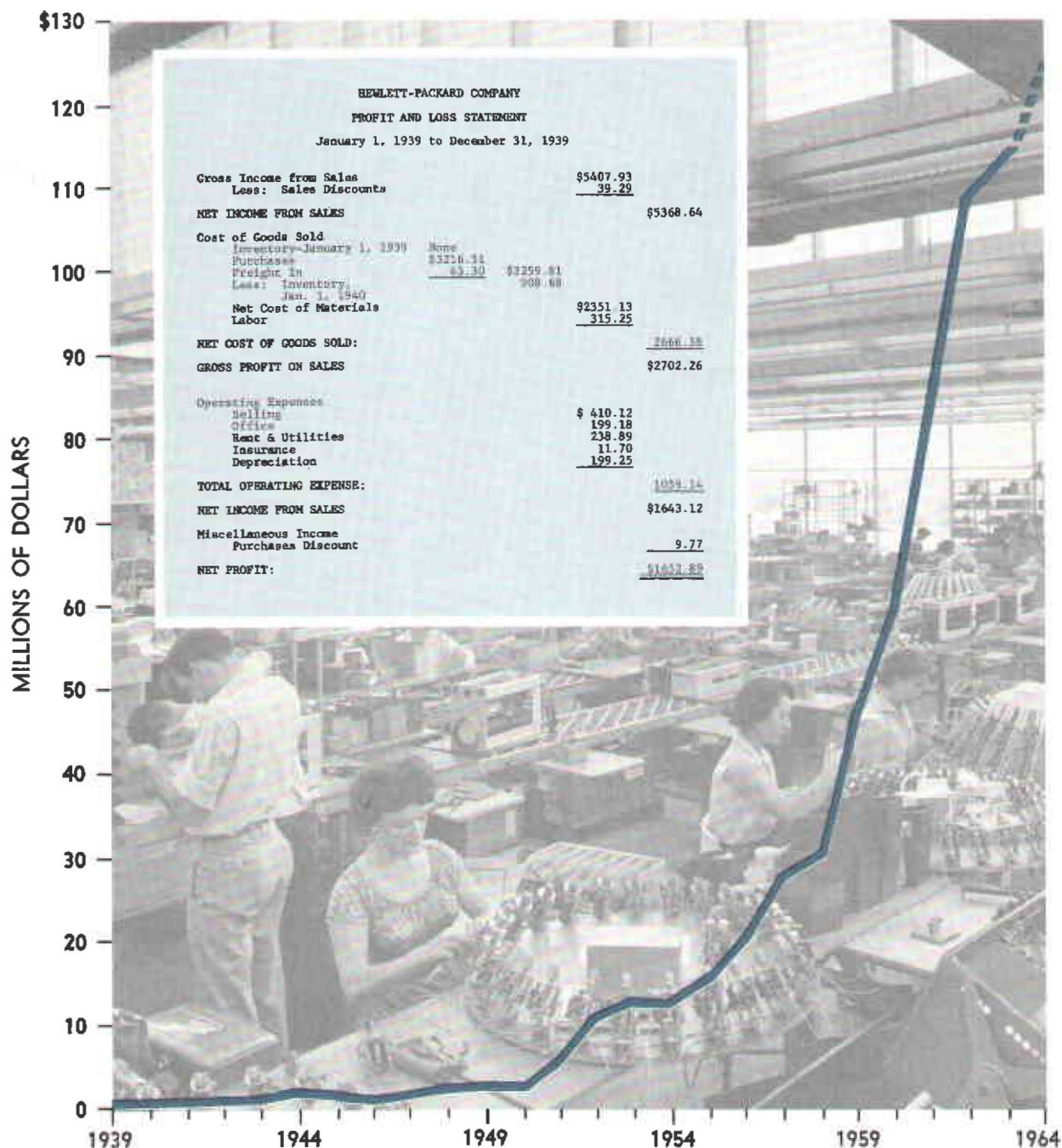
8 percent profit goal can be expected to finance a minimum growth of 20 to 25 percent each year. The formula for growth from earnings applied here, he says, "is very simple and just about as valid as Ohm's law." In essence it is as follows: the percentage of sales growth that can be financed each year is equal to the percentage of profit after taxes multiplied by capital turnover. (Capital turnover is an accounting ratio arrived at by dividing annual sales dollars by total capital invested in the business.)

In the past ten years, the corporation's annual sales volume has increased from about \$22,000,000 to \$125,000,000. During this same period, net profits after taxes have averaged about 7 percent of sales.

□ From the financing standpoint, HP has evolved through several eras marked by significant events. As a partnership, the initial capital and equipment—valued at \$538—was provided by Packard and Hewlett. When expansion in Palo Alto picked up during the forties, it became advisable in 1947 to change from a partnership to a corporation with its tax advantages and limited liability. Ten years later, to broaden the base of ownership, the co-founders offered 10 percent of all outstanding shares of common stock for public sale.

By 1960, the mounting interest in the stock had pushed the "over-the-counter" market price to a high level and it was deemed advisable by the board of directors to announce a three-for-one stock split. This, of course, tripled the number of shares authorized and outstanding, reduced the market price accordingly, and made the stock more attractive to more investors, thus broadening once again the base of ownership.

□ A red-letter day in any corporation's financial history occurs when it is accepted for listing on the New York Stock Exchange—the "big board." This happened for HP on March 17, 1961, with a simultaneous listing on the Pacific Coast Stock Exchange. The prestige of being able to meet the rigid requirements of these exchanges helps attract new shareholders and creates greater general interest in the



TWENTY-FIVE YEARS OF SALES GROWTH

HP's sales, including sales of subsidiaries from dates of acquisition, have jumped from \$5,369 in 1939 to an estimated \$125 million in 1964. The company's first profit and loss statement is shown in the upper left-hand corner.

corporation. Many investors will buy only listed stocks.

Today there are over 18,000 people, many of whom are HP employees, who are share owners of Hewlett-Packard. By August, 1964, there were 11,301,629 shares of common stock outstanding.

However, Hewlett-Packard does not exist alone for share owners, important as they are to the corporation. Expressions like "good citizenship," "contribution to human welfare," "recognition of personal worth of employees," and "scientific achievement" have a special meaning in the corporate dialogue. From the financial point of view, being able to operate profitably also enables the company to achieve these worthy goals.

□ As a corporate citizen, HP is a heavy taxpayer federally and in the states, communities, and foreign countries where there are operations. Last year, for instance, the federal and foreign tax bill alone was nearly \$8,000,000.

This year's consolidated payroll is expected to reach nearly \$48,000,000, an important economic factor in the communities where employees reside. In addition, HP's purchases of raw materials, equipment, supplies, and services from countless other business firms help stimulate jobs outside the company.

The financial operations of the company—like manufacturing and sales—have been largely divisionalized and decentralized in the recent years of expansion for greater efficiency and flexibility. Each division, affiliate, and subsidiary has its own staff of people responsible for accounting functions. Among their more important roles is supplying operating management with financial data to aid in policy and decision making. There are 35 of these accounting groups in the company.

□ The central finance and accounting group in Palo Alto provides a number of vital services, including the accumulation of financial data from the 35 reporting entities, the review and analysis of division-

al financial performance, the establishment of uniform accounting practices, and the preparation of various fiscal reports required by government agencies.

One method of achieving close harmony between all these groups is provided by an annual financial seminar in Palo Alto, where everyone has an opportunity to air his views and discuss ways of contributing further toward the generation of profits—those red corpuscles of industry.

When you're 83, your memory begins to play tricks on you, but I can recall quite well the circumstances surrounding HP's first bank loan. It was in 1940 and I was president of Palo Alto National, which has since become a branch of Crocker-Citizens. We were located on the corner of University and Ramona in downtown Palo Alto, and at that time had about ten employees.

Anyway, Dave Packard came in one day on a "cold call." I didn't know him at the time, although I'd seen him perform as a track man at Stanford. He was an imposing fellow, and also a well-prepared salesman. He explained in considerable detail what he and Bill Hewlett were up to, pointing out that they'd had some initial success and now needed a thousand dollars to expand the business. That was a pretty good-sized loan in those days, but I told Dave I'd see what I could do.

The next day I wrote to a couple of HP's customers to get a reference on the young company. Both replied promptly and favorably, so then I took the matter up with our loan committee. This consisted of three or four officers of the bank, and we had a policy that if any one officer objected to a loan it wouldn't go through.

Fortunately—and I'm sure this saved us considerable embarrassment in future years—everybody O.K.'d the deal. So Dave and Bill got their money and we picked up a new customer that has been doing business with the bank ever since.

CHARLES J. "JUD" CRARY
Retired Banker, Palo Alto

THE PEOPLE

"We want our people to feel a sense for achievement...to share in the company's

Every winning team brags about its players, and Hewlett-Packard is no exception. But there are some genuinely unique qualities about HP people and the way they work together. Statistics show that personnel turnover is exceptionally low . . . customers say that product quality is high . . . and the profit level indicates that the whole team is working toward its objectives.

□ Being guided by objectives rather than by directives is an important concept in the HP philosophy of human relations. Speaking before a conference of professional personnel people in 1959, Dave Packard stated his conviction that "an organization of well-trained, intelligent people, working together, can do a job far more efficiently if they understand thoroughly the objectives of the organization and work in an atmosphere of freedom without rigid direction and control in detail from the top."

Some of the objectives of the corporation have been mentioned previously—to make important contributions to electronic instrumentation and human welfare, to direct growth toward strength for the future, to maintain a profitable operation.

Another objective, and a most important one, is HP's determination to recognize the personal worth of its 7,100 employees. But this kind of statement

is very much in vogue nowadays. One might ask, "Just how does the company back its thought with deeds?"

There are many ways. Some are intangible, such as the establishment of high standards of performance or the policy of promoting from within, while others are very tangible, affecting employees' security and pocketbooks.

Much of the HP philosophy about how people should work together was formulated about the time the first product was being developed. As people were hired and the operation moved to new quarters, various benefits were introduced which were designed to stimulate performance, reward achievement, and provide security. In 1941, HP employees already had a production bonus as liberal as any to be found in industry.

Now there are many other benefits which affect most or all people throughout the corporation — hospitalization, group insurance, stock purchase plan, retirement program, profit sharing, and educational assistance, to name but a few.

□ In such a highly technical industry as electronics, where quality is essential, the selection of people becomes particularly critical. For all its life the company has had a policy of non-discrimination in



of accomplishment...to be recognized success”

hiring and subsequent advancement. The quality necessary for production and engineering standards has been found in all groups through careful screening of applicants. For research, engineering, and production jobs requiring special educational backgrounds, the company must recruit through colleges and universities. This year, HP representatives have visited a total of 40 schools throughout the nation seeking the best candidates to fill various positions.

□ Because of the dependence on technological skills, the company recognizes the important role played by the schools as a source of qualified personnel. The Funds Matching Program was introduced in 1955 to help support the nation's colleges and universities. This is a volunteer plan whereby the company offers to match any gift up to \$500 a year which an employee may wish to give to a four-year accredited college or university. Since the inception of the plan, 1,431 employees have donated \$53,000, which, when matched by the company, has become a total of \$106,000 in gifts to 62 schools. In addition, the company gives over \$100,000 annually to schools as special grants.

HP's interest in higher education extends also to the children of employees. Funds contributed by the company and employees are placed in trust and

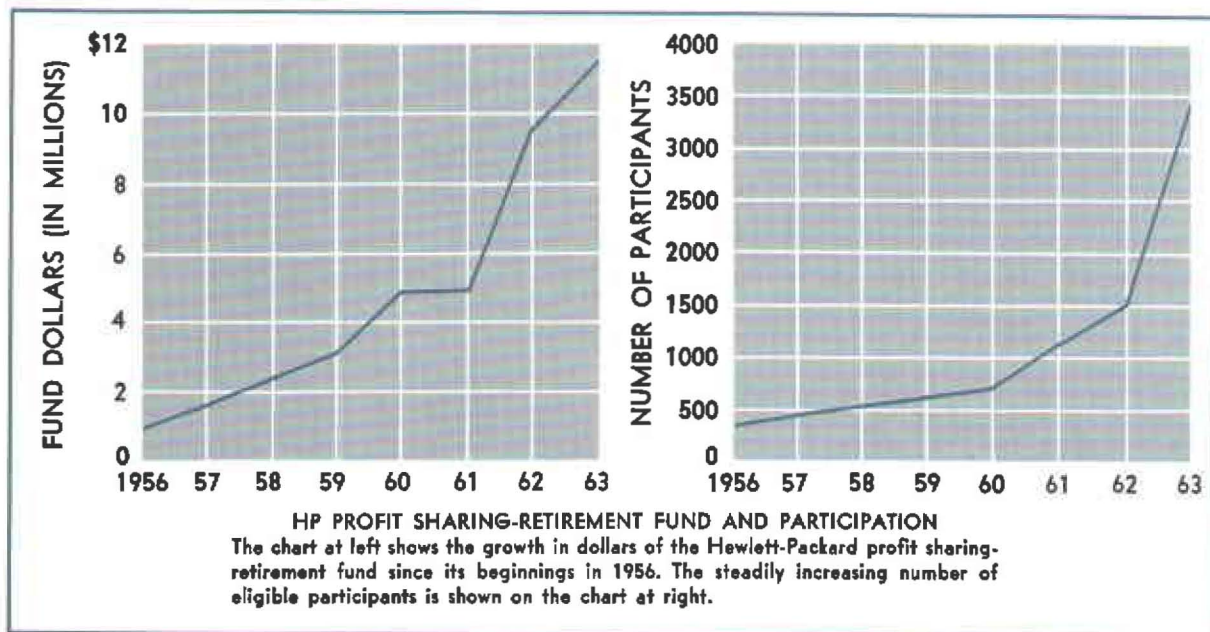
the earnings enable a number of \$500 college scholarships to be awarded each year. Thus far, 60 students have been recipients.

Continuing efforts are made to encourage employees to further their education. Ten years ago the company worked with Stanford University to develop what is known as the "honors cooperative program," which gives employees of various industries in the area an opportunity to obtain a graduate degree while holding down jobs. Fifty-four HP people have earned degrees under this program.

Another educational assistance program provides for a 50 percent refund of tuition, textbook costs, and laboratory fees. Employees take advantage of this by studying job-related courses at certain accredited schools.

□ On-the-job training takes many forms. In production, there are apprentice training, technical, and supervisory instruction programs. Seminars where various specialists and management people speak are frequently held for sales personnel as well as production and engineering people. Last year, in Palo Alto alone, some 700 employees had some form of in-plant training and another 300 completed outside courses of various kinds.





The stock purchase plan and the retirement plan enable HP people to share in the company's success and build financial security. In the stock purchase plan, an employee can have an amount deducted from his paycheck (up to 6 percent of base pay) for the purchase of Hewlett-Packard common shares. The company contributes 25 percent of the purchase price.

□ The retirement plan in the U.S. is a deferred profit-sharing program. HP annually contributes 10 percent of profits before taxes to a trust, which in turn conservatively invests the funds for income and growth. When an employee retires, an amount is returned to him based on his share of the fund at that time. The plan also provides generous life insurance and disability payment features.

Hewlett-Packard's respect for its people and determination to provide job security and incentives have created tangible results. Surveys show, for example, that the turnover rate for HP employees in Palo Alto is about half of that for industry as a whole in California. Another result, real yet un-

measurable in statistical terms, is the high degree of cooperative effort which characterizes HP's internal operations. The atmosphere is informal; employee communications are pervaded by a spirit of mutual assistance.

The existence of pleasant working conditions, generous benefit programs, and ample opportunities for individual growth places a definite and continuing responsibility on each HP employee. It is a responsibility to contribute, day in and day out, a job performance consistent with the standards of excellence associated with the Hewlett-Packard name.

This responsibility, this obligation to excellence, carries over into the personal lives of HP people. Extensive participation in civic affairs, generous giving of time and money to community activities, leadership in professional societies—these are a few of the ways they manifest their commitment to good citizenship. Among the people of Hewlett-Packard, the urgency of making significant contributions extends far beyond the bounds of plant, laboratory, and office.

"We must recognize that the future
is limited only by our ability
to get the job done..."

If anything can be said with certainty about the future of electronics, it is that man's relentless pursuit of the electron into uncharted regions will culminate in discoveries more exciting than anything yet experienced. "Crystal balling" is a favorite avocation of the industry, an activity of inestimable value.

The unfettered imagination of scientists and engineers has enabled them to penetrate the impenetrable, to illuminate the invisible, to measure the immeasurable. From the birth of electronics less than sixty years ago, when De Forest introduced his "primitive" vacuum tube, the field has surged forward with ever-increasing speed and ever-increasing importance to life on earth.

There is no letup in sight. Quite the contrary, the momentum is growing with each new discovery, with each new bit of knowledge which changes an unknown to a known quantity.

□ Hewlett-Packard's role in this exciting drama is manifest. The foregoing sections have highlighted the more important concepts, decisions, and events which have shaped the company's course over the first twenty-five years of its existence. It is not an easy task to define—to capsule—a large, decentralized organization made up of thousands of individuals at dozens of locations in 42 countries. It is even more difficult to foretell the future of such a company, although there are signposts which make predictions more than pure guesswork.

Most important of these signposts is the solid base upon which the company now rests. The people . . . the products they manufacture and market . . . the imagination and genius they lend to research and development, all represent vast human and material resources capable of carrying the company to new heights of achievement.

There are other clues to the future. The corporation's present effort to extend its participation in new fields of electronic measurement will surely have telling and favorable effects. For example, in the field of medicine, where Sanborn and Mechrolab have already made significant contributions, there

are innumerable other areas where electronic instrumentation can provide meaningful service to human welfare. The company is investigating new techniques for electronic anesthesia, blood analysis, and various advanced diagnostic methods for probing the human body with electrically generated signals.

□ Industry's advance toward more complete automation of routine and repetitive tasks of production is another promising area for Hewlett-Packard. As more and better sensors are developed, and as the necessary computers become cheaper and more reliable, the automatic factory will become a reality. New test and measuring instruments, capable of being integrated into these systems, will have to be developed.

Along this line, HP is already working on various instrument systems for collecting and processing data acquired from electronic measurements. A new magnetic tape transport has been developed which is expected to lead to several interesting products in the industrial and medical recording fields.

□ A special group in Palo Alto is studying crystal technology and applications for various advanced solid-state devices as masers and lasers. Utilizing a beam of sorted atoms in an excited state, rather than electrons, masers permit greater amplification of weaker signals than can be amplified with electron tubes. Because of this, they are playing an important part in satellite communications and radio astronomy. They also show great promise in the development of incredibly accurate frequency and time devices.

Lasers, which are sometimes described as optical masers, produce light of a single frequency which can be "focused" to a single point. For instance, if a laser beam were projected to the moon (over 200,000 miles) the spot of light it produced on the moon's surface would be only one mile in diameter. The potential uses for lasers can hardly be estimated. Already they promise miracles in fields as diverse as medicine and metal-working.

Hewlett-Packard's investigation of new areas of instrumentation has and will increase with each passing year. A great deal of work will be done in the field of mechanical and linear measurement . . . in the measurement of nuclear phenomena . . . and in the testing and analysis of gases, liquids, and solids. As experiments in any science become more complex, they require more precise measurement and control. Companies like Hewlett-Packard have already proved that they are capable of providing electronic instrumentation to deliver reliable information on virtually any physical variable—pressure, displacement, velocity, acceleration, temperature, acidity, magnetic field strength, brightness, color, radiation flux, and on and on.

□ As the company becomes more diverse in its products and markets, there will be a continuing need for new philosophies and approaches in customer contact and service.

A plan is presently under development, for example, which will provide greater autonomy within individual geographic sales regions. Field and staff engineers will be backed by teams of specialists in medical, nuclear, chemical, and other scientific disciplines who can offer immediate, on-the-spot consultation to customers regarding the application of highly specialized HP instrumentation.

In manufacturing, physical expansion, improved production methods, and greater efficiency have been a "way of life" throughout the history of the corporation. Several new plants are already under construction, and growth will continue to meet the needs of the future.

And what kind of a world will this future bring? Probably no one can say for sure, but if the poet is correct who wrote that "all our past proclaims our future," then we can expect continued progress in all fields of human endeavor. The scientific and technological revolution will become even more important to all of us, influencing our home life, our jobs, our health, our education, our leisure time. Government economists have estimated that two-thirds of all the products we will buy twenty years from now are still to be developed, and half of the children now in the first six grades of school will be employed in occupations which aren't even in existence today.

All in all, it promises to be an exciting tomorrow—a tomorrow destined to offer vast and untapped opportunity for Hewlett-Packard men and women throughout the world.



David Packard
Chairman of the Board

William R. Hewlett
President

M Measure

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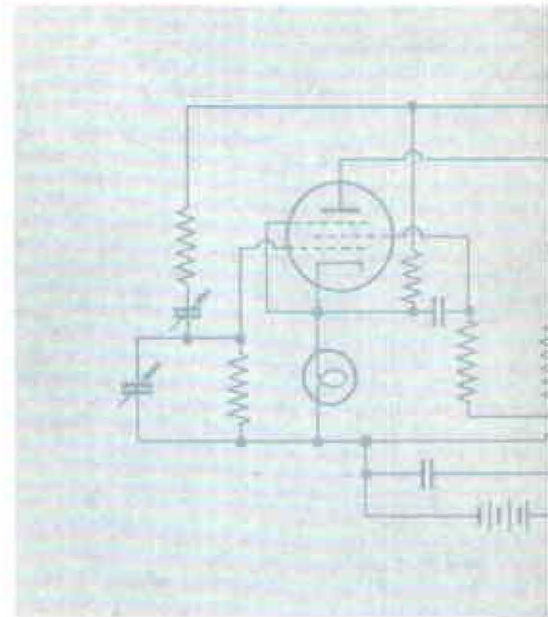
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