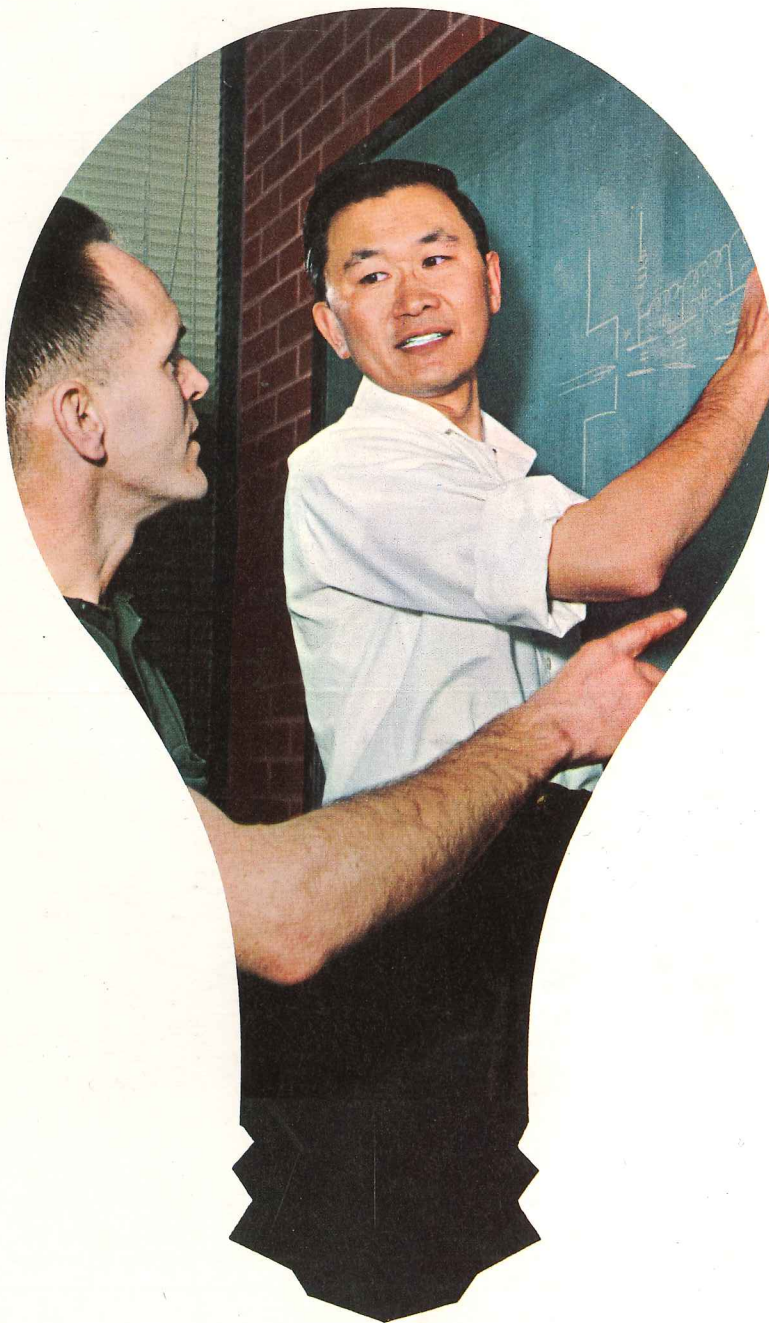


# tek talk

The Tektronix Employees Magazine

Spring 1969



**Tektronix:  
Its Concepts**



TYPIST IN Sony/Tektronix office, Tokyo, has a harder job than her counterpart in Beaverton. Japanese typewriter uses three type





IT'S EASIER to describe someone's appearance than his personality.

It's easier to talk about a company's physical aspects than to define the basic beliefs that, down beneath the industrial surface, make the whole complex human enterprise work, in a particular and unique way.

The concepts that Tektronix people have come to believe, and try to live by, are just as real (although not as easy to define) as the more tangible signs of corporate existence—numbers of products, dollars of sales, stock price, square footage, and the names of particular people.

This issue is one attempt to talk about some of those less definable Tektronix realities. What advertising men like to call, the sizzle rather than the steak.

HET IS GEMAKKELIJKER iemands uiterlijk te beschrijven dan zijn persoonlijkheid.

Het is gemakkelijker over de tastbare aspecten van een bedrijf te spreken, dan de grondgedachten te omschrijven welke, onder het industriële oppervlak schuilgaand, maken dat de gehele onderneming op een speciale en unieke manier werkt.

De ideeën waarin mensen van Tektronix zijn gaan geloven en waarnaar ze proberen te leven, zijn even reëel (hoewel niet zo gemakkelijk te omschrijven) als de meer tastbare kentekenen van het bestaan van de maatschappij zoals productiecijfers, verkoopcijfers, waarde van de aandelen, oppervlakte van het bedrijf en namen van speciale mensen.

Deze uitgave is een poging om over enkele minder gemakkelijk te omschrijven Tektronix ideeën te spreken. Wat men zou kunnen noemen: We praten over de verpakking en niet over het product.

IL EST PLUS FACILE de décrire l'apparence de quelqu'un plutôt que sa personnalité.

Il est plus facile de parler des conditions physiques d'une Compagnie que de définir les concepts de base qui, sous le masque de l'Industrie, font fonctionner d'une façon particulière et unique, l'entière et complexe entreprise humaine.

Les principes auxquels nous sommes venus à croire, nous à Tektronix, et selon lesquels nous essayons de vivre, sont aussi réels—bien que moins faciles à définir—que les signes plus tangibles de l'existence de la firme tels que le nombre de produits, le volume des ventes, le prix des actions, la superficie des bâtiments ou le nom d'employés remarquables.

Dans cette brochure nous essayons de parler de quelques unes de ces réalités, difficiles à définir, qui font Tektronix. Ce que les agents de publicité américains aiment appeler "le grésille du feu au lieu de la viande."

人を表現するのは、その性格より、外見の方がやさしいものです。同様に一つの会社について語るときにも外面的概略の方が、その会社のもっている経営の根本信条よりも、第一に問題にされます。

テクトロニクスに働く人々の信条は、会社の表面的な物——すなわち、生産高、売上高、株價の動き、会社規模の大きさ、主な経営者の名前など——以上にはつきり言葉で表わせない、リアルな感じを全員が持つことです。それに個人が誠実にベストを盡すことが、たえず必要で、これこそ私達の信ずる処であります。

本誌では、むしろ、そうした、はつきりしない テクトロニクスの実体について、お話ししたいと思います。それは、ちょうど宣傳関係の人達が好んで使う言いまわしである、「ステーキの肉よりも、音をたてて料理されている焼き模様」を御説明することにあります。

beds, each containing 3000 characters.





(FROM LEFT) V.K., Dick, Tom and Ingrid



JOSEF (left) and Kip

## THIS ISSUE: The Makings

IF YOU'RE in the US, this issue will read about like others; if you're in France or The Netherlands, it won't.

Tek Talk, for the first time, is being printed in three languages — fitting enough for a company that does one-third of its business in foreign countries.

Just by chance (and, to be honest, something we'd never really thought about until we looked around), the TT staff itself is a pretty cosmopolitan crew—representing a variety of national and ethnic backgrounds, and able to speak something like a dozen languages, depending on how you count.

Most Tek Talk photographs are the work of Josef Oswald, who began his career in Germany as an editor, then became a master of the camera. Josef, 68, is now a US citizen.

So is V. K. Sawhney, who wrote the stories beginning on page 26 and page 29. V. K. (for Vinode Kumar) was born in India and educated through high school there.

Then there's quiet Richard Koe, who's responsible for the sleek "new look" of the graphics in this issue; and Tom Unthank, who'll be giving Dick an assist from time to time. Dick, US born, can speak Chinese; Tom, US born, speaks Soul.

Kip Moxness, writer of the stories starting on pages 16 and 25, is a Yan-

kee—after a fashion. Born Stateside, he has, however, lived 14 of his 23 years in foreign countries.

Ingrid Louiselle, editor of Tekweek, TT's sister publication, had a story in this issue—almost. She also—almost—was born in Canada, she says, missing that achievement by 1-1/2 days. Ingrid speaks Hebrew, Spanish, French and German, and can say a few things in Swahili, should that ever become necessary.

Other languages TT staffers can handle with some facility include Arabic, Latin, Greek, Hindi, Punjabi and Urdu. (Okay, now tell us you caught several proofreading errors in our English copy; go on.)

So, when you see Tek Talk going multilingual, maybe the real wonder is that it has taken us so long.

THERE'S MORE to language than just words. Language may reflect the whole culture and outlook of a people—something you can't always translate. Japanese, for one, has a real grace of phrasing—and you sense it even in the English version.

From what other country would one technical guy write another a letter with this kind of opening sentence? (The letter is from Hirokazu Kawabe at Sony/Tektronix in Tokyo, to Roger Haight at Beaverton; and it has to do,

ultimately, with component evaluation.)

It begins:

"Winter has triumphed and swept all of warmth from heaven in our land. "I'm sending two types of switch . . . etc., etc. . . ."

We sort of like that.

SOMEHOW, WHEN you consider the problems of translation, you don't think about the differences between English and English. That is, American English and English English aren't precisely identical. So it is that, when TT sent a draft of "To Market, to Market" (page 8) to Harry Sellers in London to look over, he quick-like scratched out one word from the copy.

The word happened to be a common and completely harmless bit of US slang, fit to speak in front even of little children. But Harry's comment was, "We **never** use this word here—in polite company."

Interestingly, the guy who said the word was International Manager Don Alvey, a transplanted Britisher who, for an unguarded moment, was talking American. Don speaks crisply and—so we'd thought—very Britishly. Can it be that his few years in Beaverton are turning him into a Darnyankee?

Darnyankee, better make that.



# tek talk

Spring 1969

## TEKTRONIX: ITS CONCEPTS

### A Credo

6

Written seven years ago, this statement was never intended to be what it has become: The "official" Tektronix philosophy. Can you make it better?

### To Market, to Market: a Symposium

8

The sale is not the end, but the beginning; the Tektronix customer buys not a product, but a product plus continuing support in its use. Here, four Marketing men talk about our company, which includes the customer as part of its "organizational chart."

### The Individual

16

By drawing on the strength of each individual, we become more than the sum of our numbers. Interviews with an engineer and a teacher.

### "Tek Tech" Gets a New Headmaster

18

The responsibility for broadening the individual is one that's shared by employee and company. A look at Tek's educational program, and the man in charge.

### How to Succeed in Business Without (Really) Trying

25

Can you advance in a company by studying East Samoan sculpture? Well . . . why not?

### Creative Engineer Meets Electronic Idiot

26

Tektronix intends for people to do the "people jobs" and machines to do the machine jobs. The 1130 computer is a machine; and it's doing a lot of jobs that, although very complex, would still be drudgery for a human being.

### The Ubiquitous Oscilloscope

29

There is no "oscilloscope market." There are, rather, many oscilloscope markets. Here are two more uses for our versatile product.

### Glitches and Snivets; a Miscellany

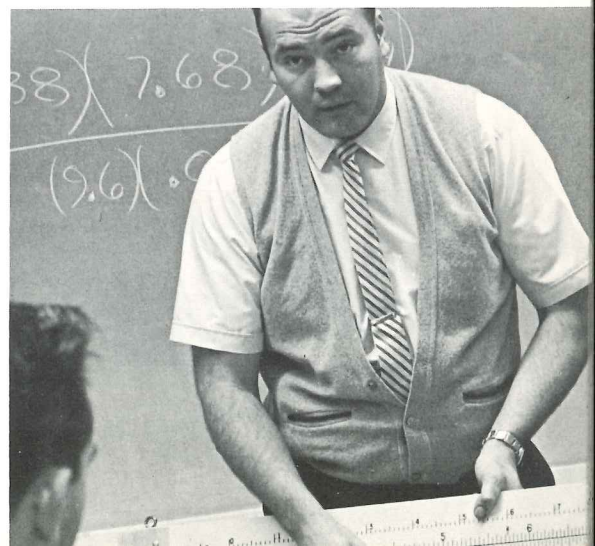
34

Employees publication of Tektronix, Inc., P.O. Box 500, Beaverton, Oregon, 97005. Address mail to Communications department: Joe Floren, editor; Dick Koe, editorial associate; Josef Oswald, staff photographer. Photomechanical production by Tektronix Photography department; printing by Printing department.

OTHER CREDITS: Help with translation came from Hiro Moriyasu, Pierre Morinaud, Ahne Oosterhof and Hideki Iwata at Beaverton, plus unsung Tek people in Heerenveen and Paris. Sony/Tektronix photo was supplied by N. Nishio and Bill Pyle. Most of the typing (and retyping) was done by Ann Donaca, who always smiled.

© 1969 Tektronix, Inc. All rights reserved.

Tek Talk will be sent regularly to persons outside Tektronix who request it.



# TEKTRONIX: A CREDO

THE ARTICLE on this page first appeared in Tek Talk in February 1962, with the somewhat diffident title: "Some Thoughts About Tektronix Philosophy." It was intended then to be, if not a rough draft, at least far from a final one. A composite of many people's ideas, it was prepared to serve as a statement of principles that might help guide employees in their day-to-day decisions.

It was never intended to be **The** Tektronix philosophy, but rather to stimulate thought about the whole subject. President Howard Vollum, who was actively associated in the project, asked readers to feel free to add their comments:

"... If you can suggest improvements in expression, have additions or illustrations to expand or clarify it, or—most importantly—differ with it . . .

"With your help, a more useful and comprehensive statement of Tektronix philosophy will be written, as we learn and as conditions change."

Conditions have changed—continually. And, hopefully, we **are** learning. Yet the statement has remained intact for seven years and, in spite of all intentions, has come to be accepted as a more-or-less "official" explanation of how Tektronix looks at business, and at people.

In response to requests from many new employees, and not a few older ones—as well as from "outsiders" with their own reasons for identifying with Tektronix—the article is here once again published. With, once again, the encouragement to each of you to feel free to suggest ways it can be made better.

**T** EKTRONIX IS A COMPANY of individual human beings. The Tektronix spirit, as it has been called, is above all a concern *for* individual human beings. If we draw our strength from the uniqueness of each individual, together we become more than the sum of our numbers.

We base our philosophy about people — and about business — on the belief that the goals we share, as a company, do not conflict with the goals we seek as persons.

We all are employees, although our jobs differ. The division of some companies into "management" and "labor" groups may imply that the aims of the organization conflict with those of the individual. We believe they do not.

As Tektronix, what goals do we share?

Like any business, we seek to make a profit and to grow. By serving science in particular and society at large with our skills and products, we seek to contribute positively to the world in which we exist. We also try to provide, truly, a good place to work — and to be thought of not as a company with many employees but as many people who, together, are creating a company.

As individuals, what goals do we seek?

We believe each person also wants to grow—to do a good job, to be proud of what he has achieved, to receive not only material reward but also the respect of others. These individual goals dovetail with company aims for high quality, fair price and excellent service—thus increased value and satisfied customers.

We believe that a company benefits by building in and strengthening human judgment. You cannot *order* judgment, but you can provide the environment in which it grows. And so we favor those practices that encourage each individual to make judgments that meet both company and personal needs.

Our company is not perfect. Certainly mistakes will occur. We view them as something to learn from, not something to punish for.

Two persons in similar situations may make different judgments. We respect and encourage these individual viewpoints, believing that each person should receive continuing opportunity to influence, and thus help, other persons.

We feel sure that, although a business that ignores values other than profit — human values — may prosper, it does so at the expense of society.

A road from one point to another is not always smooth or direct, but it still provides a means to your destination. In its winding, it sometimes takes you the wrong way; yet you know the *overall* direction prevails and the destination doesn't change.

So it is with the company: Each sound judgment may not satisfy all individual needs and meet all company goals. But we believe that our best



judgments, taken all together and over the long haul, can bring us nearer that destination.

Like any organization, ours requires authority — but a person's authority at Tektronix is over the job to be done, not over the people doing it. Here, the power to influence should depend as much as possible on the worth of an individual's judgment and on the nature of the particular situation. Some people do have more authority, more responsibility and more pay than others. We try to avoid the view that these factors are a statement of someone's worth—a statement that he is superior *as a person*.

We believe that people react positively when confidence is placed in them, and when the best is expected of them. We try to reflect this belief in our work relationships, in our dealings with customers and suppliers, and in an unwritten but binding code of behavior.

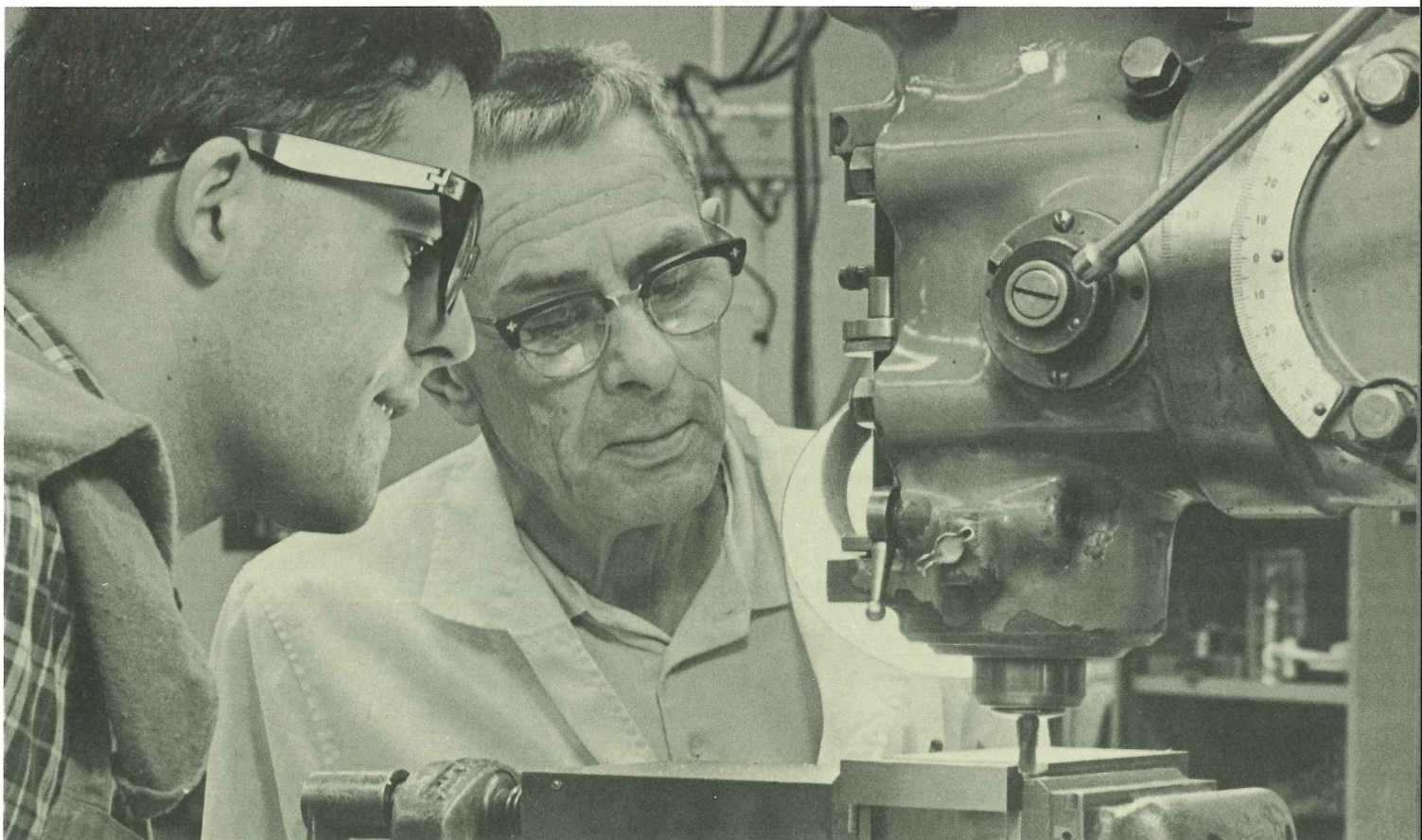
We believe that people derive greatest satisfaction from completing those tasks that require them to exercise judgment; thus, that it is better to educate them than to command them.

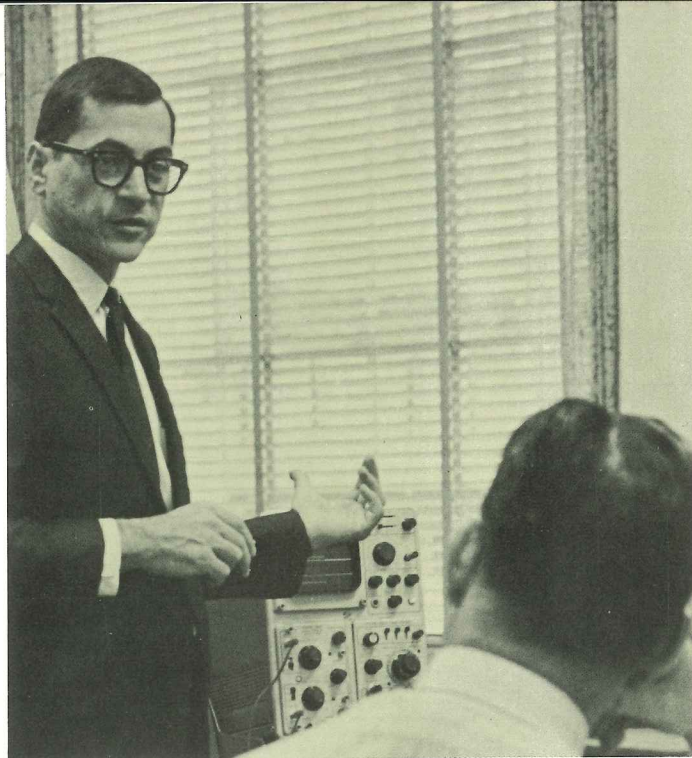
How do you describe a company? It's one thing to an engineer, another to a production worker, another to a supplier, another to a neighbor. Its values are measured on many scales.

These values must shift continuously, interacting in delicate balance, so none will be sacrificed for the others.

How do you maintain the balance? How prevent the sacrifice? There is no one way. There is no easy way. But the balance must be kept, and the sacrifice avoided.

"WE TRY to be thought of as . . . many people who, together, are creating a company . . ."





# TO MARKET TO MARKET

A Tek Talk Symposium

A TEKTRONIX CUSTOMER once told his engineers this:

If your instrument setup won't operate, and you can't figure out what's wrong, call your Tek FE. Tell him the oscilloscope won't work.

When he comes out to check the scope, the man said, he'll fix your whole darn setup for you . . .

Not every call by every Tek FE gives that much service. (And not all customers are that crafty.) But, over the years, "Tektronix" and "service" *have* come to mean the same thing.

Our Marketing organization has been frequently flattered; that is to say, others have copied it. Still, it remains a model for the industry; that much has been said often enough. But what *makes* it so? What kind of outfit are we?

A funny one, by some standards.

A company of 8000-plus, we can be totally committed by the front-line man, the field engineer, thousands of miles away. The subsidiary manager, an ocean from us, can make decisions with even broader implications.

From the farthest dot of Norway to the south of





SETTING UP the new Portland field office, Field Engineer Dick Hornicak and Field Secretary Des Prenger work to develop an updated mailing list for Tektronix technical and advertising publications. On opposite page, Dick makes a scope "demo."



DON HOFMANN

South America, the Tek FE meets the end user of our instrument face-to-face. All shapes and sizes, all nationalities, they still talk *one* language: Technical Expertise. The Marketing man must speak it, fluently.

The FE, a rare breed of teacher/engineer/salesman, must operate with great independence, a long way from "home." He has no rule book in the traditional sense. He does have a boss—but one whose job is not to boss him. Does he have an expense account? Not so you'd notice.

For his pains, he receives no commission. He's paid—like you, like me—base plus profit share.

Far out on the end of a long road, he must never be out on a limb. Strong backup sees to it that Tektronix does what he says we'll do: Backup from the field secretary, his boss and the boss's boss, and support groups at home. Backup, in fact, as needed, from *all* of Tektronix' more than 8000 scope experts.

For everyone, as one Tek manager commented—*everyone* is "in Marketing."

The FE sees to it that the customer, far off in his corner of the world, remains only a hoot and a holler from the top of our organization. (And when you look at the Tek "organizational chart," you'll notice that the customer is *part* of it. Ours is a company to whom service is not an old-fashioned virtue at all, but as contemporary as our latest instrument.)

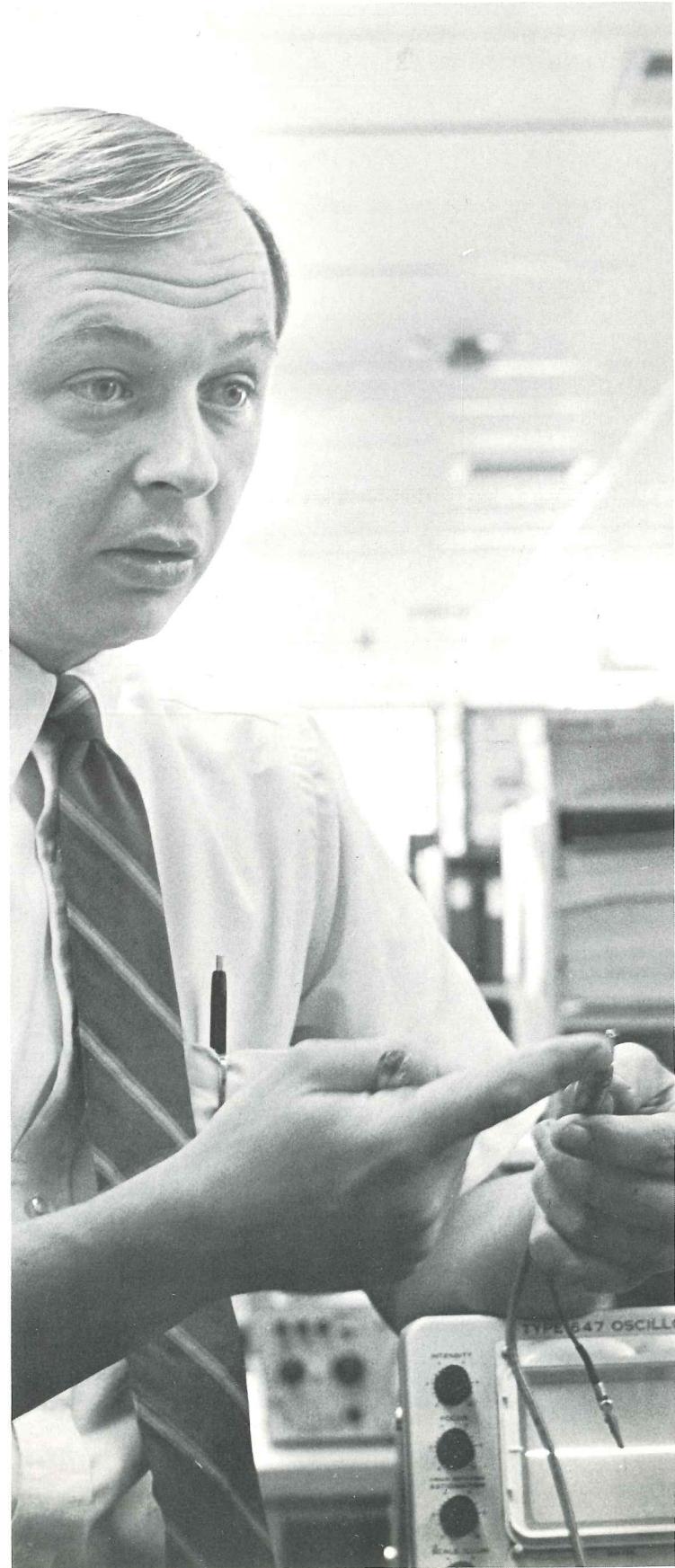
A good name opens many doors: and, for openers, you can't beat "Tektronix," and the world-wide reputation of its instruments. But a good name is not an unmixed blessing; for it may set standards so high as to discourage the faint of heart. In Marketing, as throughout our company, "It has to be Tek quality" is an informal, but unrelenting, criterion.

To paraphrase someone else's advertising:

We're (only) first—so *we try harder*.

**W**hat makes the Tek marketing man tick? Here, four of them share their views. They are Chuck Bouffiou, Don Alvey, Harry Sellers and Don Hofmann. Chuck is our new US Marketing manager; Don Alvey, International manager. Harry works for Don Alvey as manager of Tektronix U.K. Limited. Don Hofmann has been a field engineer, and is now assistant Long Island region sales manager.

In the following conversation, they take a close informal look at themselves, their jobs and the company with whom they all are most closely involved.

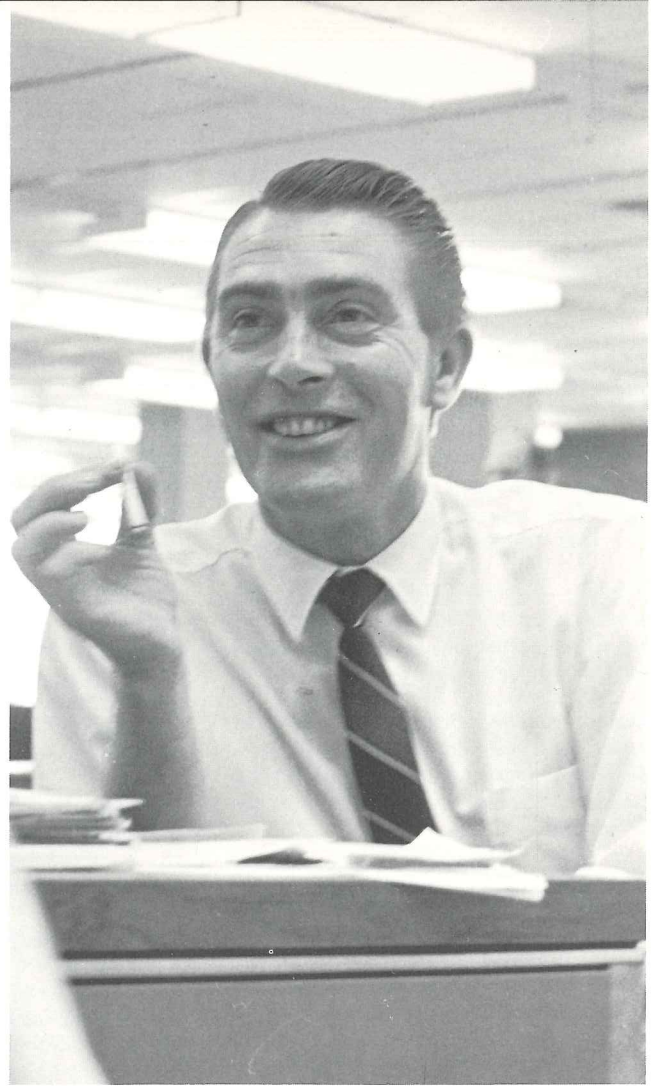




HARRY SELLERS



CHUCK BOUFFIOU



DON ALVEY

*What unusual aspects are there in Tektronix' approach to marketing?*

**Chuck**—The independence of the field engineer, for one thing. It's very unusual in this business to allow—or, rather, expect—the first-line man to commit his company. His ability to do so all comes under “marketing judgment”—which is hard to define, but most of our guys have it. What Tek does is give them a chance to use it.

To the customer, the field engineer is Tektronix.

To **expand** the FE's responsibility, we've shortened the management line. It goes from FE to region manager to me. If he fully understands the company and our product line, if he can make the **total** commitment, he gains satisfaction and recognition. And that maintains his long-range interest.

*How different is our approach from what our competition does?*

**Chuck**—Significantly different. Competitors would like to say the same thing. The fact of the matter is, it's not so.

For instance, in most companies, some salesmen are awarded “key accounts.” But we assign territory on a geographic basis. **Any** customer there is the FE's responsibility.

**Don H.**—Even our “rule book” is liberal—we have none, really, except for prices, discount policy, etc. The field engineer may have interface with the customer in any regard: Parts, prices, servicing, product availability. On very few



occasions will he have to say, "I'll go and check. . ."

*Is this approach true outside the US? How much autonomy does the overseas marketing manager have?*

**Don A.**—An unbelievable amount. He may or may not be as free-lance as an FE in the States, but his decisions could have far more implications.

**Harry**—Freedom of the subsidiary manager to use his judgment in policy-setting and implementation couldn't be better. This has been the greatest joy of my years at Tek UK.

We operate within broad Tek policies but, when local circumstances call for changes of slant, I feel free to apply them—provided I report back to Don (Alvey) here, making sure he's aware of the reasons for our actions.

The field engineer overseas also has wide freedom. We regard him as manager of his area, and encourage him to act accordingly.

**Chuck**—A significant difference is that our organization is flat; most competitors' are tall—vertical. We do this to get the customer coupled closely to management. He appreciates that, and his opinions and needs are communicated to Tek with much less filtering than is the case in a vertical organization. And, interestingly enough, any Tek organizational block we look at has the customer as a part of it . . .

**Don H.**—One unique aspect is the way we're paid. Not being paid a commission, an FE tends not to overemphasize short-range results, but to think in a long-term continuum. For example, he many times will feel free to suggest that a customer buy a less costly instrument—an attitude that creates customer confidence in 'Tektronix' integrity.

*Why would a salesman work for a company that doesn't pay commissions?*

**Chuck**—Many wouldn't. I believe that the person who **does**, has a greater interest in assisting others—another reason the field organization is oriented

toward the long-term, rather than just "closing the sale" today.

A result is that most customers expect a much higher degree of objectivity from our FEs than from the salesmen of other companies in the industry.

**Don H.**—There's no one unique ingredient about which you can say "That's it." A big one, though, that **flails** the doors open for you, is that the FE can talk on the same basis as the engineer who uses our products. I mean technical excellence.

We **have** to. We talk to the end user, the guy on the bench. A person who has a tactile sense of the instrument: He uses it, repairs it, or calibrates it. . .

**Harry**—As the unquestioned leader in oscilloscopes, I think we are really unique in many ways. Most people in the industry would say the same. Many of our philosophies and practices are unique, too—though some of them are increasingly appreciated (and adopted) elsewhere.

Customers compare us very favorably to most electronic instrument companies, both British and American.

To the outsider, I think "integrity" sums up the most respected facet of Tektronix.

*How do we achieve—and continue—this unique reputation?*

**Don A.**—We hire only marketing guys who **believe** in our way of doing business.

First off, you never whang a guy into that kind of job, stone cold. (It may look like we did in your case, Harry; but then, I'd known you for years). . .

Then, you need a lot of sitdown communications with the guy to explore the ground rules. There must be, most of all, mutual confidence.

**Chuck**—We establish guidelines within which the FE is free to plan his day, and to decide his interaction with customers. Each one does it a little differently. . .

Performance evaluation of the FE relates to a set of standards—rather than to comparison with his immediate associates. Nor is the region manager there to measure him, but rather to give him an assist.

You can't use FE territory sales as a measure, either, because we lead in the market. The **number** of dollars, short-term, wouldn't vary much, anyhow, and the long-term result of a dollar emphasis is **devastating** . . .

The region manager **does** review the FE's performance—but that assessment is qualitative rather than quantitative. There's no part of his job that lends itself to meaningful "measurement".

Whether you **have** created a job the FE can function in is a delicate matter. If you don't let him operate, other than as a leg man, you're in trouble. We've created an atmosphere that allows the FE to direct his own activities. His region manager supports him with training, administration and understanding of company policies and practices.

But the RM doesn't **direct** him.

Here in Beaverton, in all the Marketing support areas—you have to have dedicated people also. It's vitally important, once you agree with the customer, to see that what was agreed would happen, happens.

**Don H.**—You bet. The guy we hire probably has enough "smarts" to do a good marketing job; but if you took away his tools and support, he couldn't work.

**Don A.**—For instance, now Product Technical Information, in US Marketing, is broadened in both base and personnel. We keep one or more overseas people there. It has an international flavor now in its understanding of problems. It's a worldwide communications service, that is—giving support overseas as well as to FEs stateside.

**Harry**—The FE's job can be made easy, or difficult, depending upon the service his customers get from his office; the promise kept by the dispatch clerk; the quotation and literature arriving when the customer expected it (or before); the prompt and detailed response





THE TEKTRONIX marketing approach includes conducting a lot of formal and informal classes in oscilloscope use and maintenance. Here FE Dick Hornicak (Portland) is teacher; members of Pacific Northwest Bell, his students.

to a technical question or problem; the response by the telephonist and receptionist; the impression created by **everyone** when the customer visits a Tek establishment.

In short, by the quality of management and supervisors in **all** they do to recognize the importance of the customer, and convince him he's dealing with an organization second to none in **all** that it does.

The biggest burden for all this rests on the shoulders of our Marketing managers. More than ever, we need ability, drive, training, resilience, responsiveness to change and leadership of the highest order.

(We also need our share of Dame Fortune's favours.)

*Is the FE free to determine his working habits—hours and so on?*

**Don H.**—Yes, if you can call it "free". But many customers work obtuse hours. Many FEs have given classes at 11 p.m., and crawled up TV antennas in the middle of the night. . . **You** work when the **customer** works. If the FE takes

the attitude, "This is an 8-to-5 job," he can't effectively meet his customer's needs.

**Chuck**—You know, it's actually the combination of **FE and field secretary** that does the total chore of relating to the customer.

The FE does the physical work, running around with the customer. The secretary does the principal amount of order work and parts work. She's able—via Portland support—to resolve customer requirements for spare parts on a single-contact basis. The FE-secretary combination has enough information at their desks to insure the customer of after-sales service, and respond to him with answers.

Every company says they do this; we have inputs from our customers that say we do it **better**. Doing a common thing in an uncommon way, so to speak. Because most of them become repeat customers, doing this is vitally important.

**Don H.**—What Chuck says is sure true. The field secretary is **far** more than a typist, order taker and dictation

transcriber. She must have the training and judgment to decide how best to satisfy each customer inquiry; to know when she ought to supply information available in the field office, and when the response must come from the FE. Thus she has a direct effect on the customer's attitude toward Tektronix.

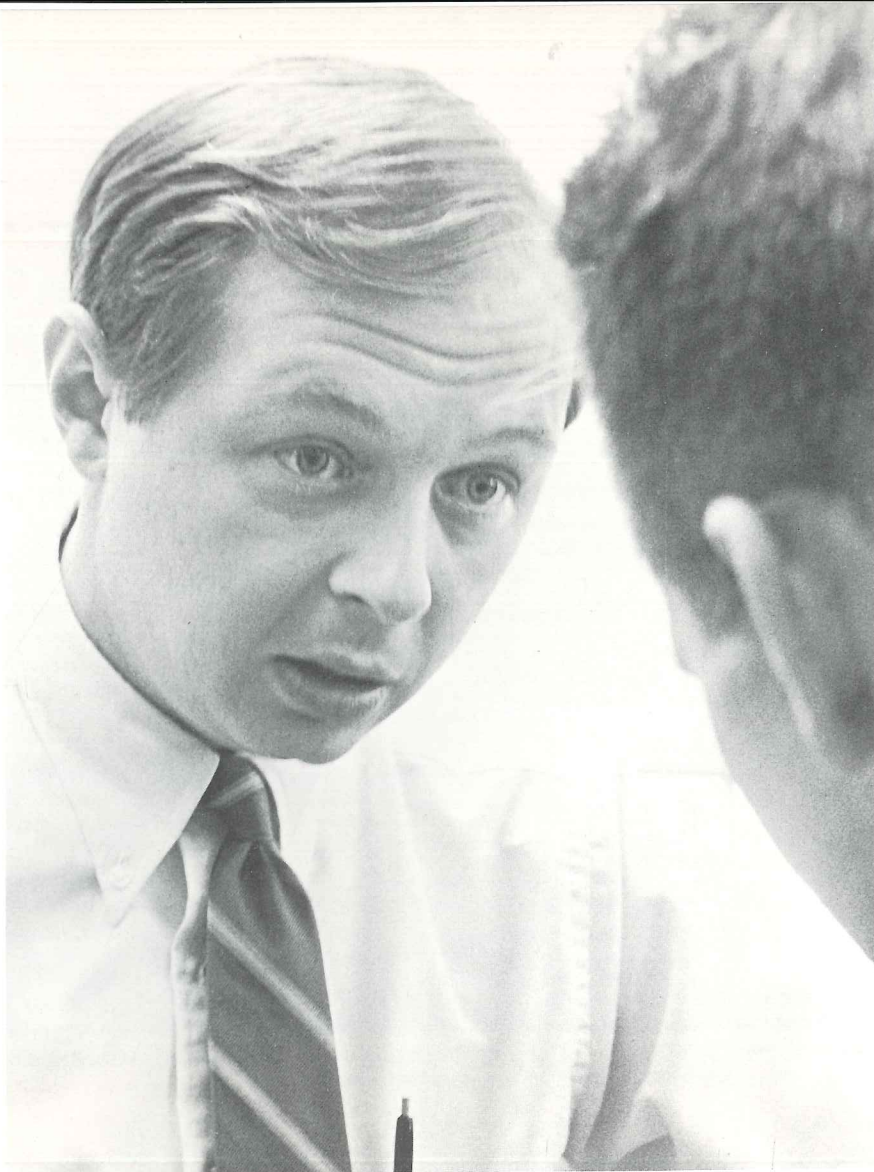
If the FE should have a question about company attitudes or policies, he goes to his region manager. I always took the attitude that he was available whenever I wanted him. I've gotten Chuck here out of bed at night to talk to him, when he was my RM.

*What major obligations do you feel Tek placed on you as an FE?*

**Don H.**—One healthy emphasis is on personal development, to develop a fairly wide background—in the arts, for example, or to fill gaps in business knowledge. FEs need to constantly grow and accept new things—if only because marketing is changing continuously.

All this breeds the kind of guy you want—one who **can** make decisions.





One aspect of our FE/field secretary/geographic-territory organizational concept is that, for most FEs, this is a valuable first exposure to the management of people and resources. We could probably organize the order-processing function to be a little bit more "efficient"—but at the cost of a considerable loss of effectiveness, and loss of a valuable first step in manager training. . . .

*Do you feel, then, that the broader a person is, in his ability and interests, the better he'll do his job?*

**Don H.**—Yes—irrespective of the variety of things he knows. Broadness helps him understand people better—which is our game. The mark of a good FE is knowing to whom he can go for good information, whom he can trust, whom he can take into his confidence—that is, his ability to assess people.

For me, knowing the technical aspects is the **easier** part. Much more difficult is understanding the human aspects.

*It's an unfair question, but how do our FEs compare with those of our competitors?*

**Don H.**—Obviously better. I'm not tooting my horn or that of my peers in the field, but it's true: When you compare our field engineer with other companies', or our field secretary against others—or when you see the response an FE gets from Beaverton when he hollers for help—you can't help but be impressed. And, the FE gets to see closely how other companies work; you're all in the same lobby. Some peddlers are only "lobby men"—highly paid messenger boys, carrying spec sheets, for instance.

*Does the fact we're a profit-sharing company affect the way Marketing operates?*

**Chuck**—Yes. First of all, we're in the measurement business, not the entertainment business. We don't spend company dollars to wine and dine

prospective customers—and the evidence is that customers purchase because of what the instrument will do for them, not what kind of night on the town the salesman can show them.

There's little reason to believe our field people look upon profit-sharing any differently from those at the factory. They're likely to give greater consideration to benefits to the group, rather than solely to themselves.

**Don H.**—When you look at our cost of sales, it's very, very low.

The FE (or any employee) tends not to think in opulent terms—in outfitting his office for prestige, for example. Our newer field offices are tending toward a businesslike appearance not unlike our facilities in Beaverton; you know: neat but not gaudy. . . .

*Is the "Tektronix philosophy" more than an abstract concept to the FE?*

**Don H.**—It sure is. You get the same kind of feeling in the field concerning "Tek spirit" that you get here in Beaverton, although many field people (such as secretaries) have never been here. Our dialogue with Beaverton, even on Telex—even the ring of a voice on the phone—helps a lot.

**Chuck**—A person must be fairly compensated. After that, he works for job satisfaction. I believe that for any person to **have** job satisfaction, he needs to know what's expected of him, and he deserves to know how well he'll be **compensated** for that performance.

The "Tek Spirit" is that we **have** been able to get satisfaction from our jobs.

**Don A.**—Overseas, we've proved sufficient times that, although we do different things in different countries, we're the same company everywhere.

If you go to an environment with a strong national character, you either "go local" or "go Beaverton." Some companies just act like another local company, doing what **they** do. (Like having a union, for example.) That approach is the least trouble.

By contrast, we say: We'll make our philosophy the starting point. If it's



unacceptable to the people, then we'll stop.

Profit share, as one example, has proved **acceptable** to all our people.

But, we adapt to local circumstances. In Japan, as an example, it takes you three tea sessions before it's acceptable to discuss business. This formality, and concentration on just getting to know the other fellow, is essential. What we call a "fire call" just won't happen there.

*Are there major differences in marketing overseas from marketing in the US?*

**Don A.**—The one we face all the time—it seems like a major one—is the very diversified nature of the overseas market. National practices die very slowly. And customer expectations are very different in different countries. You're always testing whether your dollars and energy are giving good service—and that it's what the customer **considers** good service.

We make a big thing about getting a guy into the user's lab or factory; but, in some countries, this generates **bad** will. The company may say, "All contact must be with the front office."

When we **do** get to the user, though, he's the same kind of animal, world-wide. If you visit an Italian user, he thinks that's tremendous. In the farthest dot of Norway, I was the only rep from **any** supplier who'd ever been there; they went out of their minds. Still, another customer may resent that you couldn't talk to him in his own language; this might even outweigh the pleasure he has in dealing with Tek.

**Harry**—The most important difference in the UK is our local standing. In the States we're batting on our own wicket—sorry, **diamond**—but in overseas countries, we're the visiting team. The rivalry, particularly in highly industrialized countries with strong electronics industries of their own, can be fierce and nationalistic.

In Britain, this problem is compounded by our balance-of-payments situation.

Import saving is just as vital to them as export making.

On the other hand, British electronics industries are high on the list of world competitors. They **must** have the most advanced test and measuring instruments (ours) if they're to produce state-of-the-art equipment. That's the real secret of the buoyancy of Tek's UK business in the face of strong local competition, the "Buy British" attitude, and the well-publicized economic difficulties over here.

In the UK we've tried to comply with British needs and preferences whilst preserving as much as possible of basic Tektronix philosophies and practices. I think we've achieved a pretty good balance.

*Do you have the same kinds of problems in dealing with the government that we seem to have in the States, Don?*

**Don A.**—Yes—multiplied by X number of governments. Often this is compounded by the US being seen as "foreign." The countries worry about us withdrawing, and about the strategic risks of their military program relying solely on a US company. As an example of red tape:

One European Air Force took two years to evaluate an instrument to decide whether to put it on the approved product list. By that time, we'd obsoleted it. We said we'd give them the "B" version at the same price. But their red tape wouldn't allow this, so we made the "A"s—and **no one** benefited.

A related problem is that of the US Government's overseas-investment restrictions, which no one really understands. We spend time—almost daily—worrying about that one.

**Harry**—As a customer, the British Government is very different from commercial customers. It makes its own rules, and we have to decide which we can take. If we don't comply, we have to face the possible consequences—but Tek is in a stronger position technically than many competitors.

As our overlords, I prefer to pass. The archives in International Marketing are full of my comments on this subject, unless (as I suspect) they're read with varying interest and tolerance, and consigned to the round-filing box with a "Harry's at it again."

*Tektronix has chosen to place most of its efforts, in its 22 years, on the oscilloscope. What are the advantages and disadvantages of this specialization?*

**Chuck**—An obvious advantage is the ability to concentrate engineering, manufacturing and marketing efforts. If we substantially covered the instrument field, the training necessary to support our sales, in the manner our customers have come to expect, would be overwhelming.

**Harry**—I agree. We'd have to face knowing less and less about more and more if we broadened out into **all** kinds of products—even if many were allied ones.

**Don A.**—The fact that ours is a multi-user market gives Tek a stable and confident position. When one technological market is down, one is up. It's a self-balancing thing. One **country** will be up, one down, also.

Even though technology changes—from vacuum tubes to solid-state, for instance—it's still exclusively a scope-measurement game that our guy plays. (Now, he also has to be a spectrum-analyzer man, and that's been tough. Multiply that problem 50 times, and you see its dimensions for some companies. It's physically impossible for them to have expertise in all their instruments.)

The same thing applies to maintenance and customer contact. You can develop rapid and intensive repair skills when you specialize and don't have to dilute your effort.

*Are we faster with repairs than competitors?*

**Don A.**—We aim to be.

But good service attracts use of that

Continued on page 30



# THE INDIVIDUAL

## RICHARD FROST simple answers? no!

Story by Kip Moxness

DR. RICHARD T. FROST, Professor of Political Science at Portland's Reed College, was first attracted to Tektronix' education program because:

"Tektronix seemed to be doing something about the upcoming urban crisis by providing meaningful jobs — instead of merely delivering another speech to the City Club, as so many companies were doing."

Dr. Frost, an outspoken and controversial man with an impressive record of accomplishment, served as National Director of Upward Bound—the Federal Government's "Headstart" program for teenagers—during 1966-67.

Dr. Frost brings to his Tek class, Urban Crisis, an insight into the complex problems of the city—and the political institutions that deal with them—an insight that can be felt only by someone who has been actively involved in solving them.

One of the first things Dr. Frost strives to do is to get people not to think about complex issues in "simple-minded ways." An example is the emotion-laden issue of public welfare.

He points out that every year in the United States \$8 billion is spent on outright welfare. However, he notes, **everyone** is "on welfare": The airliner we ride was subsidized in the development stage by the government, for instance.

His approach to education fits in with Tektronix' own. Dr. Frost sees the education program here as an attempt not so much to train but to add to people's perspective—the way they look at a phenomenon.



Dr. Frost finds the differences between undergraduate and adult education both interesting and stimulating. Particularly noticeable at Tek, he says, is the wide range of student backgrounds and educational sophistication.

Another difference, he says, is that without the usual "rewards" of the educational system—such as academic credit and grades—you avoid all the classic schoolboy problems of trying to "beat the system".

He believes that there are very few people in society who are not "salvageable" if they are able to get help in time. And he believes that the key is education.

Dr. Frost is critical of schools. He feels that too many colleges, for example, make their reputations on how many people they reject. He believes that schools are too often unable to respond to academically unsuccessful kids—kids who nevertheless show how smart they are by the imaginative kinds of trouble they get into.

"Upward Bound" provides an alternative, Dr. Frost says. The program was started in the fall of 1965 with grants to 250 colleges, to recruit high-school kids and bring them onto college campuses the summer between their senior year and their first year of college—to help fill serious gaps in their education. This was a way of saying "You have some talent"—something the kids had never been told.

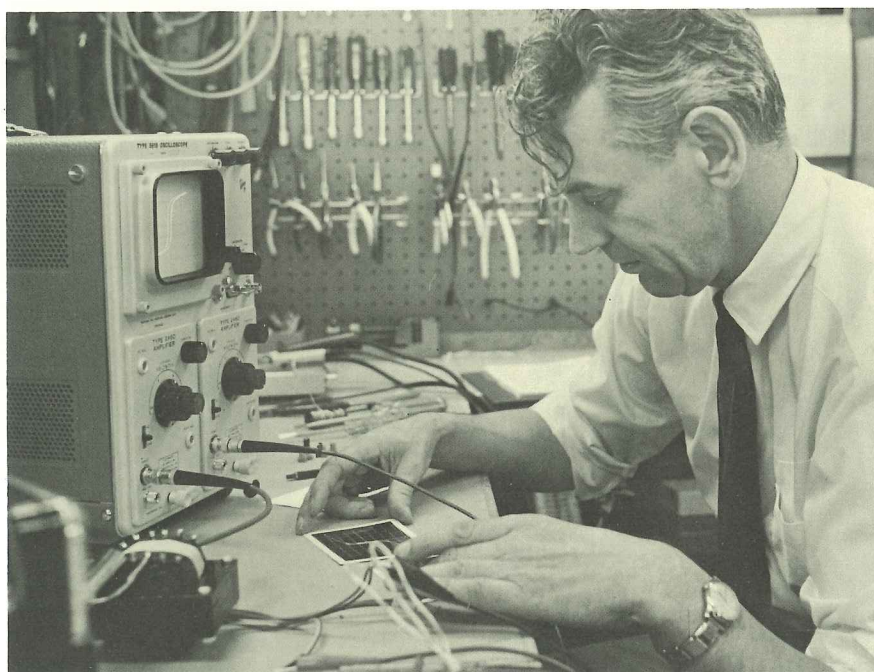
Dr. Frost points out that 600,000 poor kids graduate from high school every year. He notes that youngsters from good environments go on to college at the rate of 60 per cent, while the poor go on to higher education at a rate of only 10 per cent. The 40,000 kids who received help from Upward Bound went on successfully to college at a rate of 82 per cent.

The great social issues are very complex, Dr. Frost warns, and no one program will solve them.

But the best weapon in the long uphill struggle is education.



"If we draw our strength from the uniqueness of each individual, together we become more than the sum of our numbers."



Story by Kip Moxness

IT HAS BEEN a long road for Peter Staric from the six months he spent in an Italian concentration camp during World War II to his position as an electronics engineer in Evaluation Engineering.

Peter grew up in Ljubljana, a beautiful city of 120,000 on the northern tip of Yugoslavia. Within his life there, Peter has seen five distinct historic periods. First a monarchy ruled Yugoslavia, then the Nazis invaded. After the Italians came the Germans, then Communism under Russian influence; and later Tito's Yugoslavia, an independent socialist state.

For us here in the United States these are merely events in a history book, but to Peter—imprisoned at 17 by the Italians—they were very real.

Peter exudes an air of quiet confidence and a real love of life. He speaks fondly of his wife Cveta, his daughter Zorana, 17, and his son Miroslav, 19. He has seen none of them for over a year. Peter's wife is

a pediatrician in Yugoslavia; she and her daughter hope to join him in the United States this year. His son, like men here, may have to complete his military obligation in Yugoslavia before he can rejoin his family.

Peter's introduction to oscillography came in 1948, when he built a crude oscilloscope out of parts salvaged from war-surplus German radio equipment, the only electrical components available at that time.

In 1953 he began working with the Physical Institute of the Medical faculty at University of Ljubljana. Peter worked on various problems in acoustics and physiology, and built and did experiments on electrocardiographs. In 1961 he became an assistant to his professor at the Faculty for Electrical Engineering.

In addition, he wrote articles on electronics and reviewed technical books from all over the world. His command of languages has served as a great asset. Peter is a great believer in the value of mastering languages. "So many

## PETER STARIC

love of life? yes!

times the answer to a vexing problem lies so near," he says, "between the pages of a book. But because of the barrier of language it is useless."

Peter worked at Iskra, a large manufacturing concern, in the Division of Automation for 11 years. His full-time engineering work there was in addition to his duties as a writer, and his position at the Medical Faculty, and later at Faculty for Electrical (and Electronic) Engineering. He designed and built oscilloscopes, particularly "Telequipment type" oscilloscopes for testing TV sets and radio servicing.

Peter misses his country, yet he is enjoying his stay in the US. He believes that there is an opportunity here for a man who is willing to work. He feels his ideas are well received at Tek, and that he has great flexibility in his work. He particularly enjoys the variations in it. Comparing his first job, looking for problems in production instruments, with his present position, he says, "What I did before was like pediatrics; and what I do now is like obstetrics."

It would be misleading to imply that Peter is all business. He enjoys the outdoors to the utmost. An avid mountaineer and hiker, he joined Mazamas, and goes on expeditions with them in the Northwest. Peter is no stranger to the mountains; Northern Yugoslavia offers a landscape of majestic peaks, the Julian Alps, and he has spent many gruelling hours climbing them.

His enjoyment of Nature extends even to the obstacles she places in his path. He feels that an obstruction on a mountain trail, or a challenging problem in the engineering lab, both call on the best that is in him.



# "Tek Tech" Gets A New Headmaster

DERROL PENNINGTON



Story by Dick Koe

**m**ARK 1968 AS A YEAR of learning at Tektronix.

Better still, mark 1968 as a year of **broadening** education for the company.

Tektronix, throughout its 22-year history, has emphasized broadening of its employees—a continuing self-renewal process necessary for both their growth and that of the company itself.

Last year, in response to increased employee participation in the voluntary education program and to rapid changes in technology—especially in electronics—an even broader education program was launched by the Tektronix Management Committee.

To spearhead this expanded program, they named Derrol Pennington director of education—a new position. Derrol—a chemistry graduate of Portland's Reed College (B.A.) and the University of Texas (Ph.D.), former teacher at the University of Oregon and University of Washington, Beaverton school board member—has been at Tek since 1951, and, until recently, was Component Manufacturing manager.

His duties, as his job description spells them out:

“Administer the company's Education and Training program; establish new relationships between Tektronix and outside schools and educators; explore educational needs; and implement solutions to them.”

In short, Derrol will oversee all education and training activities, other





than Marketing Technical Training and Product Manufacturing Training, at Tektronix—a far more extensive job than that of Education and Training manager, a Personnel function, which was concerned mainly with our voluntary education program.

Since his appointment last summer, Derrol has collected information on company-wide educational activities, evaluating needs and establishing and ranking programs required for Tek.

Based on his findings thus far, he plans continuing improvement of the voluntary education program, expansion of management development, creation of new training programs and increased contacts with the outside academic community.

But, overriding all these plans, he

believes, is the need to restate the company's goals and aims in both education and training, and the need to capture new ideas and explore new approaches to reach these objectives.

"Tek's education program is not really a fringe benefit or a luxury," he insists. "It is **essential** in guaranteeing the continued success of this company. We spend large sums to improve our machines, processes, materials and designs; it only makes sense that we also maintain the quality of our most important resource—our employees.

"This is especially true at Tektronix, where technology changes so rapidly. We must keep looking toward new ventures and new ideas as part of our living. It takes time to build up

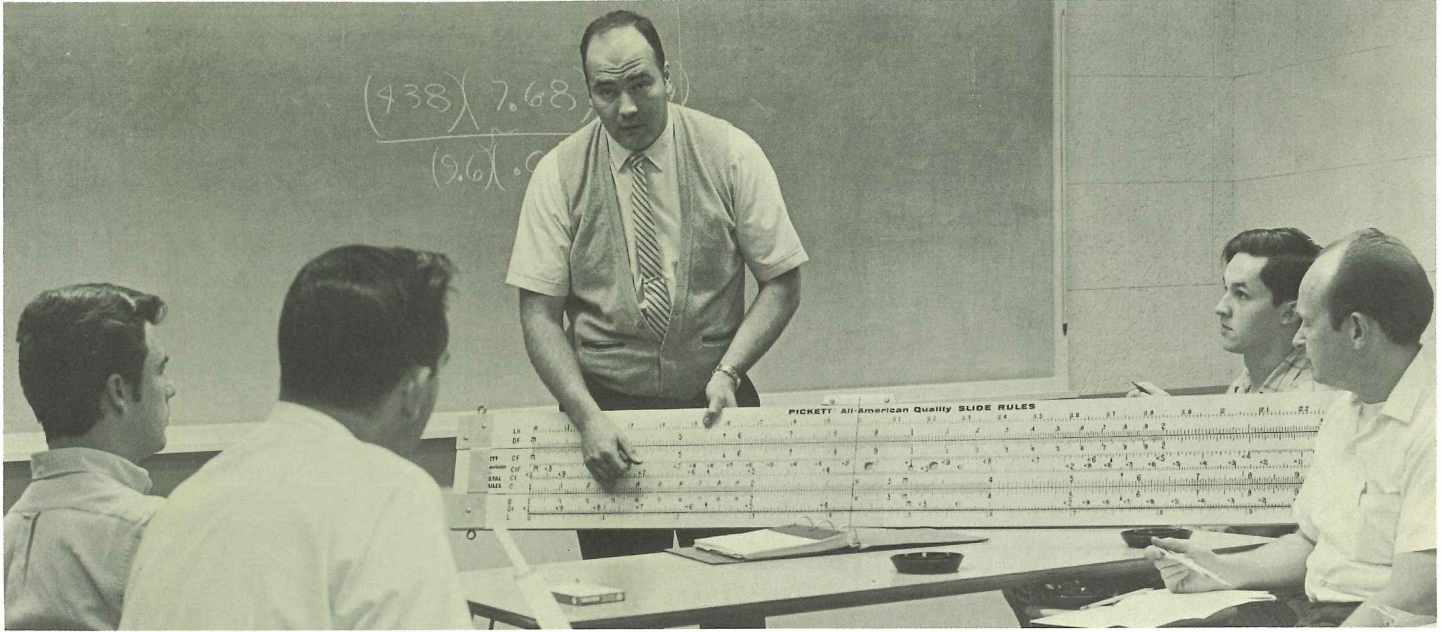
people, but the task of educating is challenging and, most important, filled with great possibilities."

Tek's main education objective, Derrol asserts, is to encourage employees to keep lines open to new experiences and new ideas, including those they otherwise might tend to avoid.

And these experiences may cover a very broad range. Derrol recalls President Howard Vollum's comment that a person, by studying poetry, might become a better employee. Literature, the expression of someone's thoughts, may be worthwhile to any employee, whatever his job, he said, since it has lasted a long time and survived the examination of knowledgeable people.

Howard has also said: "It does an employee little good to do a job well

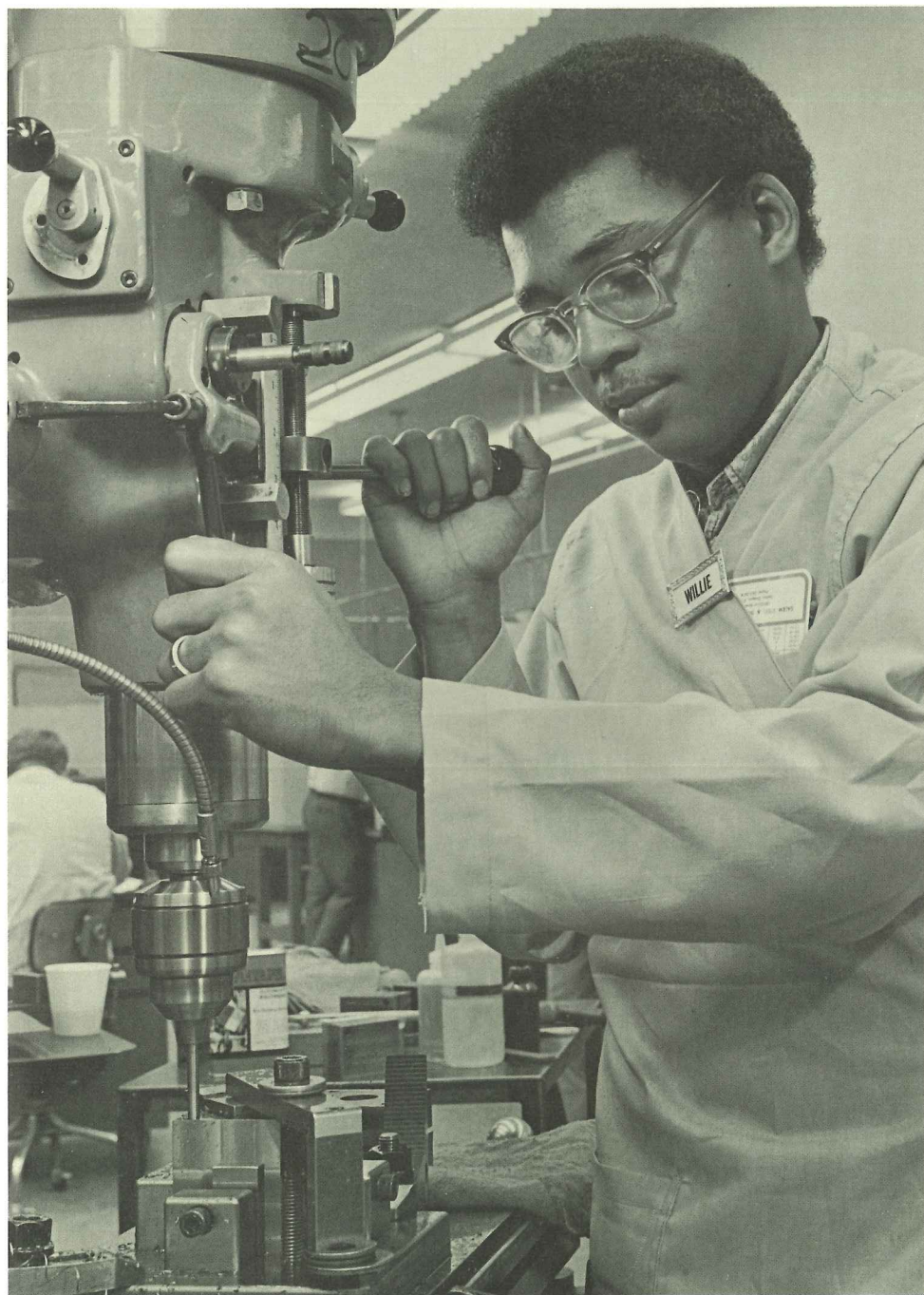




EDUCATION AND TRAINING activities run an increasingly wide gamut at Tektronix, from specific instruction in technical or professional skills, mostly job-related, to broad general education aimed at the fullest development of the employee as a human being.







unless he has outside interests, and understanding, and is pleased with himself as a person. The goal of Tek's education program is to produce not only a better employee, but also a **broad human being.**"

Derrol believes a distinct difference exists between "education" and "training" and the role each plays at Tek.

He sees education as a set of activities aimed at "growing" people, adding to their ideas and expanding their experiences—with the incidental result that their jobs may be done better. Training, on the other hand, is a set of activities whose objective is to accomplish a given task more effectively. The emphasis in training is on the task; the emphasis in education, on the doer.

At Tek, Derrol views training as the responsibility of a particular work area, whereas education is a total corporate effort.

"This is not to say, however, that we aren't concerned, as a company, with training. In fact, the Education and Training staff will be more than willing to help areas get started on training courses with such aids as audiovisual equipment and other training techniques.

"The staff also will have an important role in meeting the company's education responsibility, counseling individuals for various fields of study and developing broad curriculums."

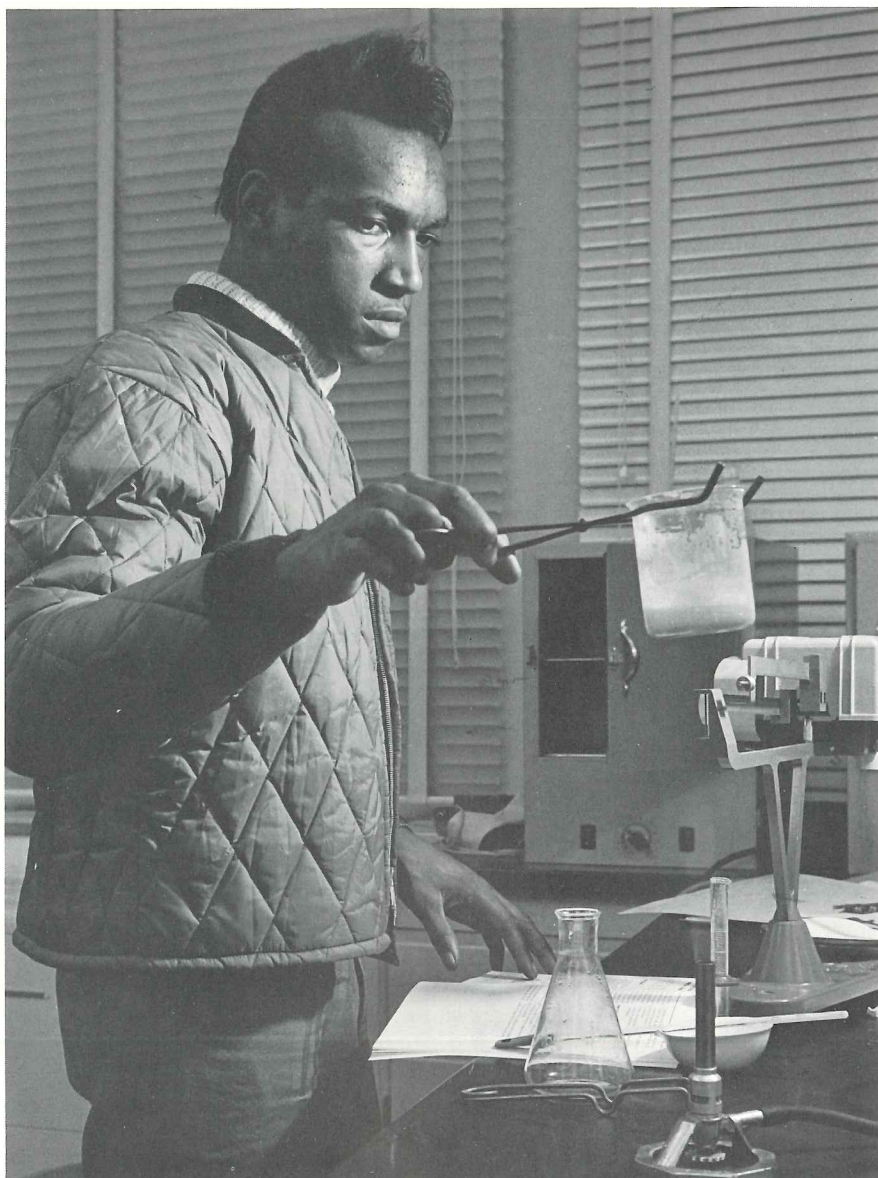
As to specific programs, Derrol has high praise for our voluntary-education effort, now entering its tenth year.

"This program focuses on self-renewal for employees. They have their pick of courses to acquire more general knowledge, increase present job skills, or even gain new skills for different jobs. Both voluntary classes and tuition-refund for outside education are ongoing programs, and we look for continued improvement in both."

One phase of Tek's educational activity on which Derrol plans to place more emphasis is the general-development series—courses he regards as the backbone of the entire voluntary education program. (See page 25.)

These courses, taught by selected ed-





ucators from local colleges and universities, promote general educational development, stimulating students and helping them develop their capacity to view a wide variety of timely and relevant topics from a broad standpoint.

Some of the courses and topics offered in the general development series pertain to physical sciences, business enterprise, behavioral sciences, American government and foreign policy, American economic system, business practices and concepts, law in society, novels and poetry, anthropology, art and astronomy.

"We're trying for a more diversified series of courses, using the availability of gifted teachers in the Portland area whose field of general interest is very broad, ranging from economics to behavioral sciences."

Speaking of outside teachers, the

company's voluntary program appeals very much to them. Tek employees, they say, have a great desire to learn, and are mature and critical; this type of classroom atmosphere provides rewarding experiences for the instructor, contributing to his own continued growth.

This situation contrasts with the academic classroom, where students sometimes take courses to fulfill graduation requirements and where grades and grade-point averages may work against the pleasure of learning and the quest for knowledge.

Derrol also singles out the Distinguished Lecture Series as a way to diversify and broaden. The series is now taught by members of the Portland State University faculty, but future series could include teachers from a number of colleges in the metropolitan area, in a wider variety of fields

and on more timely subjects. In addition, teachers in voluntary Tek courses could present single lectures in their field of specialty for the series.

New to this year's general-development courses is another lecture series, devoted to modern medicine and taught by staff members from the University of Oregon Medical School. More than 50 persons registered for the series, indicating strong interest among employees and their spouses in heart transplants, use of drugs and other timely medical topics.

Management training, now handled by Jim Kurilo (formerly Product Manufacturing Administration manager), will continue to help Tek managers strengthen their understanding and skills within their existing jobs.

"The goal of management training," Derrol noted, "is to equip Tek managers to help their people grow. Managers must encourage their own employees to extend their abilities; this should be a part of each manager's job description."

Tek's management training program combines several courses, ranging from coaching and knowledge of federal and state laws to sessions on handling performance reviews, meetings and discussions. In addition, two-day group-process laboratories are held, at a location away from Tektronix, to help managers gain an appreciation of human behavior and motivation.

An innovation Derrol helped to introduce is a technicians' development program, to help alleviate the serious problem of obtaining available technicians—ceramics, chemical, electronics, metal, mechanical and plastics, among others—besides offering advancement for many employees.

Although only in the exploration stage, the proposed technician's development program would be open to all qualified employees. Acceptance would be decided by objective screening techniques that evaluate each applicant's probability of success.

The program could be in-house training—within a certain work area—or incorporated within Tek's Educa-



tion and Training program. The Electrochemistry plant already offers a broad training program for electroplaters, including chemistry courses and other specific training sessions.

For the Tek employee pursuing an undergraduate or graduate degree in an accredited college, the company's education loan program, introduced in fall of 1967, covers from 50 to 100 per cent of the cost of tuition, fees and books. The loan is renewable on a year-to-year basis until the degree program is completed.

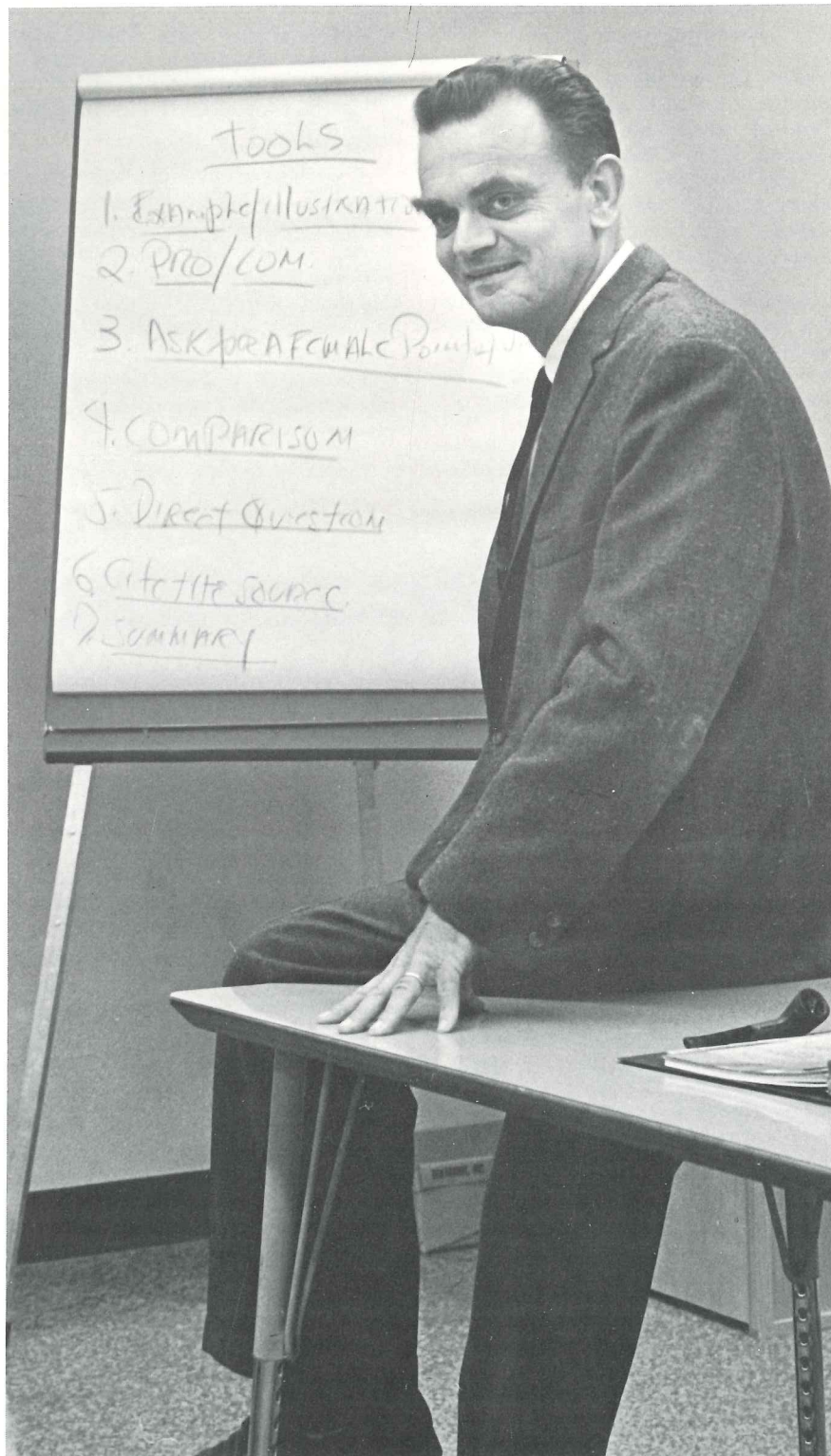
If the employee returns to Tektronix for at least a year following successful completion of the program, he does not need to repay the loan. Loans are not restrictive to any field of study; grants are made upon the employees' manager's recommendation and the operating manager's approval. Those enrolled in the program may take a leave of absence.

Nine persons received loans for the 1968-69 school year, six majoring in sciences and three in electrical engineering. The programs range from undergraduate courses in applied science at Portland State University to a Ph.D. in physics at Washington State University.

In his contacts with the outside academic community, Derrol plans not only to exchange information on student needs and educational trends, but also to be aware of employee educational opportunities offered by other industries and business firms.

Derrol's office is also hard at work on the possibility of offering accredited engineering courses at Tek through the School of Engineering at Oregon State University. That is, the Tek student would receive college credit. Courses now in the talking stages apply only to the undergraduate level, but could be extended to graduate subjects. Instructors would probably be from the OSU staff.

Besides OSU, contacts have been made with Portland State on offering credit courses for Tek employees at Beaverton schools. Last fall, four PSU courses were offered: General chemistry, English composition, introductory



HELMUT SCHREIMA, assistant professor of Business Administration at Oregon State University, Corvallis, listens to a student question during his lecture in Business Law, part of the Tektronix Education program.



college mathematics, and vacuum-science technology.

With the increasing scope of Tek's voluntary program and the introduction of accredited college courses through local schools, the possibility of the company itself becoming a state-accredited educational institution someday is not too far-fetched. "Tek Tech" may yet become a reality.

Another type of outside contact is the work-study program for underprivileged teenagers launched last year by the Portland Public Schools in cooperation with local industries.

At Tek, 82 teenagers were enrolled in the program last summer, which consist-

ed of a variety of jobs, from production to administrative and support work. Sixty-three teenagers are continuing in the program during the school year on a part-time-classroom and part-time-work basis.

A work-study program was also established in September with Beaverton School District 48 to provide high-school seniors with an actual work environment and an opportunity to find and hold jobs. The program, known as "Occupational Education," consists of three to four days of paid work at Tektronix in manufacturing, clerical or custodial jobs—in addition to regular classes at school.

Handling the work-study programs

at Tek have been Personnel and Manufacturing, with Derrol's staff assisting. "Results thus far have been beneficial for all—the schools, the students, the company—and especially the community," he notes.

With Derrol only a few months at the helm, his education plans are still largely in the making. His information-gathering has taken him to many meetings with Tek managers and employees—even those on graveyard shift.

The results of these dialogues will be new programs, new curriculums, new courses—and new, maybe surprising directions—all marked to keep employees learning, and the employees and the company growing.





# How To Succeed in Business Without (Really) Trying

Story by Kip Moxness

SCIENCE-ORIENTED COMPANIES like Tektronix, constantly working on the fringes of discovery, know that their future depends on the inventiveness and adaptability of their employees.

Tek's employees have traditionally been self-directing. To help them, the company has tried to develop an education and training program flexible enough to meet the changing needs of both the company and the individual.

The General Development Lecture Series is part of this comprehensive program; it concentrates on personal growth rather than job application. Speakers and topics range widely, from Dr. Frank Munk (Political Science professor at Portland State University) and his timely comments on Czechoslovakia to more esoteric topics like "The Challenge of Visual Stimulation in Communication," by Gary Robinson (Community Relations representative from PSU).

A unique and related series is being given by the faculty of University of Oregon Medical School. It is being offered as a result of the efforts of John Lamb, Education and Training.

The lectures are designed to familiarize laymen with current problems and advances in medical science. Topics will range from the transplantation of tissue to the controversial chemical DMSO, explained by the country's leading experts on its medical application.

Derrol Pennington, Director of Education, observed in a recent meeting with the Area Representatives that the individual in his attitude toward the company may take one of two basic approaches: Some fulfill their "contract" with the company in a more-or-less traditional way by putting in their time and doing good work. This is fine; and many companies ask no more than this.

But there is another kind of employee, one who increasingly realizes the connection between personal development and the fortunes of the company. With one out of two Tek employees now involved in some sort of educational en-

deavor, it appears that this concept of personal identity with the company is growing.

The rewards of this approach are twofold: Not only does the employee help the company by contributing more advanced skills, but he also increases the dimension of his own knowledge, which helps him cope with the complexity of modern living.

One of the facts of life Tektronix must confront as a company is the factor of change. If the company is unable to adjust and keep abreast—or ahead—of the prevailing technology, then it will no longer be competitive.

The same thing is true of people. If one stops learning at any point, obviously events will pass him by. Even someone consciously working at it cannot keep abreast of the tremendous body of knowledge constantly becoming available in his own field alone.

Because social change affects individual and corporation alike, it is necessary for the company to provide avenues so that people who desire to do so can obtain knowledge in other fields.

One of the recruiting problems scientific and technical companies are running into, according to Derrol, is that young men in college today are turning increasingly away from technology and to the social sciences, seeing them as areas that are more challenging and satisfying from a personal standpoint, and more relevant to society. There may be a sense of alienation felt by someone in the laboratory, if it seems the gut issues lie in the ghettos.

To offset this feeling, the company and the individual are teaming up at Tektronix to make sure they are not left on the sidelines watching events pass them by.

The victories in this sort of drive for personal development are personal ones. There are no promises, either explicit or implied, of any financial gain. It is an act of faith that, by self-improvement and cooperation, the company and the individual will reinforce one another and fulfill the goals of both.





# CREATIVE ENGINEER MEETS ELECTRONIC IDIOT

Story by V. K. Sawhney

**T**HE COMPUTER — the mathematical machine that has an aura of mystery — is a unique and remarkable tool. But it is only a tool.

Some look at the computer as a mysterious genius that will take their jobs away from them. Others, as a tool that will remove some of the drudgery from their work.

The IBM 1130 computer is being used more and more by Tektronix engineers as a design tool; and it is removing some of the drudgery from **their** jobs.

What's more, that computer has saved us substantial amounts of money by letting us know **in advance** how certain parts and circuits will perform.

A computer — any computer — is really very simple-minded. It cannot think — or make decisions. And it

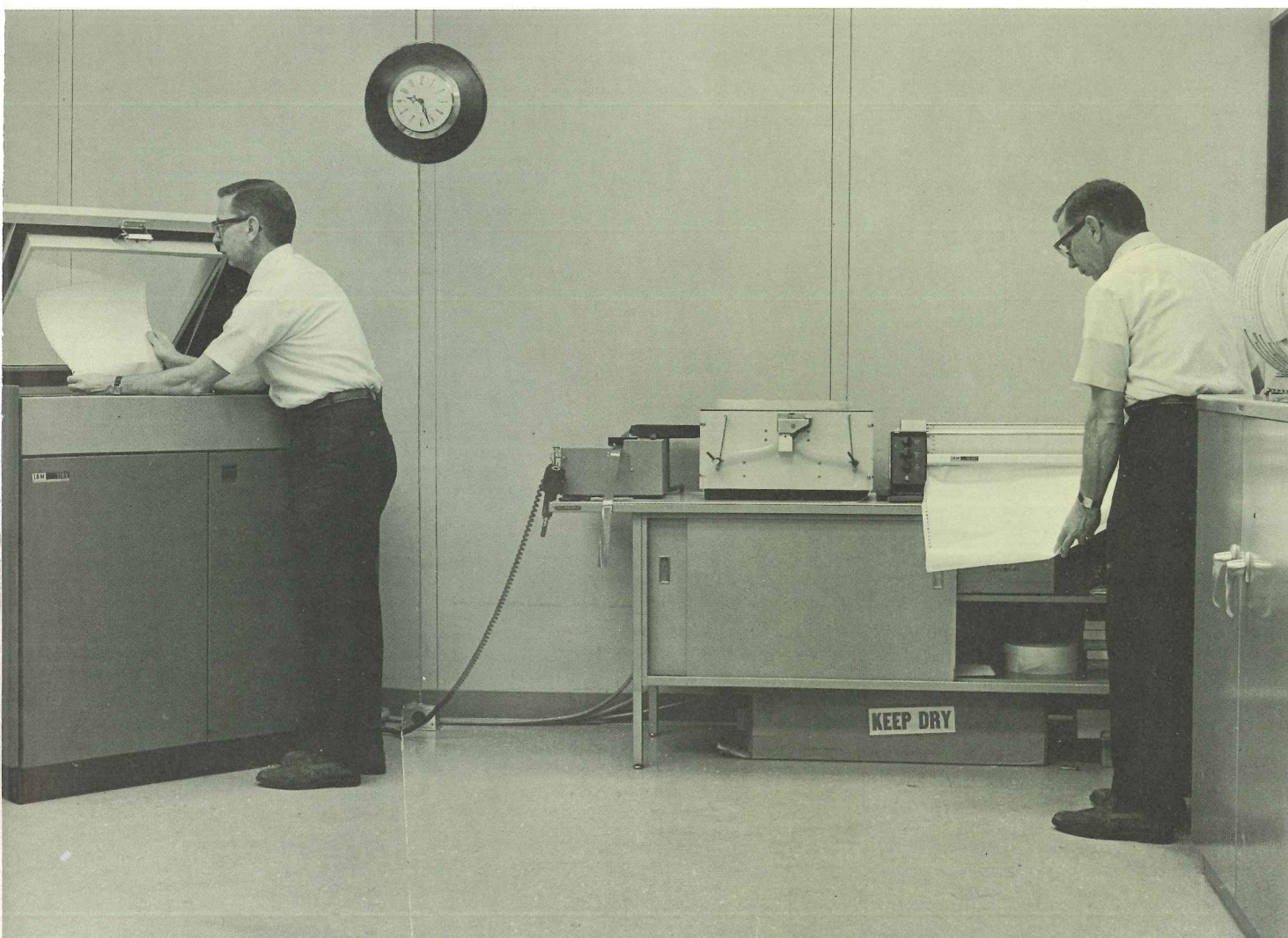
certainly cannot increase a person's creativity. But it can make extremely complicated calculations almost instantly, freeing a person's time for more creative thought.

A computer can pay undivided attention to details that would drive a human out of his mind; if you ask it to, it will work on the most boring problem forever, no matter how trivial. And, when told something, it won't forget it until ordered to do so.

However, a computer must be told **exactly** what to do. Once told, it will follow instructions precisely. If the instructions are wrong, the computer's answer will also be wrong.

Located on the fourth level of the Technical Center, the 1130 computer has been in use here since September 1966. It is freeing engineers' time for more creative tasks, while the "machine" solves the complicated mathematical equations. And the machine can do its job much more rapidly and accurately than a human could.





A COMPUTER, by doing much of the mental drudgery, saves a person a lot of time—as proved here by Stan Wheeler (left), 1130 computer operator. He is assisted by Stan Wheeler (center) and Stan Wheeler (right).

For example, the 1130, in predicting the behavior of deflection-plate designs, makes rapid calculations from raw data, allowing the engineer to consider perhaps 10 variations of a design in the same period that he would do the calculations by hand for one variation. In making one workable design, the engineer usually must make 12 tubes; the computer has reduced this to three, with a prediction accuracy of  $\pm 3$  per cent. The computer can also predict where the beam will strike the deflection plates.

The 1130, programmed in FORTRAN computer language, is hooked directly to a plotter that makes graphs on paper up to 120 feet long.

In developing each cathode-ray-tube type, there are three sets of complicated calculations which reduce raw measurements to meaningful graphs of performance characteristics. Without the computer, the engineer must make calculations and plot graphs for each of the rough, altered and final design stages. He can do it, but each stage takes about 20 hours, at a cost of over \$200. The computer, once programmed, can do it in less than two hours; the cost is about \$51. And it can do it error-free, whereas an engineer might make a mathematical error; this would throw the entire design results off.

One of the performance characteristics the computer compiles is the deflection-linearity graphs, which are useful to the instrument designer in making sure the scope's sensitivity is uniform from the center to the edge of the CRT faceplate. The computer can work out the values in about four minutes; the previous approach of hand calculations took about an hour.

The computer can analyze performance characteristics of cathode-ray tubes, and the plotter can provide the information in graphical form. While analyzing the data, the computer can also determine trends. Normally, the plots of the various characteristics have large distributions, making it nearly impossible to deduce the trends by looking at the individual data points.

Tektronix' Electronic Circuit Analysis Program (ECAP) allows the circuit designer to draw a circuit on paper and have the computer "construct" and analyze it — without a circuit actually being built. Larry Biggs, Conventional Instruments project engineer, said this allows many changes in a design to be made and analyzed before actually hooking it up.

Once told what to do, the computer takes 15 to 20 minutes





RACHEL BLACK, applied mathematician, writes programs for the 1130, saving researchers hours of manual calculations.

to "construct" and analyze a circuit. Without the computer, the engineer might spend three or four days to get the same results.

Larry Biggs: "ECAP (and other programs of this type) do not **design** circuits, they analyze a design. So, the human mind is still the best idea factory for all but simple design problems."

Manufacturing has also been using the 1130, for its numeric-control equipment. Demand on the 1130, in fact, has been so great — about 88 hours a week — that Tektronix this year has obtained a second one. Ray McGinley, Computer Software manager, said the new 1130 has been installed in the Metals building; now the 1130 in the Technical Center will be used exclusively for engineering projects.

One of the main uses of the plotter is in checking the control tapes generated by the computer for the numerically-controlled automated metal-punching machines in Manufacturing. From the control tape, the plotter makes a drawing which can quickly be compared to the original drawing. Previously, Manufacturing had to run the tape in the machine — which made the part — and then check that part visually.

Stan Wheeler, programmer assigned to the 1130 computer room, says the ability to "see" the part on the plotter and compare it with the original drawing has saved the company a substantial amount of money.

Similar plots are also made to assist in cam-switch design and circuit-board design.

Most of the 80 users — engineers and Manufacturing personnel — operate the computer themselves, after taking programming classes at Tektronix. They can use the com-

puter daily from 8 a.m. to 10 p.m. Computer operators run the 1130 during the night, working on circuit-board and cam-switch design problems, and numeric-control support.

Has the computer, in the two years Tektronix has used it, increased the creativity of engineers?

Larry Biggs: "No, in my opinion, it hasn't changed the creativity — and it can't. It has freed the engineer from some of the drudgery, so he has more **time** to be creative. It is a tool which allows more insight into problems, and this insight increases creativity."

Larry Simpson (CRT Engineering manager), chairman of the committee that recommended Tektronix obtain the 1130: "It has allowed the engineer to try more designs in a given period of time. It has allowed him also to get immediate feedback on changes in his design."

In addition to the 1130, Tektronix has two far larger computers — both Type 360 Mod 40s — for commercial uses, such as processing Tektronix' production reporting, payroll, and inventory control and analysis.

The basic difference between the 360 and 1130 systems is that the 1130 has less "storage" capacity and operates at a lower cost, Ray said. He said the 360 system could handle the problems the 1130 assists engineers to solve, but at a greater cost until the 360 can operate in a time-sharing environment.

The computer is, as many think, a fast adding machine. But it is more than that, much more. It may baffle some, but it lacks common sense; for, it can't reason. It can only assist man; it is, after all, only a tool. And while the computer may not make man more creative, it certainly allows him the time for creative thought.



# The Ubiquitous Oscilloscope

Stories by V. K. Sawhney

## Taking the mystery out of meteorites

METEORITES — pieces of stone and metal speeding through outer space — aren't as mysterious as they used to be. Smithsonian Institute scientists in Washington, D.C. are using Tektronix oscilloscopes and an electron microprobe system built by a California firm to delve further into the mysteries.

Meteorites range in size from specks of dust to masses weighing many tons. Most burn up in their fiery passage through the atmosphere, but some larger masses frequently collide with the earth at speeds up to 36,000 miles per hour.

Scientists have found that meteorites are composed of chemical elements familiar to man, but the structure is unlike any natural rocks or metal found on earth.

Scientists do not know, however, where meteorites come from, how they are formed or what causes their unusual structure. These are a few of the questions Dr. Kurt Fredericksson and his associates are trying to answer at the Smithsonian.

To discover more about meteorites, the scientists bombard the polished surface of a meteorite sample in a vacuum chamber with a beam of electrons from the electron microprobe, causing the bombarded atoms to emit X-rays. The energy of the X-ray emission, detected by the microprobe system, assists the scientists in discovering what particular chemical element is being bombarded by the electron beam.

The beam, only .00025 inch in diameter, is swept horizontally and scanned vertically across the sample surface at a rate synchronized with the sweep of a Tektronix 535A; 561A; or 564 storage oscilloscope. The oscilloscope beam is turned on and off by the signal from the X-ray detector.

The oscilloscope display represents a "map" of the distribution of a particular element, such as nickel or phosphorus, on the surface of the meteorite sample.

Dr. Fredericksson: "This technique has resulted in the discovery of a new mineral, perryite, not previously known to occur in meteorites or on Earth."

## Sit down, lean back, check your heart

BIOMEDICAL ENGINEERS have developed an experimental recliner chair that will detect abnormal heart action, in the Missouri Regional Medical Program's attack on heart disease, the leading cause of death in the United States.

The chair, designed to be used in mass screening for heart abnormalities, reduces the time required for an electrocardiogram from 20 minutes, normally required by the present method in doctors' offices, to only five minutes.

Blair Rowley, one of the four developers, is using Tektronix' Type 410 physiological monitor as a display device to monitor the electrocardiogram, heart sounds and the blood pulse wave.

He has devised an electrode system whereby he saturates a section of each of the arm rests and a section of the footrest with a conductive material. The patient's bare arms and a bared ankle are merely rested against the electrodes to make the three-point pickup for a simple electrocardiogram.

(In a doctor's office, under present methods, the electrodes are strapped onto the patient. In addition, the patient must wait about 10 minutes for the electrocardiograph machine to warm up.)

The side cushions of the chair are speakers that pick up heart sounds, and a footrest transducer picks up a blood pulse wave in the ankle. The blood pulse wave occurs after every heart beat. By measuring the time delay between heart sound and the occurrence of the blood pulse wave, an analysis of the condition of the aorta can be made—the great trunk artery that carries blood from the heart to be distributed by branch arteries through the body.

In addition to being monitored on the 410, the data can be stored on magnetic tape to be analyzed by a computer.

Mr. Rowley, who presented a paper describing the chair at the 21st annual conference on engineering in medicine and biology in Houston last November, said the chair may be put in a van and used in mass screening for heart abnormalities in much the way mass X-rays are taken for early detection of lung ailments.



## TO MARKET

Continued from page 15

service. Lots of customers have had, and used, their own in-house maintenance facilities. But we turned their scopes back faster and did it cheaper; knowing what we do, we don't have to fiddle with them as long. Many customers have found it costs less to send them out. Probably we're still in front with facilities available for customers to come learn maintenance and service. Still, the efficiency of our own maintenance facilities mustn't decline.

**Don H.**—So much for the marketing advantage of our "single product". But there are more subtle things. For instance, any one of our 8000 employees has only **that** product in mind.

**Chuck**—Briefly, the big advantage is that the scope has such a very broad base of use. The weakness is that a competitor could hurt you with a single mousetrap—maybe. But then, if you really need to, you know you can outrun them; you have the horses to do it.

But our strength as a company is that we continue to produce state-of-the-art instruments.

**Don H.**—Because of what we've done with our "single product", we can afford the "luxury" of having technical salesmen. A Tek FE never has to "get a guy from the factory out" to show new products, as some competitive salesmen have to do.

**Harry**—The disadvantages in specialization, as Chuck says, **could** lie in someone, someday, coming up with something so revolutionary that our only prop was knocked away. But, should that occur, I'd expect the "someone" will be us. Let's be sure it is. . .

*What are some changing aspects of our Marketing organization?*

**Don H.**—Our whole Marketing approach has changed drastically, even in my six years. You once could have characterized our Marketing organization as "traveling repairmen," but, as the market has developed, so has the need for real expertise.

I recall a story told me by one of our best guys in the field, on how he became an FE: (He was kidding, but he makes a point.)

He was working in a service center repairing Tek scopes, he says, when somebody stuck his head in the back room and yelled: "We need a field engineer. Who's got a white shirt on?"

*But, even so, weren't those the years in which Tek gained its marketing reputation?*

**Don H.**—Yes. Because what we did then was more than adequate for the needs of the day; we were small; but so was the market. And, even **then**, we knew more about scopes than anybody else did.

*What are the major problems the Marketing organization faces today?*

**Chuck**—I think a continuing problem is that a manager, naturally anxious to do a good job, may want to **control** the people he works with. It's not the natural instinct, but a **discipline**, to be comfortable working through others in contact with the customer.

No matter how much a region sales manager may tend to "overmanage", if he has 15 or so people accountable to him, delegation becomes **essential**.

It is natural for him to want everything to go right, and to want to keep on top of all activities. But, to delegate effectively, he must really believe that his **own** manager doesn't expect everything to go right 100 per cent of the time. He has to be able to communicate the same belief to those accountable to him.

**Harry**—In some ways, we have the easiest of marketing tasks, because

"Tektronix" and "oscilloscope" are synonymous to engineers the world over.

In other ways, we have the toughest task. We in Marketing have to live up to the standing of the product in everything we do—from how clean we sweep the floor to the integrity of our technical and commercial utterances and actions.

We can only be as good as the product and back-up services allow us to be. To match up to the products of today and tomorrow, we've got to be very good indeed.

**Chuck**—We **do** set high standards, yes. But we also offer people the opportunity to get quite an amount of satisfaction.

The biggest continuing problem for the FE is to stay abreast of the whole product line. There's always the question, Should FEs specialize? You can have two reactions: One is that our best people don't **want** it. The less aggressive guy might often like not quite as big a challenge; but, if you limit him, he loses the feeling of **total** responsibility that's important to us—and to most FEs, I think.

The second aspect is training: Being able to handle the output of 700 engineers is a tough thing. (The good FE sees this not as a problem, though, but as a challenge.)

**Don A.**—Speed of technology is a big problem. Our technology is moving; so is the customer's technology. And that always means new problems.

*Has our adding the less-sophisticated Telequipment oscilloscope line caused new market problems?*

**Don H.**—We have to talk to different marketing segments now. This opens doors we didn't open before, where the need for precision isn't there, or the available dollars aren't. Telequipment sales are doing very well—and both lines offer an excellent price/performance balance.

**Don A.**—Telequipment customers will be future Tek customers as they begin to need more exotic instruments and more precision. We'll be in touch,





and recognize the need when it arrives. It's a bargain: With distribution now through our own channels, the customer gets Tek service on an inexpensive instrument—the best in service and support that he **can** get.

*Along the same line, what marketing problems may be caused by our recent diversification into storage display units and terminals?*

**Harry**—We have to get to grips with quite different customer groups and requirements. Advertising media and approach are quite different; in display units and terminals, we won't have the same standing as Tek does in scopes; and we **certainly** don't have a broad range of products to offer a customer.

We have to set our stall out to cover new customer areas outside our traditional field—and perhaps come to have some "specialist" FEs instead of having "all-rounders." Call for call, these new fields are more expensive than in the past. We have to try to talk the user's language—not an easy task at all.

**Chuck**—First, you have to look at these new markets, and ask: What background do our people need to serve them? For example, training.

Spectrum analyzers are a good example. When we began with that new product, we recognized that our people lacked strong radio-frequency backgrounds; so we put together a training program, and allocated the FEs time to get that training.

Analyzer customers were the same people we sell scopes to, so this approach—a training approach—made sense.

As to computer terminals, if we were to go to the end user we might not **want** an "engineer" salesman. We might want a "programmer" to sell them, to make this interface.

*Has our size increase made it harder to keep customers closely linked to the factory?*

**Harry**—Sure it has. But if we recognize the problem, we're part way toward solving it.

**Don H.**—I don't think the customer is linked to the factory, but to the field office, an extension of the factory. And I don't think growing big **has** affected these relationships, no.

**Chuck**—Oh, our problems probably increase at about the same rate as our business. But our field organization is geared to increase in the same proportion also.

*What kinds of problems are brought on by growth in size, and in markets?*

**Harry**—People come high in the list. The time and care involved in recruiting and training the right kind of FEs is no mean problem. The same goes for maintenance engineers.

Technical training, always a problem 6000 miles from headquarters, becomes even greater with the continuous movement of our technology, and entry into new fields. We're greatly encouraged by steps now being taken in Beaverton to provide audio/visual aids to supplement the mass of information in writing.

Time—for training and up-dating—can hardly be spared from day-to-day pressures; but it **must** be, if we're not to go on chasing our tail forever.

*What kinds of problems has international growth caused?*

**Don A.**—The company is going through a phase of growing that other companies also have seen.

The nature of the management chore—that is, what we have to manage—is far different than it was five or eight years ago. Our approach to managing has to change also, to deal with a different bag of problems.

When you decide to go worldly, you'll end up **being** worldly. In some companies, **all** of their management has come up through world problems, so to speak. No one sat down and said, "Let's do it this way;" but those people have tended to become the management.



An increasingly international outlook is going to be a natural occurrence here.

We've tended to get bogged down in international problems, sometimes, because we discussed them among a group of people who were at ground zero. But, we'll drift to a quicker decision-making group—quicker because the group is already cognizant of the problems.

I'm not saying our managers today **aren't** international. Compared to several years ago, we can identify Tek people who warm to, and participate in, discussions more vigorously and less shyly. They're in and out of Europe, in and out of Japan. . . .

A lot of our early overseas growth went on almost without the real awareness of management, I think. Still, we managed to chunk along. We're talking more bucks now; and with megabucks you **have** to care.

Thirty-five per cent of total sales, which is the overseas part of Tek's business, is far more than anyone else in the electronic instrument field. The value of that business to us now causes us to take steps to protect our position that smaller size wouldn't. We invest **lots** of money in market research, for example. . . .

Our spread of products worldwide gives us a high level of business, thus an economical reason for having a large number of people on the move all around the world all the time. Teleequipment, for instance, never would have had an economic justification for on-the-spot service in foreign markets. But we turned that service on after we acquired their product line.

We're being copied overseas—as we have been in the States. Customers have told our competitors what they like about doing business with Tek—and so FEs, repair centers, spare parts near the customer, centralized order processing—all have been copied.

We'll continue our marketing approach into new market areas as they come to a critical level, and as it becomes economical to do so. Bert Mazzoni, our FE in Latin America, and Jerry

Racanelli in Southeast Asia bring us half-way to that stage.

It's tough to cover sparsely developed technical markets adequately, with technically able people working **for you**.

Another problem is the long distances. Sometimes we're asked to repair a scope by correspondence, for instance. The guy may say only, "My scope broke down; send me replacement parts."

Add to all this, the language problem. . . .

**Harry**—A problem that Tek UK does **not** have (except in a minor degree) is language. The saving grace is that English is the international language of electronics. Still, we cannot ignore the problems of the FE and customer who speaks English, yet not as a native language.

*Do we see the world as one single market?*

**Don A.**—We're rapidly moving toward that view, yes.

This will be more noticeable as the "time gap" closes. Technologically significant things used not to happen abroad until three to five years after they occurred in the US. Now they may take only three to five **months**. Europe is not a follower now; it has caught up—or is even ahead in certain specifics.

We used to design products for the US market and felt they'd probably also sell abroad. We'd plan for the US market, then add a third or 50 per cent. . . .

But this approach won't work as the numbers become more equal. We want to make sure we don't ace ourselves out of a share of the overseas market.

*Might that market ever equal the US market?*

**Don A.**—It sure **could**. The US will lead in many areas, because most development and research bucks are

spent here. But the time lag will catch up . . . You **know** a lot has to happen. TV isn't as developed overseas in terms of national coverage, or hours per day of transmission time. (Norway, for instance, still has only three hours a day of TV, and only one channel.)

Also, not much overseas TV has yet gone to color. And medical facilities worldwide are not highly developed. Then there are the technologically underdeveloped areas; there are more people "outside" than "in."

*What advantages do we have over competitors in marketing our products?*

**Harry**—Insistence on the highest degree of technical excellence possible through top-grade FEs and support engineers, intensive training and first-class back-up from technical publications of all kinds. Plus the **tremendous** advantage of being specialists.

*Is that our biggest advantage?*

**Chuck**—No. Our big advantage is our faith that people will do a good job for us. In our long experience we've **never** been disappointed by an FE's performance; that is, he never failed to do his dead level best. People are good, in other words.

**Harry**—Certainly the FE, being the one who meets the customer face to face, day in and day out, has the greatest share in our success or failure.

Marketing managers, at all levels, enhance this relationship by visits; at exhibitions and conferences; and by phone and correspondence. But, we must be sure we are not inadvertently reducing the status of our FEs in the customer's eyes.

*Can you describe our emphasis on training, and how you fit into this part of the program?*

**Harry**—Our new FEs go for technical training, to the Guernsey Training Centre. This is not ideal; the demand is not sufficient to run continuous FE courses, as in Beaverton. Indeed, present thinking is moving toward future



FEs coming to Beaverton for initial training.

**Chuck**—Our initial investment in training field people greatly exceeds that of anyone else in the oscilloscope business. As a result, we're considerably more responsive to potential measurement needs than is the company whose salesman knows little more than the contents of his catalog.

**Don H.**—You can look at training in two senses:

From an absolute viewpoint, I could work 10 hours a day, five days a week, for 20 years, training myself. You never know all you'd like to.

But in a practical sense—is the training adequate for the job?—**definitely** it is. An FE can't have all the answers all the time; there are too many possibilities for questions. But he **does** feel comfortable in any situation.

*How much traveling does the Marketing job involve?*

**Don A.**—Travel overseas takes different forms. With many overseas markets handled by Tek sales subsidiaries, we only go out from Beaverton on big problems. But our technical people travel a lot **within** Tek, to get together and thrash out problems. FEs who work with distributors also travel a lot.

Travel is on the up . . . . The Tek guy needs to be mobile, in the sense that he's often away from home—typically gone two to three weeks at a whack. Our "roving" FEs total five: One in South America, one in Southeast Asia, three in Europe.

**Chuck**—The only measure of travel I can make is that Tek gets more hours in, in a day. We're there earlier and stay longer—and our people **make a contribution** to the customer. This makes it easy for a new man; the customer knows that **all** our people are competent.

*In that regard, does the Tek name give us an edge over competitors?*

**Don H.**—Yes, and not **only** in that regard. Our history, and our reputation, open a lot of doors.

**Don A.**—As to reputation, we were the first to step outside the US with a quick-growing marketing organization, good instruments and background of support services. Once we **had** the reputation, we had to live up to it.

Most customers are astounded that we'll give the same attention to a problem, irrespective of customer size or order size. Our FE doesn't **ever** answer a customer, "You're too small for us to fuss with."

But when a new customer gets his first taste of it, then we get the kind of letter that says, admiringly, "My problem got the **personal** attention of Mr. So and So . . . ."

Often the cost of the cable we send exceeds the value of the problem. Most companies, I'm sure, would send a letter rather than a cable . . . .

**Harry**—My own belief is that Tek's reputation and future growth lie in the diversification of electronics as a whole. The use of scopes moves into new areas all the time and, so long as we stay out front, **wherever** electronics goes, there go we.





# Glitches and Snivets

PHOTOS, remarks Tek Talk's Josef Oswald, are where you find them. He found this one while on a picture assignment in the Assembly area:



How would you headline it?

EMPLOYEE TREATED FOR UNUSUAL ON-JOB INJURY?

VISITORS WARNED NOT TO POKE NOSES INTO RESTRICTED AREAS?

FACE MASKS MAY STOP SPREAD OF FLU?

What it is, Josef explains, is a CRT shield on a bench and, on the wall behind it, a more-than-life-size calendar-girl photograph.

A "glitch," as people know who look at oscilloscope displays, is a not-entirely-technical term used to describe an isolated aberration in a waveform.

A "snivet" is a burst of such hiccups. "Sort of a multi-syllable glitch," explains Geoff Gass (PE Custom Mods).

Neither, he points out, should be confused with the other categories of waveform irregularity—namely "grass" and "crud."

So, appropriately, this column is restricted to snivets and glitches only. (If you notice any grass or, worse yet, crud, notify the editor.)

**ARE YOU NORMAL?** Ever wonder? Or, for that matter, give a hoot?

An insurance company, with its own reasons for wanting to know, has poked around into folks's habits, and let Tek Talk in on the results of their research.

It's normal to want to be "normal." (It's also normal, one suspects, not to want to be "average.")

Do you use mouthwash? You're normal. Eighty-five per cent of those over 15 use it often. If you don't drink buttermilk, that's normal, too.

Sixty-five per cent of US females wear girdles. And 15 per cent of US males.

Men and women snore equally often. On a "typical" night there are 25 million snores—a ghastly statistic if ever one existed.

Even worse:

"Under optimum snoring conditions, the soft palate can produce up to 83 decibels—equivalent to the bellow of an angry bull." (What are these "optimum conditions?" It doesn't specify. Something to avoid at all costs, obviously . . .)

AMONG THE normal things to do when you sleep is grind your teeth. Not so, dreaming in Technicolor; only 5 percent of the population does that.



Americans gulp over three billion oysters a year. Ten per cent of them are swallowed raw. Yes, on purpose.

The normal person spent nearly \$100 on liquor last year. (Let's all take another look at our little old UGN pledge cards. . .)

Corns are normal—a statistic somewhat offset by the fact that the human toe is vanishing. Don't sit up watching it, though; it won't have gone completely until the year 11948. (By then, folks who count on their piggies will have found a replacement for the decimal system.)

We're a fat country (half of us are overweight) and not a nation of swimmers; half our boaters would drown if they plopped into the drink and no one fished them out.

It comes as no astounding fact to learn that being a millionaire isn't normal. Still and all, there are about 100,000 in the US.

America also has half a million vice-presidents (make that 500,005, now that Tek has added five new ones); 10 million hay-fever sufferers; and apparently an endless supply of people with headaches: The amount of aspirin consumed per day by Americans is **21 tons!**

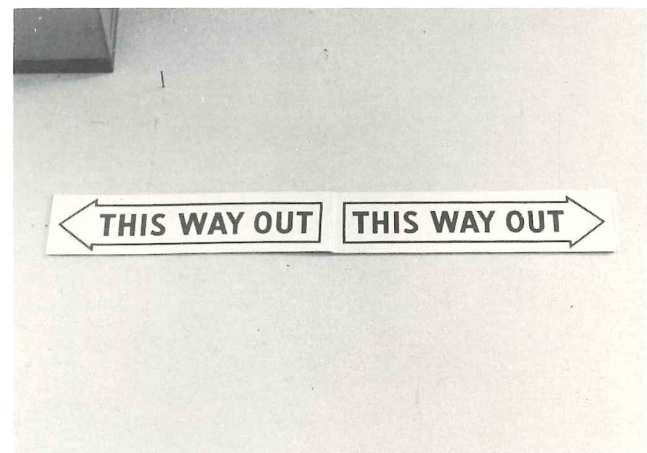
JUST TO bring some of these figures down to Tektronix' level:

Helen Thomas (Health Services) thinks Tek uses about 500 aspirin pills per day; the gals in Food Services agree that buttermilk is not one of our more popular menu items here; the same may be said for oysters.

However, counting millionaires must be done with tact, and research into how many Tek fellers wear girdles is like as not to earn you a punch in the snoot (which, under optimum punching conditions, will cause you to emit up to 83 decibels).

ATTEMPTS to communicate:

Sam Njoroge (Electrochem) noticed this sign at a hallway intersection in the Education Center:



"It hardly seems necessary," Sam remarks.

AN EMPLOYEE wonders whether this comment on his performance review is good news or bad news:

"Performance has been satisfactory but not adequate."

ANOTHER reports seeing a sign in a local restaurant, advertising "Freshly Battered Halibut." Must've put up a good fight. . . .





