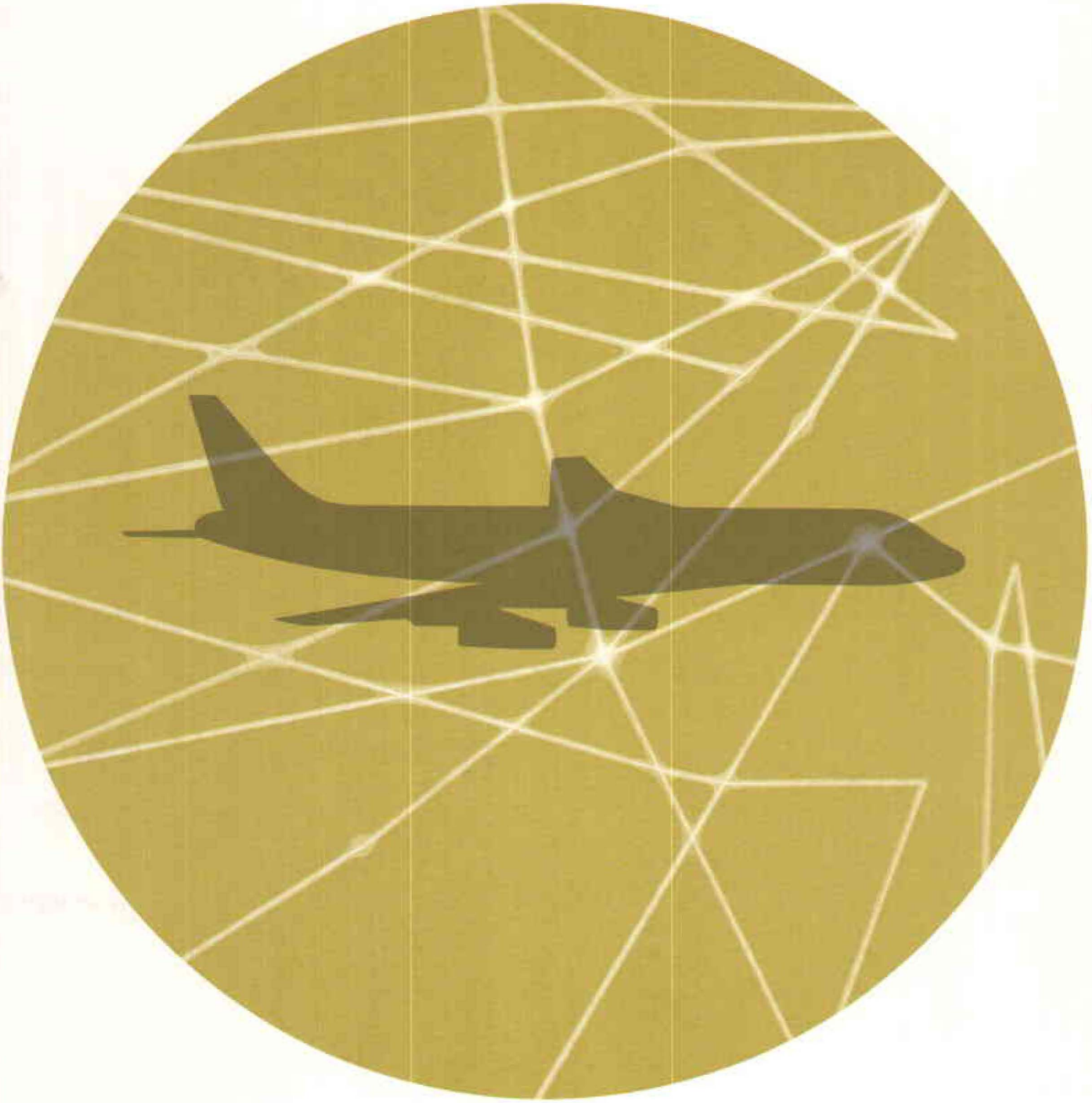

Measure

For the men and women of Hewlett-Packard / APRIL 1968

Flight 27

Electronic highways guide the traveler through today's crowded skies

Relaxing for the first time in a business-packed day, Mr. Veteran Traveler adjusts his window seat and for the umpteenth time watches the pre-flight testing of the control surfaces. At last, the eight-million-dollar United Air Lines DC-8 moves away from the loading dock toward a distant runway. Kennedy Airport buildings begin to move past his eyes, and his almost trance-like state is broken only when a stewardess begins the pre-flight announcements over the PA system. At the end of the field, the huge plane halts before swinging out onto the long, long runway. Flight 27 is ready for takeoff.

Flight 27 actually had begun hours earlier on that Friday. A computer in the airline company's headquarters offices in Chicago started the chain of events when it selected one flight plan from among 1,000 different potential plans between Kennedy and San Francisco airports. Filed with the Federal Aviation Agency (FAA) an hour or so before flight time, the selected plan was the key that set in motion a non-stop sequence of contacts and controls between the aircraft and FAA's Air Traffic Control (ATC) centers across the nation.

Holding short of the runway, Flight 27 — with pilot, copilot, flight engineer, four stewardesses, 110 passengers, a full load of baggage, and 18,000 gallons of kerosene fuel — was the center of intense surveillance by one of the most elaborate networks of communication ever devised by man.

The pilot swung the big plane onto the runway, increased his engines to full power, and within just a few seconds of its scheduled departure time of 5:30 p.m. Flight 27 was in the air.

Using radar, the tower "vectored" the jet through the crowded New York skies to a preset position at 24,000 feet.

Back in the cabin, the No Smoking and Fasten Seat Belts signs went out, and people began to stir into action. Stewardesses distributed magazines and earphones. Mr. Veteran Traveler took the latter, plugged them in, and settled back to listen to some stereo music. Ahead of him lay a relaxing drink, a good dinner, and a wide-screen John Wayne movie. It would be another pleasant, but routine and unexciting trip. Nothing much to flying anymore, he thought.

Once in the air, Flight 27 was guided by the ATC's long-range air route surveillance radar. As it moved toward San Francisco it would be observed and con-

Tower controller directs aircraft as they take off and land. Last year Federal Aviation Agency controllers handled takeoffs and landings at some 275 U.S. commercial airports.

trolled by eight ATC centers along its route. In addition, it had a requirement to tune in by radio with 13 VOR (VHF Omni-Range) facilities dotting its path. These in turn would provide the basic data for guidance to its destination.

Much of this complex flight operation is accomplished within the aircraft by automatic instrumentation and controls such as the autopilot and air data computer systems. But the vigilance of the flight crew is constant. The crew is prepared at all times to take over manual control of the aircraft or to adopt any of the alternate systems devised in the interest of air safety. In fact, more than half the controls in the cockpit of the modern jet are made up of just such backup systems.

About three out of four times Flight 27 proceeds according to its flight plan with little or no change. The plan is selected as carefully as possible to put the plane above and beyond the reach of known storms and turbulence, and on a course computed for a combination of safety, comfort, and economy (in that order, according to airline officials).

But, tonight's Flight 27 has just received new information. A storm has been reported building up at flight altitude beyond the Great Lakes area. The storm's front is wide, but not deep — typical of the thunderstorms that bombard the Midwest from March to August. Pilots call it "radar weather."

Cocktails have been served, and many passengers are having dinner. Outside it is growing dark, and there is so little motion in the plane, that most of the occupants find it hard to believe that they are dining some 31,000 feet in the air. Finally, the dinner trays are removed, the screens lowered, and Mr. Veteran Traveler settles back to watch John Wayne and his fight to tame the Old West.

With notification of the storm front, Flight 27's skipper turns his attention to the plane's weather radar scope to see just what is in store for the ship and its passengers. To the north of his flight pattern he spots a break, a hole in the storm. Flying with manual controls, the pilot maneuvers the DC-8 on a wide sweeping approach to the break. Meanwhile the copilot has contacted the controlling ATC center and advised it of the change in flight plans.

Thanks to the 150-mile range of the radar there is time to make an easy exit through the storm. The seat belt sign remains off, and there is scarcely a ripple in the coffee being served in the cabin.

(continued)

electronic highways



Maintenance and calibration of flight instruments is a major task for airlines and FAA, which employ thousands of electronic technicians to perform these critical functions. HP equipment is widely used throughout the commercial aviation industry in jobs ranging from research to routine checkout of aircraft flight instruments. Above from left are examples of applications at United Air Lines' maintenance facility near San Francisco: quartz crystal thermometer is used in standard lab for differential testing of special barometers; a VHF transceiver—combined transmitting and receiving unit—is checked through a variety of HP instruments including RF millivoltmeter, audio oscillator, scope, and VHF signal generator; an eight-channel tape unit is tested on similar equipment.

In 10 years, the number of aircraft in U.S. skies has doubled. The number of landings and takeoffs in 1967 rose to more than 41 million, with approximately one out of every three handled by FAA instrument flight rules. The takeoff and landing figure is expected to almost triple in the next decade, and the airlines forecast that they'll be carrying some 350 million passengers a year by 1978. Airports are also expected to increase from the 120 that can now handle jets to some 500 by 1975.

The result will be something of a traffic jam both at the airports and in the skies. To relieve this congestion the Federal government and the aviation industry have turned increasingly to systems of automatic guidance, control, and communications. By all counts, these systems have done a remarkable job. Air collisions have almost become a thing of the past.

Still, a look at the future indicates that there can be no letup in the need to search for even better control. On the list of most experts are collision warning devices, and systems that will permit total instrument landings regardless of weather and visibility.

Implicit in the overall aviation picture is the need for electronic test instrumentation that is both accurate and unfailing. With jumbo planes due to carry hundreds of passengers at supersonic speeds, the margin for error will have shrunk out of sight.

A visit to an FAA facility or an airline maintenance center quickly shows HP's involvement in the commercial aviation industry. At one maintenance facility, a huge complex employing more than 7,000 people and located near the San Francisco airport, there are literally hundreds of HP products being used to check and calibrate all of the various aircraft systems—navigation, communications, engine, and even entertainment.

Each of the FAA's 32 control centers represent sizeable concentrations of HP instrumentation. In addition, many of the smaller FAA facilities, including the scores of airport towers handling aircraft using instrument flight rules, also employ considerable HP gear.

Moreover, there is a substantial involvement in aviation standards labs where the test instruments themselves are evaluated and calibrated, as well as in the R&D labs where new flight instruments and systems are engineered.

It is apparent that here is one of the company's most interesting and exciting markets. And because of the nature of the industry, particularly since the advent of instrument flight rules, it is a market which bears a critical requirement for reliability.

The sounds of blazing guns, rattling stagecoaches, and saloon brawls cover the soft drone of the plane. After innumerable setbacks, the good guys finally win, and the movie screens are put away for another day. Throughout the cabin, thoughts turn to San Francisco.

Comfortably past the storm area, Flight 27 is back on autopilot. As it has moved along, and its fuel load lightened, the plane has climbed from 31,000 to 35,000 and finally to 39,000 feet — gaining speed at each new level as it encounters less air resistance. This altitude gain is particularly important on the east-to-west run because of the prevailing high-speed, high-altitude winds caused by the earth's rotation. (The flight from west to east is one hour faster.)

The pilot dials in to VOR check points at Crazy Woman, Wyoming; Boysen Reservoir and Malad City in Idaho; and Battle Mountain and Reno, Nevada. Then, 39,000 feet over the Sierra it begins the long glide toward the Pacific Coast.

With the Oakland ATC center in control, Flight 27 heads south to receive vector headings from the bay approach control, preliminary to its approach into the San Francisco airport. About 25 miles from San Francisco, the tower controllers see Flight 27 as a double blip on the edge of radarscope. The extra blip is the product of the plane's transponder which, in military situations, provides a "friend or foe" signal.

But quite suddenly another blip comes into view that conceivably could intercept Flight 27.

The No Smoking and Fasten Seat Belt signs are on in preparation for the landing, and passengers are having final, last-minute conversations with seat companions.

The pilot of Flight 27 has also observed the blinking lights of an aircraft ahead.

However, the pilot knows that such lights can seem close when in fact the planes are separated by more than the required 1,000 feet in altitude. A quick check with the tower establishes that the new blip is an identified plane on a holding pattern well above Flight 27.

Flight 27 is now ready to make its ILS (instrument landing system) approach to San Francisco International. Approximately seven miles from the runway a purple light flashes on the ILS indicator telling the pilot that he has passed the outer marker of the glide slope. Next comes the inner marker signal, an amber light on the indicator. The glide slope — actually a complex radio system furnishing horizontal and vertical flight guidance down a narrowing course — leads the plane along the correct descent angle to a point within easy visual touchdown on the runway. Tower controllers then talk the plane through its taxi run to the terminal.

"Home again with no sweat," said the traveler to his seat companion. "It gets easier all the time. Yes, sir, old John Wayne got us through again. Remember him in 'Stagecoach'? Now there was the exciting way to travel."

Flight 27, and all other aircraft flying by instrument flight rules, are handled between airports by 32 air route traffic control centers across the country. Highly sophisticated instruments including long-range radar help keep airborne IFR craft under surveillance at all times.

Pete Dawson (right) of Palo Alto Division describes a portion of the inner workings of the new 2012B data acquisition system for a prospective customer.

HP at IEEE: more than meets the eye...

☐ With some 50 new instruments, Hewlett-Packard once again put on a very solid showing at the Institute of Electrical and Electronics Engineers (IEEE) show in New York City last month.

But looking beyond individual instruments, a canny observer would have seen an even bigger picture — the changing nature of HP's business. Never before has the company put such emphasis on interrelated instrument systems, and never before has the influence of the computer played such a major role in this trend.

Here are some examples: Microwave displayed its automatic network analyzer system that uses a 2115A computer. This system does things — many things — in seconds that used to take hours and a room full of instruments.

Palo Alto Division premiered a data acquisition system that has the new 2402A integrating digital voltmeter as its measuring instrument.

Frequency & Time Division introduced its computerized signal averager system that will enable engineers and scientists to recover and analyze signals that have previously been buried under avalanches of noise.

However, individual instruments and components got their share of attention from the thousands of daily visitors passing through the HP booth areas on the second and third floors of the mammoth New York Coliseum.

Among the attention-getters were four new integrated circuit counters and the rubidium frequency standard from Frequency & Time; a new spectrum analyzer (frequency domain oscilloscope) and RF sweeper/signal generator from Microwave; Moseley's 11-by-17-inch x-y recorder with plug-in modules; Harrison's digital/analog converter; Waltham's eight-channel amplifier; Loveland's AC calibrator; Colorado Springs' new 500 kHz oscilloscope family; and, HPA's low-cost, extremely fast, hot carrier diodes.

The competition also had a few surprises. One company, for example, showed a counter operating on a new principle, and another company exhibited a comprehensive new line of counters and frequency synthesizers. However,

Inquiring IEEE visitor hears from Moseley's Ron Whitburn regarding one of the division's products on display at the show.

Trend in HP's business was apparent in the various systems shown at IEEE. Here, Microwave's John Minck discusses highly versatile functioning of the 8541A automatic network analyzer system.

the show wasn't the complete supermarket showcase of the industry that it had been in the past. A number of the larger, former exhibitors bowed out of the 1968 event, and others reduced booth space. Most of them quoted reasons of cost. HP utilized existing modular booths, and limited product displays to those that were absolutely new and fresh to those attending this international show.

HP took advantage of the IEEE show to promote its revolutionary new desk top calculator. The instrument was not actually shown at the Coliseum, but those who inquired at the booth were invited to the Essex House. There, in two hotel suites, prospective customers watched demonstrations and posed problems for the calculator to solve.

The show produced one interesting surprise for company marketing men. Original equipment manufacturer representatives visited the HP booths to look into the possibility of using HP counter modules as components in larger and more complex products of their own.

Nothing's simple any more. □

"...we have to do a bett

"So, your glorious new color TV went phooey the day before the Super Bowl? Then your sporty compact turned sour just as you tried to match speeds entering the freeway? And you say the deluxe washing machine busted a bearing first time out of the box? Almost shook your new three-bedroom bungalow to bits?

"Cheer up, friend! You're covered, of course? Oh, you say your puppies chewed up the warranty papers. And the insurance policies. Oh, well . . . "

☐ It's a cinch that all these disasters experienced by the old philosopher's friend will be repaired under terms of new-product warranties and policies, even if those documents are somewhat ragged and worn. But it's also a cinch that the experiences have produced a very unhappy customer. What are the chances, do you think, of him going back to those same manufacturers when the time comes to replace his TV, his car, and his washing machine?

Closer to home, when a Hewlett-Packard instrument reaches a customer DOA (defective on arrival), or fails at any time in the first-year warranty period, it sometimes means a whole lot more than just delay or inconvenience. Last year, for example, one large defense contracting firm claimed that an HP instrument failure resulting from an unsoldered transistor caused weeks of disruption in a major project. Right or wrong, and forgetting the money involved, there was plenty of ground to be made up in recovering this customer's confidence in HP. Such final, and sometimes irreparable, effects on customer confidence is the key point made by President Bill Hewlett in the following interview with MEASURE.

MEASURE: We hear a lot about warranties and warranty costs. What is HP's warranty policy?

MR. HEWLETT: Let me approach that question in a slightly different vein. We have built our reputation on the quality and reliability of our products. Our customers have

er job..."

come to expect this. When we say, for example, that the distortion of an instrument will be down 50 db, we won't let an instrument out the door unless the distortion is down, say, 55 or 56 db. We go to great pains to build into our equipment the reliability that will allow the customer to have a minimum amount of down time. Our warranty program is an extension of this policy, which simply says we will assure the customer of at least a year of trouble-free operation. If the product fails during this period, we will fix it at our own expense.

MEASURE: Can you give us some idea of the magnitude of our warranty expense?

MR. HEWLETT: Last year we spent several million dollars in making good this guarantee to our customers. If I remember correctly, this represents about 26,000 instrument repairs during the year.

MEASURE: The cost of warranties has been rising. Some of this can be attributed to the increasing number of instruments covered by warranty each year. Is complexity of today's instrumentation also a factor?

MR. HEWLETT: Certainly modern technology allows us to design infinitely more complex equipment than designed a few years ago. But, this does not mean that simply because we have more complex designs — more components to fail — that we are justified in accepting a greater percentage of instrument failures than our customers have learned to count on from HP products. It simply means that we have to do a better job of design, a better job of component selecting and testing, and a better job of manufacturing than we did with the less complex instruments of a few years ago.

MEASURE: Each of the manufacturing divisions keep detailed records of instrument failures. Based on the consolidated reports you see, what are the major contributing causes?

MR. HEWLETT: Ostensibly, the major cause of failure is components. In many cases, however, we shouldn't blame the component manufacturer for problems of our own making at the design level. This can be traced to misapplication of components, design overload, or just not paying attention to uncontrollable parameters. At the production level, for example, many failures can be traced to mechanical or thermal abuse of components during the assembly process. Examples would be bending leads so sharply that the wires break, or, exposing components to excess thermal shock due to improper soldering techniques. In the test phase, many failures can be traced to carelessness, such as shorting leads on PC boards. This type of workmanship can mortally damage components and cause them to have shortened lives.

MEASURE: Manufacturing has a number of activities underway to zero in on the warranty problem, but how about the marketing organizations? Do they have a role to play?

MR. HEWLETT: There is much that manufacturing can do, and is doing. Through proper training and instruction many of the above causes of failure can be eliminated. But the responsibility does not rest with the factory alone. We also need active cooperation of the marketing people to feed back, as rapidly as possible, information about failures and to cooperate with the factories in returning samples of defective components where the factory feels that the problem can only be solved by a study of the particular component.

MEASURE: Replacement or repair of defective instruments during the warranty period is measurable in dollars and cents. Have we any measure of another important aspect of this problem, that of the effect on customer confidence?

MR: HEWLETT: I feel the most alarming by-product of an increase in failure rates of our products — any of our products — is that of customer reaction. It strikes at one of our most treasured attributes, that of the confidence our customers place in HP as a designer of reliable equipment. All of us just have to do everything in our power to preserve, and enhance, the reputation that we have been building up over the years.

In the light of last year's operating results, it's clear that the higher costs of the company's warranty program was an important factor in holding down the level of profits and profit sharing.

The question is — what can be done to reverse this trend?

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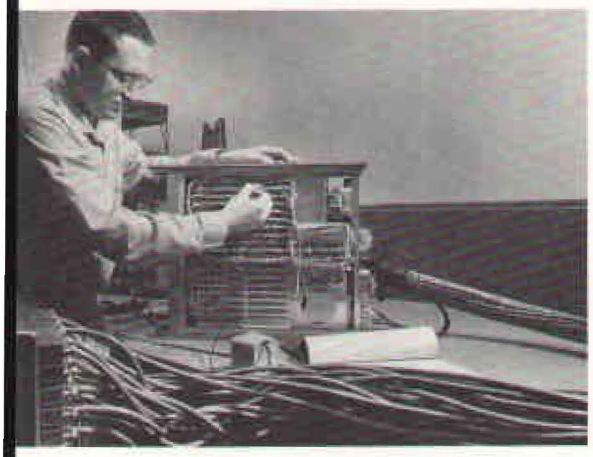

With product complexity one of the big factors in higher warranty costs, the need is for improved testing methods. Here F&T's Larry Koepke uses a new HP instrument wiring tester capable of checking up to 600 wires in six seconds.

Uncovering weaknesses in products before they get into the hands of customers is the function of this aging cabinet designed by Waltham's Dick Meaney (above). Instruments get 15 hours of fast aging to expose hidden problems.

Shaker test at Colorado Springs is another way divisions are catching faults before they turn into costly warranty claims. Most such problems occur early in the life of an instrument. Here, Leon Skidmore tests new oscilloscope.

Warranty

To determine reliability, the heat is literally put on new products at HP GmbH in West Germany. Following a heat run in the specially built hot room, products are given a five-minute shake as shown here with Srini Nageshwar.

Components can be prime source of after-sale trouble, particularly when exposed to loads not contemplated in specs. Here, Microwave's Terry Bowman conducts computer-based test of parameters of transistor seen in foreground.

Actually, the problem of warranty costs is being attacked by the divisions on many fronts.

Component failures, for example, represent a big share of the problem. In assessing this situation it should be kept in mind that all components have a natural failure rate — a transistor is not going to last forever, no matter how well engineered and manufactured. The trouble is with those components that fail very early in the life cycle of HP products.

One essential step for the divisions then has been to emphasize efforts aimed at evaluating components more critically. This is exactly the goal, for example, of the transistor testing program developed by the component evaluation section of Microwave's materials engineering department. The specific target here is to be able to test several hundred transistors within an instrument in a matter of seconds.

As shown in the photographs above, a variety of quality assurance approaches are underway. Aging rooms, heat tests, shaker tables, and wiring tests are all being put into service in efforts to "harden" company products in advance of deliveries. The objective is something like preventive medicine.

There are other sides to the warranty problem — workmanship, for one. MEASURE will take a close look at this aspect in a future issue. It will also report on product quality from the point of view of the customer — the ultimate judge of all our efforts. □

Perspective: HP Ltd. (South Queensferry)

Auld lang syne is now

☐ Though hindsight may not be one of the nobler senses, it seems inevitable in looking back that Scotland would eventually attract the Hewlett-Packard organization — and that HP would discover an environment very much to its liking.

Historically, here was a country that had launched thousands of Britain's great ships, staffed the engine rooms of fleets around the world, put a high price on individual skill and initiative, and produced a more than fair share of scientists and engineers. HP, on the other hand, was a company whose objectives and technical achievements the Scots could readily appreciate.

Now, after 18 months of actual on-the-spot experience at the new South Queensferry plant, eight miles from Edinburgh, the expectations that backed the decision to move to Scotland, after some five years in Bedford, England, have been amply borne out. But it wasn't all that easy.

There was, first, the matter of rebuilding the work force. The apparent labor shortage that had helped prompt the move from Bedford was not a problem in the Edinburgh area. However, the HP recruiters found a challenge or two. Home telephones, for example, are a rarity in the area, so getting in touch with job seekers turned out to be an exercise in mass communications, using advertising, publicity, bulletin boards, and other techniques to attract people.

As it developed, the company enjoyed unusual success in this undertaking. Applicants flocked to the site, and HP was able to maintain a very high standard in its selection. Oddly enough, more than 80 percent of applicants already had jobs, but the HP approach was new and interesting to them.

What was so new? For one thing, most people in the area had been used to "piece" work. HP offered a monthly salary. In the distilleries and biscuit factories and offices, the usual work situation called for close "over-the-shoulder" supervision. HP's management-by-objective and individual goal setting meant a new dimension in work dignity and personal responsibility. The company also had the advantage of being new in the area, of being able to offer a whole new range of opportunities for training and advancement in a region classified by the British Board of Trade as seriously in need of such new industry.

Of course, HP didn't start up the South Queensferry facility without the help of experienced people. Approximately 100 employees and their families from the Bedford plant journeyed with the company to the scenic West Lothian site. Special housing was built by the government to help make this migration possible. Today, the payroll for the manufacturing division of HP Ltd. hovers around the 450 mark (the sales division at Slough, England, accounts for another 127 people).

Training still looms as a very large factor at South Queensferry, with the emphasis on finding people who have a natural aptitude for their work. Girls applying for wiring

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Perspective: HP Ltd.

jobs, for example, receive an initial interview where they are screened for dexterity and eyesight. Then they are invited to attend a voluntary class running 15 hours over six nights. Those who succeed here are offered employment, after which they undergo two weeks' additional training.

Another training program under way is designed to create a cadre of test technicians. It's worth noting here that the region, while reasonably well off in engineering industries, including some large electronics manufacturers, had almost zero experience in the testing of electronic measuring instruments.

Management skills are also being fostered. A Management Diploma course has attracted a group of employees now in their second year of study. This course and another in accountancy include visits by university professors to the

Management team, left to right: David Simpson, managing director; John Penrose, company secretary; Alan Watts, personnel; David Goodwin, manufacturing engineering; Leon Hughes, marketing; Gordon Roberts, technical.

Section of highly successful microwave link analyzer is reviewed by, from left: Alistair Lucas, Finlay McKenzie, Lance Mills, and Peter Carmichael. Prototype was shown at recent IEEE show.

plant. In addition, R&D engineers are active in furthering their studies at Edinburgh University and other nearby colleges.

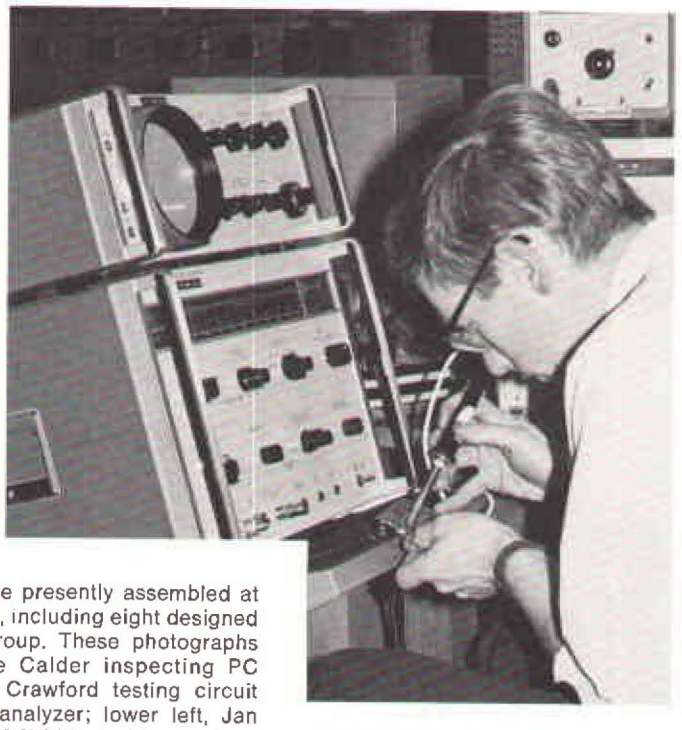
Presently, the division has the capability of manufacturing 68 different HP instruments, including a variety of frequency and time products, oscilloscopes, communications test equipment, X-Y recorders, power supplies, digital voltmeters, power meters, and RMS voltmeters.

The division takes genuine pride in the fact that one of the eight products developed by the HP Ltd. research and development group — a microwave link analyzer — is currently its top seller. For such products, of course, HP Ltd. has worldwide markets, while its other products based on U.S. designs are shipped throughout Europe. Other products in heavy demand include the 5245L digital counter, the 180A and 140A oscilloscopes, and the 3440A digital voltmeter.

This year the division has in its view a target of increasing shipments by some 45 percent over last year, and they are hopeful that about one-fifth of their 1968 shipments will be made up with products of HP Ltd.'s own design.

Along with emphasis on training and R&D, the goal also is targeted on improved product quality and higher productivity, all with the ultimate aim of achieving higher operating profits. This is the aim of progressive industry in Britain today.

The Scots well understand such a goal: a penny earned is a penny saved. After all, they invented that idea, didn't they? □



Some 68 HP instruments are presently assembled at the South Queensferry plant, including eight designed by division's own R&D group. These photographs show: above left, Bernice Calder inspecting PC boards; above right, Tom Crawford testing circuit with use of HP spectrum analyzer; lower left, Jan Mundie wiring front panel of 3701A; and lower right, R&D's John Pickering using HP computer to simulate an instrument before building lab prototype. Approximately 100 people from Bedford, England, plant transferred to new site in 1966.

News in brief

Atlantic City, New Jersey — Palo Alto Division will introduce two major new products at the Spring Joint Computer Conference, which will be held here April 30 to May 2. One of these is a small, low-priced ($9,950) computer, dubbed the 2114A and said to have the best price-to-performance ratio of any comparable computer presently on the market. The second product introduction is the HP 2000A time-sharing system, a major new area for the company. This system, which employs a small HP digital computer, links as many as 16 input/output teleprinters via wires or telephone lines. It thus gives a customer benefit of computer time-sharing at the low cost provided by a small computer.

Richardson, Texas — The new Texas area/Dallas district marketing offices were opened at 201 East Arapahoe Road here April 1. It is a 17,000-square-foot structure on a 3.25-acre site.

Palo Alto — On March 18, the U.S. Supreme Court denied HP's request for a review of lower court decisions against the company in its dispute with the General Accounting Office (see page 11, MEASURE, February 1968). In response to press queries that resulted, HP Chairman Dave Packard made the following statement:

"We are disappointed that the Supreme Court has chosen not to hear our case with the General Accounting Office. Although this marks the end of the judicial process, we believe some of the problems at which the litigation was directed were alleviated during the time the case was in the courts.

"For example, the GAO has modified its practice of giving undue publicity to its investigations, and has made some attempt to protect the confidentiality of private company records, particularly those relating to standard commercial products.

"The case also has helped focus the interest and concern of many businessmen who, like ourselves, supply standard catalog items to the government. We share their hope that the government will, in the future, recognize the importance and desirability of protecting the confidential affairs of business from unwarranted intrusion, and that a mutual understanding on this matter can be achieved without specific legislative action. Such an understanding will be most beneficial in maintaining an effective working relationship between business and government."

Paramus, New Jersey — Two Eastern Sales Region marketing area offices are being relocated. The Burlington, Massachusetts, office was moved to the nearby Boston suburb of Lexington in mid-March; it is now housed in a 25,000-square-foot building on a 5.8-acre plot at 32 Hartwell Avenue in the Lexington Industrial Park. The Washington, D.C., area office in Rockville, Maryland, is being moved April 22 to 2 Choke Cherry Road; there it will have a new, 24,000-square-foot home on a seven-acre site.

Lima, Peru — HP's medical instruments will be exhibited here April 20-27 at Tecnomed '68, an inter-American cardiology congress. Among the many instruments to be shown is HP GmbH's cardiotocograph, a fetal heartbeat monitor introduced March 28 in Berlin.

Bellevue, Washington — The Northwest area marketing office moved April 15 into new offices at 433 - 108th Avenue N.E. in this Seattle suburb.

People on the move

Corporate — Jack Brigham, to contract administrator, patent counsel, from internal auditor, Neely-North Hollywood; George DeLannoy, to accounts receivable supervisor, corporate Palo Alto finance, from financial analysis and targets.

CSC — Don Wolf, to parts center manager, from material handling manager.

F&T — Ham Chisholm, to R&D (frequency synthesizers) from R&D (nuclear instruments).

International — Alan Darbyshire, to accounting supervisor, from accounting staff (HP Australia); Barrie Sutton, to business manager, from accounting supervisor (HP Australia); Ed Valencia, to accounting manager, from accounts receivable supervisor, corporate Palo Alto finance.

Loveland — Glade Lybbert, to development engineer, R&D staff, from F&T R&D staff.

Microwave — Les Besser, to applications engineer, marketing staff, from R&D staff; Joe Mello, to technical writer from production staff; Mike Mellon, to marketing staff from R&D staff; Carl Nale, to R&D staff, from corporate Materials Engineering staff; Dennis Paul, to materials engineering, from inventory control; Larry Ritchie, to production engineering (network analysis and passive instruments), from R&D staff; Charles Wieck, to inventory control-purchasing, materials management, from materials staff, Paeco Division.

Palo Alto — Mike Cohen, to advertising staff, from advertising staff, corporate Marketing; Paul Gearhart, to systems staff (project group 3), from CSC repair department.

Rockaway — Augie Stuart, to manufacturing-engineering manager from engineering group leader.

Eastern — Larry Motzkus, to personnel manager (Paramus), from personnel staff, Loveland.

Midwest — Ray Baribeau, to electronic field sales engineer (Skokie), from service engineer, Loveland Division; Phil Wolf, to electronic field manager, from electronic field sales engineer (Southfield office); Frank Zwiazek, to medical field service coordinator, from field service technician.

Neely — Tom Smith, to staff engineer, (Palo Alto), from CSC repair department.

from the chairman's desk

As our company has grown over the years it has gradually evolved into a divisionalized organization and during this period of time, strong ties of identification have developed in terms of both products and people. We have seen related products grouped into the framework of a division, and a similar grouping of the people responsible for the design and development of these products.

Because of the increasing complexity and size of the company, continued rigid adherence to this pattern of operation tends to inhibit the inter-relation among divisions that is so necessary to the technological growth of the company, and the growth of opportunities for our people.

As I mentioned last month, I am convinced that reassignment between divisions of both people and products is a good thing. For example, we recently assigned the responsibility for the manufacture of the desk top calculator to the Loveland Division. This new instrument doesn't fall into the family of products historically associated with the Loveland Division, but we felt that it would give Loveland people additional opportunities beyond those provided by the division's standard line of products.

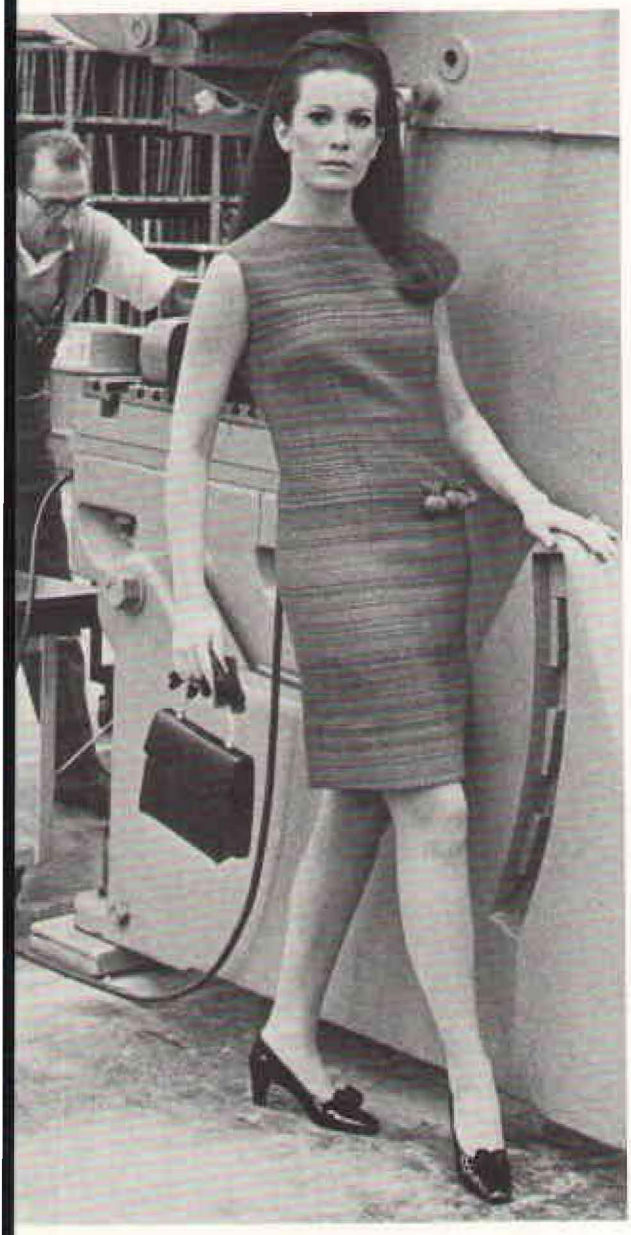
Similarly, the transfer of the new integrator from Loveland to the Avondale Division brings that instrument closer to its logical and appropriate market, and provides broader opportunities for Avondale people.

Without question, our people are the most important factor in determining the long range success of the company, and we want to be able to provide them with maximum opportunities to achieve their personal aspirations. Reassignments of people among divisions, along with new alignments of product responsibilities, can contribute to this end.

Each manager, throughout the company, must pay greater attention to his manpower development function. Developmental activities such as job rotation, special assignments, and various other programs, along with increased responsibilities for people, must be planned and carried out if we are to engender the versatility, flexibility, and imagination that will be needed to meet the challenges our company will face in the years ahead.

I realize that reassignments of people and the shifting of product lines have an effect on the strong divisional loyalties and close associations that have developed through the years. But in the final analysis, it is the effective interaction among divisions that determines the common good of the company and the sharing in its success. I hope we will have your understanding and support as we encourage the interaction that will help reach these objectives.

David Packard



Spring at the Springs?

What makes you so sure there's something unusual about the presence of these two young women on the premises of the Colorado Springs Division? Is it because the girl on the left is not wearing safety glasses? Or is it that you detect a certain unfamiliarity in approach to that rack of CRTs by the lass posed at right? Your suspicions are well founded. The young ladies were indeed special guests at the plant last month, there to be photographed by an ace lensman of the Colorado Springs *Gazette-Telegraph*. It was all for the cause of sweet publicity in advance of the city's sixth annual fashion show benefiting CARE. The funds raised there and at two other showings in Denver will be used to build school houses in remote parts of Guatemala.

Measure

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