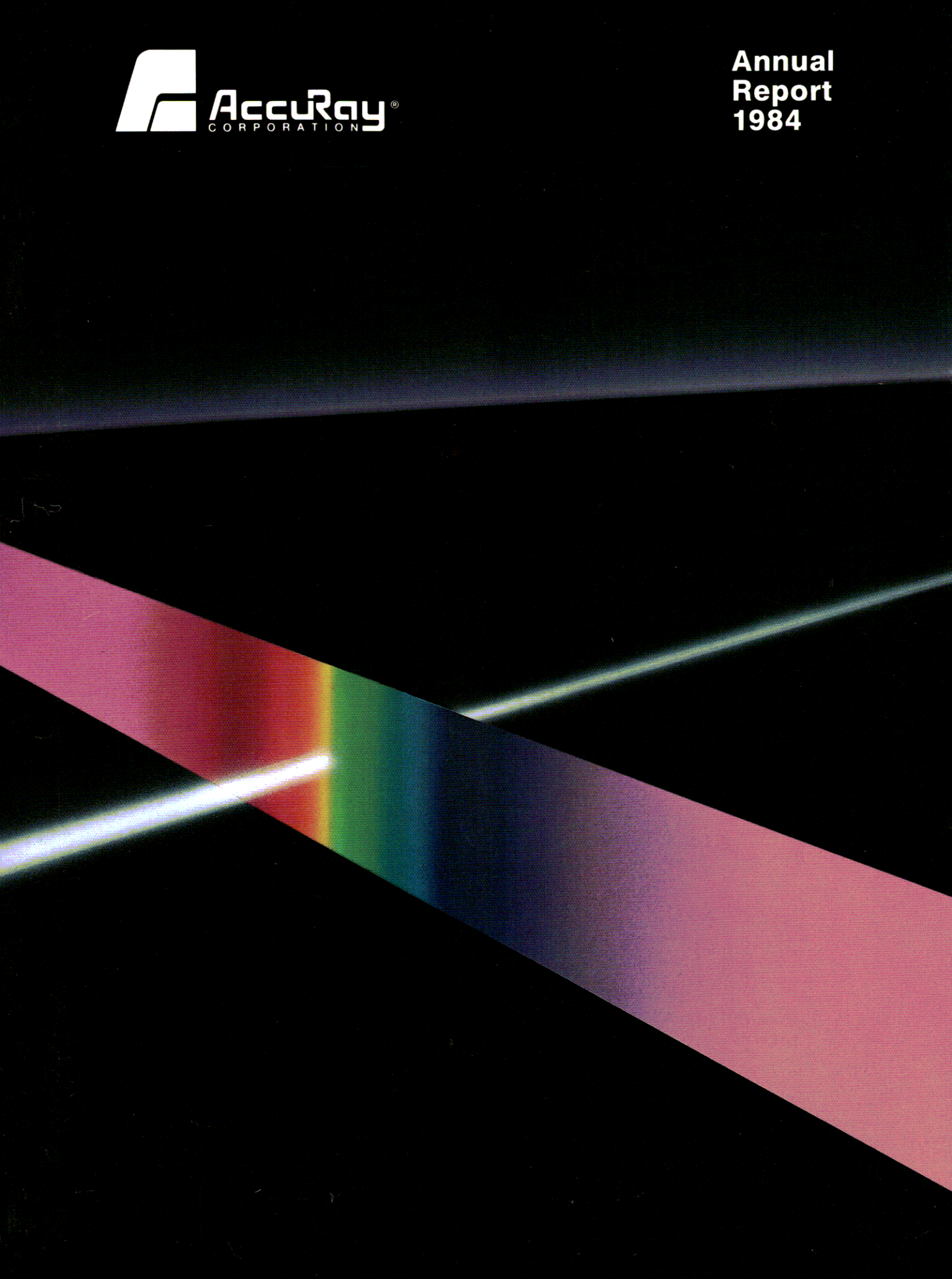




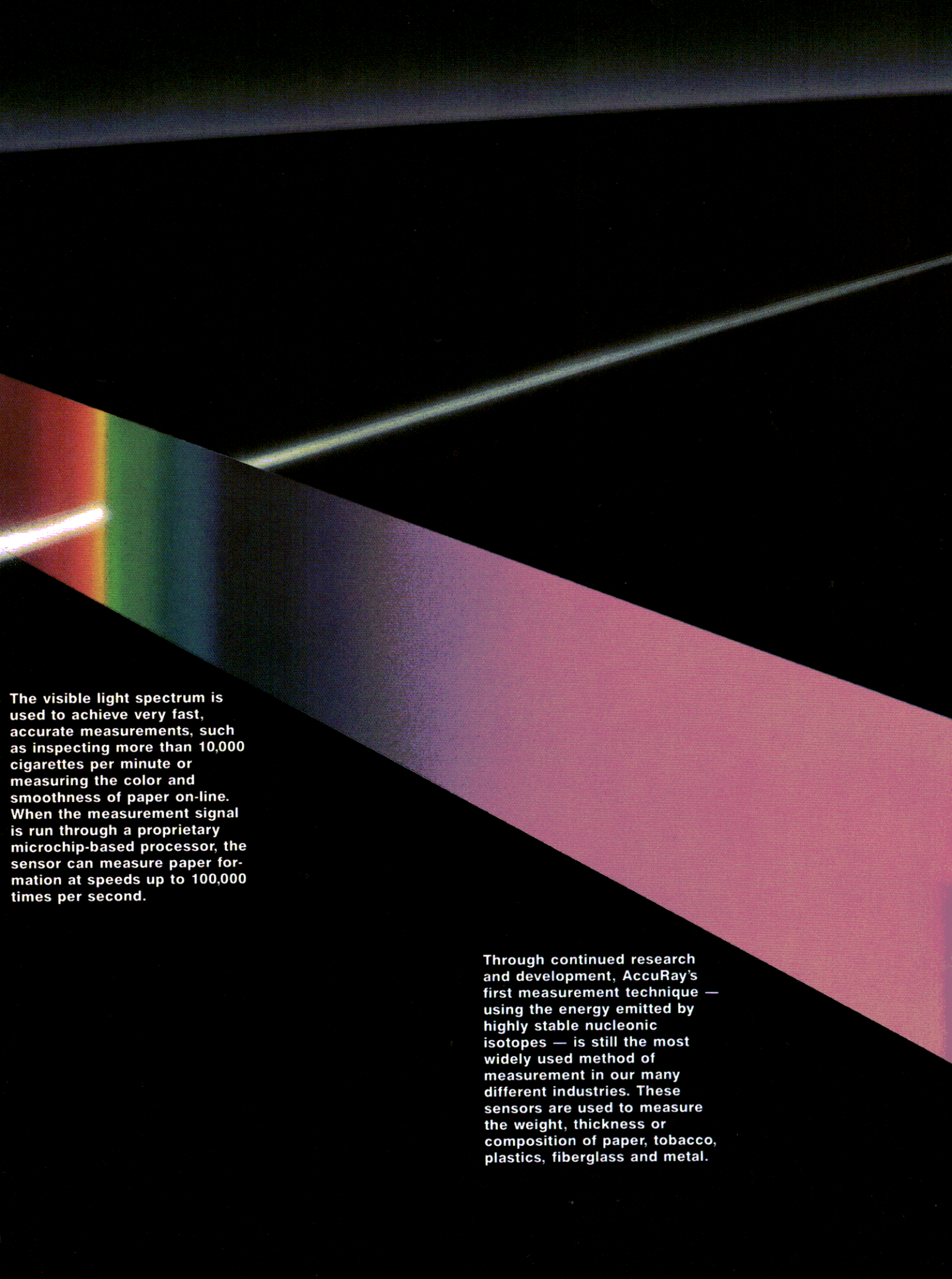
**Annual
Report
1984**



A Measurable Difference


In the infrared spectrum many materials have unique "fingerprints." The measurement challenge is to devise sensors that only identify those fingerprints without being influenced by other materials. AccuRay currently offers about 40 infrared sensors, for the plastics, paper and tobacco industries, used to measure such parameters as moisture, weight thickness, composition or product defects.

In addition to the three technologies highlighted above, AccuRay also utilizes other Spectrum of Measurement technologies, including Electro-Mechanical, Ultrasonic, Radio Frequency, Microwave, Ultraviolet and X-ray.



The visible light spectrum is used to achieve very fast, accurate measurements, such as inspecting more than 10,000 cigarettes per minute or measuring the color and smoothness of paper on-line. When the measurement signal is run through a proprietary microchip-based processor, the sensor can measure paper formation at speeds up to 100,000 times per second.

Through continued research and development, AccuRay's first measurement technique — using the energy emitted by highly stable nucleonic isotopes — is still the most widely used method of measurement in our many different industries. These sensors are used to measure the weight, thickness or composition of paper, tobacco, plastics, fiberglass and metal.



AccuRay Corporation designs, manufactures and markets application packages that measure the product and control the manufacturing process for basic industries throughout the world. Our customers buy these application packages — combinations of hardware, software and services — to improve product quality, reduce raw materials usage, increase productivity and lower costs.

To achieve growth, our efforts have been focused upon areas where AccuRay products can achieve the greatest benefit for our customers — and where we can be clearly recognized as superior. We call these areas of **measurable difference**, something you'll see throughout this report.

One prime area of measurable difference is our expertise in measurement (sensor) development — the first and most important step in controlling any process. The electro-magnetic spectrum depicted on these pages shows the full range of measurement technologies used in AccuRay sensors. We encourage you to review this Spectrum of Measurement — and the rest of the report — to get a better understanding of how we harness technology to create measurements that work in harsh industrial environments.

To Our Stockholders and Associates:

1984 was the eighth consecutive year of profit increases for AccuRay Corporation and the most profitable year in our history. In addition, at year-end, the backlog of new business for future deliveries was at a record level. It was also a year in which we clarified and defined our future corporate growth strategy to accomplish the objectives presented in our 1983 Annual Report, i.e. Quality Leadership, Cost-Effective Supplier, Annual Business Growth Rate of 16 Percent and After Tax Profits of 10 Percent of Revenues.

Financial Highlights

Net income rose to \$6,787,000, or \$1.64 per share, compared with \$5,255,000, or \$1.31 per share in 1983. Total operating revenues increased to \$125.8 million in 1984 compared with \$116.5 million in 1983.

New orders received in 1984 increased to \$95.0 million from \$70.3 million in 1983. Backlog at December 31, 1984, was \$52.4 million, compared with \$41.3 million a year earlier. This backlog includes equipment and related commitments for initial services. Beginning January 1, 1985, we will include in reported revenues the value of cross-machine control actuators supplied to customers under new Original Equipment Manufacturer (OEM) agreements. As a result, \$2.7 million of orders for these actuators received in 1984 are included in the orders and backlog reported above.

Research and development expenses were \$9.5 million in 1984, compared with \$7.7 million in 1983. This R&D investment represented 14.9 percent of sales revenues and 7.6 percent of total operating revenues in 1984.

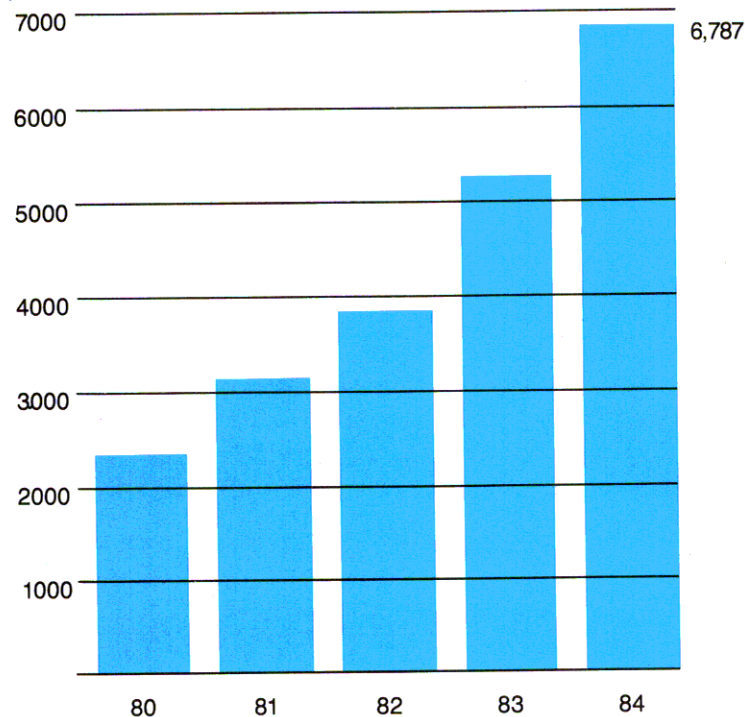
Total operating revenues per employee increased to \$69,700 in 1984, compared with \$65,500 a year earlier. At year-end 1984, total employment was 1,840, compared with 1,770 at the end of 1983.

1985 Strategic Plan

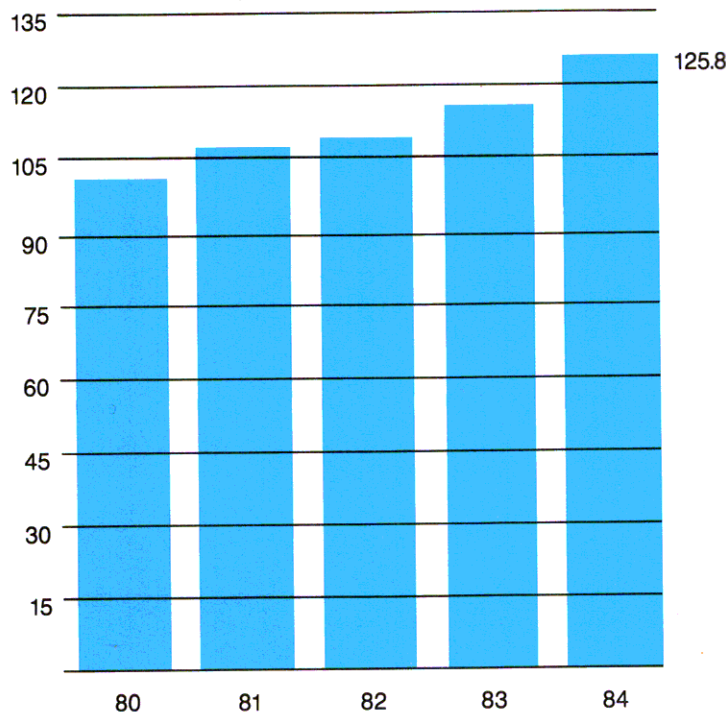
In a similar planning cycle to that reviewed in last year's Annual Report, the 1985 Corporate Strategic Plan was formally approved in November 1984 by the AccuRay Board of Directors. The plan was then presented in group meetings to all company associates based in Columbus and simultaneously video-taped for AccuRay associates throughout the world.

Integrated information and control system technology is now changing so rapidly that the historic term "process automation", as used in the past to describe our company, may actually mean many different things to different people. For example, it can easily refer to many areas of specialization such as sensors, robotics, instrumentation, computing, electronics, information display, communications etc., combined in various levels

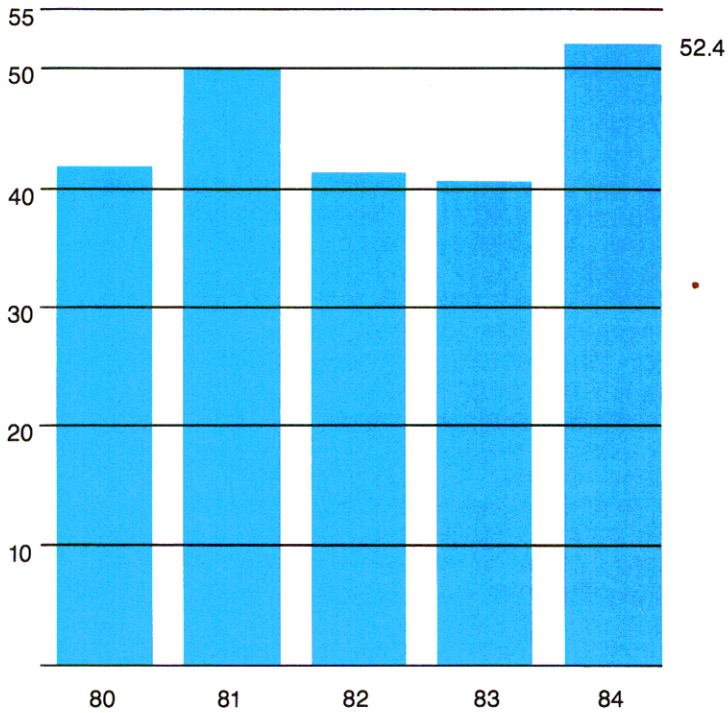
Net Income
(Thousands of Dollars)



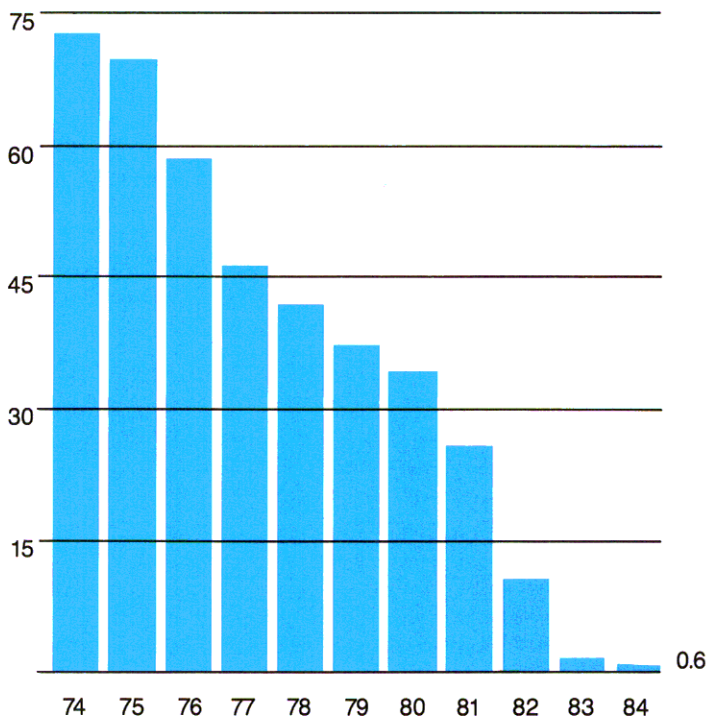
Operating Revenues
(Millions of Dollars)



Backlog - End of Year
(Millions of Dollars)



Bank Debt
(Millions of Dollars)



of regulatory, supervisory and optimization controls. For that reason, we have refined the definition of our business for 1985 in the following statement:

“We design, manufacture and market AccuRay application packages that measure the product and control the process in basic worldwide industries. Application packages consist of combinations of hardware, software and services. They can include sensors, control modules, actuators and system engineering services. Application packages improve product quality, save raw material and energy, increase productivity and reduce costs for the customer.”

In preparing the 1985 Strategic Plan, a key issue for internal analysis was how to best differentiate ourselves from the many companies who are currently being attracted to our business because it represents such an attractive growth market. We concluded that our strength must be based on the proven ability to provide superior products and services in areas of **“measurable difference”** — the theme of this 1984 Annual Report to Stockholders. We sought to identify areas of measurable difference within our business on which we can focus our efforts; areas which will be of clear benefit to customers and upon which we can be objectively evaluated.

Therefore, the 1985 Strategic Plan emphasizes areas of measurable difference with such terms as “system utilization”, “measurement systems” and “process actuators.”

Superior System Utilization is the foundation because it is the reason why customers select AccuRay over other alternatives. To achieve it, we wish to become recognized as the world’s leading producer of superior measurement systems and process actuators, and cost-justified control and service products which result in superior system utilization for the customer.

The measurable difference between AccuRay and other alternatives in the marketplace is the successful execution of regular customer performance reviews. We plan to continue to build our marketplace reputation on the strength of customer performance reviews because, in the method of implementation, they have been unique to our company. They mean regularly scheduled meetings between AccuRay representatives and individual customers where the discussion centers on how to improve AccuRay system performance. The performance review is the key to quality leadership because it allows us to understand the customer’s requirements more fully, discover problems and resolve them promptly, and build the rapport with customers that enables us to anticipate their future requirements.

Superior Measurement Systems and Process Actuators are critical areas of measurable difference. Accurately measuring the key parameters of the customer's product will always determine the ultimate benefit available from even the most sophisticated integrated information and control system. In addition, the process actuator must be carefully designed to match the capabilities of the automatic control system in order to most efficiently adjust the process and thus gain benefits from the control. We plan to focus more of our research and development effort in support of this corporate strategy. The largest portion of R&D in the future will be devoted to creating the most complete family of superior measurement systems and process actuators available in the marketplace. In 1984, we increased our overall R&D investment by 23 percent over 1983 in order to accomplish this objective.

Quality

The history of our efforts since 1978 to position AccuRay as the quality leader in our industry is summarized in subsequent sections of this report. The following are examples of special interest to shareholders:

- On October 25, 1984, our factory in Dundalk, Ireland, accepted the 1984 Irish National Insurance Quality Control Award in the small manufacturing category. This is the first time that any company has won this distinguished award for two consecutive years. The Irish National Insurance Company annually sponsors the quality control awards program with the objective of advancing world-class quality-competitive industry in Ireland. The award is especially significant since approximately one-third of total 1984 shipments were finished and shipped from our Irish factory to customers throughout Europe.
- After January 1, 1985, all new AccuRay MICRO™ systems and replacement parts will be warranted to customers for a period of two years from the date of shipment from an AccuRay manufacturing facility or an AccuRay distribution center. Under this warranty, a replacement part will be supplied without charge if a failure occurs within the 24-month period. This new policy, which applies to all customers meeting certain warranty certification requirements, reflects the improved reliability of all AccuRay manufactured equipment. It represents an industry leadership position with respect to guaranteeing quality.
- The new Two-Year Warranty Program is more than a one-year extension. In its basic form, it is a partnership between the customer and AccuRay to continuously maintain the AccuRay-supplied system

according to the specifications for which it was originally designed and sold. During the past two years, it has become increasingly apparent that an installation may have originally met these specifications, but over time conditions change and the specifications are sometimes no longer met. An example would be system power conditioning and grounding which is a general problem in the computer industry. Two quotations out of a recent article in the March 1984 Computer/Electronic Service News best summarize this issue: "...up to 65 percent of computer sites have power distribution problems" and "...up to 80 percent of computer component failures can be attributed to problems in the AC power supply in the computer." The Two-Year Warranty Program has continuing certification requirements to monitor installation specifications.

- In February 1983, AccuRay introduced the industry's first extended 12-month warranty program. This initial program resulted in a more thorough understanding of the causes of failures, and corrective action steps were put in place to address areas that we felt needed improvement. At the end of 1984, an internal audit by our corporate Quality and Productivity Management Department indicated that the total parts failure rate during the system's first year was reduced by approximately 40% in 1984.

Continuing Services

During the last few years the electronic products service industry, which includes our own service business, has witnessed a substantial emergence of third party maintenance organizations. We are now more frequently experiencing these organizations contacting our customers and offering to provide service for AccuRay equipment at rates below our normal pricing structure. We have an excellent record of shared maintenance programs between the customer's internal maintenance organization and our own AccuRay service organization. However, we are very much opposed to a third-party maintenance organization replacing our own AccuRay service because:

- We believe that the only parties who are ultimately interested in the long-term performance and utilization of process control systems are the manufacturer and the owner.
- As we are accountable to our customers for on-going performance and utilization, we are continuing to make investments each year to address on-site parts handling, preventive maintenance, grounding, power distribution, power conditioning and system in-

stallation procedures. These programs will lead in the future to zero parts failures, higher system uptimes and, in turn, to higher system utilization. The depth of this AccuRay commitment cannot be matched by any third-party service organization.

Research Limited Partnership

During 1984, we were able to provide for an increase in R&D investment in 1984 and 1985 through the formation of an AccuRay Research Limited Partnership. The partnership takes advantage of Federal tax benefits which have been established under existing tax laws to encourage private investors to take financial risks to fund research and development projects. Under this arrangement, approximately \$2,000,000 was raised for the purpose of conducting the research, development and subsequent marketing of three new product introductions. The products to be developed are for applications in sawmills and pulp mills and include:

- A "Bucking Control System", which will be a system for use in sawmills to measure and control the "cross-wise" cutting or "bucking" of tree-length stems into their optimum lengths, given the sawmill's machinery dimensions and the stem's physical characteristics;
- A "Primary Breakdown System", which will be a system for use in sawmills to measure and control the "primary breakdown", a "length-wise" cutting process of "bucked" logs into roughly cut and untrimmed planks, which are ready for further trimming into finished lumber products;
- A "Fiberline Control System", which will be a system to automatically control unit processes of a pulp mill such as continuous and batch digesters. The design is being configured and the application software being developed for use in the Honeywell TDC 3000 Distributed Control System.

Demonstration Center

In order to more effectively demonstrate the technical capability and quality of our latest AccuRay systems to customers, suppliers, associates and stockholders, we are completing a new Visitors Demonstration Center at our corporate headquarters in Columbus. Work began on the facility in July 1984 and we are planning for our first customers to use the facility in April 1985. We view this project as a major first step to providing a more highly informative and comprehensive introduction to our headquarters, research and development, and manufacturing activities. Upon entering, the customer

will be drawn into an environment which is composed of individual, yet related, demonstration spaces; one for each AccuRay basic industry.

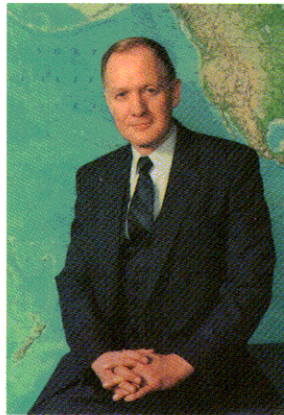
After a visit to the demonstration center, our customers will feel that they have observed evidence of why AccuRay is the industry leader in advanced and sophisticated measurement systems, control and process actuators. A visual depicting this area can be found on pages 8 and 9 of this report.

We extend a cordial invitation to stockholders to visit our new Demonstration Center either at the time of the Annual Meeting on May 10, 1985, or at any convenient opportunity.

Sincerely,



David L. Nelson
President



Quality means conformance to customer requirements. These requirements are:

1. Manufacture and delivery of a defect-free measurement and control system.

Open communication with these groups provides the feedback necessary to avoid quality problems, correct what we are doing wrong and further improve what we are doing right.

Even though our printed circuit board failure rate was the lowest in the industry, failure rates were still cut 50% in 1984.

2. Rapid installation and startup at the customer's site.

1180 MICRO System installations on paper machines #4 and #6 at Union Camp Corporation, Savannah, GA, pulp and paper mill.

Thursday
November 8
1984

Installation of five operator stations completed, powered-up and checked-out as operational.

Sunday
December 23
1984

Paper machines shut down for installation of 1180 MICRO systems, two scanning frames, two water spray actuators, four steambox actuators, a motorized slice actuator and a thermal hydraulic slice actuator.

Monday
January 7
1985

Paper machines restarted.

Tuesday
January 8
1985

Basis weight automatic control implemented.

Wednesday
January 9
1985

Automatic CD control of water sprays implemented.

Thursday
January 10
1985

Moisture automatic control implemented.

Friday
January 11
1985

Automatic CD control of steamboxes implemented.

Sunday
January 13
1985

Automatic CD weight control implemented.

5. Constant feedback through Performance Reviews with customers, associates and suppliers.

"Our objectives for installing the AccuRay Trimmer Optimizer and Chip-N-Saw Control System were to increase yield and improve both product quality and the sawmill's overall efficiency. The reductions in overtrim to below 2% and undertrim to less than 3% have achieved or exceeded all our expectations. The high quality of your installation had both systems working in automatic when the sawmill was restarted. The subsequent reliability of the equipment has been excellent and maintenance requirements minimal."

Del C. Berg
Unit Manager,
Aberdeen Sawmill
Weyerhaeuser Company

4. Full customer utilization of all system controls and management information features.

MICRO System part failures during the initial year of system operation declined 40% in 1984.

3. Consistent uptime of 99.8% or better.

AccuRay has taken the necessary steps to achieve quality.

The result is a higher return-on-investment over the life of the system.

1978

Senior Management includes Quality as a major corporate objective

1979

Established Senior Executive position dedicated to Quality. Quality Steering Committee established. Statistical Quality methods introduced

1980

Quality Audit teams established to audit AccuRay system performance

1981

Productivity Teams and semi-annual customer reviews instituted

Field Specification Engineer position created to improve definition of customer and installation requirements

1982

January

Quality Programs Group established within Engineering

March

Installation Quality Seminar held. Quality Response System initiated

April

Parts Quality Program introduced

June

Additional Productivity Teams initiated

July

Quality Task Forces established for:

- Engineering/Manufacturing
- Vendors
- Field

October

President Reagan visits AccuRay acknowledging the Company for its exporting excellence and dedication to improving quality

November

Manufacturing Supervisors and Team Leaders complete leadership and statistical training. Established Defect Prevention and Quality Communications Programs. Director of Quality Management position elevated to Vice President level

December

Internalized Vendor Quality and Field Quality task forces into line organization. Launched statistical quality control training for all associates

1983

January

Established worldwide Installation Quality Results Program and Human Productivity Results Program

February

19 senior managers attend Dr. Juran seminar on Upper Management and Quality

May

Electro-Static Discharge Prevention Program initiated

June

Interdepartment Quality Action Forum Team established

July

Project Management Course introduced to European field organization

August

Product histories reviewed to identify areas for improvement

October

- New review process for product development that emphasizes process diagnosis, seen as quality breakthrough

November

Dundalk manufacturing operation selected for Irish National Quality Control Award

December

40 percent of all associates complete statistical quality control training. Manufacturing completes break from quality inspection to self-inspection

1984

January

Nine senior managers attend Crosby Quality College and bring a renewed dedication to the Quality Steering Committee

February

Project Management Training begins for U.S. field force as part of Installation Quality Program

March

AccuRay becomes one of the first companies to take Electro-Static Discharge training into the field organization

May

Manufacturing/Engineering organizations complete Electro-Static Discharge training

July

Post-installation Audit Review process initiated

August

Power and Grounding Task Force assembled in Engineering

September

Two Focus Factories started as pilot projects within Manufacturing

November

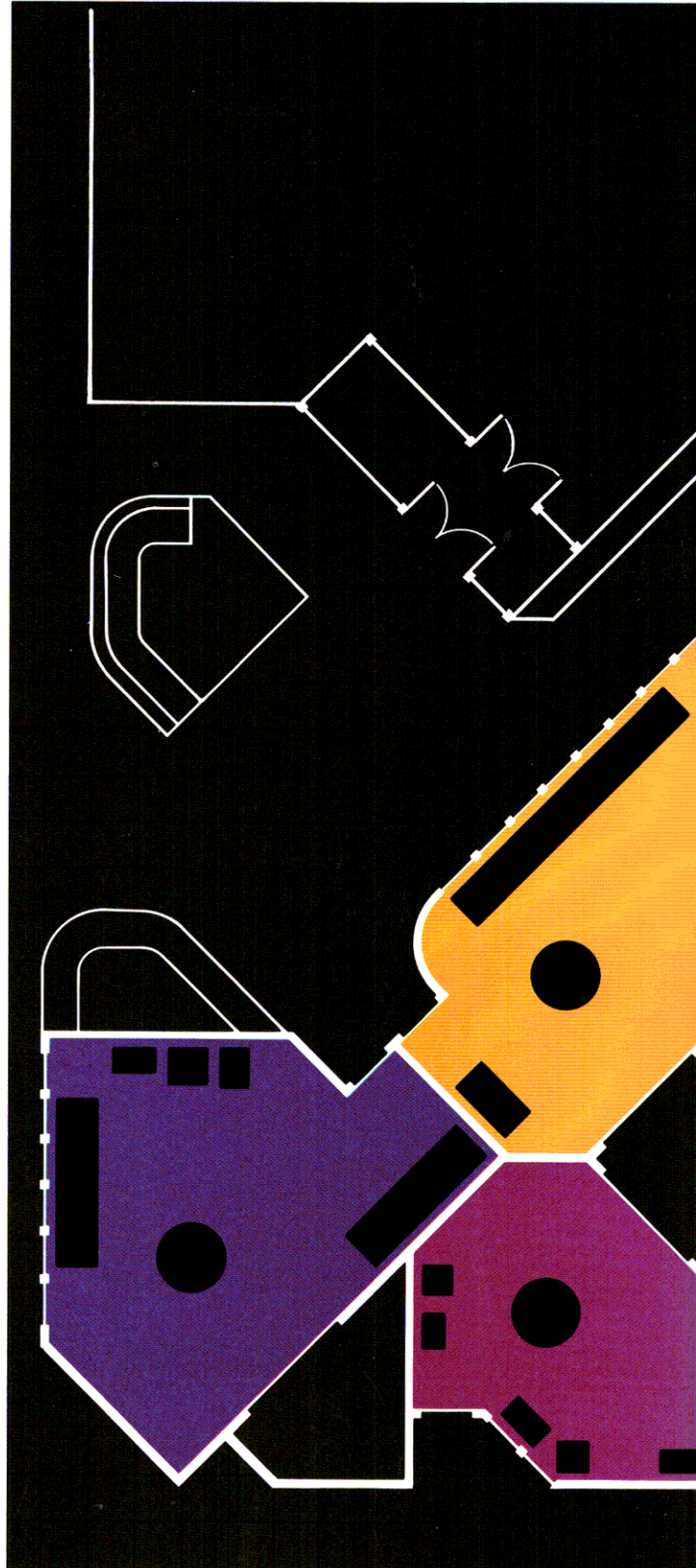
Dundalk factory wins unprecedented second consecutive Irish National Quality Control Award

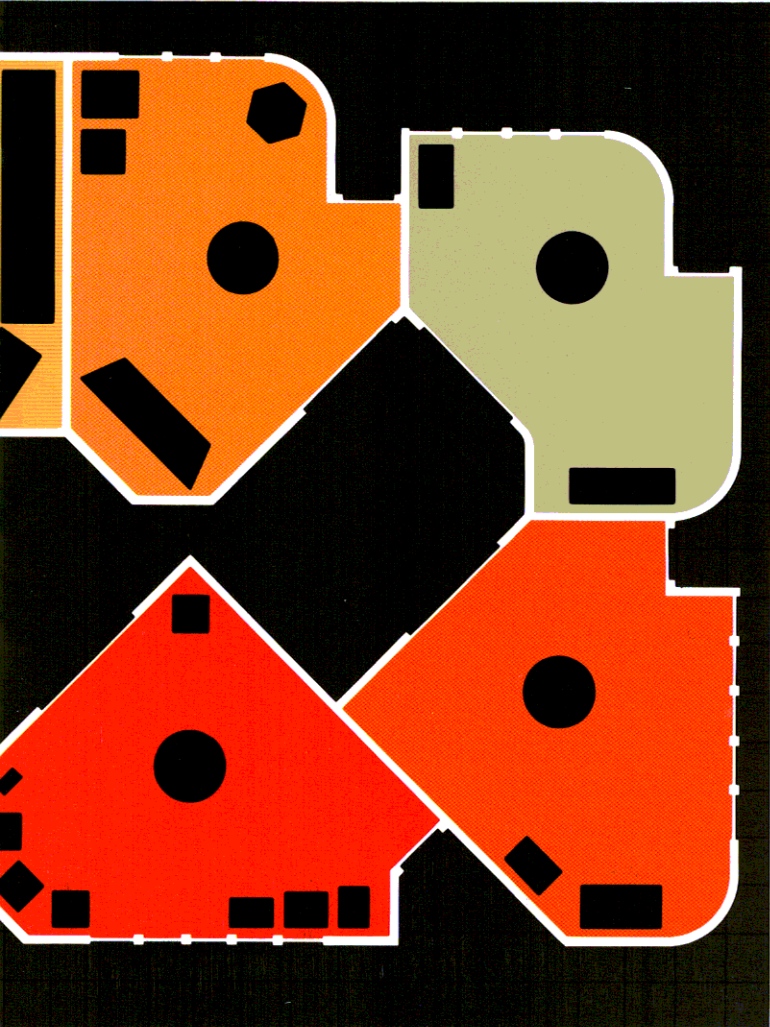
December

As the result of quality improvements, Two-Year Warranty is introduced. Statistical quality control training completed by 85% of all associates worldwide

Demonstration Center

Scheduled for completion in April 1985, the Visitor Demonstration Center is the cornerstone of our program to clarify and strengthen AccuRay's identity as a measurement and control company. Prominently located in our Columbus, Ohio, headquarters, the facility will feature self-contained demonstration rooms for each of our major markets. All rooms will be tied into a central audio-visual system that will be used not only for customer presentations, but also to create a specific "environment" in each room. As a result, customers and visitors will leave Columbus with a clear picture of our **measurable difference** in each market area. And the image we create will carry forward into everything we do as a corporation throughout the world.





The Demonstration Center schematic (left) indicates the location of AccuRay equipment displays for each of the following markets:

- Paper and Cross-Machine Control
- Pulp
- Wood Products
- Metals
- Tobacco
- Plastics

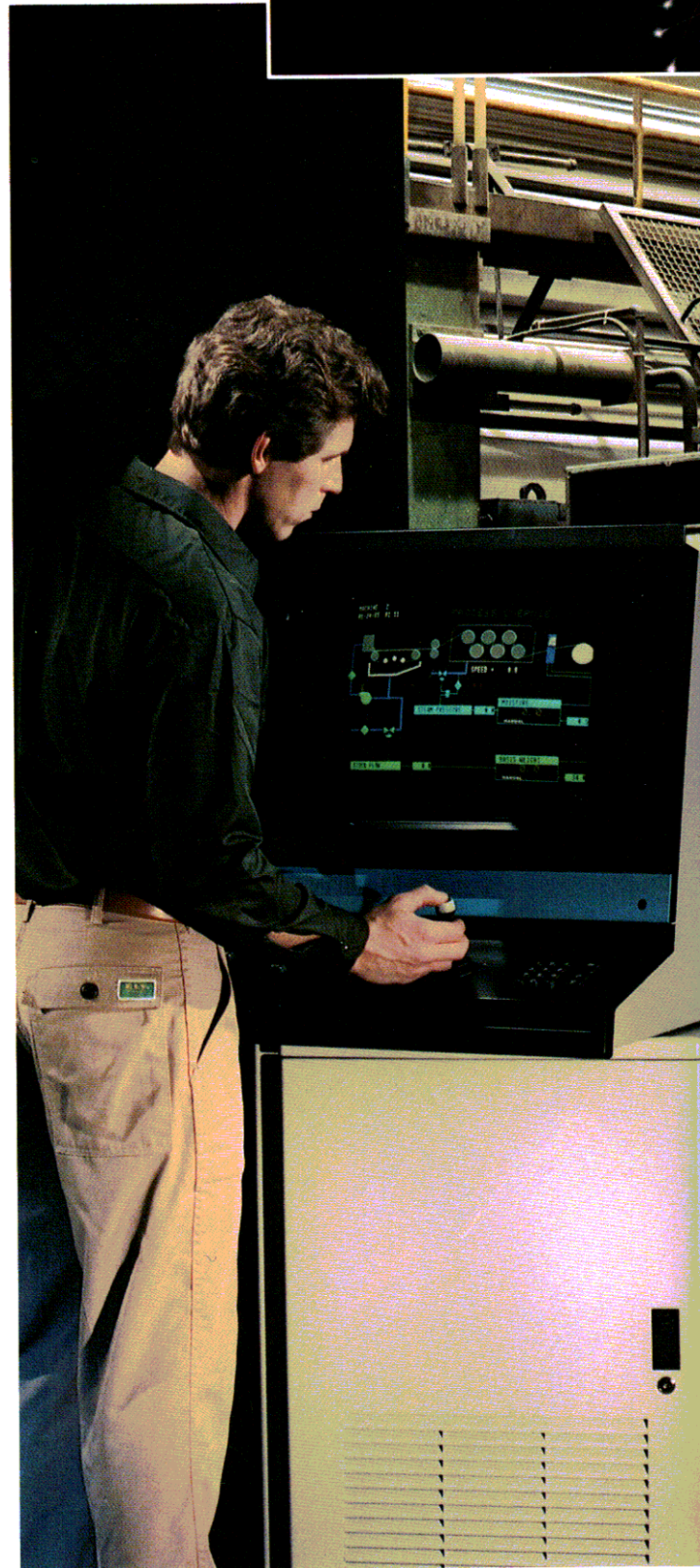
Paper

Market

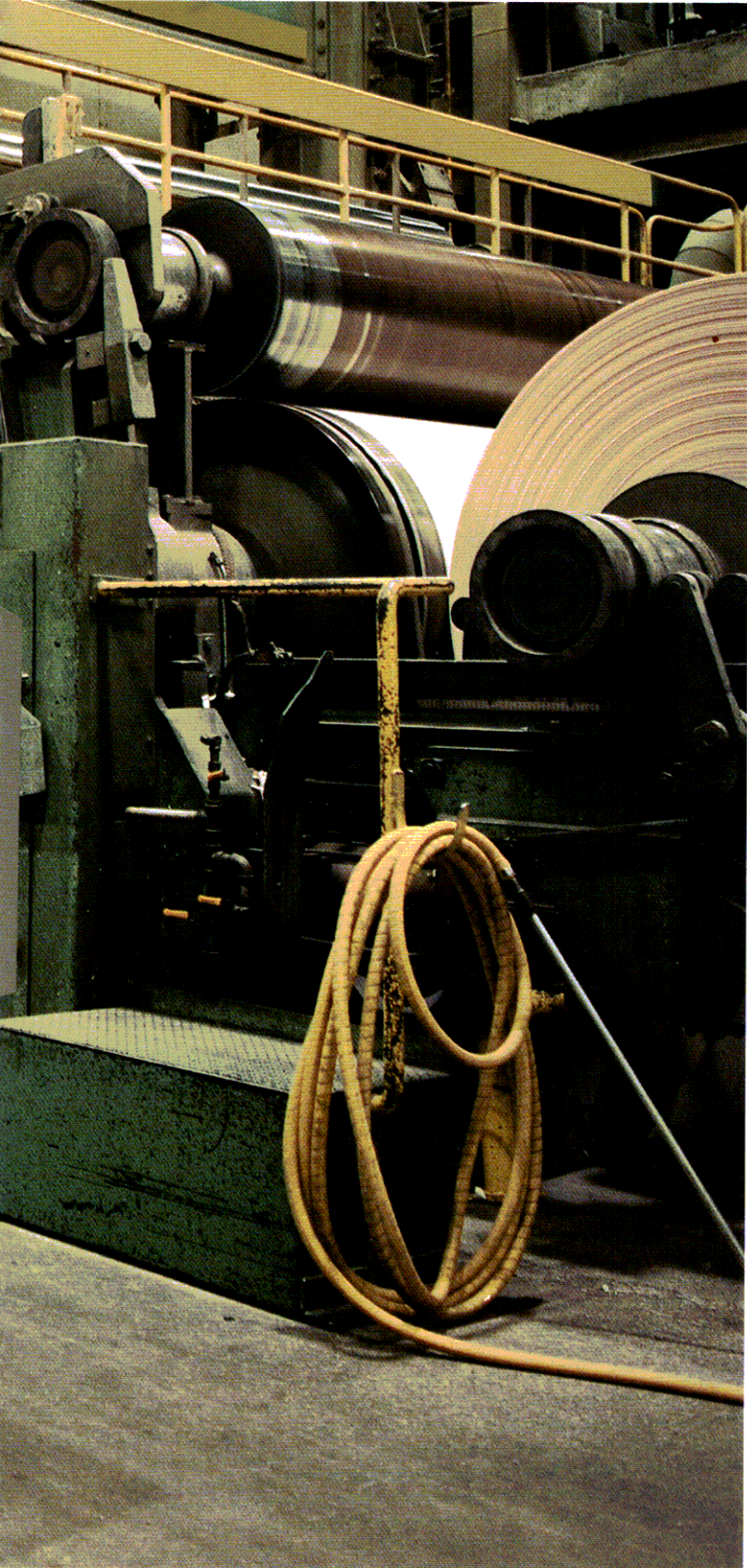
Revenues from the paper industry, traditionally AccuRay's largest market, increased approximately 20% from 1983 levels to an all-time high in 1984. The renewed health of the paper market was reflected in continued orders for the AccuRay 1180 MICRO™ — the largest selling measurement and control system in the industry — and expansion products, such as the family of AccuRay Profile Manager™ cross-machine controls and MICROSCAN™ sensors.

The North American paper market made a strong recovery in 1984, particularly in communications papers, used primarily for photocopying, printing and computer printouts, and in packaging grades, such as linerboard and corrugating medium. The continued strength of the North American paper market, along with an anticipated improvement in the European economy and further penetration of the Australasian market, should continue to improve AccuRay's order and revenue levels over the near term. As in 1984, paper companies are expected to channel the majority of their capital funds into productivity and quality improvement projects rather than into additional production capacity.

As a result of market research and human factors studies, a radically new user interface, DeltaComm™, was introduced in January 1985. Its compact size, simplicity and custom graphics capabilities are designed to improve system utilization.



**Measurement technologies used:
Electro-Mechanical, Ultrasonic, Radio Frequency,
Microwave, Infrared, Visible Light, Ultraviolet,
Nucleonic/X-Ray.**



Products and Progress

AccuRay continues to build on its strength — a family of measurement systems unmatched in depth and breadth. This family was expanded during 1984 through the introduction of new sensors for optically measuring paper quality parameters and enhanced versions of existing sensors.

The most significant of these was the October 1984 introduction of OptiPak™ — the industry's first accurate, on-line formation sensor — combined with paper brightness and opacity (see-through) measurements. Evaluating formation has always been more a subjective art than an objective science. Papermakers literally held paper up to a light and visually analyzed formation. OptiPak imitates the "human evaluation" of paper formation by optically measuring and then comparing a small portion of the paper against the area surrounding it, then displaying an easy-to-understand index of formation for the machine operator. This is a significant measurement breakthrough, since previous attempts at measuring formation were either inaccurate or too complicated to understand.

Another paper quality measurement using visible light, the MICROSCAN Smoothness sensor, was introduced in October 1984. Smoothness, a measure of the surface "roughness" of paper, is a key indicator of printability, i.e. the smoother the paper, the better its printability. With the combination of OptiPak and the MICROSCAN Smoothness sensor, papermakers can now measure and control the most critical printing quality parameters.

HemiPlus, an improved moisture sensor that overcomes traditional infrared measurement shortcomings, was introduced in April 1984. The sensor uses multiple wavelengths of infrared energy transmitted through the sheet to directly determine the percentage of water — without the assistance of additional sensors — in hard-to-measure paper grades such as newsprint, transluents, corrugating medium and recycled fibers.

All of these new measurements have been well received by the industry after rigorous field testing proved them accurate and reliable. The **measurable difference** these sensors add to AccuRay 1180 MICRO systems has a significant impact upon securing new orders for complete measurement and control systems: a strength that again will grow in 1985 with the market release of additional unique or improved measurement packages.

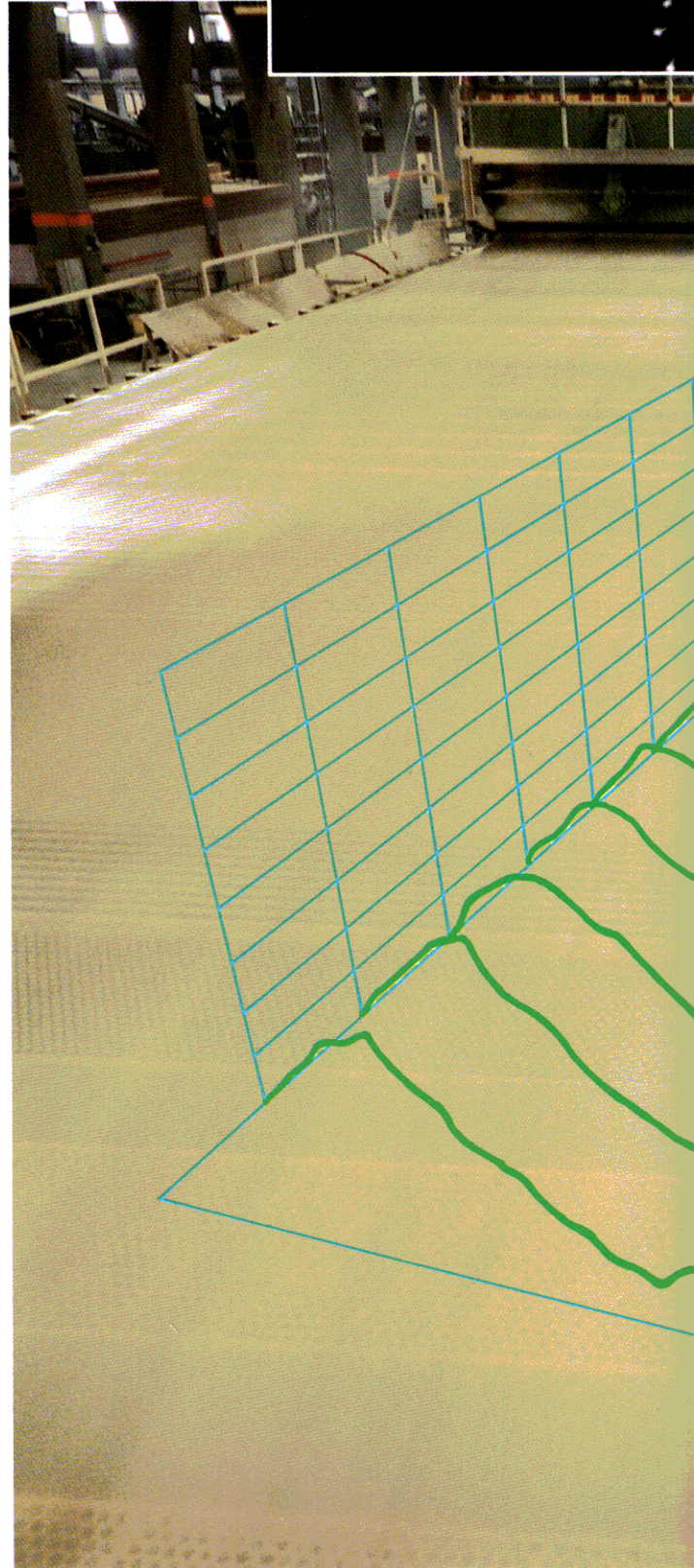
Cross-Machine Control

Market

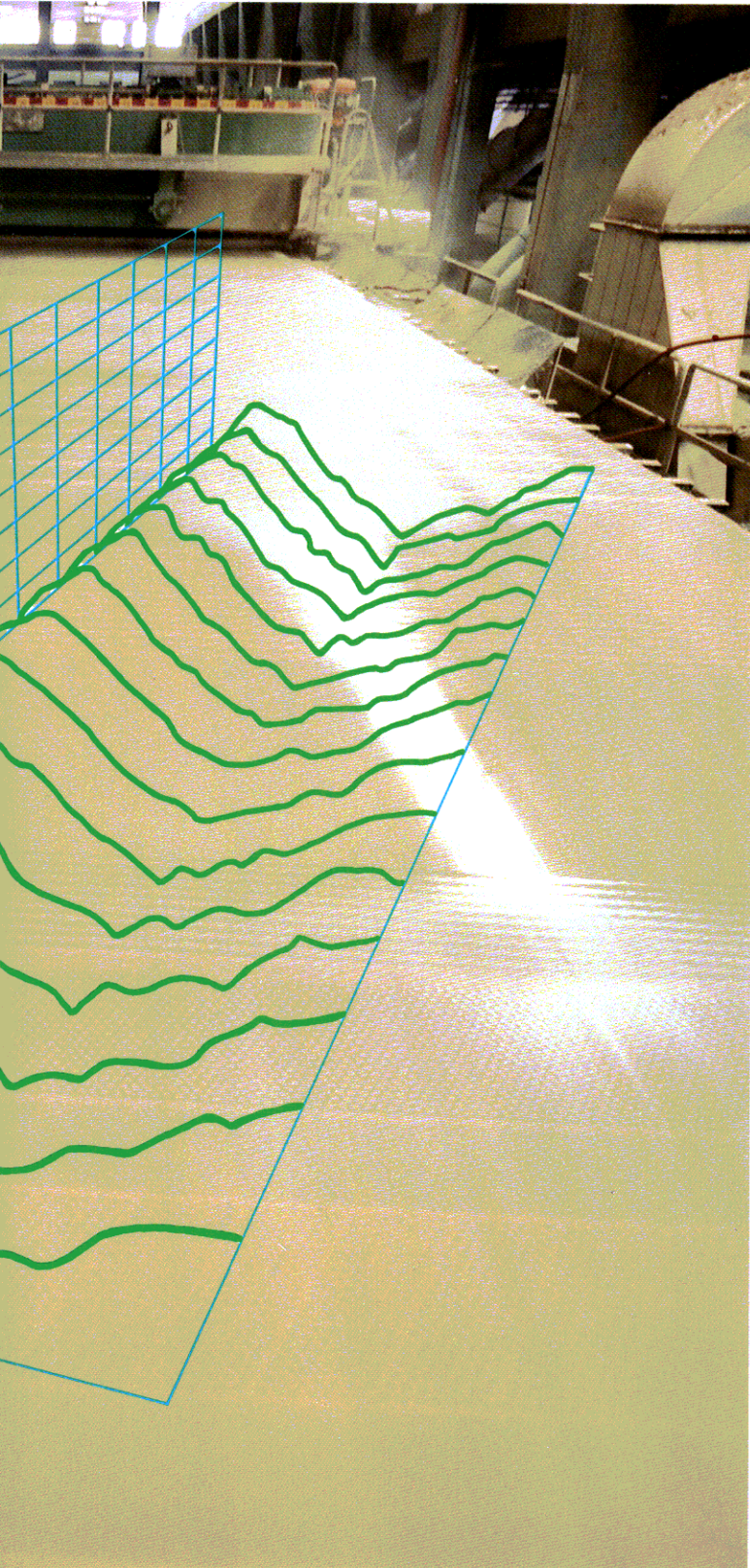
When you consider that converting logs into paper requires more money per ton than making steel from ore, it's not surprising that measurement and control systems have traditionally been sold on their ability to increase productivity while reducing manufacturing costs. During the 1980's, growing demands for improved product quality from printers and other end users have expanded the industry's requirements to include not only optimization of manufacturing costs but product quality as well.

Evidence of this trend is the 42% increase in total orders received for AccuRay Profile Manager cross-machine controls of weight, moisture, caliper (thickness) and reel hardness. The benefits of cross-machine control are so attractive, nearly every new paper machine system now includes at least two of these controls. And even though its acceptance is widespread, this particular market is just beginning to be penetrated. That makes the potential market for cross-machine control as large as that for complete new systems — and makes cross-machine control a major part of AccuRay's opportunity to double pulp and paper industry revenues by 1990. Since this technology is being actively transferred into several other markets, such as plastics and metals, cross-machine control will play a key role in increasing AccuRay's overall revenues.

Cost-effectively meeting the demand for improved paper quality helped increase total orders for AccuRay Profile Manager cross-machine controls by over 40% during 1984. The new Cross-Machine Profile History video display is shown superimposed over the wet-end of a paper machine.



**Measurement technologies used:
Electro-Mechanical, Radio Frequency,
Microwave, Infrared, Visible Light, Ultraviolet,
Nucleonic/X-Ray**



Products & Progress

AccuRay provides customers with a measurable difference in each of the three major areas of cross-machine control: accurate measurements of the parameter to be controlled, superior control logic, and fast implementation through the most complete line of actuators. When used in combination with existing machine-direction controls, Profile Manager can achieve a rapid payback by further reducing product variations 50% to 80%.

In order to accurately measure a product for cross-machine control, sensors must meet stringent demands. Instead of needing just the average of a parameter from a single scan across the sheet, cross-machine control requires a specific value for every portion of the sheet.

The AccuRay MICROSCAN Caliper Sensor was developed to meet these increased measurement needs. Uniform paper thickness has emerged as one of today's top quality parameters since thickness variations can severely hamper high speed printing and converting operations. Introduced in 1983, over 100 MICROSCAN Caliper Sensors have been ordered and proven accurate in measuring thickness down to 0.35 microns. To illustrate how accurate that is, one micron is equivalent to 1/60 the width of a human hair.

In addition to accurate measurements, cross-machine control requires fast, reliable actuators. If you think of sensors as the eyes of the control system, then you can think of actuators as the hands. They take the system's control commands and translate them from electronic signals into changes in steam, air and water flow, as well as valve position. These changes are determined by control logic within the 1180 MICRO System that "learns" from each interaction with the process, then anticipates the impact of future control adjustments.

AccuRay has targeted superior actuators as one of its **measurable differences** and allocated manpower and funding to create the most complete line of actuators available in the industry. These actuators, which are either manufactured by AccuRay or produced to AccuRay specifications under OEM purchasing agreements, cover a wide range of customer needs and return-on-investment criteria. At year-end 1984, actuator orders accounted for nearly \$2.7 million of our equipment backlog.

Pulp

Market

Over the past several years, there has been a growing need in the pulp and paper market to integrate process, product and production control to improve paper quality and reduce the cost per ton. In 1984, AccuRay and Honeywell took a major step toward meeting that need by agreeing to market a new product implementing AccuRay's measurement and supervisory control through the Honeywell TDC 3000 distributed digital computing system.

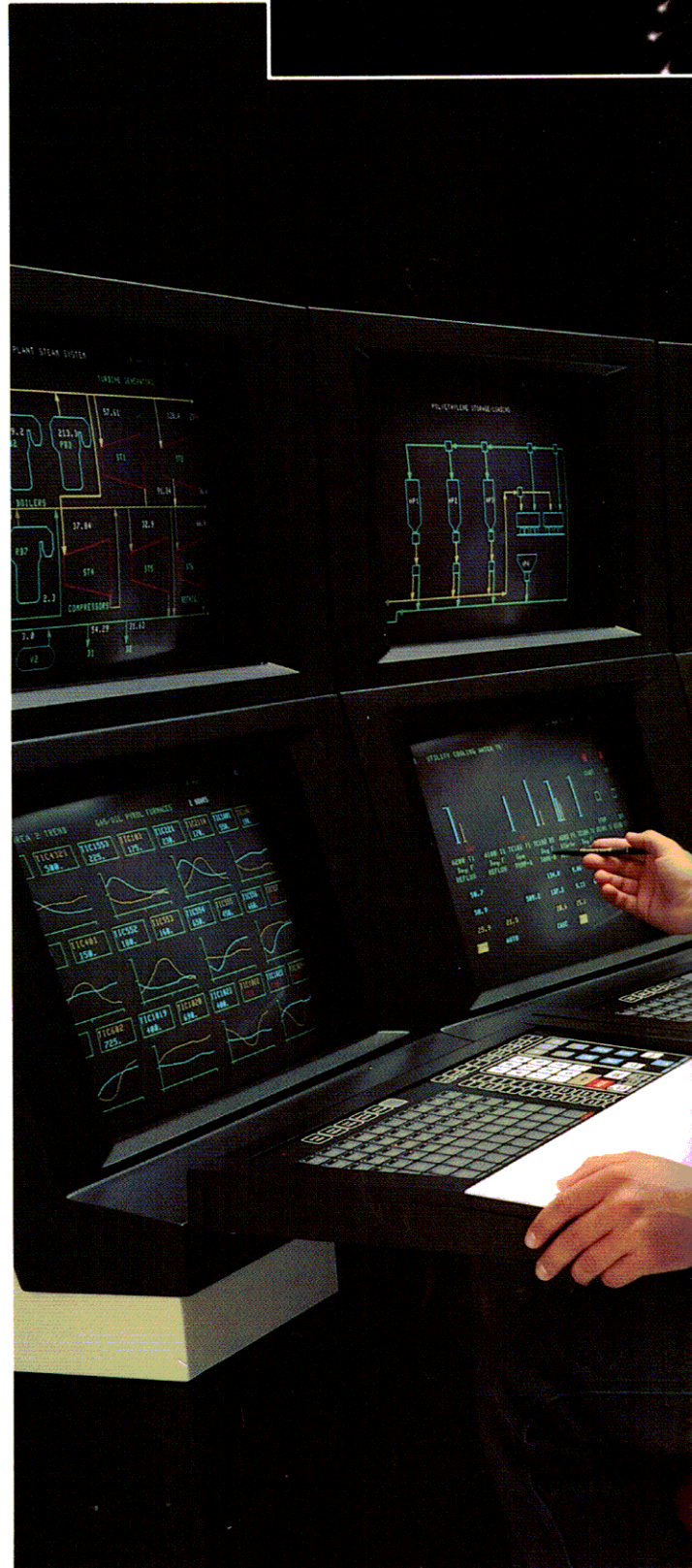
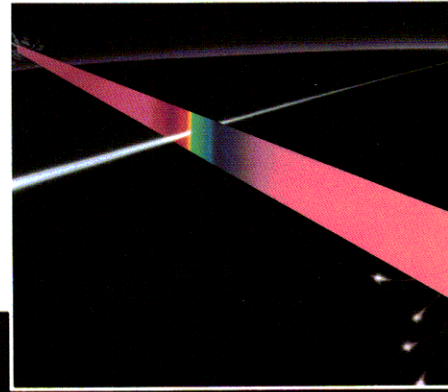
As industry analyst Ole-Kristian Fadum put it:

"The agreement gives AccuRay..(and) Honeywell an edge over their competitors. (It) also confirms that most of the functions which previously required a packaged computer system can be done more easily and less expensively in a distributed control system.

"The industry reaction to this agreement appears to be favorable and it has definitely created a lot of scrambling among the major competitors."

Indeed, the industry reaction has been favorable. Already this new product has significantly increased the volume of pulp system orders from the U.S. and Canada. With the potential to provide a single window to the entire papermaking process, this new product will substantially improve AccuRay's pulp and paper business volume over the next five years. However, profit margins on OEM supplied products, such as this and actuators, are expected to be lower than on AccuRay's other pulp and paper products.

Through an OEM agreement to purchase Honeywell TDC 3000 hardware, AccuRay is now offering a Fiberline Control System that combines state-of-the-art distributed computing architecture with AccuRay's proven expertise in pulp mill control.





Products and Progress

Unlike flat sheet products, control of liquid pulp requires measurements of the process rather than the product. To best achieve this, AccuRay has teamed with Honeywell to introduce a new system for pulp mill control.

Initial cooperation between the two companies dates back to 1969 when AccuRay specified Honeywell for its first computer-based measurement and control systems. Subsequently, the Honeywell Level 6 minicomputer became an integral part of AccuRay's system architecture. During the latter part of the 1970's, AccuRay acquired a Honeywell 68/80 MULTICS Computer and created a highly efficient software factory for both development and production purposes.

In April 1984, this past cooperation helped lead to a potent new teaming of the powerful Honeywell TDC 3000 distributed digital computing system — a new product born of an \$80 million investment — with AccuRay's measurement systems, optimizing controls and application expertise. Already, a new pulp mill control product has resulted from the agreement. Now, additional capabilities are being added to achieve a universal window to optimize the entire production process — from the pulp mill through the paper mill. Further expansion plans utilizing product introductions by both AccuRay and Honeywell will achieve the true integration of product, process and production control within a plantwide automation system.

Besides creating an advanced product offering, this agreement allows AccuRay to focus its research and development efforts on areas of **measurable difference** — superior application packages for measurement and specialized control — efficiently interfaced to a larger, distributed control system. In 1984, we invested heavily in this area, increasing overall research and development funding by 23%.

Wood Products

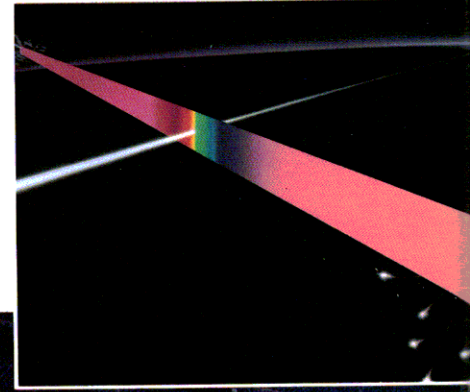
Market

Despite continued uncertainty over mortgage interest rates, housing starts, housing demand and lumber prices, AccuRay's revenues from this market continue to increase. As our products continue to penetrate the sawmill market in the South and Pacific Northwest, we look for revenues from solid wood products to triple by 1987.

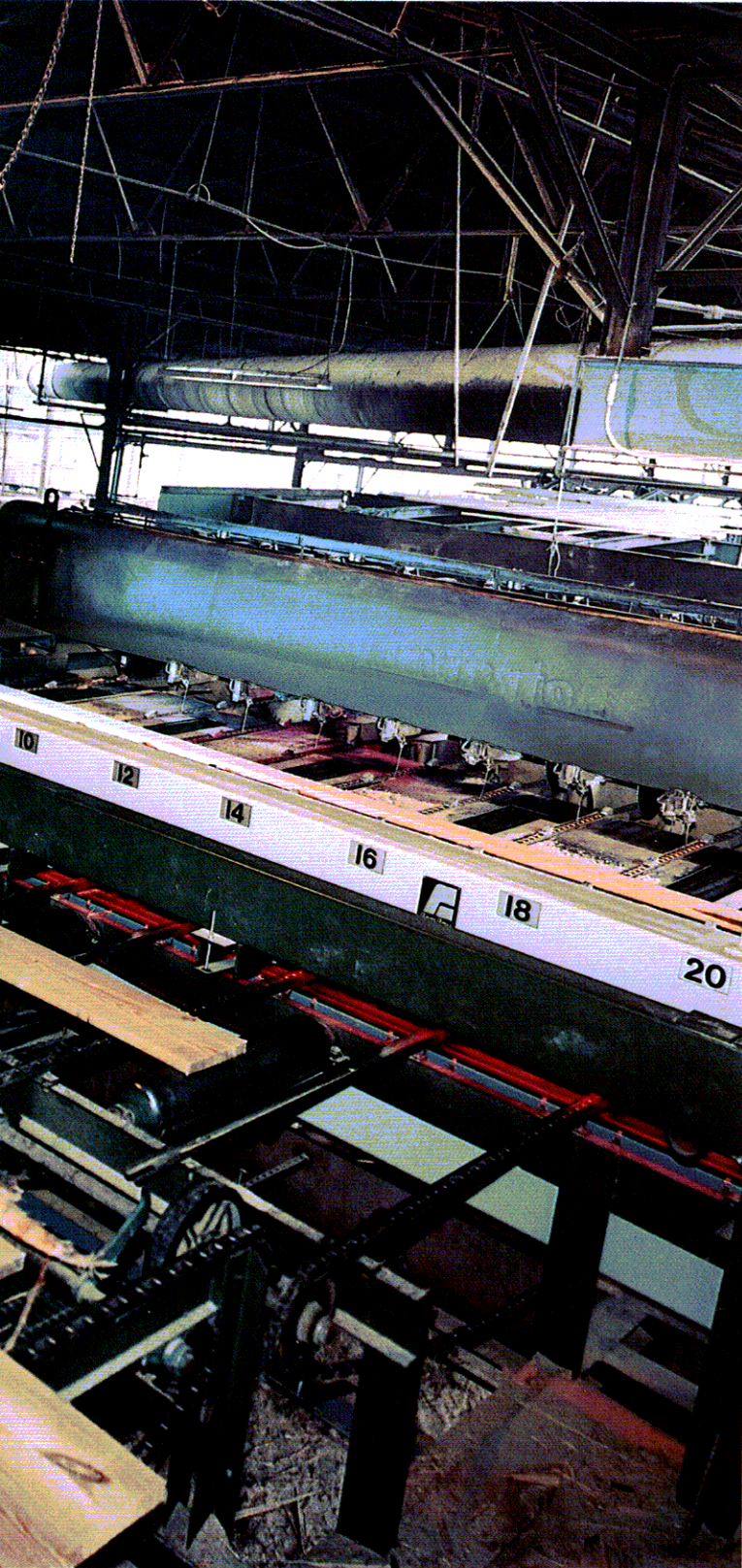
The industry's acceptance of computers and electronics, such as AccuRay sawmill automation equipment, has been hastened by recent economic conditions, as well as raw materials mostly composed of smaller logs that produce fewer boards. Especially in the case of smaller logs, the impact automation has upon utilization of the lumber (lumber recovery) can turn marginal operations into profit makers. AccuRay measurement and control systems meet these needs by improving lumber recovery and raising board quality (value) to help offset the rising cost of raw materials, labor and energy.

AccuRay's leadership position in trimmer optimization was strengthened in March of 1984 by the introduction of an IBM Personal Computer-based Trimmer Optimizer System. This new offering broadens the product line and expands the total market potential for Trimmer Optimizer systems.

By broadening the Trimmer Optimizer product line to include an IBM Personal Computer-based system, more sawmills can now afford the industry's best Trimmer Optimizer.



Measurement technologies used: Electro-Mechanical, Infrared, Visible Light



Product and Progress

A typical sawmill usually produces only 50% to 65% of the lumber that could theoretically be processed from a log. The balance is converted into chips or sawdust which are worth much less than lumber. AccuRay's products help sawmills turn more of their logs into lumber and less into chips and sawdust.

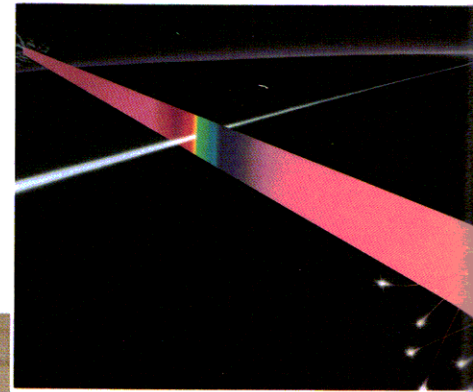
AccuRay is the only supplier using optical measurements of board length, width and shape, along with a unique combination of rotary-optical sensors and specially-designed profiling arms. These provide an accurate, two-sided measurement of lumber thickness and shape. This **measurable difference** allows the AccuRay system to determine an optimal cutting solution from among several alternatives, position the piece and then cut it into one or more boards with the highest possible market value.

Other unique advantages are the number of service options and personnel we can offer as this industry's largest optimization supplier, as well as our system's ability to provide quality control reports that trace production problems to their source. To date, these proven abilities have saved the typical sawmill almost \$1 million a year and helped AccuRay achieve more Trimmer Optimizer installations in North America than all our competitors combined.

AccuRay Corporation has just expanded this product line with an IBM Personal Computer-based system offering our advanced cut logic and control at a significantly reduced price. In addition to measurement and control, this product provides statistical quality control and production reports that can be used to improve the efficiency of the sawmill's various machine centers. With this new system, AccuRay products now meet the needs of a broader base of North American sawmills.

AccuRay continues to fund projects to enhance current sensors, expand controls, and introduce new products, such as the development of Bucking and Primary Breakdown Systems. Bucking is the process in which the complete tree trunk is sawn "cross-wise" into standard-sized, shorter sections or logs. Automatic measurement and control of this process will allow sawmills to recover more lumber, as well as more valuable lumber, from the same amount of logs. After Bucking, logs are cut "length-wise" by Primary Breakdown equipment into roughly cut, untrimmed planks ready for further processing into finished lumber products. Measurement and control to optimize this process will improve lumber yield, enhance quality and lead to greater productivity for the sawmill.

Tobacco



Market

Following years of continuous growth, cigarette production has now leveled off, mostly due to low population growth in developed countries, coupled with the impact of legislation and taxation.

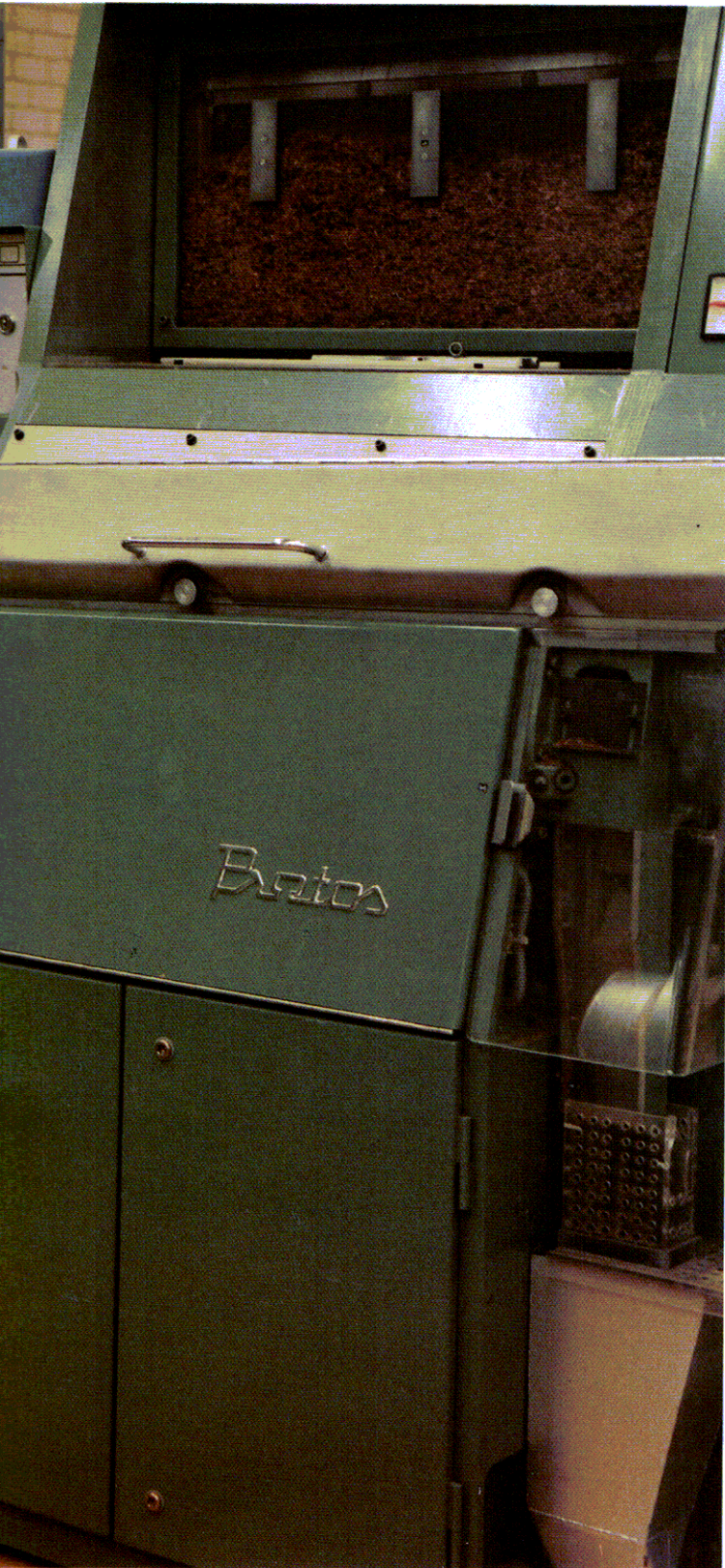
Although lower market growth rates have had little impact on current revenues and profits, cigarette manufacturers are well aware that the future vitality of their business is dependent upon gaining a larger share of the current market. To achieve this, they are paying special attention to product quality and the productivity of manufacturing operations: two areas where AccuRay products play a vital role. Quality is important to market share because as prices rise, so do consumer expectations for consistently high product quality. If consumers perceive that quality is not in line with the cost, they may switch to another brand. To preserve profitability, cigarette manufacturers must maintain manufacturing volume and get the maximum productivity out of both existing equipment and new high speed makers.

With over 30 years experience in this business, AccuRay has established a strong position with the several large companies who manufacture most of the world's cigarettes. In fact, AccuRay systems are presently at work in the factories of every major cigarette producer in the world.



With the most complete line of measurement, inspection and control products, AccuRay is the leading supplier of application packages for the cigarette-making industry.

**Measurement technologies used:
Infrared, Visible Light, Nucleonic/X-Ray**



Products and Progress

To meet the quality and productivity trends emerging in the tobacco industry, AccuRay has introduced, or is developing, a variety of new, **measurably different** application packages.

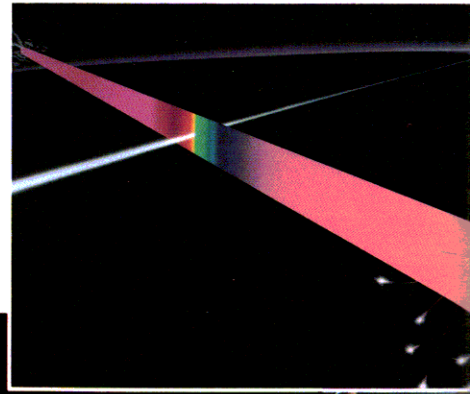
One new product being prepared for 1985 introduction is an entirely new cigarette rod weight measurement to accurately and reliably measure cigarettes at speeds in excess of 10,000 per minute. Along with increasing the speed of our measurements, the system's data handling and reporting must also increase. To meet this need, our major product for the tobacco industry, the 7000 MICRO™ System, is being enhanced with new microcomputer hardware and software to process these faster measurement signals; and we are doubling the memory capacity of the 7000 MICRO's machine interface, the Video Display Module.

Another new product being prepared for market introduction will expand the input, output and computing capacity of the 7000 MICRO System so other areas of the cigarette fabrication process can be tied into the AccuRay system. This product will help achieve improved efficiencies by better coordinating the functions of combined maker/tipper/packer complexes. Also, by helping cigarette manufacturers better maintain, utilize and, in some cases, replace existing cigarette machine electronics, we expect that this module will extend the useful life of existing cigarette production machinery.

In addition to new product introductions, we continued to enhance existing products during 1984. One example is the new multi-beam tip scanner added for the Cigarette Inspection Module (CIM)™ to improve its filter tip inspection capabilities at speeds in excess of 10,000 cigarettes per minute. CIM is an on-line optical measurement that detects not only physical flaws like holes and protrusions, but also flaws in appearance, such as discoloration. It removes over half of the cigarettes consumers would complain about and traces the causes of quality problems to their source for immediate correction.

Through a fourfold increase in the number of infrared light beams used by the CIM's tip scanner, a wider range of cigarette filter lengths and configurations can now be inspected. This enhanced optical inspection allows CIM to more effectively detect and reject filters that are too small or have bad filter wraps, such as potentially "leaky" filters where the paper wrap is not properly fastened to the filter. This latest enhancement to the CIM module, along with an improved rod scanner incorporated into the product during 1983, has kept CIM the most advanced and effective cigarette inspection device available.

Metals



Market

The successful 1983 introduction of the 7000 MICRO, a microprocessor system for measuring the thickness of flat rolled sheet, strip and foil, continued into 1984 as aluminum and steel industry demand doubled our equipment revenues.

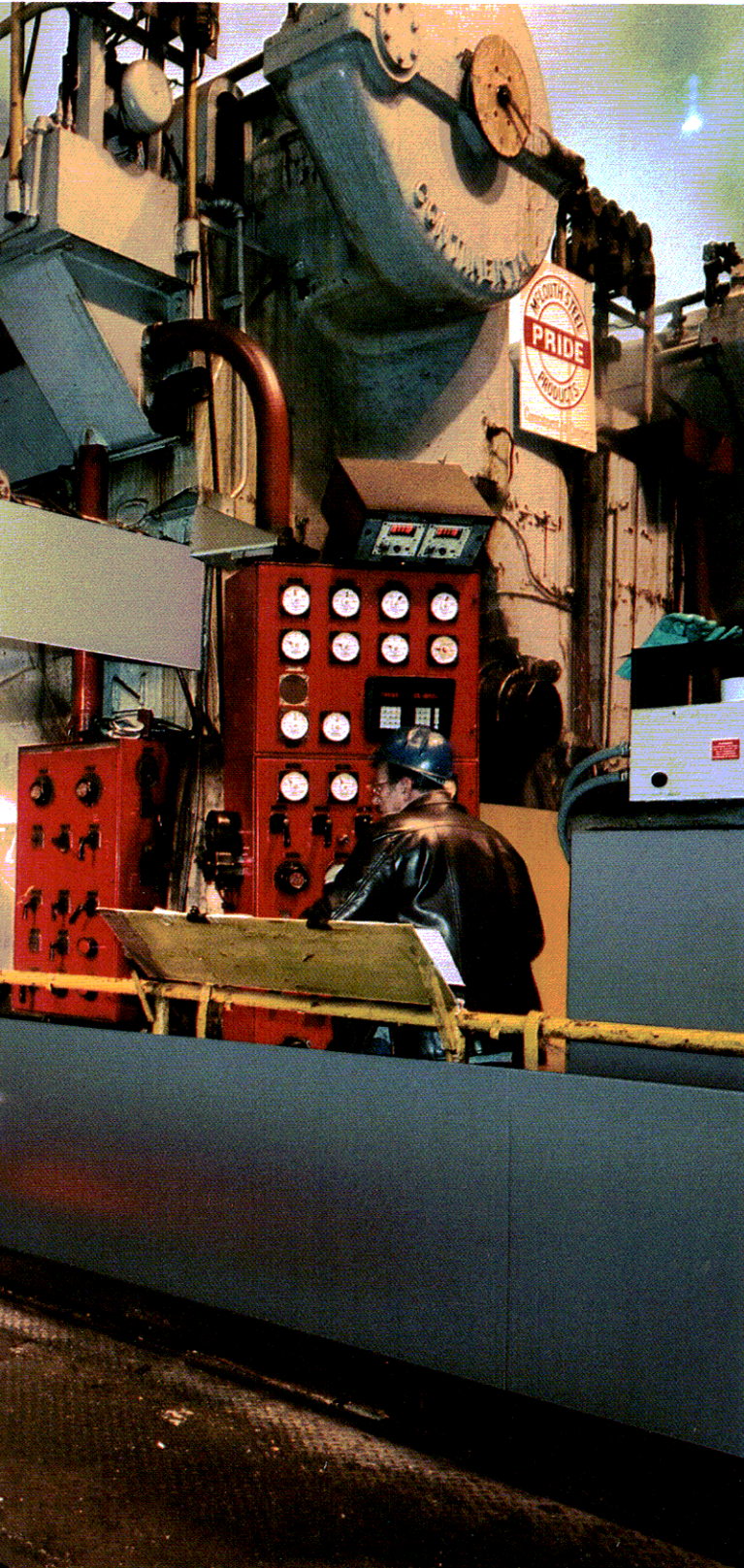
To meet increased customer demands for better quality (tolerance) specifications, these industries are investing in AccuRay measurement systems because they are faster — measure more of the product — and more precise. In many cases, end-users, such as can and auto manufacturers, require verification of the product's quality through statistical quality control (SQC) reports — like the one-page SQC report compiled by the 7000 MICRO.

Most of the business increase in this renewed market has come from North America, where AccuRay has a large installed base and an established market position. With the current healthy economy, this trend should continue as hundreds of older technology measurement systems are upgraded or replaced with the 7000 MICRO.



Stable, accurate measurements can improve the uniformity of rolled metal products by 50% or more, allowing manufacturers to squeeze more product and profit from their raw materials.

Measurement technologies used: Nucleonic/X-Ray



Products and Progress

AccuRay is the leading supplier of thickness measurement systems for the aluminum sheet used to make cans, auto bodies, siding for houses and other products. This leadership has been achieved because our measurements are simple, accurate and reliable. Also, our nucleonic measurement approach costs less to maintain than alternative approaches and is insensitive to alloy variations.

As thickness requirements have been tightened, so has our customers' need for faster measurements that see more of the metal strip as it's made and inspected. AccuRay's metals sensors meet this need with a measurement frequency of 100 times per second. In addition, the 7000 MICRO uses four microprocessors for four times the measurement signal processing of competitive designs. In aluminum foil, where X-ray measurement technology is used, our response time is up to 20 times faster than competitive offerings. In addition, the measurement is twice as accurate and three times less sensitive to changes in alloy composition. This **measurable difference** is the result of a proprietary, long-life, low-energy X-ray tube developed specifically for AccuRay. Both in the U.S. and in Europe, customers are finding our approach more accurate, less costly to purchase, easier to use and cheaper to maintain.

The 7000 MICRO System also compiles all of the measurement data it has gathered, creating a one-page statistical quality summary. By allowing manufacturers to document the quantity and quality of metal rolled into each coil, this report fits right into the statistical quality reporting systems now emerging in steel and aluminum. The system's quality control capabilities are so attractive that rolling mill inspection lines — where the primary economic benefit is improved quality — have been frequent customers.

Although the 7000 MICRO was introduced in 1983, AccuRay has been a supplier to the metals industry since 1950. As a result, there are hundreds of analog technology systems installed in the sixties and early seventies that are nearing the end of their useful life. With the 7000 MICRO System, these customers can install the latest in microprocessor technology while retaining their investment in existing measurement platforms and sensors.

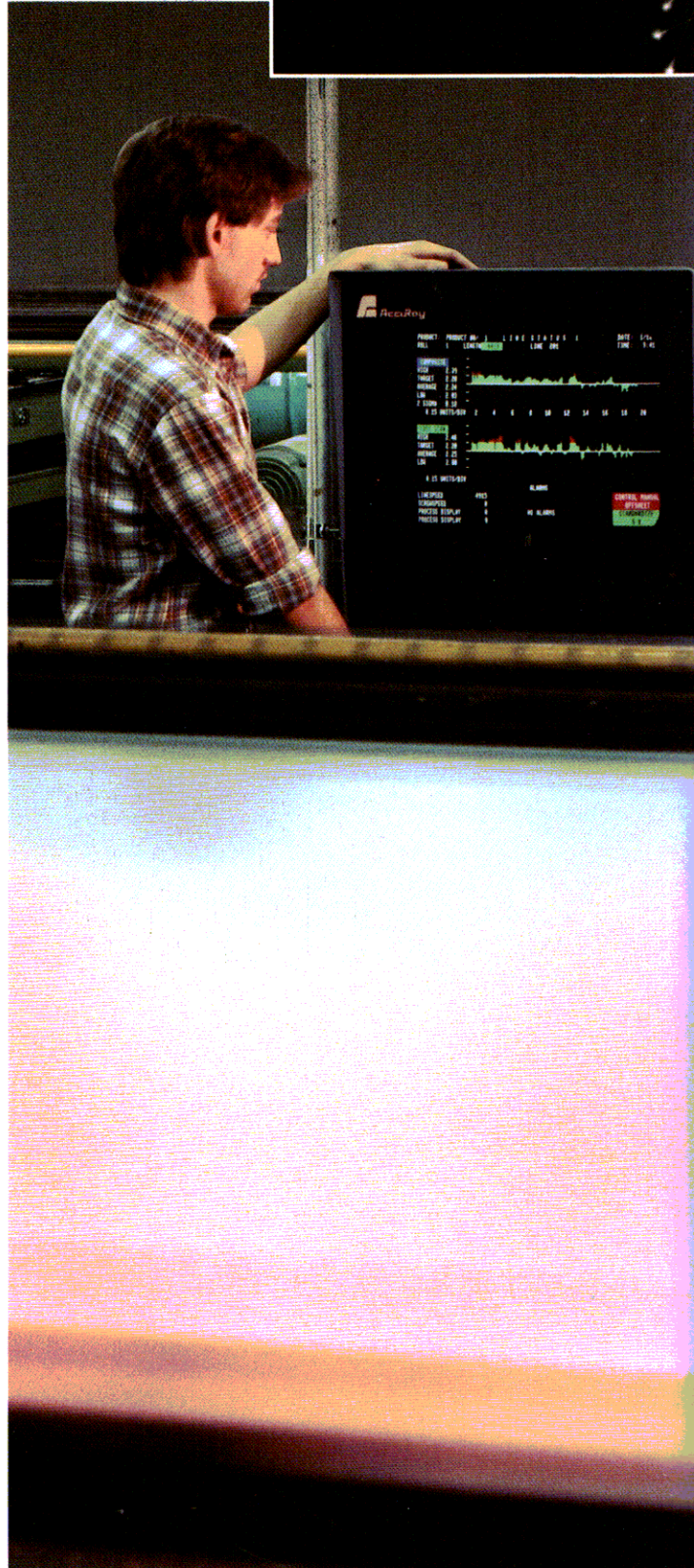
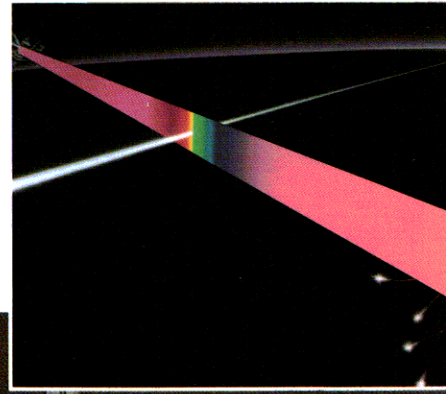
Plastics

Market

Manufacturers of extruded plastic come in a wide range of sizes from large corporations to small, custom operations. And the products they produce — including extrusion coating, aseptic packaging, fiberglass insulation and vinyl — create a variety of potential markets and demands for AccuRay systems. That's why AccuRay has a two-tiered product offering for this market.

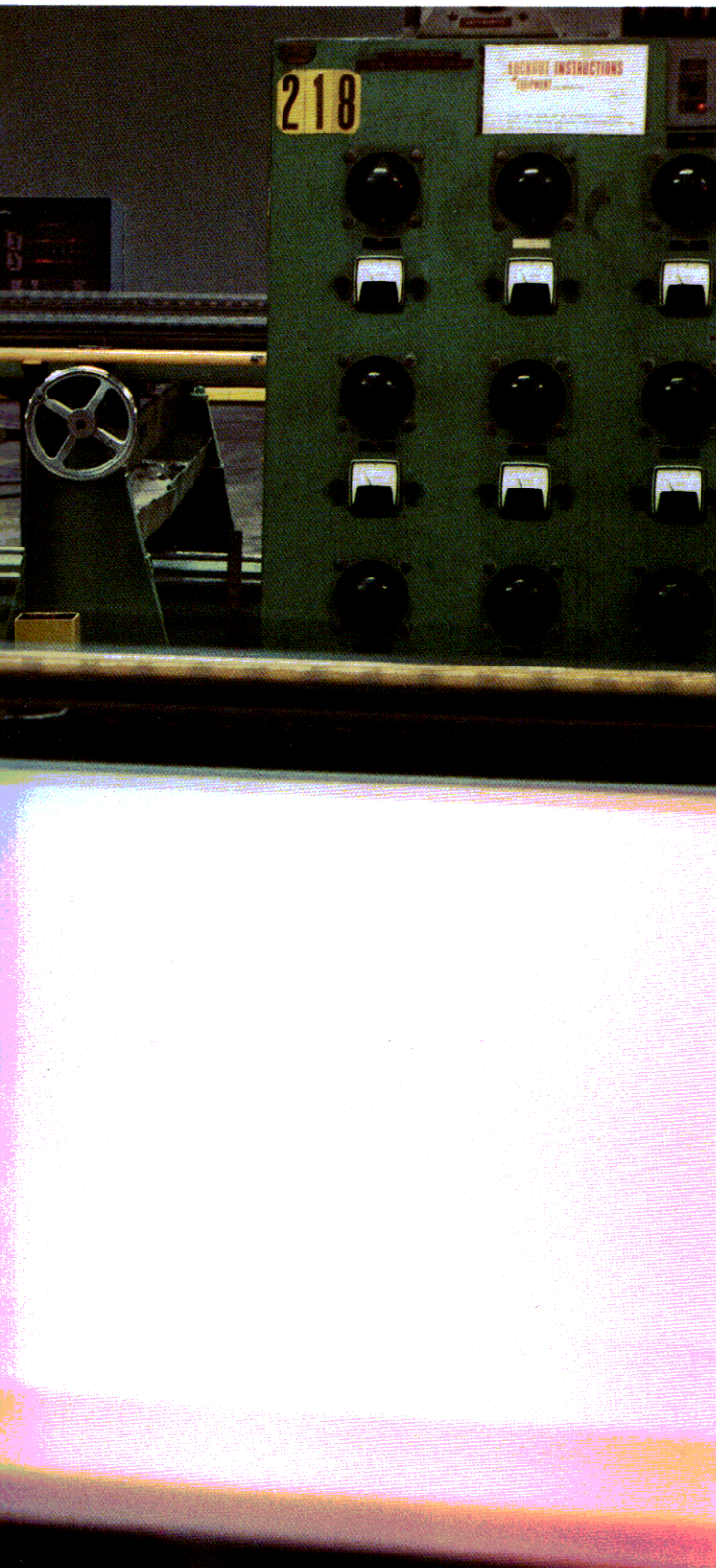
The first scanning 7000 MICRO System was introduced in 1984 to meet the needs of a large, growing segment of this industry looking for accurate thickness measurement and display systems for single extrusion lines. Our other product offering for this industry, the 1180 MICRO System, continues to be the premier measurement and control system for complex applications. To date, this system has earned a large portion of the aseptic packaging measurement and control business in Europe, Asia and the Third World. In the U.S., AccuRay's position should help earn a large share of the market for the 100 new lines that will be started up by 1990 — more than twice the number of lines that existed throughout the world in 1983.

With two systems, AccuRay can now address more segments of this growing market and can expect significant increases in business volume from the plastics industry during 1985 and beyond.



The first scanning 7000 MICRO System was introduced in 1984 to measure and display the thickness of flat plastic sheet and film on individual extrusion lines.

Measurement technologies used: Infrared, Nucleonic



Products and Progress

AccuRay established a **measurable difference** in the plastics industry through an ability to perform unique measurements. One example of this is measuring each of the several layers in aseptic packaging material. This capability to customize measurements to the specific process has allowed us to develop unique measurements — unmatched by competitors — for Polyvinyladin Chloride (PVDC), Ionomers, Ethyl Acrylic Acid (EAA) and other specialized co-polymers.

The new 7000 MICRO measurement system is the latest example of AccuRay's measurable difference in the plastics industry: accurate, reliable measurements in an affordably priced microprocessor-based system. The 7000 MICRO System achieves rapid economic results by getting extruded film or sheet products on-grade faster, reducing the amount of off-spec material produced and reducing thickness variations. Because of the system's ability to trace thickness fluctuations to individual die bolts, extruders can expand their system to include cross-machine (automatic die) control.

Since we've been a supplier to the plastics industry for over three decades, most prior technology AccuRay system installations — there are over 600 — can upgrade to the 7000 MICRO at a very low cost by retrofitting their existing scanning platforms and sensors.

For processes requiring more sophisticated control, especially in multi-layer coextrusion, aseptic packaging, fiberglass insulation, vinyl calendering and extrusion coating applications, the 1180 MICRO System is a well-established product. This leadership position can be attributed to unique measurement and control capabilities, such as in aseptic packaging where up to eight plastic, paper and foil layers are melded together to form a complex extruded sheet. The 1180 MICRO has also performed well in measuring and controlling the amount of glass fiber and binding material used to produce a continuous sheet of fiberglass insulation. By achieving a more uniform sheet of insulation, manufacturers can achieve better adherence to specified insulating values, while optimizing raw material and energy consumption.

Directors and Officers

Directors

Edward McC. Blair

Senior Partner
William Blair & Co.
(Investment Banking)

Christopher J. Campbell

Executive Vice President
AccuRay Corporation

Henry R. Chope

President
The Chope Company

Dr. J. Laurence Kulp

Vice President -
Technology Strategy
Weyerhaeuser Company

William M. McLaughlin

Chairman
Calibre Corporation

Dr. David L. Morrison

President
IIT Research Institute

David L. Nelson

President
AccuRay Corporation

George F. Schlaudecker

Consultant

Robert E. Swenson

Senior Vice President -
Finance
AccuRay Corporation



Robert E.
Swenson

Christopher J.
Campbell

George F.
Schlaudecker



Dr. J. Laurence
Kulp

William M.
McLaughlin

Dr. David L.
Morrison



Henry R.
Chope

David L.
Nelson

Edward
McC. Blair

Operating Officers of AccuRay Corporation and Subsidiaries

William L. Adams
Senior Vice President

Walter H. Canter, Jr.
Vice President

Maxwell L. Close
Vice President

Donald D. Danison
Vice President

John E. DeWitt
Senior Vice President

Mark K. Duyck
European Controller

John E. Eickelberg
Vice President

John T. Fleckenstein
Vice President

David J. Foster
Vice President

Ladd R. Grapski
Controller

Herbert J. Kahn
Senior Vice President

Vincent J. Mahoney
Director of European Finance

James D. Mitchell
Senior Vice President

Dennis A. Orwig
Vice President

Ronald F. Shuff
Secretary and General Counsel

Douglas J. Spence
Vice President

John C. Witherspoon
Vice President

Robert F. Zust
Treasurer

AccuRay Corporation Principal Offices

Corporate Headquarters and Manufacturing

650 Ackerman Rd.
Columbus, Ohio 43202
Tel: (614) 261-2000

Manufacturing

Finnabair Industrial Park
Dundalk
County Louth
Republic of Ireland
Tel: (353) 042-36201

Argentina:

Av. Santa Fe 1780
Oficina 907/8
1060 Buenos Aires
Tel: (54) 41-4160

Australia:

Suite 5, Forum Centre
522/24 Kingsway
Miranda
New South Wales 2228
Tel: (61) 2-525-2767

Benelux Countries:

Genevestraat 10
1140 Brussels
Tel: (32) 2-2162440

Brazil:

Rua Beneficencia Portuguesa, 24
S/411
CEP 01033
Sao Paulo
Tel: (55) 11-229-1388

Canada:

3525 Ashby
St. Laurent
Quebec H4R 2C1
Tel: (514) 331-5670

Finland:

Salomonkatu 17 A 12
00100 Helsinki 10
Tel: (358) 0-6940844

France:

8, Rue Auguste-Renoir
78400 Chatou
Tel: (33) 3-9521754

Germany:

Holzgasse 29-33
52 Siegburg
Tel: (49) 2241-64087

Italy:

Via A. Volta 16
20093 Cologno Monzese
Milano
Tel: (39) 2-2538051

Japan:

New Kudan Building No. 7
3-Chome Kanda-Jimbocho
Chiyoda-ku
Tokyo 101
Tel: (81) 3-2659465

Korea:

Room 1105, Lions Building
50-6 Chung Moo Ro 2KA
Chung-ku
Seoul
Tel: (82) 267-1180

Mexico:

Avenida de las Palmas 731-704
Piso 7
Lomas de Chapultepec
Mexico 10 D.F.
Tel: (905) 520-6058

New Zealand:

65 Marquerita Street
P.O. Box 1643
Rotorua
Tel: (64) 73-476928

Singapore:

55 Ayer Rajah Crescent -07-17/19
Ayer Rajah Industrial Estate
Singapore 0513
Tel: (65) 779-3811

South Africa:

7th Floor
Standard Bank Building Arcade
4th Street
Springs
Tel: (27) 011-569171

Spain:

Calle Milanésado 21-23
Barcelona 17
Tel: (34) 3-203-2254
(34) 3-203-2208

Sweden:

Bergshojden 32
Box 7102
S-17207 Sundbyberg
Tel: (46) 8-980835

United Kingdom:

Coronation Road
High Wycombe HP12 3TA
Tel: (44) 494-442171

United States:

Suite N
2866 Dauphin Street
Mobile, Alabama 36606
Tel: (205) 476-2580

Suite 303
Suffield Center
Suffield, Connecticut 06078
Tel: (203) 668-1217

Suite 240
4800 S.W. Macadam Avenue
Portland, Oregon 97201
Tel: (503) 248-1191

Piedmont Center Building
33 Villa Road, Suite 400A
Greenville, South Carolina 29615
Tel: (803) 271-8730

711 North Lynndale Drive
Appleton, Wisconsin 54914
Tel: (414) 739-2383

