

Measure

For the men and women of Hewlett-Packard / Mar.-Apr. 1969

The subject of this **special double issue** is change, specifically **the changing look of Hewlett-Packard** Company. Why this subject at this time? Perhaps to mark the company's 30th anniversary? Perhaps. But there's a more fundamental reason: The very subject of change itself seems most appropriate right now. Never before have so many changes been so apparent in the company's products, markets, technology, organizational structure, job responsibilities and



awareness of social pressures. Evidence of such changes is seen in the physical shifts taking place or pending in so many areas, in the news stories announcing new organizational moves, and even in the index pages of the product catalogs that reveal the addition of totally new categories as well as hundreds of new products over the past few years. What follows is an attempt to examine what these changes are and what are the main internal and external influences that underlie them. Since **people are at the base of most change**, the story is told here directly by Hewlett-Packard people, as much as possible in their own words.

THE CHANGING COMPANY

THE VIEW FROM JUST BELOW PIKE'S PEAK

**Bill Terry, General Manager,
Colorado Springs Division**

"It is particularly significant for our future, I think, that we are becoming a large company at a time of improved, modern communications. This is creating both a demand and an opportunity for us to develop ourselves along lines quite different from the big corporate organizations that have already matured.

"A number of these larger and older organizations have already grown into rather cumbersome collections of almost autonomous units having interaction only at the top levels of management. We have the opportunity to grow in more orderly, creative, and communicative ways. I believe we will be able to maintain a strong central identity yet allow our operating members to grow with great freedom and support. This is because — fortunately at this point in our corporate evolution — we have the opportunity to communicate more effectively among ourselves and with our customers.

"Of course, in the 30 years of HP's development, it seems that there have been quite a few such 'fortuitous' circumstances. When you reflect on these, it's clear that a great many wise and far-sighted decisions were made at the right time.

"As an example, one of HP's keys to success has been its orientation to customers. This direction was established in the very beginning when Bill Hewlett invented the HP audio oscillator: it was needed, it was useful, and it did a better job than any-

thing else. That set a path for what has followed. It has helped us resist the temptation to change just for the sake of change or to invent something exotic just because it was 'fun to invent'.

"Change is an everyday happening throughout this company. If you were to define life as a series of experiences involving change, then working for HP is a series of 'adventures' because of the great emphasis on change. Just coming to work in the morning is an adventure for me because I can always look forward to finding something new, something being done differently. Come to think of it, if a process or procedure has been standing still for, say, a couple of years without changing, then we ought to look at it closer. Probably it's not serving as well as it should — because everything else is changing — because many people have found better ways of doing things in many other related areas.

"I think the real challenge for HP is how we manage change: How, for example, are we going to respond and organize ourselves to meet the changing needs of customers? And even more importantly, how are we going to maintain the human values that have been such an important part of the experience of working for this company?

"The problems of our customers are much more complex these days. Just recently I watched the television transmission of the lunar surface from Apollo 8. When you consider both the skill and courage of the crew plus the sophistication of the on-board electronics, which includes several computers, in relation



to the needs of 30 years ago, that tells a dramatic story about the extent to which many of our customers have changed.

"I think we've become a lot smarter in the past few years in looking at things that bear on our own business. In such areas as setting targets for our research, we have greatly improved the probabilities of inventing the right products at the right times.

"Our concern for the individual employee — his sense of identity in the midst of great change — has sharpened, too. I suppose it is quite natural in an enterprise as dynamic as HP for people to want more out of their jobs — more satisfaction, more knowledge of their job and where their efforts lead. They want to feel part of the total organization and not just job holders.

"I know that one of the concerns of HP people has been with the introduction of new techniques that could affect jobs. In essence they've said: 'Gee, you're going to get all these new-type circuits and computer techniques and you're not going to need so many people — so what's going to happen to me?' The answer is: 'In all probability we will need just as many people as before, but we HP people must change also and learn new techniques. Because we're a customer-oriented company and our customers' problems are growing more complex, the instruments are becoming more complicated. Each unit represents more value, more instrument per cubic inch. To accomplish this, HP people also are going to need more capabilities. In any case, this will develop over a long period of time.

"HP has been fortunate — it has attracted good people who have learned to enjoy and appreciate great flexibility in their day-to-day jobs. This flexibility is a very great asset in getting the job done and in creating a pleasant and adventurous work environment.

"In my mind, the key to managing change — to meeting the needs of our customers and our own people — will be found in the ways we

communicate. Computer-based information systems alone won't come close to doing the job, but they can be a very important tool. In the end, the answer lies in understanding the things that make us great — great people working toward common objectives — and better communications among all of us so that we understand the problems and the goals. The right decisions will follow."



AND THEN SOME . . .

John Terry, Experimental Model Maker, Manufacturing Division

"I think it was in November of 1939 when the fellow in the employment office told me about Hewlett and Packard. I said, 'They're building radios or something, aren't they?' So I looked in on them and told them, 'It looks like you need a little sheet metal work.'

"There were seven people there then, including Dave and Bill. We did a bit of everything that had to be done. None of us had any idea it would grow like this then. But when they were building the Redwood Building, I said I didn't think it was going to be big enough. I said they'll eventually have to build to the corner, and then some."



MANAGING OUR RESOURCES

Wayne Briggs, Corporate Accounting Manager

"Twelve years ago, when I joined the company, we did about \$28 million in business, and we had just one profit center to account for. Now we are getting close to that dollar figure each month, and at the moment there are 45 profit centers reporting.

"This growth has meant a complete revision of our accounts, involving a uniform accounting system covering 17 operating divisions and 28 marketing organizations—one that top management can use and one that is useful in the field.

"Although this system has been under continuous tweaking, we want to take a broader look at it, and

have assigned a task force made up of 'information users' to do just that. First, they'll be looking at each operation to see if decisions are made because they are the right decisions and not just because they please management. They'll take a look at our intra-corporate pricing practices and how these affect decision making. Finally, the whole philosophy of performance evaluation will be reviewed—all of this to make sure our present policies and methodology are responsive and meaningful.

"The emphasis on profit performance is not insignificant. More than most, we have relied on profit to finance our own growth, and realistically we should expect a doubling of growth in the next five years. Now to do that, we have to increase

our cash resources at the rate of 16 percent per year compounded.

"In the long term, we should probably shoot for a return on investment of 25 percent—not the 17, 18 or 19 percent of recent years. I can foresee realistic goals of 10 percent after taxes on sales and an asset-turnover ratio of 2.5 times.

"In addition to our internal growth, there perhaps are going to be other investment opportunities that would require cash.

"Our dealings with the government are unquestionably going to become more complex. That's just a way of life now. Consequently our group organizations can expect to add experts in the fields of tax regulations, commercial controls, and procurement regulations.

"Within the company there'll be increasing importance given to internal auditing, a function that didn't exist a few years ago. This audit will be not only for financial matters but also management systems—reviewing them for conformity and economy, making sure we are getting the highest return on our resources.

"Because the finance organization is worldwide and because of the magnitude of the company's growth, one of the major challenges to this department is going to be managing our chief resource—our finance and business management people. In the past I think we have been successful in promoting their development and providing opportunities for personal growth, and in keeping them stimulated and in communication with one another on common problems. All areas of the company face this same challenge."



CHANGE IS WHAT WE HAVE FOR SALE

**Jim Prestridge, Area Manager,
Lexington, Mass.**

"The big problem we are having to come to grips with is not that of the changing customer: his basic needs are not changing that much that fast. The real problem is our 'exploding product line.' Part of that explosion has been related to sociological change that has brought about a need for automation as a means of relieving human labor, with a resulting increase in the complexity of our equipment. But it is also related to our own growth resulting from our entry into new markets.

"The core of the problem is: how do we continue to put highly competent salesmen in front of our customers? In the past we've had a very strong sales force because we have been able to do just that. The salesman was able to approach the customer as a consultant — a role that

makes buying from us enjoyable, and one that is most productive.

"So we have been looking at ways to perpetuate this relationship, but it is increasingly difficult. It's clear that some degree of specialization in the field sales force is necessary. But the danger here is that specializing our sales force could tend to depersonalize our customer relationships. Almost by definition this is bad selling and certainly not in keeping with consultive selling.

"Another factor is that the field sales force is becoming quite large in its own right. Now in this area we are looking for half a dozen good men instead of the two or three a year we sought just several years ago. Over the years we've been able to attract mostly professional senior men who have been able to operate alone and almost without supervision. But I think that more and more we are going to have to train our own men from the start — to start with younger, less experienced people and train them ourselves.

"Perhaps there will be some sort of evolutionary training process whereby the new salesman will start out selling, say, calculators, go on to selling computers, and then on to systems — something like that — then perhaps back to the factory or into field management. The point is, we are going to be less able to rely on industry to train people for us. As a result, the fundamental makeup of our field sales force is changing.

"A significant change also is occurring in the role of salesmen in new product development. In the past, as a company, we have been

our own best customers, and many of our products for sale were originally developed to help us test our own efforts in the lab and the test bench. This was the most perfect form of market research, and we have had a very good batting average. But as the product line has broadened we've found that we can't do that so much any more because we are only one class of user while there are many classes of instruments in the new product line. Clearly it becomes increasingly dangerous to predicate our own product development on our own internal experience.

"So we need some continuous sort of monitoring of the information that's being generated constantly by our field people. The field men receive tremendous amounts of information about competitors and customers and products, but a good part of it gets lost because it doesn't fit any present method we have for information handling, assimilation and evaluation.

"Unquestionably, change is what we have to sell. Our customers do look to us to lead the way in new products and technologies, and the contribution of new products to the company's growth is more significant than ever before. This imposes an extra challenge to creative selling. By that I mean the type of selling that influences customers to buy the products they need by helping them to recognize their needs.

"But — we are coming to our problems openly, and since they are problems of growth and opportunity, they are the most delightful ones to have. I think the real challenge is to serve our customers even

better than we have in the past. Our goal in the new product areas should be the same as in our traditional areas, which essentially has been to make our customer's relationship with us one that is worry free for him personally and profitable for his company."



WE MUST LOOK FURTHER AHEAD

Austin Marx, Corporate Planning

"In spite of the many changes that 30 years have brought to the company, most of the original HP principles and objectives are still appropriate. One, for example, that

comes to mind is direct lines of communication — that the person with the problem goes to the person with the answer — not necessarily formal channels of communication.

"In the future, this tradition of direct communication may well put us further out ahead of our competitors who have more formal lines.

"A great deal of planning effort has gone into defining what we think our future role should be in our various markets. It's clear that we have plenty to do to keep us busy in serving these markets . . ."

"In the past few years, though, it has become clear that we needed more formalized long-range planning. Among the reasons for doing this were the obviously increased complexity of doing business, the worldwide scope of operations, rapid changes in technological development, sheer size of the organization, and the fact that it was growing fast and in continuing need of new facilities, services, and good people. There was a need to set long-range objectives and goals in a more coherent way so that managers could make better day-to-day decisions.

"As an example, it was long-range planning that showed some time ago that most of the manufacturing divisions had plans to set up integrated circuit manufacturing

operations of their own. As a result we've been able to locate these expensive facilities where they're needed and shared by other divisions.

"In the past, an important planning 'gap' has been in land and buildings; generally we've tended to underestimate our needs. So now we are coming to the point where we look ahead five or more years.

"Some of our communications problems are solving themselves — with the aid of planning. At first, the various businesses that were acquired in the past tended to operate at arm's length. Now they all appear to be pretty well part of the corporate family, thanks in part to the interchange of people, technology and even products.

"Now we are coping with some of our complex communications needs through organizational change. I think we should look on the new group structure as a very flexible concept able to change with our needs.

"A great deal of planning effort has gone into defining what we think our future role should be in our various markets. It's clear that we have plenty to do to keep us busy in serving these present and projected markets.

"Based on experience, we have found that we frequently can do new things better 'in house' rather than by acquisition. Our return on investment is better. In our R&D people we have a combination of resources unduplicated in the world. So rather than invest in a company that has made some progress in an area, we've found we can most likely go into that market more quickly and skillfully ourselves."

CHANGING MARKETS

For about the first 20 years of its corporate life, Hewlett-Packard remained exclusively in the field of electronic test instrumentation. Today, on the eve of its 30th anniversary, the product line has exploded to include acoustical, analytical, computational, medical, nuclear, and systems categories as well as special components, plus a greatly broadened group of the traditional instruments. The job of marketing these products on an increasingly world-wide scale is placing new demands on our marketing skills.

ZEROING IN ON 'TRADITIONAL' MARKETS

Bob Brunner, Marketing Manager, Operations Group

"Even though we are entering new markets and doing new things, there's still a great deal of growth available in the area of our traditional products. Just by employing more innovative marketing techniques, for example, I'm sure we could get more of the existing potential business for these lines.

"A great deal of our growth in the future will come from the non-electronic segments of industry. This tremendous part of the industrial complex is still not making full use of electronics. But new and automated ways of doing things are going to change all that. Even the explosion of computer and data product use will create related markets for a number of our traditional instruments.

"While we are a long way from having a line of consumer products, HP's products are beginning to become visible to the general public. This is happening in the hospitals and in many departments of our universities other than just engineering. It will begin to happen at secondary schools and business establishments because of the calculator, and in various other places where such broadly useful techniques as gas chromatography are needed. Along with this we will need a wider



range of selling techniques and a more diversified organization.

"The 'how to sell it' question has come up in regard to products such as power supplies: How do you get a busy sales engineer to sell a \$90 power supply? It would take selling 8,000 of them for a typical field engineer to make his yearly quota. There is still a big need around the world for instruments costing under \$1,000. Not everyone wants programmability or computer controls or a super network analyzer. To

keep on top of this low-cost market we need to have our selling effort somehow organized so that some people are putting major effort into getting these products sold to the very large number of small-quantity buyers who represent an untapped growth potential.

"Another possibility for increasing our business in traditional products lies in really 'zeroing in' on a specific business that just naturally uses large quantities of that type of product. A perfect example of this is the communications industry. By 'zeroing in' I mean making a combination engineering and marketing effort that results in our doing an outstanding product definition and design job, and then following up with an equally effective selling effort. To do this requires an in-depth understanding of the technology, operating requirements, and sales strategy that applies to the communications industry. Such a coordinated attack will certainly involve extensive cooperation among a number of divisions and sales regions, but this is just another dimension of our increasing marketing sophistication.

"It so happens that a number of our marketing people have, on their own, recognized the need to tackle this problem on an organized basis and they are now implementing their ideas with management approval. Their aim is to outline for all of HP the approaches we need to take to really penetrate the communications test equipment market, what products are needed, and what techniques are needed to sell them. Their first get-together on this was at an outstanding seminar held early

this year in Denver. A combination of regional sales and divisional marketing people, plus appropriate engineers formed a steering committee and put on a program that dealt specifically with the communications industry . . . what the product applications are and what strategy we need to adopt. It was immediately apparent that we can make great strides using such a concerted approach to a specific industry."

THE IMPORTANCE OF BEING INTERNATIONAL

Dick Alberding, General Manager, HPSA (Geneva)

"When HPSA was first set up in the late 1950s, the European market was many steps behind the U.S. There wasn't the high degree of demand for technological advancement that you find today and therefore less need for HP kinds of instruments. However, getting HP into the European marketplace at an early date was a key move for the company and showed a great deal of foresight, as borne out by the fact that European sales now account for over 15 percent of our total business.

"The establishment of HP manufacturing facilities in Europe has also contributed to this. Not only do they provide the marketing program with U.S.-designed products for manufacture within the European marketing community — they have also led to European-designed instruments and systems. It helps us compete price-wise, and it also helps develop the image that HP is in Europe to stay.



"The same kind of thinking prompted the company to make similar moves in Japan and the Far Eastern market in the early 1960s.

"HP brought a lot of new marketing concepts to Europe — one price policy, travel labs and demos, short delivery times, highly trained professional field engineers, after-sale service — practices that are common today. But we can't depend just on U.S.-developed ideas such as those. Here in Europe we are in a professional market that demands more than just the old and traditional marketing approaches.

"For example, we now have a regional sales framework — including discipline sales management — but we will have to move more slowly than our counterparts in the U.S. Professional as the market is, we still have to devise marketing programs that take into consideration such things as nationalism, language problems, business formality, the smaller size of our customer-companies, people and in-

strument mobility, and the difficulty in attracting people for field engineering positions.

"We have to personalize our marketing for each individual country, but many of our activities such as service and calibration, parts supply, personnel availability, and so forth, can be handled regionally. In fact, we will be starting a direct mail campaign within the next six months to tell our customers about this regional/area concept.

"HP has evolved into what has been called a 'geo-centric' company. Not only is there an awareness that international markets have their own identities, requiring overseas organizations established on this concept, but also — and very importantly — that there must be an international awareness within the U.S.-based manufacturing divisions and the corporate and group executive functions. In other words a global concept in setting policies and practices and in developing products and product families.

"In Europe, for example, our marketing operations are affected by the attempts at an economic union, by the growing size of the market, by the international growth of our European customers, and by the tremendously expanding product line, particularly when you include medical, data products, and chemical analysis. Without divisional and corporate understanding of these factors our marketing success would be severely limited.

"We have developed a truly international look to the company because our thinking goes far beyond just selling overseas — it involves all functions."



GREENHOUSES FOR GROWTH IN DATA PRODUCTS

Bill Davidow, Sales Manager, Data Products Group

"Predictions that the computer industry and related services will become the number-one industry in this country in the not-too-distant future are beginning to look quite realistic. It is our intention to be right in the thick of that growth.

"In the last 10 years, the cost per computer computation decreased by a factor of 1,000, while the speed of computation increased by 100,000. If the automobile industry could improve performance in a similar fashion, cars would now travel at 6,000,000 miles per hour and cost \$2 each. Rather than park them downtown it would be cheaper to dispose of them.

"Changes of a similar magnitude are going to happen in the computer business in the next 10 years, though

probably not quite so dramatically.

"The important point, as HP looks at this market, is that more and more customers will want to do more and more things with electronic data processing. They wouldn't do these things if they cost, say, \$1,000 to do, but they definitely will if it only costs \$10 or \$1.

"On the other hand, there also are scientific types of problems that didn't lend themselves to any solution prior to modern computer technology. Now the situation has been turned around—the problems are there, the tools are there to solve

"Quite simply, we are going to outrain our competition . . ."

them—and we are faced with bringing these together.

"Our basic task, in fact, is to make visible to customers and prospects the many things they could do with data processing.

"The computer business really is a service business. Customers need help in using these sophisticated devices. The result is going to be a much higher reliance by the customer on HP in the application of these products, on our software and service.

"Our basic strategy is one of training. Quite simply, we are going to outrain our competition, using regional training centers which Bill Hewlett calls 'our own greenhouses for growing qualified people!'

"Each month at our various data processing schools we are training large numbers of our own sales and service people as well as many more customers.

"Such trained people become coaches to others. For example, I recently showed my daughter how to work a complex puzzle. Now she operates it herself. In much the same way, a computer represents a puzzle to the untrained customer. He will be more and more willing to venture into new programs with us the more he understands the puzzle and appreciates our role in unlocking its secrets.

"For the long term we have many exciting product concepts in the works. Most of them will be in the general area of 'on-line' data processing services having considerable potential in time-sharing systems, in instrumentation environments and processing environments. Our growth will broaden from that base."



OUR THREE KEY ROLES IN MEDICINE

Dean Morton, General Manager, Waltham Division

"Important changes are sweeping the medical field, and fortunately these changes are in our favor.

"Medicine in the past has been described as a 'cottage industry' similar to 18th century industry. The individual general practitioner dominated the scene. While he is still important to us, the trend is clearly toward more specialization centered in hospitals where patients can more readily select from the many skills available.

"This trend is being accelerated by third-party funding of health services by states and private sources, all of which makes it easier to implement care through hospitals, clinics, and group practices.

"The physician's image of himself also is changing to something less ruggedly individualistic, and many now feel they can do a better

job of caring for human needs in the hospital environment.

"An important change has taken place in our thinking in regard to future medical markets. We have defined the areas in which we intend to concentrate, and this has been a big help to everybody here. These areas are: intensive care systems, which we will expand to include more than coronary care; cardiography, which increasingly will be

automated (the new three-channel machine is an important step in that direction because it would become the front-end of a data acquisition cart — part of a computerized analysis system); and diagnostic systems utilizing our recording systems with their associated signal conditioners in operating rooms and labs.

"These three areas should keep us very busy for a very long time. They are all intensively electronic,



MORE RESPONSIBILITIES

Alice Ackel, Scottsdale, Arizona Office Manager, Neely Sales Region

"The trend as I see it has been to put more and more responsibilities on the branch sales office. Today we do much more of the order processing and collection work, and our general responsibilities have broadened.

"On the other hand, the new order processing system has made life much easier for the branch people. We used to have to write up an order and put it in the mail to regional headquarters who would then send it on to the factory, and we would get confirmation days later. Now we transmit orders the same day they're placed here, and receive confirmation much sooner.

"That puts more of a requirement on us to have a broader knowledge of the production lines and the company-wide organization. The problem is keeping up — keeping informed of the many changes in assignments that take place in the factory organizations."

and we are very well qualified in them.

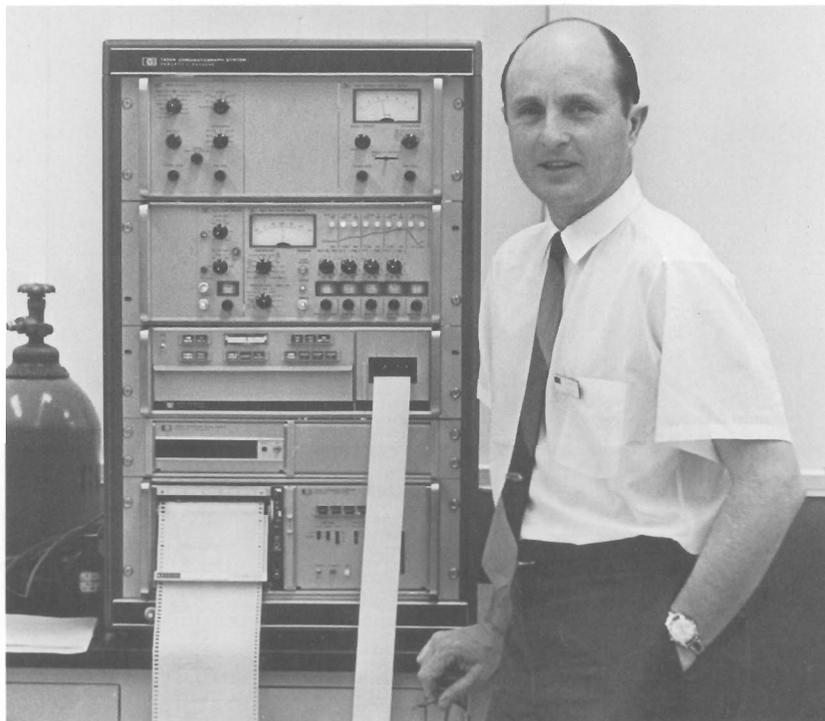
"The advantages of computer technology in medical systems are more evident every day. One important role we see in our ECG and ICU systems is simply taking some of the drudgery off the shoulders of the nurse — allowing her to spend most of her time administering to her patients. The computer can be a real servant here, and doesn't have to do complex mathematical work to be useful.

"So we have here a really big challenge — to tie together two of the faster growing areas of the company: medical products and data products.

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"To help our aims in medical products, we recently formed an action committee — MEDAC — that will bring together medical field managers from the seven basic domestic and overseas sales organizations plus representatives from Corporate Service and Waltham. The committee's function is communications concerning medical policy problems and marketing programs.

"Our goal is to maintain or surpass the 20 percent annual growth rate of our medical products during the past three years, and to provide true industry leadership in our chosen field!"



NEW THRESHOLDS FOR ANALYTICAL PRODUCTS

**Emery Rogers, General Manager,
Avondale Division**

"More than ever, I believe that HP made the correct decision when it entered the analytical business. That business forms a natural segment of the broad instrumentation spectrum.

"The fact that this division has shown improved performance in recent months, and the fact that our problems of identification with HP now appear to be resolved, lend support to this view. Now we can focus attention on positive aspects of our future.

"In the old days, the analytical instrumentation business dealt largely with retorts and test tubes. Then came what I call the 'middle period' which involved major developments in mass spectroscopy, infrared, nuclear magnetic resonance, gas chromatography and so on. These were performed by free-standing instruments, each creating its own revolution in analytical chemistry.

"Now we're in the third stage — that the corporation as a whole is feeling — in which the systems aspects, or data handling aspects, have burst to the fore.

"What's going on now is that the analytical chemist wants to automate the sample handling as thoroughly as he can, still using one of

those basic instruments as the heart of the system. He wants its output attached to an integrator or computer in order to analyze the data more effectively and efficiently, or to control the course of the experiment or analysis itself.

"Obviously, HP is a most logical contender in this era of automated analysis, because of its great strength in the world of electronics and data processing. We are, in fact, on the threshold of several very important developments of this kind.

"Among them is our new 7600 System which consists of a 7620 gas chromatograph, a 3370A integrator, an automatic liquid sampler, and a

teletype output which can match a time-share system, thereby converting the overall operation to a computer approach.

"Our field sales people are enthusiastic about the 7600 System which we introduced at the March meeting of the Analytical Conference in Cleveland.

"The analytical market, which has been through a leveling off period, now is stirring again. But beyond that we want to increase our share of the pie. Overseas markets look particularly promising.

"To create a stronger R&D link on behalf of some of our new projects, we've started an 'Avondale

West' in Palo Alto. The goal of this small group is to use all available resources to help speed projects into multiple, profitable production.

"It's important to achieve that goal because this industry is undergoing the same kind of shakeout experienced by the electronics industry as a whole several years ago. Some of the analytical instrument companies that had it easy now are finding it much harder. Just offering a technique is no longer enough. Now customers expect a quality instrument that will work all the time, and they expect us to bring them new approaches for the solution of their problems."

"Part of my new job description reads: 'The function of the regional discipline product manager is to improve factory-field communications. The expectation here is that I will be the contact on most factory-type problems with the four factories I cover. It should also include plenty of field-customer contact on my part.

"The feeling here is that, in the past, the field has not had enough influence on the kinds of products coming out of the factories. So one of the major contributions we think the product managers can make is in this area of new-product review.

"Another important concern will be product promotions. It has become harder and harder for the field men to call on the smaller customers. This is a real problem in this region because approximately half of our customers buy less than \$1,000 worth of instruments in a given year and half of these won't buy anything the following year.

"So this is where we need all the help we can get out of more imaginative and less costly ways of reaching these customers."



NEW FIELD / FACTORY RELATIONSHIP

**Fred Nearing,
Product Manager,
Midwest Sales Region**



A NEW KIND OF SALESMAN

Jack Dunn, Calculator Marketing Manager, Loveland Division

"The calculator has projected us into some very new and different markets. Now we are finding a significant portion of new types of users who don't fit anywhere in the HP order-identification code.

"This break with traditional markets has required a different composition in the calculator field sales force. Individual backgrounds of these new salesmen include mechanical engineering, civil engineering, forestry, accounting and economics. Indeed, one of our most successful salesmen in Europe previously sold carpets. He has just been a whirlwind because he remembers enough of his technical training to master the calculator, while his experience in selling a door-to-door kind of product really helps.

"In terms of selling, the calculator does present a different challenge. While the electronics field man has 'accounts' that he calls on regularly, the calculator salesman generally calls on completely new prospects each day. He has to make a very good first impression and sell himself and his product in about 90 minutes, and he has to be able to relate very quickly to the customer's particular need.

"The 9100 has had excellent acceptance in Europe. HP GmbH soon will start production in Boeblingen to help serve that market.

"In terms of the overall calculator market (which includes the scien-



tific calculator such as the HP machine, business type machines that are programmable or have subroutine capability, and the very crowded adding machine market), I believe we will always want to stay near the upper end of the scale. That is, unless we saw the possibility of making a real contribution in the hardware phase of other markets.

"In the future there probably will be less and less difference in the hardware offered by competitors. Here's where HP's strength in people will come in — in our sales ability, in software support, service capability, and the ability to interface with other instruments—coupling it with many other instruments and accessories."

CHANGING TECHNOLOGY

Ten years ago the company's research and development team was made up almost exclusively of electrical engineers plus a few mechanical engineers. Now we also have: physicists—general and engineering; chemists—general, biological, analytical and physical; engineers—aeronautical, ceramic, chemical, general industrial and mechanical; specialists in medical electronics; materials scientists; computer scientists; mathematicians; quantum electronics scientists; plus many other skills and talents. Their work promises continued technological leadership in the future.

CONCERN FOR THE SIMPLE AS WELL AS SOPHISTICATED

Marco Negrete, Engineering Manager, Loveland Division

“Technologically, things are going to change rapidly from now on into the '70s, and they are going to change because of what we are learning in the design and use of calculators and computers.

“The most significant development will be the adaptation of our new computer technology, as we find it in the calculator, to our instrument lines.

“There is concern that, because of the diversity of our product interests, we might neglect the simple bench-type instruments in the future, in favor of more sophisticated types of instruments. But I think the technology of the '70s will provide opportunities in both areas.

“The key to this is LSI—large-scale integration, that is integrated-circuit technology applied to large-scale problems. We view this as being the means of doing some of the things we would like to do without increasing costs beyond reason, and for evolving sophisticated systems while retaining the operating simplicity of bench-type instruments.

“In addition, hybrid technology will contribute greatly by making it possible to functionally integrate the analog portions of instruments, resulting in better performance and reliability.

“Not too long ago we were designing circuits of a dozen or so



active components. Now we are designing instruments with several hundred transistors or hundreds of IC packages, and if you count computing elements, then you're getting into the thousands.

“Computer-aided techniques have had to be developed to permit designs involving such numbers, so now we are concerned with developing these design tools as well as the instruments. Only in this way can we hope to keep instrument developments within reason.

“In order to satisfy our customers' needs in the future, we are going to have to understand and solve more of his total problem.

“We are going to have to fill many of the existing gaps ourselves. But in order to significantly develop totally new markets, we have to learn how to make it possible for the customer to extend existing techniques to solve his problem.”

THE SIGNIFICANCE OF SOFTWARE

Roy Clay, Software Development Manager, Cupertino Division

“Along with development of computers at HP has come a new discipline called software development. Its distinguishing characteristic from other HP developments is that it is product development without manufacturing. It is pure logic which causes the hardware to act in a certain way.

“Software will have a significantly positive effect on the company's product development effort and sales because of its effectiveness as a systems component.

“We are developing computer systems which should improve the efficiency of our operations and the quality of our products. One such system is the automatic printed cir-



cuit layout system under development in the Cupertino Division.

"Then there are diagnostics for hardware which assure quality and reliability of our products.

"It now appears that separate pricing of software and hardware is just about upon us. There are advantages to this practice for the customer in that he can purchase only what he needs, and he has multiple sources for computer products. There are advantages to the manufacturer in that he can recover development costs and get paid for value added through software. There are potential problems as well, having to do with software protection, pricing policy, demand for personnel and intensified competition within the industry.

"Regarding the potential of the software industry, what appears rather interesting to me is the very rapid rate at which efficiency is being improved everywhere. Managers are becoming more procedure oriented (generally more orderly). Technical people are working at developing new algorithms and the like, and are themselves becoming more procedure oriented. At the same time more computers are being built and programmers are becoming more observant with respect to automating new processes. Of special significance to programmers is the increasing orderliness of things. This observation is correlated with the fact that effective programming depends on detecting and describing an orderly process.

"Thus, it could happen eventually that the two remaining alternatives are: (1) to become a programmer or (2) be programmed out!"



'PROBING' THE PRODUCTION PROCESS

John Doyle, Manufacturing Manager, Palo Alto Electronics Group

"Generally in the last 10 years we've seen enormous increases in things such as printed circuitry and the use of automated processes to make manufacturing simpler and more reliable.

"The thing that will permit this to continue is the computer, especially the HP kind of small computer. It is giving us the opportunity for an entirely new generation of automation. The nice thing about these computers is that they are becoming much easier for people to interact with, so there will be lots of points along the way in which human judgment can be applied.

"Testing will increasingly be controlled by computer. We are getting further into the automation of circuit design, and eventually the art work might be produced automatically together with a tape for controlling drilling machines, and also

produce a program for loading the PC board and then testing it—all the way from design to final product in a continuous, semi-automatic process. The same sort of thing will be true of micro-assembly design.

"These kinds of changes will come about quite gradually. But more and more, we will be hiring manufacturing people who want to interact with this kind of technology. In 10 years you'll probably see people doing quite different things from today.

"In the assembly areas, the diversity of our products has prevented the development of such machines as an automated 'lazy susan' bringing parts to hand in a programmed way. Changes will occur here, too.

"The formation of the Manufacturing Division recently was designed to let us see what is happening in these manufacturing processes without confusing our view by other operations. We've pulled this one activity out sideways and can measure what it is doing on its own.

"It's clear from the new things we're producing that the company

seems to be integrating vertically more and more. For example, we've never manufactured many resistors. But when you produce integrated circuits you are also producing resistors by the millions. So, along the way, we have entered the business of producing transistors, resistors, capacitors and other things we were not making before. The solid-state display is another example of this.

"Our vertical integration is going up, too. We are building more systems—aggregations of our instruments and computers, and selling more products to other manufacturers to include in their systems.

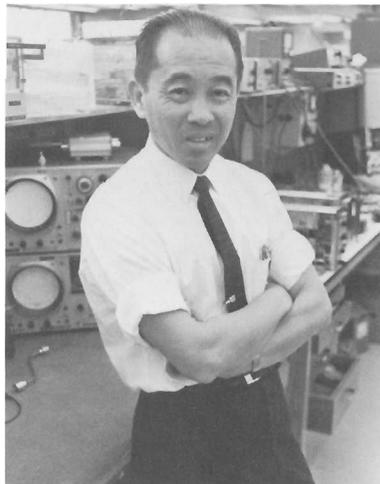
"So the strong prospect is that, along with automation, employment and opportunity are going to go up and up.

"Information systems are going to be very important in all of this. We're just getting started in this area with a system called Probe I that provides much more information right on down to the line leader. It tells where instruments are going, what the line's backlog is, and what the line shipped yesterday. It helps the line people feel much more intimately connected with the customer world. It can tell you when you are late, by how much you are late, and warns of probable lateness.

"With these systems we are moving not in the direction of less human control and involvement but more—because of more and better information. A manager is going to be more a manager than ever before because he will be relieved of tedious chores and allowed to work more with people and in making decisions.

"Probe I is the forerunner of even broader information systems that can give us great flexibility in managing our future. They will allow us at the operations level to act with all the flexibility of a small company, but to do so with the support of vital information available only through a big organization.

"Our ability to do such things is really a payoff of the new group structure?"



THE EVER-IMPORTANT INDIVIDUAL

**Art Fong, Senior Staff Engineer,
Microwave Division**

"Today, I think the field of engineering development is more interesting than ever and open to many significant contributions by the individual. Yet, because the complexity of a single part is equal to that of whole instruments in years past, it's unlikely that any one person will

ever again be solely responsible for developing a complete instrument. But the little module that the engineer works on could very well change the complexion of the whole project because of the way it reacts with other modules.

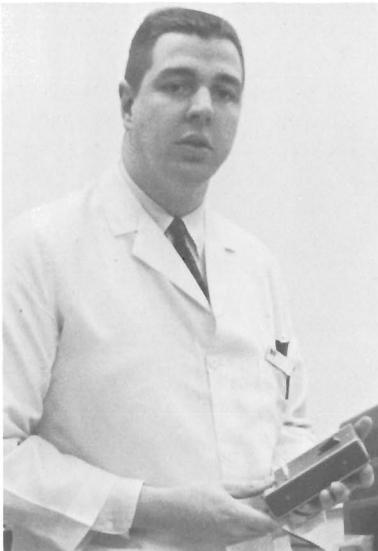
"Take the development of the spectrum analyzer as an example. At one point the project was standing still until we could find a better way of stabilizing the local oscillator. First we went through all of the various traditional methods. Then someone suggested the sampling method. Now this method was known and was in use in the sampling oscilloscope. But it took someone to recognize the problem and put the two together. I think that's a form of contribution.

"Contribution is also making what is possible in the lab feasible for production—as in thin film circuits for microwave applications. It did not require a new basic invention, but needed clever innovation. Much of the success of this company has been based on making things practical.

"There's still the opportunity for 'brainstorms'. Take the case of solving network analysis problems: all the programs that were available required a fairly large storage capacity in a computer—larger than that available in the HP computer. But an engineer in HP Labs envisioned how we would go about analyzing a network using an iterative process on the difference equation that didn't require a large storage. So as a result, it was possible to use the small computer. More than that, this approach could affect the whole market for engineering computers. So a

contribution can come about through mathematical innovation—expressing how you would solve a problem.

“Really, there are many more fields open these days in this company for the young person—such as medical and analytical instrumentation as well as the traditional fields. And there are many choices in these fields—research, design, marketing, manufacturing, management. Every one is wide open for contribution, even though more often than not it will be done in the context of team effort.”



STARTING WITH ATOMS

**Bob Burmeister, Group Leader,
Solid-State Laboratory, HP Labs**

“More and more we are working with exotic materials for special applications, because in many cases



A TEST IN TARGET SETTING

**Harlan Flattley,
Signal Generator
Production Manager,
Microwave Division**

“This year we’re going to try something new. We’re going to have each line leader sit down with his people and ask: ‘OK, what kind of production goals are we going to try to establish this year?’

“The idea is to let the individual on the line help decide what kind of target they’d like to shoot for. At the same time we want to have their ideas on how they are going to reach that target. For example, if an assembler thinks she can cut the time of a certain job in a certain way, fine—let’s hear about it.

“In the past we’ve had the line leaders set the goals and that worked out very well. This year we want the people on the line to help set the standard. Then we will post their goals and see how close we come during the year. So far, it looks good.”

now we cannot achieve a function with existing materials. So we have to create a new material—start with atoms and come up with new compounds having specific properties. For example, there are many materials that will conduct electricity but only a rare few that will modulate a light beam or generate microwaves.

“Already we have found that by using solid-state devices we have reached the limit of the human interface. We could go much smaller, since we are not far off from what is called ‘molecular electronics.’ But an instrument still needs knobs and

display devices that people can handle and see.

“However, materials technology permits us to contemplate individual instruments of much greater functional complexity combined with great ease of handling.

“It is possible, for example, to foresee the use of test devices comparable in function to some of our larger instruments but small enough to be held in the hand like a pen. We’ve even developed an experimental probe along these lines that would have its own built-in numerical display, using the new HP light-

emitting diodes that would help put measurement data right at the fingertips of the test technician.

"As a replacement for the Nixie tube, the diode is more rugged, takes less space, and operates at low voltage which makes it compatible with solid-state circuitry. In terms of materials technology it represents the push of solid-state electronics into higher and higher frequencies, in this case the optical range.

"These are some of the frontiers we are presently exploring in projects governed chiefly by the needs of the divisions for new devices — new functions — requiring precise control of properties.

"Our clients are also interested in improving reliability and economy. This is particularly important as the solid-state packages become more complex because small flaws usually cannot be reached for repair. Solid-state circuitry has a great advantage here because it is so easy for the designer to offset reduced yield through redundancy — building fail-safe circuits. Costs also have gone steadily down in spite of inflationary trends.

"The present trends in solid-state electronics clearly support the idea that instrument sizes will continue to go down while capability will go up. This has implications for all areas of the company. Obviously there will be more and more people in production areas working with parts on the scale of a human hair. An assembler will spend much time working through a microscope. Soldering may be eliminated because the circuit will already be in the material — perhaps thousands of them in a unit the size of a sugar cube."



GROWTH IN HIGH GEAR

**Tracy Storer, Engineering Manager,
Cupertino Division**

"Engineering programs in the Cupertino Division share the common components which characterize all of our Data Products Group activities . . . dynamic growth and its attendant high rate of change. This dynamic growth puts particular emphasis on two important activities: the development of a product strategy and the development of a strong engineering department through recruiting and personnel development.

"A relatively small number of very good people have been responsible for our initial product development success in computers. As we conceive and implement our next generation computer systems, we must add substantially to our hardware (and software) development staff. Our open employment requisitions for engineers speak for themselves: we have open opportunities for almost doubling our hardware design engineering staff this year. As in other HP divisions we plan to add a large number of engineers directly from universities. But we

also are active in trying to attract several key project managers with computer design experience. Some of these will come from outside the company; we expect that some will come from other HP divisions.

"The short time constant which characterizes our growth in Data Products demands increasing attention to develop our scarcest resource — people. We can make the most of our people's talents only by the investment of time and money in training programs both in-house and out. We are developing an orientation program for new engineers. In-house programs also include the excellent hardware and software courses offered by our training department. Outside programs include attendance at nearby schools and universities; we encourage completion of a master's degree and further for all engineers. In addition, special courses specific to the computer industry are available in periods from one day to two weeks.

*"... our growth demands
increasing attention to
develop our scarcest
resource — people."*

"We are often asked if we intend to 'take on IBM head-on.' Part of our answer is stated (in double negative form) by the English short story writer, Saki (H. H. Munro): 'the art of life is the avoidance of the unattainable,' says one of his characters. While avoiding the unattainable, we are concentrating on projects we can do uniquely well!"



THE IMAGE MUST BE HUMAN

Al Inhelder, Corporate Industrial Design Manager

"The 'black box' design approach is noticeably absent throughout our present product lines. This is due, in part, to greater emphasis on design in recent years. Today the industrial designer is a contributing member of the HP product development team.

"The aim has been to achieve basic tools that are easy and efficient to operate regardless of their functional complexity. More and more we have been able to match such tools to their intended environment, whether that be at the top of a telephone pole or inside a hospital.

"Our design efforts must deal with many considerations but the essential approach is one of human engineering. For example, the present degree of standardized design that has been achieved throughout the company's product lines provides a real benefit to the user. His ability to look at a new instrument and immediately recognize it as HP, or recognize familiar functions and fea-

tures, will build his confidence in his ability to operate it efficiently and accurately.

"The human relationship is also important in the question of instrument size. One of the complications, of course, arises from the rapid rate of technological change in components — their much higher density and smaller size. Added to this is the race to reduce the size of products to be smaller than one's com-

petitors. This trend is placing the electronics industry in the dangerous position of producing products that are difficult and costly to service. Spacing, positioning of controls, and knob-size-to-torque relationships all suffer, due to the severe panel size limitations imposed by this trend. The result can be wasted operator motions, errors, difficulty in manipulating controls, and general customer dissatisfaction. It must also be re-



'DOING A GOOD JOB' IS STILL BASIC

Gerry Inman, Production Engineer, F&T

"Does 'management by objective' work at the line level? You bet it does. In almost 16 years at HP I've never heard a supervisor say to someone: 'You're out of your chair — get back to work! Maybe something would be said if it was a chronic problem. But the basic approach is that generally we're saying: 'Here's your job (and we explain the job fully). You'll be evaluated on how you do that job. Do it well and there'll be advancement, raises and other opportunities'.

"The big thing is, you can't evaluate by looking over a person's shoulder. We ask people to record what they've done for a day, and this way over a month we can show them how they are performing — what their contribution is.

"I think this kind of approach to people has been extremely important to the company. It has made change and growth come much easier. People welcome change. I know the people around here have a very optimistic feeling about the move to the Santa Clara plant."

membered that while this product-size race continues, the human hand is getting larger.

"We are now taking a whole new approach to the way the hand and machine come together and saying: "How can we change the shape and function of the knobs and controls so that smaller products may be produced without sacrificing the most important consideration—its use by man?"

INTERNATIONAL TECHNICAL CONTRIBUTIONS

Wolfgang Ohme (left), GmbH R & D Manager; Heiner Blasser, GmbH Acoustics Lab Manager

"Although at times it might appear so, there is not really a significant technological gap between the U.S. and the other major countries of the world. For example, there has been much major basic research done in Europe and many important discoveries have been made: DDT, fuel cells, gas chromatography, the Hall generator, the Wankel motor, the Moessbauer effect, just to name a few.

"Rather, in Europe at least, there has been an entrepreneurial gap. There has not been enough initiative to reduce this research into practical, usable customer products. In other words, there has been little desire to take the necessary risks.

"Compounding this situation is a serious communication gap between private industry and the universities. At HP GmbH we are trying to overcome this by being more alert to university research. For example, from universities in Germany came



the basic research that led to HP's development of the cardiocograph (the fetal monitor) and the loudness analyzer.

"HP's international research and development organizations will probably have their greatest impact on the look of the company by developing instruments and systems such as those—that is, products and product families that are new to HP. Europe, because of the density of population and unstable weather conditions—just to name two key factors—has immediate need for measuring instruments that can help in combating such problems as air and noise pollution, and in better aircraft traffic control. We can design instruments to fill these needs, knowing that at some point in the future there will be markets for these instruments on a worldwide basis.

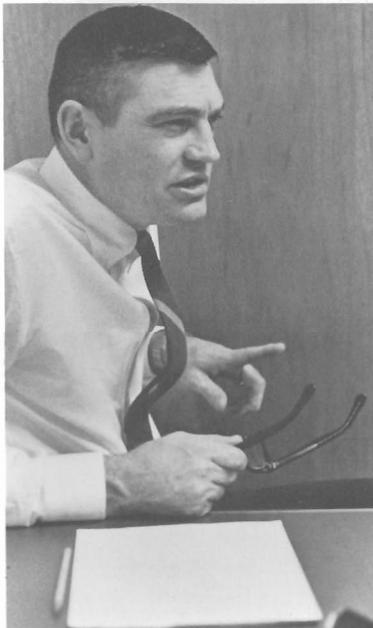
"The development of the com-

puter family and the HP systems approach has been very beneficial to us, particularly as it applies to acoustic and loudness instrumentation. Data reduction systems are also a part of this, of course. It means our customers can buy a system which has been designed, manufactured, and marketed by one manufacturer.

"We also expect the new group structure to be very beneficial. Communications between the international locations and the U.S. are difficult at best, and so we welcome any attempt to improve on the situation. The group arrangement will mean that we will be getting better and faster exchanges of technology, and better feedback on marketing needs of the future, because we only need to be in contact with representatives from four or five groups, rather than the 17 divisions under the former arrangement."

CHANGING ENVIRONMENT

During the 60s our affluent society has faced a peculiar dilemma: the sharply rising curve of our Grand National Product could almost substitute as the fever chart of the Grand National Protest. Certainly fewer and fewer people of the ghettos and campuses believe that the meek shall inherit the earth. Their voices are being heard in every living room, city and state capitol, and corporate board room. And these are not the only sounds of protest and petition rising out of an environment increasingly crowded and complex. Question: Is it any of our business?



A BASIC RESPONSIBILITY

**Dan Mirich, Personnel Manager,
Loveland Division**

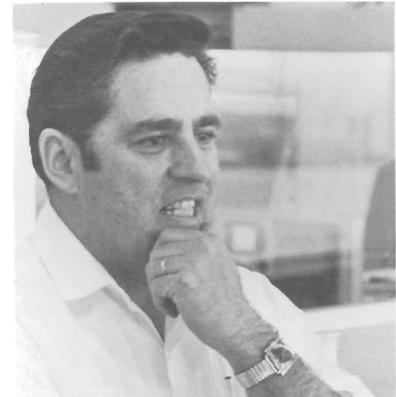
"A large business organization should have and must accept responsibilities toward the community, and here the definition of community should include society and not just the local township in which it happens to locate. HP has always been willing to do its share, if not more, in this way. However, our society today is in crisis and extraordinary measures are needed to relieve tensions and bring about a solution.

"As far as industry's responsibility toward minorities is concerned, you will notice that a great many large companies have left the core-city environment in recent years and settled in the suburbs. Now, when plants and payrolls leave the city, then taxpayers and homeowners, smaller businesses and jobs leave too. Minority people have been the ones left behind without the jobs and opportunities.

"Who should take on the responsibility for helping to correct that situation? Industry, for one thing, is in a far better position to train people for employment than government or any other agency, because industry has the know-how and the jobs. It may have to spend more time training a minority person, but the point is that he can be made a productive member of society, a taxpayer instead of a tax consumer.

"It's a question of whether industry really wants that person to be self supporting and a contributor or whether it is willing to leave the solution up to government which will add the cost onto tax bills.

"Industry may need incentives to get the job done—tax credits and the like. That's the way industry works. However, more can be gained if we do these things from the point of view that they are the right things to do, from a constitutional and moral position, and not only on the basis of fear or economics."



A BULL MARKET FOR TECHNICAL TALENT?

**Blair Harrison, Microcircuit and
Pulse Generator Lab Manager,
Colorado Springs Division**

"Some college administrators are warning us that fewer students are looking to technology as a future. And I must say that at the universities I've visited for recruitment purposes, the enrollments in the technical fields have remained relatively constant over the past few years. In comparison, total enrollment in other fields has been going up very fast. This will mean even more competition for engineering talent in the future.

"It seems to be tied partly to draft pressures and partly to the general youth rebellion that seems to be taking place throughout the U.S. and the world. Some professors I've talked to, including one from Columbia, said they thought that students were quite justified in their desire for change. But they also felt that their tactics are wrong and are self-defeating in many cases. These faculty people don't place the blame

on the universities but more on the whole society and the pressures it puts on young people today, particularly the war and the draft.

"It takes a pretty serious-minded young man to go into engineering these days, and this is probably why I have yet to interview a rebellious, irresponsible graduate engineer. Technical courses are more and more demanding, the work load is high, so apparently there is a greater risk of falling behind in grades and thus losing draft deferment status.

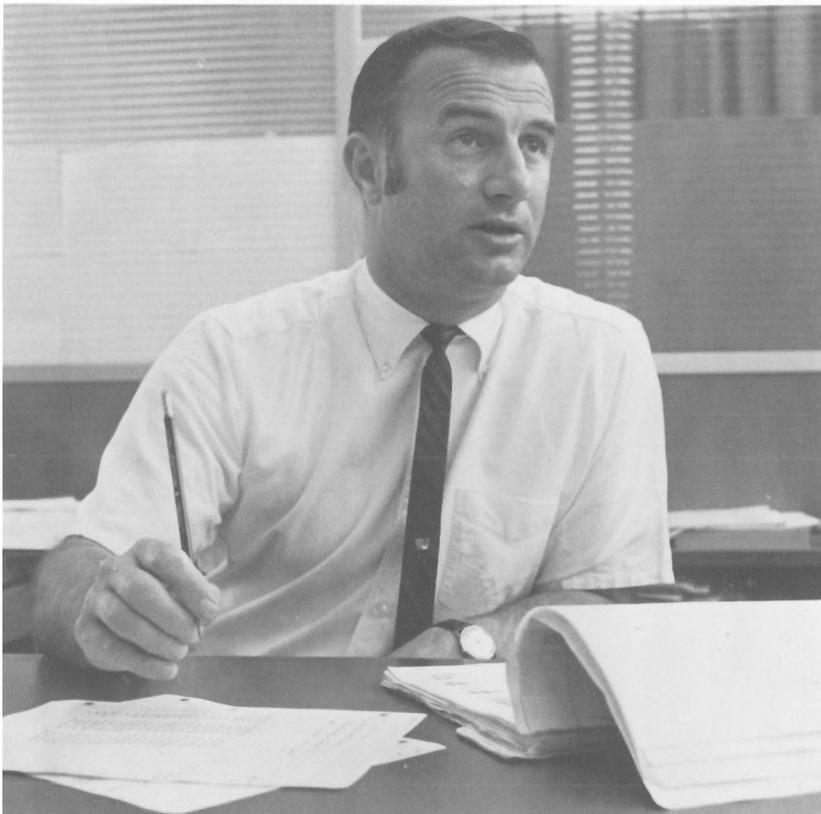
"On the other hand, today's engineering graduate, on the average, is

a little higher caliber than before—more mature, more technically sophisticated. This sophistication is on the theoretical side, and in many cases it's going to take a good amount of practical orientation to make a good working engineer out of him.

"The best we see are those that have had exposure to industry either through work-study programs or full-time work. The attitude of many of these students is: 'I don't want anybody to give me anything, but I want the opportunity to show what I can do, and I expect to get what

I'm worth out of industry'. They are really turned on. The overall perspective that comes from exposure to industry and to this attitude is extremely important to HP.

"I know HP is actively participating with some of these work-study programs, including those at Rensselaer Institute and Cornell. But the real challenge in the face of the declining enrollment ratio is for industry and education to work even more closely together to provide an adequate number of good engineers to satisfy the technological needs of today and tomorrow."



THE BLACK AND WHITE RELATIONSHIP

**Joe Barr, HP Internal
Audit Manager;
Director, EPA Electronics, Inc.**

"'Black capitalism' or 'black entrepreneurship' as it is being called will need a lot of help from the white business community. If you look at the statistics on new black businesses, a great number have failed, most of them because of management problems. Finding qualified black managers is extremely difficult. There is now a big demand for such men throughout industry and, as a result, there is a scarcity of the kind of management talent needed to make 'black capitalism' successful.

"So there has to be more emphasis on developing managers among the minorities, perhaps some sort of managerial program in which candidates would take a special business course at a local university or



junior college, and in addition, would work for a time alongside managers in a 'real world' successful business situation. If nothing is done on this point, then all of the minority business funding programs offered by the government are going to have very little meaning. These programs are important and well intended, but right now there is more money available than there are qualified managers.

"Industry will have to become involved because, in the long haul, government programs are just not going to get the job done. The game they play is not realistic, but when industry steps in, certain standards of performance are set, and this is what the people need.

"There has been talk about some sort of tax incentive for industry to take on some of the responsibility, and I think that's the way to go.

"How does all this affect the company? The social incentive to help is very strong because if industry and the private citizen do not recognize the seriousness of the minority situation then we are going to have a very dangerous problem in this country in the next few years.

"The real danger is that extremists will go too far. I think that militancy has served its purpose, but that it should now 'cool it' and not risk a backlash. As an example, the black community has got the attention of the white community, and everyone is now aware of the problem. I think there's a lot of momentum now going to work on this problem.

"In becoming involved in the everyday problems of a minority business, as I have at EPA, I've

found it easy to forget about the black and white relationship and about any racial problem. At EPA we deal with the daily problems we have, and treat each other as individuals, not as social problems.

"We are realistic about the goals of the business. Our first objective at EPA is to make a profit, because if we can't do that then we can't grow or provide the job opportunities needed in the community.

"We all—black, brown, yellow, white, polka dot or whatever—have to work together. Not in the role of martyrs or do-gooders, but as individuals who recognize the problem and are willing to share the responsibility. A temporary interest or curiosity are worthless. The commitment by industry and by you and me has to be a lasting one."

A STARTLING ATTITUDE GAP

**Stephen Adam, Project Leader,
Microwave Division; 1968-69
President, Bay Area Council for
Electronics Education**

"Several years ago, in making a survey for the Council, I asked thousands of high school science students what they thought electronic technicians did.

"The answers were startling—really bad: 88 per cent of them said they thought the technician was a TV/radio repairman. Actually, repairmen are only two percent of the total.

"With that impression it was no wonder they were holding back from entering the field.

"Meanwhile the Council has made considerable progress in cor-



recting this problem. The schools, in this area at least, are set to graduate many more qualified people. Unfortunately, with the slowdown in the industry, there may not be openings for them, so it is very possible the schools may lose their enthusiasm for our program. And then, of course, the time will come when there is great demand again.

"Actually, Hewlett-Packard has not been so affected by these fluctuations because we are not tied to contract work, as so many electronics firms are, and we can offer steady employment.

"But we are affected by public attitudes towards the careers we offer. The work is getting more and more demanding, and I can foresee where the basic requirement for starting technicians eventually will go up to the BSc and EE levels."



CHANGES ON CAMPUS

Stan McCarthy, Recorder Products Engineering Manager, Waltham Division

"I haven't seen any riots on any of the campuses I've visited in the course of recruiting, and engineering students seem to have few unorthodox views and are strongly oriented toward professional goals.

"But there are changes noticeable, and this could have a bearing on the makeup of engineering staffs at HP in the future.

"For example, there seems to be a greater degree of impatience for personal advancement on the part of the recent graduate engineer. He wants things to happen faster, and feels that he is not going to get very far unless he moves quickly into management or other areas to get ahead, whereas graduates used to want to work at least a half-dozen years before taking on more responsibilities.

"Among all of these students there's a great emphasis on avoiding the draft. This of course is tied to

the world situation. The majority of engineering students seem not so much philosophically involved as personally involved. That is, they'd just as soon not have to go to Vietnam. With draft deferments no longer easily available for graduate studies, they are interested in getting a job right after completing undergraduate school, getting an industry deferment and then continuing their work toward advanced degrees on a

co-op basis with their employers.

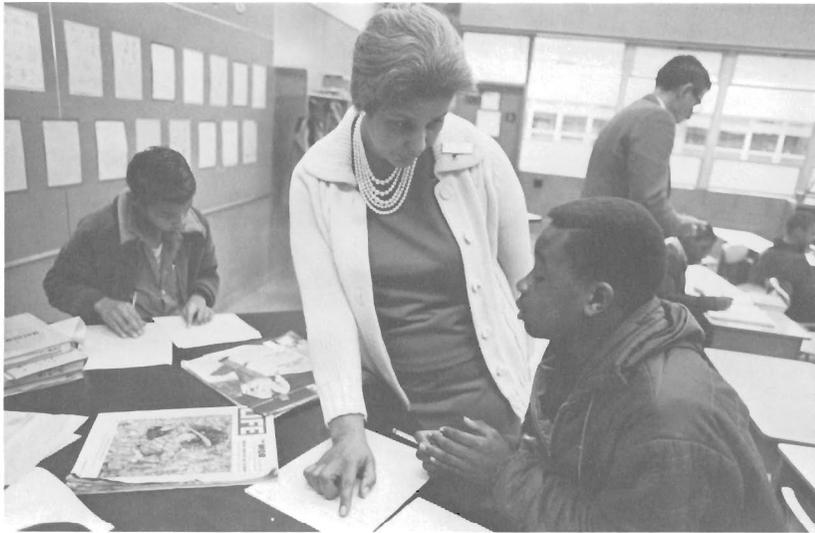
"I'm not sure that we won't some day see the advent of the five-year engineering undergraduate course, as Cornell has tried. The extra time should be filled with more than just technical studies. On the other hand, liberal arts majors probably should have more exposure to technical studies. I think that would help to improve their understanding of the world of science and technology."



PEOPLE MOVING AHEAD

Janett Urquhart, Housemother, Waltham Division

"The really encouraging change I've seen since Hewlett-Packard came here is that you can see people move ahead. So many things have been made available — training, new jobs and bigger opportunities — that a person has only to reach out and help himself. That's a great change from the days when we were a closely run small firm, and it's rather exciting. "Just this morning a girl said that she didn't see much of a future for herself in her work. I asked her what she thought she would like to try — that we could work it out because there were opportunities for change if she were willing to learn!"



HELPING GHETTO CHILDREN

**Ethel Green, Cost Accounting,
Microwave Division**

"The program of tutoring children in the ghetto was set up by Dave Packard himself. He recognized the need to give these children an extra helping hand.

"In almost all cases, the children who need this help don't get it at home. The parents don't understand or don't care, and the child suffers.

"In other cases, such as the math group I tutor twice a week, the children have the extra problem of struggling with the 'new' math. In some of the schools they just didn't get it, and of course their parents don't know it, so the students keep falling more and more behind. The instructors need help, too, because the personal problems these children bring them are just too much.

"I think we really should start

helping these children much sooner in life. I think they need the help—and will react to it better—in their pre-school years. There should be some way of involving the parents in this too. Also—surely many non-working housewives could afford the time to tutor children in need of help.

"What's really missing in the lives of these children is love. They're basically very capable of doing the work. They need encouragement of some sort, a feeling of belonging and that they matter as individuals. If they don't get this, then they throw up a wall and live in a world all their own. Or they lash out and demand attention in ways other people don't like.

"I wish more companies and people would get involved in helping these children. It would be a great help in cooling those long, hot summers we've been having."



GOOD EXPERIENCE AT SKOKIE

**Bill Harmsen, Business Manager,
Midwest Sales Region**

"What can a field sales organization do about social responsibility—about opportunities for minorities?

"Even as an independent rep organization years ago, we subscribed to the practice of equal opportunity for all people, and as long as I can remember we've had employees from underprivileged environments working here—black, brown and white.

"Of course, there's more to the situation than that and there's a great deal to be done. We've made an effort to bring in more permanent employees from depressed areas. Last summer we hired two young fellows from the ghetto to give them a taste of the many kinds of jobs and possibilities they might try later.

It was a good experience because one of these boys really responded.

"It's good experience for us too, because our field people come in from time to time and they can see how this sort of thing can be done. It's something the field offices can do, and we are confident they will.

"It isn't always easy for a sales organization to do this. For one thing, our offices almost invariably are located outside the cities and out of reach of public transportation. Still, we've organized pickup service to the train depot nearest here, and that works pretty well.

"As a result of our experience in bringing kids here from technical trade schools to learn something about our industry, I'm planning to suggest the idea for the Skokie Valley Industrial Group. This represents a very large part of local industry, and if this kind of idea gets off the ground I think it could help the overall program."



WORK IS THE BEGINNING OF DIGNITY

Charles Fikes, Model Maker, Manufacturing Division

"Two things can be done to help people in the ghettos—provide jobs and help the children get a better start in life.

"If a man can get over his economic hurdles, if he can have a job

that means something, then he can work out most of his other problems. If he can't get a job, he has no dignity because he can't take care of his family. A lot of school dropouts start because these kids don't have the clothes, the food and the opportunities other people have.

"The ghetto kids are becoming more hostile than ever. They want things to happen right now, and they resent the fact that these things haven't happened already. This generation gap is not new, but it has become more profound because kids today are more aware.

"Industry and private people could help just by giving these kids more experiences and exposure to life. When Dave Packard took some of these youngsters on a picnic—you should have seen them. The only things they knew were the streets. They were amazed at everything they saw on the farm. It was a whole new world!"

HOPE
FOR
THE
'HARD
CORE'



**Carmelo Gonzales,
Waveguide Fab Shop,
Microwave Division**

"I was working in a lettuce packing shed in Tracy when I heard about the hard-core hiring program from my brother. When I applied I was told that if it wasn't for this program, none of the companies in the program probably would hire me, because of my lack of experience.

"This program is really good for school dropouts. I left school at 16 to earn money. That was in Texas. I didn't realize that some day I would want more education.

"Out there on the farms or driving a truck, you might find a job that's good, or one not so good or no job at all. I have a family and I wanted a steady job and a place for us to settle down.

"I was in training a whole month before I became full time at HP. At orientation the other day I heard about the training programs that people can take here. I want to go back to school and improve my training."

With so many things changing and growing so fast in the company, are we in fact doing a good job of communicating with one another? And how well are we maintaining the good person-to-person relationships and sense of participation traditional in Hewlett-Packard? Measure selected the oscillator line at Loveland to take an on-the-spot look at how these goals are really being met right at the line level. Among reasons for choosing this particular line is the fact that it produces an important range of traditional products that also are quite up-to-date technically—a mix of the old and the new.

QUESTION:

Can we still communicate?

Answer:

Communication — and relating to the job — involve more than words, according to

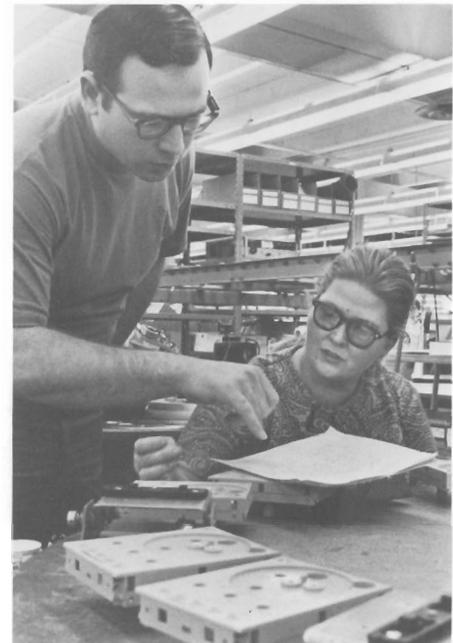
Don Cullen, Loveland's manufacturing manager. A person needs to know and understand what has been achieved. The 'Lazy Susan' assembly technique used here allows Shirley Gerlock the satisfaction of seeing the results of her day's work at day's end.





Answer:

Communication is a personal evaluation session. The chance to talk about individual performance and goals is an important communications opportunity. At this session, Geri Snyder in center hears what Supervisor Sherrill West and Line Leader Betty Moore have to discuss. It's another occasion for reinforcing the continuing two-way flow of communications.



Answer:

Communication is understanding the goals of the job. It's a line supervisor such as Bill Marr explaining the schedule to Joy Kirkpatrick. Early each month Bill visits each person in his area to review targets for the coming weeks. Cullen also tries to do a complete round at least once a month.



Answer:

Communication is bringing supervisors together on the first and third Mondays of the month. Here Production Manager Joe Conrad goes over latest results, and later showed a film on how people can improve on-the-job communications. In turn, the supervisors lead monthly extended coffee-break meetings where all people on the line have a chance to discuss common problems.



Answer:

Communication is the "Weekly Word," a quick and newsy review of the division's achievements and activities. Copies are distributed on the job to various areas and passed along, as offered here by Dee Austin to Susan Whitman of the line-fab department. The division also publishes its monthly "Hi-Points," and of course everyone reads "Measure."

Answer:

Communication is a get-together between people of various departments of the division. It's Bob Dudley of the lab, at left, talking about 651 oscillators with Homer Boutz, line test engineer. Interchange of people in divisions and between divisions is more and more an important avenue of communication.





“I think we get very good information about the company and about the job — especially since we started the new monthly meetings. We really asked a lot of questions and discovered we had a lot of questions in common. It definitely has made me aware of the new types of production and procedures that involve all of us.

“I really appreciate knowing where our products are going, who the customers are. It has given me a better feeling knowing how worldwide HP is.

“The chance for the individual to change is important, too. It’s kind of a challenge to try something new, to learn new jobs and meet new people.

“The girls here all keep an eye on the weekly performance reports that tell us how we did and how they did. I think all of us enjoy the friendly competition.”



the changing look of Hewlett-Packard

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