



Measure

For the men and women of Hewlett-Packard/NOVEMBER 1971

**“Something
to be**



thankful for”

It's very doubtful that 1971 will be remembered by many of us or our heirs in the same way our parents and grandparents reminisced about the Gay 90's and the Roaring 20's. Their memories reflected a faith and simplicity largely missing from today's multi-media society. In fact, our very awareness of the world around us seems to put us constantly in touch with problems about which we can feel concerned and often guilty. One might conclude from this that it is therefore going to be harder and harder to find cause for thankfulness and celebration.

If that is really the case, then a lot of HP people don't know it. To the question "What events in your life pleased you most in 1971?" they volunteered a great many answers ranging from the heartfelt to the humorous and from the near-tragic to the trivial. As the following examples suggest, a number of people indeed have reason to remember 1971 with some degree of pleasure or gratitude:



Joe Corbin

Joe Corbin, custodian supervisor in the Lexington, Mass., sales office, has been working with Alcoholics Anonymous in the nearby Lowell area for more than nine years.

Over those years, he has been able to help many people in their fight against alcoholism, and he counts each day of each year as an achievement.

But this year he can be especially proud. Through his efforts and those of other concerned citizens, a six-year dream will soon become a reality. In the next few months, a Halfway House for male alcoholics will open in the Lowell area. When completed, the Lowell House, as it is called, will care for about 15 men, with plans to expand to about 30. The men will be provided a place to stay, food to eat and full-time personnel to maintain the home and act as counselors.

Original financing for the home was provided by Community Teamwork, a local non-profit group. Later, additional financing will be available from the Federal Government.

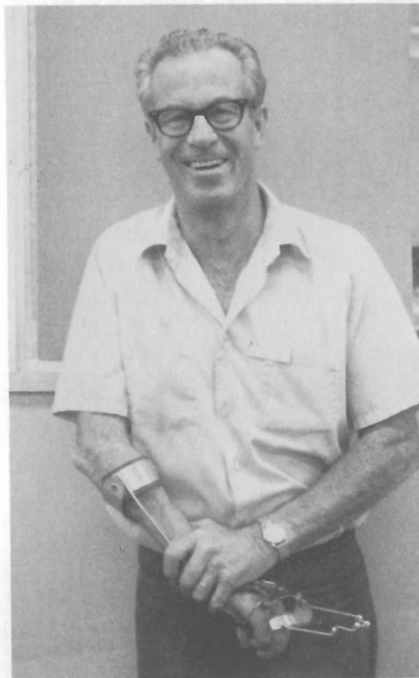
But financing is just part of the story. The building that was purchased has needed extensive renovation and decorating, now the project of Joe and the other volunteers.

"That's where I spend my spare time," Joe said.

In addition, Joe makes himself available 24 hours a day to talk to friends from the AA.

He can count 56 men and women he has talked to directly over the past nine years who are still off alcohol.

"They're people I'm very proud of," he said.



Gene Vidal

Smiles come easily this year to Gene Vidal. Recently he began working full time again for Manufacturing Division after two years absence to recover from a near-tragic accident.

In Gene's own words:

"My thoughts are still quite selfish about the apparent successful recovery of my once completely severed arm. They rejoined it at Stanford Hospital only hours after my accident in the die cast shop two years ago. I'm pleased also that my once curled fingers have now straightened through the use of the splint I wear. Equally satisfying, I returned to work. I was placed in Plastic Molding and given a senator's welcome."

One of only 15 people in the United States to have a severed arm rejoined, Gene came through a long process of rehabilitation, including several operations to restore movement in his arm, with flying colors.

He recalls one of the most significant milestones in his recovery came the day he was able to shake hands with the surgeon who performed his operations.

Now that Gene has realized his goal of returning to work, he's set up yet another challenge for himself—learning to play the electric organ. Bravissimo.



Carol Lopez

"I thought the end of the world had come." To Carol Lopez, personnel clerk in the North Hollywood headquarters of Neely Sales Region, February 9 brought a day of terror and near tragedy. At 6:01 A.M. the earth shook, walls cracked, windows broke, beams twisted, furniture tumbled, and water gushed from a broken line. Carol, her husband Dick and their two-year-old daughter Monica, had indeed passed through the almost supernatural experience of an earthquake estimated at eight points on the Richter scale. Their home in Sylmar, epicenter of the Southern California quake, suffered almost \$5,000 in property and personal damage, their car was crushed by a falling wall, neighboring houses went up in flames, and a nearby hospital tumbled to the ground, causing many injuries and deaths. So why does Carol feel thankful? "We survived. That's something to be thankful for. This was our worst year but we came through it. Our home is fixed up with the help of an emergency loan. We're closer together than ever. My feeling now is that I will never again put much value or emphasis on material things. I feel good about that, even though I had to learn it the hard way?"

(continued)



Doug Scribner

Serving as chairman of HP's 1971 United Fund drive in the Bay Area involved a lot of extra work for Microwave's Doug Scribner—and a great deal of personal satisfaction: "The encouragement of top management, the tremendous enthusiasm of the campaign workers in each division, and the willingness of so many HP people to contribute confirmed my conviction that the company really is committed to its corporate citizenship objective. As a result, the campaign raised \$115,055 this year, an 18 percent increase over last year, and exceeded the best previous year by \$6,600. Since the total employee contribution is matched by the company, it means that \$230,110 will go to the agencies supported by United Fund in this area.

"Another experience that really pleased me was to visit with and meet a number of the United Fund agencies. The other HP campaign leaders and I were so impressed that we arranged to bring some of them into the plant for other employees to meet. This was successful and I hope we continue the practice in the future. All considered, it was a very rewarding experience."



Les Bailey

Les Bailey, purchasing services supervisor for the Colorado Springs Division, is ending 1971 tired but happy—for several nice reasons.

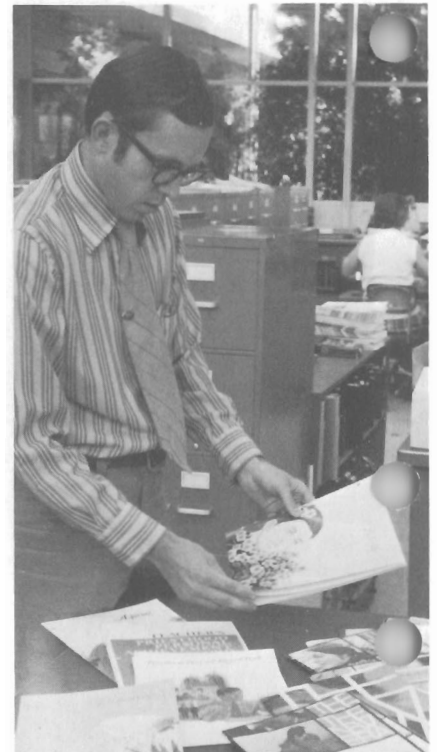
Nearly 10 years ago after he started working for HP as a stock clerk, and after 18 consecutive semesters attending evening classes at the University of Colorado, he will graduate in December with a B.S. in business. He began his study program in 1966, and has attended classes year round, usually three nights a week. While working full time and devoting time to his wife and three children, ages 12, 8 and 6, he still managed to maintain better than a 3.0 average.

"It was quite a task. I don't think I'd do it again," Les said.

The highlight of his school work came when one of his term papers was published this year in *Rocky Mountain Industries* magazine. It is ironic that the paper, entitled "Human Resource Accounting as a Management Tool," received only a C grade from the professor. "His face got a little red when he found out," Les said. "He gave me an A on the course?"

To round out an eventful '71, Les reports he came out on top in a legal hassle with a used car dealer. The story began when the Baileys bought a fairly new used car as a graduation present. The trouble came when Les applied for a transfer of warranty on his new 1970 car, and was rejected because the dealer apparently had turned the mileage back. A lawyer advised him he had a good case, so he kept after the dealer who, as a result, finally handed Les a check for \$1,000. Les has quite a feeling of satisfaction for having beat the system.

"My B.S. is worth something after all," he kidded.



Jay Rockwood

Helping to install a new program this year for the youth in his church has been very rewarding for Jay Rockwood, senior buyer for HP Associates.

Jay serves both on the High Council and a youth committee for the Mateo Stake of the Church of Jesus Christ of Latter-Day Saints (Mormon).

In these capacities he has helped to implement for his local church a new nationwide personal achievement program for Mormon youth, 12 to 18 years old.

The program is designed to help young people establish and realize personal goals, with the aid of counselors such as Jay.

As tangible evidence of their efforts, each age group is given a personal achievement journal, shown by Jay in the photograph. In the attractive books, they can record their goals and achievements over a year's period.

"With an increased concern for our youth in our nation, community and church, I'm glad to see a program help young people prepare themselves for and measure up to what society will expect of them in the future," Jay said.



Greg Yergatian

Greg Yergatian is a Pisces and this is supposed to be a good year for Pisces. Even though Greg formerly didn't believe in astrology—now he's beginning to because this has been a great year for him.

Item: He was promoted to data processing operations supervisor at HP's Medical Electronics Division.

Item: He received his Master's degree in business administration from Babson College.

Item: His wife is expecting a baby when they had given up hope and were going through the adoption process.

Item: He didn't lose any money on the stock market in a bearish year.

"It's been a good year, so far," Greg said in a masterful understatement. "Everything happened at once."

Greg began working for HP in 1967 as a business programmer. In his new position he is supervisor of six keypunch and computer operators, plus he is still doing some programming.

He even has his nights reasonably free now. Up until September, he was juggling time between his job, home life and evening graduate classes. He started working toward his MBA three years ago, going to school two nights a week and studying the other nights.

He considers two keys to the successful completion of his schooling are the fact that he's an organized, schedule-maker type, and he has a cooperative wife. The Yergatians had to sacrifice most of their recreational time so Greg could study.

How does Greg feel now that he's at the end of a busy few years?

"Doing it all at once makes you appreciate it all the more," Greg said. However, he advises: "Get your schooling finished before you get married. It's a lot easier."



Amador Garrote

1971 is the third of three very good years for Amador Garrote.

Amador essentially has two jobs. By night he is a machinist in the sheet metal department of the Avondale plant. By day, for the past three years, he has tutored and generally been a helping hand to the children of Puerto Rican migrant workers in the Avondale area. Working with a local school district, Amador serves as an important link between the children, 6 to 12 years old, the schools and the working world.

The aim of the program is to encourage the children to continue their schooling. "Not many Puerto Rican kids go to high school," Amador said. He explained this is partly because their families move around too much with the migrant labor market, partly because the children don't realize they can actually get work in industry if they finish school. As part of his program, Amador has taken the children to the Avondale plant. "Everything was so nice and neat, they couldn't believe they could ever work there," Amador said.

Amador had about 65 children in the summer program. During the school year, he works as a teacher's aide with smaller groups of children. This year he is tutoring a group of fifth graders.

He and his wife, Eva, both help migrant children in many informal ways, such as visits to their homes, translating materials from Spanish into English, and chauffeuring them wherever they need to go. In the words of a member of the school district staff, "Just his presence is a big help."

When the Garrotes came to America from Argentina nine years ago they spoke no English—so they can appreciate how important learning is to the migrant children.

Amador is particularly happy about the program this year because the children have shown more interest than ever before. He attributes this to several factors: the children, most of whom he has worked with for three years, can see their vast improvement compared to new children in the program; plus the program itself has received increasing interest and assistance from community people.

Even though Amador has what some people might consider a grueling schedule, he remains relaxed and able to enjoy his dual jobs.

"When some of the children say something to you they've learned, it makes you proud. It makes it worthwhile," Amador said.



Measuring the Measurers

(Dialogue with an HP Dimensional Metrology technician):

Visitor: Hello. Is this where you work?

Tech.: Yes, the Mechanical Standards Department.

Visitor: What goes on here?

Tech.: We apply the science of dimensional metrology to linear and surface geometry.

Visitor: Ah ha. Well...?

Tech.: Actually, with the equipment you see inside the clean room, we make extremely precise and exacting mechanical measurements. This capability is used in calibrating all types of mechanical gages and measuring instruments utilized by our manufacturing and process departments and quality control inspectors, as well as our R&D process development engineers.

Visitor: Very interesting.

Tech.: Right! As a Mechanical Standards department, we are the last word to all of HP as far as dimensional control is concerned.

Visitor: Great. I never realized that.

Tech.: But wait. I'd like to explain *why* we do what we do. Take a look at this piece of metal, for example.

Looks nice and flat on this surface, and smooth and round outside, doesn't it?

Visitor: Right...

Tech.: Wrong! Nothing in this world is ever perfectly flat or round or square or concentric. No two items are ever exactly alike, dimensionally speaking. Material quality varies, surfaces abrade, tools wear and warp, machines vibrate, and controls are accurate only within limits.

Our job is to uncover these effects and limitations through surveillance of gages, calibration of precision machines, and by making special precision measurements.

Visitor: I'm sure that's very useful...

Tech.: I prefer to think of it as essential. Consider what would follow if the 20,000 production gages and measuring devices we now calibrate were left unchecked. Within weeks, defects and inaccuracies would begin to show themselves in manufactured parts. Reject rates would rise sharply. Later on there would be wholesale problems of quality and performance of products in the field. Can't you just see it...? Chaos! Loss of reputation! Plummeting profits! End of the Golden Era of measurement!

Visitor: There, there. I'm sure they wouldn't let that happen. As a stockholder, I'd be glad to bring it up to top management.

Tech.: Would you? Tell them Glenn, Ed, Rick, Tom, Nadine, Ralph, Bill and Mary sent you.



Opening the lab for business, Nadine Boldt reviews the items that have been sent in for calibration. The lab maintains a calibration history for all calibrated parts and instruments.

State of the art dimensional metrology is personified in this measurement system involving an HP laser interferometer, magic cube, and the new laser interferometer angle-measuring accessories. This set up, operated by Ed Duzowski, is being used to check the linearity of the range of the angle measuring system. The accessories are used in conjunction with the laser interferometer for small angle measurements as well as measuring pitch and yaw of machine tools.

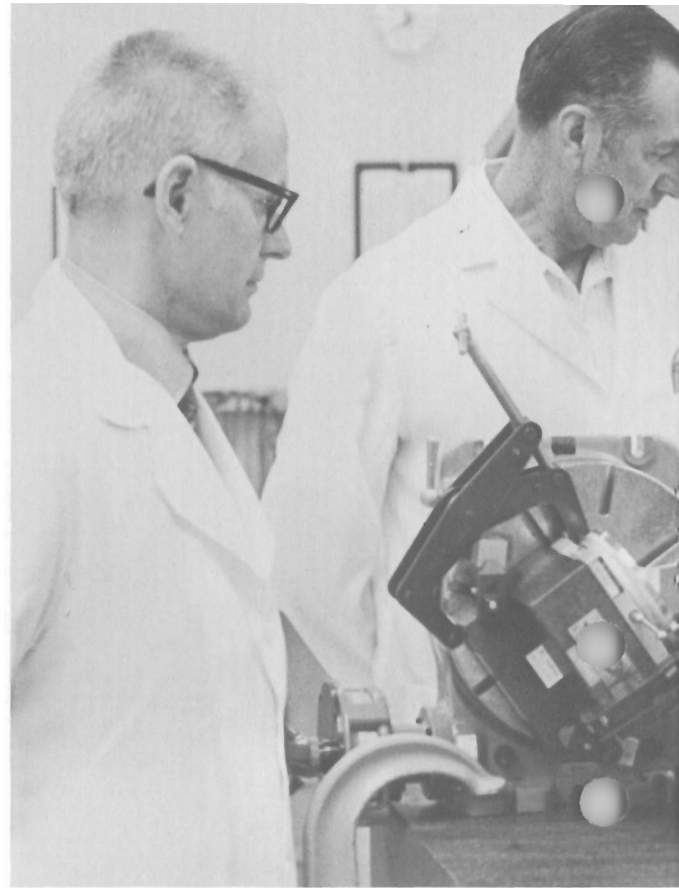
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measuring the measurers



Evaluation and repair are important functions at the lab. "Fixed" gages that show wear have to be scrapped, but most adjustable gages can be restored. Here Rick Murray works on a dial indicator in need of adjustment.

Gages used in drilling, milling and molding are among the calibration responsibilities of Tom Logue. "Clean room" conditions are maintained in the lab. Palo Alto facility basically serves Peninsula area plants, but also provides some calibration services to other U.S. divisions (Avondale, Colorado Springs, Loveland, New Jersey) as well as company-wide counselling.



Important test of surface hardness of a metal product is run by Bill Henery. Microhardness test helps determine wear and spring quality of parts, and the plated thickness of strips and wafers. Basis of testing is the penetration of diamonds into the surface as observed through microscope.





Lab manager Glenn Herreman (left) and Ed Duzowski check flatness of one surface of crystal to be used in HP laser interferometer. Most lab people have extensive experience as machinists, tool engineers, model makers or tool-and-die makers.



Mary Baker and her mobile calibration cart call on a customer, apprentice machinist Dennis McFadden, in the lathe area of Manufacturing Division. A great many machinist tools are calibrated in this on-the-spot way. Turnaround is generally a few hours compared to four to five days that are required if the tools are sent to the lab.



Ralph Richberger checks the roundness of a test arbor (precision shaft used in QA inspection) to within 10 millionths of an inch on special machine. Polar chart exaggerates and displays imperfections.





The role of HP Labs:

A new approach

The question before the meeting in the Santa Clara conference room—"Where is Electronic Products Group trying to go and what can HP Labs do to help us get there?"—was an important one. And the discussion covered many points of great interest to the audience of 47 lab managers from HP Labs. They felt they learned much from the meeting to guide them in bringing aboard new technologies and product ideas for the EPG divisions.

But the meeting itself owed its existence to events and circumstances of even greater long-run significance. Central was the formation earlier this year by Barney Oliver, vice president for R&D, of the HP Labs Advisory Council. Members of this council are the four product group managers, the heads of Corporate marketing and Corporate planning, the four lab managers of HP Labs and its administrative manager. Their basic goal is to provide more effective coupling between HP Labs and the manufacturing organizations in order to maximize the Labs' contributions to the company's overall product development program.

One key to this is communication: Labs people need to know more about the strategies of the manufacturing divisions; on the other hand, divisional R&D people benefit from a better understanding of the capabilities and facilities of HP Labs. The council will provide a high-level



forum for assessing the merits of HP Labs' R&D programs. It can also be the mechanism for reaching specific go-or-no-go decisions which are prerequisites for making the broad commitments required by both the Labs and the divisions in order to maximize the probabilities of success in the marketplace.

The communication process is well underway. In addition to the EPG meeting on October 6, the Labs people began putting their own show on the road later in the month, staging day-long interchanges with the R&D managements of divisions on the Peninsula, in Colorado and the East Coast. Still to come are presentations to HP Labs by the Analytical, Medical and Data Products groups.

Payoff is already in evidence. The Santa Clara meeting, for example, has led to the proposal of two Labs projects on behalf of Colorado Springs. Another vital matter now in the works as a result of the discussions is that of the follow-on work by the Labs once a project is transferred to a division. It was generally agreed that continued work by Labs, in close cooperation with a division, could utilize the Labs' momentum to begin next-generation R&D after the transfer. This could result in functional models and auxiliary devices earlier than would otherwise be possible. Other points and questions raised by the participants are summarized in the following captions:



John Young, vice president and EPG general manager, outlined three ways HP Labs could help EPG. In mature-product areas: "Provide help on the 'technological underpinnings' that would let the product people mine it for applications in the areas where the marketplace is well understood by them." In areas that are newly emerging, where market shares are changing: provide additional product development to help "get each of these new business segments on a profitable, well-defined basis." To insure that this is a "positive effort and not an exercise in frustration," he indicated this must be a "partnership effort." Thirdly, he suggested help in the "venture area," calling such R&D activity "something that needs to be done with restraint and understanding."

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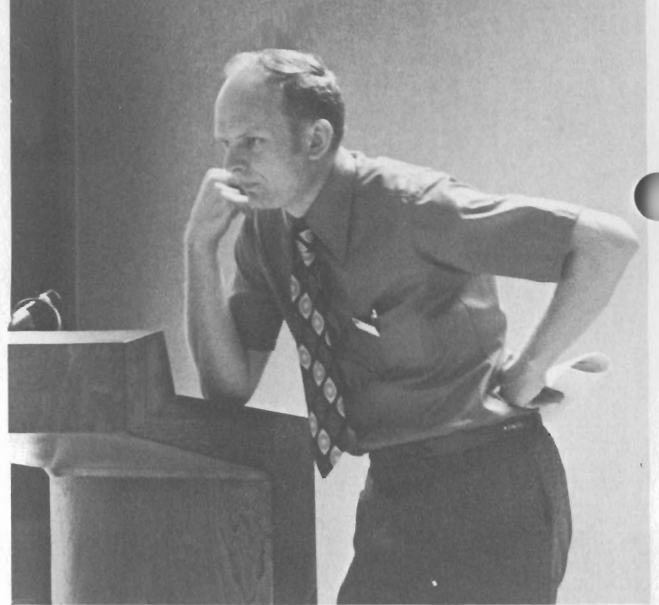
HP Labs



Panel on microelectronics – Microwave's George Bodway, Loveland's Marco Negrete and Santa Clara's Merrill Booksby – noted the company-wide importance of producing proprietary components that give HP a significant edge in its business. A recurring theme throughout the meeting was that cost is now a more critical concern than during the "battle of the specs" of the '60s.



HP's instrument business was reviewed by panel of, from left: Paul Ely, Microwave manager; Al Oliverio, EPG U.S. marketing manager; and Al Bagley, Santa Clara manager. Labs people were briefed on changing market factors such as prices, competition, and applications. A key question concerned better methods of maintaining continuity of efforts and liaison between HP Labs and divisional R&D departments.



Accelerating growth of the instrument systems business was described by AMD's Dick Anderson. Points he raised included those of how to take greater advantage of computers and programmability.



Some 47 lab and section leaders of HP Labs at half-day meeting in Santa Clara conference room heard EPG and Corporate managers discuss goals and rolls. At speakers table are, from left, Bob Brunner, EPG international marketing manager, Tom Perkins, Corporate Planning director, and HPA's Dave Weindorf. This panel discussed the ground rules and environment for new ventures. "Shooting for the long shots," coming up with "the big new ideas," and "opening new doors" were some of the roles proposed for the Corporate R&D team.

HP “writes the book”

One of the most unusual of products ever produced by Hewlett-Packard came off the press recently. That's right—off the press.

The product is the textbook you see photographically displayed right: “Electronic Measurements and Instrumentation.” Its editors were Barney Oliver, HP vice president and head of HP Labs, and John Cage of HP Labs. The 35 “authors” included 28 engineers and scientists from Hewlett-Packard organizations (plus one HP consultant).

Their efforts very likely will result in a best seller. The publisher, McGraw-Hill Book Company, looks on it as potentially the top-selling graduate text in their 13-volume Inter-University Electronic Series. As John Cage observed, “No branch of science and engineering can grow without measurement, and all are increasingly dependent on instruments, particularly electronic instrumentation. The new book fills the very clear need for a basic text in this area. At the same time it should be very useful as a technical but practical reference for the engineer.”

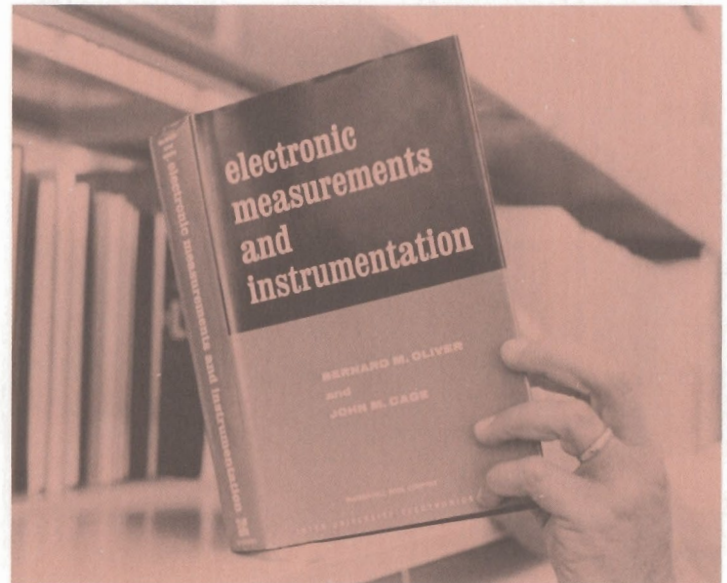
Arrangements have been made for HP people and departments to purchase the 729-page volume through the Corporate Library for \$21.00, tax included, a discount of approximately one-third off the \$29.50 retail price.

Why was “Electronic Measurements and Instrumentation” so preponderantly an HP project? The fact is, there probably is no other organization, corporate or educational, able to summon up from its lists so many authorities in the fields of instrumentation. Originally, McGraw-Hill approached Barney Oliver with the proposal that he take on the authorship of such a book. He liked the idea, but the press of business, of IEEE duties and Palo Alto School Board activities—and the magnitude of the project—worked against it.

At this point, John Cage volunteered his services, well aware of the magnitude of that task, having authored the textbook “Theory and Application of Industrial Electronics” in 1951.

The new book has already demonstrated a significant synergistic effect. This came about through Cage's work with the chapter on “Signal Analysis by Digital Techniques” submitted by Ron Potter of Santa Clara Division. Technically very heavy and presenting much new material, it required considerable study prior to editing. But that effort gave John the idea for an invention in cardiovascular sound analysis. (Essentially, it involves the ability to record weak heart sounds, sounds that usually can't be heard even with the most sophisticated stethoscopes.) The invention is considered sufficiently important that Cage now is devoting full time to its development.

How's that for a postscript.



Author, Author, Author . . .

Listed in “Electronic Measurements and Instrumentation” as contributors are the following Hewlett-Packard people:

Stephen Adam, Microwave Division
Paul Baird, Loveland Division
Al Bagley, general manager, Santa Clara Division
Arndt Bergh, Cupertino Division
Rod Carlson, Microwave Division
Bob Dudley, Loveland Division
John Dupre, Microwave Division
Dale Ewy, Automatic Measurement Division
Doug Gray, Microwave Division
Steve Hamilton, formerly HP Associates
Fred Hanson, Loveland Division
Charles House, Colorado Springs Division
Bill Heinz, Microwave Division
Bill Kay, Loveland Division
Charles Kingsford-Smith, Loveland Division
Art Miller, consultant (Medical Products Division)
Bill McCullough, Loveland Division
Dick Moss, Loveland Division
Don Norgaard, HP Labs
Barney Oliver, vice president/director, HP Labs
Fred Pramann, Microwave Division
Ron Potter, Santa Clara Division
Wally Rasmussen, Microwave Division
Gordon Roberts, engineering manager, HP Ltd.
Doug Rytting, Microwave Division
Otto Talle, Jr., San Diego Division
Terry Tuttle, Loveland Division
Craig Walter, Loveland Division
Larry Whitley, Loveland Division

News in Brief



Cupertino — HP has introduced the first small-scale computer system with true multi-programming and multi-lingual capabilities. The system is based on a radical new architectural approach to the design of small central processors.

"System/3000, HP's new disc-based computer system, will simultaneously handle time-sharing, real-time, multi-programmed batch and on-line terminal operations, each in more than one computer language. These features have previously been found only on systems that are priced in the \$500,000 to \$1,000,000 range. In contrast, System/3000 will range in price from \$100,000 to \$300,000, depending on the configuration," said George Newman, general manager of the Cupertino-based computer products division.

"This system is also the first to be designed from inception for the total marriage of hardware and software needed to provide such flexible operation," Newman said.

The system hardware was scheduled for its first demonstration at the Fall Joint Computer Conference in Las Vegas, November 16-18. System software will be demonstrated at the factory in the spring of 1972. Deliveries to customers are scheduled to begin in the fall of 1972.

"System/3000 is an extension of HP's experience in the design and manufacture of time-share, real-time and general purpose computer systems. We were therefore able to design the system to meet the needs of HP's traditional markets, and also create opportunities to explore other significant new market areas.

"Its flexibility makes System/3000 attractive for highly sophisticated, high-

technology applications in research and development work. In education, the system may be used simultaneously by various departments for scientific work and administrative tasks, in addition to use in the instruction process.

"For the company looking for maximum use of its computer capability, System/3000 can serve engineering or research department needs at the same time it is handling day-to-day data processing operations, such as order entry, order status reporting payroll and raw material inventory and ordering," Newman said.

An important key to System/3000's abilities is the HP-developed SPL/3000, a high-level system programming language, which allows program coding to be accomplished three to six times faster than with traditional assembly languages. In fact, HP was able to reduce System/3000 software development time by a factor of five, using SPL/3000 exclusively. The computer has a comprehensive file management system to simplify file usage.

In addition to SPL/3000, HP will offer a new version of FORTRAN IV and BASIC 3000, a more powerful extension of HP BASIC, now the standard of the industry. The two languages will be provided for all operating modes (time-sharing, real-time and batch).

In the photo, System/3000 is graced by Sharon Fay, Microwave Division secretary.



Singapore — Labh Singh, a member of the Hewlett-Packard Singapore security force, has been awarded a long-service medal by the President of the Republic of Singapore, Dr. B. H. Sheares. The award was given in recognition of his long career of public service in Singapore.

Mr. Singh joined the Singapore Postal Service Department in 1936 and rose to the grade of Inspector of Postmen in 1959, in which position he continued until his retirement in 1970.

Clyde Coombs, manufacturing manager, said, "His dedication to his responsibilities as well as his hard work and high integrity personify the HP spirit at Singapore."

Santa Rosa — The company has entered into a purchase agreement to acquire approximately 200 acres north of Santa Rosa, Calif., for a future plant site.

The new site, approximately 52 miles northwest of San Francisco on a property known as Fountain Grove Ranch, will be occupied by part of the company's Microwave Division, headquartered in Palo Alto.

President Bill Hewlett said the company plans to develop the property

gradually over a period of 10 years. The plans include providing extensive landscaping, and designing attractive building exteriors compatible with the natural beauty of the area.

"Although some of the division's current products will be manufactured at the new facility, this move is intended to accommodate the anticipated growth of the division, not to reduce the size of the division's operations in Palo Alto," Hewlett said.

The company's initial activity will be to establish a small training and manufacturing operation in Santa Rosa proper, probably by mid-1972. A small number of division staff members will move to Santa Rosa to organize this leased interim facility. It is currently planned that by 1973 HP will have started construction of an engineering-manufacturing facility at Fountain Grove. HP anticipates that by the time the new facility is completed in late 1974, the company may be employing as many as 500 people. Cost of the land and initial construction will be approximately \$4 million.



From the president's desk

You are probably aware that, as a matter of policy, we target to spend an amount about equal to 10 percent of our shipments to support the R&D programs of the company. Why we use this magic number of 10 percent is a long story, but suffice it to say it turns out to be about right. Approximately 85 percent of this R&D money is spent by the divisions to support their ongoing product development programs. The remainder is spent by corporate headquarters and is primarily used to support the work of HP Labs. This amounts to about \$4.5 million this year—not an insignificant sum. I thought that it might be worth saying a few words about the role of the Labs, how it is organized, and what is expected of it.

Barney Oliver as vice president for R&D has direct responsibility for the operation of the Labs. He has divided it up into four sections:

- Physical Electronics, headed by Don Hammond. Don and his group have worked on such things as the quartz thermometer and the quartz pressure transducer, now at Avondale; ESCA (Electron spectroscopy for chemical analysis) now at Scientific Instruments; and the laser interferometer, now at Santa Clara, to name a few.
- Electronics Research, directed by Paul Stoff. Paul's group has worked on a wide variety of programs such as the 9100A calculator, now at Loveland; much of

the early R&D for the digital voltmeter also produced at Loveland; the distance measuring instrument program; plus a host of other projects.

- Solid State Lab, managed by Paul Greene. This group did most of the basic R&D on the light emitting diode being produced at HPA; much of the technology used by HP in its integrated circuits; and materials research that has made much of the microwave diode work possible.
- Special Projects headed by Len Cutler. The principle output of this group to date has been in the field of cesium beam tubes, the heart of our precision time standards program.

In addition to the specific programs that I have mentioned, all of these groups have served as a reservoir of special knowledge that, either directly or indirectly, substantially improved both our products and our competitive position in the industry.

Thus it can be seen that the Labs has served us well in many ways. First, it has served as a mechanism to place us in new market areas—the calculator program is a prime example of this activity. Secondly, it has been used as a major cutting edge for the development of new products when the logical division for manufacturing and marketing has not had the necessary background to achieve a technical breakthrough in an acceptable time—an example of this is the ESCA program. Thirdly, it has developed important techniques and technical processes that have allowed one or more divisions to vastly improve their competitive position in the industry—the work of the Solid State Lab is a case in point. Finally, it has served as the reservoir of technical knowledge that I referred to earlier. This knowledge has spread into many corners of the company's operations, but because of its diffuse and informal nature, it is hard to pinpoint and identify.

To insure adequate feedback and coupling between the user divisions and the Labs, there recently has been established an HP Labs Advisory Council composed of the four Labs directors mentioned above; John Young, Bill Terry, Dean Morton, and Emery Rogers, representing the company's four major product areas; Bob Boniface, vice president of marketing; Tom Perkins, director of Corporate Planning; and Dan Lansdon, Labs administrative manager. The Advisory Council meets several times a year for a formal review of the Labs program, and thus helps guide the Labs into those areas of real interest to the divisions. This program appears to be working very well.

Like advertising, advance R&D such as the Labs engages in is hard to evaluate on a direct dollars and cents basis. However, there is no doubt in my mind that this group of engineers and scientists coupled with Barney's leadership is one of our major corporate assets.

Bill Hewlett



This is one of the scenes that confronted staff members of Neely Sales Region's headquarters in North Hollywood, recently. An early morning fire had spread from the teletype room into the accounts receivable room and thence into one end of the order room before being brought under control. Office machines and phones melted into pools of plastic and metal, file cases buckled, windows burst, woodwork turned to char, and smoke and ashes saturated every corner of the building. Yet business was resumed almost as usual. Everybody pitched in to help in between answering phones and processing orders. The importance of fire precaution measures is suggested in the smiling procession led by Pat Delgado. Until the fire, the nightly routine of wheeling their invoice carts into the safety vault had seemed a bit unnecessary to the accounts receivable girls. Now it's gangbusters.



Measure

EDITOR
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