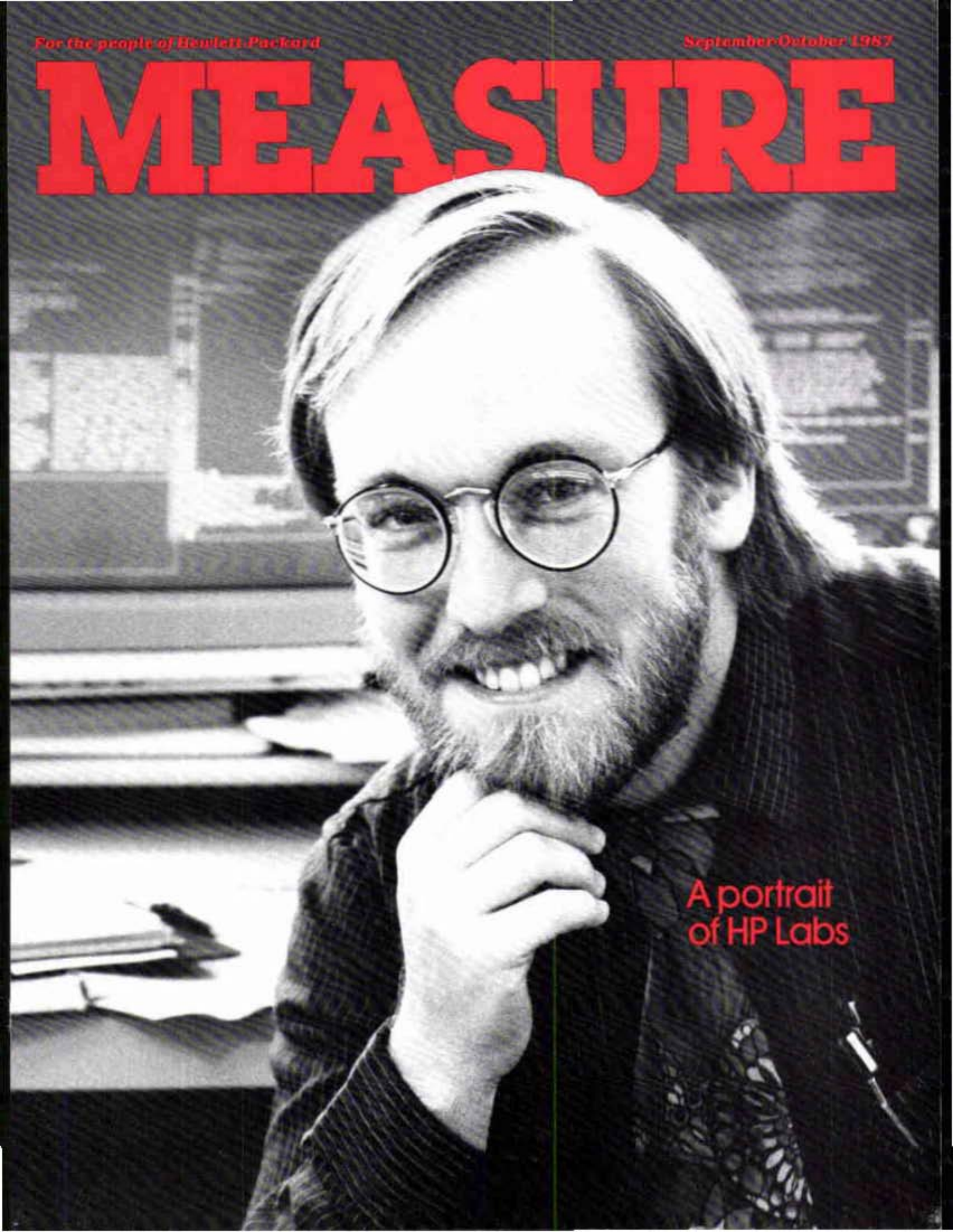
For the people of Hewlett-Packard

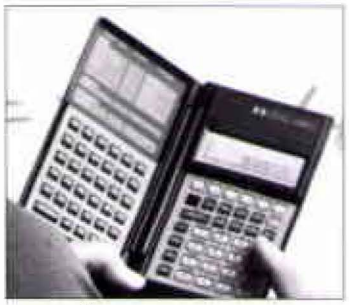
September-October 1987

MEASURE



A portrait of HP Labs

THE INSIDE STORIES



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Bill Hewlett and Dave Packard launched HP at the urging of their Stanford University professor. Today the company has close ties to hundreds of colleges around the globe.

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MEASURE

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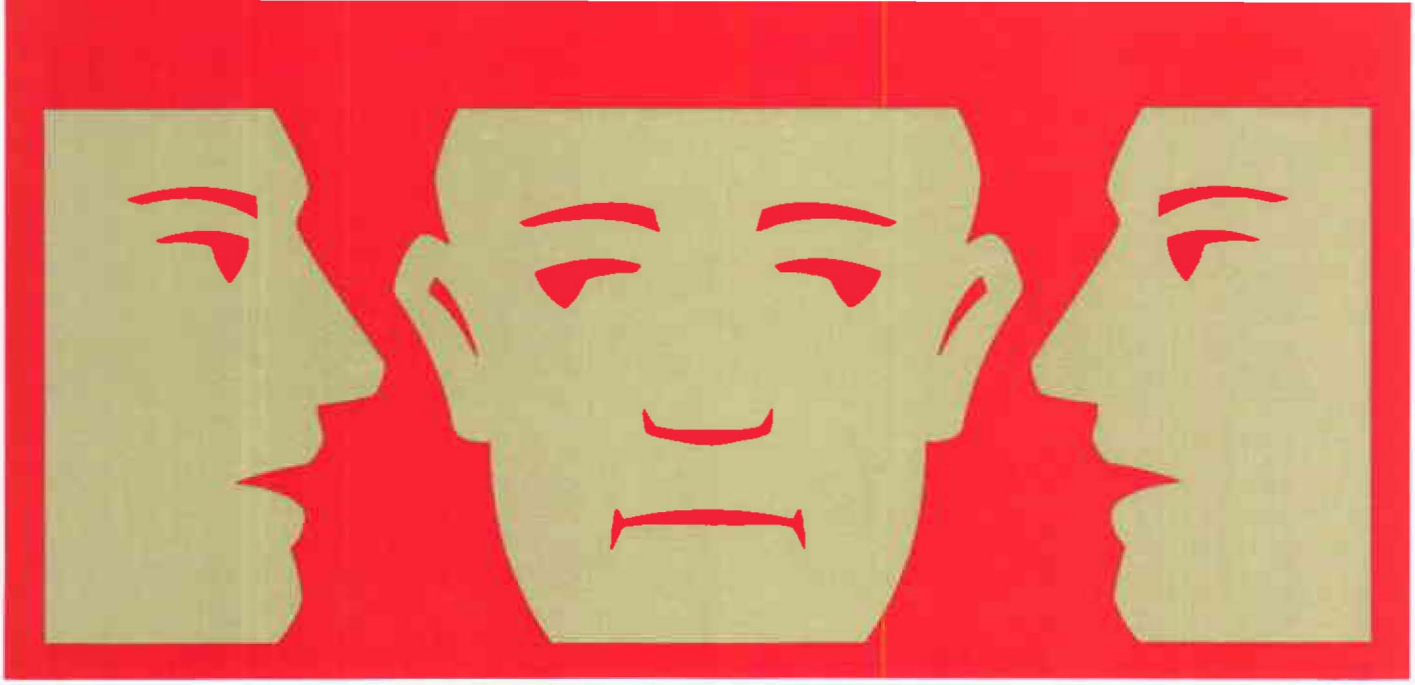


Have you ever heard little voices tell you what you should and shouldn't do in a tough situation? Or how to tell right from wrong? Listen to them carefully, because in business today, it's not whether you win or lose that counts,

It's how you play the game

Think of ethics as philosophical blackjack. Cards are dealt and choices must be made. The "right" choice is not always apparent. To play the game well, you need to understand the rules and draw on experiences to make a good decision.

Of course in blackjack, you know the score soon after you've made your choice. With ethics, not even a well-thought-out decision always yields a clear result. Ethical situations and their consequences are rarely black and white—from the way a situation is perceived, to the various options that influence a decision, to the outcome.

Nearly all of us face ethical questions daily, and the work place provides more of these challenges than we may realize. "Yet, being ethical is not necessarily more difficult," says Lew Platt, executive vice president for technical systems. "A sense of ethics based on general philosophies like the HP way and defined, though broad, goals like the seven corporate objectives may actually make choices easier, since there is a set of standards upon which we can base decisions."

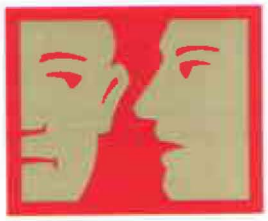
For the sake of discussion, think of ethics as a code of conduct that guides behavior. This code has several components:

- It's generally considered to reflect what is "good" for a society, community, organization, family or individual. (Of course, "good" is subjective. For some people, lying is good because it allows them to conveniently reach certain ends.)

Ethics flow from established standards and go beyond written law. You can still follow the law and leave ethics by the wayside.

- Ethical decisions are often difficult to make because it's not clear that one choice is necessarily better than another.
- Ethical foundations are usually in place by adulthood. By the time you joined HP, you probably had developed a personal code of conduct.

In mid-1987, ethics is on the rebound as a topic of interest. Every day newspapers carry accounts of questionable behavior in politics and business. Ethical abuses are studied by groups such as President Reagan's Blue Ribbon Commission on Defense Management. Ethics is a staple of daily conversations, nourished by the behavior of Wall Street trader Ivan Boesky.



evangelist Jim Bakker and Senator Gary Hart.

Experts say we're too focused on the fast-paced race to reach our ends, and we don't look at the means to those ends. There are just not enough people saying "no" to unethical behavior.

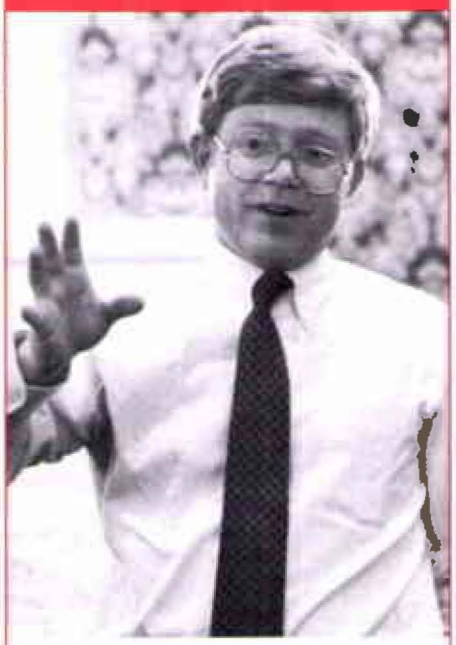
"There is, in business today, likely to be more unethical behavior because situations are more complex and standards of behavior are less defined," according to Kirk Hanson, a management consultant and lecturer at Stanford University's Graduate School of Business. He is examining ethics at HP as part of a study of 10 US companies by the National Business Roundtable.

"People rarely set out to do something unethical," Kirk says, "but competitive pressures to perform are overwhelming. At some point, people realize that what they're doing is wrong, but they're too oriented toward reaching the ends."

Kirk believes unethical behavior in business results from cutting corners to meet goals, poor decision-making, excessive expectations and misinterpretations of management's wishes. "In the past, our general culture determined what was appropriate and ethical behavior," he says. "Today, things are too complex. People need clearly defined values and discussions of ethics in work groups."

Central to the HP way is a belief that individuals want to do a good job and will, provided they understand the direction of the company and their role. However "we will not tell people how to behave," says Jack Brigham, HP's vice president of administration and general counsel. "There's an assumption here that people know the fundamental difference between right and wrong and will act properly. Of course this trusting nature leaves open the possibility of abuse."

HP published its Standards of Business Conduct in 1979 when ethics began to be taken seriously as a business issue. The Foreign Corrupt Practices Act of 1977 set new standards of behavior for international companies. HP responded by formally articulating the values inherent in the HP way and corporate objectives.



"People rarely set out to do something unethical."
—Kirk Hanson

"HP's fundamental ethical standards have generally been the same since 1939," says Jack. "The Standards of Business Conduct is a formal statement of those values and is something all employees should review from time to time."

To help employees resolve some tough ethical questions, Charlie Marshall, executive resources manager, developed a companywide confidentiality campaign known as "Be Aware Before You Share."

"HP people are constantly faced with ethical challenges from outside the company," says Charlie. "People call and pose as fellow employees to gain proprietary information. Some former employees use friends at HP to recruit current employees. We tend to be a trusting bunch and there's no doubt that's a positive trait. But it also can cause problems when we don't think about our actions."

Insider trading in the stock market is another example of a situation many employees face: it isn't only a concern of Wall Street brokers. Any HP employee who personally profits from important information about HP that's not generally available to the public for who provides such information to someone outside HP) may be guilty of violating federal laws against insider trading. Though it's against the law, insider trading also falls into a gray area, since the Securities and Exchange Commission is not equipped to track every stock transaction. The trades of HP's officers and directors often appear in newspaper reports as "insider" trading since HP reports these actions directly to the SEC.

According to Jack, "HP executives take this issue very seriously. We want to avoid even the appearance of impropriety. In this regard, the New York Stock Exchange (NYSE) offers guidelines for people with access to inside information that suggest when it is usually appropriate to trade their stock."

Since financial information is almost always of key importance in making investment decisions, employees who

What would you do if. . .?

You can test your judgment by answering these questions from a board game developed by Citicorp, the New York-based financial services company. *The Work Ethic: An Exercise in Integrity* gets employees to talk about issues. Citicorp encourages all employees, from new hires to senior managers, to play the game.

For each situation, you have four options. Keep track of your answers. The number of points you can win is tied to what's at risk. For example, if the company reputation or a lawsuit is threatened, a higher number of points are at stake.

Incomplete pass

SITUATION 1: On occasion, you and your manager travel together on business. After an evening of cocktails during one of these trips, he makes a pass at you in the hotel elevator. He has never made any kind of advance to you in the past.

You:

a) suggest he's had too much to drink and say you'll see him in the morning. Then forget it.
b) report him to his manager.
c) tell him if he doesn't cut it out, you'll report him to Personnel.
d) ignore it because, since he didn't threaten your job, you have no right to complain.

Your answer: _____

have access to financial data should not trade in HP stock until that information is released to the public. The NYSE guidelines suggest that trading be limited to a brief one- to three-week period following an earnings announcement. But these guidelines do not offer protection should there be other important information (such as new products) which has not been announced.

Increased competition is creating new ethical challenges for HP's sales force, according to George Glenday, Neely Sales Region general manager. "The people who sell against HP are survivors—the competition is unbelieveable," he says. "We always want to sell on the merit of HP equipment, but there is a strong temptation to snap back at the competition when we hear they've made erroneous and unethical comments about us."

Setting proper customer expectations is also important. "We need to spend time talking to customers and make sure they understand what a product will do," George says. "We emphasize asking the right questions and listening to the responses. That way we can make sure the product meets the expectation."

HP people involved with sales to the federal government will soon receive training designed to reinforce existing ethics standards. The drive was inspired by the President's Blue Ribbon Commission on Defense Management, chaired last year by Dave Packard.

The commission evaluated a number of defense-management areas, including government and industry accountability. A group of defense contractors voluntarily responded with a series of guidelines called the Defense Industry Initiatives (DII) on Business Ethics and Conduct. Although HP's defense-related sales account for less than 10 percent of total revenue, Dave's commission role influenced an HP decision to join other firms, such as General Electric and McDonnell Douglas Corp., in setting an example.

"The signatories have agreed to adopt or enhance existing principles of business ethics based on recommendations included in the commission report," says Jack Brigham. "HP will increase awareness of ethical standards, provide a mechanism for sharing best practices throughout the company and allow an outside firm to audit our practices."

George Donnelly, compliance and training manager for HP's Federal Systems Operations, is developing the DII training programs for FSO employees and others involved with sales to the federal government.

"We need to promote a better understanding of what's required in doing business with the federal government, including the disclosure of pricing and discount practices," he says. "HP is also obligated to voluntarily disclose violations of federal procurement regulations, and therefore we've adopted a reporting mechanism that complies with the DII."

Employees will be able to confidentially report compliance information through their local management. "Given the number of HP people across the country involved with sales to the government," Jack says, "we felt it would be best to maintain a local reporting function. This also fits with HP's management style."

As HP improves product technology, engineers face new ethical challenges, according to Chuck House, director of Corporate Engineering. "In one case, an engineer was analyzing a food product with a new, more sensitive instrument that was under development," House says. "He detected a small amount of a carcinogen that the food manufacturer probably didn't realize

CHUCK FOX

"Ethical standards are not universal."
—Dick Hornor

Fuzzy situation

SITUATION 2: Someone you know who works for the police tells you he's conducting an investigation and asks for confidential information about a customer.

You:
a) tell him what he wants to know.
b) ask him to make his request in writing.
c) refer him to your legal department.
d) tell him you'll need a court order before you can supply the information.

Your answer: _____

Two out of three. . .

SITUATION 3: You've found a top-notch candidate for a job reporting to you. You and three colleagues have interviewed him. After rave reviews from two colleagues, you send an offer letter to the candidate. The next day, the third colleague returns from a trip and says she feels strongly that you shouldn't hire that candidate. Her good will is essential to your department.

You:
a) call the candidate and say the letter was sent by mistake.
b) do nothing and proceed to hire the candidate.
c) explain you've sent an offer letter and ask her for feedback during his probationary period.
d) hire the candidate, but let him go during his probationary period.

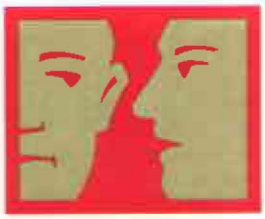
Your answer: _____

Copy, right?

SITUATION 4: You've recently been hired to review procedures in a specific operations area. You discover that tehnical staff in the area regularly copy third-party software licensed for business use. This practice has been condoned in the past by the manager in charge of the area. Previous reviews, which were conducted by your supervisor, never addressed this issue.

You:
a) discuss the situation with your supervisor.
b) write the report and mention the illegal copying of software.
c) write the report, but ignore the copying issue.
d) ask your supervisor to discuss the issue with the head of the area before you write the report.

Your answer: _____



was there. We talked about what should be done, and he decided to contact the manufacturer. Once they knew about the carcinogen, they were able to remove it."

Doing business in international markets poses special ethical challenges for a US company. "Ethical standards are not universal," says Dick Hornor, distributor development manager for Latin America. "The standards for ethical behavior in one country are not necessarily the same in another. In many countries, what we consider to be unethical behavior is the norm for doing business."

In certain countries where the government is a major customer and its fiscal policies require that budgets be spent in a given time period, HP has been asked to close a sale by issuing an invoice for goods and services that may not ship until the next fiscal year. "That is a clear violation of our standards," says George Abbott, director of Internal Audit. "Since we use invoices to record revenues into our books, invoices *must* accompany products or services."

"In any ethical conflict we encounter while doing business, HP's standards must override other considerations," says Craig Nordlund, associate general counsel and secretary of the company. "We've found that in most situations where we've held firm on our standards, we've ultimately gotten the business anyway. Potential customers might ask for considerations that would violate our standards, but we can challenge their requests and often still get the sale."

Ethical challenges are not only posed by the "big" questions of insider trading, product development or sales. "Nearly every business decision has an ethical component," according to Kirk Hanson. That includes the common questions each of us faces every day.

For example, should you stay late and make up the time if you take an extra-long lunch hour? What about putting in for overtime if you're staying late because you made personal phone calls?

Does your upcoming business trip make the best use of company resources? If you combine business with pleasure, will you be able to clearly distinguish expenses so that HP doesn't pay for your personal time off?

HP has in place the basic values and guidelines to make good ethical decisions. But a company's ethics are ultimately a reflection of the personal ethics of employees, managers and executives.

"We've got a different group of people in the company now than we've had in the past and that affects our ethics," says George Glenday. "Fewer employees have been 'home grown' by the HP way."

Chuck House agrees. "If people don't have a commitment to an organization, they take policies less seriously," he says. "But I think things are changing. Those who have stuck with us through the last couple of years are the kind of people that make HP one of the most ethical and open environments I've ever seen."

"Being an ethical company affects us in more ways than we probably realize," says Lew Platt. "Our customers value a business relationship with HP because we are ethical. I think HP people feel a sense of pride working for an organization with a strong sense of ethics."

Making good ethical decisions requires several things, according to Kirk. "Look at your job and realize that there are ethical decisions you'll have to make," he says. "Learn to anticipate those challenges and resolve conflicts successfully so that ethics are maintained."

No ethical decision may be as easy to make as playing blackjack. The stakes are often higher and the choices tougher.

However, "HP has established a good framework for maintaining an ethical environment, and that's critical to making good decisions," Kirk says. "There is a clear challenge to make sure there are opportunities for ongoing discussion and resolution of the ethical conflicts that are bound to come up. Death and taxes aren't the only things that are inevitable."—*Kevin O'Connor*

Kevin O'Connor is part of HP's Corporate Public Relations department and first learned about right and wrong as a Boy Scout growing up in Milwaukee, Wisconsin.

How did you do?

SITUATION 1:
If you answered. . .
a), you receive + 30 points.
b), + 10 points.
c), + 20 points.
d), – 30 points.

Although sexual harrassment in the workplace is never condoned, in this case it's the first instance of this behavior with your boss. a) is the best answer. However, since sexual harassment is illegal, you can report it after one incident. You should first notify Personnel c), although you can notify your manager's manager b). d) is wrong because sexual harassment is never permissible; your job doesn't have to be threatened before you take action.

SITUATION 2:
If you answered. . .
a), you receive – 30 points.
b), – 20 points.
c), + 40 points.
d), + 30 points.

Court orders are required to release customer information. It makes no difference if you know the investigator. However, in a case like this, it's best to refer the issue to your legal department. Therefore, c) is the best answer and d) also is correct. a) and b) are both wrong.

SITUATION 3:
If you answered. . .
a), you receive – 20 points.
b), + 30 points.
c), + 40 points.
d), you lose the game.

The offer letter is a contract for employment and a) is therefore incorrect. d) is clearly wrong—it's worse than breaking a contractual agreement. b), while acceptable, is not as correct as c), which is an intelligent way to handle a peer whose good will is critical to your department.

SITUATION 4:
If you answered. . .
a), you receive + 10 points.
b), + 40 points.
c), – 20 points.
d), + 30 points.

Copying third-party software for any reason is illegal. b) is the best answer, although d) also is acceptable. c) is incorrect and a) is acceptable for employees at a supervisory level.

The maximum score is + 150 points.

Citicorp admits *The Work Ethic* is not a perfect exercise since the scenarios cannot include every nuance of an ethical situation. The game's purpose, however, is not to make an exact science out of ethics, but to stimulate discussion and get players to think about the ethical issues in many business situations.

YOUR TURN

Measure readers share their views on matters of importance to employees.

Fine China

I really feel that I learned more history about China from your November-December issue than I did in school. The story made me feel proud to work for a company that is trying to do business with a country like China. Sometimes it is not easy to understand a culture and traditions from hundreds of years ago.

JUAN ANTONIO VARGAS
Guadalajara, Mexico

Happy birthday?

I was delighted to read that HP Ltd. in the UK won the Queen's Award for export achievement. But April 21 is her actual birthday, not her official birthday. Her Majesty's official birthday is held in June when the weather is more reliable.

MARYLYNNE SLAYEN
Santa Rosa, California

Righto. We got our transatlantic wires crossed on this one. Queen Elizabeth II was born on April 21, 1926. Her official birthday is in June.—Ed.

Retiree's response is on the level

In the May-June issue, John Doyle says, "When you see three levels of management. . . " This points up a problem at HP. There are too many levels of management and too many managers. HP would be more effective with 25 percent fewer managers and one to two fewer levels of management. The noise of the "yes men" drowns out the signal.

CHARLES BITTMANN
Palo Alto, California
Retired

Advantage, HP

The story about sports in the May-June issue proves to me that HP has realized the tremendous marketing advantage that participating in major sports events has in store for us.

Every year when the Lipton International Tennis Tournament rolls around, there is a sense of excitement in the Ft. Lauderdale office and among customers. The tournament had record attendance and extensive television coverage. People of all ages visited our HP booth and were impressed with our equipment, tennis ranking system and the player biographical data. You couldn't ask for greater publicity.

JOE MONTESINOS
Ft. Lauderdale, Florida

A satisfied reader

I would like to commend writer Gordon Brown for his article about customer satisfaction in the May-June issue.

I've been working for HP for 11 years and in customer service the past six. We can never hear enough good stories about customer satisfaction. In my position, all I ever hear about are problems, so it's nice to hear about customers who are satisfied with HP products. This type of positive feedback reflects in our day-to-day activities.

PETE GRAZIANO
Paramus, New Jersey

HP way still works

When I received my pledge card in 1986 for the United Way fund-raising drive, I was incensed about the agency designation on the back of the card HP had printed. I felt it was unethical. I knew that an agency would benefit from a designation only if the total money designated exceeded its normal allotment—a rare occurrence.

I was less than diplomatic in raising the issue with the HP people concerned, but I made my case and some suggestions. In 1987 I was pleased to find the following footnote on the card: "In fact, designated dollars may or may not have an effect on the final budgeted amount an agency receives."

When I started this, I saw it as a test of the HP way, and the HP way passed. For me, the HP way includes holding HP to the highest standards of ethical conduct.

MICHAEL COULTER
Cupertino, California

Redeeming feature

I enjoyed reading your article on Procter & Gamble's coupon-processing system in the July-August issue. However, the value-added business that wrote the software was never mentioned. Carpenter Computer Service, located in Rolling Meadows, Illinois, has several installations in HP's major food-processing accounts doing coupon redemption and deserves credit, as does HP, for that portion of P&G's business.

STEVE CHACHO
Rolling Meadows, Illinois

Please send mail

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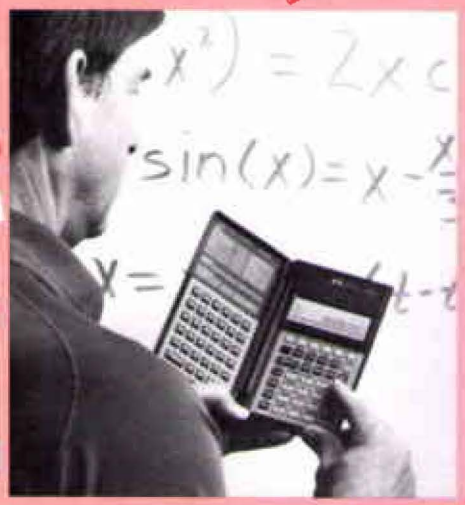
If your letter is selected for publication, you'll receive a *Measure* T-shirt. Be sure to send us a return mailing address and indicate your T-shirt size—unisex small, medium or large.

Address letters via company mail to Editor, *Measure*, Public Relations Department, Building 20BR, Palo Alto. Via regular postal service, the address is *Measure*, Hewlett-Packard Company 20BR, PO Box 10301, Palo Alto, CA 94303-0890. Try to limit your letter to 150 words. We reserve the right to edit letters. Please sign your name and give your location. Names will be withheld on request.

To market, to market

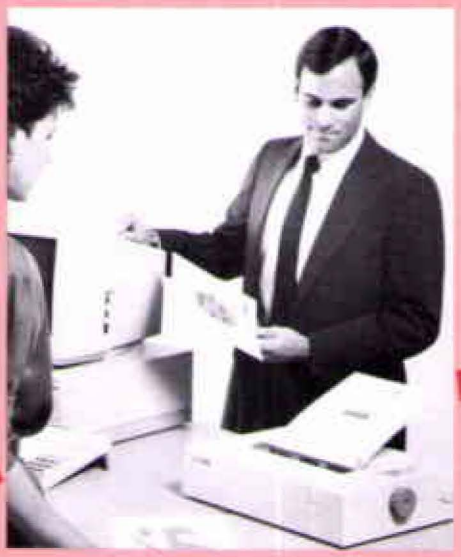
HP's got a reason to celebrate. So far in 1987, the company has let loose a stampede of new products that are leading the pack in quality and innovation. On these two pages, *Measure* has rounded up some significant entries in what HP President John Young calls "the best portfolio of new products in my memory."



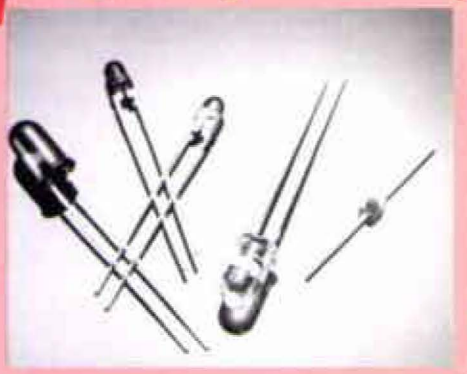
The next generation of scientific calculators begins with the HP-28C, the first calculator that lets a user enter A+B instead of 1 + 2 and still get the right answer. From the Handheld Computer and Calculator Operation.

Now there is a digital alternative for engineers in test and measurement fields. The HP 54111D digitizing oscilloscope, from the Colorado Springs Division, is super-fast and easier to use than its traditional analog counterpart.

Meeting military standards for ruggedness, the HP 8562A and 8562B (from the Signal Analysis Division) are portable, programmable microwave spectrum analyzers suitable for laboratory, field and production-line use.



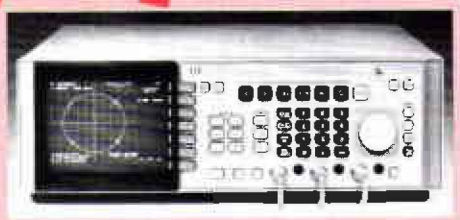
Vivid color and near-letter-quality text are now available for personal computer users. The new HP PaintJet color-graphics printer, from the San Diego Division, is ideal for everything from overhead transparencies to reports.



The brightest stars in the light-emitting diode (LED) field are those made with the aluminum gallium arsenide (AlGaAs) technology introduced by HP's Optoelectronics Division. These AlGaAs-based light sources can make automobile brake lights bright enough to stop traffic even on the sunniest day.

With color displays, touch screens and even a mouse, the HP 16500A logic analysis system can be set up to meet an individual user's needs. It's part of a new logic-analyzer family from the Colorado Springs Division.

A footprint the size of a briefcase makes the Portable Vectra CS convenient to use when an electrical outlet isn't available. Back in the office, the detachable display can be replaced with a full-size color monitor. From the Portable Computer Division.



The first off-the-shelf alternatives to expensive, custom-built equipment, the HP 8780A and 8980A vector generator and analyzer are pioneers in the field of vector modulation. From the Stanford Park Division.

Getting right to the heart of matters, the HP 21362A transesophageal transducer is inserted down a patient's throat and rests immediately behind the heart, giving doctors sharp, close-up images during surgery. From the Andover Division.

HP's first desktop scanner enables PC users to "lift" printed images and text from a broad range of documents and use them in desktop-publishing applications. It works like a photocopier—but instead of paper copies, the scanner makes electronic copies that can be stored on a disc drive. From the Greeley Divison.

And that's not all. . .

There's a whole herd of important new HP products—too many to capture in two pages. Here are a few more that couldn't be left out:

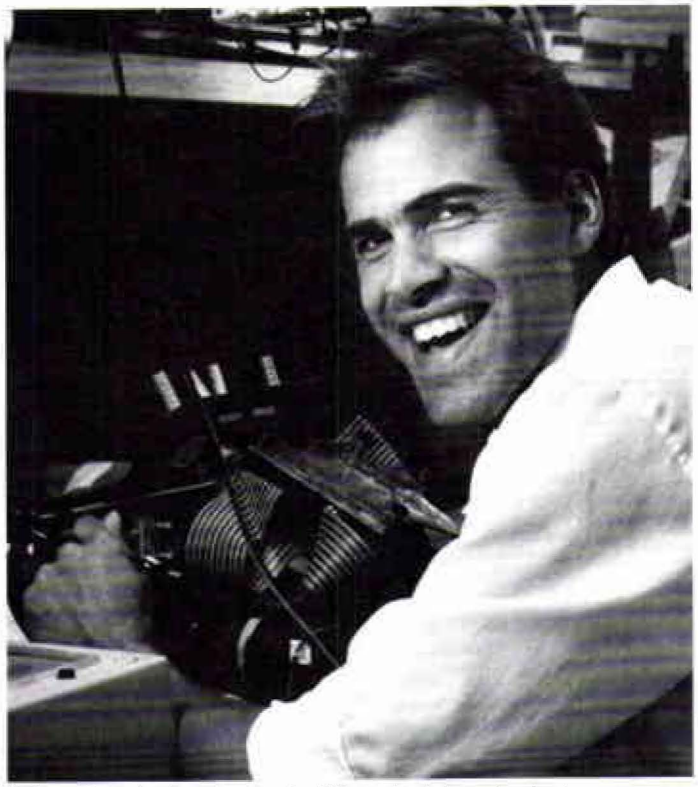
- No new-products lineup would be complete without an entry from the Spectrum program family of computers. The newest additions, the HP 3000 Series 930 and 950, are the first business computers to use the RISC-based HP Precision Architecture.
- HP has also introduced five new terminals from the Roseville Terminals Division, three of which run on other systems (IBM, DEC and ASCII), and four new high-resolution graphics workstations (HP 9000 Series 330 and 350) from the Fort Collins System Division.

—Kathleen Coady

Extra ORDINARY PEOPLE

For this year's review of the company's centralized R&D activities, HP Labs hired freelance photographer Sharon Hall to capture hundreds of Labs employees doing what they do for a living. Her photos were hung around the auditorium to show HP's top execs the faces of some of the employees who make the Labs run. Here are a few of the best from that exhibit.

Young-Soo You uses this bench covered with computerized HP test equipment to find ways to improve ink-jet printing on all sorts of papers. "We have had some small success from one of the new technologies, but there is still a lot of work to be done," he says.



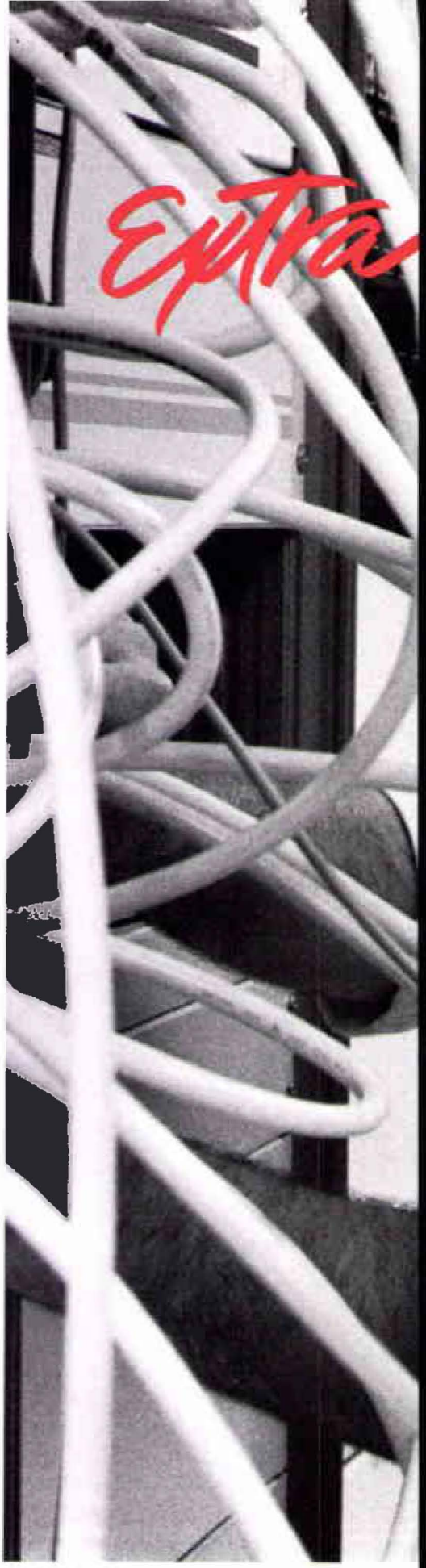
Richard Baer tests new ways for HP products to put color images on paper in HP Labs' Printing Technologies Department.

Polly Allen (left) of the Labs' graphics arts department and freelancer Lorie Bleiler work on an illustration for a technical presentation.

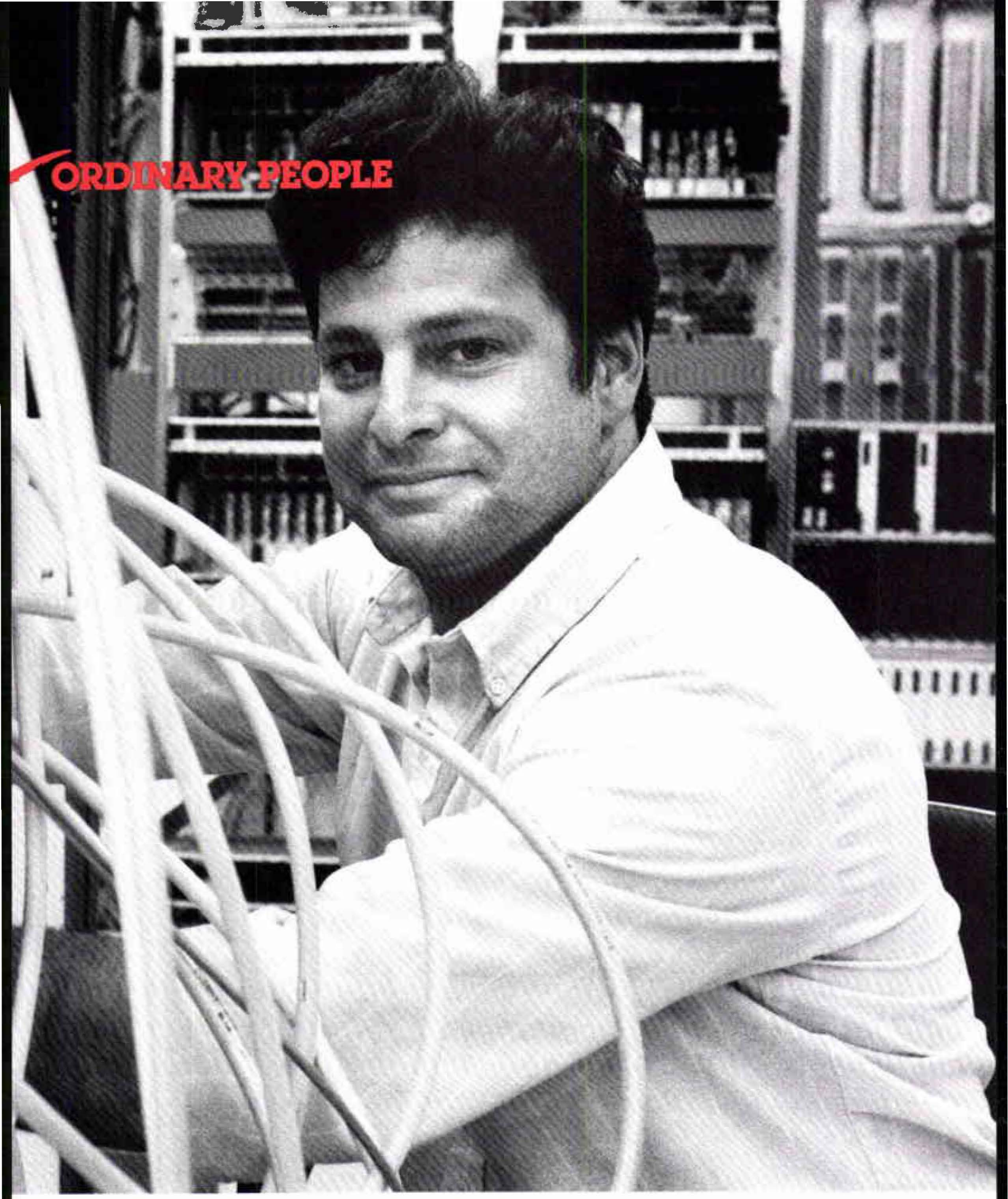
Left: Bob Jewett inspects the final check plots—called color keys—of an integrated circuit design before the circuit moves to fabrication. Finding errors at this stage avoids expensive changes at the next step in the process: making masks for photolithography.

Bill Fisher and Julie Wilker use a 6 DOF assembly robot to help find more effective ways to put products together at the Labs' Manufacturing Research Center in Palo Alto.

Susan Spach examines computer-generated images on a color display monitor. Her job is to find ways to speed the processing of such images by improving software algorithms.



PHOTOS BY SHARON HALL



Kelly Campbell built this "patch panel" in HP Labs' computer room to concentrate all the connections for a local-area network.

HP strengthens those old school ties

In medieval times, communities of scholars grew up around centers of learning or *universitas*.

The late Dr. Fred Terman of Stanford University liked to use the term "a community of technical scholars" for today's equivalent: a university strong in engineering and science, interacting with surrounding companies focused on research and development.

Putting the concept into action, he helped develop the first university research park, located on Stanford property in Palo Alto, California. An early occupant was Hewlett-Packard—started by two of Terman's former students and nourished by his interest. Silicon Valley, now replicated around the world, was Terman's vision. And universities are indeed at the heart of each such high-tech concentration.

These days HP's research-related ties to universities have a new intensity.

A wider focus

Most visible is HP Labs' Strategic Grants Program, which will grant $65 million in equipment—mostly technical workstations—through 1990. Originally announced as a $50-million artificial intelligence grants program, it has widened its focus through an added $15 million initiative for distributed computing grants. HP's largest-ever philanthropic program, it supports the company's strategic technical thrust through fostering a technical exchange with selected universities.

One way is closer contact through a series of symposia for professors and members of HP's technical staff. A graphics symposium sponsored by the grants program and Corporate Engineering in June featured faculty members from nine universities that have received grants. In July, the grants program teamed with the Association for Computational Linguistics to present a forum on evaluating natural languages systems during ACL's national meeting at Stanford. The second HP Labs European Symposium for academicians was hosted by HP Germany in Böblingen this September.

Nearly 20 HP Labs researchers now serve as technical liaisons to their counterparts at grant schools working in such areas as natural language, software engineering, knowledge representation and graphics. Jim Ambras, for instance, is a liaison to the University of Utah, which has some of the world's top experts on the programming language LISP. Jim's boss, Martin Griss, Software Technology Lab director, was on the Utah faculty before joining HP.

Research-focused grants were initiated by Vice President Joel Birnbaum when he headed HP Labs. Ira Goldstein, who recently became Technical Systems Sector R&D manager, was the moving spirit behind AI grants. In his new role he's creating a steering committee to provide strategic direction for the broader Strategic Grants Program.

As AI grants phase out next year, the new grants for distributed computing get underway. The emphasis will be on creating networks of HP workstations and "servers" (machines dedicated to providing a network service) in the typical large university's computing environment of mixed equipment.

"In the years to come we plan to employ focused grants to nurture R&D in distributed computers so we can learn from the universities and showcase HP's accomplishments," Ira says. Ralph Hyver manages the grants program, which continues under HP Labs. By this November, nearly 500 HP 9000s (Models 300 or 800) will have been installed in 21 US universities, with each school receiving from 20 to 60 units.

HP President and CEO John Young approves the idea of giving at a level "that perturbs the status quo." A heavy infusion of state-of-the-art equipment allows the faculty to redesign their whole method of instruction, he points out.

EVERETT DARCO

At Santa Clara University, Professor Tim Healy, chairman of the electrical engineering and computer science departments, points out one of a roomful of HP 9000/320 workstations purchased recently. SCU took early advantage of increased discounts now offered through HP's new Corporate Educational Marketing Program to buy 50 design centers. The large installation, serving 700 students, often serves as a demo site for HP customers.

The same principle applies to the company's five-year, $5 million grant of cash and equipment to the Harvard Medical School's New Pathway program, a radical restructuring of teaching built around HP computers. At the University of Waterloo, HP Canada has provided 310 Portable Pluses and half a dozen Vectra PCs as file servers to advance research into use of portable computing by students. They can access their files at "filling stations" on campus. Such massive grants are usually spread out over a period of several years.

Overseas grants

HP Labs' AI grants in the US are echoed in similar grants in Europe and Intercon, typically on a somewhat smaller scale.

Establishing good long-term relationships with key universities throughout Europe is a priority for HP

If Dr. Paul Wang gets homesick, the consultant at HP Labs in Palo Alto can pull up the logo of his school on his workstation terminal. One of the world's outstanding researchers in symbolic systems, Paul is a professor of mathematical sciences and director of Kent State University's Institute for Computational Mathematics.

In 1986 Paul spent an eight-month sabbatical consulting with HPL on computer-based symbolic computation systems (in which computers process symbols and formulas in addition to numbers). He was back for a month this summer. Paul's credited with contributing to R&D in the combination of symbolic, numeric and graphics techniques for the modern workstation.

Last year Paul brought one of his best graduate students to Palo Alto. Doug Young was then hired by HPL's Software Technology Lab to develop a new programming environment. Paul is philosophical about losing his research assistant. "One of the purposes of bringing Doug here was to plant a seed," he says.

To maintain a working relationship with Paul back on campus, HPL gave his department an AI Grant of HP 9000/320SRX computers. Kent serves as a beta test site for new software, along with such universities as MIT and Carnegie-Mellon. "The students love the HP systems," Paul says.

CHUCK FOX

Prof. Paul Wang (right) of Kent State University, who consults with HP Labs, and his former student Doug Young meet again in Palo Alto, where Doug is now an HP researcher.

Labs Bristol Research Centre.

In France, BRC has worked closely with researchers at the University of Paris Sud for the last three years, freely interchanging software for research purposes. Together BRC and HP France have donated two HP9000/320 workstations to the school and an extensive network of Vectras running Golden Common LISP. The same relationship is being extended to the Ecole Normale Supérieure in Paris.

At the University of Cambridge in England, BRC is installing an equipment grant at the Natural Language Lab for teaching use. It will also help draw together work on natural language by HP Labs in Palo Alto and similar work at Cambridge under sponsorship of the UK Government's Alvey Programme. A second new grant to the university's Statistics Lab will help further research methods that could be helpful to BRC in networking management and planning research.

David Booker, who manages BRC's grants, points out that one AI grant recipient has achieved a commercial success of its own. Sussex University developed an AI environment called POPLOG, running on HP equipment, which is sold through an independent software house.

Testing in Italy

HP Italy is in a number of industry-university research programs, including a major program for open system interconnection (OSIRIDE) involving Pisa University, which has the country's most advanced computer science courses. HP has just started five months of testing as part of a huge cycle of interoperability tests by computer vendors. An HP 9000/350 is connected through X.25 to each one of the machines of seven other manufacturers, including IBM and Olivetti.

Countries in Intercontinental Operations have made their own AI grants to the University of Osaka in Japan, the Korean Advanced Institute of Science and Technology (KAIST), which Fred Terman helped foster as an advisor; and Singapore's Knowledge Engineering Resource Center.

According to Rod Carlson, director of Corporate Grants, universities will receive $45 million of the total $58 million in grants that HP is making in 1987. A steady stream of the company's equipment continues to flow into schools to modernize teaching facilities (see box, page 16) through other internal granting channels.

HP carefully complies with US tax regulations that educational grants be kept separate from immediate business interests. But a natural outcome of building a network of professors who are favorably disposed toward the company is indirect benefits in such areas as recruiting and sales.

Executive Vice President John Doyle thinks industry and academia are now more comfortable in working together. He serves as HP's "executive partner" for high-level contacts at California Polytechnic Institute and is on advisory committees at the University of California at Davis and Stanford's Engineering School.

A few years ago there were concerns that the tradition of open research on campus might be compromised by a close association with industry.

It was an issue John Doyle helped thrash out during four years on the advisory board for Stanford's Center for Integrated Systems (CIS), co-funded

school ties

by the university, the US government and industry. (John Young took a lead in attracting industry participants.)

"We figured out a mechanism to deal with the proper disposition of intellectual property rights," John Doyle says. "It took some movement by both sides to bridge the gulf between the university's desire for an open exchange of ideas and the corporations' interest in gaining from proprietary inventions. Industry gave up on intellectual property rights, and both sides have benefited significantly from a closer relationship."

HP has provided a full-time visiting scholar to CIS for the past three years. Zvonko Fazarinc, a former HPL lab director, represented the company at CIS the first year. His instructions from John Young were simply, "Do what is good for the university."

Choosing partners

Frank Carrubba, director of HP Labs, still sees some pitfalls in industry-university relationships. "Many universities are becoming businesses today and some groups are even supported by venture capitalists. A university professor you're paying to solve your problem may sit on the board of directors of a competitive company." As a result, companies are becoming very selective about their partners. Frank just completed reviewing HPL's many contracts with universities.

HP is also a founding member of the Semiconductor Research Corporation, a consortium of 26 microelectronics firms that is funding research projects at 38 universities. Phil Fleming manages the relationship for the Circuit Technology Group, with 32 HP people mentoring or managing elements of projects. Half of the consortium's funds go into the area of manufacturing science, which fits with HP's own work in semiconductor technology.

In Europe, the push for companies and universities to combine their efforts in large joint projects is coming from the European Community (EC). HP has just participated in a RACE telecommunications contract and looks for more such collaboration.

On a smaller scale are such efforts as the Advanced Materials Institute (AMI), one of several programs funded by the Colorado Advanced Technology Institute—a joint effort by the state, industry and four universities to create jobs through research. Harry Schneider represents HP on the AMI board. The state pays for four AMI labs shared by the schools to study materials and materials-engineering processes; industry contributions go toward $5,000 awards to help campus researchers develop grant proposals.

"It's paid off," Harry says. "The $100,000 or so of AMI seed funding brought in several million dollars of federal research grants."

A number of HP's integrated-circuit

It was a cold January day in 1980 when Dr. Bill Moritz, professor of electrical engineering at the University of Washington, first got acquainted with HP.

It was the third year HP had invited a group of professors to Colorado Springs to take a firsthand look at the company's logic analyzers and then apply for equipment grants. Those attending the three-day symposium had a preview of the HP 64000 Logic Development System. Intrigued, Bill Moritz looked up the HP engineers who had worked on it. His interest helped spark a follow-on symposium on the new system that June.

Result of Bill's two visits to Colorado Springs: a $10,000 grant of logic-analysis equipment, used to develop a course on digital troubleshooting, and a three-station HP 64000 system with an emulator for his Microcomputer System Design course.

(In the 10 years of logic symposia, now run by the Logic Systems Division, more than 83 schools have received grants of HP 64000s.)

To see the jobs UW graduates were taking, Bill worked as a "new hire" in

UW PHOTO

Prof. Bill Moritz (left) in University of Washington's microprocessing teaching lab.

the Computer Systems Division for nine months in 1982. As part of the microcode development team for the HP 3000/37, he found its hardware set had interesting features for educational use. With the right tools, he could design different instruction sets for the computer and give a senior class in microcode architecture.

With backing from Russ Mendenhall, who heads HP's recruiting team at the UW, Bill's department received a grant of two HP 3000/37 systems—and the development tools that HP engineers had used. "Since we can't afford to support these working tools, you have a lot of faith in the faculty member using them," Russ says.

Bill has since worked a sabbatical year at the Lake Stevens Instrument Division—where he developed a vision system for HP—and established a duplicate system at the UW with a grant of an HP 9000/320 system. One of his graduate students, Jerry Stone, used the lab to develop an inspection system that can detect missing parts in printed circuit boards before soldering. This spring Jerry joined the division.

Another logic-systems symposium in 1985 brought a complete lab for a junior microprocessor class.

At last count HP's equipment donations to the UW through Prof. Bill Moritz have added up to $629,220. "Hundreds of students have been exposed to equipment and experiences close to what they might expect in industry," he says. "There's simply no way we could have provided resources like this without the generosity of Hewlett-Packard."

divisions have helped equip the University of Idaho's college of engineering with a state-of-the-art VLSI capability. As a service, the university debugs prototype software for HP divisions.

Not all of HP's contacts with university researchers start with grants. According to Corporate Tax, US entities had $14.5 million in operational research contracts with universities in 1986. Grenoble Networks Division is one of several European entities contracting for research projects. It is now working with Grenoble University to develop an expert system to aid in trouble-shooting the HP 2345.

To keep the company's own engineers and computer scientists current with technology, HP is using some new approaches in continuing education, both to develop and deliver courses.

Nearly 170 HP people take courses from the National Technological University (NTU), the first nationwide electronic university. It draws upon 24 participating universities for its graduate-level courses broadcast via satellite.

Another 480 HP people are enrolled in televised courses from Stanford and Chico State University. In Guadalajara, Mexico, HP engineers take Stanford's videotaped engineering instruction through the University of Guadalajara, which now offers the first E.E. master's program in the area. This is the first time Stanford's courses have been given outside the US.

Jan Schapers, Northern Region development manager, has been a prime mover in a European program called PACE which is modeled after NTU. It will start this January on a small scale with six non-credit courses. By 1990, it expects to start its first credit-bearing, degree-granting program. Different languages and cultures present some problems, of course. "But things have gone extremely fast in the last 12 months," Jan says.

HP and IBM co-hosted the first Joint Europe/USA Continuing Education Forum last September in the US and another forum was held in France this June.

Corporate Engineering's Alfred Moyé is a firm believer in the worth of shared courses—a new concept for many universities. "There's nothing wrong with using well-prepared materials from someone else," he says.

He arranged that HP-TV make a high-quality videotape of a breakthrough MIT course, "Structure and Interpretation of Computer Programs" taught by professors Harold Abelson and Gerald Sussman. It focuses on techniques for controlling complexity of large-scale software systems as a reflection of general principles of engineering design. HP has already donated the tapes and training materials to five schools.

Corporate Engineering draws on sources inside and outside HP for its broad array of technical courses. Faculty members at the University of Texas in Austin worked with HP to develop a three-week videotaped AI course that has been given at a number of HP locations, including Singapore. UT graduate students are hired to serve as course tutors.

With the modern telecommunications revolution, the time is coming when no community will be too remote to receive live or videotaped technical courses. HP is helping to stretch those connections (see page 20) through supporting the development of educational networks. It has even offered televised instruction of its own—more than 1,000 physicians, mostly from teaching hospitals, paid to see the Andover Division's videoconference on colorflow imaging, sent by HP-TV to 22 sites via satellite. Large-scale interactive instruction, with a new Cupertino telecast facility linked to classrooms in 17 US area offices, will soon be a reality within HP. First comes HP Precision Architecture product training, and then?

Today Fred Terman's "community of technical scholars" isn't bounded by geographic proximity. New tools for research and communication are expanding the concept of *universitas* into a worldwide meeting of minds.

—*Betty Gerard*

(Readers familiar with company programs supporting schools at all levels know it would take a full issue of Measure *to tell the complete story of HP's partnership with education —and the many HP people who are teachers, students, curriculum advisors, volunteers, sales reps and recruiters on campus.)*

LARRY MURPHY, UNIVERSITY OF TEXAS AT AUSTIN

At the University of Texas at Austin, Asst. Prof. Christine Maziar and student Matt Schmidt use a modeling and simulation lab funded by HP along with her doctoral studies.

In January Dr. Christine Maziar became an assistant professor of electrical engineering at the University of Texas at Austin. She brought a $50,000 equipment grant from HP for her department to set up a device modeling and simulation lab.

Christine, who received her Ph.D. in E.E. from Purdue University in August of last year, is one of the first new faculty members to emerge from HP's Faculty Development Program. In 1982, the company committed $6 million to encourage E.E. and computer science students to continue their university education through a Ph.D. and then teach after graduation to help relieve a faculty shortage on US campuses. HP lends the money for up to four years of tuition and living expenses. The loan is forgiven if the recipient teaches for three years after getting a doctorate. (HP attaches no other strings to the arrangement.) The equipment dowry goes along as part of the deal.

Currently more than 40 doctoral candidates at 24 US universities are supported by the HP program.

Christine is an old friend of the company. As an undergraduate, she spent three summers and a spring as a co-op student in Colorado Springs.

LETTER FROM JOHN YOUNG

HP's president describes the importance of the company's traditional instrument markets

As I was preparing my last *Measure* message on our new Spectrum program computers, one concern kept crossing my mind: How would the letter be viewed by the people in HP's instrument entities?

When I was dedicating our new Briargate facilities in Colorado Springs many instrument people told me I didn't talk as much about instruments as computers. And they wanted to know if this was a sign of lack of confidence, enthusiasm, or what. It was then that I had the idea for this issue's letter.

The message here is simple: Despite almost half a century, the instrument business isn't "old news." Nor is it a "cash cow" to be sacrificed for the greater future good of HP. Test and measurement remains a vital and exciting field for us—and will be for as far into the future as we can foresee.

Our traditional customer base—manufacturers in the communications, electronics and aerospace/defense industries—has a growing set of measurement needs and a related set of new problems we can help solve. The communications industry is faced with

"An attack by piranhas is just as deadly as the single bite of a great white shark."

an explosion in the volume of information to be transported, a wealth of new technologies, and fierce competition resulting from deregulation and privatization of the industry. The electronics industry is a $500 billion business worldwide, and nations everywhere have "targeted" it as critical to their economic success. Defense policies around the world are similarly tilted toward electronics.

While traditional customers for instruments will need improved measurement capabilities, the growing pervasiveness of electronics technology will open up new opportunities in other areas. Today, fully one-third of business spending on equipment represents purchases of electronics equipment.

A wide variety of businesses—ones that at first glance don't appear technology-based—rely on electronic products. The average automobile, for example, now contains $700 worth of electronic equipment, and the amount is going up at a rapid rate. Even the service sector has a technology slant: banks and insurance companies are among the heaviest users of computers and communications equipment.

John talks Junior Achievement with Laura Donohue, HP summer hire and president of next year's national JA conference.

Recognizing these opportunities, HP has been making significant R&D investments in the past couple of years. We're beginning to see the result of those efforts. Fiscal 1987 will be one of the strongest years ever in terms of new products, including:

- a new line of logic analyzers
- new digitizing oscilloscopes, a fast-growing market in which HP's market share has increased substantially
- three new spectrum analyzers, including two portables that have been winning us some very big deals
- and real contributions in the fields of computer-aided test, fiber optic instruments, and the testing of semiconductors, data communications and digital telecommunications.

We're taking aggressive and innovative steps to bring these new products to market. We plan to strengthen our test and measurement sales efforts by providing our field with more instrument resources—people, demonstration inventory and management focus.

We're also exploring new ways of selling instruments, such as telemarketing and direct mail. For example, our new Customer Information Center (CIC) helped implement two direct mail campaigns for digitizing oscilloscopes. So far, the qualified leads CIC passed on to our sales force have resulted in almost a half-million dollars in orders.

I hope you feel some of the excitement. Test and measurement—this "old" part of HP—lives on the cutting edge of change. And it will continue to do so, because there are still many other areas where HP can make a contribution. For our customers to develop, produce and maintain increasingly advanced products, they must be able to use measurement tools that are more sophisticated than the products they're working on. In the instrument business, we always have to be one step ahead in technology.

One step ahead—that's getting to be more difficult to achieve. The competition is heating up. The attractiveness and sheer size of the industry have encouraged dozens of companies to go after parts of the test and measurement market. The spread of digital technology has made it easier to enter the market today than it used to be. No single competitor equals HP in size or stature. Yet the sheer number of niche players is staggering. So we need to remind ourselves that an attack by piranhas is just as deadly as the single bite of a great white shark.

The important point is this: There's no such thing as an "old" business. But there can be old or tired ways of viewing it. We've got plenty of things left to do—finding new and better ways to measure, extending our measuring systems and automation capabilities, shortening our product development cycles, developing better software, and getting our costs down, to name a few. I know we're addressing all these challenges with the same fresh perspective and enthusiasm that have made HP the world's leading instrument company. We have every intention of maintaining that position.

John

Extra MEASURE

What a ham!

When HP's Paul Dubson gets together with his friends, everyone's a ham.

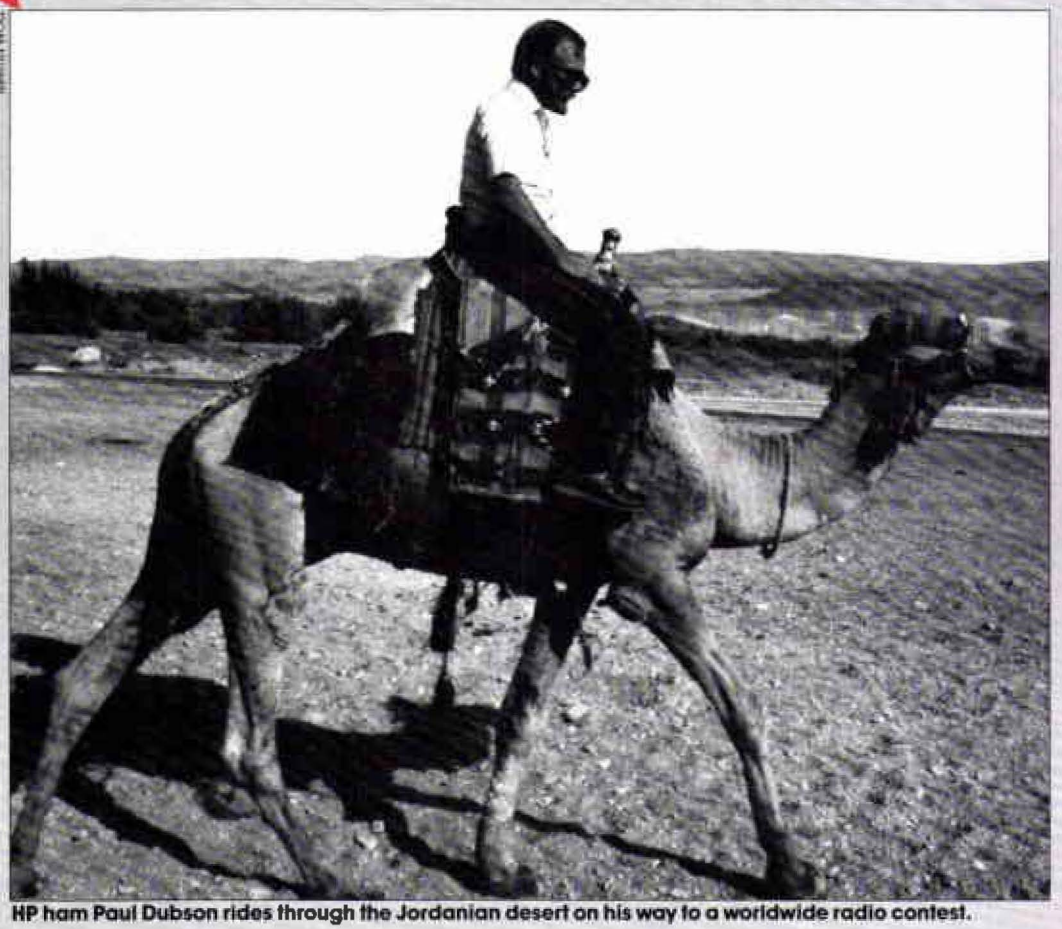
Paul, an industrial designer who built a 196-foot radio tower over his home in San Diego, California, is one of six US amateur radio operators ("hams") who traveled to Jordan to take part in a worldwide radio contest.

The group chose Jordan for its base because it is well-known for its radio activity—even His Majesty King Hussein is an avid operator.

The Americans and three Jordanian hams competed against other operators around the world to contact as many people in as many countries as possible in 48 hours.

They finished with nearly 8,000 contacts—the second highest score in the world.

TOM HUNNY



HP ham Paul Dubson rides through the Jordanian desert on his way to a worldwide radio contest.

US INFORMATION AGENCY

HP's medical gear is part of a technology exhibit in the USSR.

Sharing secrets with the Soviets

Soviet citizens in nine cities will have a chance to experience life in modern America, thanks in part to the donation of an HP cardiograph and defibrillator by the McMinnville Division.

The donation is part of an 18-month multi-media technology exhibit produced by the United States Information Agency. "Information USA—Linking People and Knowledge" will show more than 2 million Soviet citizens how Americans benefit from communication technology and information systems in schools, offices, factories, homes and health-care facilities.

Extra MEASURE

TV cameras take HP's Chris Rasmussen to college classrooms.

Educational television

Engineering professors at Washington State University and the University of Washington have found a way to keep pace with technological advances that continually race ahead of classroom laboratory equipment and processes. Their solution—video field trips—in which professional engineers demonstrate state-of-the-art techniques to students via microwave telecommunication links.

The students never leave their classrooms while the video production van, a television studio on wheels, takes them to high-tech firms in various corners of the state. HP engineers Donald Borowski of the Spokane Division and Chris Rasmussen and James Stewart of the Vancouver Division have been working with Washington State video producer Robert Maine to produce videos that demonstrate the latest in manufacturing automation and microwave electronics.

These modules will supplement engineering classes broadcast over the Washington Higher Education Telecommunication System, a microwave-television network that provides a live, two-way link between university classrooms in Vancouver, Seattle, Spokane, Pullman and Richland.

BOTTOM LINE

Hewlett-Packard Company reported a 14 percent increase in net revenue and a 20 percent increase in net earnings for the third quarter (ended July 31) of the 1987 fiscal year. Orders for the quarter were up 21 percent over the same period for 1986.

Net revenue totaled $2.054 billion, up from $1.794 billion for the same quarter in FY86, with revenue from US sales and service totaling $1.054 billion (up 10 percent from the year-ago quarter) and international revenue totaling $1 billion (up 19 percent).

Net earnings totaled $148 million or 57 cents per share on approximately 259 million shares of common stock outstanding (compared with $123 million or 48 cents per share for the year-ago third quarter).

Incoming orders for the quarter were $2.238 billion, with US and international orders both reflecting a 21 percent gain. US orders totaled $1.194 billion and international orders were $1.044 billion.

HP's board of directors voted to increase the company's regular quarterly dividend from 5½ cents per share of common stock to 6½ cents per share, payable October 14, 1987, to shareholders of record September 23, 1987.

CHART CHANGES

In the Peripherals Group, the former Greeley Tape Operation has become a new Greeley Mass Storage Division under **John Boose** as general manager. Activities of the formerly Greeley Division are now split between the new division (which consolidates manufacturing on site) and a newly formed Greeley Hardcopy Operation under **Doug McCord** as operations manager.

The Electronic Instruments Group (EIG) has formed a new Measurement Systems Operation in Loveland, Colorado, under **George Sparks** as operations manager. The Lake Stevens Instrument Division is now part of the EIG organization.

A second business unit has been formed in the Medical Products Group with the realignment of Obstetrical Care activities. **Dave Perozek** is GM of the new Imaging/OB Care BU.

NEW HATS

Don Summers to operations manager of the Queensferry Microwave Operation within the Microwave and Communications Group. . . . **Mitch Weaver** to operations manager of the Salt Lake City Operation, part of the Design Systems BU. **Patrick Landey** to country GM for HP South Africa. . . . **Rafael Piccolo** to country GM for HP de Mexico.

Q123

I don't have time for another $&*!#%! class!

"Stress for Success" is the name of the stress-awareness seminar being conducted by the Southern Sales Region.

The seminar helps employees understand stress, its causes, its effects on themselves and others, and things they can do to reduce and manage their stress level.

Some suggestions:

- Face up to the stressful situation. Ignoring it will not make it go away.
- Put the situation in perspective. Consider the worst thing that could happen, and the likeliness that it will happen.
- Accept unavoidable consequences. Focus instead on what you can do.
- Take care of yourself. Relaxation, exercise and good nutrition are essential for a healthy outlook.

JOE BAUER

Scientists use HP Portables to guide particles in this atom-smasher.

Magnetic personality

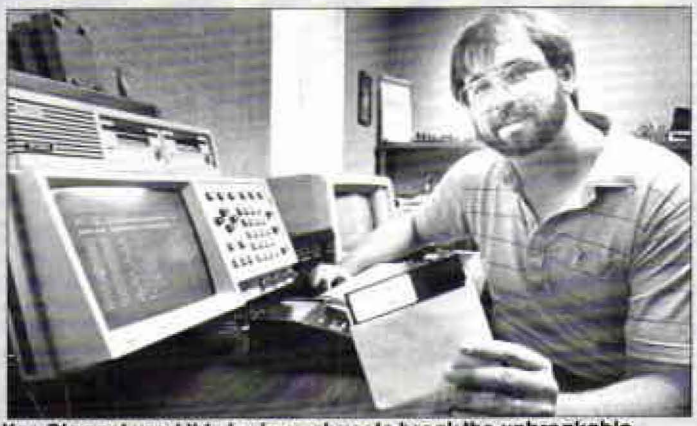
HP Portable computers are attracting attention at the two-mile-long Stanford Linear Accelerator Center in Stanford, California.

Research scientists are studying the new particles that result from colliding beams of positive and negative particles.

It takes hundreds of magnets to direct the beams toward each other from opposite ends of the world's longest linear accelerator.

The laptop computers, coupled with the center's optical alignment instruments, form a team that stores data about position. Their job is to make sure that the beams arrive on schedule by positioning the magnets according to theoretically perfect coordinates.

At the push of a button, the Portable stores the magnet's location. The information moves to a database where the ideal coordinates are computed, and the results are used to move the magnets.



MIAMI HERALD PHOTO BY ALAN FREUND

Ken Clagget used this logic analyzer to break the unbreakable.

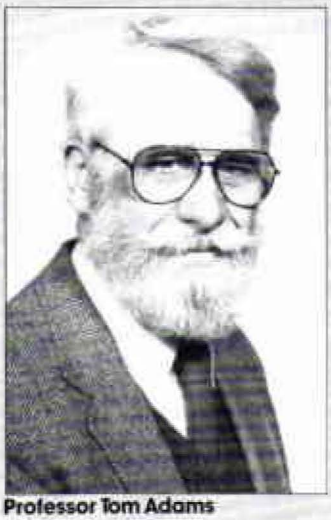
The right stuff

Computer hacker Ken Claggett is proof that, with a little time and the right tools, nothing is impossible. Ken received $25,000 for defeating *Smarty Arti*, an allegedly unbreakable copy-protection scheme created by Pride Software Development Corporation of Oakland Park, Florida.

The right tool was an HP 1631D logic analyzer which enabled Ken, an engineer at a Ft. Lauderdale computer firm, to break the program less than 10 days after the company issued the challenge.

Arti was designed to protect against unauthorized disc reproduction by binding a program to a particular disc and then freezing when a hacker tried to use a debugger to observe the copy-protection part of the program.

The logic analyzer let Ken tap into the computer's memory without letting *Arti* know that he was watching. After observing the protected disc as it started the program, he determined which part sensed the debugger and deactivated it. Then, using both a debugger and the logic analyzer, Ken modified the program to bypass the section that checked the disc and was able to make copies that ran on another PC.



LECLEAR PHOTOGRAPHERS

Professor Tom Adams

A class act

Do you know what *all* the buttons do on your HP handheld computer?

If not, Dr. Thomas Adams, a professor at Michigan State University, can help. He's the author of *Programming the HP-41C/CV/CX* and has designed a college class around it. His students use 41-CVs donated by HP's Bruce Miles, major accounts support manager in the Novi, Michigan, sales office, to learn programming techniques. They are taught not only to master existing programs but also how to design, write and document programs of their own.

Nine such programs, including several written by the professor himself, are now part of the HP User's Library.

Extra MEASURE

They don't get no respect

HP public relations people across the U.S.—Corporate Public Relations, division and region communicators and product publicity people— recently got a pat on the back for a job well done.

The results from a survey last year of the business news media shows that HP is well known by a significant percentage of the media and that overall impressions of the company are favorable. The findings came out of a study of newspaper, magazine, radio and television journalists across the country conducted by a consulting firm for 60 companies.

The principal finds for HP are:

- Ninety-seven percent of the media surveyed say they've heard of HP. The norm for the 60 companies was 83 percent.
- Thirty-five percent of the media report being "intimately or broadly familiar" with HP, compared to a norm of 27 percent for all the companies.
- Overall impressions are very favorable (HP received a rating of 4.5 on a one-to-six scale where the norm was 3.9 and the highest ranking was 5.0).
- More than three out of four journalists mentioned specific strengths of HP, including management capabilities, R&D and technology, high quality products, and strong market position.
- HP's media relations efforts received high marks, especially among journalists who are very familiar with the company. Reasons include HP's responsiveness, the perception that HP has proactive company communications, and the quality of media relations and materials provided to the press.

MAKING HISTORY

The one-car garage at 367 Addison Avenue in Palo Alto where Bill Hewlett and Dave Packard began developing their first product in 1938 has been officially designated a California State Historical Landmark. An official plaque will mark the site. HP's co-founders used the garage as a workshop for two years, formally starting their business there in 1939.

NEW PRODUCTS

To capture high-speed, single-shot and repetitive events with excellent voltage resolution, the Santa Clara Division has introduced the HP 5185A waveform recorder and HP 5885T precision digitizing oscilloscope—believed to be the first to offer characterized analysis from the signal input through the final analysis result.

The HP 8904A multifunction synthesizer from the Spokane Division is "an instrument on a chip." It uses Spectrum program technology to generate complex signals from a single chip.

Headliners: the Disc Memory Division's new HP 97530 family of high-capacity 5¼-inch disc drives for the OEM marketplace. . .The Optoelectronics Division's new HEDS-5500 series encoders that take only four steps to assemble. . .HP's first complete board-test system under US $100,000: the HP 3065ST from the Manufacturing Test Division. . . An HP TEMPEST ThinkJet from Federal Systems Operations, with electronic emanations that meet federal standards for security.

The high-speed HP 8145A optical time-domain reflectometer from the Böblingen Instrument Division uses a data-correlation technique that allows a fiber optics tech to pick the signal out of background noise. It allows measurements much deeper in the fiber.

(For other new products, see pages 8 and 9.)

WORTH NOTING

The Vannevar Bush Award of the National Science Board was awarded to **David Packard**.

. . . **John Minck** of Stanford Park Division received the 1987 William A. Wildhack Award from the National Conference of Standards Laboratories.

The HP 5965A Fourier transform infrared detector—the first ever developed specifically for capillary gas chromatography—has received an IR 100 award from *Research & Development* magazine as one of the 100 most significant scientific products introduced in 1986. Product manager was **Ed Darland** of the Scientific Instruments Division. . . .

BETTY GERARD

Ed Darland, HP 5965A

SAN FRANCISCO SYMPHONY

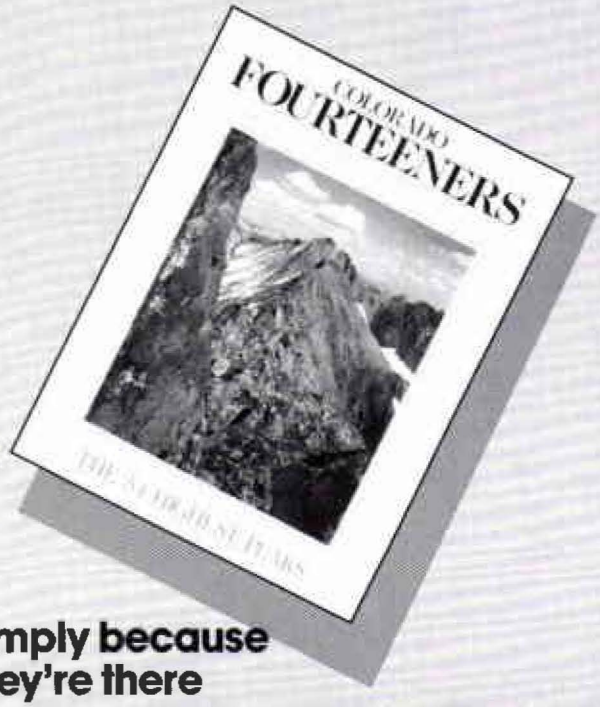
Herbert Blomstedt directs the San Francisco Symphony orchestra.

Conducting itself like a business

With the help of an HP 3000 computer system, the San Francisco Symphony has orchestrated the first fully integrated data-base management system for a performing arts organization.

The computer handles long-range planning, ticket sales, season subscriptions, fund raising, music cataloging and word processing, making the symphony the leading business model among major orchestras in the world.

The system, which was donated by HP, allows the symphony to print each purchaser's name on the tickets of season subscribers. It also calls the bank to check credit-card authorizations for phone orders and automatically selects the best seats in the house.



Simply because they're there

After climbing all 54 of Colorado's "fourteeners" (mountains over 14,000 feet high), you might think Roger Edrinn would be happy to sit back and put his feet up for a while.

Not this HP engineer from Fort Collins. He started all over again; this time with his camera.

In 1976, Roger began photographing the fourteeners to document his adventures. He recently published *Colorado Fourteeners, The 54 Highest Peaks*, a full-color guidebook for climbers looking for the best approach to the peaks, as well as for the non-climber who just wants a glimpse of their beauty.

According to Roger, the most important requirements for climbing a fourteener are desire and a "can-do" attitude (although rock-climbing lessons wouldn't hurt either).

SHIRLEY GILBERT

HP's Pam Tablak accepts thanks from students at a local school.

Perfect harmony

Students at Fremont Older School are singing the praises of the HP Singers, a 30-member choir from HP's Cupertino, California, site.

Last spring, the group entertained students with selected tunes from Broadway hits like *Oklahoma*, *A Chorus Line* and *West Side Story*. Before the show, director Pam Tablak explained the different parts of a choir and how they work together.

The children enjoyed the event so much that they invited Pam back later to teach them several songs. The kids made their vocal debut for senior citizens at the nearby Beverley Manor convalescent home.

Providing a timely solution

The Telecommunications Authority of Singapore dialed the right number when it called for a reference clock built with HP equipment to synchronize all the digital components of what will be the most sophisticated telecommunications switching complex in the world.

The electronic switch is regulated by three HP 5061B cesium-beam atomic clocks. Two HP time-interval counters determine the most accurate of these and feed it to the switching mechanism. An HP computer provides the brains for the whole setup which is accurate to one second in 7,927 years. That should keep Singapore in sync well into the 100th century.

PARTING SHOT

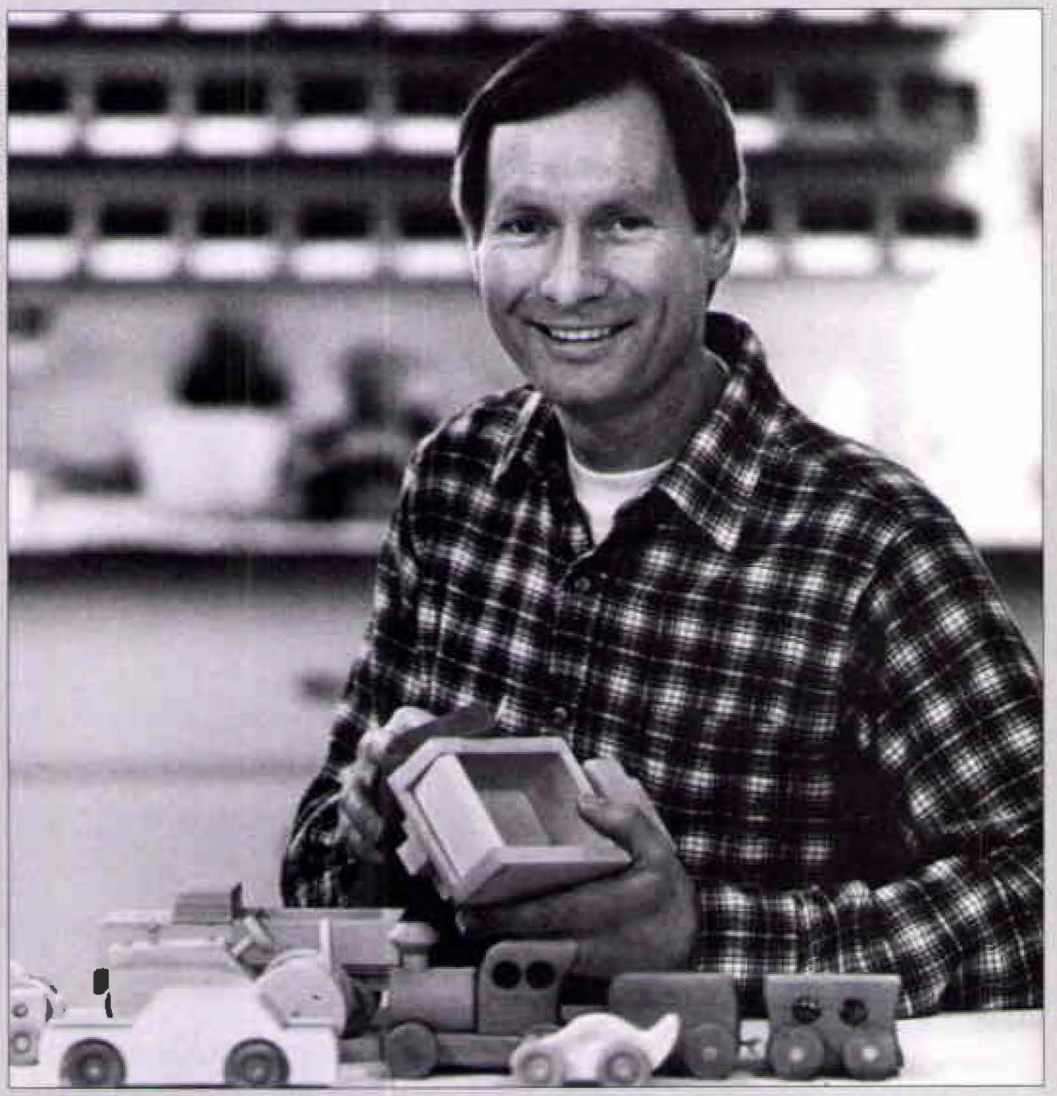
And how are *your* holiday plans coming along?

Most of us don't seriously think about the holiday season until December, but Spokane Division's Dave Schmeder is getting ready for it already.

The production test supervisor builds wooden toys in his workshop to donate to the Toys for Tots charity. Last year, he donated 76 of the hand-crafted toys; this year he's shooting for 100. Though Dave and his wife Bonita have no children of their own, dozens of children in needy families wake up to the magic of brand new trains, pickups, dump trucks and other toys on Christmas morning because of him.

He puts in the long weekend and holiday hours on the project because, "Each Christmas I felt like something was missing. I wanted to do something for the community, to make Christmas a little more special for others."

SPOKANE CHRONICLE PHOTO BY MARK JACKSON



Woodworker Dave Schmeder plays Santa Claus for dozens of needy children in the Spokane area.

MOVED LATELY? CHANGE OF ADDRESS SHOULD BE REPORTED TO YOUR PERSONNEL DEPARTMENT.

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