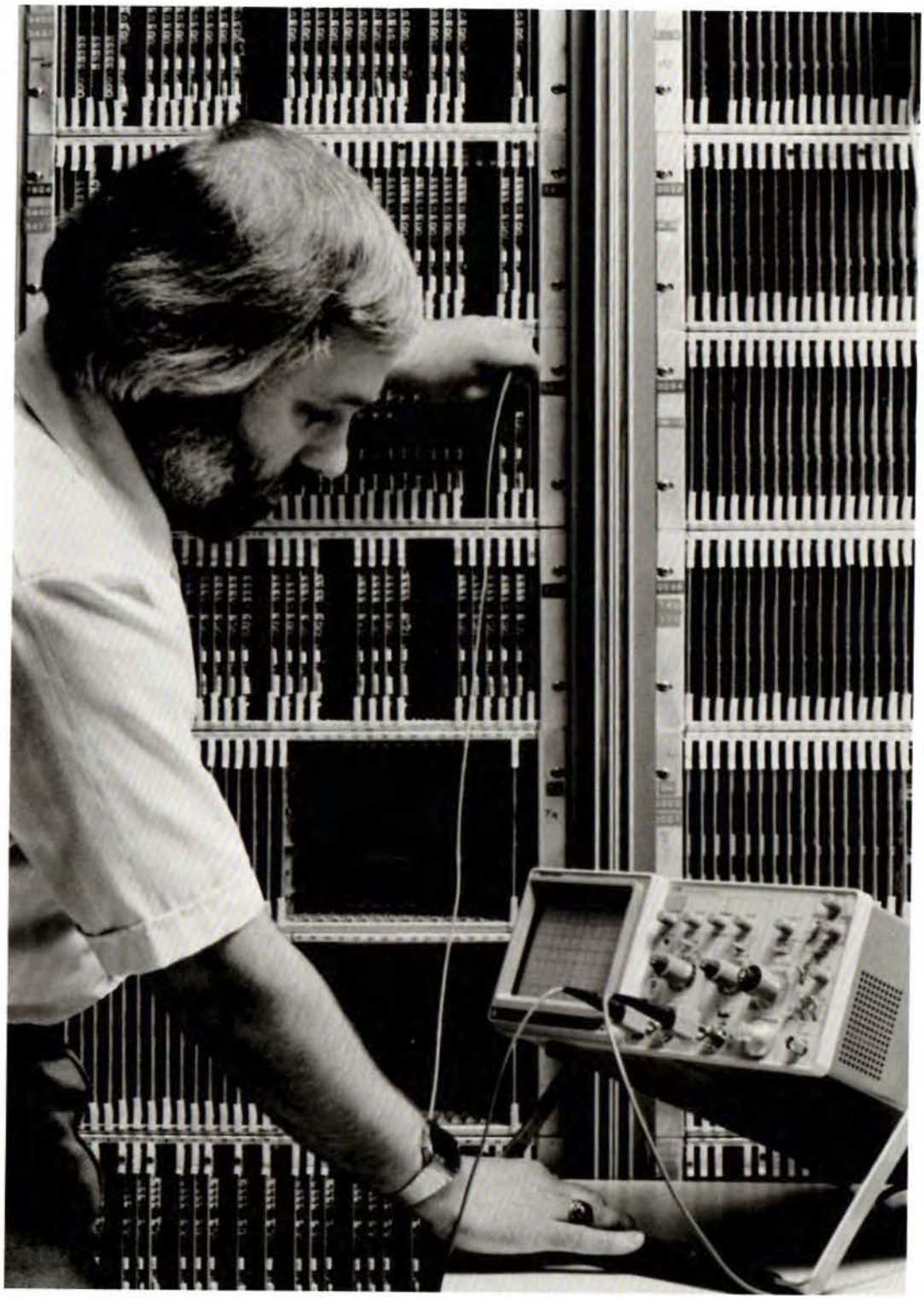
TEKTRONIX, INC./ANNUAL REPORT/35TH YEAR/MAY 30, 1981

Tektronix 1981 Financial Highlights in thousands

53 Weeks to May 31, 1980		52 Weeks to May 30, 1981		Increase (Decrease)		
$1,049,000	**100%**	**$1,040,000**	**100%**	**$ (9,000)**	**−1%**	**ORDERS** received from customers, some of which were
317,000	30%	295,000	28%	(22,000)	−7%	UNFILLED ORDERS at year-end.
$ 971,306	**100%**	**$1,061,834**	**100%**	**$ 90,528**	**9%**	**SALES** comprised of
722,060	74%	757,973	71%	35,913	5%	TEST AND MEASUREMENT products and
249,246	26%	303,861	29%	54,615	22%	INFORMATION DISPLAY products—sold to
591,760	61%	625,335	59%	33,575	6%	UNITED STATES customers and
379,546	39%	436,499	41%	56,953	15%	INTERNATIONAL customers.
$ 7,523	**1%**	**$ 26,318**	**3%**	**$ 18,795**	**250%**	**REVENUE** from non-operating sources.
$ 893,757	**92%**	**$1,007,985**	**95%**	**$114,228**	**13%**	**LESS COSTS AND EXPENSES** to be paid
468,380	48%	525,040	49%	56,660	12%	TO EMPLOYEES who design, produce, sell and service products as well as those who support their efforts;
337,856	35%	381,802	36%	43,946	13%	TO SUPPLIERS for materials, components, supplies, services and the use of their property and funds;
57,218	6%	58,915	6%	1,697	3%	TO GOVERNMENTS as taxes in the United States and abroad—and to provide
30,303	3%	42,228	4%	11,925	39%	FOR FACILITIES depreciation which allows for the use, wear and aging of buildings and equipment.
$ 85,072	**9%**	**$ 80,167**	**8%**	**$ (4,905)**	**−6%**	**RESULTING IN EARNINGS** to be reinvested in the business and for dividends to shareowners.
$4.66	**100%**	**$4.34**	**100%**	**$ (.32)**	**−7%**	**EARNINGS PER SHARE** based on average shares.
.79	17%	.90	21%	.11	14%	DIVIDENDS PER SHARE paid to shareowners.



LIGHT WEIGHT, low cost and high performance typify our new 2200-series portable oscilloscopes.

Interrupting the Growth Habit

So as not to hem and haw about it: Yes, this has been a poor year.

Details are on pages 3 through 12, with further elaboration elsewhere in the appropriately muted gray text pages.

We did convert the preceding year's roughly billion-dollar order total into roughly a billion dollars of sales; but that seemed a hollow achievement in light of our drop in earnings. For a company habituated to strong earnings growth (we've had nine straight years of it), it's traumatic to have to pause. We're not used to that.

We'd be ducking responsibility to lay it all at the feet of the US economy, or the wild terpsichore of currencies, or stultifying interest rates. Those things did happen – but that's life. The job of managing is to take the world the way it's dealt out and make the most of it; somewhere it says that.

Tek, as past annual reports have divulged to you, tends to be run in a participative fashion; most decisions are consensual. Regarding the past year, our management's consensus isn't just that we didn't do very well (shucks, this year a ***lot*** *of companies could say that) but, worse:* ***That we should have done better.***

Some of the bad things we'd blame if we could are summarized on pages 7 through 9.

If at one time the handwriting was on the wall, today the alphanumerics are on the terminal screen. What they say is that the '80s are going to be an increasingly competitive time.

Tektronix, in a significant organizational change, is at work forming the kind of company the new decade demands. The main building blocks have been set in place: Product-oriented divisions, designed to move with sureness and alacrity through the uncharted '80s.

Divisionalizing means different things to different folks. What ***we*** *mean by it is explained on page 17 and beyond.*

An outrush of innovative products – our strongest in many years – has begun. They represent advances in major product areas, and have a real excitement about them: Not only in analog instrumentation, where we made our fame and early fortune; but also in the newer area of digital, or logic, products, where a good share of our future rests.

What the products are and what they do are discussed in some detail beginning on page 23.

A Bittersweet Billion-Dollar Year

It was a tough, tough 12 months. And Tektronix didn't do at all well.

To start things off, the order rate nosedived; then orders staggered barely upward, in a fitful, unreassuring manner. They ended just below those of the year before. Earnings — after nine years of continued increases—fell off by 6 per cent.

Sales were up a bit — in dollars. But those dollar figures don't give the whole picture. Sift from them the effect of our product price increases, and it's possible we actually sold **fewer** products than the year before.

Part of the problem was the economic recession. But only part. Another part was us, and our failure to live up to our own set of performance standards. It's ironic, and most disappointing, that Tektronix' first billion-dollar sales year should be a downer.

Sales were up by 9 per cent from those of a year earlier. They moved to $1,061,834,000 from $971,306,000. Of those, the *US portion* increased by 6 per cent; the *international segment* by 15 per cent. Figures were: US sales, $625,335,000, up from $591,760,000; international sales, $436,499,000, up from $379,546,000.

Sales of *Test and Measurement products* increased, to $757,973,000 from $722,060,000, or up 5 per cent; those of *Information Display products* increased 22 per cent, going to $303,861,000 from $249,246,000.

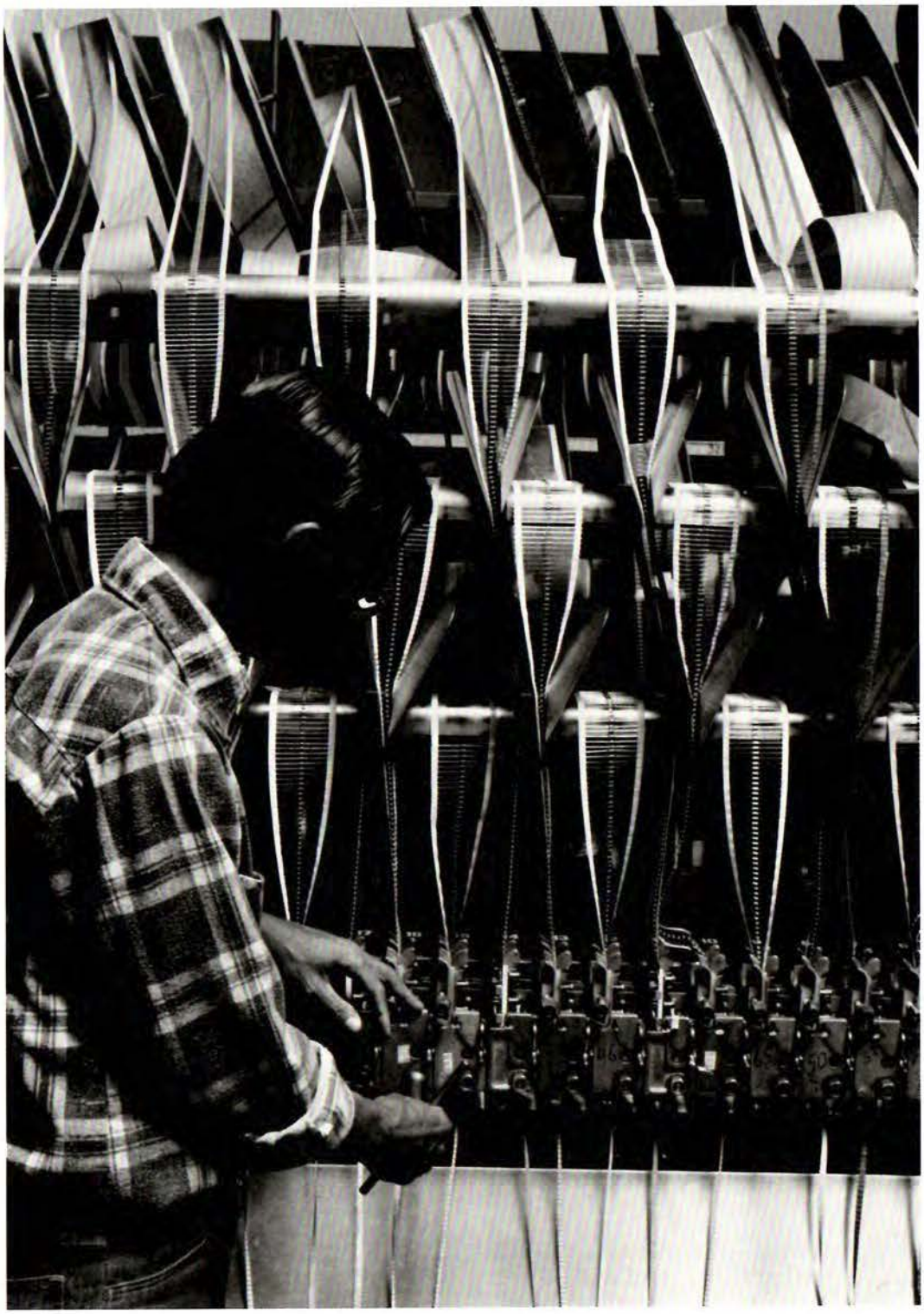
For the past three years, these were the sales of Test and Measurement products and Information Display products:

Test and Measurement			Information Display		
1979	$606,795,000	77.1%	1979	$180,141,000	22.9%
1980	$722,060,000	74.3%	1980	$249,246,000	25.7%
1981	$757,973,000	71.4%	1981	$303,861,000	28.6%

Earnings declined for the first time in 10 years. They were off by 6 per cent, totaling $80,167,000, compared to $85,072,000 last year. Similarly, *earnings per share* dropped, to $4.34 from $4.66. Of the earnings, about 28 cents per share resulted from the sale to Squibb Corporation of our portable-patient-monitor business unit.

Incoming orders were about flat, down 1 per cent from those of the year before, at $1,040,000,000. *Unfilled orders* decreased to $295 million from $317 million.

We had 24,028 employees when the year ended. We had started out with 23,890. Normal attrition wore away that original total; so did the sale of our patient-monitor business



NEW 2200-series oscilloscopes are aimed at high-volume production. Here is part of the component-insertion line.

and loss of its 79 employees. But we added 412 people when we acquired the distributorship of Tek products in Germany. Hence the overall increase.

Those who tend to be thankful for small favors may wish to know that the preceding fiscal year had 53 weeks, and this year only 52.

The Late, Great Recession—Mostly Late

"Almost certainly, what you really want to learn is what's down the road," our last year's report said. And it added "Well, we don't know. ..."

That turned out to be a perceptive comment. We *didn't* know—when the recession would finally swat our company; how long it would last; how hard it would hurt.

"We *are* in for some easing of growth rates," we went on, putting it mildly. The report continued its amiable, euphemistic rendition of the future (italics added):

"That *economic correction* should do us some good .... The *moderation of business levels* will give us time to address... problems...." The dots represent more of the same — an indication that the magnitude of the recession exceeded anything we'd expected.

We admit it. We were so poor at forecasting this economic cycle that we could almost qualify as economists. Even the national "experts" over the preceding two years had been in disarray with their forecasts. But they are a dogged lot of predictors, and they kept at it until they got at least the timing right; the US recession finally *did* take place.

The economy had feinted once and feinted twice before it slid into its deep slump. By this time Tek was off balance. We had trusted in two earlier negative forecasts by underplanning our capacity. This time, reluctant to undershoot again, we planned for moderate growth. But it never came.

The economy slammed on the brakes. Like passengers thrown to the front, Tektronix pitched forward into its new year with overcapacity.

From our standpoint, it would have been better if the recession had occurred when it was supposed to — about 18 months before it did. The longer it was delayed, the tougher the job of correction was bound to be.

In the three preceding years, Tek had been growing really fast. We'd more than doubled our sales in that period, and did about the same with employee numbers.

With that kind of growth going on—at a compound rate of 29 per cent per year—a lot of people were doing a lot of new jobs; that makes it hard to keep track of everything, to handle it all just right. So, we met the recession with a less-tight ship than we'd have liked.

Throttling Back

The drooping demand for our products caught us with much more capacity than we could use. The same unsavory pair of choices stared at us that faces most companies in the same fix: Keep on building, and park the unordered products in inventory (which costs a lot and runs the risk of product obsolescence), or lay off people.

We'd used a third option successfully in the recessions of 1970-71 and 1975: shared shutdown days. We chose that route again this past year. Through a combination of partial and total plant shutdown weeks and individual days off, we shared an aggregate of 20 days of company closure.

We tried to make the best of a bad situation; employees responded in a positive and cooperative way, and with good spirit. Some of the shutdowns were timed to provide added togetherness for families, by extending our normal Thanksgiving and Christmas vacations, plus a week during most local schools' spring vacation. Other days off, which coincided with not much of anything, were probably less popular. Employees were allowed to take vacation in lieu of unpaid absence.

We're aware that our attempts to thus keep the workforce intact can be criticized as mushy management, by critics who view the labor force as a pawn in supply-and-demand economics.

We disagree. And it's not just because of the human element, either, although that's always been a strong influence at Tek. It costs money to go through a layoff. And it costs to hire again when things turn up, and to train new employees.

Still, although layoffs are a disagreeable option, they *are* an option; we had one in 1971, for instance. And we've told employees that our current emphasis on cost reduction may well result in some layoffs.

That we *have* used this option only once before suggests, correctly, that we highly value long-term employment. That's because, as we've noted earlier and often, we've found that the most-productive employee relationships come about through long association.

Suddenly Last Summer:

Mark Twain once recounted that, riding a bucking horse, he was thrown this way and that, sometimes landing on his seat, sometimes on his knees, sometimes facing the rear. That

TECHNICIAN REMOVES a wafer platen after an aluminum coating has been deposited on integrated-circuit wafers.

was, he concluded, entirely too much variety for him.

In the same way, a number of things came together all at once for Tek: Our fiscal year, lower-than-anticipated sales, a worldwide recession, a dispute with the Government, record interest rates, stiffer competition, radical currency fluctuations, a new high in depreciation expense, a costly acquisition of our German distributorship, and a spate of internal problems. That was entirely too much coincidence for us; we could have done with about half of it.

Having been one of the few US companies to make its way successfully through the 1975 recession didn't help us at all this time around. This downturn had a different complexion.

First, it was global rather than patchy as in '75. Often when one country has a recession, some other is doing all right. This has a smoothing-out effect on companies that sell worldwide. But this slump infected most of our major market nations all at one time.

Second, it ran almost in synchronization with our fiscal year, rather than straddling two; so we felt its brunt all in one difficult 12-month period.

Down the 'Up' Dollar

Then there's the strengthening US dollar. It shot up rapidly in value against almost all major currencies. Hooray for America, of course; still and all, the effect on a US company like Tek, with substantial overseas assets and liabilities, can be punishing.

(Remember that in some years a weakening dollar has worked the other way for us, and that past annual reports have talked about that.)

The first effect of a stronger dollar is that, if we are to maintain our profitability, we must raise prices in the foreign currency. This year we had to do it in the face of already weakening markets. This makes our products less of a good buy in other countries than they were.

The resulting damper on sales is a genuine cause for concern, but not one that financial statements measure. (You can't count the sales you didn't get.) The other five effects *are* reflected in one way or another in our financial summary:

• Effect 2 is the gain or loss that occurs when we buy or sell a currency, mostly to settle trade between one Tek company and another. Our sales company that sells in francs, for instance, still must pay Tektronix, Inc. in dollars.

When you travel abroad, you exchange dollars for the local currency, to have spending money. Sometimes you come out ahead, sometimes behind. So it is with us, and this year we came out behind.

• Effect 3 is what happens when our assets and liabilities in foreign currencies are translated into dollars, for our consolidated accounting.

This annual snapshot-in-dollars has an effect *on the books only.* It tells you no more about how well we ran our business than a photo of a basketball game tells you about how well that game was played.

If we have more foreign cash and receivables than we owe, and the dollar strengthens, those assets *are* worth less in dollars. But, within the country in which they occur, they have just as much value to our business as before.

Effect 2 above is called a *transaction gain or loss* on currency exchange. Effect 3 is called a *net monetary asset translation.* Both of these kinds of gains and losses are included in Non-Operating Income.

• Effect 4 is good news: Our expenses paid in foreign currencies cost us less when the dollar is strong—like those tourist bargains you've been reading about.

• Effect 5 is on taxes. You'd think that, as with expenses, a stronger dollar would pay more local income taxes — and it does. The rub is, the income taxer in a foreign country doesn't see the translation losses described in Effect 3. They occur only on our consolidated statement, not on the books of any Tek company. If there is no loss *within that country,* our taxes there do not drop—even though the foreign assets are worth less on our dollar balance sheet. So the actual taxable income is greater than our consolidated accounting shows.

This effect can be dramatic. One Tek company operates in a country that taxes 50 per cent in its currency. The actual effect, when that currency was translated into dollars, was a sky-high 96 per cent tax rate. Our after-tax profit was *4 per cent* of taxable income.

• Effect 6 may be most dramatic of all: When sales *are* made, they show up as fewer dollars than before. And, when currency changes are rapid, as they were this year, you're always behind; you can't change your price lists fast enough to keep up.

(During our year the dollar increased 34 per cent against the French franc, 31 per cent against the German mark and 14 per cent against the British pound. To show how fast this can happen, our final four-week period represented about *37 per cent* of our loss for the whole year.)

For instance, you quote a price in the buyer's local currency: 2000 palookas (then worth $1000 US). By delivery time the dollar has gotten stronger, the palooka weaker. The 2000-palooka sale that would have meant $1000 to Tek now yields, say, only $900.

"HUMAN ENGINEERING"–to enable maximum ease of use–is a major emphasis at Tektronix. Here, two industrial designers discuss front-panel design.

Effects 4 through 6 are called *income-statement translations.* Their impact is reflected in the various sales and expense items.

The Statement Notes in the back of this report will tell you non-operating income was reduced by $3.3 million because of shifting currencies. A less visible but more severe loss was from the income-statement effects just described. It was perhaps *four times* that amount.

Fighting City Hall

A war of words with the US General Services Administration did nothing but hurt Tek sales, in a year when that was the last thing we needed. We went through most of the year without several of our GSA contracts.

Well, they *call* it a contract; what it really is, is a list of "qualified vendors"; being on it makes it much easier for US Government agencies and contractors to buy from you.

The dispute had to do with discounts. The GSA, under fire from two Presidents and the Congress for various reasons, has been pushing for greater and greater discounts from suppliers.

Discounts can be a good business practice; but we didn't agree with their version. What GSA proposed is that agencies' onesy-twosy purchases should be added up and a discount given, based on the total. We held that applying a "large-order" rate to a passel of small orders (which allows a company no chance to gain economies of scale) wasn't our idea of a quantity discount. But it was theirs, and the GSA held tough through most of the year.

Our absence from GSA schedules (we're still discussing some with them) hasn't prevented agencies from buying from Tek, but it makes it much more cumbersome. We believe the hassle has resulted in reduced or deferred US Government sales.

We'll Sell our own Products in Germany

We took over direct marketing of our products in Germany, which should mean major long-term benefits. Historically, each time we have supplanted a distributor with our own sales organization, business in that country has increased.

Our new company, Tektronix GmbH, has over 400 employees, with offices in Cologne, Hamburg, Karlsruhe, Munich, Nuremberg and West Berlin. It is the largest distributorship we have acquired.

The timing of the move was something else again. We'd hoped that the transition would take place during a good economic year. That was the plan; but apparently nobody told Germany. Von Murphy's law prevailed, and the normally rock-solid German economy fell into a recession.

Almost in time with the changeover, the dollar began its strongest-ever showing against the mark—18 per cent in our first five months. That rise, plus the slowing economy, plus normal costly transition headaches, left us with sales and income well below what we'd expected. (It didn't help a bit that we acquired our distributor's Tek product inventory at his cost. As products were sold from this inventory, this higher cost was picked up as our cost of sales.) This acquisition might have made the difference between up and down earnings for us this year.

Rising Sun?

The trade press finds it fashionable to refer to growing Japanese competition as "Japan, Inc.," implying that somehow a whole country is ganging up on hapless isolated competitors from elsewhere.

It *is* a catchy phrase, isn't it? And undoubtedly there is a business-and-government tandem in that export-or-die nation that's a far cry from the adversary relationship we often see here.

In the oscilloscope field, Japanese competitors, over many years, have proved to be good ones, and must be taken seriously — as we take all our good competitors seriously.

But there's no point in being overawed; they are from Japan, not Krypton. What Tek faces is several determined, efficient, well-managed oscilloscope manufacturers, sharing a high dedication to quality. And, like any leader, we're always open to attack in whatever seems our weakest spot. In our case, that may have appeared to be the lower-price, lower-performance end of the scope line.

Appeared to be, we said. But look again, in the light of our new 2200 series of portables, introduced this year. It offers higher performance for the price than *any* competition, Occidental or Oriental. It was designed to make sure that, if our heels are being nibbled, they at least are not of the Achilles variety.

Japan is getting a good press nowadays — deservedly. But competition from that country needs to be put into perspective:

If Japanese manufacturers have a strong (and earned) reputation for high quality, US manufacturers have an equally strong (and earned) reputation for innovation. (It's maybe worth noting that most of the vaunted Japanese manufacturing techniques and processes are Western, not Eastern, ideas.)

NEW AUTOMATED WAREHOUSE, which went on-line this year, enables computer management of parts and materials.

The Way it Is

"When in doubt, mumble," an expert advises would-be bureaucrats.

Hundreds of US companies this year — a year of black news and red ink — must have been tempted to mumble to shareholders in their annual reports; i.e., (1) Don't say very much; (2) Use lots of pictures; (3) Speak in abstractions; (4) Qualify all statements so the negative impact gets blurred.

Well, it *is* a temptation to use those options. But Tek long ago chose to produce annual reports that are informative and candid. There's little point in starting to mumble this year.

Prosperity is lovely, but it takes work. In nine years of boomtime, most of our energy was absorbed in just meeting customer demand. As we slid into the trough of recession, we were an organization out of balance — ahead in some ways (more building space than we can now use), behind in others (lacking good information systems) and, in more ways than we'd like, inefficient.

Cost of sales is nearly 50 per cent of sales; it must be brought down. Work-in-process inventory is much higher than it should be; and it takes a lot of high-priced money to support that. Our manufacturing planning system, once at the forefront of the art, has been outpaced by strong company growth; it is obsolescent and erratic, and no longer yields the kind or the quality of information we can trust. Delivery delays from some of our own component areas are something we wouldn't tolerate from outside suppliers; and our own product delivery is nothing we can brag about. Although quality is good (and improving), customer expectations also are increasing; we can't ease up.

Outside:

The US economy, even under the most wishful squinting, shows no clear signs that it is resurging. Overseas economies, most of them, remain anemic. High interest rates continue to suppress customers' appetites for capital purchases. And the strengthening US dollar negatively impacts our overseas business.

(As you may have guessed, that's the bad news.)

Bring on the '80s

We are our own most severe critics. But that's as it should be. An intensely self-critical organization, never satisfied even in a good year, we are at our most self-flagellating when things work out *less* well than expected.

But don't let this year's disappointments obscure the essential vitality of your company.

Tektronix is strong, technically and financially — and inordinately rich in competent and dedicated people; when problems exist, they find answers. Tek is historically self-correcting.

We have a worldwide reputation for high quality and innovation. We intend each year to re-earn it.

Further, the company is changing in very positive ways. And, we are optimistic about the rest of the '80s; bring them on.

The worst failing would be not to produce what customers need and want; we won't allow that. Our current outburst of high-impact digital and analog products is just the start.

In a very important change, we are decentralizing into more self-contained, agile product groups. They are headed by energetic and experienced general managers. The transition to the division structure is going very well.

Thus bringing product-linked functions together under single direction enables a close communication that draws out the best in each of them. Synergism, is the fancy word for it; and we're seeing a lot of it already.

The market will get tougher. Finer and finer differences will separate the leader from the also-rans. For that reason, we're hammering home to all employees the critical nature of quality. We don't intend to let up. To underline its importance, a Director of Quality Assurance has been named, a vice-president reporting to the Office of the President.

The most dramatic changes you'll see may be in manufacturing. There, the computer will become more and more a people's tool — for data gathering, management planning, scheduling ... Our new oscilloscope plant will be up-to-the-minute, with the best in material handling and inventory control, and backed up by computer-aided parts design.

In the coming years you can expect to see the same technical inventiveness applied to our manufacturing as we have successfully brought to bear on product design. From production lines to component building, creative ideas are rampant in our manufacturing areas.

Underlying it all—always—is the quality of our employees. We've tried to select the best people and give them the room, and the support, to grow better. They are our sustaining resource through thick and thin. We have always known that; so we probably work harder than many companies do to hold onto our workforce and provide long-term employment.

We've emerged from a tough year with most of our experi-

INSPECTIONS ARE FREQUENT during the production of integrated circuits. Here, wafers undergo one of many visual checks that insure top-quality products.

enced, trained and loyal employee group still with us.

These people, like all people, want to do a good job; few things are more rewarding. This year we're structuring an organization that, more than ever before, helps them to do it.

Tools For Technical People

At age 35½, Tektronix is somewhat the younger of the world's two largest test and measurement instrument companies. We produce tools for technical people engaged in the full range of scientific, industrial and educational pursuits.

Our products feature high technology—and they are very broadly useful. Almost certainly they had some role in the creation or perfecting of anything you use or consume.

Tektronix' commercial customers number nearly 50,000. No one of them accounts for as much as 4 per cent of our business.

Tektronix earned its early fame as the maker of cathode-ray oscilloscopes. They remain the strong anchor of our product line, and we lead the world in their development and sale. But other Tektronix products have come along to complement them, and today we offer a wide range of high-quality, very useful instruments.

The scope has outlasted many of its detractors, who felt it sooner or later would be displaced. Although some of its functions have been supplemented by specialized products, others have not; and it remains the only convenient way you have of looking at a waveform. So many people in so many areas have found this visual feature necessary that the scope market has continued to expand. It's alive and well today; witness the heightened scrambling by competitors (including Japanese) for a share of it.

In an oscilloscope, a focused electron beam bombards the sensitive cathode-ray-tube (CRT) screen, producing a graph. This waveform tells you what's going on at some point inside an electrical circuit. You can thus study electrical "events" or anything that has been turned into voltage. And that's just about anything: Pressure, sound, velocity, nuclear events, heat, strain, signals from the reaches of space or the depths of a human body.

Scopes have changed a lot since the early days. They've been broadened in bandwidth, which determines how wide a range of signals they can measure , and increased in sensitivity, which tells how small a signal they can detect. Their CRTs have been improved to afford brighter, more stable, finer-line images. And scopes have added a wide assortment of useful features, including artificial "intelligence" and digital readout of waveform information.

Some scopes are large, designed to sit on the lab workbench. Our biggest, when packed with four plug-ins, totals about 73 pounds and stands a bit over a foot high.

Others are portable, ranging down to very small indeed. Our 3.7-pound "mini" scope can be held in one hand and tweaked with the other. In between lab and "mini" instruments, Tek produces many models of benchtop or portable scopes.

Some are monolithic; that is, they have a built-in set of characteristics. Others can widely vary what and how they measure by mixing and combining up to four of many interchangeable plug-in units. These include amplifiers to expand either the time or the voltage segments of the CRT display; and multimeters and counters.

Some scopes are coupled to computers, or contain their own (in the form of mite-sized microprocessor chips), for further analysis of waveform information. They are commonly called "smart." Some scopes can retain the graphed waveform after the event it pictures is done with. They do this either by storing the waveform on the CRT phosphor; or else by converting the signal into digits, storing those in memory, then rebuilding from them a stable replica of the waveform.

Tektronix Test and Measurement products are:

- Oscilloscopes and their plug-ins; scope accessories, including probes, attenuators and waveform-recording cameras; modular programmable and manual instruments; semiconductor curve tracers; and isolators and ground isolation monitors, which add safety to "floating" scope measurements, those made when neither point is grounded.
- Waveform and picture monitors, signal generators and vectorscopes, all of which test and display the quality of video transmission; spectrum analyzers, and cable testers; plus production and routing switchers and special-effects systems for TV, produced by our California subsidiary, The Grass Valley Group, Inc. Both Tektronix and Grass Valley television products are the leading ones.
- Microprocessor-development systems, tools that assist in software writing, hardware debugging and software/hardware integration; logic analyzers, which capture and analyze parallel streams of binary data from digital equipment and systems; and large semiconductor test systems.

Information Display products include: Graphic computer terminals, that display words and numbers, maps, diagrams

IONIZED DOPANTS ARE implanted into silicon to create transistors on integrated-circuit wafers.

and other pictorial content, in monochrome or full color; graphic computing systems, which function as desktop computers or interact with a host mainframe; hard-copy units, which make paper copies of CRT screen contents; display monitors, and digital plotters that can produce up to eight-color plots on paper or mylar.

Most of these terminals and computing systems use storage CRTs, which hold onto the images after they've been rewritten only once. Others employ TV-like raster-scan tubes, which continually "refresh" the image so it can be viewed. Some models combine storage and refreshed modes. Some terminals and all the computing systems have microprocessor or other intelligence.

A World Market

Tektronix products are cosmopolitan, sold in most countries. Our markets blanket the range of human endeavors in science, industry and education.

Eighteen solely or jointly owned Tektronix sales and service companies in major nations are supplemented by 49 commercial distributors serving 58 countries.

Our largest market is in the US, but in a given year about 40 per cent of our business is done outside this country. Principal foreign markets are the United Kingdom, France, Germany and Japan. Following them are Canada, Switzerland, Italy, Sweden and The Netherlands.

Our major customers, in order of contribution to sales:

- Manufacturers of electronic and electrical equipment (electric motors, industrial controls, radio and television sets, telephone equipment, radar systems).
- The computer industry.
- US, state, local and foreign governments. They buy our standard commercial products.
- Education—in medical schools, in vocational and technical instutitions, in graduate investigative labs and—thanks to there being more and more computers in schools — in the classroom itself.
- The instrumentation industry.
- Broadcast, cable and closed-circuit television.

The rest of Tektronix sales are widely distributed throughout such industries as petroleum and other energy companies, chemicals, transportation, printing and publishing, and medicine.

Component Manufacturing

It has often been economical, and even necessary, for us to design and build our own components. Sometimes it has meant having them on time, sometimes having them in adequate number and quality; sometimes it has meant just having them at all. It's often tough for an outside supplier to produce short-run or custom components for us.

So we've become a highly vertically integrated company. Being able to design both component and product has a reciprocal effect: each can be optimized with the other in mind. The result is improved performance.

We build our own CRTs, other than raster-scan video tubes; some semiconductors; integrated circuitry; transformers; chassis and cabinets; ceramic hybrid circuits; ceramic CRT envelopes; some phosphors; etched circuitry; potentiometers; switches; precision capacitors and resistors; inductors; relays and oscillators; coaxial cables, and a variety of metal and plastic parts.

The Rough Idle

Louie the Service-Station Man wasn't much of a mechanic. He had one treatment for any customer's car that idled rough: Simply turn up the idle so the engine ran faster. Given enough RPMs, the hum would "smooth out" the rough noises. Nothing was cured, you understand, but it did sound okay.

Something like that can happen in a manufacturing company. When things are humming, a lot of inefficiency can be drowned out in the hum. It's when things slow down a bit that the troubles "suddenly" appear.

Tektronix has had an impressive string of growth years. This year we slowed down — and revealed an organization that was idling rough.

We're bearing down on an interrelated set of internal problems. They're probably not totally separable; but they seem to fall into three categories. They are alike only in that growth has caused or intensified them; or that growth masked their severity; or that growth caused us to take our eyes off them in favor of more-dramatic daily problems.

Changes that take place very slowly are surprisingly hard to detect. (We're just great, of course, at those that occur in a nanosecond.) And that's the way that these organizational problems grew — slowly:

1. Our functional organizations (component manufacture, sales, administrative services . . .) had gotten unresponsive, slow to react.

2. We'd outgrown many of our centralized support systems, especially for manufacturing requirements and planning. Thanks to our burgeoning ranks of "chasers"

COMPONENTS ARE machine-inserted into printed circuit boards, as part of the production of 2200-series oscilloscopes.

— expediters, coordinators, et al — we managed to keep operating anyway, but as often by bypassing the creaky system as by using it.

3. Some management habits arose that wouldn't have been condoned in austere times, including an appetite for functions and services that are nice but less than essential.

We're taking these major steps:

1. Emphasizing smaller, more manageable product divisions, headed by action-oriented general managers. Each will have control over the integrated functions he needs to make the division succeed.

2. Instituting a state-of-the-art material requirements planning system. To make sure it's employed with the necessary discipline, we've begun a from-the-top-down company-wide training program in its use.

3. Selective pruning. Just to realign our existing functions would mean, in some cases, merely converting unsightly fat to sightly fat. So we're taking a sterner look at *all* Tek activities in light of their contribution to our shared goals. We will weed out any that are beside the point.

Divisions — a New (and Old) Way of Life

Like the person who knew that quitting smoking was easy, since he'd done it so often, Tektronix shouldn't find it hard to reorganize.

It's probably expectable that a company founded and largely managed by technical people will continually change its organizational shape. Technical folks, after all, love to tinker. They're typically never satisfied without tuning here, tweaking there. Tek has been like that, in any given year organizationally a bit different from what it was the year before.

In short, we've created an environment of change. And that may be one of the reasons that our moves toward continued divisionalizing are, by all assessments, going very well.

The following is an oversimplification; but there is something to it:

Picture a small company as two concentric rings on a background, and surrounding a core. The background represents the market; the outer ring, the people in contact with the customer. The core represents the product; the inner ring, the people who produce it.

In the small company, that's about it. Those who design the product typically are also involved in the manufacture, or in customer contact, or both.

But as a company grows, the circle enlarges, and adds a lot of intervening layers. Three bad things happen:

1. Those who build are farther removed from the end user.

2. Those who sell are farther removed from the production line.

3. Most worrisome, there are a lot of people now who neither touch the product (or understand it) nor touch the customer (or understand the market.) Their jobs are managing, linking and supporting—all useful behavior. But there *is* a high risk that an organization this size can take on bureaucratic overtones.

"Divisionalizing" is an abstract term; it means whatever you say it does. In fact, discerning readers of these annual reports will have noticed that word being bandied about long before this year—meaning different things at different times.

What's going on now is two separate but related activities: One is *decentralizing,* distributing the decision-making power more broadly. The other is *divisionalizing,* restructuring the company into smaller, more-responsive units.

There's no cookbook on how to do it, no one way. You can divvy up an organization just about any which way you want, and rationalize whatever choice you make: Geographically, by markets served, by technological similarity....

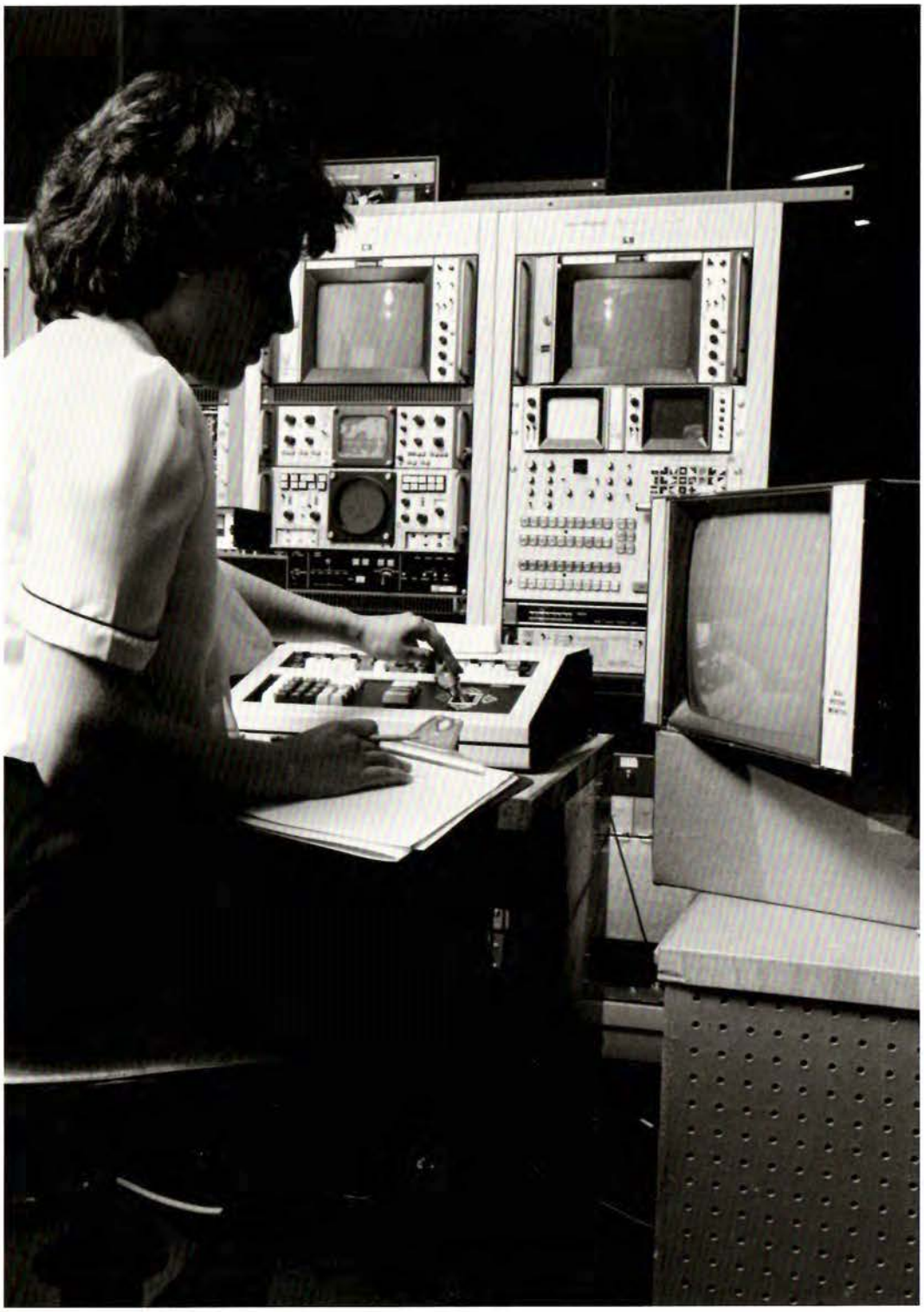
The way that seems best to us is by product. (The markets served by Tek products abut upon and crisscross one another. So do the technologies those products employ.)

Two of our new product divisions have had a lot of chance to practice: Information Display grew up remote; from 1975, it was a division with a home all its own, our industrial park down the road at Wilsonville. Our Communications division also early-on had its own integrated engineering, manufacturing and (for a time) selling functions. These were, if somewhat tentative, the early stirrings of divisional behavior—and they go back many years. Hindsight being very tutorial, it strikes us now that we were on the right track, way back, and should have carried on in that direction a bit more purposefully.

So, what makes divisionalizing different this time?

1. The need is real, and obvious. If divisions were ever perceived as either experimental, efficient or convenient, they are now seen as nearly *essential:* Either Tek re-forms into a more supple organization, or we will face the '80s off balance.

2. The activity is company-wide. It has the full commitment and continual involvement of top and middle management;



OUR COMMUNICATIONS DIVISION products, sold under Tektronix and Grass Valley Group trademarks, are widely used to help bring viewers a better television picture.

and all employees are kept informed (in print, by video and face-to-face) on what's going on and why.

3. It's being done in a calculated, thorough way, with a specific time-table for the changeover. We're taking care that each step be deliberate and not abrupt. The US sales organization was first to divisionalize. Materials managers also have been assigned to each division.

4. It goes farther than our previous divisionalizing has gone. Each division general manager will have control over the elements needed to help him manage: Engineering, manufacturing, selling and administrative support. Increasingly, operating decisions will be made *at* the division level.

Of the four product divisions, three produce Test and Measurement products:

Instruments, managed by Jim Towne — Oscilloscopes, plug-ins and general-purpose instruments.

Communications, managed by Tom Long — Television products, including those manufactured by The Grass Valley Group, Inc., our California subsidiary; and spectrum analyzers.

Design Automation, managed by Larry Sutter — Logic-related products and semiconductor test systems.

The fourth division is *Information Display,* managed by Jon Reed—Terminals and display monitors, copiers and plotters, graphic computers and peripherals.

Divisionalizing needs to be put into perspective:

1. It's a *long-term* effort designed to produce long-term benefits. Its full impact is not just around the bend. (The transition itself won't be completed for maybe five years.)

2. It excludes much of the company. Our international sales operations, corporate marketing, Tektronix Labs, component manufacturing and others will be undivisionalized. (However, some parts of these organizations have been or will be broken into segments more effectively serving the division structure.)

3. "Smaller" (referring to divisions) doesn't mean *small*. Tek isn't being chowdered into smithereens. Our Instruments division alone has greater sales than the entire company did just six years ago.

What do we expect of this structure? About what you'd hope for in *any* organization, maybe. But our history shows that divisions offer a better chance for these things to happen:

1. Responsiveness to the customer. The ability to hear the market; then the incisiveness to act. Divisions should be fast on their feet.

2. Better product planning. Better product knowledge. Better product introductions. Better products, period.

3. Fewer excuses for failure. Clearer "ownership" of performance. Tek is such a complex company that it has sometimes been impossible to tell who should be held accountable —for successes *or* failures. Specific information on division performance will mean that accountability can be measured and good (or perhaps bad) performance rewarded (or perhaps not).

4. More innovation. A recent survey concluded that innovative behavior takes root fastest in small and middle-sized organizations, but battles uphill in larger ones.

In addition, divisionalizing offers two nice side benefits:

• It gives us a natural way — an organic way — to further subdivide. The integrated division is a model for reproducing a similar organizational structure in its individual product groups.

• It opens up new job opportunities for comers in the organization, whose career paths might otherwise be blocked should this period of low growth for Tektronix extend a bit.

Better Manufacturing Planning

And then there was the time we ran out of shortage forms.

That was some years back, and may have been our low point in logistics. But shortages are *always* a nagging problem for production people. At Tek, which deals in short runs of complex products with many models and options, making sure that enough of the right parts are ordered and on hand when needed is particularly tough. (Tek-made parts alone exceed 70,000 different kinds, and we built 140 million of them last year.)

In 1965 we developed a material requirements system that was at the forefront of such programs. But we failed to take what we now see as essential supplemental steps: We did not make sure it was continuously updated, as product models and options increased. And the necessary rigors to make it work were taught to and practiced by a relative few dedicated people who believed in it. (That much could be the history of many manufacturing companies, not just Tek.)

And it worked—pretty well and for a while. First off, it *was* a good system. Second, the staff responsible for its working was competent and diligent. But, as Tek grew, things worked less and less well. Parts deliveries dragged a little, then a lot; work-in-process inventory got a little larger, then a lot.

It was hard to see the overall problem, partly because it was masked by our high production volume. Also, areas in trouble were quick to tackle the symptoms—with the answer

AUTOMATED TESTING of printed circuit boards.

always seeming to be "just around the corner."

Informal "systems" arose supplementing (or sometimes circumventing) the formal one. The key people here were the problem chasers, the expediters and coordinators, the wheedlers and scroungers. Some were better at it than others; the squeakiest wheels got the most grease. Some got none.

Early signs of the problem were the growing numbers of "hot lists", rush orders and returns to stock; and, what became a regular fixture: The Friday shortage-review meeting. But the eventual result was delays in our own product deliveries that we could no longer countenance. And, when product demand dropped but the shortages and high inventory persisted, it became clear that the problem was systemic; we could no longer merely treat the symptoms.

To make things worse, the system coughed up more information than we needed, but not always what we wanted to know. (A nonswimmer wondering whether he can safely wade a stream is not enlightened to learn that its average depth is four feet.) It grew harder for us to tell real shortages from paper ones—and it took as long to "solve" one kind as the other. We would lose sight of parts from the time they left the warehouse until the time they showed up in a product.

Does a bank settle for being a penny off in its daily records? asks our new material requirements planning (MRP) manager. Of course not, he adds, suggesting that Tektronix manufacturing is a bank itself. Its resources are not pennies and dollars, but parts *worth* pennies and dollars; they ought to be (and *can* be) treated with the same exactness that a bank uses, he submits.

Moving into place now, and over the next two years, is an advanced MRP program. It seeks to give us accurate, daily updated information on exactly what's going on in the manufacturing operation, in a form that people understand and need; information that lets the individual manager plan and control costs — and be held accountable. It is, as someone here suggested, a new way of life.

Although this is an advanced and proven software program, the system is only 10 per cent of the solution. The other 90 per cent is full management commitment and solid training. We are attending to both.

The MRP manager reports to a corporate-level council. And the program has not only management support but also their direct involvement. A thoroughgoing training program has begun *with* upper management and, one way or another, will reach every employee at Tek. It stresses not only the disciplines that make the program run, but also the logic or sense behind the computerized system. That way it will be understood, thus believed and trusted.

Our components manufacturing people already have stated their goal explicitly:

To become the kind of supplier—in cost and quality—that Tek would choose if it had the *whole world* to select from.

Top Management is Changing Quite a Bit

Six vice-presidents were elected by the board of directors in March. Four of them are product-division general managers, and one a former general manager. Another new vice-president had been named earlier in the year.

The new appointees are:

• Jim Towne, general manager, Instruments division. Jim came to Tek in 1970 as a financial analyst, and carried out several division-level management jobs before he assumed his present one.

• Jon Reed, general manager, Information Display division. Jon's first job at Tektronix was engineer, in 1966. He has held a variety of engineering, marketing and management responsibilities; before his present position, he was director of Corporate Marketing

• Larry Sutter, general manager, Design Automation division. Larry began here as a product marketing manager in May 1976, and has been division general manager since September of that year.

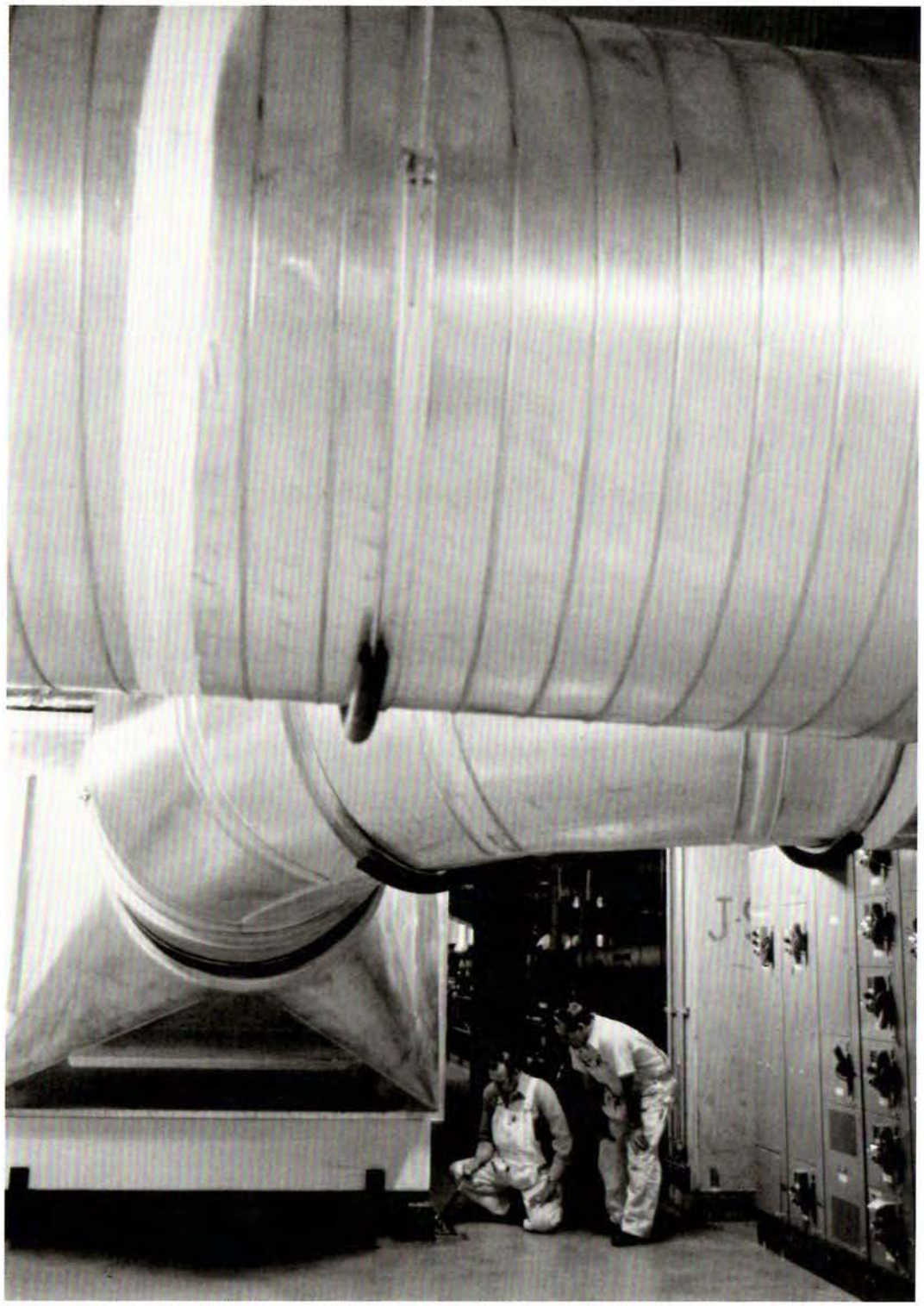
• Tom Long, general manager, Communications division. Tom began with us as field engineer in 1959, and has been division general manager since 1973.

• Howard Mikesell, manager, Production and Materials Management. His first assignment, back in 1959, was calibration technician. He has held a number of stateside and international management positions, including general manager of Information Display.

• Phil Robinson, manager, Corporate Marketing and Service. Phil started with Tek in 1979 as national sales manager, coming to us from a position as vice-president of market development for Accuray Corporation.

Phil's new job resulted from the announcement by Lewis C. Kasch, Group Vice-President/Sales and International, that he will retire in September. He'll have worked 20 years with us, having joined up in 1961 as a field engineer after completing a career with the US Marines.

To align with the evolving divisional structure, many functions performed by corporate and field-marketing support



CLEANNESS IS ESSENTIAL in the production of integrated circuits. Air-flow systems in our new Microelectronics building reduce particle contamination to less than one-half micron per cubic foot.

and service groups have coalesced into the Corporate and Marketing Service group which Phil heads.

• In September of 1980, the board selected Charles H. Frost vice-president/Administration. He is responsible for Human Resources and Facilities as well as retaining his previous duties as Director of Public Affairs.

Chuck has been with Tektronix 21 years. He started as member of the Employment staff, worked in employee relations 10 years, then became government relations representative.

• Upon retirement of James B. Castles as vice-president and general counsel in December, the board chose R. Allan Leedy Jr. as general counsel. Allan, who had succeeded Jim as secretary in 1979, has been with Tek since 1976; his first job was assistant secretary and international counsel.

Jim was Tektronix' first chief legal officer, and represented the company from its very first days, 1946. He was named to the board in 1953, and has continued as a director since his retirement. Jim also will be helping us out as a consultant on legal matters.

• Don A. Ellis, vice-president, retired May 30. Don, who joined Tektronix in 1951, was treasurer for 19 years. His was a major voice in the planning and drafting of many innovative Tektronix financial programs, including those enabling employee share-ownership.

The Product Arteries—Pumping Away

If our financial people were down in the mouth when the year closed, our technical people were not. They were too busy introducing new products to customers.

That kind of innovation is the lifeblood of any company. At year's end or close upon it, Tektronix' product arteries were pumping out the first spurts of what will be a stream of technically advanced new products, of the sort that should excite even the most somnolent market. (Bear in mind, of course, that customer excitement doesn't always convert directly to sales dollars.)

They include:

• Two new portable-oscilloscope series. One marks our strong new thrust into the low-priced end of the market. The other is a dandy little service instrument that can take the hardest knocks and still work.

• A digital-analysis system that adds a major new dimension to what have been thought of as logic analyzers.

• A modular family of compact, lightweight programmable instruments, whose convenience of use takes systems development a big step forward.

• Advances in microprocessor development labs and computer graphics.

Where is this new-product development heading? Without blurting our corporate strategic secrets, here are two of our goals. As a stakeholder, you should know them:

1. To reinforce our long leadership position in oscilloscopes, by driving hard into the expanding lower end of that market. We intend to set the pace in that segment, in value and performance to fit the market needs.

2. To become the leading company in the growing area of digital/logic-related engineering tools.

This High-Volume Featherweight has Clout

You don't mass-produce oscilloscopes.

In the first place, the term "mass production" seems to carry a faint overcast of quick-and-dirty assembly that doesn't match the craft and the process control needed to produce electronic instruments. Second, even the most popular scope ever built (the Tektronix 465) has been in its best years only a medium-volume production item. Most scopes are built in small numbers; typical might be, oh, a few thousand.

The new Tektronix 2200 series is a change. A featherweight general-purpose oscilloscope, it brings Tektronix price and performance leadership into what's often called the low end of the scope line. ("Low" here refers to price—not to value or quality.)

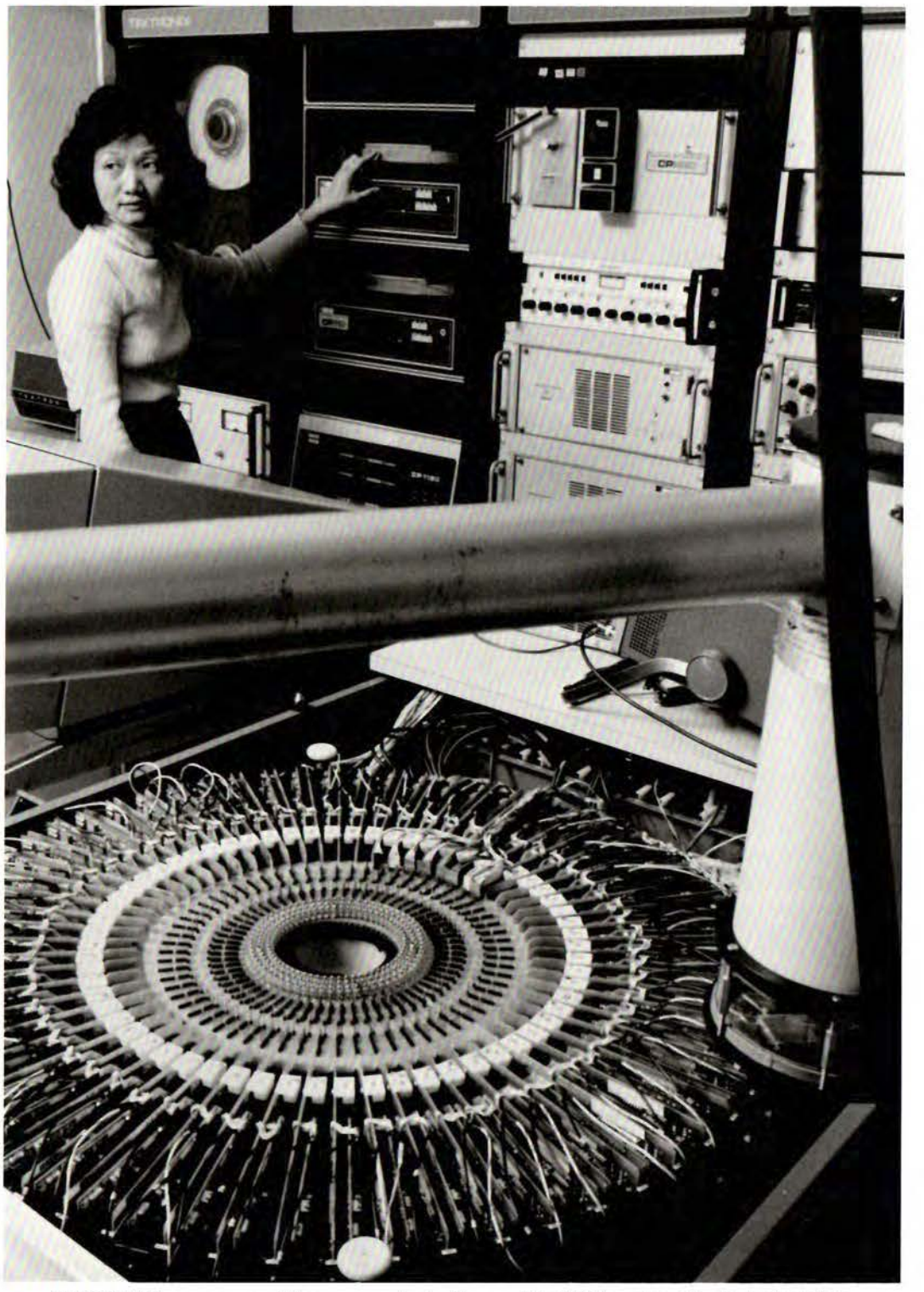
With performance beyond that of competing products, the 2200 is priced somewhat below them. To enable competitive prices, we have geared up for low-cost, high-volume production—a first in the oscilloscope field.

There's a lot more activity now in the low end of the market than there was. Two things may be at work there. (We stress "may"):

1. Electronics, a big and fast-growing industry for decades, is *really* hitting its stride now. Spurred by readily available low-cost microprocessors, electronic intelligence has infused most industries and product areas, from autos to video games to washing machines.

All those electronic devices, systems and products need to be tested and measured; and the scope remains a major tool for doing just that.

2. The current economic slump may be causing buyers to



TEKTRONIX uses many of its own products. Here, a Tek 3260 semiconductor test system is at work in our Component Evaluation area.

re-look at their needs vs. their budgets.

Whether the increased low-end stirring-about is recession-triggered or the early signs of an emerging growth market, or both, we believe the 2200 series is just the product that market needs — a better scope, at a lower price, that more people can afford.

It is superior to competition in reliability, versatility, ease of operation, display brightness and portability. Its 13.5-pound weight is good news for the service technician, who in his lifetime must lug a scope many, many miles. Competing products weigh up to 10 pounds more.

The 2200 also meets the basic needs of design work. It is what we call a full-featured scope. Its 60MHz bandwidth covers most of the common applications. It has a large 8x10-cm CRT (tested and proven in our popular 465 series), delaying sweep, fast sweep and dual trace. Versatile triggering enables measurement of all kinds of complex waveforms. Low-cost autofocus and autointensity circuits make both viewing and photography easier. It works in a broad temperature range. Enhanced auto triggering minimizes time-consuming adjustments.

Low prices require two things: Low-cost manufacturing and efficient distribution.

An innovative production line has been set up, impressive in its simplicity. The 2200 series has 65 per cent fewer mechanical parts than comparable instruments — 90 per cent less cabling and electrical connections. Seventy per cent of the components are machine inserted. The 2213 model contains only one circuit board (compared to 8 or 10 in most competing scopes). This means fewer connections, faster manufacture, greater reliability, easier servicing.

The high-efficiency power supply does away with the need for line-voltage-selection controls and enables a lighter-weight transformer.

Similarly innovative ways of distribution will supplement field sales, including a toll-free telephone order desk.

The reliable, high-performance, low-cost lightweight 2200 family will, we believe, set the price/performance standard for the low end of the scope market. It should give pause to competitors who over several years have been poking at that market as if it were the soft underbelly of Tektronix. If it ever seemed to be that, it should no longer.

A Really Tough Little Scope for Service Technicians

No one in his or her right mind would, before using an oscilloscope, pummel it with a hammer or stick it into the oven. But comparable duress is often placed on field-service scopes. Once they've rattled around awhile in the back of a van, or sat all day stashed in a car trunk under the hot sun, they're as bammed up or cooked as if they'd been maltreated on purpose. And, of course, they're expected to work right afterward.

That our scopes typically *do* survive is due to our long-time efforts to "ruggedize" them. Aware that field service is a tough scope environment (and that some users work under difficult conditions), Tek has never put out frail products. Now we believe we've outdone them all with our new series of strong, small ultra-portables, the 2300 — designed specifically for service technicians and engineers.

Once, during a demo, someone here accidentally dropped a 2300 down a manhole. It was retrieved intact; when turned on, it worked perfectly.

(This is, of course, neither a standard scope test nor an implied warranty; but it *did* happen—one indication that the 2300's are the toughest scopes on the block.)

It meets or exceeds the US military's demanding specs for humidity, temperature range, vibration, electromagnetic interference and shock. Its cantilever-mounted CRT was designed to take a 50G shock without blinking—several times what a conventional scope could handle.

The 2300 series is optimized for field use. It offers most of the proven performance features of the workhorse Tek 465 portable, which has gained broad popularity for field as well as lab use: Dual trace, 100MHz bandwidth, delaying sweep. To them the 2300 adds a new, advanced, bright, fine-line cathode-ray tube.

Our demanding internal tests insure that the scope will keep on working with minimal down time. But the user also needs ease of transport. The 2300 series provides that with its light weight (17 pounds in the lightest model) and smallness. It's easy to tote around, handy to stow away.

Its protective hinged flip-down cover contains (depending on the model) part of the controls and a liquid-crystal display of timing and digital multimeter readings. Its front panel is sheathed in scratch-resistant plastic, its body crafted of a light, strong aluminum alloy.

In performance, quality of display, light weight, reliability and sturdiness, the 2300 series should prove popular with those who troubleshoot computers and other stationary equipment, and who have to carry their tools around with them.

NEW DAS 9100 SERIES digital-analysis system undergoes test operation. Plug-in circuit boards adapt mainframe to a variety of digital-analysis tasks.

Logic Analysis Will Never be the Same Again

Logic analysis is a relatively new product area. Tektronix has set out to redefine it.

If that smacks of Marketing Talk, it nevertheless *is* the idea behind our DAS 9100 series, just introduced in August: To cause would-be buyers of logic analyzers to raise their sights; they can expect a great deal more from that kind of instrument than they have in the past.

A logic analyzer is a principal tool for designing, testing and trouble-shooting computers and computerish devices and systems. It does so by capturing, displaying and examining the parallel streams of data, coded as binary digits ("bits") and transmitted over many channels simultaneously.

The DAS *is* a logic analyzer, a high-performance one. But it also is a pattern generator. And it is a not-too-distant cousin of Tektronix plug-in oscilloscopes; here's how that works:

Early in our history we figured out that both company and customer would benefit if one scope could be made into many by the use of interchangeable plug-in units. The plug-ins, which contained a part of the scope circuitry, could enable the mainframe to vary and widely expand its performance — for far less money than an additional instrument would cost.

The concept was widely accepted. It enabled the success of our 530 and 540 scope series, then later the 5000 and superlative four-plug-in 7000 series.

The DAS works in a similar way. Its mainframe contains a keyboard, a large 9-inch raster-scan CRT, extensive memory and an "intelligent" microprocessor-driven controller. Its performance can be varied and broadened by the use of up to six modular plug-ins — large, complex circuit cards — that give it a range of performance beyond that of other logic analyzers.

Some of the plug-in cards acquire the data, the normal function of a logic analyzer. Others stimulate the logic circuit, the normal function of a pattern (or "word") generator. That instrument can feed a wide variety of data patterns into a device or system under test, so the response can be analyzed. In this respect it works like a waveform generator does with an oscilloscope.

Thus the DAS (for Digital Analysis System) combines logic analysis and pattern generation. It's a single, compact 50-pound instrument. That allows the designer to work interactively with the generation and analysis features in a way that it would be hard to do with separate units.

In the past, a logic designer has had two ways to stimulate circuits. One was to spend time jury-rigging his own test fixtures and working out his own software code. The other was to buy a commercial pattern generator, and typically begrudge both the expense and the space it took.

The DAS is a heavyweight both in the number of channels it can display and in the speed at which it can acquire data.

The signal-acquisition modules cover the range of typical logic-analyzer uses. One card enables 32 channels of data at 25MHz, useful for designers of microprocessors. Another, eight channels of data at 100MHz, typical of what discrete-logic designers deal with. A third, four channels of data at 330MHz, up in the very high speeds typical of large computer mainframes. A special mode enables 660MHz on two channels, an unprecedented 1.5 nanosecond time resolution.

The user, by combining plug-ins, can obtain up to 104 channels of data acquisition, well ahead of the nearest competitor. Today's powerful microprocessors (let alone the far more capable ones of the near future) typically require 64 channels for effective analysis.

One output plug-in provides 16 channels of pattern generation at 25MHz. By buying one or more extender cards, the user may obtain up to 80 channels of generation. Competing generators offer eight to 32 channels.

The first members of the new DAS family include six plug-ins — and two mainframes: One with keyboard and CRT; the other both keyboardless and CRTless, designed for remote operation. In this case a computer fills in for both functions. The family also includes four "pre-configured" packages of mainframe and plug-ins that cover some of the most-common logic-design and troubleshooting needs: Software/hardware integration and hardware debugging.

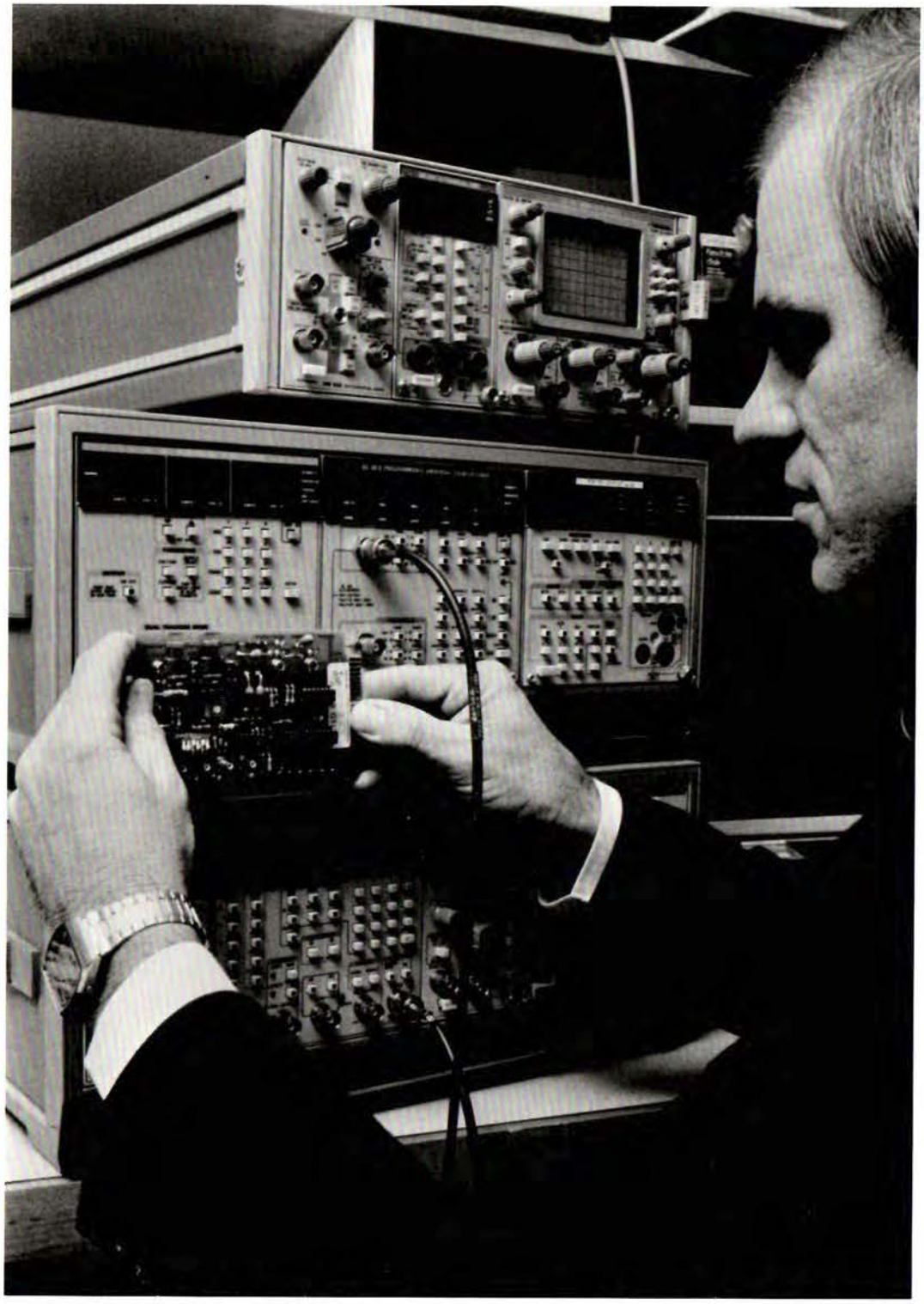
By buying only those plug-ins that meet immediate needs, a user can obtain a DAS at reasonable cost. Then he can later upgrade and expand it as needs change. New plug-ins will fit the existing mainframes, and the other way around.

Typically logic analyzers are complicated to run. This one is simple. A lot of that is due to its extensive 160,000-word firmware memory.

It is a "friendly" instrument, very forgiving of user error; you don't have to feel dumb around it. For instance, unlike most analyzers, which simply point out that an error has been made, ours specifically tells what the mistake is; then, in a comradely manner, suggests some ways to correct it.

The on-screen prompts made possible by high-level software language; color-coded keyboard, and single-keystroke control over complex operations all make it easy for a beginner to rapidly master the use of this product.

It offers as an option a magnetic tape drive that can store setup information, programs and tests and other data and



TM 5000 SERIES features the ability to function as part of a computerized test and measurement system.

send it on to others; for instance, the folks in production testing.

This product may not fit every need; some users may desire sometimes to separate analyzers and generators. But customers who have had a good look at the integrated, powerful DAS agree with our assessment: Logic analysis will never be the same again.

Teaching Instruments to Talk English

Perhaps a quarter of test and measurement product sales are of programmable instruments. That percentage is likely to go up.

Today's emphasis on productivity and quality calls for more, and more-reliable, measurements per minute. Technically skilled people are hard to come by, and not easy to afford, either; that means products must become easier to operate. Low-cost documentation of tests is more and more a requisite.

Electronic instruments can multiply their power if used together with others in such integrated systems. But getting them to "talk" to each other has been easier said than done.

The earliest problem was to standardize the hardware. Since all the information in a system must be carried serially, over a single channel, a way had to be found to set protocol, determining the order of the transmitted signals and so on. The electronics industry found that way in 1975 by standardizing on a general-purpose information bus (GPIB); now instruments of a wide variety can converse on a single line in a consistent and orderly manner.

Even so, they seldom speak the same language; their software codes vary, as does their information format. And most of the languages are arbitrary computertalk, gibberish unless you keep referring to the manual.

Tektronix this year has taken the next logical step in 20 years of systems development: Simplifying the software by establishing a common language for all the instruments in a system. We speak of it as "Engineering English."

Our new TM 5000 family of programmable instruments (the first 10 members of which were introduced this August) is very easy to learn and use, and cuts down the user's software development time by employing common codes and formats for all instruments in a system. And the language is English, not Computer.

For example, if, on a TM 5000 controller, you direct the command "Amplitude" to a function generator, followed by numbers, you'll get an output with that amplitude. This achievement may well fail to dazzle a novice; after all, he may ask, don't all systems work this way?

The truth is, they do not. In most systems you'd have to memorize non-English computer codes (and probably a different language for each instrument).

The TM 5000 system "calls things by their right names." The system language uses the same wording as on the instruments' front panels. A stranger could soon figure it out.

The TM 5000 is "friendly"—and easygoing, up to a point. For instance, a user may choose to give input commands in full or in a number of commonsense abbreviations (*amplitude, amp, am,* etc.)

But the system's tolerance is limited; it will not (as some systems will) mistake a capital O for a zero, a common and frustrating keyboard error that can raise hob with programming. Nor will it (as many systems will) execute a string of commands that has an error in it.

To give an idea why simplifying software is so important: In systems development, software costs can outrun hardware costs by as much as five to one. And 60 per cent of software expense is for updating and modifying.

The TM 5000 family—an outgrowth of our TM 500 manual products—comprises high-performance, compact, modular programmable instruments. They plug into three- or six-compartment mainframes that contain transformer, power supply and interconnections. The more than 40 TM 500 products also can plug into these mainframes.

The user may mix and match just those instruments that fit his immediate system needs, then expand it later as those needs change.

TM 5000 instruments are small—only about one-third as bulky as competing products. That is really important. The use of programmable systems up to now has been limited by their size. But the *need* for systems knows no such limits. To test and service complex electronic equipment in vans, on submarines and in airplanes *requires* smallness and portability.

Our first offering of these microprocessor-based modules includes a state-of-the art 350MHz counter that can resolve time to one picosecond. (That's how long it takes for light to travel .012 inch.)

Direction of TM 5000 systems is done either with a 4052 graphics terminal, or (typically for automated production testing) our new 4041 controller, with powerful 16-bit microprocessor, extensive memory, cassette tape drive and a 20-character LED display of words and numbers.

You don't have to be a whiz to use the TM 5000. A pro-

ADVANTAGES OF NEW graphics terminal are extolled by a Tektronix sales engineer in a Tek demo room.

gramming dullard who doesn't know software from hardtack can simply set each instrument manually. The resulting setting then becomes part of the control software.

Besides the commonsense language, TM 5000 systems software prompts the user in a chummy way, including (on the 4052) pictorial clues and guidelines. The systems are interactive. User and instruments talk back and forth, checking settings, determining the adequacy of test setups, discussing errors...

For the less-skilled, the "execute-only" mode provides prompts, instructions and automatic switching. For someone engaged in advanced R & D work, the simple, consistent language is a powerful tool for speeding up and simplifying complex procedures. And the language allows extensions that let the knowledgeable user go on to very advanced uses; he won't be tongue-tied.

Repetitive tests take lots of time to do manually. That may cause boredom and (if the bored operator starts taking risky short-cuts) costly errors.

Automated TM 5000 measurement enables tests that otherwise might take many minutes to be done in a matter of seconds — often with a hard copy to boot.

The TM 5000 standard codes, displays and format are consistent with those of other Tektronix products, including our 7854 digital oscilloscope.

Virtuoso Graphics

An exceptional family of intelligent graphic terminals paced our end-of-the-year surge of new information-display products. It includes an easy-to-read direct-view storage terminal for fine-line graphics and a high-performance raster-scan product.

Just to remind you: Raster terminals create images by rewriting, or "refreshing", the onscreen picture. Direct-view storage terminals write the image once; then the CRT itself retains it. Both technologies offer benefits; but only Tektronix *has* both. We intend to make the most of that — and this year continued to expand the capabilities of each.

Although designed for use with a host computer, the new 4112 and 4114 terminals have a great deal of intelligence and can figure a lot of things out for themselves. Productivity-sensitive users can now greatly reduce the costs and delays that may result from overdependence on the host processor.

The two terminals make a fine team. They use the same peripherals and programs. They work enough alike that a person trained in the use of one can quickly learn the other without extensive re-education. Together they should provide answers to *whatever* graphics problem the customer faces.

And they are compatible with our 4010 family, including the 4014, the world's most widely used graphics terminal. Thus the myriad existing 4010 owners won't feel abandoned but instead delighted; their software investment (always far greater than hardware costs) is protected, and will continue to pay off for years to come.

The 4114's large 19-inch screen offers unequalled information density: 13 million viewable points. If that's a meaningless figure to you, take it from us: Nothing else on the market comes even close. It enables high-resolution graphics adequate for even the most complex scientific or engineering applications, typical of the high-technology end of the graphics market we have chosen to serve.

To its unparalleled screen content and image sharpness, the 4114 adds three interesting and powerful features: Fast rewrite; optional two-color displays, and microprocessor-controlled intelligence. It can do graphic shorthand by storing entire pictorial segments, then easily retrieving and manipulating them onscreen. That plus its very high rate of information transmittal help make it the fastest graphics tool ever designed for the sophisticated user.

Its direct-view storage is supplemented, as in some other Tek terminals, by extensive refreshed display. This provides a scratchpad area for preliminary graphics the user doesn't want to store just yet.

For some additional cost, that refreshed portion can be provided in a second color: A vivid amber that contrasts sharply with the bright-green DVST image. This feature can be of great value in many applications: To keep refreshed and stored portions separate in a complex map; or to superimpose refreshed and stored layers in a schematic of a multilayer circuit board.

The 4114 can "repaint" (expunge and redraw) its entire screen contents in the blink of an eye. So the user can, in effect, quickly erase or revise selected segments of the total display.

The 4114's forte is high-density fine-line graphics. The 4112 may find favor with users for whom resolution is less important than dynamics, the ability to make a lot of changes really fast. It has the best zoom feature for the money, letting a user blow any portion of the display up to full-screen size for a close look. It has an option of an eight-level gray scale for easy separation of information. And it enables up to 64 simultaneous views showing various aspects of the same subject.

Other new information-display products include the 4611

FORMAL TRAINING FOR all Tektronix sales and service people takes place not only when they are first employed but also (as here) each time new products are introduced to the market.

and 4612 electrostatic hard copiers, complementing our widely used 4630 series copiers, which use dry-silver paper. Copier cost with the 4611-12 is a bit less; *copy* cost is *substantially* less. These are legible working copies; for archival or report-quality copies, the dry-silver process is preferable. The user now has a choice.

Owners of our 4662 plotter will cheer a new option converting it to an eight-pen device that can produce 11x17-inch drawings on paper or mylar in up to eight colors from monochrome or color CRT screen contents.

Keeping Our Word to Microprocessor Developers

Folks who design with microprocessors (μPs) need all the help they can get. Not only is their job a painstaking and complex one, but there are nowhere near enough designers to go around. Just about *everybody* nowadays seems to be demanding the pint-sized, potent computerchips to build into their products and systems. The emphasis in μP design (maybe even more than elsewhere) is: More productivity.

That's where Tektronix comes in. We're a major supplier of microprocessor development labs (MDLs), a sophisticated tool for software design and hardware debugging, making those complex tasks faster and easier.

In announcing ourselves as a dead-serious contender in that product area, we made three public promises:

1. That we would support *all* modes of MDL use: Single-user, multi-user and with host computer.
2. That we would support powerful 16-bit μP chips.
3. That we would protect our customers' investment, by enabling easy upgrading of hardware and software.

We have kept our word. This year we:

- Introduced the 8500 family of modular instruments. The 8550 single-user system appeared in October. It was followed (after fiscal year's end) by the 8540 distributed emulation station, which is used with a host computer. Our multi-user multiple-design station is in the works, and on schedule.
- Introduced the Z8000 emulator, our first to support a 16-bit chip; and assemblers for the 8086, 68000 and Z8000. (We now support 29 μP chips, far more than anyone else.)
- Protected customer hardware and software investment, through the modular design of our systems. A user may operate in any of the possible modes, with the same MDL mainframes and emulators, and change as needed. Owners of Tek 8001 MDLs (which the 8540 replaces) and 8002A MDLs will find *their* products compatible with the new series also.

An MDL system, whatever its mode, has three jobs: Software generation; software debugging; and integrating the software (the program of instructions) and the prototype hardware (a general-purpose μP chip and associated circuitry) in its normal environment (as part of a telephone switching network, let's say).

It simplifies the horrendous task of software writing and editing, by automatically converting assembly code into binary 1s and 0s. It files the completed sequences and puts the program in order. Then, using its emulator processor (which has a μP just like that in the hardware prototype), it debugs the program in a "known good environment;" that is, under control of the development system. Since MDL memory, μP and input-output circuitry are tested and error-free, any problem at this stage must be in the software.

Then the software and hardware are integrated. The program is transferred from MDL to prototype, a piece at a time, checking for correctness at each stage before transferring. In this respect, the MDL works much like a heart-lung machine during major surgery, filling in temporarily for body functions.

Finally, the software and hardware are debugged by firing up the prototype at the speed at which it will have to function in, for instance, the phone-switching system. Our MDL is a superior tool for this task, using a trigger-trace analyzer, unique to Tek. It is a very sophisticated special-purpose logic analyzer designed to operate together with an emulator. It lets the designer zero in on any point of the program sequence and display any desired portions of the data. It may trigger a logic analyzer or oscilloscope to picture the output at that point.

The 8550 does all these jobs. The 8540 doesn't have to; the host computer with which it will work can handle the job of software writing and testing; the 8540 will do the debugging and integration. Since it doesn't need as many features as the 8550, it costs somewhat less.

A typical 8540 user will be someone who owns a host computer already, who has developed a lot of support software for it, and whose needs are for sophisticated μP systems, typically requiring many designers — maybe up to 50. Our distributed-emulation stations are programmed so they can work with a very wide variety of mainframes and minicomputers.

Strangely, most suppliers have paid little attention to this mode of MDL use (our 8001 was an early exception). But it may be the fastest-growing area. There are a *lot* of computer mainframes around; it only stands to reason that the owners will want to make the most of them.

DISCUSSION OF scheduling occupies four Circuit Board employees.

Tektronix Worldwide

Tektronix, Inc.

CORPORATE OFFICE:
Beaverton, Oregon

MANUFACTURING:
Beaverton, Oregon
Portland, Oregon
Vancouver, Washington
Wilsonville, Oregon

AMERICAS-PACIFIC OPERATIONS:
Tektronix, Inc.
Beaverton, Oregon

EUROPEAN OPERATIONS:
Tektronix Europe B.V.
Amstelveen, The Netherlands
Tektronix Limited
Guernsey, Channel Islands

MANUFACTURING:
*SONY/Tektronix Corporation
Tokyo and Gotemba, Japan
Tektronix Guernsey Limited
Guernsey, Channel Islands
Tektronix Holland N.V.
Heerenveen, The Netherlands
Tektronix U.K. Limited
Hoddesden, United Kingdom

*Joint Venture Companies

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Rockville, MD
St. Louis, MO
St. Paul, MN
Salt Lake City, UT
San Antonio, TX
San Diego, CA
Santa Clara, CA
Seattle, WA
Syracuse, NY
Woodbridge, NJ

INTERNATIONAL SALES AND SERVICE:

Australia—Tektronix Australia Pty. Limited, Sydney, Adelaide, Brisbane, Canberra, Melbourne and Perth

Austria—*Rohde & Schwarz-Tektronix Ges.mbH, Vienna

Belgium—Tektronix S.A., Brussels

Brazil—Tektronix Indústria e Comércio Ltda., Sao Paulo and Rio de Janeiro

Canada—Tektronix Canada, Inc., Barrie, Calgary, Dartmouth, Edmonton, Montreal, Ottawa, Toronto, Vancouver and Winnipeg

Denmark—Tektronix A/S, Copenhagen

Finland—Tektronix Oy, Helsinki

France—Tektronix, Paris, Aix-en-Provence, Lyon, Nanterre, Rennes, Strasbourg and Toulouse

Germany—Tektronix GmbH, Cologne, Berlin, Hamburg, Karlsruhe, Munich, Nuremberg

Italy—Tektronix S.p.A., Milan, Rome and Turin

Japan—*SONY/Tektronix Corporation, Tokyo, Fukuoka, Nagoya, Osaka and Sendai

Mexico—*Tektronix S.A. de C.V., Mexico City

The Netherlands—Tektronix Holland N.V., Badhoevedorp

Norway—Tektronix Norge A/S, Oslo

Ireland—Tektronix U.K. Limited, Dublin

Spain—Tektronix Espanola S.A., Madrid and Barcelona

Sweden—Tektronix A.B., Stockholm and Gothenburg

Switzerland—Tektronix International A.G., Zug and Geneva

United Kingdom—Tektronix U.K. Limited, London, Harpenden, Livingston, Maidenhead and Manchester

The Grass Valley Group, Inc.

MANUFACTURING:
Grass Valley, California

UNITED STATES SALES AND SERVICE:

Arden Hills, MN
Atlanta, GA
Dallas, TX
Elkhart, IN
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Tektronix Management Review

This past fiscal year Tektronix has experienced moderating demand for its products. Management believes this is primarily because of the United States recession beginning in 1980 and a slowing of orders for capital goods that typically accompanies an economic downturn. Ongoing economic uncertainty in this country and, more recently, in Europe has continued to depress customer orders. Maturity of the Company's product lines, the absence of GSA supply contracts with the U.S. Government for most of the year and the relative increase in the dollar against major foreign currencies were additional factors contributing to this reduced demand.

Management recognizes the development and introduction of successful new products as being essential to the Company's future. Within the past few months, six new product series have been announced which the Company believes will strengthen its position as a leader in the principal markets that it serves. Since its founding in 1946, Tektronix has played a significant role in the advancement of science as a supplier of products that facilitate the development and expansion of technology. The Company expects the growth of technology to continue, and thus views its principal focus for the future as that of a broad-based supplier of products in this field.

Financial Condition—Management believes that the Company is well positioned with its customers, its product development, and its financial strength for the future. Tektronix has substantial internal cash flows as well as the capability to finance externally.

Growth has been financed largely by funds generated from operations: $122 million in the fiscal year ending in 1981, $117 million in 1980, and $96 million in 1979. An ongoing program that encourages employee ownership in the Company has added $28 million to share capital during these three years. Because of the rapid growth experienced in 1978 and 1979, and an expanding need for technologically advanced facilities, internal funds have been supplemented with net additions of long-term debt amounting to $12 million in 1981, $77 million in 1980, and $27 million in 1979. With these financings the ratio of long-term debt to equity capital has increased since 1978 from eleven percent to twenty-six percent.

Management expects that future cash needs will also be met from these basic sources, as well as from short-term borrowings. The Company maintains stand-by credits of $75 million in long-term bank commitments, and $81 million of unused short-term bank lines.

Tektronix' working capital has varied between thirty-four percent and thirty-six percent of sales for the past three years. Management believes that the Company's investment in accounts receivable is relatively smaller than that of comparable companies, but offset by a relatively larger investment in inventories. Inventory levels are influenced by the large number of components the Company manufactures for its own products; improved inventory management is presently a primary management goal. Over the past three years, short-term debt has varied between seven and nine percent of current assets.

Capital expenditures for land, buildings and equipment increased much more rapidly than sales revenue in 1978 and 1979, and have remained high at $114 million in 1981, $116 million in 1980, and $100 million in 1979. Both the growing need for facilities, discussed above, and inflation have contributed to increases in capital expenditures. The Company expects to continue to make capital expenditures during the current year at a level comparable to 1980 and 1981, and generally to make capital investments as needed to support future growth. The cost to complete capital projects under way at year-end 1981 is estimated to be $72 million.

Results of Operations—The growth in Tektronix' orders and sales has slowed during the past two years from increases in excess of thirty percent in 1978 and 1979. The twenty-three percent sales increase in 1980 was more representative of the Company's growth over the past ten years. Nevertheless, 1980 sales were somewhat depressed by a technical problem in component manufacturing.

Sales growth in 1981 (nine percent) was significantly affected by an unexpected reduction in United States orders at the beginning of that year. Customer orders improved in the United States as the year progressed, but the improvement was largely offset by a weakening of demand in Europe. As a result, consolidated orders for the year were essentially unchanged from the prior year, and were significantly lower than expected.

Management believes that unit sales volume did not increase or decrease significantly in 1981 after giving effect to price increases for the Company's products and to the increase in the value of the dollar against most major foreign currencies, which reduced the dollar value of revenues from sales in those currencies.

Manufacturing costs have been a growing concern. Cost of sales has risen from forty-three percent in 1977 to forty-eight percent in 1981. This increase reflects cost variances resulting from lower than anticipated sales. Higher depreciation expense associated with facilities expansion, inflationary pressures on materials and labor, not compensated for by higher prices, and an increased number of non-production employees in manufacturing have contributed to higher costs. In addition, the Company acquired its German distributor in 1981, and in doing so, in effect, repurchased its own product inventory at the distributor's higher cost. Sales from this repurchased inventory caused an increase of about one half percentage point in the cost of sales ratio on a consolidated basis.

The percentages of sales revenue used for engineering, selling, and administrative expenses have increased each year

since 1979. However, a reduction in profit sharing expense, caused by the reduction in pre-tax income on which employee profit share is based, has generally compensated for that increase. As a result, total operating expenses have remained almost constant as a percentage of sales, thirty-eight to thirty-nine percent since 1979.

Interest expense has increased by $21 million in the past three years, and has increased from nearly one percent of sales to almost two and a half percent. This is due to greater reliance on debt financing and higher interest rates. Non-operating income also increased during this three year period. The major components of non-operating income are detailed in the notes to financial statements on page 45. The most significant of these were the non-recurring gains of $10.5 million (from selling a business unit in 1981) and $4.5 million (in satisfaction of a judgment for patent infringement in 1979), currency gains and losses, and the Company's equity in the earnings of non-consolidated affiliates, principally SONY/Tektronix Corporation.

The Company enjoys a relatively low effective rate of income taxation because of lower income tax rates applicable to certain earnings retained abroad, and because of investment tax credits. The effective income tax rate has varied for the past three years between thirty-eight percent and thirty-nine percent, and the amount of income tax between five percent and six percent of sales. In 1981, the benefit of lower income tax rates on foreign earnings was substantially reduced by the effects of currency translation.

Earnings declined six percent in 1981, following increases of ten percent in 1980 and thirty-six percent in 1979. The Company's earnings margin on sales has declined one percent in each of the last three years. The primary cause of the declining earnings margin is the increase in the ratio of cost of sales to sales. Increased interest expense is another factor, partially offset by increases in non-operating income.

A discussion of the impact of inflation and changing prices on sales and earnings is contained in the notes to financial statements on page 46.

AUDITORS' OPINION

To the Shareowners of Tektronix, Inc.:

We have examined the statements of consolidated financial position of Tektronix, Inc. and subsidiaries as of May 30, 1981, May 31, 1980, May 26, 1979, May 27, 1978 and May 28, 1977, and the related statements of consolidated income and reinvested earnings and of consolidated changes in financial position for each of the five years in the period ended May 30, 1981. Our examinations were 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 at May 30, 1981, May 31, 1980, May 26, 1979, May 27, 1978 and May 28, 1977, and the results of their operations and the changes in their financial position for each of the five years in the period ended May 30, 1981, in conformity with generally accepted accounting principles applied on a consistent basis.

Deloitte Haskins + Sells

Portland, Oregon
July 23, 1981

Tektronix Consolidated Financial Position in thousands

1977	1978	1979	1980	1981	
$310,245	**$357,704**	**$428,787**	**$540,917**	**$573,791**	**CURRENT ASSETS** are cash and assets that should be converted to cash or used in operations within one year
94,954	66,208	41,788	57,145	47,862	CASH AND CASH EARNING INTEREST — bank deposits and short-term securities
87,292	115,100	153,568	198,069	204,952	ACCOUNTS RECEIVABLE — due from customers after an allowance for doubtful accounts
118,423	163,523	214,533	263,563	293,705	INVENTORIES — materials, accumulated manufacturing costs and finished products awaiting sale
9,576	12,873	18,898	22,140	27,272	PREPAID EXPENSES — supplies and services that have not been used, and deposits that will be refunded
84,277	**107,556**	**153,135**	**193,831**	**214,527**	**CURRENT LIABILITIES** are obligations that are to be paid within one year
5,382	10,351	28,997	45,809	50,175	SHORT-TERM DEBT—borrowed for less than one year and that portion of long-term debt repayable within a year
24,087	33,108	42,033	49,034	60,405	ACCOUNTS PAYABLE — owed for materials, services, interest, miscellaneous taxes and dividends declared
19,645	18,458	20,444	27,404	28,788	INCOME TAXES — payable to United States and foreign governments
35,163	45,639	61,661	71,584	75,159	ACCRUED COMPENSATION—payable to employees, and their retirement and incentive plans
225,968	**250,148**	**275,652**	**347,086**	**359,264**	**WORKING CAPITAL** is the current assets in excess of the current liabilities
95,375	119,533	194,454	276,771	340,912	FACILITIES — the cost of land, buildings and equipment after deducting accumulated depreciation
9,708	13,893	19,666	24,005	39,050	OTHER LONG-TERM ASSETS — the equity in joint ventures, receivables not due within a year, and intangibles
39,783	37,086	62,094	136,196	146,143	LONG-TERM DEBT—funds borrowed for more than a year, less that portion due within a year
14,103	16,029	19,150	23,974	30,765	DEFERRED TAX LIABILITY—income taxes which have not become payable
3,043	3,763	5,728	4,354	4,774	OTHER LONG-TERM LIABILITIES—incentive compensation payable in future years
274,122	**326,696**	**402,800**	**483,338**	**557,544**	**SHAREOWNERS' EQUITY** is the book value owned by the shareowners
17,903	24,332	31,950	41,844	52,515	SHARE CAPITAL — the proceeds of shares sold less the cost of shares repurchased
256,219	302,364	370,850	441,494	505,029	REINVESTED EARNINGS — accumulated earnings that have been reinvested in the business
17,675	17,913	18,143	18,372	18,574	COMMON SHARES — the number of shares outstanding at year-end, of the forty million no par value shares authorized

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

Tektronix Consolidated Income And Reinvested Earnings in thousands

1977	1978	1979	1980	1981	
$454,958	**$598,886**	**$786,936**	**$971,306**	**$1,061,834**	**NET SALES** and rentals to customers for products, replacement components and services
196,055	266,474	359,740	458,464	513,145	COST OF SALES — the materials, labor and facilities related to manufacturing goods and providing services
258,903	**332,412**	**427,196**	**512,842**	**548,689**	**GROSS PROFIT** remaining from sales revenue after production costs
38,657	49,832	60,561	77,797	91,147	ENGINEERING EXPENSE — for research and the development of products and components
64,045	86,850	113,461	135,405	157,105	SELLING EXPENSE — for marketing and sales programs, and the distribution system
40,290	53,063	68,044	88,343	100,715	ADMINISTRATIVE EXPENSE — for general management and supporting services
39,339	48,528	63,682	63,448	61,686	PROFIT SHARING — the incentive portion of employee compensation
76,572	**94,139**	**121,448**	**147,849**	**138,036**	**OPERATING INCOME** remaining from sales revenue after the costs and expenses of operations
4,129	4,246	6,428	15,956	25,274	INTEREST EXPENSE — the cost of borrowed funds and banking services
3,303	6,068	11,631	5,029	19,630	NON-OPERATING INCOME — interest income, joint venture earnings, currencies, and other income and expense
75,746	**95,961**	**126,651**	**136,922**	**132,392**	**INCOME BEFORE TAXES** remaining from sales revenue after operating costs and expenses and non-operating items
31,775	39,115	49,500	51,850	52,225	INCOME TAXES — provision for income related taxes levied by United States and foreign governments
43,971	**56,846**	**77,151**	**85,072**	**80,167**	**EARNINGS** remaining from sales revenue for reinvestment in the business and for dividends
216,307	256,219	302,364	370,850	441,494	REINVESTED EARNINGS — from prior years
(3,971)	(10,701)	(8,665)	(14,428)	(16,632)	DIVIDENDS — declared for payment to the shareowners
(88)	—	—	—	—	TRANSFERRED — to share capital due to a share split
256,219	**302,364**	**370,850**	**441,494**	**505,029**	**REINVESTED EARNINGS** at year-end
17,628	17,808	18,031	18,264	18,482	COMMON SHARES — the weighted average number of shares outstanding during the year
$2.49	**$3.19**	**$4.28**	**$4.66**	**$4.34**	**EARNINGS PER SHARE**—the earnings allocated to each of the weighted average common shares outstanding
.225	.60	.48	.79	.90	DIVIDENDS DECLARED PER SHARE — accrued for payment
.225	.48	.60	.79	.90	DIVIDENDS PAID PER SHARE — received by the shareowners

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

Tektronix Consolidated Changes in Financial Position in thousands

1977	1978	1979	1980	1981	
$ 55,402	**$ 69,879**	**$ 96,385**	**$117,472**	**$121,934**	**WORKING CAPITAL PROVIDED** from operations
43,971	56,846	77,151	85,072	80,167	EARNINGS — the primary source of working capital
12,781	15,294	21,258	30,303	42,228	DEPRECIATION — non-cash charge to income for facilities
(1,738)	(4,187)	(5,145)	(2,727)	(7,252)	JOINT VENTURE EARNINGS — reduced by their dividends
388	1,926	3,121	4,824	6,791	DEFERRED INCOME TAXES — payable in future years
9,577	**7,698**	**39,230**	**84,968**	**41,658**	**WORKING CAPITAL PROVIDED** from other sources
1,759	—	28,096	77,604	32,910	LONG-TERM DEBT — new borrowings
2,118	6,429	7,618	9,894	10,671	COMMON SHARES — sold to employees
5,700	1,269	3,516	(2,530)	(1,923)	OTHER — sources and uses of working capital
26,818	**53,397**	**110,111**	**131,006**	**151,414**	**WORKING CAPITAL** used for
22,173	41,697	100,349	115,926	114,065	FACILITIES — additions of land, buildings and equipment
674	999	1,097	652	20,717	LONG-TERM DEBT — due for payment within one year
3,971	10,701	8,665	14,428	16,632	DIVIDENDS — declared for payment to shareowners
38,161	**24,180**	**25,504**	**71,434**	**12,178**	**WORKING CAPITAL INCREASE** made up of changes in
24,502	(28,746)	(24,420)	15,357	(9,283)	CASH AND CASH EARNING INTEREST
17,154	27,808	38,468	44,501	6,883	ACCOUNTS RECEIVABLE
19,277	45,100	51,010	49,030	30,142	INVENTORIES
964	3,297	6,025	3,242	5,132	PREPAID EXPENSES
(2,327)	(4,969)	(18,646)	(16,812)	(4,366)	SHORT-TERM DEBT
(6,311)	(9,021)	(8,925)	(7,001)	(11,371)	ACCOUNTS PAYABLE
(6,079)	1,187	(1,986)	(6,960)	(1,384)	INCOME TAXES PAYABLE
(9,019)	(10,476)	(16,022)	(9,923)	(3,575)	ACCRUED COMPENSATION
187,807	**225,968**	**250,148**	**275,652**	**347,086**	**WORKING CAPITAL** from the prior year and the working capital increase above results in
225,968	**250,148**	**275,652**	**347,086**	**359,264**	**WORKING CAPITAL** at year-end

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

Tektronix Consolidated Notes to Financial Statements

ACCOUNTING POLICIES

Principles of Consolidation — The consolidated financial statements include the accounts of Tektronix, Inc. and its wholly owned subsidiaries since dates of organization or acquisition. All material intercompany transactions and balances have been eliminated.

Joint Venture Companies — Investments in joint venture companies, where the Company holds fifty percent or less of the share capital, are stated at cost plus the Company's equity in their reinvested earnings. All material intercompany profits have been eliminated.

Foreign Currencies — Foreign affiliate monetary assets and liabilities, as well as any foreign currency exchange contracts, are translated into United States dollars at year-end rates of exchange. Inventories, facilities and related depreciation, and other non-monetary assets are translated at historic exchange rates prevailing at the time the assets were acquired. Sales and expenses, other than cost of sales and depreciation where historical rates are used, are translated at rates prevailing at the beginning of each accounting period. Translation of net monetary assets and exchange transaction gains and losses are included in non-operating income.

Inventories — Parent company inventories are stated at the lower of market or cost, with cost determined on the last-in, first-out basis (LIFO). Subsidiary inventories are stated at the lower of market or cost on the first-in, first-out basis (FIFO).

Facilities and Depreciation — Facilities are stated at cost. Accelerated methods of depreciation are generally used both for financial accounting and tax reporting based on estimated useful lives of the facilities which vary from 10 to 48 years for buildings and 3 to 15 years for equipment and capital leases. Leasehold improvements are amortized on a straight-line basis over the estimated useful life or the lease term, whichever is less.

Engineering Expense — Expenditures for research, development and engineering of products and manufacturing processes are expensed as incurred.

Pension Expense — Pension expense is funded as accrued, including amortization of past service cost by the declining balance method over twenty years.

Income Taxes — Investment tax credits are accounted for by the "flow-through" method, which recognizes the reduction in income tax in the year the related facility is placed in service. Tax deferral resulting from Domestic International Sales Corporation (DISC) subsidiaries is recognized in the provision for income taxes and included in the deferred tax liability.

Per Share Amounts — The earnings per share are based on the weighted average number of shares outstanding during the fiscal year.

Fiscal Year — The Company's fiscal year is the 52 or 53 weeks ending the last Saturday in May. The 52 week years are comprised of 13 four-week accounting periods separated into two 12 week quarters ending during August and November, a 16 week quarter ending during March, and a 12 week quarter ending during May. A 53 week year results in a five-week accounting period and a 13 week quarter at the beginning of the fiscal year. 1980 was a 53 week fiscal year.

Rounding — All financial amounts, except per share, are rounded to the nearest one thousand dollars in the statements and notes.

BUSINESS SEGMENTS

The Company operates predominantly in a single industry segment; the design, manufacture and sale of electronic measurement and display instruments used in science and industry. Joint venture companies operate in the same industry segment.

Geographically the Company operates primarily in the industrialized world. Sales, income and assets in the United States, Europe and other geographic areas were:

1978	1979	1980	1981	
$381,465	$487,172	$591,760	$ 625,335	Sales to U.S. customers
31,949	47,167	57,805	71,714	U.S. Export sales
107,590	147,414	185,772	219,976	Transfers from U.S.
521,004	681,753	835,337	917,025	U.S. Sales
160,663	225,388	288,630	322,900	European sales to customers
2,580	1,665	577	2,665	Transfers from Europe
163,243	227,053	289,207	325,565	European sales
24,809	27,209	33,111	41,885	Other area sales to customers
(110,170)	(149,079)	(186,349)	(222,641)	Inter-area eliminations
$598,886	$786,936	$971,306	$1,061,834	Net sales
$ 79,952	$102,702	$123,170	$ 118,688	U.S. Operating income
21,374	28,506	34,002	30,132	European operating income
578	1,418	2,139	3,768	Other area operating income
(3,496)	(6,025)	(5,529)	(8,412)	Inter-area eliminations
98,408	126,601	153,782	144,176	Area operating income
(4,269)	(5,153)	(5,933)	(6,140)	General corporate expense
(4,246)	(6,428)	(15,956)	(25,274)	Interest expense
6,068	11,631	5,029	19,630	Non-operating income
$95,961	$126,651	$136,922	$ 132,392	Income before taxes

1978	1979	1980	1981	
$324,657	$464,330	$607,686	$ 680,138	U.S. assets
85,942	120,525	156,444	198,702	European assets
9,720	11,554	13,203	16,383	Other area assets
(4,759)	(8,571)	(11,027)	(14,395)	Inter-area eliminations
415,560	587,838	766,306	880,828	Area assets
11,885	17,030	19,759	27,011	Joint venture equity
63,685	38,039	55,628	45,914	Corporate cash
$491,130	$642,907	$841,693	$ 953,753	Assets at year-end

Transfers of products and services are made at arms-length prices between geographic areas. The profit on transfers between geographic areas is not recognized by the manufacturer until sales are made to unaffiliated customers. Area operating income includes all directly incurred and allocable costs, except identified corporate expenses. Identifiable assets are those which are specifically associated with the operations of each geographic area.

Net sales to United States and foreign government agencies did not separately total as much as 10% of consolidated net sales in 1978, 1979, 1980 nor 1981.

FOREIGN AFFILIATES

The Company has 18 foreign operating subsidiaries located in Australia, Belgium, Brazil, Canada, Denmark, Finland, France, Germany, Guernsey, Italy, The Netherlands, Norway, Spain, Sweden, Switzerland, and United Kingdom with a branch in Ireland. The acquisition of the Company's German distributor during 1981, if included on a pro forma basis, would have no material effect on prior years consolidated income. This acquisition added $7,542,000 to other assets for the purchase price in excess of the net assets acquired. The income, assets and liabilities of foreign subsidiaries are included in the consolidated financial statements in these amounts:

1977	1978	1979	1980	1981	
$ 20,296	$ 23,632	$ 31,809	$ 39,781	$ 33,301	Income before taxes
13,408	16,714	22,853	29,882	19,401	Earnings
88,256	106,098	141,446	169,051	208,864	Current assets
21,685	32,105	39,090	55,483	68,207	Current liabilities
13,273	15,337	18,585	22,185	28,938	Facilities less depreciation
503	889	1,118	907	410	Other assets
4,832	2,222	6,732	7,857	8,228	Other liabilities

The Company has investments in three joint venture companies located in Austria, Japan and Mexico. These investments, included in other assets, and the Company's share of sales, income, assets and liabilities not included in the consolidated financial statements consisted of:

1977	1978	1979	1980	1981	
$ 5,680	$ 7,418	$ 11,605	$ 16,750	$ 19,477	Reinvested earnings at prior year-end
1,772	4,249	5,222	2,930	7,597	Earnings
(34)	(62)	(77)	(203)	(345)	Dividends
7,418	11,605	16,750	19,477	26,729	Reinvested earnings at year-end
280	280	280	282	282	Share capital
$ 7,698	$ 11,885	$ 17,030	$ 19,759	$ 27,011	Investments
$ 16,762	$ 25,457	$ 40,551	$ 46,064	$ 59,660	Net sales
6,471	10,118	16,740	16,107	23,728	Gross profit
3,811	7,235	10,618	8,041	15,575	Income before taxes
1,772	4,249	5,222	2,930	7,597	Earnings
8,790	12,991	21,713	24,873	32,173	Current assets
4,631	7,359	10,936	12,903	16,892	Current liabilities
2,893	3,577	3,939	5,477	8,686	Facilities less depreciation
1,388	3,662	3,202	3,063	4,236	Other assets
768	1,772	1,145	1,558	1,417	Other liabilities

The Company has arms-length sales to, purchases from, and accounts receivables due from joint venture companies amounting to:

1977	1978	1979	1980	1981	
$ 15,292	$ 22,499	$ 34,904	$ 44,764	$ 54,130	Sales to
2,576	5,312	6,106	8,628	10,954	Purchases from
2,274	4,306	6,458	8,487	10,143	Accounts receivable

There are no significant restrictions which prevent dividends to the parent company from subsidiary or joint venture companies.

ACCOUNTS RECEIVABLE

The accounts receivable have been reduced by an allowance for doubtful accounts which was $993,000 in 1977, $1,238,000 in 1978, $1,752,000 in 1979, $2,022,000 in 1980, and $2,177,000 in 1981. The net charges to this reserve for uncollected credit sales are not material.

INVENTORIES

The inventories valued on a first-in, first-out basis (FIFO), less the reserve for those inventories adjusted to the last-in, first-out basis (LIFO), consisted of:

1977	1978	1979	1980	1981	
$ 27,078	$ 32,609	$ 43,989	$ 62,197	$ 57,698	Purchased materials
66,011	96,504	128,926	169,706	196,925	Work-in-process
36,117	46,977	66,567	81,388	115,181	Finished goods
129,206	176,090	239,482	313,291	369,804	Inventories at FIFO
(10,783)	(12,567)	(24,949)	(49,728)	(76,099)	LIFO reserve
$118,423	$163,523	$214,533	$263,563	$293,705	Inventories

FACILITIES AND DEPRECIATION

The original cost of facilities, additions and disposals consisted of:

1977	1978	1979	1980	1981	
$ 5,916	$ 6,495	$ 6,511	$ 8,240	$ 15,524	Land at prior year-end
789	16	1,880	7,360	12,668	Additions
(210)		(151)	(76)	(536)	Disposals
6,495	6,511	8,240	15,524	27,656	Land at year-end
75,114	74,574	83,598	102,976	163,598	Buildings at prior year-end
1,790	9,722	20,460	61,057	34,935	Additions
(2,330)	(698)	(1,082)	(435)	(3,401)	Disposals
74,574	83,598	102,976	163,598	195,132	Buildings at year-end
71,091	83,461	102,122	142,257	193,514	Equipment at prior year-end
18,021	24,194	48,513	59,342	69,119	Additions
(5,651)	(5,533)	(8,378)	(8,085)	(8,507)	Disposals
83,461	102,122	142,257	193,514	254,126	Equipment at year-end
3,124	4,697	12,462	41,958	30,125	Construction at prior year-end
1,573	7,765	29,496	(11,833)	(2,657)	Net changes
4,697	12,462	41,958	30,125	27,468	Construction at year-end
$169,227	$204,693	$295,431	$402,761	$504,382	Facilities

The accumulated depreciation, depreciation expense and depreciation related to disposals consisted of:

1977	1978	1979	1980	1981	
$ 25,681	$ 26,279	$ 28,887	$ 32,331	$37,462	For buildings at prior year-end
3,036	3,053	3,648	5,346	7,535	Depreciation expense
(2,438)	(445)	(204)	(215)	(261)	Depreciation on disposals
26,279	28,887	32,331	37,462	44,736	For buildings at year-end
41,001	47,573	56,273	68,646	88,528	For equipment at prior year-end
9,745	12,242	17,610	24,957	34,693	Depreciation expense
(3,173)	(3,542)	(5,237)	(5,075)	(4,487)	Depreciation on disposals
47,573	56,273	68,646	88,528	118,734	For equipment at year-end
$ 73,852	$ 85,160	$100,977	$125,990	$163,470	Accumulated depreciation

SHORT-TERM DEBT

A summary of short-term borrowings is:

1977	1978	1979	1980	1981	Bank Borrowings
					At year-end:
$4,708	$ 9,352	$17,900	$17,457	$29,458	Outstanding
11.0%	9.8%	11.1%	16.2%	17.1%	Average interest rate

Short-term Debt continued

1977	1978	1979	1980	1981	
					Bank Borrowings
					At accounting period-end:
$4,269	$ 6,941	$13,072	$17,541	$23,144	Average outstanding
9.9%	9.2%	10.0%	13.0%	15.7%	Average interest rate
$5,400	$10,494	$20,415	$24,981	$31,224	Maximum outstanding
					Commercial Paper Borrowings
					At year-end:
		$10,000	$27,700		Outstanding
		10.0%	11.4%		Average interest rate
					At accounting period-end:
		$ 714	$49,763		Average outstanding
		10.0%	15.2%		Average interest rate
		$10,000	$83,100		Maximum outstanding

The Company has lines of credit with United States and foreign banks which aggregated $111 million at May 30, 1981, of which approximately $81 million was unused. These lines are fee compensated and the charges are not significant. In 1981 the Company converted some of its lines of credit to long-term bank commitments. As a result, the commercial paper borrowings which these commitments support are included in long-term debt.

LONG-TERM DEBT

The long-term indebtedness consisted of:

1977	1978	1979	1980	1981	
				$ 31,000	Commercial Paper Borrowings
			$ 75,000	75,000	11% Notes due July 15, 1990
			(467)	(435)	Unamortized discount
$35,000	$35,000	$35,000	35,000	35,000	8⅞% Notes due May 15, 1983
(184)	(153)	(123)	(92)	(61)	Unamortized discount
		20,000	20,000	20,000	9⅛% Note due November 15, 1981
5,641	3,238	8,314	7,407	6,356	Other borrowings
40,457	38,085	63,191	136,848	166,860	Long-term borrowings
(674)	(999)	(1,097)	(652)	(20,717)	Current maturities
$39,783	$37,086	$62,094	$136,196	$146,143	Long-term debt

The commercial paper borrowings, with a weighted average interest rate of 17.8% at year-end, are supported by revolving credit commitments. These commitments aggregated $75 million at May 30, 1981, with $65 million being convertible to four year term loans in 1983. The Company intends to replace these commercial paper borrowings at some future time with long-term financing.

The 11% and 8⅞% Notes may be redeemed at any time at the option of the Company on or after July 15, 1986 and November 15, 1981 respectively, at the principal amount together with accrued interest. The 9⅛% Notes became redeemable on November 15, 1980.

Aggregate long-term debt principal payments for each of the next five years will be $20,717,000 in 1982, $35,717,000 in 1983, $9,167,000 in 1984, $8,476,000 in 1985, and $8,049,000 in 1986.

RETIREMENT AND INCENTIVE PLANS

Pension—The parent company and a domestic subsidiary have defined benefit pension plans which are integrated with social security and cover all United States employees. The weighted average assumed rate of return used in determining the actuarial present value of accumulated plan benefits was 7.5% for 1981. The actuarial present value of accumulated plan benefits, the plan net assets available for benefits and pension expenses were:

1977	1978	1979	1980	1981	
				$39,577	Vested benefits
				11,864	Non-vested benefits
				$51,441	Plan benefit value
$13,501	$20,127	$30,079	$42,145	$60,205	Plan net assets available for benefits
5,569	5,714	8,475	9,406	12,172	Pension expenses

Foreign subsidiaries provide for employee retirement in keeping with the practices and laws of the countries in which they operate. Foreign plans are not required to report to governmental agencies pursuant to ERISA, nor are these plans considered to be material. Foreign subsidiary pension expenses were $1,145,000 in 1977, $1,605,000 in 1978, $1,924,000 in 1979, $2,360,000 in 1980, and $2,733,000 in 1981.

Profit Sharing—As a part of compensation, most employees receive cash and deferred profit share amounting to 27.5% of income of participating companies before profit sharing, incentive compensation, charitable contributions and income taxes. Additional profit share of 7.5% is contributed to a retirement trust for parent company employes.

Incentives — The Company has incentive compensation plans for executives. The plans provide for compensation based on consolidated performance over a three-year period. These charges are included in profit sharing and amounted to $2,493,000 in 1977, $737,000 in 1978, $869,000 in 1979, $106,000 in 1980, and a reduction of previous years' accrual of $218,000 in 1981.

Amounts owing under retirement and incentive plans, and included in accrued compensation, were $18,550,000 in 1977, $22,750,000 in 1978, $31,691,000 in 1979, $33,964,000 in 1980, and $33,870,000 in 1981.

Employee Share Purchase—Employees of the parent company and a domestic subsidiary are eligible to participate in an Employee Share Purchase Plan in which 4,366 employees were participants, of 20,563 eligible employees, at May 30, 1981. Under the Plan 329,842 common shares of the Company were reserved at May 30, 1981, and 498,153 at May 31,1980. During 1981, 168,311 shares with a market value of $9,914,000 were issued for $7,931,000, while 164,473 shares with a market value of $8,863,000 were issued for $7,090,000 in 1980. The share purchase discount provided in the plan has been charged to non-operating income.

Stock Options —The Company has a stock option plan for selected employees. At May 30, 1981, 594,177 common shares were reserved for issuance under the plan. There were 522,164 shares subject to outstanding options, of which 154,592 were exercisable. The outstanding options are held by 600 participants, are exercisable at prices from $12.13 to $59.45, and expire between August 29, 1984 and January 29, 1991. The options that have been exercised under this and prior plans are:

1977	1978	1979	1980	1981	
63,848	144,313	110,417	64,750	33,294	Number of shares
$1,307	$ 2,989	$ 1,855	$1,022	$ 757	Option value

The stock option plan allows stock appreciation rights (SARs) to be granted to participants. When granted, all or part of an option may be surrendered for shares or payment in an amount equal to the difference between the option price and the market price of the option right surrendered. An accrual of $1,671,000 was included in profit sharing in 1981, nothing in 1980, and $2,116,000 in 1979, for the increase in market price over the option price to provide for future SARs.

There is no material potential dilution to earnings per share from unexercised stock options.

EXPENSE SUPPLEMENT

A summary of selected expense categories is:

1977	1978	1979	1980	1981	
$14,237	$15,227	$22,454	$31,477	$36,433	Maintenance and repair expense
6,804	9,997	10,416	12,393	18,341	Advertising expense

NON-OPERATING INCOME

The non-operating sources of income and expense which comprise non-operating income consisted of:

1977	1978	1979	1980	1981	
$3,332	$4,180	$ 3,448	$4,593	$ 8,183	Interest income
1,773	4,249	5,222	2,930	7,597	Equity in joint venture earnings
(544)	(15)	435	1,729	(3,309)	Currency gains and (losses)
—	—	4,507	—	10,538	Non-recurring income
(1,258)	(2,346)	(1,981)	(4,223)	(3,379)	Other expense—net
$3,303	$6,068	$11,631	$5,029	$19,630	Non-operating income

The non-recurring income is the satisfaction of a patent infringement judgment against the United States Government in 1979, and the sale of the Company's patient monitoring business in 1981.

INCOME TAXES

The provision for income taxes consisted of:

1977	1978	1979	1980	1981	
$21,837	$28,342	$33,422	$34,468	$31,225	United States
3,050	3,855	7,122	7,483	7,100	State
6,888	6,918	8,956	9,899	13,900	Foreign
$31,775	$39,115	$49,500	$51,850	$52,225	Income taxes

The above provisions were less than the amounts which would result by applying the United States statutory rate to income before income taxes, which was 46% for 1981 and 1980, 47.2% for 1979, and 48% for earlier fiscal years. A reconciliation of the difference is:

1977	1978	1879	1980	1981	
$36,358	$46,061	$59,779	$62,984	$60,901	Income taxes based on U.S. statutory rate
(991)	(1,926)	(3,786)	(5,296)	(5,258)	U.S. investment tax credits
(1,329)	(402)	(1,903)	(556)	(2,204)	Other U.S. adjustments
1,655	2,013	3,754	4,052	3,833	State income taxes, net of U.S. tax
(3,067)	(4,591)	(5,879)	(7,986)	(1,552)	Effect of foreign subsidiaries taxed below U.S. rate
(851)	(2,040)	(2,465)	(1,348)	(3,495)	Effect of after tax joint venture earnings
$31,775	$39,115	$49,500	$51,850	$52,225	Income taxes

Undistributed reinvested earnings of foreign subsidiaries and Domestic International Sales Corporation (DISC) subsidiaries amounted to approximately $212 million at May 30, 1981. Except for accumulated deferred income tax provisions of $27 million, primarily for DISCs, relating to approximately $64 million of such reinvested earnings, no provision has been made for additional United States income taxes which could result from the transfer of undistributed reinvested earnings to the parent company. If the undistributed reinvested earnings were to be transferred, foreign tax credits would be available to partially offset the amount of United States income taxes otherwise payable. The Company has no present intention of transferring such earnings.

Equity in the reinvested earnings of joint venture companies amounted to approximately $27 million at May 30, 1981. No provision has been made for United States income taxes which could result from the transfer of such earnings because foreign tax credits would be available to offset the amount of United States income taxes otherwise payable.

The increase in the deferred tax liability included in the provision for income taxes was:

1977	1978	1979	1980	1981	
$1,587	$2,340	$1,040	$3,946	$4,386	Undistributed earnings of DISCs
(1,199)	(414)	2,081	878	2,405	Other provisions—net
$ 388	$1,926	$3,121	$4,824	$6,791	Change in deferred tax liability

COMMITMENTS

The Company is committed under operating leases for buildings and equipment in the aggregate amount of $46,441,000; payable $11,760,000 in 1982, $9,161,000 in 1983, $6,369,000 in 1984, $4,714,000 in 1985, $3,476,000 in 1986 and $10,961,000 thereafter. Rental expense charged to income under these leases was $5,505,000 in 1977, $5,699,000 in 1978, $8,199,000 in 1979, $12,322,000 in 1980, and $16,179,000 in 1981.

The cost to complete projects under construction at May 30, 1981 is approximately $72 million.

INFLATION (unaudited)

The effects of inflation are not apparent in traditional financial statements, which are based on historical cost. The Company has attempted to identify the financial effects of changing prices using two different methods which are highly dependent upon estimates, approximations and assumptions.

One method, called constant dollar, measures the effects of general inflation by changing the unit of measurement for the historical cost financial statements to units of general purchasing power, using the average consumer price index for all urban consumers. The other method, called current cost, measures changes in specific prices for the goods and services actually used in the Company's operations, using appropriate price indexes related to the costs and expenses incurred. The estimated impact of inflation using these two methods is not significantly different and, therefore, only the effects of the constant dollar method are presented.

Parent company inventories are valued on a last-in, first-out basis (LIFO), which approximates cost of sales in constant dollars. The adjustments made for cost of sales are for subsidiary inventories, which are not on a LIFO basis. The depreciation adjustments were determined by indexing historical cost depreciation to constant dollars. The restatement uses the same depreciation methods, useful lives and salvage values as the historical statements. Income taxes are not adjusted, as current tax laws do not recognize the effects of inflation.

Inflation results in gains or losses in the purchasing power of monetary items, which are money or a claim to receive or pay money in an amount which is presently fixed or determinable. Since the Company owes more to its creditors than it holds in cash and has due from customers, a future gain occurs as these creditors are paid with money that has declined in purchasing power.

This selected financial information, in average 1981 dollars, has been adjusted for the impact of general inflation using the constant dollar method:

1977	1978	1979	1980	1981	
$669,934	$826,546	$995,352	$1,087,474	$1,061,834	Net sales
			$ 95,247	$ 80,167	Earnings
					Adjustments for:
			(2,437)	(4,760)	Cost of sales before depreciation
			(10,658)	(10,271)	Depreciation expense
			$ 82,152	$ 65,136	Earnings adjusted for inflation
			$ 676,640	$ 729,875	Shareowners' equity
			6,031	8,062	Gain from decline in purchasing power
			4.50	3.52	Earnings per share
$ .34	$ .83	$ .60	.88	.90	Dividends declared per share
48.28	53.93	59.20	52.31	58.15	Share price at year-end
174.8	186.5	203.5	230.0	257.5	Average consumer price index

QUARTERLY FINANCIAL SUMMARY (unaudited)

In the opinion of management, this unaudited quarterly financial summary includes all adjustments necessary to present fairly the results for the periods represented:

13 Weeks to Aug. 25, 1979	12 Weeks to Nov. 17, 1979	16 Weeks to Mar. 8, 1980	12 Weeks to May 31, 1980	53 Weeks to May 31, 1980	
$207,468	$221,933	$285,933	$255,972	$971,306	Net sales
113,722	119,497	146,259	133,364	512,842	Gross profit
31,285	39,410	36,564	40,590	147,849	Operating income
30,458	34,079	34,872	37,513	136,922	Income before taxes
18,488	21,329	20,767	24,488	85,072	Earnings
1.02	1.17	1.14	1.33	4.66	Earnings per share
.16	.21	.21	.21	.79	Dividends per share
12 Weeks to Aug. 23, 1980	**12 Weeks to Nov. 15, 1980**	**16 Weeks to Mar. 7, 1981**	**12 Weeks to May 30, 1981**	**52 Weeks to May 30, 1981**	
$232,501	$248,714	$310,823	$269,796	$1,061,834	Net sales
125,563	127,754	155,691	139,681	548,689	Gross profit
31,760	32,579	35,953	37,744	138,036	Operating income
29,166	29,740	40,017	33,469	132,392	Income before taxes
16,916	17,738	23,819	21,694	80,167	Earnings
.92	.96	1.29	1.17	4.34	Earnings per share
.21	.23	.23	.23	.90	Dividends per share

The third quarter of 1981, 16 weeks to March 7, was significantly effected by the non-recurring gain from the sale of a business unit.

COMMON SHARE PRICES

The Company's common shares are traded on the New York and Pacific Stock Exchanges. There were 8,206 shareowners of record at May 30, 1981. The market price range and close are the composite prices reported by The Wall Street Journal rounded to full cents per share:

1977	1978	1979	1980	1981	
					First fiscal quarter
$33.50	$37.50	$46.88	$59.50	$70.25	Highest trade
28.00	33.38	40.00	48.63	47.50	Lowest trade
30.88	37.50	46.00	57.25	67.63	Closing share price
					Second fiscal quarter
34.25	39.50	50.50	61.50	69.88	Highest trade
29.00	35.00	39.00	53.25	59.25	Lowest trade
29.25	39.25	43.25	59.00	65.50	Closing share price
					Third fiscal quarter
34.38	40.00	54.00	64.25	68.50	Highest trade
28.25	33.38	41.50	51.00	50.50	Lowest trade
29.00	33.75	51.38	51.13	52.63	Closing share price
					Fourth fiscal quarter
34.50	44.00	57.00	52.00	63.25	Highest trade
28.82	32.50	46.88	41.63	51.75	Lowest trade
33.88	40.50	49.25	49.75	60.75	Closing share price

DIVIDEND POLICY

The payment of dividends is discretionary with the Board of Directors. Future dividends will be based upon the Company's earnings, financial condition and capital requirements among other considerations.

Tektronix Consolidated Performance

1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	
26.69	**17.13**	**21.38**	**18.69**	**30.13**	**33.88**	**40.50**	**49.25**	**49.75**	**60.75**	**SHARE PRICE AT YEAR-END**
35.1%	−35.8%	24.8%	−12.6%	61.2%	12.4%	19.5%	21.6%	1.0%	22.1%	Market appreciation
—	.4%	.6%	.5%	.6%	.7%	1.4%	1.5%	1.6%	1.5%	Dividend yield
8.9%	**11.4%**	**12.9%**	**13.9%**	**13.9%**	**17.4%**	**18.9%**	**21.2%**	**19.2%**	**15.4%**	**RETURN ON EQUITY**
7.0%	8.3%	7.9%	7.8%	8.2%	9.7%	9.5%	9.8%	8.8%	7.5%	Earnings Margin
1.28x	1.40x	1.67x	1.78x	1.69x	1.80x	1.99x	2.16x	2.19x	2.04x	Equity Turnover
8.4%	**10.8%**	**11.9%**	**12.6%**	**12.3%**	**15.4%**	**16.9%**	**18.4%**	**15.8%**	**12.7%**	**RETURN ON CAPITAL**
7.2%	8.4%	8.0%	8.3%	8.7%	10.0%	9.8%	10.1%	9.4%	8.5%	Preinterest Margin
1.18x	1.30x	1.50x	1.52x	1.41x	1.53x	1.73x	1.81x	1.68x	1.50x	Capital Turnover
174,000	**232,000**	**297,000**	**329,000**	**376,000**	**513,000**	**650,000**	**847,000**	**1,049,000**	**1,040,000**	**CUSTOMER ORDERS**
20.0%	33.3%	28.0%	10.8%	14.3%	36.4%	26.7%	30.3%	23.8%	−.9%	Increase
12.1%	22.8%	24.9%	18.5%	18.6%	25.0%	27.5%	28.2%	30.2%	28.4%	Orders Unfilled at Year-end
167,482	**202,855**	**271,428**	**336,645**	**366,645**	**454,958**	**598,886**	**786,936**	**971,306**	**1,061,834**	**NET SALES**
12.1%	21.1%	33.8%	24.0%	8.9%	24.1%	31.6%	31.4%	23.4%	9.3%	Increase
48.3%	49.4%	49.9%	51.4%	53.8%	56.9%	55.5%	54.3%	52.8%	51.7%	Gross Profit Margin
11.9%	14.2%	14.2%	15.1%	15.8%	16.8%	15.7%	15.4%	15.2%	13.0%	Operating Income Margin
12.5%	15.0%	14.2%	13.9%	15.1%	16.6%	16.0%	16.1%	14.1%	12.5%	Pretax Margin
44.0%	45.1%	44.5%	43.8%	45.5%	41.9%	40.8%	39.1%	37.9%	39.4%	Income Tax Rate
11,764	**16,739**	**21,353**	**26,329**	**30,089**	**43,971**	**56,846**	**77,151**	**85,072**	**80,167**	**EARNINGS**
18.8%	42.3%	27.6%	23.3%	14.3%	46.1%	29.3%	35.7%	10.3%	−5.8%	Increase
.69	.97	1.23	1.52	1.71	2.49	3.19	4.28	4.66	4.34	Earnings Per Share
—	.10	.10	.10	.12	.225	.48	.60	.79	.90	Dividends Per Share
173,743	**206,599**	**251,061**	**306,616**	**344,860**	**415,328**	**491,130**	**642,907**	**841,693**	**953,753**	**TOTAL ASSETS**
1.02x	1.07x	1.20x	1.21x	1.13x	1.20x	1.32x	1.39x	1.31x	1.18x	Asset Turnover
5.63x	5.25x	5.50x	5.78x	5.58x	5.78x	5.92x	5.86x	5.52x	5.27x	Receivable Turnover
2.85x	3.17x	3.27x	3.30x	3.52x	4.18x	4.25x	4.16x	4.06x	3.81x	Inventory Turnover
3.49x	4.35x	5.10x	4.68x	4.28x	4.95x	5.57x	5.01x	4.12x	3.44x	Facility Turnover
148,376	**167,330**	**199,461**	**244,906**	**273,659**	**319,287**	**374,133**	**493,133**	**665,343**	**753,862**	**INVESTED CAPITAL**
6.7%	7.0%	12.0%	17.4%	15.2%	14.1%	12.7%	18.4%	27.4%	26.0%	Short & Long-Term Debt
93.3%	93.0%	88.0%	82.6%	84.8%	85.9%	87.3%	81.6%	72.6%	74.0%	Shareowners' Equity
8,334	10,580	12,693	12,664	12,970	14,637	19,147	21,291	23,890	24,028	Employees
19.2	21.5	23.3	26.6	28.6	33.0	35.5	38.9	43.0	44.3	Sales Per
2,429	2,612	2,940	3,420	3,705	3,906	3,987	4,935	5,921	7,300	Square Feet in Use
70.4	80.5	97.8	105.9	102.9	119.6	151.8	176.4	178.9	160.6	Sales Per Thousand

Returns, ratios, turnovers and sales per are based on average assets, capital, employees and square feet. Amounts are in thousands except per share and employees.

BOARD OF DIRECTORS

PAUL E. BRAGDON, *President, Reed College*
JAMES B. CASTLES, *retired Vice President and General Counsel*
JOHN D. GRAY, *Chairman, Omark Industries, Inc.*
LEONARD LASTER, *President, University of Oregon Health Sciences Center*
LOUIS B. PERRY, *President, Standard Insurance Company*
HOWARD VOLLUM, *Chairman of the Board*
WILLIAM D. WALKER, *Executive Vice President and Chief Operating Officer*
EARL WANTLAND, *President and Chief Executive Officer*
FRANK M. WARREN, *retired Chairman, Portland General Electric Co.*

OFFICERS

HOWARD VOLLUM, *Chairman of the Board*
EARL WANTLAND, *President and Chief Executive Officer*
WILLIAM D. WALKER, *Executive Vice President and Chief Operating Officer*
LARRY N. CHORUBY, *Group Vice President-Finance*
LEWIS C. KASCH, *Group Vice President*
LAWRENCE L. MAYHEW, *Group Vice President*
FRANCIS DOYLE, *Vice President*
CHARLES H. FROST, *Vice President*
JOHN L. LANDIS, *Vice President*
TOM LONG, *Vice President*
HOWARD W. MIKESELL, *Vice President*
WILLIAM J. POLITS, *Vice President*
JON S. REED, *Vice President*
PHILIP J. ROBINSON, *Vice President*
LAWRENCE T. SUTTER, *Vice President*
JAMES C. TOWNE, *Vice President*
WILLEM B. VELSINK, *Vice President*
R. ALLAN LEEDY, JR., *Secretary and General Counsel*
KENNETH H. KNOX, *Treasurer*
BILL J. ROBINSON, *Controller*
N. ERIC JORGENSEN, *Assistant Secretary*
EDWARD J. LEWIS, *Assistant Secretary*
FLETCHER C. CHAMBERLIN, *Assistant Treasurer*
JAMES O. HUGHES, *Assistant Treasurer*

SHAREOWNERS' MEETING

The annual meeting of shareowners of Tektronix, Inc., will be held on Saturday, September 26, 1981, at 9 a.m. Pacific Daylight Time, in the Assembly Cafeteria Building, S.W. Karl Braun Drive, Tektronix Industrial Park, near Beaverton, Oregon.

Exchange Listings:
New York Stock Exchange
Pacific Stock Exchange

Transfer Agents:
Morgan Guaranty Trust Company of New York, New York
United States National Bank of Oregon, Portland

Registrars:
Citibank, N.A., New York
First Interstate Bank of Oregon N.A., Portland

Corporate Office:
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COMMITTED TO EXCELLENCE