
WATT'S CURRE

WATT'S CURRENT

Published Monthly by

HEWLETT-PACKARD COMPANY

Laboratory Instruments for Speed and Accuracy

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Editorial Board..... NOEL E. PORTER
W. NOEL ELDRED
RAY WILBUR
DAVID B. KIRBY

Editor..... WILLIAM L. BIGLER

Production Assistant..... BYRD BEH

VOL. XVII OCTOBER, 1962 NO. 10

-hp- Organizational Changes

John Morton, Stanford Plant 2 Production Manager, is on a 6-month temporary assignment with the F. L. Moseley Company in Pasadena.

James Gorrell transferred from the Oscilloscope Division R&D to Colorado Springs on October 16, 1962.

This Month's Front Cover...

Aesthetically depicts dramatic entrance to -hp-'s new 140,000-square-foot Loveland facility. H-P's new plant, first of an eventual three-building complex, is situated on the eastern slope of Colorado's majestic Rockies. Please refer to feature article on Loveland plant dedication, page 4 of this issue.

October Features

From Our President's Desk

THE ACTIVITIES of our company break down into three functional areas—new-product development, manufacturing, and selling. I have often emphasized in the past that we must excel in each of these three areas to be successful, and I believe we have done so over the course of our company history. There is, of course, a fourth basic function—that of finance—which is responsible for providing the buildings, equipment, and operating funds necessary to maintain our sound and steady growth. Financial problems are relatively easy to handle if the other jobs are done well, and in the end are insurmountable if they are not.

We are currently undergoing an important and historic change in our sales function. As of November 1, the majority of our independent sales representatives are joining our company on a permanent basis. In this new capacity, they will be able to devote their entire efforts to expanding the market for the -hp- family of products. Some of the "reps" will operate as divisions of the Hewlett-Packard Company, and some will continue as separate corporations wholly owned by -hp-. The difference is of no consequence in the way they will do their job.

The success we have been able to achieve thus far is attributable in no small measure to the excellent sales job our reps have done. Over the years we have developed a very close working relationship with them, and I am delighted to have them take a permanent place in the corporate family.

The sales representative system developed because many small companies could not afford to hire enough salesmen to cover a large marketing area. In addition, a salesman can often be much more effective when he is able to offer the customer a number of related products instead of just one.

We have long since grown to a size where we could easily afford our own sales organization. We also have more than enough products to enable a salesman to achieve maximum efficiency in his calls. In fact, it is already impossible for every salesman to know enough about every one of our products, and consequently we must support him with expert help from the factory on many calls.

Although we outgrew, so to speak, the sales representative system some years ago, there are important reasons why we have maintained it. First, we have worked so closely with our rep organizations over the years that they have been able to develop a group of field engineers uniquely qualified to fulfill our needs. These engineers are highly trained in the -hp- family of products, and possess an enthusiasm and loyalty for our company which we believe is unparalleled in the electronics industry. We feel that our new concept of common ownership is the best way of assuring these people a permanent opportunity with the -hp- organization.

The second reason we have continued with the reps so long in the face of traditional practice is because we place great emphasis on the importance of independent management. In all areas of management the capable person can do his job best when he is encouraged to use his own initiative and ingenuity. This applies to selling as well as to engineering and production. Often the salesman can and should take the customer's side of the question. He can never be a really good salesman if he is a mere puppet on the end of a string maneuvered by a central sales department.

We are fortunate in bringing into the -hp- family the finest group of electronic instrument salesmen in the country. They are highly trained, they are energetic and enthusiastic, and they are imbued with a spirit of independent management. We intend to create an atmosphere which will enable them to retain and nurture these qualities.

Each of our rep organizations has done an excellent job for us in the past, and we expect an even better performance from them in the future. Welcome aboard!

David Packard

BOONTON, PAECO ASSUME DIVISIONAL STATUS

PRESIDENT DAVE PACKARD recently announced that two -hp- subsidiaries—Boonton Radio Corporation and Palo Alto Engineering Company—are being converted into divisions of the company. The change to divisional status is effective November 1, the beginning of the 1963 fiscal year.

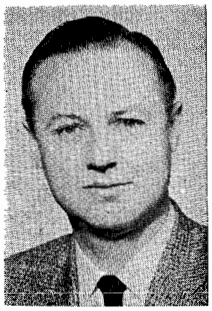
Boonton Radio was founded in 1935, and Palo Alto Engineering (PAECO) in 1951. Both have been -hp- subsidiaries since 1959.

"The conversion of these two firms to divisions is part of our program of gradually divisionalizing our corporate structure," Packard said. "The purpose of this program is to achieve greater flexibility in our entire organization and to improve our over-all operating efficiency."

Packard pointed out that the new divisions will retain their present policies and product lines. Boonton Radio designs and manufactures instruments for measuring electrical circuit quality and testing aircraft guidance systems. PAECO produces a variety of magnetic components, including transformers, and AC power supplies.

He also announced that George A. Downsbrough, who has served as president of Boonton Radio for 20 years and was instrumental in effecting and consolidating the affiliation with -hp-, has decided to resign from the organization.

"Dr. Downsbrough has, during his years as president of Boonton Radio, contributed a great deal to the firm's success and stature," Packard said. "He has also been active in the Scientific Apparatus Makers Association, and has undertaken a number of civic responsibilities as well. I am very sorry personally that Dr. Downsbrough will no longer be with our organization."



William Myers

He also stated that William D. Myers has been named general manager of the new Boonton Radio Division.

Myers was formerly manufacturing manager of -hp's- Microwave Division in Palo Alto. He joined the company in 1944 as a development engineer and has since held a number of executive positions, including manager of quality-control engineering.

A native of San Jose, California, Myers is an electrical engineering graduate of Stanford University and a senior member of the Institute of Radio Engineers.

Operations News

BY NOEL E. PORTER
Vice President, Operations

TAKING A QUICK CHECK across the board, we find the order picture is still a bit soft and following the usual seasonal pattern. Historically, however, our business picks up during the winter months. So, by carefully scheduling our production, we hope to be in an optimum position to take advantage of increased orders and provide prompt deliveries on all our popular and high-volume items. We're winding up fiscal 1962 well over our $100 million sales objective and will show a good profit performance as well.

We've talked a lot recently about decentralization and divisionalization—two big words which have an important bearing on our growth philosophy. We've already taken steps to decentralize our parent company engineering-manufacturing operations into integrated product divisions. Our next big job is gradually to provide each of these divisions with its own marketing function. One important step here is the development of an order-processing system that will best serve a multi-plant, multi-sales office, and multi-customer operation. We've had a sharp task group working on this problem and they've already come up with several recommendations. By putting these into action, we hope to improve coordination between our marketing and production functions, and strengthen our over-all customer service.

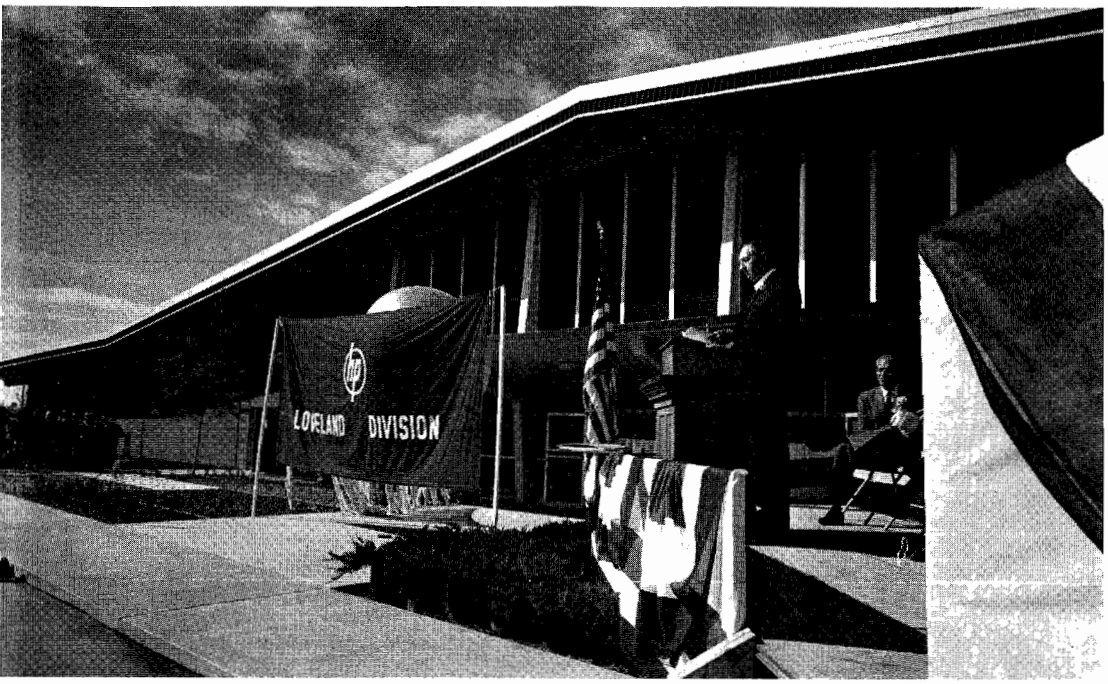
Another thing we do here at Palo Alto on a periodic basis is to make a quality-control check of instruments in finished inventory. Instruments in the shipping department are taken off the shelf, unpacked, and subjected to full-performance specification tests. While this takes time and may seem an unnecessary precaution, it's an important double check on our quality-control system.

As announced in article above, Bill Myers is the new head of Boonton Radio, which assumes divisional status November 1. Bill is an -hp- veteran with a well-rounded background in engineering, marketing, and production. With the full support of the Boonton organization, Bill is working hard to overcome Boonton's production-engineering problems and improve its delivery picture. We'll keep you posted on progress in future issues.

H-P Associates, our Palo Alto brain trust, is coming up with several exciting developments and products in the solid-state area. HPA is really beginning to roll, and is now selling some of its products to other than -hp- users.

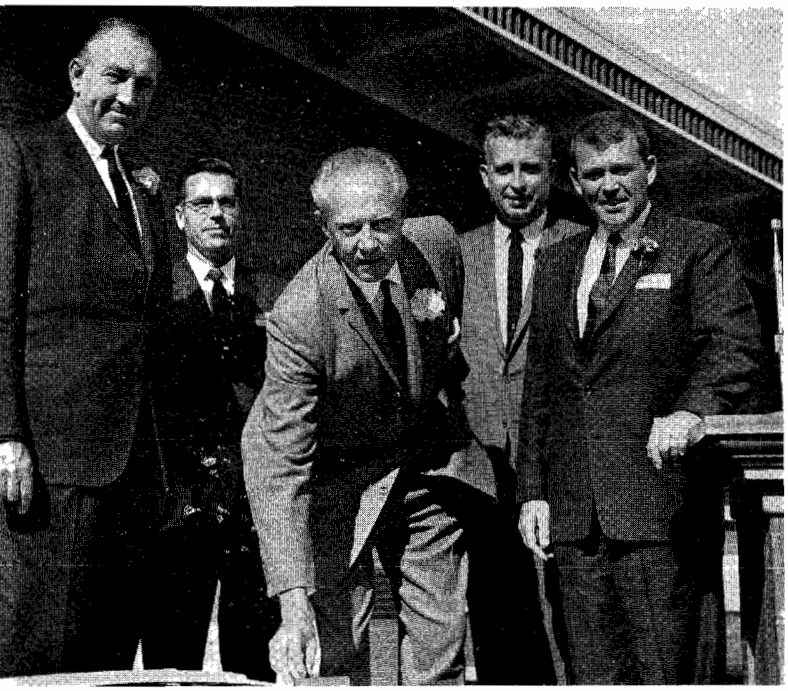
Our Loveland dedication was an overwhelming success. We were particularly happy to have representatives from various divisions and affiliates at this important event, including the top brass from Sanborn, Moseley, Neely, Crossley, and Lahana. The dedication was truly a milestone in -hp- progress.

In the next issue we'll report on our actual performance for fiscal '62 and discuss areas for improvement in the year ahead.



In his address at the dedication ceremony, President Dave Packard thanked the citizens of Loveland and neighboring communities for their "warm hospitality and wholehearted cooperation with -hp-." The plant's main entrance formed an impressive backdrop for the colorful ceremonies.

LOVELAND PLANT DEDICATION ATTRACTS 9000



The moment of truth! Governor Stephen McNichols (center) pushes switch which electronically lifts curtain, exposing main entrance to the plant. Flanking the Governor at this climax to the dedication ceremony are Dave Packard, Jean Gaines, Stan Selby, and Bill Hewlett.

ONE OF THE MOST SIGNIFICANT and colorful events in -hp's- history was the dedication of the company's new facility in Loveland, Colorado, on Saturday, October 13. Blessed with sunny skies and 80-degree temperature, the dedication was followed by an open house which attracted more than 9000 residents of Loveland and neighboring communities.

A large crowd began to assemble in front of the beautiful 140,000-square-foot plant well before the 10:00 a.m. dedication ceremonies. Contributing to the festive atmosphere of the occasion was the 110-piece Loveland High School band, which preceded the formal program with several selections from "Music Man."

Following welcoming remarks by Stan Selby, general manager of the Loveland Division, brief talks were presented by Stephen McNichols, Governor of Colorado; David Packard, -hp- president; William R. Hewlett, executive vice-president; and Jean A. Gaines, president of the Loveland City Council.

Governor McNichols pointed out that "all citizens of Colorado are very proud to have Hewlett-Packard as one of our major space-age industries.

"We appreciate the confidence which this company's progressive leadership has shown in Colorado," he said, "and we pledge that our healthy industrial climate will continue to ac-

Several hours following the dedication ceremony there was still a steady stream of visitors entering the plant. The open house was extended until 7:30 in the evening to accommodate the more than 9000 people who wished to inspect -hp's- new facilities.

Governor Officially Opens H-P's New Colorado Facility

HOW IT WORKED!

Here, in a Rube Goldberg nutshell, is how Governor McNichols officially opened the plant:

In front of the Governor on the speakers' platform was a detailed scale model of the plant. Mounted on the model was a switch and a tuned metal rod. When the Governor flipped the switch, a small hammer was released, striking the rod.

The rod transmitted a 40,000-cycles-per-second signal to a special microphone hidden inside the model. The signal was amplified and connected to an -hp- 302A wave analyzer. The wave analyzer detected the amplified signal and produced a direct current pulse which triggered a dc amplifier and switch. This switch, through a relay, applied 440 volts ac to a #22 wire holding a 10-foot balloon filled with helium.

When the wire disintegrated, the balloon rose high into the sky, inverting an 8 x 16-foot curtain and displaying the word "WELCOME."

Meanwhile, back at the ranch . . .

celerate the growth of one of America's most respected electronic firms."

The ceremonies were climaxed when the Governor pushed a switch actuating an electronic mechanism. The mechanism, an ingenious (and unpatentable) product of Marco Negrete's engineering group, in turn lifted a curtain, exposing the impressive main entrance of the $2-million plant. (For technical details, see above box.)

Plant tours began immediately following the ceremony, and ontinued throughout the afternoon and early evening. Although the number of visitors was larger than anticipated, the tours progressed smoothly through all principal plant areas, including the engineering department on the mezzanine floor. Loveland Division employees were spotted at various locations throughout the plant to answer questions and explain various manufacturing operations.

One of the most popular attractions on the tour was the display of instruments manufactured by the Loveland Division. Equally attractive, at least to the "knee-pants" set, was the large display of refreshments on the plant's south patio. This consisted of a full complement of sandwiches, ice cream, cake, soft drinks, and coffee, and drew a steady stream of visitors throughout the day.

Shortly after noon a reception and luncheon was held for approximately 200 special guests, including state and local officials, civic leaders, press representatives, and heads of various -hp- divisions and affiliates. The luncheon, short on speeches and long on conviviality, was held in the plant's "banquet room," a part of the spacious R&D laboratory.

Indicating the broad community interest generated by the new -hp- facility, the open house attracted visitors from nearly all parts of Colorado, including such distant cities as Pueblo and Grand Junction. One out-of-state guest said he'd come all the way from Boise, Idaho, because he'd "heard a lot about the plant" and wanted to see it for himself.

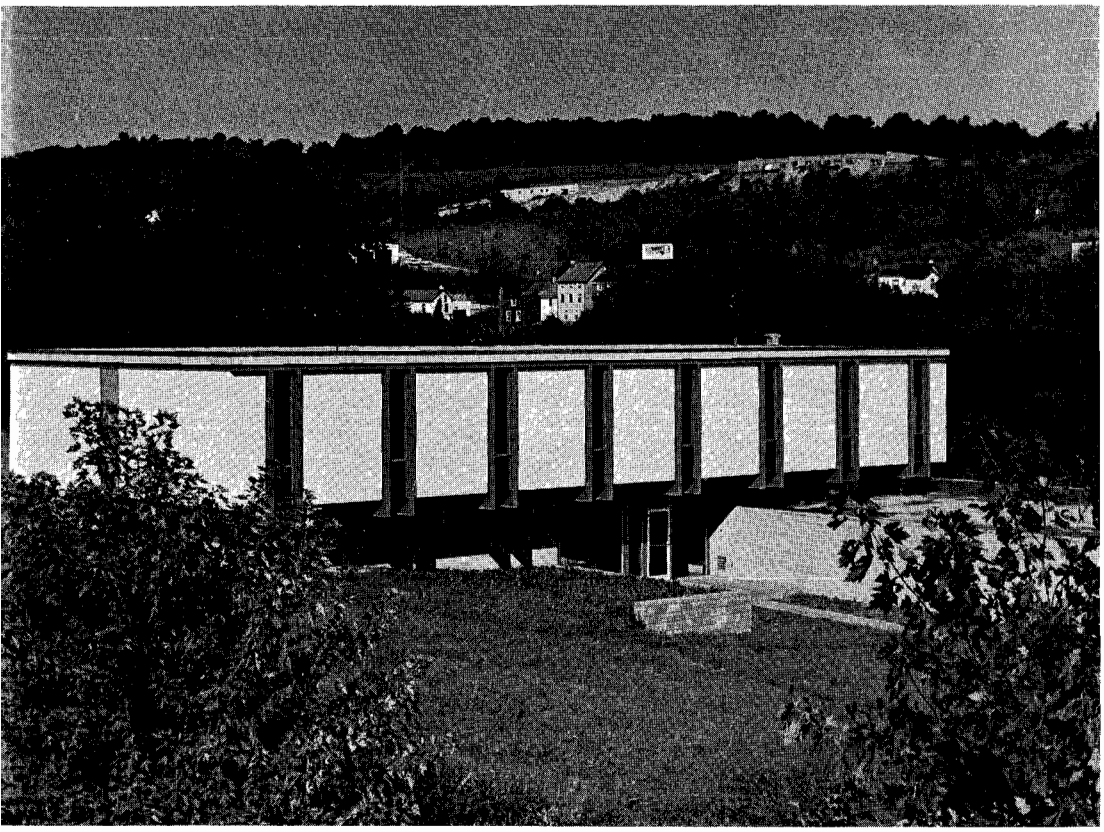
Judging from the comments of visitors, they were most impressed with the plant's size and beauty. With three acres under roof, the plant is the largest single building in -hp's- worldwide complex. It is 400 feet long, has a graceful peaked roof, nd is enclosed on its north and south sides by tinted glass. The north side offers a sweeping view of the majestic Rockies.

The plant represents a major addition to -hp's- research and manufacturing facilities, and is already making a significant contribution to Colorado's growing industrial strength.

As in Palo Alto, the plant makes extensive use of skate conveyor to speed the production, testing, and shipment of instruments.

Governor McNichols pauses in his plant tour to observe an 8-year-old unofficial inspector of the Rivet Department. Among the amused bystanders are Bill Hewlett and Dave Packard, who accompanied the Governor.

Stationed at various locations throughout the plant, Loveland Division personnel explained manufacturing processes and techniques to open-house guests.



Robinson Sales Division's new 11,000-square-foot headquarters building.

Robinson Division's sleek "Volts Wagon" unit uniquely displays -hp's- latest developments in electronic instrumentation plus playing an important part in promoting sales throughout their territory.

Robinson Sales Division of West Conshohocken, Pa.

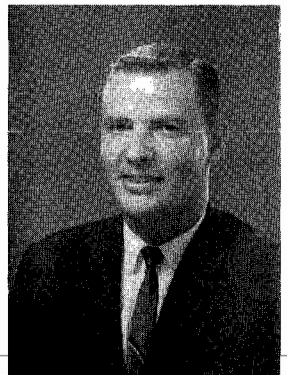
One of -hp's- Newest Marketing Units--

THE ROBINSON SALES DIVISION (formerly The I. E. Robinson Company) was officially organized on July 1, 1953, by Ivan (Robby) Robinson and Leon Levy. They were two of the "nine old men" who had been selling -hp- products for about five years previously as field engineers for Burlingame Associates. The death of Colonel Bruce Burlingame, plus a change in -hp's- marketing plans, resulted in several meetings of the typical "smoked-filled room" variety. At the conclusion of these meetings a pact was made with Dave Packard, Bill Hewlett, and Noel Eldred, and Robby and Leon were launched on a successful sales representative's career in the eastern Pennsylvania and southern New Jersey area, with -hp- products as the backbone of their electronic-instrument line.

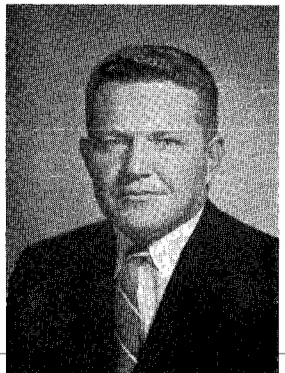
Growth, change, more growth, and more change followed each other as the company evolved . . . from 1200 square feet of space in the first office to 6000 square feet, and finally to their new 11,000-sq.-ft. building in West Conshohocken, Pennsylvania. This modern facility is just off the Schuylkill Express-

Ivan Robinson

Rick Weaver



Toi Toivonen
Asbury Park Manager



Walt Friedrich
Camp Hill Manager

way leading in to Philadelphia. Branch offices also have been established in Camp Hill, Pennsylvania, and Asbury Park, New Jersey.

The field engineering team of the Robinson organization has always been strong in technical depth, with several of the fellows holding advanced degrees. Rick Weaver, who is sales manager, is a graduate of Villanova and a former -hp- sales trainee. Rick joined Robby in 1956 as an "inside" salesman, but the lure of getting out into the field became too strong, so he persuaded a friend and classmate, Pete Roddy, to come with the organization and take over his post. Pete is now a senior field engineer.

Engineer Jay Halprin had been doing microwave antenna design with American Electronics Laboratories, and Joe Groves had engaged in design and applications engineering of pulse logic circuitry for Burroughs, before the sales bug hit them. Joe Dzwonczyk had been in the components group at RCA; whereas Toi Toivonen, who now manages the Asbury Park office, had been dealing with large data-processing applications and equipment prior to becoming interested in marketing. Earnie Philips brought with him some sales experience from Sonex. Walt Friedrich, who is in charge of the Camp Hill office, came from NARCO (National Aeronautical Corporation), where he had had a wealth of experience designing and servicing test setups for the production of omnidirectional navigation equipment.

This variety of experience and knowledge of the individuals in the group has contributed greatly to the background of everyone through mutual exchange of information at sales meetings and other get-togethers.

The service and parts department, which started out as a one-man affair, now boasts six technicians, under the able direction of Don Robson, who had spent many years previously in the instrumentation department at Westinghouse. Don's hard-working crew believes that the best way to increase sales is to help the customer keep his equipment in tiptop shape—and they put this belief into action.

An aggressive promotional and advertising program was instituted early in the company's history and is still going strong under the present leadership of Rich Nelson. The "Volts Wagon" (see photo) takes to the road twice a year, loaded with the newest instruments for the prospects to see in actual demonstration setups. Robby holds "Open House" once a year and participates in the annual EER Show. Also, service seminars, with an able assist from the factory, are held often. Full-page ads appear monthly in the local technical magazines, describing the products and services offered.

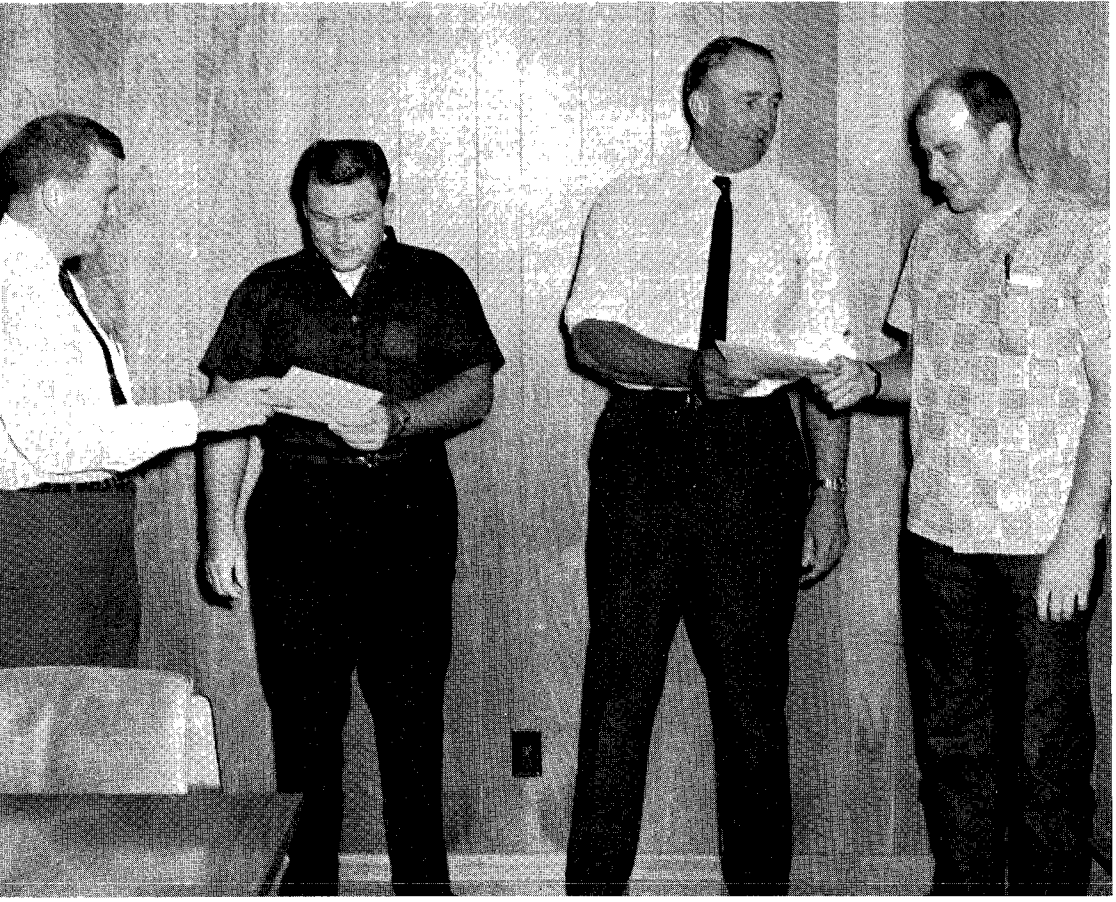
To bolster the marketing team in the field, Barrie Wilmarth, Don Lewis, and Jerry Tully ably handle the inside sales function, giving the customer immediate answers to his technical and routine questions. Don is beginning to handle some Philadelphia field engineering assignments and Jerry is presently commuting to Asbury Park to assist Toivonen with field engineering in his territory.

The sales picture has been one of constant growth, going from $1,500,000 in 1954 to $7,500,000 in 1961, and the organization has become one of the most highly regarded sales groups in the area. With the continuous outpouring of new and better equipment from -hp- and its subsidiaries, Robby feels there is every reason to believe that the sales curve will continue to rise for many years to come.

Partial view of Robinson Sales Division, Audio-Video Section

Typical Robinson field service seminar in session. Subject: Signal and Sweep Generators; instructor: Duane Dobratz, -hp-.

West Conshohocken office Parts Department staffed by Ruth Andrews, left, and Jeannine Taylor.



A signal honor in the lives of Tom Nelson (2nd left) and Bill Grimm (right) was the receiving of certificates from Bill Hewlett (left) and Dave Packard upon completion of their apprenticeship "on-the-job" training program.

HOW H-P'S APPRENTICE PROGRAM DEVELOPS RESERVOIR OF SKILLED MANPOWER

HEWLETT-PACKARD COMPANY

PALO ALTO, CALIFORNIA

Has issued this

Certificate of Completion

to

Thomas N. Nelson

FOR SATISFACTORILY FULFILLING

THE APPRENTICESHIP TRAINING REQUIREMENTS

FOR JOURNEYMAN

Tool and Die Maker

Dated November 1, 1962

Chairman, Apprenticeship Committee

Vice President, Manufacturing

President

Above certificate testifies that recipient has satisfactorily fulfilled the necessary requirements for journeyman "Tool and Die Maker"—thus completing four years of on-the-job training. A similar certificate is awarded to journeyman "Machinist."

APPRENTICESHIP is an organized program of "learning by doing." It combines on-the-job training with related classroom instruction. The product of this combination provides industry, the community, and our nation with people who possess the necessary skills by which our economic leadership can be maintained.

More specifically, apprenticeship supplies -hp- with a reservoir of skilled craftsmen to perform successfully the precise manufacturing processes demanded by electronic instrumentation. Our supervisors are able to exploit one of the more challenging facets of their job—training and developing their people. Our journeymen, who assist in on-the-job coaching, are given the opportunity of contributing to the continuity of their crafts. Our apprentices are able to learn a skilled trade, which in turn leads to economic advancement. As an added incentive, doors of more responsible positions can open for the outstanding apprentices who are willing to go "the extra mile."

Although evidence of apprenticeship may be traced to early Babylonian history, it is a relatively new concept with -hp-.

Plan Introduces a Neophyte Into Project Monthly--

Early in 1959, Ralph Lee, vice president of manufacturing, decided that in order to maintain the skills necessary to build electronic instrumentation of increasing complexity, we must have an organized machinist and tool and diemaker apprenticeship program. This program, he contended, could develop a reservoir of skilled manpower from which graduates could be drawn and placed into one of the most crucial spots in the entire manufacturing process—the machine and tool shops.

Lee Seligson, the then newly acquired personnel development coordinator, was assigned to organize the program. Under his direction, and with the full cooperation of all shop personnel, the program was launched in November, 1959. Thirteen apprentices were selected to begin training.

In succeeding months the program underwent several changes and refinements. Constant observation and measurement of over-all effectiveness by such individuals as Dick Arms, Ken King, Connie Henderson, and Harmon Traver, to name but a few, helped to pinpoint areas where meaningful changes could be made. Implementation of these improvements have made -hp's- present apprenticeship program truly outstanding.

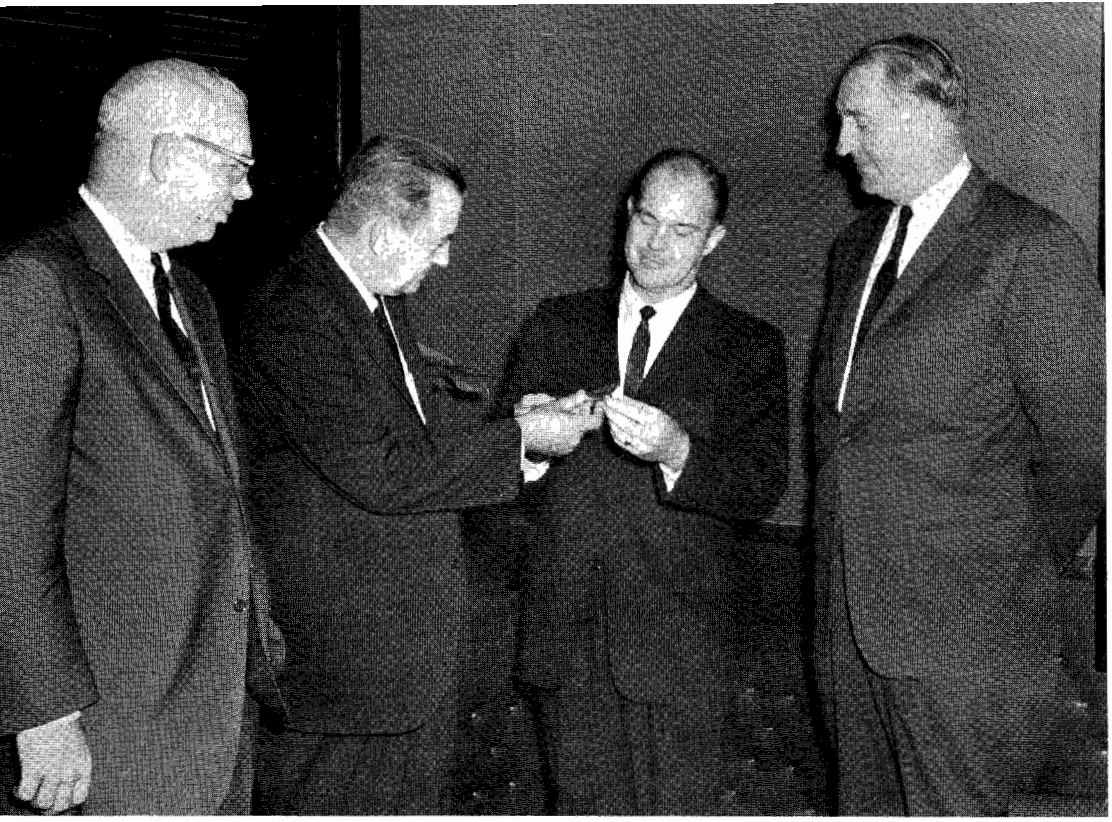
To maintain full shop support for the continual betterment of this program, supervisory and administrative responsibilities lie with a steering group composed of operating managers and supervisors from the participating shops.

Each apprentice is required to complete four years' on-the-job training. This time is divided, as required, among several work processes, with emphasis placed upon processes involving the major machine tools—lathes, mills, drills. Complementing this are brief familiarization processes which are essentially -hp- oriented and help provide the depth required for the well-rounded craftsman. While experiencing these various processes, the apprentice, through a well-designed rotational system, performs in all of the participating shops throughout -hp-. Unnecessary training time is avoided for apprentices having previous experience on a required work process, as credit may be granted by the steering group if warranted by job performance.

Training progress is measured by a rather unusual performance-appraisal system. Every apprentice is evaluated upon completion of each work process, or at least every three months on processes of longer duration. His progress is measured with specific training objectives and performance standards for each process. In addition to the knowledge exhibited on the specific process, general shop skills and personal attributes are considered. An individual appraisal interview is then conducted by immediate supervision. At this time the appraisal may be clarified and constructive performance suggestions offered.

Unlike many apprenticeship programs, -hp's- related instruction courses must be completed in an accredited junior college. Approximately 22 semester hours of evening study are required through the four-year period. Many of these courses are extracted from complete curricula in tool design and industrial management. Apprentices having long-range aspirations for supervision or tool design are encouraged to complete the balance of these curricula after they achieve journeyman status. Several years' practical experience as a skilled craftsman, coupled with an Associate Arts degree, can well equip this group to compete favorably for more responsible positions at Hewlett-Packard.

The -hp- apprentice "on-the-job" program is governed by the steering committee shown in photo at right. Supervisory and administrative responsibilities lie within the province of this group, which is composed of operating managers and supervisors from participating shops. Present members are, clockwise: Bill Girdner, Harmon Traver, Stan Corbett (consultant), Chick Alexander, Hugh Foster, Gordon Smith, Connie Henderson, Harry Bligh and George Bower.



Carl Clement receives 1962 Alcoa Industrial Design Award from George B. D. Peterson, Alcoa's vice president in charge of field sales and distribution. Extending their congratulations to -hp's- manager of industrial design are E. M. Tatman (left), Alcoa district sales manager, and Dave Packard (right), -hp- president.

CLEMENT RECEIVES TOP DESIGN AWARD

Alcoa Honors -hp- Modular Enclosures--

THE NEW MODULAR ENCLOSURE system for -hp- instruments has received further national recognition with the presentation to Carl Clement of the 1962 Alcoa Industrial Design Award.

The award, presented annually by the Aluminum Company of America for "outstanding design in aluminum," was granted to Clement for his work and that of his -hp- industrial design department in designing the modular system.

Clement, sole recipient of the 1962 award, was presented with a sculpted aluminum symbol of the award at a special luncheon in Palo Alto on October 8. The presentation was made by George B. D. Peterson, Alcoa vice president in charge of field sales and distribution. Several other Alcoa officials attended the presentation ceremony, including E. M. Tatman, district sales manager; S. L. Fahnestock, manager of industrial design; and J. William Daisa, West Coast promotion manager.

In past years the Alcoa award has been given to as many as three industrial designers. This year, however, Clement was the only winner from among a number of entrants from all parts of the country. Selection was by an independent jury composed of A. James Speyer, curator of Twentieth Century Art, The Art Institute of Chicago; John Entenza, executive director, Graham Foundation for Advanced Studies in the Fine Arts; Raymond C. Sandin, manager of industrial design, Hotpoint Company; and A. W. Duncan, manager of industrial design, Sears, Roebuck & Company.

In accepting the award, Clement noted that -hp's- modular enclosure system was the result of a team effort involving several members of the industrial design group. He pointed out that Tom Lauhon, Andi Are, Allen Inhelder, and Dick Payne were instrumental in designing the award-winning system.

H-P's new enclosures were introduced at the 1961 IRE Show. In his *Watt's Current* letter following the show, Dave Packard wrote:

"Almost without exception every one of our new products was clearly ahead of the field, but more important they had an elegance and finish in their design which is going to be hard to duplicate. Carl Clement's new cabinet program was the hit of the show. In fact, it was considered by many as the most impressive contribution to the packaging of electronic instrumentation that has ever been made."

Later that year the modular enclosures received the top industrial design award at the WESCON Show in San Francisco.

According to Alcoa officials, the enclosures and -hp's- industrial design group will receive additional recognition in a forthcoming issue of *Fortune Magazine*. A four-page Alcoa ad, tentatively scheduled for the December issue, will present an illustrated description of the enclosure system and point out, in detail, why Clement and his staff were selected for the coveted Alcoa award.

HORMAN ASSOCIATES HOSTS

1230 at Annual "Open House"

Exhibit Features 21 Demonstrations—

HORMAN ASSOCIATES' Fifth Annual Open House Exhibit of electronic instruments, held September 12 and 13, was the biggest, best ever. During the two days of the exhibit there were 1230 engineers attending, representing 154 different customers for the -hp- family of instruments. This represents a 30 percent increase over last year, which shows that this annual affair is growing in stature and, in fact, is outranking on an attendance basis many of the local and sectional shows.

The exhibit featured 21 active demonstrations which emphasized the most important features of our new instruments. There was a surprising total of 62 saleable instruments shown. The startling fact that comes from these figures is that if every visitor took a look at each of the instruments there was a mathematical possibility of 1230x62, or 76,260 demonstrations of equipment.

The exhibit required an all-out effort on the part of Fred Horman and his crew, and they were backed up by help from -hp- who, in addition to supplying the new instruments, sent people to handle the demonstrations. Dan Lansdon and Vic Van Duzer from the Counter Division were on hand to demonstrate their new 5243L transistorized electronic counter, which caught the fancy of key BuShips and FAA people. Horman had the help of Gene Warrington, product manager of the Oscilloscope Group, who was kept busy hopping between the 175A oscilloscope demonstration and the very popular 130C low-frequency oscilloscope which drew a great deal of interest.

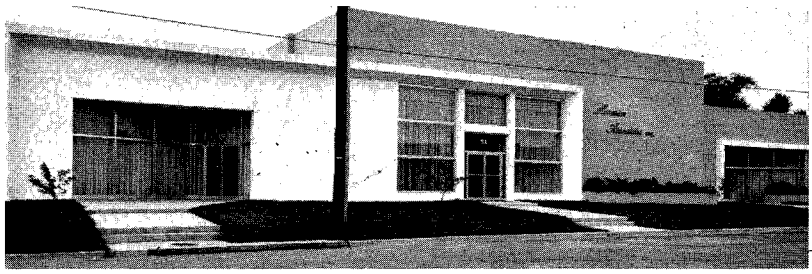
Lyle Jevons, product manager, Microwave Division, did yeoman duty demonstrating the new 8614A VHF signal generator and 8714A modulator, as well as meeting with the various key engineers at FAA to discuss some of their special requirements.

Dick Cline was on hand from the Marketing Department, and Noel Porter with Al Lonnberg, president of Sanborn, were on hand available for backup.

One unusual occurrence was the arrival of a Navy Department bus with 50 Bureau of Ships engineers sent to the Open House. These were engineers drawn from various naval installations all over the country (mechanical, electrical, etc., other than electronic engineers) and Civil Service employees undergoing re-training to fill electronic engineering positions throughout the Bureau. The Horman Open House was considered part of their training, and many of these people will be specifying general-purpose electronic instruments shortly. Fred Horman was most pleased to help with their "on the job" training.

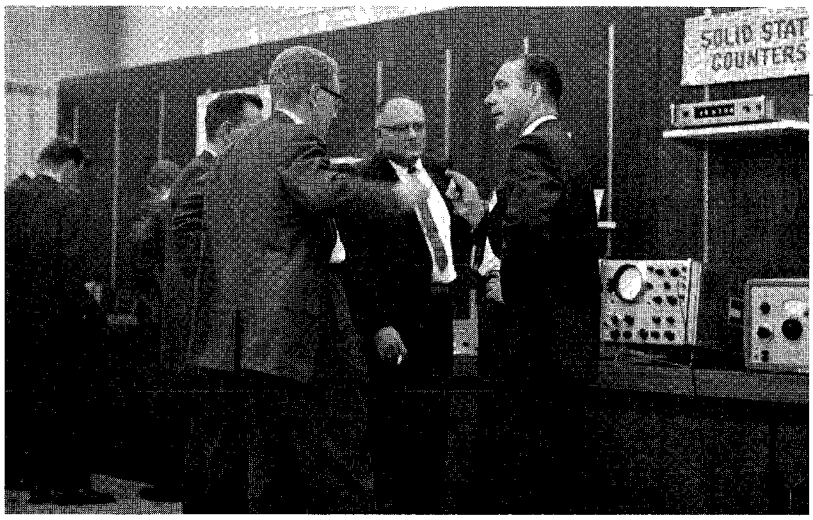
Another unusual feature of Horman's Open House was the first public introduction of a new -hp- instrument at a local rather than a national exhibit. The new -hp- Model 5100A/5110A synthesizer was introduced for the first time ever at the Open House and generated a great deal of interest and excitement.

PAECO and Harrison Labs had their own individual sections displaying pertinent products.



Horman Associates' Rockville office, site of the Fifth Annual Open House.

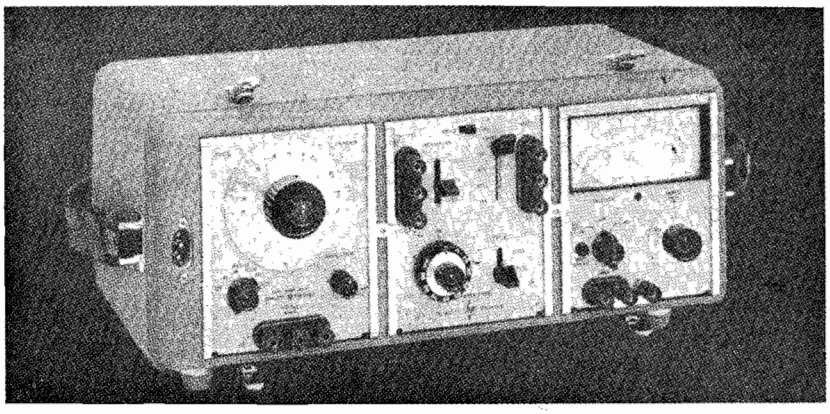
Vic Van Duzer of the Counter Division, center, explaining some of the fine points of new Model 5100A/5110A synthesizer.



Joe Fasulo of Horman's Baltimore office (on right) discusses new 175A oscilloscope with potential customers.

Tom Lott, back to camera, watches demonstration of new synthesizer with Dr. Harris Hastings of NRL, left.

SIMPLIFY communications maintenance



NEW portable test set measures gain, attenuation, frequency response

The new hp 3550A Portable Test Set, designed specifically for transmission system testing, is especially useful for alignment and maintenance of multichannel communication systems. It incorporates a 5 cps to 560 kc oscillator with fully floating output, a 1 mv to 300 v 5 cps to 2 mc voltmeter, and attenuator and impedance matching networks to individually match the oscillator and voltmeter to 135, 600 and 900 ohm lines.

The solid state instruments are housed in a compact case with a splash-proof cover, and both the oscillator and voltmeter operate from internal rechargeable batteries or from an ac line. The three instruments may be used separately in or out of the case.

The oscillator provides flat frequency response and excellent amplitude and frequency stability. The highly accurate voltmeter provides a db scale for easy measurement—72 to +52 dbm. The attenuator and impedance matching unit includes calibrate features to eliminate insertion loss. Oscillator and voltmeter batteries recharge during ac operation.

Check the specifications for the remarkable versatility and convenience of this test set, then contact your hp representative or call direct for a demonstration on your bench or in the field.

SPECIFICATIONS

OSCILLATOR (hp H07-204B)

Frequency Range:	5 cps to 560 kc, 5 ranges
Dial Accuracy:	±3%
Frequency Response:	±3% into rated load
Output Impedance:	600 ohms
Output:	10 mw (2.5 v rms) into 600 ohms, 5 v rms open circuit, completely isolated
Distortion:	Less than 1%
Hum and Noise:	Less than 0.05%
Temperature Range:	—20° to +50° C

VOLTMETER (hp 403B)

Range:	0.001 to 300 v rms full scale; —72 to +52 dbm
Frequency Range:	5 cps to 2 mc
Accuracy:	0°C to 50°C, within ± 2% of full scale from 10 cps to 1 mc, within ± 5% of full scale from 5 to 10 cps and 1 to 2 mc (on 300 v range, accuracy is ± 10% from 1 to 2 mc; AC-21A 10:1 Divider Probe allows measurements to 300 v in the 1 to 2 mc range with an accuracy of ± 5%); 0°C to — 20°C, ± 8% of full scale from 5 cps to 2 mc
Nominal Input Impedance:	2 megohms, shunted by approximately 40 pf on 0.001 v to 0.03 v ranges, 20 pf on 0.1 v to 3 v ranges, 15 pf on 10 to 300 v ranges
DC Isolation:	Signal ground may be ±500 v dc from external case
Noise:	Less than 4% of full scale on 1 mv range, 3% on other ranges

ATTENUATOR/PATCH PANEL

Attenuation:	110 db in 1 db steps
Accuracy:	10 db section, error less than ±0.125 db at any step, dc to 100 kc; less than ±0.25 db, 100 kc to 1 mc. 100 db section, error less than ±0.25 db at any step up to 70 db, less than ±0.5 db above 70 db, from dc to 100 kc; less than ±0.5 db up to 70 db, less than ±0.75 db above 70 db, 100 kc to 1 mc
Impedance:	600 ohms
Input and Output:	50 cps to 560 kc; balance better than 40 db; frequency response ±0.5 db, 50 cps to 560 kc; impedance, 135, 600, 900 ohms center tapped. Input includes 10K bridging impedance; insertion loss, less than 0.75 db at 1 kc; maximum level +10 dbm (2.5 v into 600 ohms)

GENERAL

Power:	Voltmeter and oscillator each use a power supply of 4 rechargeable batteries (furnished, 40 hr. operation per recharge [20 hours at —20° C], up to 500 recharging cycles). Automatic recharging during ac operation
Dimensions:	8⅜" high, 19¼" wide, 13¼" deep. Weight 30½ lbs.
Price:	$990.00

Data subject to change without notice. Price f.o.b. factory.

HEWLETT-PACKARD COMPANY
1501 Page Mill Road, Palo Alto, California, Area Code 415, DA 6-7000
Sales and service representatives in all principal areas; Europe, Hewlett-Packard S. A., 54-54bis Route des Acacias, Geneva; Canada, Hewlett-Packard (Canada) Ltd., 8270 Mayrand Street, Montreal

8090

Above ad, pertinent to the Loveland-designed and manufactured Model 3550A portable test set, will appear in several current scientific publications read by communications and electronics engineers. The 3550A includes a 204B oscillator, a 403B-db voltmeter, and a 353A attenuator and patch panel, all mounted in a weather-proof carrying case.