
# TEKTRONIX®

*committed to technical excellence*

**Annual Report 27th Year May 26, 1973**

## TO SHAREHOLDERS AND EMPLOYEES:

In a hectic year, with Manufacturing overtaxed, parts and material shortages a daily fact of life and delays in product deliveries commonplace, it's almost a relief to refer you to the financial section of this report, which shows Tektronix business growing steeply, to all-time highs. Things have been good across the board, in all our major markets, and in our major product areas: Cathode-ray oscilloscopy, information display and television measurement. It's hard to single out a highlight.

Our strong, broad, widely useful lines of new products coincided with a surge in capital-goods purchasing power, both in the US and in most major overseas markets. The effect was more than additive.

Success doesn't just happen. It takes high tolerance to frustration, and a large dose of just plain hard work. As they have so often done, Tektronix people once again grasped the challenges, and the opportunities, and made this year one of enviable accomplishment. For their extra efforts, and all the adrenalin they called forth, we would like to convey our personal thanks.

Continuation of growth will require a corresponding investment in plant and equipment. Already approved is a two-story light-manufacturing building at Beaverton; the year will also see the start of other major facilities, both here and in the field.

International markets more than kept pace with the robust US economy. Tektronix applauds current "summit" negotiations aimed at a more open relationship among nations, including freer trade. Reduced tensions in recent years have already shown up for us in sharply increased (though not yet substantial) business in Eastern Europe. It may well be that mankind's long-time goal of international understanding will yet occur through what one writer calls "the mundane, pragmatic, yet strangely compelling process of the marketplace."

But it will take some doing. Protectionist attitudes persist, including those in the US. For instance, we expect legislation this year that will increase taxation of US companies' overseas operations. If this occurs, it will adversely affect our earnings.

In John D. Gray and Louis B. Perry, highly respected business and community leaders, our board of directors has gained breadth and experience. We welcome these outstanding men; they fit well into the image of ours as a "working" board.

In a year like this, it's easy for long-term values to become swamped in the sea of immediate challenges. We try to avoid that. Tektronix has always worked (with reasonable success) to integrate its corporate goals with the economic and social needs of the community — and with those of the men and women who *are* this company.

Our in-house educational program took on new dimensions this year with the addition of bachelor's and master's degree programs conducted entirely on the Tektronix campus. We've long believed that a company whose employees are actively involved in self-renewal will itself become a healthier, richer organization.

The year's accomplishments are discussed in some detail later. This report also elaborates on our financial results for the year, which (although we always would like to have done better) were nevertheless quite good.

Howard Vollum
Chairman of the Board

Earl Wantland
President

August 2, 1973

# Tektronix 1973 Financial Highlights

The accounting year is the 52 or 53 weeks ending the last Saturday in May.

| 1972 | | 1973 | | Increase (Decrease) | | |
|---|---|---|---|---|---|---|
| $164,267,000 | 100% | $198,197,000 | 100% | $33,930,000 | 21% | **RECEIVED BY THE COMPANY**<br>For the sale of products, accessories, repair and replacement parts. |
| 153,049,000 | 93% | 182,524,000 | 92% | 29,475,000 | 19% | **RELATED COSTS AND EXPENSES** |
| 59,208,000 | 36% | 67,166,000 | 34% | 7,958,000 | 13% | TO OUTSIDE SOURCES<br>To pay for raw materials, purchased parts, rent, utilities, insurance, advertising, interest and other business expenses. |
| 75,861,000 | 46% | 92,977,000 | 47% | 17,116,000 | 23% | FOR EMPLOYEES<br>To pay the men and women who design, make, sell and service our products—including profit share, social security and other employee benefits. |
| 6,299,000 | 4% | 6,743,000 | 3% | 444,000 | 7% | FOR USE OF FACILITIES OWNED<br>To provide for depreciation in value of buildings, machinery and furniture resulting from use, wear and age, mostly computed by sum-of-years-digits method. |
| 11,681,000 | 7% | 15,638,000 | 8% | 3,957,000 | 34% | FOR TAXES<br>To pay U.S., foreign, state and local taxes. |
| 11,218,000 | 7% | 15,673,000 | 8% | 4,455,000 | 40% | **RESULTING IN EARNINGS**<br>Reinvested in expansion of our business after payment of dividends. |
| $1.38 | | $1.92 | | $.54 | 39% | **EARNINGS PER COMMON SHARE**<br>Dilution if all outstanding share options had been exercised would not have reduced primary earnings more than two cents. |
| — | | 20¢ | | 20¢ | | **DIVIDENDS PAID PER SHARE** |
| 169,951,000 | 103½% | 226,620,000 | 114% | 56,669,000 | 33% | **ORDERS RECEIVED**<br>Customers' orders measured at catalog price. |

| 1972 | 1973 | Increase (Decrease) | |
|---|---|---|---|
| $116,914,000 | $145,935,000 | $29,021,000 | **Current Assets** |
| 33,205,000 | 49,207,000 | 16,002,000 | **Current Liabilities** |
| 83,709,000 | 96,728,000 | 13,019,000 | **Working Capital** |
| 46,071,000 | 45,054,000 | (1,017,000) | **Facilities—Net** |
| 1,215,000 | 1,052,000 | (163,000) | **Long-Term Indebtedness** |
| 133,862,000 | 149,981,000 | 16,119,000 | **Shareowners' Equity** |
| 20,076,000 | 50,050,000 | 29,974,000 | **Unfilled Customers' Orders**<br>Measured at catalog price. |
| 18,103,000 | 16,372,000 | (1,731,000) | **Finished Product Inventory**<br>Available for sale measured at catalog price. |
| 8,234 | 10,450 | 2,216 | **Number of Employees at Year End** |

# All The Whelming We Could Stand

Any chronology of a year just ended tends to miss the point. It suffers as narrative because things don't really begin and end "in sync" with the start and close of the fiscal period.

So, reading an annual report must be something like walking into the middle of one movie and walking out midway through another.

Still, the end of a year does make a handy time for reflection, and the start of a new one an appropriate time for resolve.

We might begin by looking over the product line. Over the years, it has grown to be a broad one. Tektronix now ranks as an important source of (alphabetically):

Automated test systems, cathode-ray oscilloscopes and related accessories, computer terminals, counters, digital multimeters, digital photometers, display monitors, generators in wide variety, hard-copy units, physiological monitors, semiconductor curve tracers, scan converters, spectrum analyzers, television picture monitors, time-domain reflectometers, trace-recording cameras, vectorscopes and waveform monitors for TV.

Other products either less significant to our effort or too new to assess include amplifiers, power supplies, engine analyzers and programmable calculators.

In three major worldwide markets, we have an established leadership position. They are:

1. Oscilloscopes and accessories;
2. Graphic terminals and related information-display products, and
3. Television measurement instrumentation.

In each of these markets, our lead is not only substantial, but also, we believe, lengthening.

Our list of product and market diversification grows longer with the years. Of course, not every venture begun proves worth following. One that hasn't is machine-control products. We have discontinued them as a Tektronix line after two years of market investigation and developmental effort, and a modest financial investment.

Here's the way we size up our machine-control products: Although well-designed, innovative and of high quality, they do not promise to meet the kind of profit goals expected at Tektronix. In a year when customer demands press us hard in many other areas, we've elected to turn our manpower and money to other productive uses.

Since Tektronix doesn't capitalize development cost, closing down a project like this involves only a small write-off of unusable parts.

We'll continue to fully support machine-control products already in the field. To this end, the MC activity has been absorbed into our Information Display division.

### Business Was Down, In Sri Lanka

Other than a sales decline in Sri Lanka (from $10,235 to $2276), we don't have a great deal of bad news for shareholders this year.

No matter how you view it (geographically, or by market, or by product), our business was thriving—up by what, for lack of a fresher term, are usually referred to as "record" amounts, and reaching "record" highs.

The triteness of that term aside, our earnings, sales and orders all hit marks well beyond any in the past.

*Earnings* were up 40 per cent, to a new high of $15,673,000, from $11,218,000 a year ago. *Earnings per share* increased 39 per cent, to $1.92 from $1.38.

*Consolidated sales* climbed to $198,197,000, from

$164,267,000, a growth of 21 per cent. The *international portion* grew by 22 per cent, to $80,478,000 from $65,909,000; the *US segment,* by 20 per cent, to $117,719,000 from $98,357,000. Despite the very strong US economic recovery, International improved its share of total Tektronix business—a healthy 41 per cent.

*Customer orders* totaled $226,620,000, which was 33 per cent higher than last year's $169,951,000.

And, we now have *more employees* than ever: 10,450, a net addition of 2216, or 27 per cent.

The year began with a strong order rate, brisk sales and high output. Then things began to improve.

It may or may not be accurate to say the order rate "overwhelmed" us; but we certainly were whelmed about as much as we could stand. When the dust began to settle, we were up to our ears in backlog: $50 million plus, up 149 per cent from $20.1 million a year ago.

This backlog, too, was a "record," if you want to call it that; we'd far rather have been able to produce and deliver the products right away. (But it's an excellent cushion as we move into the next year.)

## Staggering Down The Critical Path

Bottlenecks hardly exist any more, but only because the language of management has changed. Nowadays, if you hold things up, you're said to be "in the critical path."

The pent-up US demand for capital goods had begun to surface a year ago, but almost no one guessed its magnitude. The US economy boomed many decibels more loudly than we'd foreseen. It was small consolation to find that most others also had misjudged it, particularly since some of those others were our suppliers, caught short by the unexpected demand.

As supply lead times stretched longer and longer, our own product deliveries suffered. This problem, although competitors shared it, undoubtedly cost us some sales, particularly in the highly competitive portable-oscilloscope market.

Along with headaches caused by parts and raw-material shortages—one thing, then another—we soon showed symptoms of another ailment.

"Cranking up" our large manufacturing machine (already producing a product a minute) fast enough to absorb the order overload meant installing new equipment and complex new processes. We had to hire and train over 2000 people, some of them in advanced technologies, and find space where they could work without bumping each other.

Production indigestion, is what it amounted to. We could have used a seltzer tablet.

Not all the shortages came from outside. Tek makes about 25,000 of its own components and subparts, so our in-house suppliers often found themselves in the critical path also. One example was integrated-circuit manufacturing.

An integrated circuit combines on a pinhead-sized speck of silicon hundreds of microscopic resistors, transistors and diodes. An ornery little thing to build, it yields only grudgingly to volume production. This is particularly true of high-frequency ICs.

The processes involved are hypersensitive, to just about everything: It's said you can't even sneeze in the IC production area without affecting yields. What's more, ICs are crucial to the smallness, low power consumption, reliability and general high performance of all our new oscilloscope models. So, as product orders poured in, the demand on IC production grew increasingly difficult. Our original plan was revised, then re-revised, and finally called for nearly six times the increase that we had first expected.

Well, we didn't make it by year's end. In fact, even

now we're barely over the hump. But, thanks to a great effort by production people, IC shortages are seldom delaying product deliveries. Someone else is in the critical path.

Tribute must be paid also to IC Engineering for development of Super High II. This unique process gives us high-frequency integrated circuits that no one else anywhere has matched outside a laboratory.

Outstanding developmental work also has gone on in cathode-ray tubes. Our conventional, storage and scan-converter tube technology clearly is at the forefront of the industry.

A growing influence *throughout* the company is that of Tek Labs, which combines all our advanced research and development. Its goal is to provide, through forward-looking technology, the devices essential to give the degree of superiority demanded of our products. It is a very capable group, doing outstanding work.

Credit, in fact, is due to *all* those people whose long hours and extra efforts brought about a 19 per cent increase in output, while our manufacturing cost dropped as a percentage of sales. They may read these words through bleary red eyes—overtime does wear you down—but they should know they're appreciated.

# In Retrospect: What Went Right

The financial pages of this report suggest it was a very good year. That's pretty true. So, the following comments will be kept brief; readers aren't likely to plow through very many pages just to find out what went right.

A lot of things did. We had "the right products, at the right price, at the right time." In that formula, each part is important, as we learned just a few years ago. At that time, we'd introduced an advanced new "generation" of oscilloscopes at just about the time US customers were tightening their pursestrings for a long, cold economic "winter."

Those new products were very high in performance, but priced accordingly. They encompassed a tremendous chunk of state-of-the-art technology, which made them hard to build.

But, with adversity as a stern teacher, we set out in pursuit of the radically altered market. The technology in our new products was exceptional. All we needed was to make them lower-priced, more versatile in performance, lighter, smaller, more reliable, easier to build and more convenient to use. Other than that, we were okay.

The effort succeeded, and this year the formula was complete: Tektronix offered the products our customers needed, at prices they could afford, at a time when US purchasing power—and that of the European and Japanese economies—came to life.

One result has been more backlog than we like. Still, it *was* a good year.

These days, when being a "multinational corporation" is as like as not to earn you a dirty look, it seems appropriate to re-emphasize the large part foreign sales play in Tektronix profitability. They continue to represent about 40 per cent of our total business.

That's a lot; and it underlines the value of geographic dispersion, a long-time "plus" for Tek. Our market countries for the most part are politically separate and economically independent variables.

Almost never do their economies slump all at once, in an orchestrated way. One or two may go down; but the effect of that sag will be buffered by those that are up.

During the recent US downturn, it was our business in other countries that helped hold profits at reasonable levels—and, incidentally, let us maintain US employment with only slight adjustments. (Conservatively, one out of four Tek Beaverton jobs depends on overseas business.)

More about the "multinational" controversy, later in this report.

Our business has been better, here and there, now and then; but seldom has it been so good *everywhere* as it was this year. Sales to every major national market increased. Prosperity was breaking out all over. Favorable balances of trade in most European countries generated more dollars to spend on capital goods. The Affluent American is being joined by the Affluent European.

Like those in Europe, sales in Canada, Australia and Japan were also strong.

(Does this across-the-board economic health seem to challenge what was said in the preceding paragraphs, by suggesting that all those economies might also *decline* at the same time? A parallel to human beings seems to make sense. In any group of a dozen people, occasionally they'll all be healthy; very seldom will they all be sick.)

Business in Eastern Europe, while not huge, is nevertheless growing fast. And one Communist country (a suspiciously capitalistic-acting one) is approaching the status of a major Tektronix market. That's Yugoslavia.

There are new ropes to learn, in dealing with these markets. For instance, you won't get far walking in with a business proposition in the third year of a Five-Year Plan. But we're learning, and doing a lot of groundwork. For openers, we've found that the Tektronix name is already well-known and highly respected.

A minor landmark this year was the sale of our first product to the People's Republic of China: A TV signal generator. Television products lead our sales to Communist countries, where many of our advanced scientific instruments are ruled off limits by the US government because of their possible "strategic" or even military value.

In the so-called "developing" countries, still in their technological adolescence, our business also improved. Sales volume in many of them is still so small that you don't want to make too much of the yo-yo annual fluctuations; but, taken all together, sales to those nations went up sharply this year. That's good news.

Our Telequipment line does well in these markets, where users have neither the need nor the dollars to buy higher-performance, higher-priced Tektronix models. Telequipment business hit record highs this year, as it has every year.

Sales to these less industrialized countries are more significant in establishing early market position than in generating revenue. Still, as one of our managers noted, half-seriously: "A million here, a million there. It all adds up."

# The Ever-Broader Scope

To every thing there is a season; a time to sow, a time to reap . . . a time to look back over last year's annual report and see if there are any words that must be eaten.

The intention of this report each year is to tell it straight, the bad along with the good, and to assess objectively (as far as that's possible from inside looking out) what the prospects might be for this or that product. There's always a danger of getting carried away. So, glancing over last year's product "predictions" is kind of scary; you always expect to find an Edsel in there somewhere.

The past annual report holds up pretty well. Although we didn't foresee the trouble we'd have with deliveries and shortages, most estimates of new-product acceptance were, if anything, understated. No Edsels.

From plug-in oscilloscopes, where our lead was never challenged, to portables, where it was, our scope sales grew. More people in more areas were using them; and, in the brand switching intensified by such a hectic year, more users turned to us than away from us.

The oscilloscope is the most important, and most common, electronic instrument, with an ever-widening range of uses. It is a complex and integrated system that performs a simple-sounding function: To draw a graph of some electrical "event"—or of any phenomenon that has been converted to voltage—so someone can measure the amplitude of that event and its duration.

It produces its graph by "writing" on the sensitive phosphor screen of a *cathode-ray tube* (CRT) with a focused beam of electrons. In the CRT, essentially a bottle with the air pumped out, this electron "pencil" is accelerated to great speeds and fired against the screen, causing the area it hits to glow, a spot of light.

The repetitive, uniform left-to-right movement of this writing beam is controlled by the *time-base generator,* from speeds as "slow" as seconds to under a hundred-millionths of a second; then, the moving spot of light looks like a solid line. The wider the range of speeds at which the CRT beam can "sweep," the greater variety of waveforms you can look at. On most of our oscilloscopes, the fastest sweep is several hundred million times more rapid than the slowest one is.

The up-and-down movement of the electron beam, depicting the changing voltage being measured, is governed by the scope's *vertical-deflection system.*

The CRT screen is ruled off just like graph paper is; you can make each vertical and horizontal division represent however much or little voltage and time you say.

The number of vertical divisions the spot moves tells you the signal voltage, and thus the amplitude of whatever that voltage represents. The graph also tells you whether the voltage is changing positively or negatively, the shape of the waveform and its duration.

Phenomena that rapidly and regularly repeat produce a continuous stable image on the CRT. *Storage* oscilloscopes can also graph events that happen slowly, or at random—or only once, like a fracture or an explosion—by retaining the image of that isolated event on the phosphor screen. Also, our *trace-recording cameras* can preserve that event photographically.

Oscilloscopes differ in many ways. Some use interchangeable *plug-in units* to vary their ability to acquire signals. Most plug-ins are part of the scope's time-base or its vertical-deflection system, controlling either the left-to-right or up-and-down beam movement.

Most *vertical plug-ins* can either amplify small signals or reduce larger signals, so they may be graphed. Others let the scope draw more than one graph on the screen at a time. Still others do arithmetic, either comparing two points in a circuit and presenting the voltage difference to the CRT, or canceling out a large unwanted voltage segment and expanding the small portion you want to look at.

*Horizontal plug-ins* (those that control horizontal deflection) let you widely vary the beam's range of sweep speeds. Some plug-ins delay the waveform until the desired segment of the signal occurs, then trigger a second, faster sweep that fills the screen with that segment.

Other plug-ins enable a scope to perform *spectrum analysis,* by converting from a time-base to a frequency-base display. Some are *counters* or *meters* that digitally measure current, voltage, resistance, temperature and frequency. Some picture an electrical change that occurs too fast for conventional scopes (faster than the speed of light, for example), by *sampling* successive bits of a repetitive signal and reassembling the samples into a graph of the waveform.

Some scopes offer *readout* (many of them on the CRT screen itself), giving the user signal information in numbers and letters as well as waveforms.

Some scopes are *portables,* optimized for easy carrying-about. We even have some small enough to be *hand-held* while in use.

An oscilloscope has several basic characteristics. The limitations on them at a given time are collectively referred to in the industry as the "state of the art."

*Sensitivity* describes how small a signal the instrument can measure. Some Tektronix scopes picture signals smaller than a millionth of a volt.

*Risetime* tells you how fast a voltage change an instrument can record on its vertical axis. Our fastest, or highest-frequency, scopes can picture signals occurring in billionths of a second.

*Bandwidth* describes the range of frequencies a scope can display. Commonly, an instrument will be described by the top limit of its bandwidth only; for instance, our 500 MHz (megaHertz, or millions of cycles per second) 7904 is the world's fastest general-purpose oscilloscope. Some other scopes are optimized to display low-frequency signals; one such model ranges from DC (direct current, or zero cycles per second) to only 2 MHz.

The enormous speed and very light weight of electrons allow display of extremely small and extremely fast events. Still, bandwidth, sensitivity and display brightness all tend to fight one another; as one of these characteristics is improved, physical laws come into play that may adversely affect one or both of the others.

Unlike man-made ones, physical laws can't be repealed; but the artful designer can apply them to the best advantage (much as a skillful sailor uses the wind) so that the negative characteristics are minimized, thus advancing the "state of the art."

Through *transducers*—devices that convert non-electrical events into electrical signals—there's almost no limit to the things that can be oscilloscopically investigated: Heat, sound, pressure, strain, velocity, chemical changes . . .

Thus the term "the oscilloscope market" is a misnomer. Scopes are needed *wherever* man must measure and analyze changing phenomena. Today, that might be just about anywhere.

HIGH-PERFORMANCE portable oscilloscopes, such as the 485, require painstaking care at each of the many stages in their manufacture.

Paced by our new strength in storage oscilloscopy, our 7000-series line of plug-in scopes had an exceptional sales year. With its continually widening assortment of interchangeable plug-ins (now exceeding 30), and variety of three- and four-hole mainframes, it offers the buyer a value that increases year after year.

To say that anything is unassailable just tempts someone to assail it. But this line of laboratory oscilloscopes, with its extreme versatility and wide range of performance, may be as close as we've ever come.

The 5000-series of lower-priced, simplified scopes also showed continuing high acceptance.

In the most competitive market area, our portable oscilloscopes had very strong sales. Demand for the 465 and 475, introduced early in the year, was the largest contributor to our product backlog.

And our hand-held 211 miniscope created an entirely *new* market. People who'd never needed one before found this to be an oscilloscope that would fit their pocket—and their pocketbook.

The high performance, light weight and low price of the 465 and 475 gained rapid and widespread favor from service-oriented users. Computer people did their part, steeply increasing their orders.

That industry's needs are changing, as they always *have* been. We expect those needs will entail more oscilloscopes, including specialized types—and some non-scope test products not yet existing.

Tektronix has been "in the computer business" longer than most people employed by that industry. We feel our relationships there are good; we "track well" with them. Furthermore, our business is *measurement,* not just oscilloscopes. As other products are needed, we intend to be closest to the problem, and first with the best solution.

A lot of people who didn't used to know a scope from a toaster and couldn't afford to find out the difference are now owners of 211 miniscopes. Light and easy to use, the 211 is a natural for service applications. Some portion of these users will undoubtedly graduate to higher-performance oscilloscopes, so our total market base has been broadened.

There was less displacement of other portable-scope sales than we'd expected. Minis tended to go to other markets. Industries as diverse as the bottling business and the railroads have proved major users.

Popularity has its off side: One customer, dismayed at the number of "lost" 211s, suggested that the most useful accessory for that product would be a chain.

Unexpected delay in product introduction held back both the marketing effort and the order rate for our new TM500 modular test and instrumentation system. But customers reacted enthusiastically to its compactness, light weight, plug-in interchangeability and packaging concept. We expect a much-multiplied sales figure in the year ahead for this unique system, which includes power supplies, counters, meters and signal sources, in a choice of two mainframes.

# Do You, Scope, Take This Computer. . . ?

The world we know and the world of data processing are essentially different. The "real" world is perceived by our senses in *analogs;* we see images, hear sounds, feel movement. . . . The realm of data processing is *digital,* using artificial constructs such as numbers and words to produce answers.

The most impressive digital equipment may be computers, which, when fed "bits" of information in special languages, can perform great computational feats.

The growing need to bridge the gap between the world of our senses and that of data-processing technology made inevitable the marriage of the most versatile analog instrument with a modern digital computer. Thus emerged the Tektronix DPO (Digital Processing Oscilloscope). Hailed by one industry journal as possessing "brain power," it wedded the scope's unequalled ability to acquire signals and display waveforms to the computer's calculating capacity.

The DPO is an acquisition/processing/display sandwich. The outer layers are a high-performance general-purpose 7704A oscilloscope. In the middle is a processor, which interfaces with a computer (or a Tektronix calculator).

*Acquisition:* The DPO accepts any four of the over 30 7000-series plug-ins to acquire and condition the signals.

*Processing:* Although most of the processing is done by the computer, the DPO processor converts the analog signals into digital form. It can store up to four waveforms (and words, numbers and symbols related to each) and recall them for display.

The computer, directed by any of 13 Tektronix software routines, or those provided by the user, then manipulates the digitized information in a variety of ways. These range from very fast simple arithmetic (adding or subtracting waveforms) to complex calculations that otherwise would take up to hundreds of hours and are thus, for practical purposes, impossible.

It can, for instance, extract frequency information from a voltage display, or phase information from a frequency-based spectrum-analyzer display—complicated math that a scope, unaided, wouldn't be able to do.

Or it can, by rapidly scanning a large number of repetitive waveforms, extract a very small signal from a lot of random "noise," since noise eventually averages out to zero. An example is picking weak nerve impulses out of a maze of random bio-electrical signals in the body. Signal averaging brings out the neural-impulse waveform in clear detail.

*Display:* The bright 7704A CRT gives sharp displays in waveforms or other kinds of analog, plus digital information relating to them. It can show "answers," for instance the result of waveform adding or subtracting; statistical distribution of signals, or any number of other user-programmed displays. Or the CRT can print out simple messages from the computer, such as operating instructions.

When they're not working as a unit, the scope and the computer (or Tek calculator) may be used separately.

It's too soon to evaluate the impact of this system. It does cost a lot of money; but a 7704A owner with access to a minicomputer can gain greatly expanded ability for little additional cost by buying only the interface and software.

What will its uses be? Take two questions: "What can a computer be used for?" and "What can an oscilloscope be used for?" Either answer would entail

a very, very long list. So the question, "What can you do when the two are coupled?" may not be a mind-boggler, but it's one no single user will be able to answer.

Whether this product is merely a modest beginning, or opens the floodgates to unimagined new areas of measurement, it is an advance that needed to be made into an area where an industry leader is expected to lead.

Alone or in conjunction with a DPO, the new 500MHz R7912 transient digitizer offers state-of-the-art ability to capture and keep waveforms of very fast electrical events—even if they occur at random or once only, such as in nuclear-energy research.

Its stored writing rate exceeds that of the fastest storage oscilloscope. Also, it can convert to digits shorter-lasting single-shot events than any other method—by a factor of about 30. In its signal-acquisition section, it accepts all 7000-series plug-ins.

It should be invaluable in private and governmental nuclear research, as well as investigation of lasers, computer fast-pulse work and the study of certain chemical phenomena.

It's a scan converter, much like the one discussed on page 20, only designed for extreme speed. Up until now, the only way to capture fast single-shot transients has been with a camera, snapping their image as they zipped across the CRT of a high-frequency scope. Film quickly runs into a lot of money.

The R (for rackmount) 7912 does two things: It digitizes the waveform so its components can be entered into a computer for processing, displayed on a Tektronix storage monitor or put into an optional self-contained memory for later storage on magnetic tape; or it converts the waveform into video signals that produce a large, bright display on TV monitors, such as the Tektronix 630/650.

Scan conversion may be compared to photography. A camera records the picture subject on an intermediate negative, which is then transformed into a photographic print. Similarly, our scan-converter CRT turns the waveform signal into an invisible electrical pattern on an intermediate semiconductor target, then scans this image and converts it into slower signals for digitizing or TV display.

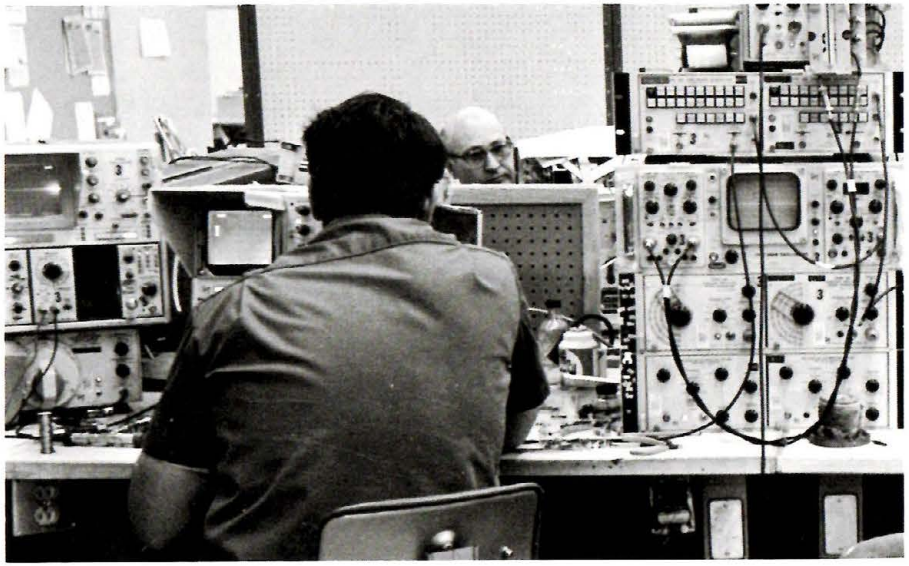
Our Tek-made tube has two electron guns, one before and one behind a $\frac{3}{8} \times \frac{1}{2}$-inch target comprising 800,000 tiny diodes arrayed on a silicon wafer. When the CRT writing beam strikes the target, the impact changes its few high-velocity electrons into many low-velocity electrons, causing the diodes struck to store.

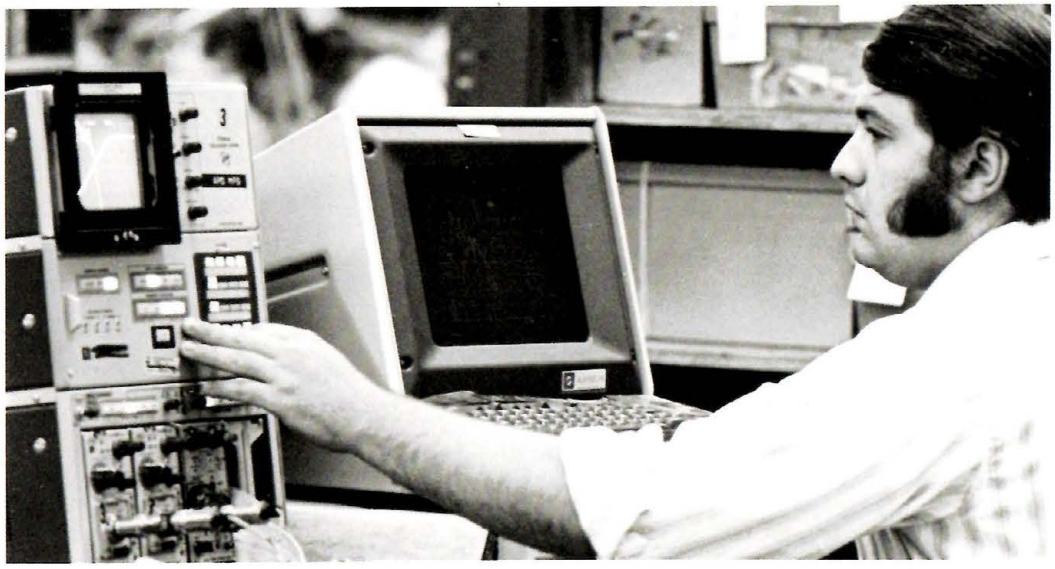
This storage target isn't in the same league with that of a storage scope—its retention is just a fragment of a second. But that's still up to a million times longer than the captured event itself. In the world of electronics, that's plenty of time for the slower "reading" beam at the other end of the tube to scan the back of the target at its own pace and convert the invisible image into signals for digitizing or TV.

The idea of scan-conversion has been around a while. But building a high-quality instrument like this requires a rare combination of skills: CRT design, unique targetry, precision workmanship, high-speed circuits, packaging. . . . That's a hard way to spell "state of the art." But there is no easy way.

Although the rate of new-product introduction eased just enough to let production people catch their breath, several other noteworthy additions have been (or are about to be) made to our line:

- *The 211 miniscope has company:* The 3.4-pound dual-trace 212 and its storage version, the 214, which also has single-sweep capability. These additions greatly increase the amount of scope power you can carry in one hand to wherever it is the measurement needs to be made.





CLOCKWISE, FROM TOP LEFT: Instrument calibration; integrated-circuit layout; the digital processing oscilloscope; the 212 "mini."

The 214's storage attribute and its low bandwidth make it a good choice for electromechanical service uses, which typically involve low-repetition-rate signals.

• *The 5403 oscilloscope* is a versatile three-hole plug-in instrument similar in construction to the popular 5100 series. Two plug-ins introduced with it provide delaying sweep and dual trace—all for a very low price: $1850. Another $350 buys scale-factor readout on the face of the CRT. This is the least expensive way to obtain CRT readout.

As an option, external access to the readout lets users write on the CRT their own data—process name, time, whatever they like—for permanent record.

The 5403 will accept all the 15 existing 5000-series plug-in units. More plug-ins and alternate display modules will be added this year.

It converts easily from bench to rackmount or the other way around.

• *The Tektronix 21 and 31 programmable calculators* are sophisticated in function, easy and natural to use, and lower in cost than competitive models. They can be addressed in the language of math, just the way you learned it in school; there's no need to memorize complex programming languages, as there is with other calculators.

This naturalness of use—and freedom from the barrier of machine language—is especially important when you consider that many people typically share a calculator. Also, the infrequent user would otherwise have to keep "brushing up" on machine language.

The 31 is the more complex of the two; the 21 is a lower-priced, simpler version. Both have silent thermal printers, which give answers on continuous paper tape.

Our calculators' light weight, reliability and low cost are partly due to the use in such products of MOS/LSI (metal-oxide silicon large-scale integration). This mass of initials describes an advanced technology—like integrated circuitry, only more of it. These products contain 13 MOS/LSI chips of our own design.

• *Eleven new TM500 products* round out that versatile modular-instrument line at 24 plug-ins, and add signal processing and waveform monitoring to its capabilities.

Worth special mention is a pulse generator that provides higher performance than similar instruments, at about one-third the cost of the closest comparable product.

The other 10 run a wide gamut of test and measurement usage: A counter and time-interval meter; a function generator; four plug-ins that comprise a physical-research family; and four that constitute a complete oscilloscope calibration/test equipment "package."

Other products that will make a contribution to profitability are:

The *J-16 digital photometer/radiometer,* with probes, a specialized tool designed for the illuminance engineer; the *1105-1106 inverter,* which puts out line voltage to supply several Tektronix instruments out where there is no power, providing "a wall plug anywhere"; and the *577 curve-tracer* with a storage-CRT option, aimed at linear-integrated-circuit and semiconductor testing; its early introduction brought about a high order rate.

# TV: An Ever-Brighter Picture

As Al Capp might put it: We had another (yawn) great year in television instrumentation. Once again, Tektronix' pre-eminent position in that world-wide market was reasserted; our new products were accepted as the industry standards in the US and abroad.

This Tektronix effort accounts for under 10 per cent of our total business. But things look good. Tek's TV measurement sales have more than doubled in the past two years.

When television was young, just "having a TV" was the thing. Possession was first a status symbol, then quickly became a necessity; the same thing happened when color came along.

But, the human eye being the sensitive detector it is, the viewer soon began to be pretty discriminating about picture quality. As the grosser flaws in video transmission were done away with, he was able to discern subtler distortions to complain about. Picky, picky, picky. But that's the way people are.

And that's the way the television industry is, too—increasingly concerned with providing the home viewer a high-quality TV image. This year, from the trouble-plagued Skylab in space to the tragedy-marred Olympics at Munich, the good news and the bad news were brought home to the viewer so vividly that he almost felt part of it.

Your home TV picture has grown clearer and sharper over the years. Tektronix has had a hand in that. We've served the industry since it wasn't very old, foretold its needs for measurement and met them with forward-looking instruments to monitor and measure transmitted signal quality. In the process, we've grown to be the acknowledged global leader in this field. Our products enjoy broad acceptance in television systems throughout the world.

Although TV is taken for granted, it is the most complex information-transmission system ever devised. After the original scene is photographed, the transmitted signals can pass through hundreds of points where they may be distorted: Cameras, amplifiers, phone lines, video-tape recorders, transmitters. When these distortions occur, your color picture blurs or fades, or Walter Cronkite's face turns green.

Our Tektronix products improve video transmission quality in many ways. They include *signal generators,* that make sure the video signals are synchronized, or that produce patterns and signals allowing identification of even the smallest transmission flaws; *waveform monitors,* that enable detailed waveform analysis of TV picture signals; *picture monitors,* that allow quality measurements to be made while the TV image is being viewed; and *vectorscopes,* that produce circular graphs of transmitted color video-signal components.

And, this year we've taken the obvious next step. In addition to signal generation, and waveform and signal analysis and monitoring, we now offer products that *automatically correct* transmission errors, almost right up to the home receiver.

On their list of Least Favorite Kinds of Exercise, most people will include rousting themselves from the easy chair and walking to the TV set for purposes of twiddling. Color variations from station to station, program to program, or even within a program, are downright annoying.

It's hardly witty any more to report that "Everybody talks about the weather, but nobody does anything about it." In a way, though, that's been true of Tektronix and TV color distortions. Our instruments


TEKTRONIX TV products were just about everywhere at the annual International Television Symposium held at Montreux, Switzerland.

have increasingly enabled detection of signal transmission flaws. But we've left it to others to "do something" about those flaws, once detected.

Now that has changed. This year we introduced the 1440 VIRS controlled-correction amplifier, which corrects color-transmission errors. And it does this *automatically*—there isn't a knob on it.

Vertical-interval reference signals (VIRS) were devised by the television industry to minimize color flaws. These VIRS, of fixed composition, are inserted as part of the video signal at program origin, when the picture is just right. Thus, as transmitted picture quality changes, so do the VIRS.

The 1440, which may be used at any point in the lengthy transmission sequence, uses the VIRS as a reference to automatically restore picture hue and intensity to their original levels.

Tektronix signal generators were the first to include VIRS. This year, having foreseen the increased use of this signal, we've introduced an inexpensive VIRS inserter/deleter, the 1441, which is used at the point of program origin.

European color TV has always been a tad better than American. Their system came along later, and could avoid some of the problems ours had. Now, thanks to VIRS, the color picture will be as good in Hoboken as in Hamburg.

Use of the VIR signal takes a long step toward insuring color quality. We believe competitive pressures will lead most stations to acquire this equipment.

There are still other color problems to be solved—smearing, for example. But the 1440 fixes most of the common ones. As a knob-twiddling TV viewer, you'll be glad.

Munich and Montreux are good focal points for a discussion of Tektronix color picture monitors.

Television coverage of the summer Olympics required as many as 700 to 800 Tek TV products. The exclusive color monitor for video-tape recorders there was our model 650.

Every major broadcast VTR manufacturer uses the 650. At the giant annual International TV Symposium, held in May at Montreux, Switzerland, all VTR systems featured our monitor.

Its success has been worldwide. This year we introduced the 653 version, to serve the SECAM system used in France and Eastern Europe.

Essentially a high-quality television viewer designed for critical applications, the 650 enables measurement as well as close visual inspection of the color picture. Its superb performance filled a need not met by existing monitors. It's more stable than they are, preventing convergence drift that lets one color contaminate another; and it fits into a $10^1/_2$-inch rack installation.

Other introductions this year were two large-screen color monitors, the 670, for TV systems in the Western Hemisphere and Japan, and the 671, for those in Europe. Like the 650 series, these 17-inch monitors use the single-gun SONY Trinitron picture tube.

Looking ahead:

- Automation in measurement is a growing need. This year we expect to come up with our ANSWER.

The ANSWER telemetry system allows automated and remote measurements of transmission distortions, wherever they occur, including at unattended transmitters.

Competition among TV signal carriers is increasing, with microwave common carriers penetrating a market which was once the private realm of the telephone company.

Once rate schedules include penalties for poor picture quality, the carrier loses money if color standards are not met. ANSWER will let a network supervisor

(or anyone else), just by dialing a phone, learn anything he wants to know about signal quality, at many points along the line.

• Cable television (CATV) has been threatening to "explode" for, oh, several years now, since it came under the auspices of the Federal Communications Commission. In 1972 the FCC required proof-of-performance tests, aimed at assuring picture quality. Another requirement is that most cable systems must now be able not just to relay network broadcasts to areas with poor reception, but also to generate their own.

Thus the CATV situation has changed a great deal. Picture quality is increasingly important, and the needs for studio and measurement equipment have expanded.

Cable systems are television, but they're more than that: A visual communications medium of potentially very broad application, they may someday let you shop from home, guard your house against burglars, receive a newspaper off the screen, have your utility meters read, sound a fire alarm . . .

"Narrowcasting" is a word just getting into the language. Cable systems "pipe" information to the individual home, rather than broadcast it. Thus, sending a program to a limited geographic area, for instance a single city neighborhood, is now both technically and economically possible.

Limitations on the number of channels are practical rather than technical ones. A single cable can carry 30 channels, and there's no legal limit to the number of cables.

Tektronix approaches this market on two fronts:

1. With instrumentation designed to keep well ahead of FCC requirements.

2. With a simple set of proof-of-performance procedures (called "No Loose Ends") understandable by CATV operators, not all of whom are technically sophisticated. (Many of them have been victims or near-victims of manufacturers who used the FCC requirements as a lever to sell them expensive and unneeded equipment.) "No Loose Ends" also includes a recommended test-equipment package that costs relatively little and meets FCC standards.

Certainly CATV will have a major impact on communications in the future. By next year's report, we hope to be able to discuss some of its implications in more detail.

Formalizing of our television activities this year as the Communications division was no accident of nomenclature. The name reflects the broadened role envisioned for this organization.

As a market, communications is a vast one, and television is just a part of it. From the telephone industry, old hat but still dynamic, to the more esoteric satellite transmission, each segment has its own unique product needs.

Tektronix is no stranger to this broad market, having served it for many years with oscilloscopes and related test instruments, as well as specializing in products for the television segment.

The industry is growing rapidly. It *has* to; human needs for information demand it. Current discussions in the world political arena are aimed at broader, freer interchange among people. As those efforts bear fruit, the need for communications will increase correspondingly.

Thus, if the name of our new division implies broad potential, it's supposed to.

# IDP: A Graphic Example

It was a storybook year for Information Display Products. Sales showed the healthy gain we'd looked for. Innovative "seed" products were introduced (and well received), whose technology will set promising future directions. We have an expanded and increasingly knowledgeable sales force. And, rare enough for anyone in a boom year, IDP met all its deliveries on schedule.

Computer graphics is a relatively new field for us. Although it accounts for less than 10 per cent of total Tektronix business, that field is growing rapidly. As the leader, our biggest strength lies in neither hardware nor software, but rather in a simpler-sounding thing: A growing awareness of how problem-solvers solve problems.

Og, the Caveman, whose sharp eyes could pick out a distant small animal from the pattern of foliage in which it was hiding, never did learn to spell his own name. Visual recognition is among man's most basic ways of making sense of things. It was a long while before verbal intelligence developed.

When electronic computers came along, they greatly extended the human ability to process words and numbers. Only recently, with the advent of *graphic computer terminals,* has there been an equivalent chance to extend the age-old skills of visual interpretation.

Whether he's near to or far from it, the point at which man interacts with a computer is very often a *terminal.* It provides him a way to put in information, or to take it out, or to ask questions and look at the responses.

Most terminals insert coded information from a keyboard and get word-and-number (alphanumeric) answers either displayed on a picture tube or printed on paper.

Our terminals do this, too. What makes them different is their *graphic* attributes. They let the user display and manipulate pictorial material — charts, graphs, diagrams, maps—which is more meaningful in many cases than the same information in alphanumerics. (No number of words could have had the dramatic impact of the first photo of Earth from space.)

Our terminals' storage CRT holds the computerized information in place while it's being looked at. The user's input is made on a keyboard, or with various devices that let him "write" on the CRT screen. He can then change the information display, or enlarge part of it.

Related products include *hard copiers,* which quickly make paper duplicates of the CRT screen contents; *display monitors,* which receive and picture computer output in a variety of ways; *scan converters,* which change electrical signals into TV-type displays; and (new for Tektronix this year) high-quality *alphanumeric terminals,* which do not provide graphics.

The market for graphic terminals has many reasons to grow. One is the large number of computers already out in the world; demand for their more efficient use will bring about increasing employment of terminals. Second is the continuing growth of that industry, with more and more computers being installed. Third is the increasing number of terminal users who are finding that alphanumerics are just not enough, and that graphic displays are often the fastest or best way to make sense of data.

And sometimes the *only* way.

Tektronix' prominence in graphic terminals has been largely due to their major component—the simple, rugged, direct-view storage CRT, which retains the written or pictured image after it's been sent by the computer only once, and displays it sharp and flicker-free.

Storage tubes are bigger and better than ever. "Better and bigger" was actually the sequence: Last year, tube cost went down and display brightness went up; *This* year the tube emerged in a large-screen version.

Like our standard 12-inch-screen terminals, the 19-inch 4014 (and its companion 4015, which uses a high-powered scientific programming language known as APL) have exceptional alphanumeric capability besides enabling fine-line graphics.

Competing large-screen graphic terminals are more costly because they must use "refreshed" displays on non-storage tubes. The memory unit required for the high information density typical of graphics can become very expensive. In our tube, the phosphor screen holds the display; no memory is needed.

The 4014 has $3\frac{1}{2}$ times the screen area of our standard terminals, and can display 8500 characters, sharp-edged and bright. (It can encompass, for instance, an entire page of computer line-printer output—or four standard typewriter pages.)

The 4014 is too new a product to have made any sales impact. But we feel its high content density (possibly approaching the eye's ability to absorb information) should be a boon to map-making, computer-aided education and automated design.

For the customer who doesn't need graphics (yet), we've produced our first alphanumeric terminal. The 4023 is a high-quality "refreshed" product with, we believe, the broadest range of features on the market for this price.

Most graphic terminals are bought by the innovator segment of science, education and business. A much larger market is the clerical segment, where need for graphics is less apparent.

Our intention with this alphanumeric terminal is to meet today's needs (as users perceive them), and maintain communications with those customers. Then, when they begin to think graphics, we'll be there. In addition, they become potential customers for other IDP products; for example, our new 4623 hard copier, designed as a companion to the 4023.

This terminal embodies Tektronix' reputation for technical quality, reliability and service. As our first product enters the alphanumeric market (about 10 times the size of the market for graphic terminals), we're optimistic.

A large and growing number of information systems —in hospitals, schools and industry—require displays on television screens. These systems need a way to transform the original information into video. One method is scan conversion.

Tektronix' high-resolution 4503 scan converter, another new product, obsoletes our 4501 with higher performance at lower cost.

Scan-converter input may be almost anything — physiological signals, computer output, a single frame of a TV sequence. . . . These signals direct the beam in a special CRT to "write" an invisible image on a tiny semiconductor target. Our CRT gun does double-duty; it then "reads" the stored image, converting it into signals that produce the TV picture.

A special feature of the 4503 lets the user selectively erase parts of the video image—enabling, as an example, a hospital to replace old (computer-stored) with new data.

This scan converter can also be used to display the screen contents of Tek graphic terminals on TV sets somewhere else.

OCEANOGRAPHY is one of many areas in which innovators are learning the value of graphics in displaying computerized information.

"Hard" copies are paper duplicates of CRT screen contents. Tektronix hard copiers have proved very popular products: Some that make 8½x11-inch dry black-on-white copies from our own storage terminals, and others that provide similar gray-scale copies from any standard video terminal. This year we introduced a new line of the latter kind.

The 4632 (and the 4623, designed to accompany our new 4023 "refreshed" terminal) offer sharper, better copies and faster than earlier models. They are even more reliable, and allow a wider variety of applications. And they're considerably lower in cost.

Unfortunately, computers are not graphics oriented. The task of our software is to "fake out" existing computer systems so they can do elaborate graphics in spite of themselves.

For the first time, IDP sold software packages separately from terminals. Software—the "sheet music" for computers— is one of our strong points. We lead in its application to graphic terminals.

This year we introduced the "Decision Maker," an advanced applications package that anyone can use without having to do programming: Entering data; graphing and analyzing it, and then displaying the resulting information in a variety of useful formats.

Information Display's OEM (original equipment manufacturer) business was strong this year. Our products sold in OEM contracts are marketed by the buyer under his trade name and as part of his own computer (or other) system.

Such business has plusses and minuses, so we try to maintain a reasonable OEM/non-OEM balance. It lets us reach customers we otherwise could not; on the other hand, continuing face-to-face market feedback is essential to our product development; you typically don't get those insights indirectly.

## The Nitty-Gritty Of Progress

Picture someone laying groundwork.

If you can do that, you're pretty good. "Groundwork laying" is one of those vague generalities that often fill pages when there's nothing to report.

But, with a record sales year behind it, our Marketing organization needn't blush to say it's been "laying groundwork" this year. It may well be one of our most significant organizational activities.

In a word, what's happened is specialization, in recognition of our increasingly diverse markets.

The stereotype of the early Tek field engineer was based on reality. When we got started and the product line was small, he was an enviable (and emulated) combination of technical wizard, applications expert, repairman, office manager—and salesman.

Now, by assigning facilities management and other administrative duties to others, our FE has been freed to sell. And, rather than having to intimately know every one of our many products (it's hard to remember them by name, much less by technical characteristics), he's a specialist—in television, or information display, calculators, oscilloscopes, etc. In his specialty area, he's expected to develop an extensive knowledge of user needs and product applications.

A comprehensive formal sales-training program at Beaverton (and in the field, aided by video tapes) has been underlined by a sales-bonus incentive.

As our "salesmen" do the selling, the fixing has been given to the fixers. Tek's service and repair organization has grown 80 per cent.

One measure of growing field activity is a plant and equipment expansion program now under way.

Being listed as a "multinational corporation" nowadays makes a company feel like the person being ridden out of town on a rail. If it weren't for the honor of the thing, he said, he'd just as soon walk.

A segment of organized labor, and legislators sympathetic to them, are seeking to blame multinationals for selective US unemployment and other economic ills. The thesis is that overseas operations mean "exporting" jobs Americans would otherwise have.

The answer, these critics feel, is punitive legislation, such as the Burke-Hartke bill, making it tough to do business from overseas bases. Although that bill is unlikely to pass, some of its provisions may become law. Old protectionist attitudes never die; they just fade away, only to reappear in other legislation.

People generalize a lot. (Some mistrust computers just because Coke machines don't always work.) Thus the negative effect of one "multinational's" activities taints the reputation of all others, even though the term encompasses many kinds of companies that engage in foreign business for a wide range of reasons.

Some move overseas to take advantage of cheap labor. Others, like oil companies, go there because that's where the resources are. For others, like airlines and shipping, their business *is* international. And some set up operations abroad to protect their markets (including US markets) by preventing protected local competitors from springing up and prospering uncontested. Tektronix fits this latter category.

Legislative barriers to overseas investment, including restrictive taxation, might well be like killing the goose that laid golden eggs, and reduce rather than expand US jobs. Tektronix' experience echoes that of most multinationals: Our exports from Beaverton have increased, including into every country where we've set up a subsidiary. Our US employment has also grown as a result of foreign expansion; and our contribution to US balance of payments, again like multinationals overall, has been highly positive: $303 million in the last 10 years.

If you'd like, you may obtain a thorough statement of our multinational role by writing our Communications department.

To improve the standard of living the world over, and as a viable alternative to wars, Tektronix believes strongly in free trade. We support current efforts at the executive level to replace past world tensions with an era of economic interdependence among the family of nations of which we are all part.

- In our suit against the US government in the Court of Claims, progress didn't slow down any. But that's not saying much. The delay-ridden suit, trudging into its 13th year (and third Commissioner), hasn't been noteworthy for annual forward movement.

We *did* win it, two years ago, when the Court said we were entitled to "reasonable and entire compensation" because government contractors had infringed eight Tektronix patents. What's going on now is the accounting phase, to figure damages.

We've repeatedly suggested not to count on the settlement being a great windfall; that is, it's no reason to purchase Tek stock. On the other hand, should the Court accept our request to base damages on lost profits, the amount might not be insubstantial, either.

For what it's worth, the trial to determine damages is scheduled to begin November 5.

- Three new vice-presidents were elected in April:

Willem B. Velsink, director, Tektronix Labs. Wim, who began at Tek in 1961 as design engineer, has been in advanced product development since 1965;

Lawrence L. Mayhew, general manager, Informa-

DELIVERY is continually improving, as stocks of new Tek products grow. Here are shelves full of the popular TM 500 digital voltmeter.

tion Display Products division. Larry joined us as a design engineer in 1961, and later served as operations manager for Tektronix Holland and then as International Manufacturing manager;

Lewis C. Kasch, manager, US Marketing. After 20 years in the Marines, Lew came to Tektronix in April 1961. He has held responsibilities in sales and marketing management, most of them International.

- Two new directors took office:

Louis B. Perry, president of Standard Insurance Company, Portland, was elected in January to fill the unexpired term of Robert Fitzgerald. Fitz resigned after 20 years of invaluable service to Tektronix, including several years as executive vice-president.

Mr. Perry is a former president of Whitman College, Walla Walla, Wash.

In June (after the close of the fiscal year) John D. Gray, chairman of the board of Omark Industries, Portland, was elected to fill the unexpired term of Walter P. Dyke. Field Emission Corporation, of which company Mr. Dyke is president, was purchased by Hewlett-Packard, a Tektronix competitor.

Mr. Gray is chairman of the board of Reed College, Portland, and a trustee of Oregon Graduate Center.

- The board, in September and again in January, approved a dividend: 10 cents per share of common stock. The dividends, first in our history, reflected the continuing high level of Tektronix business. Dividends will be reviewed semiannually.
- A new marketing subsidiary, Rohde & Schwarz/Tektronix, was approved by the board. The subsidiary, situated in Vienna, will serve Austrian customers and be the base of operations for Tektronix roving field engineers in Eastern Europe.

This organization is different in two ways. It is our first marketing subsidiary to be jointly owned. We own 50 per cent; Rohde & Schwarz, our German distributor for many years and a well-known instrument manufacturer in its own right, owns the other half. Secondly, this subsidiary will sell both companies' products, rather than ours alone.

- An employee-education program possibly without parallel anywhere was begun this year. Employees who qualify may now obtain bachelor's degrees in one subject area and master's degrees in two, all on Tektronix premises.

The programs, almost entirely paid for by the company, allow participants to qualify for these degrees:

1. Bachelor of arts in electrical engineering, involving a minimum of 134 semester hours. This program is conducted through University of Portland. The program began this summer; 90 students are signed up for fall.

2. Master of science degree in EE, through the auspices of Oregon State University, and taught both by OSU staff members and by accredited Tektronix people. The course involves a minimum of 45 credit hours. Twenty-seven employees will be students this coming fall.

3. Master's degree in business administration, also through University of Portland. This program began in September; we'll have our first two dozen graduates by fall.

These programs, besides helping us recruit (and retain) capable employees who seek academic growth, reinforce our long-term emphasis on self-renewal.

- Nomination of the "Warm Springs plant" as Subcontractor of the Year focused attention on a little-publicized but valuable activity: "Farmout".

In addition to contracting parts and fabrication work to existing companies to relieve our capacity problems, Tektronix also "farms out" a variety of jobs to areas with willing workers but little economic opportunity. Those areas include Indian reservations, such as Warm Springs, and sheltered workshops for the physically and mentally handicapped.

In the search for excellence, you can't afford to overlook any source.

# The Unbalanced Ledger

There must be a large market for a state-of-the-art crystal ball. Existing models have too little sensitivity and aren't always reliable.

This specialized field of display technology would benefit from a couple of useful "plug-ins": a *trend spotter* and a *rumble discounter*. As it is, when appraising the future of the US economy, it's hard to pick out the signals from the "noise."

That aside, the managers interviewed for this report agree that almost nothing can keep us from having a good year except, as one said, "if the whole damn world caves in."

(If tomorrow's headline reads WORLD CAVES IN, discount this section.)

Our ledger is favorably unbalanced, well in the black. Here are some of the reasons:

*Product freshness.* Nearly 80 per cent of our products are in their early stages of sales growth.

*Huge order backlog,* historically "safe"—that is, Tek customers tend not to be hasty order cancelers.

*Strong financial position,* which will enable next year's large investment in field and overseas facilities, and a resumed building program at Beaverton.

*A sharpened sales attack.* Bonus and other incentive programs seek to achieve all that's achievable in the market. Can we exceed corporate expectations? Our competitive, specialist field salesmen say "yes."

*New product areas.* Programmable calculators, photometry, refreshed computer displays, oscilloscope computerization are continuing signs of technical diversification.

*An unobtrusive organization.* Over the years our people, and our management team, have learned to work in an informal, mutually helpful mode that's one of our continuing strengths. We try to make sure the Tektronix organization doesn't get in their way.

*The challenge of competent people.* Tek has accumulated a vast reservoir of human competence. Paradoxically, the better the crew, the tougher is management's job of setting company directions. Few things can hurt you more than hard-charging, intelligent, talented people all headed the wrong way; you'd be better off in that case with plodders and stumblers.

*Improved Productivity.* With the logjam year behind us and heavy hiring ended, we'll have a chance to become more efficient, get any remaining bugs out of our new technology and tidy up some processes, substituting finesse for the "brute strength" often needed when you're in a rush.

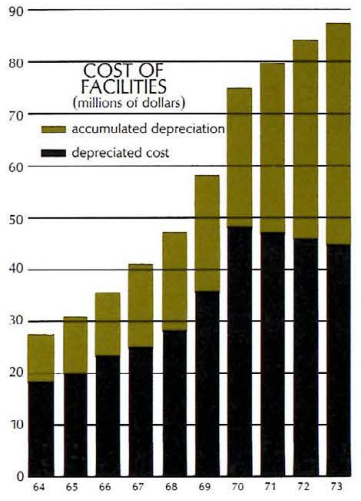
*Depth and breadth of talent.* "I believe," said a senior engineer, "that Tek is one of the 10 (or maybe 20) top technological companies in the entire country." (The foregoing comments do not necessarily represent the views of management and should not be considered an endorsement by them of unbridled optimism.) His point is that the technological avenues we're able to pursue are very numerous indeed.

*Low profile.* A questionable attribute? Maybe. But over the years Tek has tended to be conservative, and to understate. As a result, we've gained a credibility that can't help but stand us in good stead. There's hardly anything more humanly rewarding, and economically gratifying, than having the trust of the people with whom you deal.

A recent Tek spec sheet contained the following disclaimer:

"The specifications presented are tentative, but we have every expectation that any changes reflected in the final specifications will be improvements."

That is, things *may* be even better than they look.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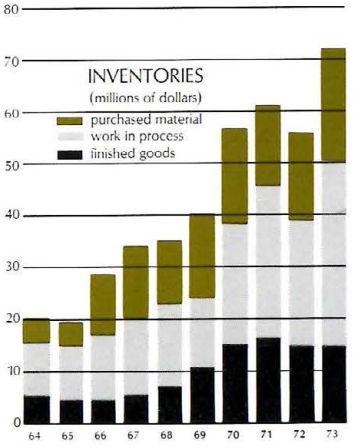
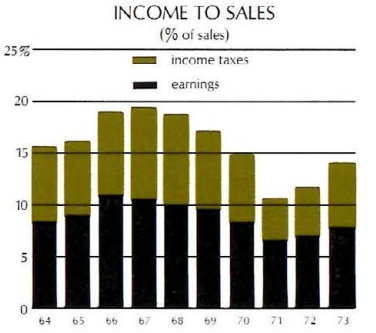
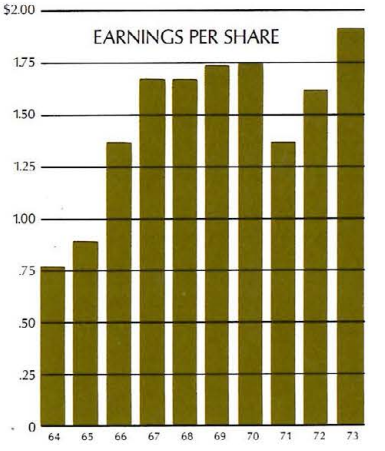
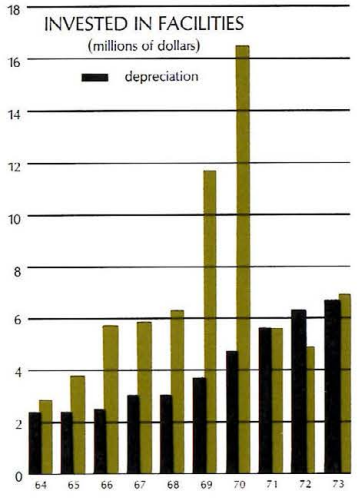
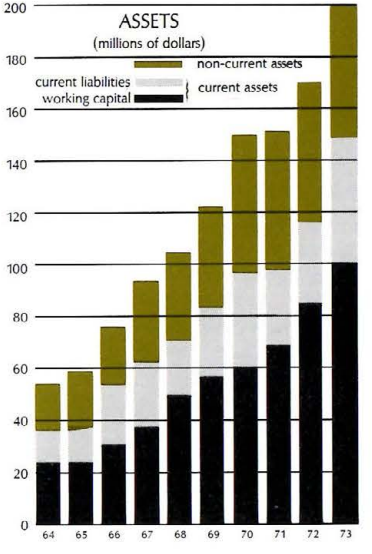
0
64 65 66 67 68 69 70 71 72 73

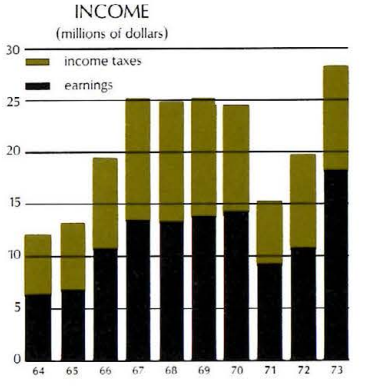

INVENTORIES
(millions of dollars)
purchased material
work in process
finished goods
80
70
60
50
40
30
20
10
0
64 65 66 67 68 69 70 71 72 73

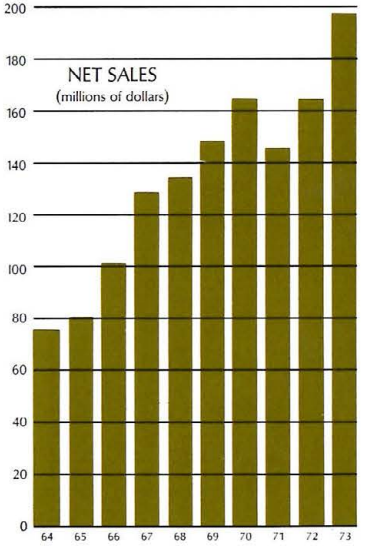

INCOME TO SALES
(% of sales)
income taxes
earnings
25%
20
15
10
5
0
64 65 66 67 68 69 70 71 72 73


EARNINGS PER SHARE
$2.00
1.75
1.50
1.25
1.00
.75
.50
.25
0
64 65 66 67 68 69 70 71 72 73


INVESTED IN FACILITIES
(millions of dollars)
depreciation
18
16
14
12
10
8
6
4
2
0
64 65 66 67 68 69 70 71 72 73


ASSETS
(millions of dollars)
non-current assets
current liabilities
working capital
current assets
200
180
160
140
120
100
80
60
40
20
0
64 65 66 67 68 69 70 71 72 73


INCOME
(millions of dollars)
income taxes
earnings
30
25
20
15
10
5
0
64 65 66 67 68 69 70 71 72 73


NET SALES
(millions of dollars)
200
180
160
140
120
100
80
60
40
20
0
64 65 66 67 68 69 70 71 72 73

# Tektronix Consolidated Income And Reinvested Earnings

The accounting year is the 52 or 53 weeks ending the last Saturday in May.

(THOUSANDS)

| 1971 | 1972 | 1973 | |
|---|---|---|---|
| **$145,999** | **$164,267** | **$198,197** | **NET SALES** Amounts receivable for products sold or rented. Tektronix sold directly to customers at retail in the U.S., and countries in which it has marketing subsidiaries, and to distributors (including 50% owned companies) at a discount, for resale in most of the rest of the world. From NET SALES are deducted |
| **80,085** | **84,974** | **98,496** | **MANUFACTURING COST OF SALES** The cost of materials used in the products sold. Also, the payroll costs of the employees who fabricated and assembled them, their supervisors, those who assisted them, those who devise improved manufacturing methods and those who design and make tools and equipment. Also, the expense of running the manufacturing operations, leaving |
| **65,914** | **79,293** | **99,701** | **GROSS PROFIT** From which must be deducted |
| **49,869** | **60,851†** | **73,591** | **OPERATING EXPENSE AND PROFIT SHARING** |
| 15,718 | 18,863 | 25,075 | SELLING Comprising payroll of sales engineers and employees who assist them, commissions to some marketing representatives, advertising, travel, rent of offices, and the other expenses of marketing. |
| 14,509 | 17,942 | 18,101 | ENGINEERING Payroll of engineers, creators and those who help them design and develop new products and the components to be assembled into them; improve existing products; and assure that new product designs provide "buildability" by the improved methods. The expenditure includes cost of materials, supplies, space and related expense. |
| 11,367 | 13,584 | 15,540 | ADMINISTRATIVE Including payroll of executives and personnel working on accounting, employment, data processing, facilities and communications functions, and the many expenses related to them. |
| 8,275 | 10,462† | 14,875 | PROFIT SHARING (Note 5) Which acts as an incentive for employees' performance by rewarding them with 35% of the profits they are responsible for generating, leaving |
| **16,045** | **18,442†** | **26,110** | **OPERATING INCOME** Which is (increased) or decreased by non-operating items. |
| **366** | **(1,470)†** | **(2,263)** | **NON-OPERATING EXPENSE (INCOME)** |
| (325) | (597) | (1,161) | INTEREST INCOME Earnings of cash and investments earning interest. |
| (477) | (602) | (834) | EQUITY IN EARNINGS OF 50% OWNED COMPANIES. |
| (120) | (377) | (756) | GAIN ON DISPOSITION OF FACILITIES Net amount in excess of depreciated cost from sale or abandonment of facilities no longer needed. |
| (57) | (1,060) | (606) | CURRENCY FLUCTUATION (GAIN) LOSS Net gain on translation and exchange of foreign currencies. |
| 1,154 | 693 | 666 | INTEREST EXPENSE Cost of borrowed money. |
| 438 | 557 | 536 | AMORTIZATION OF INTANGIBLE ASSETS Amounts expensed representing write-off of cost of intangible assets. |
| (247) | (84) | (108) | OTHER Mostly net royalty income and uninsured losses. |
| **15,679** | **19,912†** | **28,373** | **INCOME BEFORE INCOME TAXES** From which is deducted |
| **6,350** | **8,694†** | **12,700** | **PROVISION FOR INCOME TAXES** (Note 4) Estimated income taxes of Tektronix, Inc. to be paid to the United States and state and local governments, plus estimated income taxes to be paid other countries, related to the taxable income of each subsidiary. The provision for U. S. income taxes is sufficient to cover any U. S. income taxes on dividends that we may be required to repatriate from subsidiaries by the Direct Foreign Investment Regulations. Deduction of income taxes resulted in |
| 3,771 | 5,949† | 8,880 | U. S. |
| 575 | 620 | 915 | STATE |
| 2,004 | 2,125 | 2,905 | FOREIGN |
| **9,329** | **11,218** | **15,673** | **EARNINGS** The measure of company performance—the amount reinvested in expansion of business after payment of dividend. |
| 105,581 | 114,941 | 126,161 | REINVESTED EARNINGS AT BEGINNING OF YEAR From which is deducted |
| — | — | (1,637) | DIVIDENDS PAID at 20c per share. |
| 31 | 2 | — | PROCEEDS FROM SALE OF TREASURY SHARES IN EXCESS OF (LESS THAN) COST |
| 114,941 | 126,161 | 140,197 | REINVESTED EARNINGS AT END OF YEAR |
| **8,124** | **8,136** | **8,185** | **COMMON SHARES OUTSTANDING AT END OF YEAR** |
| **$1.15** | **$1.38** | **$1.92** | **EARNINGS PER COMMON SHARE** Earnings for the year divided by the average number of common shares outstanding during the year. Dilution if all outstanding share options were exercised would not have reduced primary earnings more than two cents. |

†See Note 9.

The accompanying notes are an integral part of these financial statements.

# Tektronix Consolidated Financial Position

(THOUSANDS)

| May 29, 1971 | May 27, 1972 | May 26, 1973 | |
|---|---|---|---|
| **$99,084** | **$116,914** | **$145,935** | **CURRENT ASSETS** Those assets likely to be converted to cash or used in the ordinary operation of the business, made up of: |
| 1,069 | 1,862 | 2,409 | CASH Mostly in checking accounts or deposits in transit. |
| 6,706 | 24,938 | 24,799 | CASH EARNING INTEREST Invested in savings accounts, certificates of deposit, U. S. treasury bills, prime commercial paper or short-term tax-exempt securities. |
| 26,538 | 32,351 | 43,812 | ACCOUNTS RECEIVABLE Amounts due from customers for sales on credit. |
| (205) | (288) | (323) | ALLOWANCE FOR DOUBTFUL ACCOUNTS Estimate of erosion in value of accounts receivable because a few customers may not pay us. |
| 2,667 | 2,685 | 3,094 | PREPAID EXPENSES AND DEPOSITS Amounts paid for things that will not be used and deducted until the following year, and deposits that will be refunded. |
| 1,151 | 1,148 | 1,475 | SUPPLIES Items that will be consumed in operating offices, maintaining facilities and running manufacturing plants. |
| 61,158 | 54,218 | 70,669 | INVENTORIES, AT LOWER OF COST (FIRST-IN, FIRST-OUT) OR MARKET The cost of products finished but not yet sold; purchased materials and parts to be fabricated and assembled into products; and the materials, payroll costs and other costs accumulated in the process of manufacturing products not yet completed. |
| 16,360 | 14,622 | 14,663 | Consisting of: Finished goods |
| 29,127 | 26,543 | 35,930 | Work in process |
| 15,671 | 13,053 | 20,076 | Purchased materials |
| **29,481** | **33,205** | **49,207** | |
| 9,800 | 8,600 | 10,600 | **CURRENT LIABILITIES** Obligations due to be paid within one year, including: |
| 125 | 144 | 116 | NOTES PAYABLE Amounts borrowed for less than one year. |
| 6,028 | 6,148 | 11,670 | CURRENT PORTION OF LONG-TERM INDEBTEDNESS (Note 3) Installment payments due within one year. |
| 4,439 | 6,076 | 10,938 | ACCOUNTS PAYABLE Amounts due suppliers for materials and services bought on credit. |
| 3,752 | 6,099 | 7,499 | U.S., STATE AND FOREIGN INCOME TAXES (Note 4) Taxes not yet paid. |
| 2,903 | 3,100 | 5,156 | EMPLOYEE PROFIT SHARING (Note 5) Due employees and their retirement funds. |
| 1,400 | 1,929 | 2,422 | PAYROLL AND PAYROLL TAXES Amounts due employees next payday, and taxes due on or withheld from pay. |
| 1,034 | 1,109 | 806 | VACATIONS Amounts earned by employees for their vacations, but not yet used or paid. |
| | | | INTEREST AND MISCELLANEOUS TAXES Interest, property tax, and sales taxes collected, not yet paid. |
| **69,603** | **83,709** | **96,728** | **WORKING CAPITAL** Current Assets minus Current Liabilities. |
| **48,062** | **46,071** | **45,054** | **FACILITIES AT DEPRECIATED COST** (Note 3) The cost of buildings and equipment used in the business, reduced by depreciation. |
| 45,150 | 45,294 | 45,180 | BUILDINGS AND GROUNDS Cost of buildings, including parking lots and landscaping. |
| 31,789 | 35,338 | 39,008 | MACHINERY AND FURNITURE Cost of furnishings. |
| 254 | 261 | 286 | LEASEHOLD IMPROVEMENTS Cost of remodeling rented space. |
| (31,843) | (37,349) | (43,047) | ACCUMULATED DEPRECIATION Reduction of value for use, wear and age which has been claimed as an expense of doing business, mostly computed by accelerated depreciation methods. |
| 1,927 | 1,927 | 1,723 | LAND Cost of land used in business. |
| 785 | 600 | 1,904 | CONSTRUCTION IN PROGRESS Costs accrued on equipment and buildings not yet put into operation. |
| **3,842** | **2,808** | **2,205** | **INTANGIBLE ASSETS** Amounts not yet deducted (amortized) as a cost of doing business for the excess paid over the values ascribed to the net tangible assets of the companies acquired. These amounts are frequently called goodwill. |
| **2,438** | **2,860** | **6,929** | **INVESTMENTS AND LONG-TERM RECEIVABLES** (Note 2) The investment in and advances to 50% owned companies and one half their reinvested earnings. Also included are installments of sale and lease contracts receivable due after one year and securities not expected to be liquidated within a year. |
| **(1,732)** | **(1,071)** | **(935)** | **LONG-TERM INDEBTEDNESS LESS CURRENT PORTION** (Note 3) The unpaid portion minus payments due within one year of amounts borrowed for more than one year. |
| **—** | **(515)** | **—** | **RESERVE FOR CURRENCY FLUCTUATION** Amount reserved to offset losses on translation of foreign currencies. |
| **122,213** | **133,862** | **149,981** | **SHAREOWNERS' EQUITY** (Notes 6 and 7) The net assets or book value owned by shareowners. This is equal to the total assets (above) minus the current liabilities, long-term indebtedness and reserves. Shareowners' equity is made up of: |
| 7,290 | 7,756 | 10,452 | COMMON SHARES The amount the company received for issuance of common shares. |
| (18) | (55) | (668) | TREASURY SHARES The cost of Tektronix, Inc. common shares repurchased by the company and held in the company treasury. |
| 114,941 | 126,161 | 140,197 | REINVESTED EARNINGS The accumulation of earnings that has been reinvested in the business. |

The accompanying notes are an integral part of these financial statements.

# Tektronix Consolidated Changes In Financial Position

The accounting year is the 52 or 53 weeks ending the last Saturday in May.

| (THOUSANDS) 1971 | 1972 | 1973 | |
|---|---|---|---|
| | | | This statement summarizes how working capital was provided and used. |
| **$15,103** | **$17,987†** | **$21,603** | **WORKING CAPTAL PROVIDED FROM OPERATION:** |
| 9,329 | 11,218† | 15,673 | EARNINGS Net income after income taxes as shown on EARNINGS STATEMENT. |
| 5,813 | 6,299 | 6,743 | DEPRECIATION OF FACILITIES The amounts deducted from net sales representing the decrease in value of buildings, machinery and furniture resulting from use, wear and age. These did not involve outlays of working capital, and most were computed by the sum-of-years-digits method. |
| 438 | 557 | 536 | AMORTIZATION OF INTANGIBLE ASSETS The amounts deducted from net sales representing the write-off of costs of intangible assets, which also did not involve outlays of working capital. |
| (477) | (602) | (834) | EQUITY IN EARNINGS OF 50% OWNED COMPANIES including equity in net gain on translation of their monetary items. These amounts added to investment. |
| — | 515 | (515) | RESERVE FOR CURRENCY VALUATION Amount reserved to offset anticipated losses in translation of foreign currencies, which did not require (provide) working capital. |
| **2,838** | **1,997** | **4,412** | **WORKING CAPITAL PROVIDED FROM:** |
| 277 | 161 | 143 | DISPOSITION OF TREASURY SHARES Net proceeds from sale of Tektronix, Inc. treasury shares to employees as part of our employee share purchase plan. |
| 579 | 466 | 2,696 | ISSUANCE OF COMMON SHARES Net proceeds from sales of Tektronix, Inc. unissued shares to employees exercising stock options. |
| 330 | 549 | 1,294 | RECOVERY OF COST ON SALES OF FACILITIES That part of the proceeds from sales of facilities no longer needed by the company, equivalent to the depreciated cost. |
| 1,452 | — | — | LONG-TERM INDEBTEDNESS INCURRED The portion of the estimated purchase price of the businesses acquired to be paid in instalments as earned. |
| 200 | 225 | 167 | REDUCTION OF LONG-TERM ADVANCES Amounts becoming current assets due within one year. |
| — | 596 | 112 | REDUCTION OF INTANGIBLE ASSETS Reduction in estimate of purchase price of business acquired. |
| **8,195** | **5,878** | **12,996** | **WORKING CAPITAL USED FOR:** |
| 5,956 | 4,858 | 7,020 | ADDITIONS TO FACILITIES Cost of land, buildings, machinery and furniture purchased or constructed. |
| 26 | 660 | 136 | REDUCTION OF LONG-TERM INDEBTEDNESS Amounts becoming current liabilities due within one year, and reduction in estimate of purchase price of business acquired. |
| 1,854 | 120 | 45 | INTANGIBLE ASSETS Amounts accrued in excess of values ascribed to the net tangible assets of the businesses acquired (goodwill). |
| 112 | 44 | 3,402 | INVESTMENTS Long-term securities, receivables and advances to 50% owned companies. |
| 247 | 196 | 756 | PURCHASE OF TREASURY SHARES Cost of Tektronix, Inc. common shares acquired by company. |
| — | — | 1,637 | PAYMENT OF DIVIDEND |
| **9,746** | **14,106** | **13,019** | **RESULTING INCREASE IN WORKING CAPITAL** Made up of |
| **654** | **17,830** | **29,022** | **INCREASE (DECREASE) IN CURRENT ASSETS** Minus |
| (204) | 19,025 | 408 | CASH AND CASH EARNING INTEREST |
| (2,186) | 5,730 | 11,426 | ACCOUNTS RECEIVABLE—NET |
| 4,107 | (6,940) | 16,451 | INVENTORIES |
| (1,063) | 15 | 737 | SUPPLIES, PREPAID EXPENSES AND DEPOSITS |
| **(9,092)** | **3,724** | **16,003** | **INCREASE (DECREASE) IN CURRENT LIABILITIES** |
| (3,601) | (1,181) | 1,972 | NOTES PAYABLE AND CURRENT PORTION OF LONG-TERM DEBT |
| (968) | 921 | 7,770 | ACCOUNTS PAYABLE AND OTHER CURRENT LIABILITIES |
| (2,663) | 2,347 | 1,400 | EMPLOYEE PROFIT SHARING |
| (1,860) | 1,637 | 4,861 | U.S., STATE AND FOREIGN INCOME TAXES |
| 59,857 | 69,603 | 83,709 | WORKING CAPITAL AT BEGINNING OF PERIOD Plus increase in working capital equals |
| **69,603** | **83,709** | **96,728** | **WORKING CAPITAL AT END OF PERIOD** As shown on FINANCIAL POSITION STATEMENT. |

†See Note 9.

The accompanying notes are an integral part of these financial statements.

# Notes To Financial Statements: Tektronix, Inc. And Subsidiaries

## 1. SIGNIFICANT ACCOUNTING POLICIES:

### Principles of Consolidation

The consolidated financial statements include the accounts of Tektronix, Inc. and its subsidiaries, all of which are wholly-owned. Investments in 50%-owned joint venture companies are stated at cost plus the Company's equity in undistributed earnings since dates of organization. All material intercompany accounts, transactions and profits have been eliminated in the consolidated financial statements.

### Foreign Currency Translation

Facilities and related depreciation, inventories and other nonmonetary assets of foreign subsidiaries are translated into U. S. dollars at historical rates of exchange; cash, accounts receivable, current liabilities, long-term receivables and long-term debt are translated at year-end rates of exchange. Income and expenses, other than depreciation expense, are translated at the rates prevailing at the end of each four-week accounting period. Translation and exchange gains and losses are included in nonoperating income; however, translation gains are deferred to the extent that translation losses have occurred shortly after the end of a reporting period.

### Inventories

Inventories are valued at the lower of cost, on a first in-first out basis, or market.

### Facilities and Depreciation

Facilities are carried at cost. Expenditures for maintenance, repairs, and betterments which do not add to the original value of the related assets or materially extend their original lives are expensed as they are incurred. Accelerated methods of depreciation are generally used both for financial accounting and tax purposes based on estimated useful lives of the properties. Leasehold improvements are amortized on the straight-line basis over the periods of the leases.

### Intangible Assets

Intangibles consist primarily of the excess of the purchase price over the value ascribed to the net tangible assets of businesses acquired. These amounts are being amortized on the straight-line method over periods not exceeding 15 years.

### Income Taxes

In addition to making provision for applicable income taxes in each country and state, adequate provision is made for additional U. S. income tax on any dividends likely to be received from foreign subsidiaries. No provision is made for income taxes allowed to be deferred by operation of Tektronix Export Corporation, which has elected to be treated as a Domestic International Sales Corporation (DISC).

Investment tax credits are accounted for on the "flow-through" method, which recognizes the reduction in tax in the year in which the assets giving rise to the credit are placed in service.

### Engineering and Development

Expenditures for plant start-up, engineering, and research and development are expensed as they are incurred.

## 2. SUBSIDIARIES AND 50%-OWNED COMPANIES:

Assets, liabilities and equity in net earnings of the subsidiaries in the following amounts (translated at appropriate rates of exchange) are included in the consolidated financial statements:

| | May 26, 1973 | May 27, 1972 | May 29,1971 |
|---|---|---|---|
| Current assets | $44,291,252 | $38,817,843 | $33,657,228 |
| Property—net | 7,881,677 | 8,670,581 | 8,662,829 |
| Intangible assets and investments | 4,626,194 | 1,531,677 | 1,836,380 |
| Current liabilities | 6,738,803 | 5,601,833 | 5,317,057 |
| Long-term indebtedness | 226,810 | 250,409 | 279,630 |
| Equity in net earnings | 10,134,700 | 7,377,046 | 4,465,619 |

The Company's share of the net assets of 50%-owned companies, included in investments, consists of the following:

| | May 26, 1973 | May 27, 1972 | May 29,1971 |
|---|---|---|---|
| Capital | $ 262,618 | $ 139,334 | $ 139,334 |
| Current year's earnings | 834,182 | 602,351 | 477,113 |
| Prior years' earnings | 1,784,099 | 1,181,748 | 704,635 |
| TOTAL | $ 2,880,899 | $ 1,923,433 | $ 1,321,082 |

## 3. LONG-TERM INDEBTEDNESS:

Long-term indebtedness consists of the following:

| | May 26, 1973 | May 27, 1972 | May 29,1971 |
|---|---|---|---|
| Note payable to the City of Heerenveen, The Netherlands (original amount, $528,200) | $ 226,810 | $ 250,409 | $ 279,630 |
| Contract payable | 708,628 | 821,128 | 1,452,205 |
| TOTAL | $ 935,438 | $ 1,071,537 | $ 1,731,835 |

The indebtedness to the City of Heerenveen is payable in annual installments of $33,250 plus interest at 4½%. Facilities which cost $1,300,000 are pledged as collateral.

The contract payable represents the discounted estimated contingent portion (which estimate was revised downward during the years ended May 26, 1973 and May 27, 1972) of the purchase price of the assets of an electronic calculator business acquired in May, 1971. Contingent payments are based on sales of calculator products to May, 1976. The Company is amortizing the contingent portion of the purchase price as the payments accrue.

4. INCOME TAXES:

The liability for U.S., state and foreign income taxes includes approximately $3,500,000 of U.S. income taxes which will accrue upon transfer of a portion of foreign subsidiary earnings to Tektronix, Inc. Of this amount, $1,500,000 was provided in the year ended May 26, 1973, $1,300,000 was provided in the year ended May 27, 1972, and $700,000 was provided in prior years. The Company anticipates that the balance of foreign subsidiary reinvested earnings, upon which U.S. income taxes have not been provided, will be employed in its operations.

Reductions of U.S. income taxes resulting from the tax incentives available to Tektronix Export Corporation, a Domestic International Sales Corporation (DISC), approximated $1,300,000 in 1973 and $350,000 in 1972.

Investment tax credits reduced the provision for income taxes by approximately $250,000 in 1973, $250,000 in 1972, and $23,000 in 1971.

5. EMPLOYEE PROFIT-SHARING:

Under the terms of the Company's profit-sharing plan, 35% of income before income taxes, profit-sharing, and charitable contributions is provided for employee profit-sharing.

6. SHAREOWNERS' EQUITY:

Authorized capital consists of 20,000,000 shares without par value. Issued and outstanding shares are as follows:

| | May 26, 1973 | May 27, 1972 | May 29,1971 |
|---|---|---|---|
| Issued | 8,203,095 | 8,137,372 | 8,124,522 |
| Held in treasury | 18,127 | 1,445 | 731 |
| Outstanding | 8,184,968 | 8,135,927 | 8,123,791 |

7. EMPLOYEE STOCK OPTION AND SHARE PURCHASE PLANS:

Under stock option plans for employees, in which the options are "qualified stock options" as defined by the Internal Revenue Code, 335,307 common shares of the Company are reserved. The plans provide that the option price shall be not less than 100% of the fair market value of the shares on the date of grant and that the options are exercisable in four (or fewer, where the option period is less than five years) cumulative annual installments beginning one year after the date of grant.

At May 26, 1973, options to purchase 314,192 shares were outstanding, for which the option price, ranging from $24.45 to $60.10 per share, amounted to $13,312,292, and options to purchase 109,903 shares were exercisable, for which the option price amounted to $5,477,069. During the year then ended, options which became exercisable and options exercised were as follows:

| | Options | |
|---|---|---|
| | Which Became Exercisable | Which were Exercised |
| Number of shares | 38,031 | 65,723 |
| Option price: | | |
| Range per share | $24.45 to $58.20 | $24.45 to $57.00 |
| Total | $1,674,898 | $2,695,908 |
| Market value at date exercisable or exercised: | | |
| Range per share | $35.90 to $64.65 | $37.45 to $64.65 |
| Total | $1,853,539 | $3,402,591 |

Option and market prices, respectively, for options which became exercisable and for options which were exercised in 1972 and 1971 were as follows: 1972—options exercisable $2,388,433 and $2,025,083, options exercised $465,520 and $577,024; 1971—options exercisable $2,702,120 and $2,007,047, options exercised $579,102 and $673,254.

Under an "Employee Share Purchase Plan," 168,411 common shares of the Company are reserved. The share purchase discount provided in the plan (which may not exceed 15% of market value on the date of purchase), has been charged to income as follows: $3,431 in 1973, $9,219 in 1972, and $17,674 in 1971.

8. COMMITMENTS AND CONTINGENT LIABILITIES:

The companies are committed to pay aggregate rentals of approximately $4,716,000 on building and equipment

leases expiring from June 1973 to June 1991. Rentals under these leases for the year ending May 25, 1974 will be approximately $1,206,000.

9. CLASSIFICATION OF TRANSLATION GAINS:

Foreign currency translation gains reported as an extraordinary item of income in 1972 have been reclassified to conform to the Company's current practice of including them in Currency Fluctuation (Gain) Loss as part of Non-operating Expense (Income).

## ACCOUNTANTS' OPINION

TEKTRONIX, INC.:

We have examined the statements of consolidated financial position of Tektronix, Inc. and subsidiaries as of May 26, 1973, May 27, 1972, and May 29, 1971 and the related statements of consolidated income and reinvested earnings and of consolidated changes in financial position for the years then ended. Our examination was made in accordance with generally accepted auditing standards, and accordingly included such tests of the accounting records and such other auditing procedures as we considered necessary in the circumstances.

In our opinion, the accompanying statements present fairly the financial position of the companies as of May 26, 1973, May 27, 1972, and May 29, 1971 and the results of their operations and the changes in their financial position for the years then ended, in conformity with generally accepted accounting principles applied on a consistent basis.

Haskins & Sells

Portland, Oregon
July 12, 1973

## EXPLANATION OF FINANCIAL STATEMENTS

Corporate performance and strength are usually measured by financial figures, although they only tell part of the story. It is hoped the explanation included as part of the financial statements will assist shareowners unfamiliar with financial analyses to a better understanding of Tektronix.

*Performance* is usually presented on the income statement, which shows how much of the revenue, mostly from sales, can be kept by the company after paying the costs of goods sold and the expenses of running the business.

*Strength* is pictured by the financial position statement, which shows the cost of the assets or resources used in the business and tells what part of them is owned by the shareowners and what part owed to creditors.

Another statement called Changes in Financial Position shows the connection between the other two statements. Note that the first item on this statement is the earnings shown on the income statement. The last item is the working capital shown on the financial position statement.

To best adapt to conditions outside the United States, Tektronix operates in Japan and Austria through nonconsolidated 50% owned companies, and elsewhere through wholly-owned subsidiary corporations. However, a meaningful financial picture of Tektronix is gained only by consolidated figures.

The figures on the financial statements are rounded to the nearest thousand dollars.

We hope these explanations will contribute to better understanding, and lead to further clarification.

## SHAREOWNERS' MEETING

The annual meeting of shareowners of Tektronix, Inc. will be held on Saturday, September 15, 1973, at 9 a.m. Pacific Daylight Time, in the Cafeteria Building, S.W. Karl Braun Drive, Tektronix Industrial Park, near Beaverton, Oregon.

*Transfer Agents*

United States National Bank of Oregon
Portland, Oregon

Morgan Guaranty Trust Company
New York, New York

*Registrars*

First National Bank of Oregon
Portland, Oregon

First National City Bank
New York, New York

*Mailing Address*
TEKTRONIX, INC.
P.O. Box 500
Beaverton, Oregon 97005
*Telephone*
503/644-0161

# Tektronix Consolidated Financial Statistics

(**DOLLARS,** SHARES AND SQUARE FEET IN THOUSANDS)

| 1964 | 1965 | 1966 | 1967 | 1968 | 1969 | 1970 | 1971 | 1972 | 1973 | Fiscal year ending in May |
|---|---|---|---|---|---|---|---|---|---|---|
| **75,503** | **81,099** | **101,759** | **129,031** | **133,656** | **148,857** | **165,205** | **145,999** | **164,267** | **198,197** | **NET SALES** |
| **6,308** | **7,319** | **11,052** | **13,389** | **13,429** | **14,089** | **14,254** | **9,329** | **11,218** | **15,673** | **EARNINGS** |
| 78c | 91c | $1.38 | $1.68 | $1.68 | $1.75 | $1.76 | $1.15 | $1.38 | $1.92 | Per Share |
| 8.4% | 9.0% | 10.9% | 10.4% | 10.0% | 9.5% | 8.6% | 6.4% | 6.8% | 7.9% | % of Sales |
| 20.7% | 19.1% | 25.0% | 24.4% | 19.9% | 17.3% | 14.6% | 8.3% | 9.2% | 11.7% | % of Beginning-of-Year Shareowners' Equity |
| **8,636** | **9,718** | **13,589** | **16,577** | **17,335** | **18,359** | **19,495** | **15,580** | **18,074** | **22,952** | **CASH FLOW** |
| **12,200** | **13,566** | **19,602** | **25,179** | **25,102** | **25,327** | **24,744** | **15,679** | **19,912†** | **28,373** | **INCOME BEFORE INCOME TAXES** |
| 16.2% | 16.7% | 19.3% | 19.5% | 18.8% | 17.0% | 15.0% | 10.7% | 12.1%† | 14.3% | % of Sales |
| 48.3% | 46.0% | 43.6% | 46.6% | 46.0% | 44.2% | 42.4% | 40.5% | 43.7%† | 44.8% | Income Tax Rate |
| **26,146** | **26,018** | **32,489** | **38,192** | **41,356** | **48,686** | **59,515** | **55,426** | **57,512** | **69,893** | **PAYROLL BEFORE PROFIT SHARE** |
| **6,509** | **7,553** | **10,810** | **13,744** | **13,542** | **13,360** | **13,144** | **8,275** | **10,462†** | **14,875** | **EMPLOYEE PROFIT SHARE** |
| 1,185 | 1,198 | 1,436 | 1,588 | 1,698 | 1,800 | 2,081 | 2,299 | 2,399 | 2,582 | Facilities in Use at Year End (in Square Feet) |
| **27,123** | **30,712** | **35,781** | **41,157** | **47,168** | **58,378** | **74,750** | **79,905** | **83,420** | **88,101** | **COST OF FACILITIES** |
| **3,043** | **3,910** | **5,705** | **5,803** | **6,464** | **11,861** | **16,770** | **5,956** | **4,858** | **7,020** | **INVESTED IN FACILITIES** (during year) |
| **2,301** | **2,342** | **2,456** | **2,991** | **3,436** | **3,823** | **4,823** | **5,813** | **6,299** | **6,743** | **FACILITIES DEPRECIATION** (mostly accelerated) |
| **9,031** | **11,196** | **13,061** | **15,724** | **18,836** | **22,183** | **26,565** | **31,843** | **37,349** | **43,047** | **ACCUMULATED DEPRECIATION** |
| **55,322** | **59,147** | **76,116** | **92,720** | **104,962** | **124,544** | **151,155** | **153,426** | **168,653** | **200,123** | **TOTAL ASSETS** |
| **10,801** | **12,679** | **17,053** | **21,557** | **22,612** | **27,073** | **28,519** | **26,333** | **32,063** | **43,489** | **ACCOUNTS RECEIVABLE NET** |
| **20,430** | **19,678** | **28,473** | **34,150** | **34,982** | **41,031** | **58,259** | **62,309** | **55,366** | **72,144** | **INVENTORY** (including supplies) |
| **36,857** | **39,064** | **52,781** | **62,952** | **72,626** | **84,313** | **98,430** | **99,084** | **116,914** | **145,935** | **CURRENT ASSETS** |
| **12,762** | **14,397** | **20,864** | **23,258** | **21,839** | **26,672** | **38,573** | **29,481** | **33,205** | **49,207** | **CURRENT LIABILITIES** |
| **24,095** | **24,667** | **31,917** | **39,694** | **50,787** | **57,641** | **59,857** | **69,603** | **83,709** | **96,728** | **WORKING CAPITAL** |
| **4,728** | **501** | **458** | **2,077** | **988** | **379** | **332** | **1,857** | **1,215** | **1,052** | **LONG-TERM INDEBTEDNESS** (including current portion) |
| 8,073 | 8,008 | 7,984 | 7,970 | 7,998 | 8,094 | 8,108 | 8,124 | 8,136 | 8,185 | Common Shares Outstanding at Year End |
| **38,258** | **44,275** | **54,819** | **67,548** | **81,597** | **97,519** | **112,276** | **122,213** | **133,862** | **149,981** | **SHAREOWNERS' EQUITY** |
| **5,844** | **5,997** | **5,997** | **5,997** | **5,997** | **6,196** | **6,711** | **7,290** | **7,756** | **10,452** | **COMMON-SHARE CAPITAL** |
| **32,414** | **39,733** | **50,785** | **64,174** | **77,603** | **91,346** | **105,581** | **114,941** | **126,161** | **140,197** | **REINVESTED EARNINGS** |
| 4,910 | 4,982 | 6,482 | 7,270 | 7,852 | 8,752 | 9,857 | 8,991 | 8,234 | 10,450 | Number of Employees at Year End |

†See Note 9.

# Directors, Officers And Management

## BOARD OF DIRECTORS

HOWARD VOLLUM, *Chairman*
PAUL L. BOLEY, *Partner, Davies, Biggs, Strayer, Stoel and Boley*
JAMES B. CASTLES, *Secretary and General Counsel*
JOHN D. GRAY, *Chairman, Omark Industries*
LOUIS B. PERRY, *President, Standard Insurance Company*
EARL WANTLAND, *President*
FRANK M. WARREN, *President, Portland General Electric Company*

## OFFICERS

HOWARD VOLLUM, *Chairman and Chief Executive Officer*
EARL WANTLAND, *President*
LESLIE F. STEVENS, *Group Vice President—Finance*
DONALD ALVEY, *Group Vice President*
WILLIAM J. POLITS, *Group Vice President*
WILLIAM D. WALKER, *Group Vice President*
FRANK O. CONSALVO, *Vice President*
FRANCIS DOYLE, *Vice President*
LEWIS C. KASCH, *Vice President*
LAWRENCE L. MAYHEW, *Vice President*
MICHAEL J. PARK, *Vice President*
WILLEM B. VELSINK, *Vice President*
WILLIAM B. WEBBER, *Vice President*
JAMES B. CASTLES, *Secretary and General Counsel*
DON A. ELLIS, *Treasurer*
ELWELL E. SWANSON, *Controller and Assistant Secretary*
F. H. NEISSER, *Assistant Secretary*
KENNETH H. KNOX, *Assistant Treasurer*

## FINANCE & ADMINISTRATION

LESLIE F. STEVENS, *Group Vice President—Finance*
DON A. ELLIS, *Treasurer*
ELWELL E. SWANSON, *Controller*
KENNETH H. KNOX, *Assistant Treasurer*
LARRY N. CHORUBY, *Budget Director*
GALE KINGSBURY, *International Finance*
RICHARD J. REISINGER, *Corporate Planning*
BILL J. ROBINSON, *Manufacturing Accounting*
WILLIAM B. WEBBER, *Vice President and Community Relations*
FRANK O. CONSALVO, *Vice President and Administrative Services*
GUYOT FRAZIER, *Employee Development*
ROBERT G. MARTYN, *Personnel*
LARRY D. FROST, *Facilities*
HUGO PANKOW, *Data Services*
CHARLES H. FROST, *Public Affairs*
JOHN STEMBER, *IDP Finance*

## INFORMATION DISPLAY PRODUCTS

LAWRENCE L. MAYHEW, *Vice President and Manager*
JOHN BOWNE, *Engineering*
PETER G. COOK, *Software*
MORGAN E. HOWELLS, *Marketing*
JON REED, *Manufacturing*
JOHN STEMBER, *Finance*

## COMMUNICATIONS PRODUCTS

TOM LONG, *Manager*
STEPHEN D. KERMAN, *Marketing*
CHARLES RHODES, *Engineering*
CALVIN A. SMITH, *Manufacturing*

## RESEARCH & ENGINEERING

WILLIAM D. WALKER, *Group Vice President*
WILLEM B. VELSINK, *Vice President and Tektronix Labs*
J. LARRY BOWMAN, *Integrated Circuits Design*
JOHN BOWNE, *Information Display Products Engineering*
MICHAEL BRAND, *Engineering Operations*
JOHN GATES, *Portable Oscilloscope Design*
TOM LONG, *General Instrument Design*
HIRO MORIYASU, *Calculator Products Design*
JEROME L. SHANNON, *Low Frequency Oscilloscope Design*

## MANUFACTURING

WILLIAM J. POLITS, *Group Vice President*
MICHAEL J. PARK, *Vice President and Manufacturing Planning*
BURTON A. AVERY, *Production and Inventory Control*
FERDINAND P. BARICEVIC, *Product Manufacturing*
ROSS PORTER, *Product Manufacturing*
OTTO ZACH, *Product Manufacturing*
THOMAS E. SLY, *Component Manufacturing*
KENNETH F. SPOONER, *Component Manufacturing*
EDWIN SREBNIK, *Component Manufacturing*
SCOTT E. FOSTER, JR., *Purchasing*
RICHARD W. MONTAG, *International Manufacturing*

## U.S. MARKETING & INTERNATIONAL OPERATIONS

DONALD ALVEY, *Group Vice President*
FRANCIS DOYLE, *Vice President and European Operations*
LEWIS C. KASCH, *Vice President and U. S. Marketing*
HAROLD D. BUTTS, *U.S. Sales*
FRANK P. ELARDO, JR., *Product Marketing*
EDWARD M. VAUGHAN, *Eastern Marketing*
WILLIAM L. WARD, *Western Marketing*
EBERHARD VON CLEMM, *International Marketing*
WARREN CLARK, *European Marketing*
LADNER GOODMAN, *Field Administration*
MORGAN HOWELLS, *Information Display Marketing*
GALE KINGSBURY, *International Finance*
ALBERT E. GRAHAM, *European Finance*
STANLEY F. KOUBA, *Field Service*
RICHARD W. MONTAG, *International Manufacturing*
EARL MUSIC, *Advertising*

## MANAGERS OF SUBSIDIARIES:

STEN ARKSTEDT, *Tektronix A/S, Denmark, & Tektronix AB., Sweden*
CHARLES BILLET, *Tektronix, France*
ALBERT E. GRAHAM, *Tektronix Limited & Tektronix Guernsey Limited*
E. D. E. GROOM, *Tektronix U.K. Ltd. & Telequipment, London, England*
HOWARD MIKESELL, *Tektronix Holland N.V., Tektronix Datatek N.V., Holland, Tektronix S.A., Belgium*
RAOUL STEFFEN, *Tektronix International A.G., Switzerland*
PETER STRONG, *Tektronix Australia Pty. Limited*
RONALD R. WAMBOLT, *Tektronix Canada Ltd.*
GERRIT ADRIAANSE, *Tektronix S.A., Belgium*
ULRICH SCHNEEMAN, *Rohde & Schwarz-Tektronix GmbH & Co., KG, Vienna, Austria*

**SONY/Tektronix Corporation,** *Tokyo, Japan:*
MASANOBU TADA, *Chairman of the Board*
TAKASHI KUMAKURA, *President*

# Tektronix International Facilities

**Tektronix Export Corporation, Beaverton, Oregon**—A Domestic International Sales Corporation

### MANUFACTURING SUBSIDIARIES

**Tektronix Guernsey Limited, Guernsey**—Principally serving European Free Trade Association;
**Tektronix Holland N.V., Heerenveen, The Netherlands**—Principally serving European Common Market;
**Tektronix U.K. Ltd., London**—Telequipment Instruments;
**SONY/Tektronix Corporation, Tokyo, Japan**—Serving Japan.

### MARKETING SUBSIDIARIES

**Australia**—Tektronix Australia Pty. Limited, Sydney, Melbourne and Adelaide;
**Belgium**—Tektronix S.A., Brussels;
**Canada**—Tektronix Canada Ltd., Montreal, Toronto, Ottawa, Calgary, Vancouver and Halifax;
**Denmark**—Tektronix A/S, Copenhagen;
**England**—Tektronix U.K. Ltd., Harpenden, London, Manchester and Scotland;
**France**—Tektronix, Paris, Tolouse, Nice, Lyons, Rennes and Nancy;
**Japan**—SONY/Tektronix Corporation, Tokyo, Osaka and Nagoya;
**Sweden**—Tektronix AB., Bromma and Gothenburg;
**Switzerland**—Tektronix International A.G., Zug and Geneva;
**The Netherlands**—Tektronix Holland N.V., Voorschoten;
**The Netherlands**—Tektronix Datatek N.V., Schiphol.

### MARKETING REPRESENTATIVES

**Serviced by Tektronix, Inc., Beaverton**

**Argentina,** Coasin S.A., Buenos Aires, Cordoba, Rosario;
**Brazil,** Importacao Industria e Comercio Ambriex, S.A., Rio de Janeiro, Sao Paulo, Porto Alegre;
**Chile,** Equipos Industriales, S.A.C.I.;
**Colombia,** Manuel Trujillo Venegas e Hijo, Ltda., Bogota;
**Ecuador,** Proteco Coasin Cia. Ltda., Quito;
**Hong Kong,** Gilman & Co., Ltd.;
**India,** Hinditron Services Private Limited, Bombay;
**Korea,** M-C International, Seoul;
**Malaysia,** Mecomb Malaysia Sendirian, Berhad, Selangor;
**Mexico,** Tecnicos Argostal S.A., Mexico D.F., Monterrey, Guadalajara;
**New Zealand,** W & K McLean, Ltd., Auckland, Wellington;
**Pakistan,** Pak-Land Corporation, Karachi;
**Peru,** Importaciones y Representaciones Electronicas, S.A., Lima;
**Philippines,** Philippine Electronics Industries, Rizal;
**Singapore,** Mechanical & Combustion Engineering Co., Ltd., Singapore;
**Sri Lanka,** Maurice Roche Limited, Colombo;
**Taiwan,** Heighten Trading Co., Ltd., Taipei;
**Thailand,** G. Simon Radio Company Ltd., Bangkok;
**Uruguay,** Coasin Uruguaya S.A., Montevideo;
**Venezuela,** Coasin C.A., Caracas.

### MARKETING REPRESENTATIVES

**Serviced by Tektronix Limited, Guernsey, Channel Islands**

**Angola,** Equipamentos Tecnicos, Lda., Luanda;
**Austria,** Rohde & Schwarz-Tektronix GmbH
**Finland,** Into O/Y, Helsinki;
**Federal Republic of Germany,** Rohde & Schwarz Vertriebs-GmbH, Cologne, Hamburg, Munich, Karlsruhe;
**West Berlin,** Rohde & Schwarz Handels-GmbH;
**Greece,** Marios Dalleggio Representations, Athens;
**Iran,** Berkeh Co. Ltd., Tehran;
**Israel,** Eastronics Limited, Tel Aviv;
**Italy,** Silverstar Ltd., Milan, Rome, Turin;
**Kenya,** Engineering & Sales Co., Nairobi;
**Lebanon,** Projects, Beirut;
**Morocco,** F. Pignal, Casablanca;
**Mozambique,** Equipamentos Tecnicos, Lda., Mozambique;
**Norway,** Morgenstierne & Company A/S, Oslo;
**Portugal,** Equipamentos de Laboratorio Lda., Lisbon;
**Republic of South Africa,** Protea Physical & Nuclear Instrumentation (Pty) Ltd., Johannesburg;
**Spain,** C. R. Marés, S.A., Barcelona, Madrid;
**Tunisia,** Selection Internationale, Tunis;
**Turkey,** M. Suheyl Erkman, Istanbul;
**Yugoslavia,** Elektrotehna, Zagreb, Belgrade;
**Zambia,** Baird & Tatlock (Zambia) Ltd., Ndola, Lusaka.

# Tektronix United States Facilities

### UNITED STATES

**Tektronix, Inc., Beaverton, Oregon**—Headquarters and Main Plant

### FIELD OFFICES

Albany, N.Y.
*Albuquerque, N.M.
*Atlanta, Ga.
*Baltimore, Md.
*Boston, Mass.
Buffalo, N.Y.
*Chicago, Ill.
*Cleveland, Ohio
Columbus, Ohio
*Concord, Cal.
*Dallas, Texas
Dayton, Ohio
*Denver, Colo.
*Detroit, Mich.
*Endicott, N.Y.
*Fort Lauderdale, Fla.
Fort Washington, Pa.
*Greensboro, N.C.
Hampton, Va.
*Houston, Texas
*Huntsville, Ala.
*Indianapolis, Ind.
*Irvine, Cal.
*Kansas City, Kan.
**Las Vegas, Nev.
*Long Island, N.Y.
Milford, Ct.
**Mountainview, Cal.
*Oklahoma City. Okla.
*Orlando, Fla.
Palo Alto, Cal.
Pensacola, Fla.
**Philadelphia, Pa.
*Phoenix, Ariz.
*Pittsburgh, Pa.
Portland, Ore.
*Poughkeepsie, N.Y.
*Rockville, Md.
*St. Louis, Mo.
*St. Paul, Minn.
*Salt Lake City, Utah
San Antonio, Texas
*San Diego, Cal.
San Jose, Cal.
*Seattle, Wash.
*Springfield, N.J.
*Syracuse, N.Y.
*Van Nuys, Cal.

*includes Service Center
**Service Center only