



#### /ATT'S CURRENT

#### Published Monthly by

HEWLETT-PACKARD COMPANY Caboratory Instruments for Speed and Accuracy 1501 PAGE MILL ROAD PALO ALTO, CALIF.

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

WILLIAM BIGLER 

Copyright 1963, Hewlett-Packard Co.

Vol. XVIII

APRIL 1963

No. 4

#### -hp-Organizational Changes

Wayne Briggson, Manager of Palo Alto Ac-counting, transferred to Corporate Accounting

Manager.

Bob Hungate, former Supervisor of Statistics & Reporting, replaces W ayne Briggson as Manager of Palo Alto Accounting.

George Abbott replaces Bob Hungate as Supervisor of Statistics & Reporting.

Dave Davidson, former Supervisor of Production Confliction Desired Production

duction, Oscilloscope Division, transferred to Colorado Springs.

Harold Edmondson, former Plant Manager of the Microwave Division, transferred to the Oscilloscope Division as Plant Manager.
Bill Girdner, former Microwave Fabrication

Department Manager, transferred to Advanced Research and Development.

Ray Smelek, formerly with Microwave Manufacturing Engineering, transferred to International Operations for training before going to HP Limited, England.
Bob Sundberg, former Materials Manager,

now heads Corporate Purchasing.

Henry Taylor, from Assistant to the Materials Manager to Materials Manager. Harold (Swede) Wild, former Oscilloscope

Division Plant Manager, transferred to Microwave Fabrication Department Manager.

Robert Cornell transferred to Corporate Fi-nance from Manufacturing Engineering, Indle King, HP Industrial Design, transferred

to Sanborn Company, Industrial Design.

#### April Features

Λ	Tei	u	5	01	be	$\boldsymbol{P}$	lan	21						Will a		1	100					15	
	I		1	ol	^-	11		01		** *			41	19.3	Ma			127	Ħ,	2,	00	Ø.	1
See S		U)	6. 1		y,	ш		JĮ		"6			i hi	) be		188	F			a	X.C		i.
e ci	r	إيوا	c		110	72	1,15	4	1	17	ille vi			Hed vi		7	j.		-	- T.	Up.	m,	
, ci	Ea	13	.,	216	eı	1	1	ŢŅ	****	L	21.4		123		30.	-		Į.		a	ge	H	,
and the	20	16	. 4		in the	-	NO.			113	The state of	1	hall.	Ne		W.	1		36		ind.	110	
S	lii	65	3	aie	J.	i,	ivi	5/	m	any	M	[ 1:		n.) ad	ma <sup>1</sup>	4	w	Med .		u	ge	( - )	6
	selv + .	G.L.	I) 13	Be w	745	3 11 12	. 487	1 B.	Jill A	94.1	164	11/1	T.	Ţ.			Ŋ.		114	5.1			e.I
7	be	? <i>I</i>	e	201	e	Be	h	na	1 1		,	63	20	m	Du	te	1	à i	418	a	20	. 5	8
Fred.	Mair.	2,000	14	Lalf of	n	TILL L	20 110		P - 1	To a			E . 3	The Ca	'n,	in .	Œ.	17			16	15	
1	1 1	ei	v.	Pro	od	uci	tio	12	D	771	1	of	T.	- 10	±.			1	, Deb		55		ŀ.
page 1	E (1)	4		in		4			1	119	egri in Si vo			J.		ě.		ħ,	112	D <sub>a</sub>		11	n
	1	1///	CE Z		ĸ	716		• 7 4	u	Z-i gg	1	•	40					74		a	80	17	v

Late News Flash!

## JOINT VENTURE IN JAPAN

S WATT'S CURRENT was going to press, President Dave Packard announced that HP has signed an agreement with the Yokogawa Electric Works, Ltd., of Tokyo to form a jointly owned company in Japan for the production of electronic test instruments.

The signing successfully culminates several months of negotiations with the Yokogawa firm. The agreement has been submitted to the Japanese Government and is expected to gain its approval, according to Mr. Packard.

The new company, to be known as Yokogawa-Hewlett-Packard, Ltd., will engage in the design, manufacture, and marketing of a broad range of electronic instrumentation. Yokogawa Electric, located on the western outskirts of Tokyo, was founded in 1915. It produces a wide variety of electrical and electronic equipment, including industrial controls, recording devices, and test instruments. It is a publicly held firm with annual sales of about \$30 million and an employment of more than 3,000.

"We're delighted to form this joint venture with such a highly respected and successful company as Yokogawa," Mr. Packard said. "The firm enjoys an excellent reputation throughout Japan for its technical competence and the high quality and reliability of its products.'

He pointed out that Japan is now one of HP's largest overseas markets, exceeded in size by only Western Europe and Canada. "By establishing manufacturing facilities in Japan and providing technical know-how to our Japanese partners, we will be better able to participate in the continuing growth of this important area," he said.

Under terms of the agreement, the new company will have an authorized capital of \$5.6 million and an initial paid-in capital of \$1.4 million. In line with the Japanese Government's policy on such joint ventures, 52 percent of the stock will be owned by Yokogawa and 49 percent by HP. Both companies will be equally represented on the new firm's Board of Directors.

The joint venture will be managed and staffed by Japanese, with Shozo Yokogawa serving as president. Mr. Yokogawa is currently managing director of administrative affairs for Yokogawa Electric Works.

The new firm plans to build a manufacturing facility on an eight-acre site in Hachioji, about 40 miles from the center of Tokyo. The plant's first unit will provide 68,000 square feet of office and manufacturing space. Long-range plans call for a four-building complex of about 300,000 square feet. Until the new plant is completed, the company plans to lease part of Yokogawa's facilities in Tokyo for its initial operations.

A handshake between Dave Packard and Iwao Yamasaki, president of Yokogawa, completes joint-venture agreement. Assisting with the negotiations were Shozo Yokogawa, president of the new company, and Bill Doolittle, HP vice president.



## Paris Show Report

Anyone attending the International Exhibition of Electronics Components in Paris, February 8-12, had 700 exhibits to view and would have walked about three niles to visit all of them. The HP exhibit ad three booths to display products of the company's German, English, and American subsidiaries and divisions. To make sure communications would be no problem, HPSA staffed the exhibit with Greman-, French-, Italian-, and English-speaking engineers. A variety of products were shown, including transistor counters, oscilloscopes, voltmeters, X-Y recorders, oscillographic recorders, and signal generators. In all, HPSA received more than 400 technical inquiries from 18 nations. The exhibition originally started in Paris as the Wireless Show 39 years ago and was opened to manufacturers outside France in 1957.



## Operations News

BY NOEL E. PORTER Vice President, Operations

E'RE HAPPY TO STATE that the order picture is beginning to look a little brighter. April orders are up significantly for the parent company, and we expect this trend to continue over the next few months. Moseley, Harrison, and Dymec are running well ahead of their respective order rates for the corresponding period last year.

Since most of our operating units have a high level of finished goods inventories, however, we've been re-evaluating our targets for the balance of the fiscal year (May through October). As a result, we've lowered our sights a bit and have set a 1963 goal of \$69 million for the parent group, which is below earlier projections but still 7 percent above fiscal '62. Our revised order target for the total corporation is \$119 million, about 8 percent higher than last year.

We believe these new targets are on the conservative side. Certainly we can exceed them if we get some breaks and if we continue to bear down on our new product programs. We're hopeful that many of the new products introduced at the IEEE Show will add a sizable increment to our 1963 volume.

The big news during April was the announcement of our plans to expand our Colorado Springs operation. Another highlight on the Colorado scene was the presentation to Dave Packard of the American Way of Life award by the Pueblo Sertoma Club. Both of these events are fully covered elsewhere in this issue. The important point here is our desire to get the new Colorado Springs plant on the air as early as possible in 1964.

#### New Office for Lahana

Going on around the circuit, and still in Colorado, plans for the new Lahana & Company office in Denver are currently out for bid. This new sales facility, costing about \$100,000, is expected to be completed in November. At Loveland, enthusiasm still abounds and here we plan to accelerate the transfer of transformer and molded hardware production from Palo Alto to the Loveland component section. Loveland's new product program is building a good head of steam and will be generating some important new instruments in the near future.

Bids were recently opened for the new Harrison Laboratories plant, and construction will begin shortly. This new facility, costing nearly \$1 million, is expected to be ready for outfitting in December. It's urgently needed to accommodate the continuing growth of Harrison Labs.

As reported earlier, the Boonton division is now operating well in the black and still has a healthy backlog to work off. Boonton's engineering people are working closely with our corporate group to get maximum mileage from their product development programs.

Things are really jumping at Moseley, with incoming orders at a record high and profits continuing at a strong level. Switching back to the East Coast, we've made some adjustments at Sanborn to balance output with input. Sanborn's incoming orders have begun to show an encouraging upturn this past month.

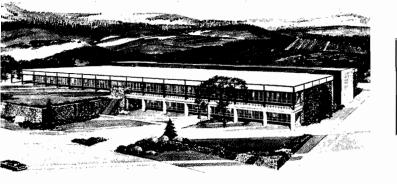
#### HPA Activity on the Rise

Our Palo Alto operations are moving ahead. HP Associates is beginning to sell some of its solid-state devices to outside customers and will increase its production substantially in the next few months. As a result, HPA is in a bind for space and will be taking over about half the PAECO building by midsummer.

Our transformer load is being reduced with the introduction of new transistorized instruments requiring much smaller transformers. In addition we plan to transfer most of our transformer production to the Loveland component section over the next year. We want to emphasize the fact that this transfer will in no way dislocate PAECO employees. Those affected by the change will be moved to other units in the Palo Alto complex (Dymec, HPA, etc.) where their experience and skills are needed.

Orders and interest in the new frequency synthesizer are mounting rapidly, and we plan to devote a large portion of Plant 2 on the hill to the production of this all-important item. Meanwhile, we've consolidated the Central Materials function within the Microwave Division, and are also consolidating certain functions of Dymec and the Palo Alto oscilloscope group to increase our over-all efficiency.

The IEEE Show clearly demonstrated the fact that competition is increasing all across the board. However, we're still leading the pack and can lengthen our lead with continuing strong efforts in all areas of our expanding operations.



Designed by Denver architects Moore & Bush, HP's new oscilloscope plant will be a single unit of 137,500 square feet. Half of the building will be of two-level construction, with the top level running the entire length of the glass-enclosed structure.

Inspirational Setting

## Ultramodern Scope Plant for Colorado Springs

ORKING IN THE SHADOW of majestic Pikes Peak, construction crews will soon break ground for another major Hewlett-Packard facility in Colorado—a \$2-million plant for the design and manufacture of oscilloscopes.

Plans for the new facility were announced by President Dave Packard at a press conference and luncheon in Colorado Springs on April 20. He said construction of the plant, a single, ultramodern building of 137,500 square feet, will begin about June 15. The building is scheduled for occupancy in mid-1964.

#### 30-ACRE INDUSTRIAL PARK SITE

Serving as headquarters for the company's Oscilloscope Division, the plant will be built on a 30-acre site in Pikes Peak Industrial Park. This is a new industrial area northwest of Colorado Springs. Situated on the eastern slope of the Rockies, it is considered one of the most attractive plant sites in the entire country.

HP already has two facilities in Colorado—a 140,000-square-foot plant in Loveland, about 50 miles north of Denver, and a 20,000-square-foot leased plant in Colorado Springs. The latter facility, established by the Oscilloscope Division a year ago, currently employs about 60 people. The division will continue to use this building until the new plant is completed. It also has recently leased a smaller building in Colorado Springs to serve as an interim headquarters for its engineering staff.



Cort Van Rensselaer

At present the bulk of HP oscilloscopes are produced in Palo Alto. However, Mr. Packard said that the company will gradually transfer its entire Oscilloscope Division to Colorado Springs.

"This new plant will enable us to set up a completely integrated operation for the design, manufacture, and marketing of oscilloscopes and pulse generators," he said. "The plant will also include facilities for manufacturing cathode ray tubes and other oscilloscope components."

#### FOUR BUILDINGS IN MASTER PLAN

The new facility will eventually employ about 650 people. According to the company's long-range plans, it will be only the first unit of a four-building complex which will provide some 400,000 square feet and employ more than 2,000 people.

Many of the Oscilloscope Division's key administrative and engineering personnel will transfer from Palo Alto to Colorado Springs over the next 18 months, according to Cort Van Rensselaer, division general manager.

"This will be a gradual move," he said, "and will be accomplished as smoothly as possible. Although most of our key people will come from Palo Alto, we intend to hire our production staff from the local Colorado Springs area. Those people remaining in Palo Alto will eventually be transferred to other divisions where their experience and skills can be used effectively."

The new Colorado Springs plant was designed by the Denver architectural firm of Moore & Bush. As indicated in the above photo, half the plant will be of two-level construction. The top level, running the entire length of the building, will be approximately 90,000 square feet. It will be devoted primarily to manufacturing, while the bottom level will include administrative offices and engineering laboratories.

#### TINTED GLASS AND NATIVE STONE

The plant will be basically of concrete and steel construction. As in the HP facilities in Palo Alto and Loveland, two sides of the building will be enclosed by tinted glass. The end walls will include liberal amounts of native stone to enhance the over-all attractiveness of the building.

Ample parking space has been provided. The first unit's lot will accommodate 560 cars, nearly one space per employee. The master plan for the four-building complex provides space for 1,500 cars.

According to present schedules, plans for the new building will be put out for bid in the latter part of May. Shortly thereafter a contractor will be selected, and it is anticipated that construction will begin about June 15.

"Easy Street" Draws Tens-of-Thousands

# IEEE SCORES HIT AT NEW YORK

WITH ATTENDANCE RUNNING in the neighborhood of 70,000, the IEEE show in New York City, March 25-28, proved once again to be the *big* event of the year for the electronics industry.

And it was only fitting that HP, as one of the fastest-growing members of the industry, should put its best foot forward with the largest, and one of the most popular, exhibits at the show.

Using the "Easy Street" theme which proved so successful at the '62 WESCON show, HP and affiliated companies occupied a total of 170 frontage feet of booths in the Coliseum. The Dymec and Hewlett-Packard booths were faced across the aisle by Boonton, Harrison Laboratories, Moseley, and Sanborn. Carpeting on the aisle and in the booths made "Easy Street" easy on the feet for visitors and the hard-working company representatives who manned the exhibit in four-hour shifts.

#### 1,300 ENGINEERS WANT TO KNOW MORE

Cards available to visitors offered further technical information on the various instruments and components displayed. More than 1,300 of these cards were filled out! Perhaps even more significant is the fact that only seven people out of that number checked every box (which show visitors often do automatically), indicating a definite interest in *specific* equipment shown.

The 175A Oscilloscope pulled the most inquiries. Running close on its heels were such instruments as the new 5100A/5110A Frequency Synthesizer, the 692A Sweep Oscillator, the 214A High Power Pulse Generator, and the 410C Electronic Voltmeter.



HP engineers from F&T Division discuss new counters and frequency synthesizer with prospective clients at New York Show.

Copies of the new HP catalog—soon to be issued—were shown and aroused considerable interest.

#### DOUBLE FEATURE

For the first time since the company has participated in the IEEE show (formerly IRE), a separate exhibit was maintained away from the Coliseum. The Park Suite at the Essex House was used to exhibit a complete array of oscilloscopes, plus HP Associates' diodes and Dymec's 2401 Integrating Digital Voltmeter and the 2020B Capacitor Checking System.

On the Saturday before the show got under way, the annual sales meeting was held at the Essex House, with 220 company sales personnel and corporate executives attending. Among the highlights of this meeting was President Dave Packard's forceful talk in which he made an analysis of the company's current business position, reviewed accomplishments of each division and affiliate, and set broad objectives for everyone to strive for during the coming months.

Below, pre-show over-all view points up HP's impressive corporate exhibit area, a major attraction at the '63 IEEE.





Another Feature in the Series on HP's Field Sales Organization Tells About the Stiles Sales Division—

A Mere Handful of People in Sunny Florida Who Make Up . . .

## A SMALL BUT MIGHTY TEAM



OST EVERYONE OUTSIDE OF CALIFORNIA will agree that Florida is the livin' end. But over and above beautiful weather and fine physical endowments, HP's sales division there finds that the state boasts a few other admirable attributes.

Business, for instance, is booming for the Stiles Sales Division at both the headquarters location in Orlando and the branch at St. Petersburg. Being a next-door neighbor to the world's biggest missile installation has its advantages, because "Canaveral" is attracting industries from all parts of the nation.

Another stimulant to the state's phenomenal population and industrial growth is the weather—a subject which will not be mentioned again in deference to *Watt's Current's* many West Coast readers.

In any event, the division's Orlando office serves the eastern and central portions of Florida, which include the state's greatest concentration of electronic equipment customers. The staff at St. Petersburg has farther to go between calls, but the western area has come to life in the past five years and lays claim to such important customers as Electro-Mechanical Research, the Aeronautical Division of Minneapolis-Honeywell, and Electronic Communications, Inc.

Gene Dashiell (left), manager of the St. Petersburg branch, and field engineer Ed Wood talk over plans for another day of selling. Niles Howard handles order processing, and Catherine Watson is the secretary at the branch.

With palm trees and the low, contemporary lines of their headquarters building as fitting background, Stiles Division's Orlando force lines up for a family portrait. Left to right: Al Dryden, Anna Marie Fuller, Barbara Parsons, Bob Browning, Charlotte Donahue, Bob Rogers, Gene Stiles, Don Lutz, Gene Cline, George Demaris, Leon Padgett, Dale Viles, Cecil Viles, and Dick Russell.



In Orlando, Anna Marie Fuller takes a letter from division manager Gene Stiles. Having first joined HP in 1942, Stiles has had broad and varied experience in selling electronic equipment.

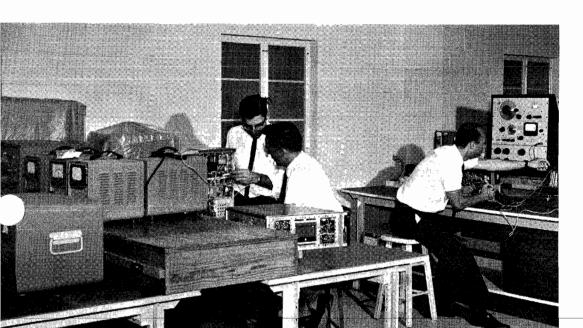
Gene Stiles, who heads the division, joined HP in 1942. Ten years later he moved to Chicago with Crossley Associates, where he remained until 1958. His next move was to Arthur H. Lynch and Associates. Through prior agreement with Lynch he took over representation in Florida of the HP, Sanborn, Dymec, and Varian lines to form Stiles Associates in 1960, with himself as president and Gene Dashiell as vice president. The other officers were Cecil Viles, treasurer, and Anna Marie Fuller, secretary.

As a newly formed HP sales division, these four continue in key positions. In addition, Don Lutz heads the customer service group, and Gene Cline has responsibility for order process-

ing, quotations, and model stock. Al Dryden, Bob Rogers, and Bob Browning work out of Orlando as field engineers.

The St. Petersburg branch is managed by Gene Dashiell, and he is assisted in direct sales by field engineer Ed Wood. Niles Howard is in charge of order processing there.

Since Stiles Associates, Inc., became Stiles Sales Division of Hewlett-Packard last November, a total of 18 people have been employed in sales, customer service, and administration. After reviewing their many achievements they like to point out that they are HP's *smallest* sales division . . . a circumstance that has not hampered their ability to produce results.



Left to right: Don Lutz, customer service manager, is seen with Dick Russell and George Demaris in the new repair and calibration area. The Orlando building recently acquired a new 2,000-square-foot addition, mainly for use by the customer service group.

The Computer Has Already Brought Vast Changes

To Our Lives and Gives Promise of Better Things to Come

Here Is a WATT'S CURRENT Report On . . .

## THE PEOPLE WHO MAKE THE COMPUTER WORK FOR HP

IN THIS AGE OF TECHNOLOGICAL MIRACLES, the computer holds a high place of esteem.

Today's sophisticated computer systems are spectacular developments in themselves. But more important, they provide us with the means to achieve more rapid progress in virtually every area of science, engineering, business, and our socio-political lives.

However, the computer is only a tool, and a tool is only as good as the person who uses it.

HP's computer in Palo Alto serves nearly every phase of our business from payroll to project analysis. The group, which for more than three years now has made the Univac 90 an important tool in our business, is the *computer programming section*.

The six imaginative, creative people in the section include head programmer John Stokdyk, with a major in economics and finance plus an M.B.A.; Betty Badenhop, who majored in physics; Paul Schmidt, an electrical engineer with an M.B.A.; Peter Brink, biology, chemistry, and an M.B.A.; John Matagne, data processing; and Sue Forgie, business administration.



The group has written more than 140 different programs for the computer. A program consists of a maximum of 5,000 internally stored logical instructions which are put together in a planned manner to operate on information fed into the computer from punched cards (the same punched card that you get with many household bills and your income tax return).

Data is converted by the computer from the punched holes in the cards to binary bits (electronic pulses coded to zero or one) which are stored magnetically on a drum rotating at more than 17,000 revolutions per minute. The computer can then perform arithmetic operations on this data in a matter of microseconds.

The Univac—located on the lower floor of the Administration Building at the Stanford plant—provides a wealth of information and calculations of value directly or indirectly to every person and segment of the company.

Starting with keeping track of sales orders and sales statistics, the computer is programmed to determine the costs, standard times of manufacturing HP instruments—and their profits.

A program is now being developed to forecast statistically future sales based on historical-trend information gathered from sales orders.

The computer also assists in the master production scheduling of instruments, calculates over-all manpower requirements, department loading, and purchased material needs for the seventeen-week production schedule.

#### SOME MAJOR PROJECTS

The programming section is currently designing a perpetual inventory control system for Dymec which will aid in recording and controlling inventory and reporting when and how much material must be ordered, expedited, or canceled. A program is planned to determine the correct quantity of material to order which will give the lowest total material cost, taking into account price breaks, ordering, and storage costs.

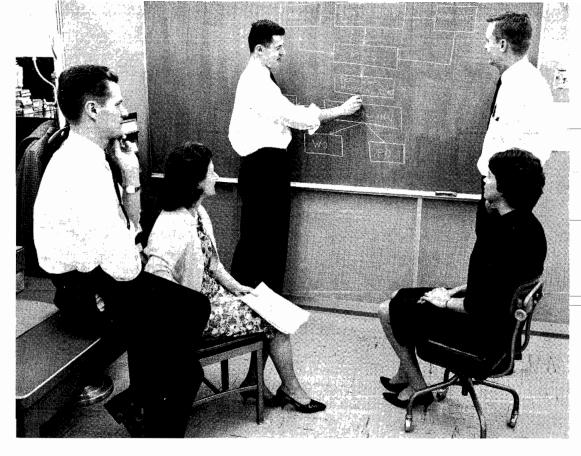
One of the recent projects was the Critical Path Method (CPM) program run for the 5100 Frequency Synthesizer, which is helping to get this new instrument into production quickly. CPM is a sophisticated planning tool used in guiding and planning for large projects, and is similar to the PERT approach to project planning.

#### FROM MONTHS TO MINUTES

The programming group also has skills in operations research, linear programming, statistical analysis, and mathematics. For the past year, Paul Schmidt, specializing in engi-

Standing by the control console of Hewlett-Packard's Univac 90 are engineering programmers Paul Schmidt and Peter Brink. Also shown are several samples of HP equipment developed in part from fast, accurate information prepared on the computer for engineers in various divisions.

Discussing a new application for the computer which will tie together several programs are John Matagne, Betty Badenhop, John Stokdyk, Peter Brink, and Sue Forgie. This group is working on an integrated computer system for material control at Dymec. The system being discussed will forecast parts requirements from the master production schedule, relate to inventory on hand, and tell how many parts should be manufactured or purchased.



neering programming, has developed more than 40 programs to help research and development solve complicated problems which might take several months to solve at a desk calculator, or, perhaps, even be too complicated to do by any other means than a computer. One of these programs calculates a novel way to design a CRT tube. Another calculates the cutting tool movements of the Milwaukee-matic to cut a near perfect cam for the 8616A Signal Generator. One program computed the padded resistance values for the Dymec 2401 voltmeter. Another analyzed the dial tracking dispersion of the J532A to assist in creating a more accurately calibrated dial.

The group is using high-speed routines like Fortran (a standard program which can generate another program) to solve complicated mathematical formulas in a matter of minutes from the time the problem is submitted, to its programming and calculation on the computer.

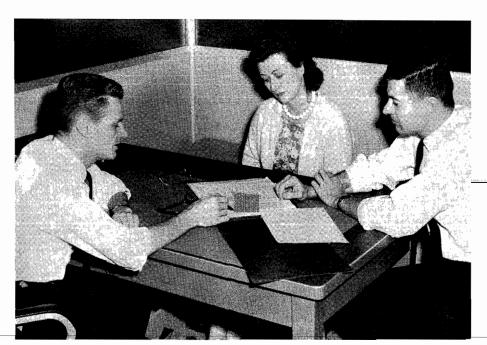
Some of the other projects recently started or completed by programming are: keeping track of the backlog of orders by instruments to assist in production planning; controlling the payment on our suppliers' invoices for up to thirty days to use our suppliers' credit terms and conserve HP capital; and a return-on-investment program to help analyze and compare various expenditures on research projects or capital equipment.

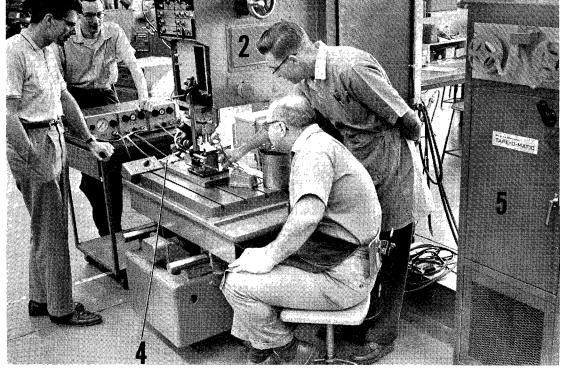
The programming section is working on a method to provide sales statistical information for our sales offices from both the Palo Alto computer center and other HP plant data-processing facilities.

These are just a few of the projects which the programming section has been working on. Their efforts are helping many of HP's outlying divisions in material control, retirement-fund accounting, stock purchases, and engineering projects.

The vehicle which is used is the computer; however, it is the talent and creativity which goes into the program that makes the computer work. There is only one limitation in the use of the computer: it is man's imagination.

Programmers often get together to exchange ideas about the best approach to a particular problem. Seen here discussing a special application are, left to right: John Matagne, Betty Badenhop, and John Stokdyk.





Watching the drilling operation with justifiable pride and a little amazement at how perfectly it works are, left to right, Ed Phillips, Bob Kirkpatrick, Bud Kincaid, and Dick Barth (seated). Equipment indicated is: (2) a standard Pratt & Whitney press which merely serves as the mounting platform; (4) air filter and supply units, motor speed control, slave circuitry; and (5) the tape control unit. The location is HP's Model Shop in Building 1L.

Did You Say Five-Millionth?

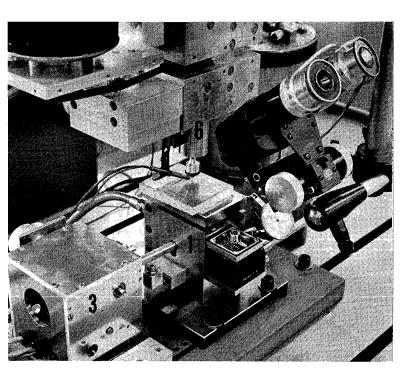
## DRILL ACHIEVES UNHEARD-OF ACCURACY

VISUALIZE A HOLE one-third the size of a fine human hair. Now try to imagine, if you can, drilling over three thousand of these holes in a thin sheet of brass a little larger than a postage stamp.

Supposing these holes—which measure 1.6-thousandths of an inch across and are spaced 2-hundredths of an inch apart—must be accurate to within 50-millionths of an inch and round to within 5-millionths of an inch.

Sounds incredible, doesn't it! But in fact, four men at the HP Stanford plant have designed and built equipment for such an automated, precision-drilling operation. To oversimplify the facts, they used a portion of a tape-controlled drill press, some specially machined and fabricated components, and a generous amount of ingenuity.

Ed Phillips of the Microwave Laboratory designed the special mechanical components, such as the air-bearing drill



spindle and the drilling platform. Bud Kincaid and Dick Barth, who work in the central tool shop, did the construction work. Electrical adaptation and circuitry design, which automate the equipment through use of a Pratt & Whitney "Tape-O-Matic," were the responsibility of the Microwave Lab's Bob Kirkpatrick.

The equipment was developed for a definite purpose—to achieve drilling and machining accuracies which are virtually unavailable in shops outside Hewlett-Packard. The little pieces of shim stock brass with their 3025 minuscule holes, for example, are being produced for HP ASSOCIATES to serve as "photographic masks." The masks are laid over photosensitized materials and exposed to bright lights. Next, these materials are "developed" (something like the family snapshot), etching away portions and leaving 3025 dots standing. HPA then shaves layers off the dots to provide tiny, uniform "wafers" which are used in such solid-state components as diodes.

One mask can be produced in 5½ hours by the tape-controlled equipment which drills holes in a wide range of sizes, unattended. By using conventional methods of drilling and boring on the shop's highest precision milling machine, it previously took three weeks to produce a single mask.

Many other applications of the equipment are possible.

Many other applications of the equipment are possible. Phillips believes that the spindle may be most useful when used on a Hardinge lathe where it has already produced turned finishes of better than 1 micro-inch RMS surface roughness with diamond tooling.

Air pressure holds the secret to the spindle and drilling platform's fantastic accuracy. Jets of air at 90 pounds per square inch are directed at both components from all sides, acting as springs and thus stabilizing the spindle and platform.

A technical description of this development is available in mimeographed form from Ed Phillips, Microwave Laboratory, Stanford plant.

Close-up view of drilling operation shows: (1) the air-bearing drilling platform; (3) housing for cam-operated lever which controls movement of platform; (6) the ultra-precision, variable-speed drill spindle. Although equipment works unattended, the microscope enables inspection of the work. Brass shim stock, mounted on plastic, is being drilled for HPA use as a photo-etching mask.

### Packard Receives National Award

A WARM HOMECOMING awaited David Packard when he returned to Pueblo, Colorado, on April 19 to receive the Pueblo Sertoma Club's annual "American Way of Life" award.

More than 300 Coloradans gathered at the Minnequa University Club for a banquet honoring HP's president. A standing ovation greeted Mr. Packard when he received the award which, in the words of Sertoma president Gene Colescott, is "presented annually to an outstanding Coloradan whose life of exemplary leadership, achievement, and service is a tribute to American freedoms and an inspiration to us all."

Originated in 1953, the award has been presented to a number of nationally known figures. Last year's winner was Byron "Whizzer" White, one-time Colorado football star and now a U.S. Supreme Court Justice. Previous recipients have included Admiral Arleigh A. Burke, three times Chief of Naval Operations; Spring Byington, actress; Ralph Edwards, TV personality; and Mrs. Dwight D. Eisenhower.

Presenting the 1963 award to Mr. Packard was Major James W. Wood (see picture at right). Major Wood is one of six astronauts chosen to fly the Air Force's X-20 (Dyna-Soar) space glider. Like Mr. Packard, he is a native of Pueblo and a graduate of Centennial High in that city.

In accepting the award, HP's president noted that he left Pueblo in 1930 to attend Stanford University. He reviewed the dramatic economic and scientific progress which had occurred in America since then, and emphasized the importance of education in the nation's future growth.

"America's economy has changed from one dependent primarily on raw materials to one primarily dependent on educated people," he said. He also stressed the importance of maintaining the tradition of free enterprise, which he called "the cornerstone of our country's amazing progress."

"Down through the years our citizens have been able to apply their individual talents and direct their energies in an environment of freedom," he said. "Nowhere in history has any other social order been so effective in advancing the welfare of its people."

Prior to the banquet, Mr. Packard had a brief (and noisy) reunion with his teammates on the Centennial High basketball team. Their memories, he noted in his address, "are quite good, since they were riding me for missing some easy shots in the state tournament of 1930."



#### New Neely Sales Manager Announced

Promotion of Al Oliverio to the position of sales manager of Neely Enterprises has been announced by Bob Boniface, vice president and general manager. Al succeeds Bob Brunner, who was recently appointed sales manager of HP's Oscilloscope Division in Palo Alto.

Al is a graduate of the University of California, holding B.S. degrees in electrical engineering and business administration. He joined Neely in 1953 as a staff engineer, and has advanced through the positions of field engineer and southern California area.



Al Oliveri

manager into his present position of sales manager.

Fifteen visitors from Japan toured HP's Stanford plant April 4, during the first leg of a six-week, cross-country study of electronic data-processing applications. The study team, sponsored by the Japan Management Association, visited Stanford Research Institute in the morning, HP in the afternoon, and will wind up in Washington, D.C., by mid-May. Public Relations Director Dave Kirby hosted the group at the plant. Vin Lacoste, Data Processing Manager, and department members John Stokdyk and Pete Brink discussed production control using electronic data-processing methods.



