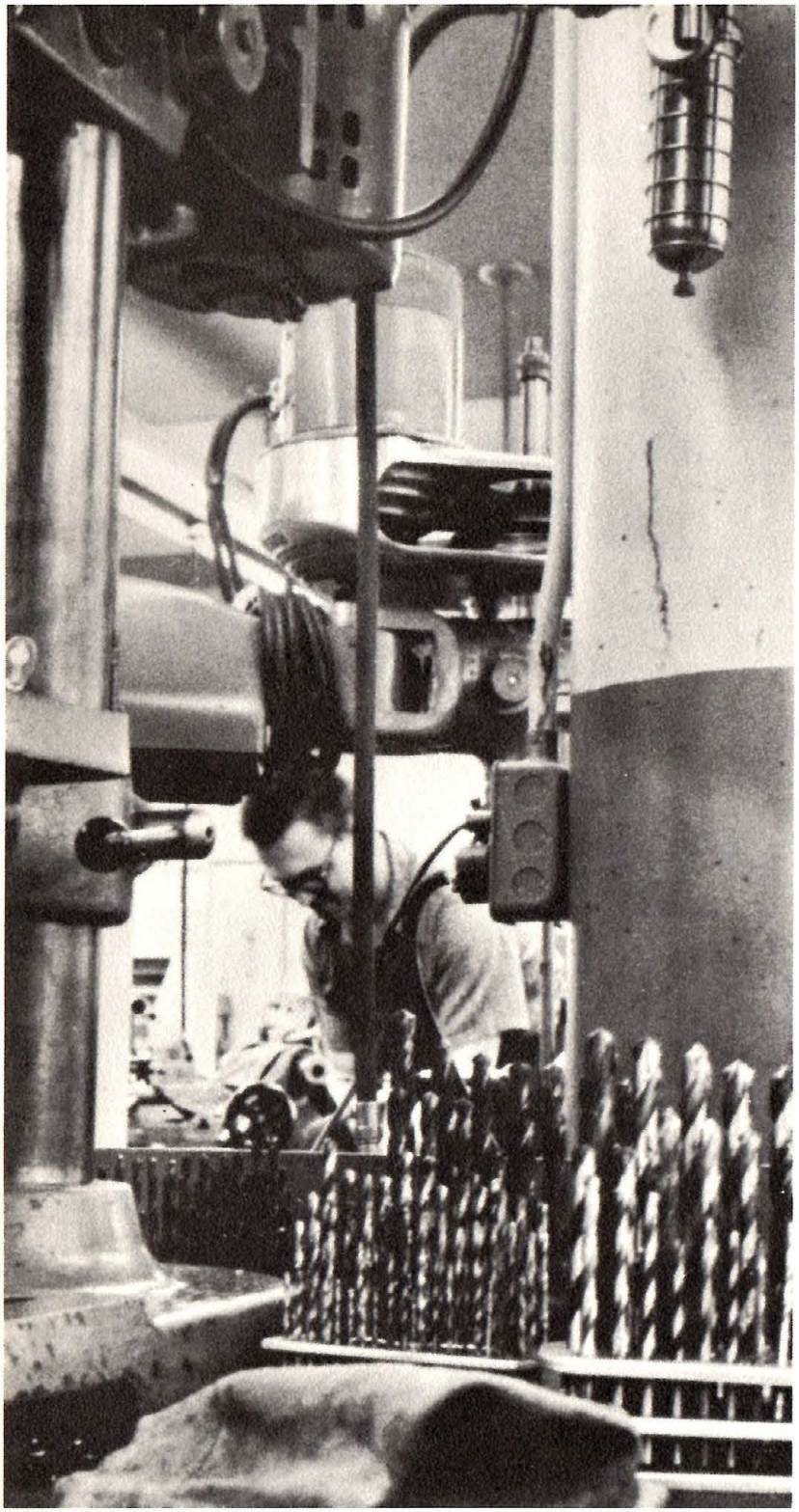

tek talk

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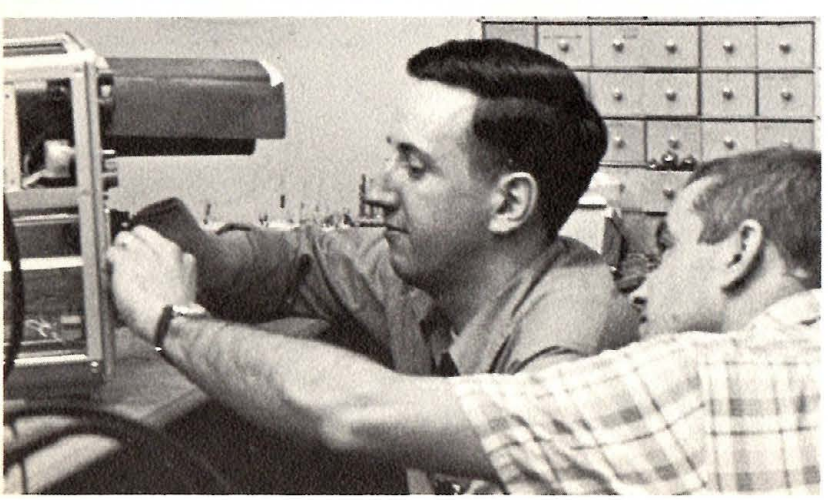

TEK NEWSREEL

About 15 Tektronix oscilloscopes are being used in exhibits at the New York World's Fair, according to George Muckenstrom, Long Island field engineer.

Major exhibitors with Tek scopes are the Bell System, RCA, National Cash Register, International Business Machines, Visual Electronics (Hall of Education), Atomedic Hospital and General Electric.

A type 564 is being used in General Electric's Nuclear Fusion demonstration as a monitoring device to display to the public the neutron yield in their deuterium gas plasma experiment.

In other exhibits several type 524, 527, 535A, 561A, 545A and 310 instruments are used as waveform monitors, audio and television test equipment and test instruments in computer displays. A 564 is used as an operating room instrument in the Atomedic display.

"At the fair, most of our oscilloscopes are used as support equipment in the larger displays," George writes, "but they should be considered tools basic to the technical development that has made the fair possible."

▬

Construction continues "on schedule" for the new Maintenance Building and Technical Center.

The 18,000-square-foot Maintenance building is rising southeast of the present Facilities building. Designed by Ray Cone of Facilities' staff, the single-story brick structure will cost about $230,000.

Planned for completion in about two months, it will house maintenance, groundskeeping and Building Services personnel and provide space for material stores.

The Technical Center, a four-story, $4,800,000 building is going up near the west end of the Cathode-Ray Tube building. It will house engineering and research facilities, as well as several administrative functions.

The brick-faced building will be air-conditioned throughout, with builtin flexibility to allow process utilities to be supplied to any point on any floor as need arises.

A cafeteria, library and lecture hall will occupy the center of the building. The Technical Center, the fourteenth building to be erected on the Industrial Park site, will be completed in the fall of 1965.

▬

Copies of Tektronix' first annual report to employees and shareholders were distributed August 7.

The 32-page, two-color illustrated report included a summary of the company's market and financial performance during the year, plus a message from President Howard Vollum, and background information on company history, products, organization, philosophy and policies.

Company earnings during the year increased to $6,308,000 from $5,771,000; per share earnings to 78 cents from 72 cents; net sales to $75,503,000 from $70,-451,000; orders to $76,908,000 from $69,-214,000; and capital to $5,844,000 from $3,990,000.

▬

Acquisition of Pentrix Corporation, Brooklyn manufacturer of spectrum analyzers, was announced in April. The small company became part of Tektronix through transfer of 30,002 shares of Tektronix, Inc. stock.

In June, 8330 shares were issued. The remaining 21,672 shares will be issued in installments over the next four years, contingent on spectrum analyzer sales.

Three Pentrix owners—Arnold Frisch, Larry Weiss and Morris Engelson — joined Tektronix Engineering in June to continue their work on spectrum analyzers.

Pentrix' product was designed as a plugin unit for several Tektronix oscilloscopes, converting them to frequency-based instruments.

According to market researchers, the spectrum analyzer market is in the neighborhood of $8 to $10 million per year.

"Pentrix fits well into Tektronix' manufacturing and marketing organization and offers new markets for both its present and acquired products," Bob Fitzgerald (vice-president, Operations) stated when making the announcement.

▬

Three Newsletters this spring announced major organizational changes affecting Manufacturing and Engineering:

Mike Park announced that Manufacturing Staff Engineering would no longer exist, with most activities and personnel becoming part of Engineering. Bill Walker, formerly MSE manager, was appointed Preproduction Engineering manager, reporting to Engineering Manager Bill Polits.

Manufacturing planning and adminstrative activities were combined. Otto Zach, who had handled Manufacturing's administrative functions, assumed the combined responsibilities. Ken Spooner became Product Manufacturing manager.

The Newsletter also announced formation of a Component Manufacturing division, encompassing Plastics, Ceramics, CRT, Electrochemical, Capacitors, Transformers and shop activities. Derrol Pennington heads the division.

Also announced was the formation of Plant 4, which manufactures products (such as cameras) which did not fit readily into our previous manufacturing lines. Ross Porter, former Manufacturing Planning manager, was named manager of the new Plant 4, which took over space in the lower floor of building 47. Custom Instruments, Component Selection, Cameras and Accessories are part of Plant 4. Their managers report to Ross.

Bill Polits announced the appointment of Lang Hedrick as Instrument Engineering manager, replacing Jack Rogers, who left Tektronix earlier in the year. Lang was formerly Preproduction Engineering manager.

▬

All material-handling activities carried on in the Customer Service department were transferred to Materials Management this spring.

Customer Service Stock, Pre-packaging, Issuing, Shipping, Quality Control, Inventory Control, and Customer Service Assembly were affected in the switchover.

Jim Leep, manager of the above areas, now reports to King Handley (Materials Management manager). Order processing systems remained the responsibility of Customer Service.

▬

President Howard Vollum was presented with the Western Electronics Manufacturers Association (WEMA) Medal of Achievement at the association's corporate luncheon in Los Angeles August 26.

Given each year to a leader in the electronics industry who has contributed greatly to the advancement of electronics in the West, the award was presented by WEMA President Burgess Dempster.

Previous recipients of the Medal of Achievement have been: H. Leslie Hoffman, president of Hoffman Electronics; David Packard, chairman of the board, Hewlett-Packard Co.; Dr. Arnold O. Beckman, president, Beckman Instruments; Dr. Daniel E. Noble, executive vice-president, Motorola; and Dr. Frederick E. Terman, vice-president and provost, Stanford University.

tek talk

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Tek Talk talks with FRANK DOYLE

(Frank Doyle is manager of Tektronix Ltd., our marketing subsidiary on the Isle of Guernsey. In this interview he answers questions about the foreign market, his job and, when cornered, himself. Frank is 37 years old, married and British as a crumpet.)

What is your history with the company?

I joined the company in August 1961, working in a planning capacity with Tekintag at Zug, Switzerland. I subsequently became European marketing coordinator and, in January 1963, European marketing manager. In spring of '63, I became manager of Tektronix Ltd., when it became a separate marketing company on its move to Guernsey.

How has your job expanded since Tektronix Ltd. was set up?

The establishment of Tektronix Ltd. was in itself an "expansion", although it did bring together various people who had been involved in other Tek operations. The creation of Tek Ltd. resulted in centralizing our marketing, warehousing and shipping facilities in one location.

Before this move, marketing was handled from Zug and our warehousing was some 600 miles away in Heerenveen, The Netherlands. Now Tek Ltd. in Guernsey provides a **central point** for order processing, warehousing, answering technical queries, distributing literature and shipping Beaverton-made instruments.

For the first time, these functions have been consolidated under one roof.

One of the difficulties we experienced prior to this consolidation was the problem of languages. In Zug, folks spoke English, although it was not their mother tongue, in communicating with Heerenveen, where **they** used English, which was not **their** mother tongue. So, we were bound to get some misunderstandings... Language is one of those problems which most people back here don't think of.

Although Zug was in the middle of the German-speaking area of Switzerland, I never really **did** learn German. (my kids learned it well, however, so when I would take my car to the garage I would have my 10-year-old tell the fellow, "Fix **this**"....).

Has centralizing in one location solved the language problem?

Well, it's made **internal** communications easier. There is a tremendous advantage to all being in one location. In addition to a substantially reduced Telex bill, it also gives us close access to the instruments we are dealing with.

Is geographical distance from Europe to Beaverton a communications barrier?

I don't find it a difficulty. The kind of problems I have can usually wait 24 hours for an answer.

How many people are there at Heerenveen and on Guernsey?

About 280 in Guernsey, working for Tektronix Guernsey Ltd., just under 200 in Heerenveen, and about 60 persons at Tek Ltd., also in Guernsey.

It's interesting to note that sometimes we can be hiring in a European location and restricting hiring in Beaverton. Employees in Beaverton may well ask, "Why is this? Why can't we make the instruments **here** instead?"

The trouble is, if you do make them here, they would probably **stay** here.

Manufacturing instruments in Europe enables us to qualify for a lower tariff figure, or lower import duty, into the various European countries. So if we don't make them in Europe, there's a good chance that we would be priced out of the market. If we're not there manufacturing instruments, somebody else will probably be making them. And, sooner or later, he could be crowding us in this country too.

By establishing two plants, one in the Common Market and one in the European Free Trade Association, we can ship scopes that we manufacture to countries in those areas with a lower cost to the customer. If, for example, we were to ship an instrument to a Common Market country from Beaverton, the import duty would probably be about 10% higher than if we sold the instrument from our Common Market plant (Heerenveen).

Hewlett-Packard, whom I call a **principal** competitor, is located in these two market sectors also.

Where are most of our competitors—in the United Kingdom?

If you mean where are the most scopes manufactured, yes. However, we have a

product line a yard long. Nobody else has as complete a line. Most scopes made in the U.K. are in the low-price end, where we are not directly competitive. In time, I guess we'll probably edge toward them, and they'll probably edge toward us . . . .

One advantage Tek has is that US technological progress (in scopes, anyway) is somewhat advanced over that in Europe. Our future lies in **keeping** that much ahead.

Don Alvey said about the same thing two years ago. Apparently, we haven't lost any ground in the interim.

I don't think so.

How are our relationships with our distributors?

Our relationships with most of them are very friendly. We have come to know each other well. Basically, I think the reason is, we are **interested** in each other. Many of our distributors have expanded as we have expanded—and in most cases Tek represents a very large portion of each distributor's business.

Most of the contact between the distributor and us concerns the filling of orders. I believe this relationship is as good now as it has ever been.

Do you feel all these are highly competent companies?

Yes. We are very fortunate in that whoever selected the people to represent us was very wise, or farsighted. Or lucky.

Our 17 distributors are 17 very different people, and the way you deal with each must be tailored accordingly. I think it's true to say that because of differing national characteristics you need to be somewhat more of a diplomat in marketing there. Some you can communicate to on a fairly easy and informal basis, but to some others you have to write a formal letter.

Some, because of their long association with Tek, have become "internationalized" and have lost some of the more apparent national characteristics.

How does our overseas field organization work?

Field engineers operate out of Guernsey, principally in liaison with distributors on technical matters, to help in staffing exhibits and to visit customers along with distributor personnel.

We make visits to distributors on an emergency basis—when requested—and also are planning to schedule 3 or 4 **regular** visits each year.

We don't operate in field engineering the same way as you do here. We don't, for example, call on customers unescorted by distributors (you can't readily chat with a bloke who doesn't speak English unless you have an "interpreter").

Getting to see customers is something we want to do **often.** You'll get comments directly from a customer that a distributor may not feel obliged to write to you about. Personal contact gives us a much better understanding of how the customer sees us.

Do you travel a lot on your job?

Compared with **some** people, yes. But it isn't a job that requires me to be constantly traveling.

In general, what is the response to Tektronix in your area?

My main impressions are based on how the **distributor** sees us, since he is our prime contact. Generally speaking, I believe our relations as a company with the distributors are pretty good—although not perfect. I'm sure certain areas need improvement; for example, Customer Service parts. Knowing the problems is half the battle because then we can concentrate our efforts on solving them. We have been, and are, taking steps to improve our service in parts supply, but the results of these steps don't show up immediately.

On instrument deliveries, I think our present performance is fairly satisfactory. We expect to have about 80 per cent of the instruments we ship available in stock in Guernsey, and the other 20 per cent we back-order. Our normal stock delivery is "2 to 4 weeks". This may not seem short to you in the States, but it isn't quite like shipping to Texas, for example. Shipments from one country to another require a little more documentation. Although our stock deliveries are 2 to 4 weeks, we do, of course, try to do it in a week to two . . . .

What portion of scopes sold in ECM and EFTA are manufactured on Guernsey and in Heerenveen?

About 25 to 30 separate instruments are manufactured in Guernsey, and from 15 to 20 in Heerenveen. These represent a sizeable chunk sold in the two market areas. Guernsey supplies over half of the instruments a typical customer requires and Heerenveen about a quarter, the remainder being of Beaverton manufacture.

All instuments manufactured on Guernsey qualify for EFTA preference—that is, a reduction in duty. About two-thirds of them qualify for Commonwealth Preference also, allowing them duty-free entry into the United Kingdom.

Tektronix Ltd. ships about 60 per cent of the instruments sold in Europe; Guernsey and Heerenveen about 20 per cent each.

What are our greatest competitive strengths?

First—although you have heard it often and know it well—is that we have a good product. The ability to produce a quality instrument, deliver it promptly and follow it up with good after-sale service—all the reasons which are valid here in the States are applicable overseas.

On a recent visit to the Middle East to appoint a couple of distributors, we found that people who **could** use our scopes already knew them and wanted them. Our reputation was there ahead of us—because we have a reputation for building a quality product.

Where is the competition keenest?

We must keep watch in every country, or possible competitors there will spot our weakness—and once they gained momentum, they would overlap into other countries.

The United Kingdom is a strong competitor in **numbers** of manufacturers, but competition is strong in most countries.

Have you noticed any significant changes in the overseas operations since you have been with Tek?

One thing .... Don Alvey and Earl Wantland being in Beaverton have increased the awareness of what's going on, and have become part of the decision-making process. It's good for us—and I think it's been good for the folks back here, too.....

". . . . if you don't have time for individuals, you become just like any other company . . . ."

Do you see any difference in the types of orders overseas compared with the U.S.?

Yes, there are some. We don't sell many rack-mounts, for example. They are often bought here in the U.S. for large governmental projects—satellite tracking and so on. There are few projects of that magnitude in Europe.

But most of your volume sellers here are our volume sellers also. . . .

A larger percentage of our European business is with schools and universities than is probably the case in the United States. One of the best potential areas there, as here, is the medical market.

Unlike the United States, there are some countries in Europe with very little industry.

Is the growth curve more stable overseas?

I think it inevitably **must** be. Here you have one area subject to the same economic and political fluctuations. In Europe, we have about 19 countries where individual economic and political influences are less likely to affect our overall business. There, it is less national and more international.

If a **general** economic slump in the whole market area should occur, of course we would feel that. . . .

There is still substantial growth in the European area, and I'm optimistic about the future. The growth curve recently has been measurably steeper than it has been domestically. . . . .

You have probably had greater **coverage** here than we have had in some European countries. We are now looking at some of the smaller areas—Israel, South Africa, etc., where there are substantial growth possibilities, and we have recently set up new distributorships in Turkey and Lebanon.

What is the likelihood of great growth in the European electronics industry as a user of scopes?

It **is** a fast-growing industry—and we do sell to it.

What are some other areas of possibly greater sales?

As I have already mentioned, the medical market is an obvious one, of course. This will become more evident with the design of special instruments **for** that market. Some of our new instruments will improve our sales potential with the various military authorities also.

Another area of obvious potential is the purely industrial field. A lot of countries have terrific growth potential in industry. We notice that trained engineers from universities who have become used to our scopes want the same reliable instruments when they get out into industry.

Another potential, though somewhat restricted, area is TV broadcasting. Many European countries will soon go into color television.

I've read that the European market tends to be some years behind that of the U.S. technologically. Do you notice this?

It depends. Lasers and masers, for example, are suddenly appearing on **both** sides of the ocean. There appears to be little gap either way. In aero engines, Britain seems to keep fairly well ahead. But in electronics, I'm sure the US **is** ahead—by some time differential I can't give. Many UK scope manufacturers, for instance, buy US-manufactured components.

How would you describe your job responsibility?

Essentially, it is to implement Tektronix marketing policies in Europe and to maintain our business relations with our distributors. I'm involved in manufacturing only as it relates to the establishment of European marketing schedules. In this respect, our contribution is in providing input to determine **which** instruments should be made **where,** as part of our overall marketing strategy.

Our market surveys are based primarily on contacts we have with distributors and their customers through our field engineers.

How is the European operation coordinated?

On a local basis, it's coordinated by frequent get-togethers of the managers involved. Bob Gwynn, Tom MacLean, Hermann Harri and I get together frequently—and Bob and I, being on the same island, often meet informally to insure that, although we operate as independent entities, we still present one picture of Tektronix to our employees.

For example, we try to insure that our salary levels are comparable, so that one firm doesn't seem a more desirable place to work than the other.

One of our greatest strengths is that Earl and Don here in Beaverton have a good understanding of each other's problems; similarly with the local managers in Europe. We and they are closely aware of, and involved in, each other's operations. There is an excellent mutual understanding among the managers involved.

It's good for our people overseas to know that there are guys living in Beaverton who have intimate first-hand knowledge of what's going on abroad. The presence of such folks in Beaverton must inevitably result in better and quicker decisions.

How is Tek marketing policy determined in Europe?

To say we have a formal marketing policy in **Europe** implies differences from the overall Tek marketing philosophy—and that would be misleading. Any differences are not ones that we have created.

We start with a basic set of policies. We may have to change them slightly in a particular country just because it won't work perfectly there. But we don't deal **essentially** differently from one country to the next—certainly no more than local circumstances dictate.

We don't want customers in one place to see us differently than customers somewhere else do.

Do you feel Tektronix is the same company overseas as it is here—in attitude toward people and so on?

Yes, I'm sure it is. We try to treat people the same in all locations (it may be for local reasons that we do some things differently in one area—like length of vacation, salary levels and working hours).

There is also the same relationship, I believe, between Tektronix and the local community that you probably find here.

Clearly, so much depends on the responsible managers in a location who implement our philosophy. If they chose to, they could dilute the differences that make us unique.

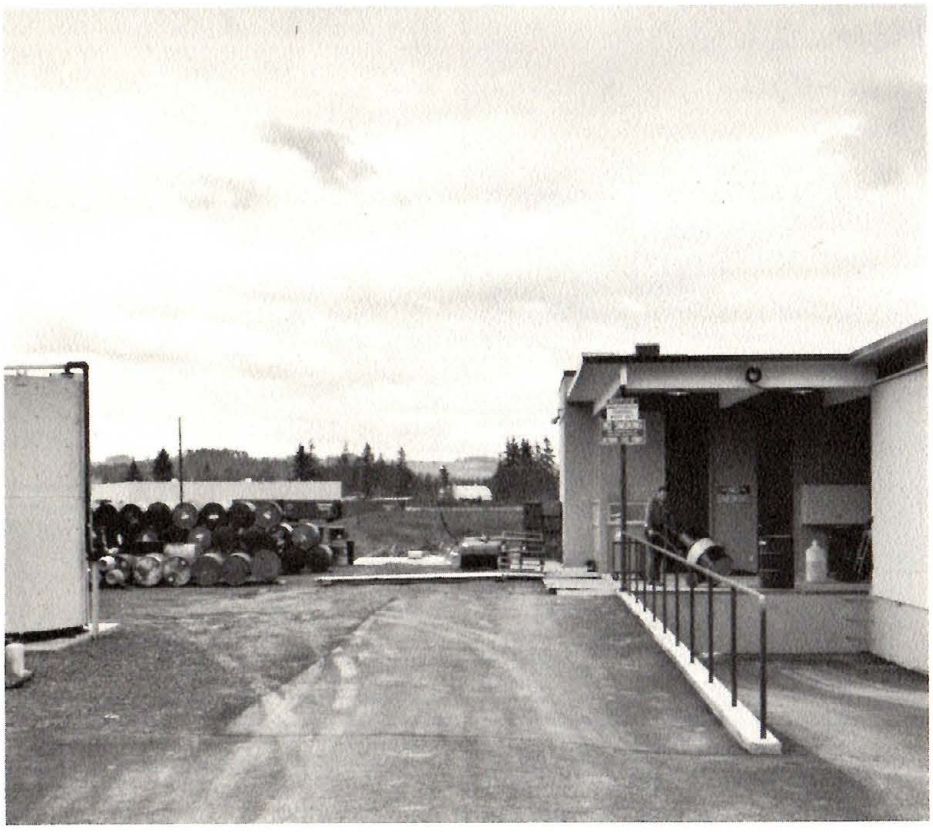
I think we have chosen guys who can, and will, **take time to talk to people.** That's all it amounts to. If you don't have time for individuals, you become like any other company.

Isn't the fact that we work through distributors a "diluting influence"?

It could be. It depends on various factors, such as the technical competence of the distributor's staff, the size market he serves, the other lines he handles in addition to ours, etc. We constantly evaluate these things to be sure we're doing the best thing for the company.

when it comes to industrial safety . . . .

Why Be Half-Safe?



MAIN ENTRANCE (above) to Chemical Storage building includes driveway, loading dock (right), 3,500-gallon tank (left) and open storage area. The dispensing room (below) has air vents near ceiling for adequate ventilation. A lanyard is strung along room (see arrow) which employees may pull in an emergency to obtain outside help.

Materials Management doesn't believe in being half-safe. Not when safety means protection against a houseful of inflammable and volatile chemicals, including all types of acids, thinners and paints.

That's why a group of safety-minded employees made sure that every essential safety device is readily available at the Chemical Storage building, recently completed south of the Electrochemical building in the industrial park area.

These included Carl Taylor, Material Control manager; Bill Lee, Materials Management safety coordinator; Walt Neff, Material Stores and Services manager; and Jim Hatter, Chemical Storage operator, who teamed up with Dick Kenyon, Tek's Safety, Health & Workman's Compensation manager, to compile this exhaustive list of safety devices and precautions for the Chemical Storage building:

1. A sensitive emergency alarm system consisting of a lanyard, or cord, which triggers a siren and sets off a warning bell in the Electrochemical building's public address system.
2. A portable self-contained air respirator.
3. A hundred feet of safety line.
4. Fire extinguishers.
5. Protective clothing and face-mask.
6. An eye bath.
7. An overhead shower.
8. A face fountain.

The last three items are for protection of personnel in case they come in contact with harmful chemicals.

In addition to these devices, the safety group posted "no smoking" and "unauthorized personnel keep out" signs at entrance ways and large fluorescent red arrows pointing to locations of fire extinguishers. Explosion-proof telephone and electrical wiring were also installed and an exhaust hood was placed over the mixing and dispensing table to provide air circulation when handling chemicals that give out an excessive amount of fumes.

The safety emphasis began when the Chemical Storage building plans were still on the drawing board. With the help of

Ray Cone, Facilities Design manager and the building's architect, the safety group made sure that proper ventilation would exist at all ties throughout the building. As a result, the rectangular holes just off the floor level and next to the ceiling in various parts of the building provide better-than-normal air circulation in addition to enhancing the building's design and form.

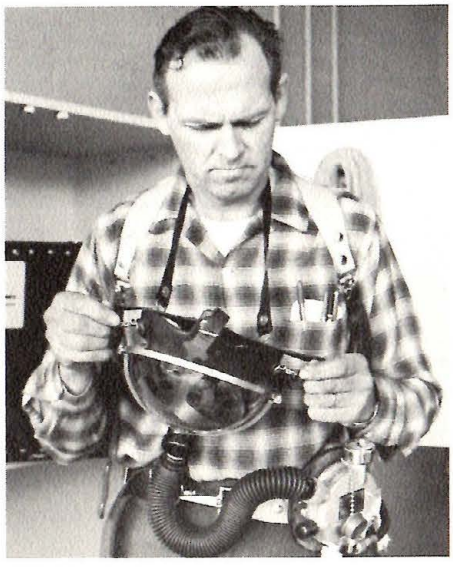
Employees, however, are the key to any successful safety operation, and the same applies to the Chemical Storage building. Those working in the area must be thoroughly acquainted with all the safety equipment and how to use it. Periodic checks are also made on the safety equipment to insure that it works properly. Most important, each employee must take first-aid training geared to treatment of accidents involving chemicals.

A reference book is available in the office area which lists the peculiarities and hazards of all chemicals stored within the building. No new chemicals will be received in the building unless information is provided on their particular hazards and the ways and means of handling them. Materials Management relies on its purchasers to obtain as much information as possible from vendors on chemical safety precautions and hazards.

Of all the safety equipment and devices available at the Chemical Storage building, the safety group is most enthusiastic about the sensitive emergency alarm system installed in the main dispensing room. A hundred-foot lanyard is suspended from the ceiling and strung along the perimeter of the room. A simple tug of the cord by anyone needing help triggers the siren. The siren can be heard throughout the entire industrial park area as well as on the Electrochemical building's loud speaker system located across the street.

When the alarm in sounded, Electrochemical supervisors respond immediately as volunteer firemen and first-aid assistants. Bill Parker's Electrochemical staff holds regular drills and works closely with Materials Management to guarantee an effective rescue procedure.

Because the lanyard alarm system is so sensitive, large warning signs are posted along the cord to caution persons who might accidently touch it. The sign reads: "Emergency warning system—pull this string for emergency only." When the building first opened, many employees triggered the alarm system out of curiosity, bringing Electrochemical personnel to the rescue.



RECEIVING ROOM (above) has chemicals in all types of containers. Jim Hatter, Chemical Storage operator, (below) tries on face mask of the portable self-contained breathing unit which enables him to go into any area where chemicals have been spilt.

The safety group is equally proud of the portable self-contained breathing unit which enables an employee to go into any area where chemicals have been spilt. The air respirator consists of a face mask, compressed air tank and regulator. It is located at the building's entrance, within easy access.

These and other safety devices can be better appreciated after a look at the chemicals stored in the building. At least 75 different chemicals—paints, acids and thinners—in solid and liquid form, stored in all types of containers—barrels, five-gallon cans, jugs and bottles—can be found in the storage and dispensing areas.

Those familiar with chemicals will recognize such names as aqua ammonia, nitric acid, phosphoric acid, hydrofluoric acid, nickel chloride, floboric acid, cadmium persulfate and refined nickel sulfate. Various types of paints and thinners are also stored in the building.

Aside from storage, the only other operation within the building is to break down the chemicals into smaller units if requested. Most of the chemicals are stored and then shipped directly to areas within Tek.

Two 3500-gallon tanks of sulfuric acid and liquid caustic are located in the storage yard adjoining the building; these are piped directly to the Electrochemical building. Both tanks are checked and filled regularly. Adjoining them is a 5000-gallon tank for trichloroethylene, just installed this summer. Also in the yard is a 450-gallon propane tank for company use only. Propane is not sold to employees.

Most of the chemicals do not freeze below a set temperature. Those that do, like dioxane and acetic acid, are stored in a room adjoining the dispensing area where the thermometer is kept at least 50 degrees fahrenheit.

Warm summer temperatures are not expected to affect the chemicals in the new building. The extra ventilation should keep the chemicals relatively "cool" during the warm months of the year. Jim Hatter, Chemical Storage operator, recalls the old chemical shed next to the Sunset plant, where vapors from chemical fumes were a familiar sight during the hot summer days.

The new Chemical Storage building, operated and maintained by Materials Management, was occupied the day before the Christmas shutdown last year. Located between the process waste control plant and the Electrochemical building, the 50 x 100 foot building has a total floor space of 45,000 square feet. The building has steel wall panels, masonry blocks and a flat built-up wood-frame roof.

In addition to the chemical dispensing room and bulk chemical storage area, the building also includes office space and a restroom. Truck loading facilities and a 2,500-foot storage yard adjoin the building. The entire area is fenced and is open only to authorized persons.

As complete as the safety program appears at the Chemical Storage building, the Materials Management safety group believes their job is a continuing one. They keep a constant watch on new chemicals, and change and add safety devices as necessary. In this way, they insure that the chemical storage operation is not half-safe, but **all**-safe.

Tek Salutes

General Electric

TV REPAIRS occupy technicians at one of distribution center's service shops (top). Wayne Hughes (below, standing), center's sales manager, chats with Ed Stuart, supervisor of operations, in display room.

"The decision to purchase property in the Tektronix Industrial Park was made after considerable research and investigation of other available sites in the Portland area. Primary factors in selecting this site over other sites were (1) the favorable protective covenants offered by this development, (2) its location in what we believe will be the future direction of growth of metropolitan Portland and (3) its proximity to the Oregon Electric Railway tracks, which offers good switching service and flexibility in routings of transcontinental freight movements."

The speaker? Ed Stuart, supervisor of operations for General Electric's Major Appliances division distribution center, located at 14305 S.W. Millikan Way. The center, a branch office in the Northwest district of the division, serves Oregon, several counties in northern California and southwest Washington. Main offices for the Northwest district are in Seattle.

Before moving to the Beaverton site in May of 1961, the Major Appliances division branch office was located in the GE Supply company on S.W. 14th in Portland, and the warehouse was in leased quarters at Guilds Lake. Since consolidation of the office and warehouse at Beaverton several employees have moved to this area.

Sells TV, Stereos

The Major Appliances division sells, distributes and services large household appliances (such as ranges, refrigerators and dishwashers), television sets, stereos, furnaces, water heaters and Weathertrons (GE's tradename for a machine providing both heat and air conditioning). The center is strictly wholesale, and is sole distributor to GE major appliance dealers within its assigned area.

The building was designed by Stanton, Boles, Maguire & Church and built by Henry Mason company, both Portland-area firms. Its 51,546 square feet of floor space includes a 3000-square-foot sales and display area, general offices of 4870 square feet, a 10,000-square-foot parts and service area, and over 33,000 square feet of warehouse space.

The GE distribution center is surrounded by Tektronix property. Only access to the center is Millikan Way. GE has an easement from Tektronix to use this private road.

Provides Sales and Service

Forty-two employees staff the Beaverton building. Ten salesmen work out of the center, keeping area GE appliance dealers informed on new models and new products. Wayne Hughes is sales manager, reporting to the district sales manager in Seattle.

Twenty-one employees work in the service area. This group services appliances, TV and stereos, both in homes and in the center's service shops. Twelve radio-dispatched service trucks cover the greater Portland area.

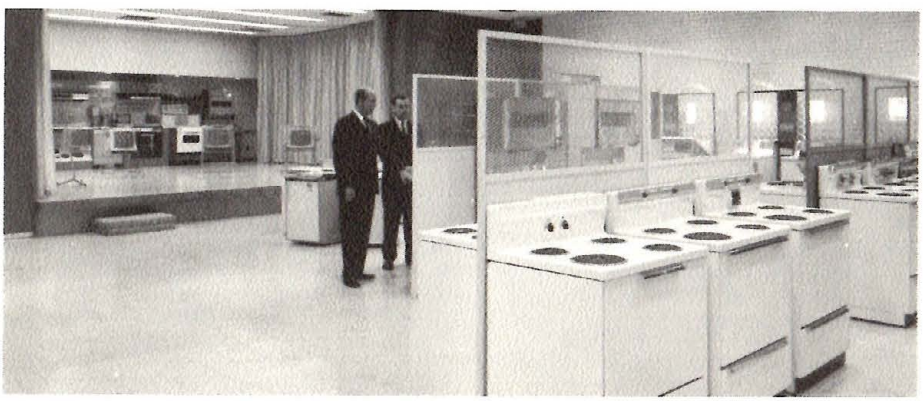
While its main function is distribution and service of GE home appliances, the center also houses two display rooms. In these rooms, staff members display new products, entertain customers and hold conferences. The larger of the two rooms is of ample size to hold technical conferences, such as the Technological Plastics Symposium, held there last September under the sponsorship of the State Industrial Accident Commission.

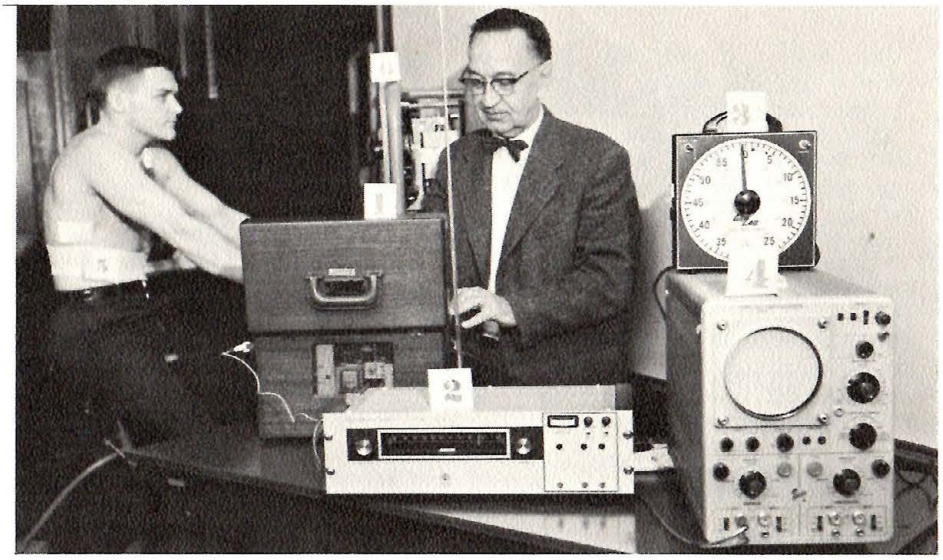
A truck loading dock stretches along the west side of the warehouse. Three large doors open onto the railroad siding on the east side, making possible simultaneous loading or unloading of three railroad cars.

The warehouse was designed with a high ceiling to allow vertical storage of appliances. Refrigerators, ranges and stereos are stacked four-high in the unheated area.

The building can be enlarged by an addition at the north end (toward the OE tracks). The concrete walls on that end have knockout panels to provide access to a new wing.

The two companies that share our industrial park with us—GE and Mears Controls—reflect the same progressive attitude that has made Tektronix a leader in the oscilloscope field. And as they look toward future expansion to better serve Oregon customers, the distribution center indeed lives up to GE's motto: "Progress is our most important product."





Dr. Herman Gawer (right) of OSU demonstrates telemetry system used to test athletes' heart action under measured amount of strain. Type 503 is used in project which may extend the uses of an electrocardiogram to persons engaged in strenuous activities.

Another (puff,pant) use for scopes

Oscilloscopes have a way of turning up in the most unlikely places, performing the most unlikely tasks.

"But the men's gym? What would an oscilloscope be doing in a gym?"

At Oregon State University, Dr. Herman Gawer is using a Tektronix 503 in cardiac testing of athletes engaged in strenuous activities. Dr. Gawer is assistant professor of Hygiene & Environmental Sanitation. A graduate of University of Oregon in 1929, he received his master's and doctor's degrees in hygiene from New York University. At New York City College he engaged in physical-fitness testing programs and health-guidance evaluation tests from 1950 to 1955.

His interest in electronics began as a hobby after his retirement in 1961 from City College, N. Y. But it blossomed into a new interest in cardiac testing related to his professional field—physical fitness. He was invited to join the staff at OSU in 1961 to continue his work, which ended his brief "retirement".

In most EKGs—electrocardiograms—the physician must attach the electrodes to the patient with cables, limiting the distance between the patient and the instrument—and certainly limiting the activity of the patient while being tested. Many times, heart problems may be present but do not appear while in a resting position, and therefore are missed in the EKG results.

Using a system of telemetry, Dr. Gawer's project allows full mobility to the subject being tested. (Telemetry is a method of transmitting electrical responses by a signal and recording and measuring the results at a location away-from the source, without the use of cables.) A small box-like transmitter is fastened to the waist with a belt and two silver-disc electrodes are carefully placed on the chest with adhesive. The two small wires attached to disc electrodes terminate in a socket of the transmitter. Through walls, floors, furniture if necessary, the signal is transmitted to a receiver which in turn is hooked to the 503. If the students are out on the track, an antenna, mounted on the window-sill of the test area, is used to pick up the signal. Dr. Gawer can then monitor visually the heart action of persons trotting around outside, dribbling a basketball around the floor or pumping away on his special bicycle, set for various foot-pounds, that can get increasingly tough to push.

An EKG tape is time-consuming to read. Under Dr. Gawer's set-up, it can be started whenever he **sees** the heart action he's looking for on the 503, thus eliminating large amounts of tape, only a small amount of which would display the defect being sought.

Dr. Gawer's subjects are male freshmen, who routinely take the OSU Motor Fitness Test when entering school. From these freshmen, he selects the students finishing in the upper 15% of the test and those finishing in the lower 15%. This gives him two distinct groups to work with and later analyze the data he's collected.

In his research project, a bicycle ergometer is used which he can set at 1230, 1790 and 2500 foot pounds of work-load. The students pedal for a predetermined time, and rest for a specified time. He monitors the results and records exactly how a "physically fit" person responds under a precise amount of strain and how a "physically inferior" person gets along under the same conditions.

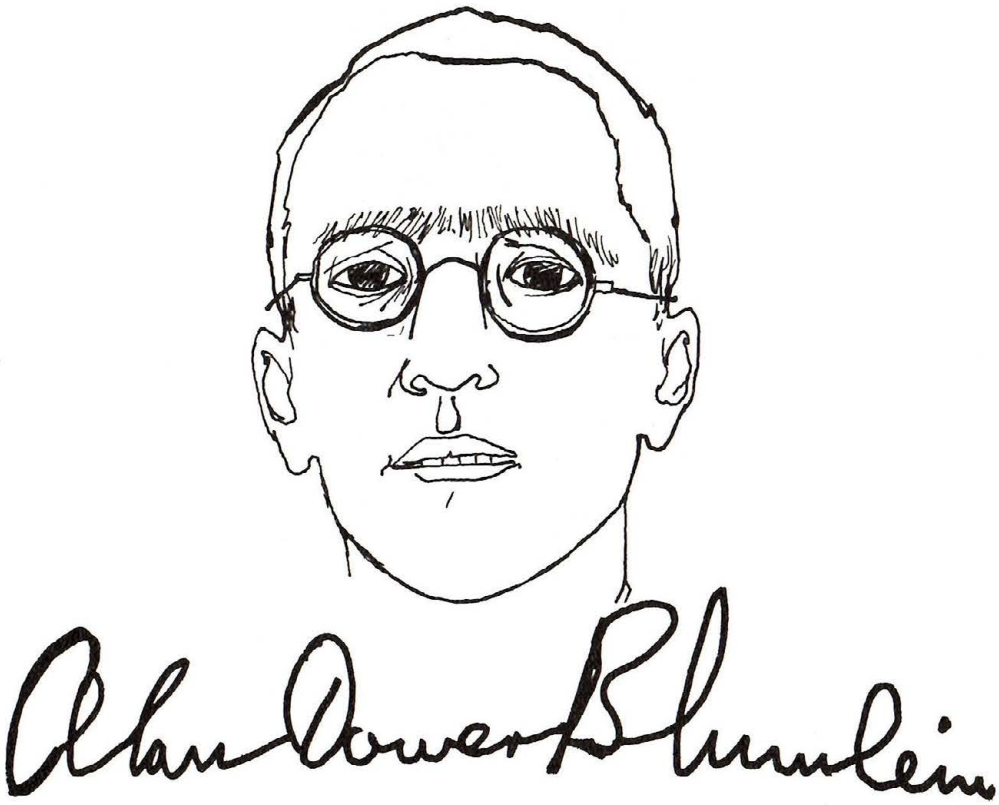
Each student's data is then recorded on a graph and sent to a panel of cardiologists to be analyzed for clinical implications. The results are then placed in a computer and analyzed according to the following seven parameters:

1. Heart rate in rest position—before exercise.
2. Rate at end of exercise period (two minutes).
3. Increase in heart rate at end of exercise period.
4. Seconds required for heartbeat to reach peak rate.
5. Seconds required (after the end of the exercise period—2 minutes) before a decrease of five beats or more is noted.
6. Seconds required (after the end of the exercise period—2 minutes) for heart rate to return to resting rate.
7. Numbers of heart beats above or below resting state at end of four minutes.

As a parent you might be concerned at times about whether to let your youngster engage in knock-down, drag-around sports. If there has ever been an indication of a heart defect, no matter how slight, he would have to refrain from sports activities. But what if you could **watch** his heart while he romped around—actually **see** whether it could operate safely under strain? Sidelined children could enter into more active play with the assurance it would have no adverse effect on their hearts.

Could you simultaneously monitor a whole gym full of gradeschoolers playing volleyball? According to Dr. Gawer, it could be done, but because of the high cost of the instruments ($300 for the small transmitter alone) it's unlikely today. But his research on how a heart responds to strain could lead to something similar. And more important it could in effect add several hundred feet of non-existent "wire" to our present electrocardiogram machines. Dr. Gawer emphasizes that the main thing he is trying to accomplish is to determine whether a system of telemetry is effective as a means of providing usable data. If it is, the possibilities of heart research in his field of physical fitness are many.

So you see, they **do** use scopes in the gymnasium. And, who knows? Some day you might see a Tek scope on the warm-up bench, looking very at home with the coaches and the second string.



(Roads in Tektronix Industrial Park have been named after four outstanding scientists who have contributed much to physics and electronics: Robert A. Millikan, Dr. A. A. Knowlton, Karl Braun and Alan D. Blumlein. This article will discuss some of Mr. Blumlein's contributions.)

June 7, 1942—In the sky over Britain a four-engine Halifax bomber is having motor trouble. Aboard is a team of research scientists returning from a flight that had tested a radar bombing aid. Among the scientists is Alan D. Blumlein. The plane is having trouble and has to crash-land—

There are no survivors.

So ended the life of Alan Blumlein, 38, one of electronics' most brilliant circuit engineers—and one of the least acknowledged. Very little of his work was published; he was too busy to write. Technical literature is the poorer for it.

His name is seldom seen. The last few years of his work were shrouded in wartime secrecy. Even his death was not reported for three years, and then only briefly.

Blumlein avoided publicity to such an extent that photographs of him are almost non-existent.

He was educated at Highgate school and the City and Guilds College, London. Soon after he graduated he began his professional career by joining International Western Electric Corporation. His work there, mainly on problems of interference in telephone lines, soon provided evidence of his exceptional ability and originality in circuit engineering. At least eight patents resulted from this line of communication work.

Among them are a method of reducing mutual interference between channels (cross-talk) in long-distance telephone cable systems. These days, long-distance telephone is usually on a modulated carrier, with conversation shifted into separate frequency bands, but at that time it was on original speech frequency.

In 1929 Blumlein moved to the research department of British Columbia Recording Company (which shortly became part of Electric & Music Industries). He became interested in the problem of practical stereophonic sound and soon realized that for two-channel reproduction over loudspeakers—a problem that differed fundamentally from earlier experimental systems using headphones—it was necessary to convert the outputs of two spaced microphones into separate amplifiers before feeding them into the speakers. Blumlein believed that the main factor in locating a source of sound was the difference in the time of the arrival of the sound at a person's two ears at low frequencies and in the difference in intensity at high frequencies. He therefore devised a method of converting phase differences in the microphone outputs into amplitude differences—the basis of modern two-channel stereo systems.

To carry the two channels in a single groove he developed the complex recording procedure universally used today in a stereo system. Stereo cutting heads and pickups were developed and a number of discs successfully cut. In 1931 Blumlein filed and was granted a British patent covering two-channel disc recording and motion pictures—a patent which lapsed before commercial use was made of his system.

Some of his original stereo records, pressed almost 30 years ago, are still in existence. When played on modern stereo equipment they show good channel separation and frequency range. However, restricted audio range and high surface noise of the shellac pressings played with the then-current steel needles, impaired the stereo illusion—one reason these discs were never marketed. Blumlein recognized the limitations of shellac as a pressing material and in his patent claim foresaw the need to develop a material of the cellulose acetate type and the use of a sapphire stylus.

Soon after this, the idea of stereo records was pigeonholed. Not until 1955 was his stereo recording system put into practice, first for EMI stereosonic tape recording and soon afterward for the modern stereo disc.

With stereo shelved, Blumlein did not remain idle. In 17 working years until his early death, 138 patents were granted to him solely or in collaboration with other engineers—an average of one every 46 days!

His circuit developments in instrumentation, recording, slot antennas, television and radar were often far in advance of his time. Even now it's claimed that many of his circuits are not being fully exploited.

Most Tektronix scopes use several of his circuits. We have paid royalties to EMI for several years for the privilege of using them.

Some of his basic work affects the millions of homes that have television receivers.

Such was the contribution of Alan Blumlein, circuit engineer and inventor.

As H. A. M. Clark of EMI, one of Britain's foremost recording engineers, said: "Alan Blumlein was a perfectionist in everything. No detail was too small to escape his attention and interest. Even when building prototype pieces of equipent, he would take the greatest care to see that his soldering was of the highest possible standard."

In his brief working life, he achieved more than a whole team of present day research engineers usually hope for. He lived to see only a small portion of his discoveries in full use. In his lifetime his stereo work was applied only for one purpose—the design of aircraft sound locators for use in a war which caused his death.

(Material for this article was taken from March 1961 "Electronics World.")

Teks

BIRDS ARE SIGGIG. Bugs are bitig. Sub people have hay feber, and sub still have head codes.

But for others, the bursting of Summertime ushers in the mad annual urge to Get Back in Shape.

In a Portland YMCA, at an hour so early that many people doubt it even exists (to wit, 6 a.m.), a hardy crew of Tek managers have been swimming, wrestling, shooting baskets, running in circles and otherwise committing athletics.

WE ALL OUGHT to say huzzah for these Early Risers; it's their kind that has made America great. But there are others, good fellows all, who are psychologically assembled in such a way that if early morning doesn't mean sack time, then it means nothing at all. Any person who'd rather loaf in bed than get up and face the bright new day can't be all bad, as the old saying goes (or should).

For every guy who is a.m.-oriented, who enjoys romping about the basketball court, egged on by the tonic odor of gym floor varnish, and who can then proceed to a giant breakfast of ham and eggs — for each one of these there is another guy who can't. There must be a scientific name for this other type (other than Lazy), giving them some sort of biological alibi.

THESE NON-MORNINGERS are the people who can't even **breathe** at 6 a.m., much less coordinate enough muscles to brush their teeth neatly. They'd never make it to the gym to do their pushups, for they would have bogged their cars in the tulip bed in a spastic attempt to back accurately from their driveway.

They are the people whose idea of breakfast is coffee at 10 a.m. To them, a bite of toast brings on intestinal clog, and the sight of a fried egg suggests only that it is a chicken embryo and should have been let alone.

But all this is aside from the point, and aside from the applause that the true Tek athletes deserve. They **are** looking trimmer and (pretending to be) happy.

DAYBREAK physical culture is probably only one step from early-morning winter golf, itself an ordeal of nasty proportions. There they'd be, the Tek athletes, leaning into the sleet and plodding ankle-deep in mud down the twilit fairways, the beams from their miner's helmets frightening night crawlers, raccoons and owls who hadn't put in their eight hours yet.

Instigator of the current fitness fad is Personnel Director Guy Frazier. It doesn't say in his job description that he **has** to, so he must have another excuse. Among his co-exercisers, to date, are Mike Park, Frank Consalvo, Bill Cronin, Dick Walker and Walt Durham.

THEIR LATEST fling at the sporting life is curling, a Scotch sort of athletics in which one player shoves a heavy polished granite stone down the rink while his buddies run along in front of it with brooms, whisking the ice free of crumbs, granules, sand, lint, Goldwater buttons and insects — and occasionally falling flat on their reputations. (This adds some slight spectator interest to a sport that would otherwise be about as interesting as watching Mama sweep the hall — Editorial Comment).

THIS ALL reminds us of a spotty effort here a couple years back to form a rock-hard, suntanned, heck-for-leather gang of Teks to work out at the YMCA. Its name was the Fight Lethargy—Add Buoyancy Society (FLABS for short) and its motto, "Change unsightly fat to sightly fat."

Despite good intentions, the venture fizzled. As the lazy, hazy, crazy days of summer came along, spring fever ran its course and the group adjourned in favor of soda, pretzels and whatever else the popular song talks about.

But all hail the current crop of athletes, and may their tribe increase.

DON ALVEY (International Marketing), who spent a couple of days in Hawaii some time back, returned what you'd call nut brown. He claims he got his sunburn while lying on the beach in the rain. Just how that works isn't made clear.

So tan was he that his co-workers, pasty-faced from blotting up fluorescent beams here at Tek, glared at him and didn't bother to hide their jealousy.

There **is** a sly way, though, to get back at these nut-brown returnees:

"Gee, Don," you say on his second day home, "You sure were tan **yesterday**."

DAY IN, day out, our society is so swamped by words, words, words, that we often become blind to some of them.

If someone asked you where he could get a Federal Reserve note in a hurry, what would you tell him?

The answer is: In his own billfold. All two-dollar bills and up (and the new one-dollar bills) are Federal Reserve notes. It even says so on each one. Look and see.

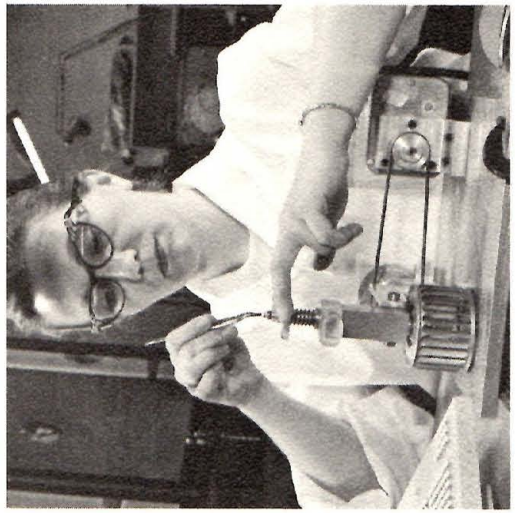
Out of curiosity, an Inquiring Reporter called the Portland office of the Internal Revenue Service, who see enough money to know about it.

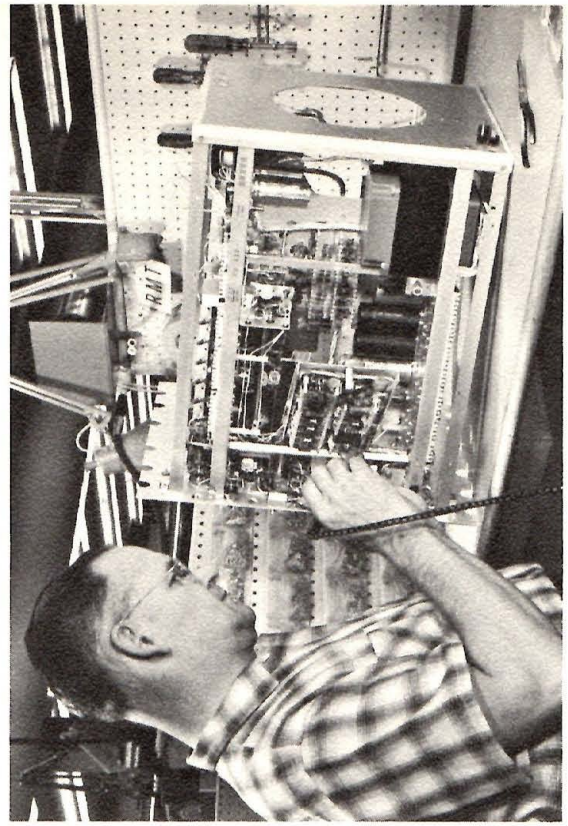
"Is it possible to pay our tax with Federal Reserve notes?" the Inquiring Reporter asked.

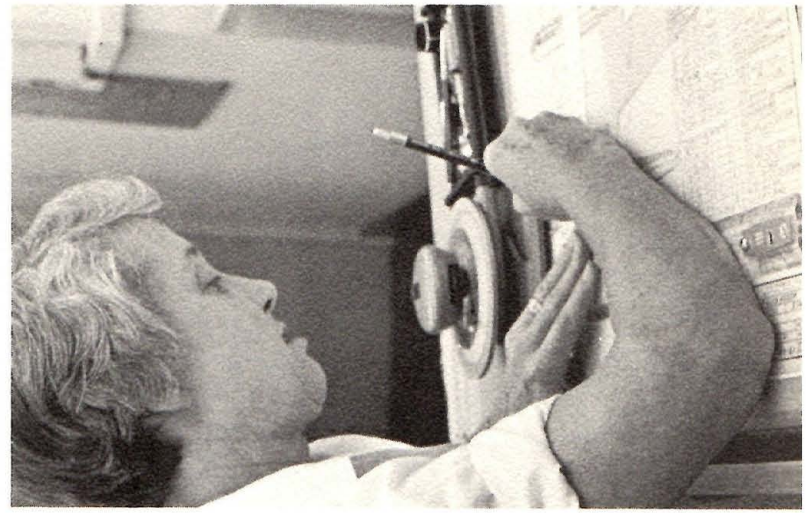
"I can answer that right now," chuckled the IRS man. "The answer is no."

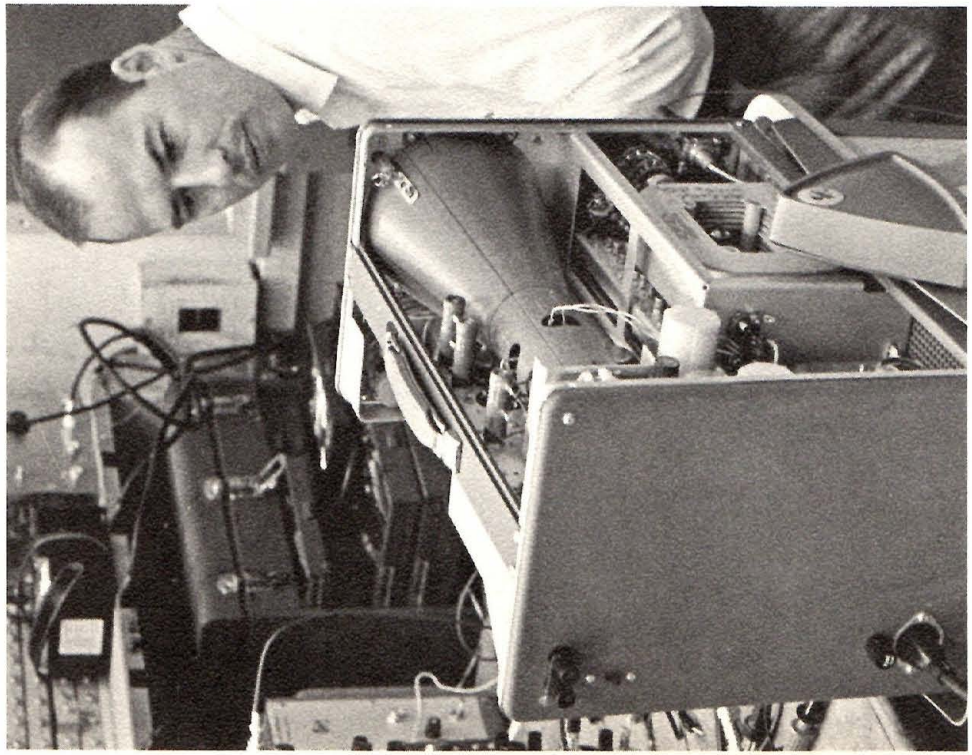
"Why is that?" persisted the Inquirer.

"Well, you have to cash them in first," the revenuer explained patiently.









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