# Industrial Nucleonics Corporation Annual Report 1971


Industrial Nucleonics applies
AccuRay automation and management information systems
to basic manufacturing processes to increase productivity,
reduce costs, and improve product quality.

## Financial Highlights

| Year Ended December 31 | 1971 | 1970 | Increase |
|---|---|---|---|
| Total Operating Revenues | $37,591,086 | $27,599,763 | 36% |
| Net Income Before Taxes | $ 5,110,429 | $ 4,429,119 | 15% |
| Net Income | $ 2,680,429 | $ 2,402,119 | 12% |
| Net Working Capital | $21,258,233 | $11,047,948 | 92% |
| Primary Net Income Per Share | $0.81 | $0.74 | 10% |

## To Our Stockholders and Employees:

Industrial Nucleonics completed the fiscal year ended December 31, 1971, with a growth record for nine consecutive years of increased revenues and earnings. This was also a year of progress for our Company in its transition to a broader based supplier of process automation and management information systems. Multi-industry acceptance of the new AccuRay® systems and services brought to market since 1969 resulted in total revenues for 1971 in excess of $37 million. During the mid-year period, we experienced some delays in receipt of anticipated orders; however, during the fourth quarter, orders exceeded $9 million for equipment and related services to be completed within twelve months, a 100 percent increase over the corresponding period in 1970. Thus we began 1972 with a continuing record of profitable growth based upon many successful new system installations in diverse industry segments and the proven competence of our experienced team of qualified personnel.

### Financial Summary

Total revenues from sales, rentals, and services amounted to $37.6 million in 1971 compared with $27.6 million for the previous year. Profits before taxes on this business were $5.1 million, yielding profits after taxes of $2.7 million compared with $2.4 million for 1970. These profits for 1971 resulted in primary earnings per share of 81 cents. All figures represent the consolidated performance of Industrial Nucleonics and its subsidiaries.

### Application of New AccuRay Systems

Virtually all orders received in 1971 were for new products introduced within the last three years to the paper, rubber, plastics, metals, tobacco, and food industries. During the year a series of initial design systems were shipped with the objective of rapidly expanding our potential for repeat orders for each new application. Many of these systems incorporated new features such as "Automatic Grade Change Control," "Speed Optimization Control," and "Dynamic Target Optimization Control." However, these system designs represent variations of our basic AccuRay 800, 700, and 600 product lines which have been developed as "master" or core systems. Included among these new system configurations shipped during 1971 were:

- An AccuRay 811 system with automatic grade change and automatic speed change for a paper machine manufacturing publication grades of paper.
- An AccuRay 832 system with target optimization control for both basis weight and moisture for a paper machine with on-machine coating for the manufacture of coated papers.
- An AccuRay 821 system with speed optimization control for a paper machine producing corrugated medium.
- An AccuRay 821 system with automatic grade change, speed optimization control, and target

optimization control for a paper machine producing linerboard.

- An AccuRay 824 system with automatic grade change control for a paper machine with on-machine coating for the foodboard industry.
- An AccuRay 811 system with target optimization control for a paper machine in the newsprint industry.
- An AccuRay 722 system designed for an off-machine coater in the coated book paper industry.
- An AccuRay 800 system with target optimization control for a tire fabric calender in the rubber industry.
- An AccuRay 620 system with automatic control and a process status display for coater processing in the plastics industry.
- An AccuRay 800 system with target optimization control designed for multiline impregnation processing in the industrial laminating field.
- An AccuRay 800 system with target optimization control of zinc coating on steel for the galvanizing industry.
- An AccuRay 800 system for the tobacco industry with advanced control of cigarette making and with automatic control of moisture in the bulk tobacco processing.

Our performance in 1972 will depend greatly upon our ability to capitalize on the success of each initial systems installation and to achieve repeat business in each industry segment. We have active marketing programs under way to contact potential users of these systems and to encourage visits to present installations in order to demonstrate the results being achieved. We anticipate a higher order level throughout 1972 and beyond as customers continue to gain experience and realize increased benefits from these new AccuRay systems.

**New Product Introductions**

During the year we continued our planned diversification with the introduction of additional systems for many new market segments in each customer industry. This expanded line of AccuRay automation systems has evolved from a planned research and development program begun in 1965. Our total investment in this research and development program will reach approximately $11 million by mid-1972. Recent introductions include:

- An AccuRay 1000 system for the tobacco industry which combines automatic moisture control in the bulk process with an overall control and information package for the cigarette making and packing processes.
- An AccuRay 800 plant-wide process management system for multiline extrusion in the plastics industry featuring throughput maximization control and continuously up-dated video profile display.
- An AccuRay 780 dedicated digital computer control system for the paper industry with such new features as multiplex capability over several paper machines and video presentation of key production and process data.
- An AccuRay 510 system for total thickness measurement of steel, aluminum, and other ferrous and nonferrous alloys on rolling mills and processing lines in the metals industry.

Within the wide range of basic systems available and the system configuration options with each generic system, Industrial Nucleonics can supply each customer with the best "application package" for his particular manufacturing operation. In addition, each system has the support of a full spectrum of systems engineering, applications engineering, and field customer engineering services.

Throughout the year we have applied the cost accounting technique of associating the learning costs on initial system applications with anticipated orders for similar applications in the future. This accounting method has aided in the rapid expansion of the basic AccuRay 800 development during the present period to new applications and industries. In 1971 this program increased our inventory valuation by approximately $1 million which had the effect

The latest advancement in information readout is the new AccuRay Video Information Center which provides customer personnel with a single data source for all process and product information.

of deferring these costs into later years. Our experience continues to show that subsequent shipments of similar systems are produced at much lower costs.

**Planned Expansion**

During the last two years, we have substantially increased both our professional staff and our physical plant and facilities to accommodate the higher level of manufacturing operations. We have made significant progress in our manufacturing standardization programs, and our new personnel are now being efficiently utilized both in manufacturing and in our field operations. The result is that we can now offer routine shipment on all major new product lines which will aid in achieving improved profit margins during 1972.

At year end we reorganized our business into two operating groups in a move designed to bring hardware and software development closer to our customers' needs. One new group, encompassing marketing and related services, will increase our applications effort to take advantage of new and developing opportunities for automation systems in the basic manufacturing industries. The second operating group, responsible for development and manufacturing, will exploit rapidly advancing technologies and develop innovative concepts to lead Industrial Nucleonics into new business areas.

Significant progress has been made in our marketing activities to stimulate new programs based upon the achievements of initial installations. As each new system was completed, we sent special invitations to key executive and operating personnel in various industries to visit our facilities in Columbus for a complete demonstration of the systems capabilities. During the year we had more than 600 customers visit Columbus from our user industries.

In addition, a complete AccuRay computerized automation and information system for the paper industry is currently on an 8-month tour through 20 major cities in the United States, Canada, and Europe. The interest and success in this demonstration, entitled "8 Profitable Hours in the Life of a Paper Machine," have been outstanding. To date, a total of 726 paper industry executives have participated in the demonstration whereby a complete paper machine operation is computer simulated.

In this high technology field, our basic strength is our people. By year-end 1971, corporate employment reached 1,418 permanent employees, half of whom are professional personnel. The total represents a 16 percent increase over 1970. We enjoy a high level of youth and enthusiasm as the average age of our employees is 32 years. The experience of our top management is yet another strength in that the average period of working together for our top 20 professional and technical personnel is now 16 years. It is upon our people that we predicate the leadership and growth of Industrial Nucleonics in 1972 and the future.

**Leasing Business**

AccuRay Leasing Corporation is presently managing a total portfolio of AccuRay automation systems in the field which represents $41 million valued on an original sales basis. Again during 1971, we noted a continuing trend toward the full-payout, or long-term, lease. Such leases are written for terms of 5, 8, or 10 years. We currently have agreements with First National City Bank and Manufacturers Hanover Trust of New York under which they will finance our long-term leased systems. When our customers desire shorter term leases for terms of 1 or 3 years, we are able to provide financing from a $9 million extension of our joint venture agreement with the St. Paul Leasing Company, a subsidiary of the St. Paul Companies, Inc., of St. Paul, Minnesota.

To support these leasing programs, Industrial Nucleonics issued and sold $15 million of 5½ percent convertible debentures in June 1971. Proceeds from this issue not initially needed for the lease program were applied to reducing the Company's short-term indebtedness. With the combination of commercial bank commitments and the proceeds of the recent debenture issue, we feel that the Company has adequate financial resources for the foreseeable future.

**Future**

The last several years have seen a significant transition in the Company to a broad systems supplier of process automation and management information systems. This has required considerable investment of resources in personnel, facilities, and capital for the necessary research, development, and product introduction. The rapid growth in total revenues of Industrial Nucleonics is the result of these commitments in resources. Presently, we believe the strength of the Company is in our broad diversification by industry, by system and product line, and by geographical markets. We remain optimistic for continued success in the years ahead as our AccuRay systems play a major role in industries here and abroad by increasing productivity, reducing costs, and improving product quality.

David L. Nelson
President

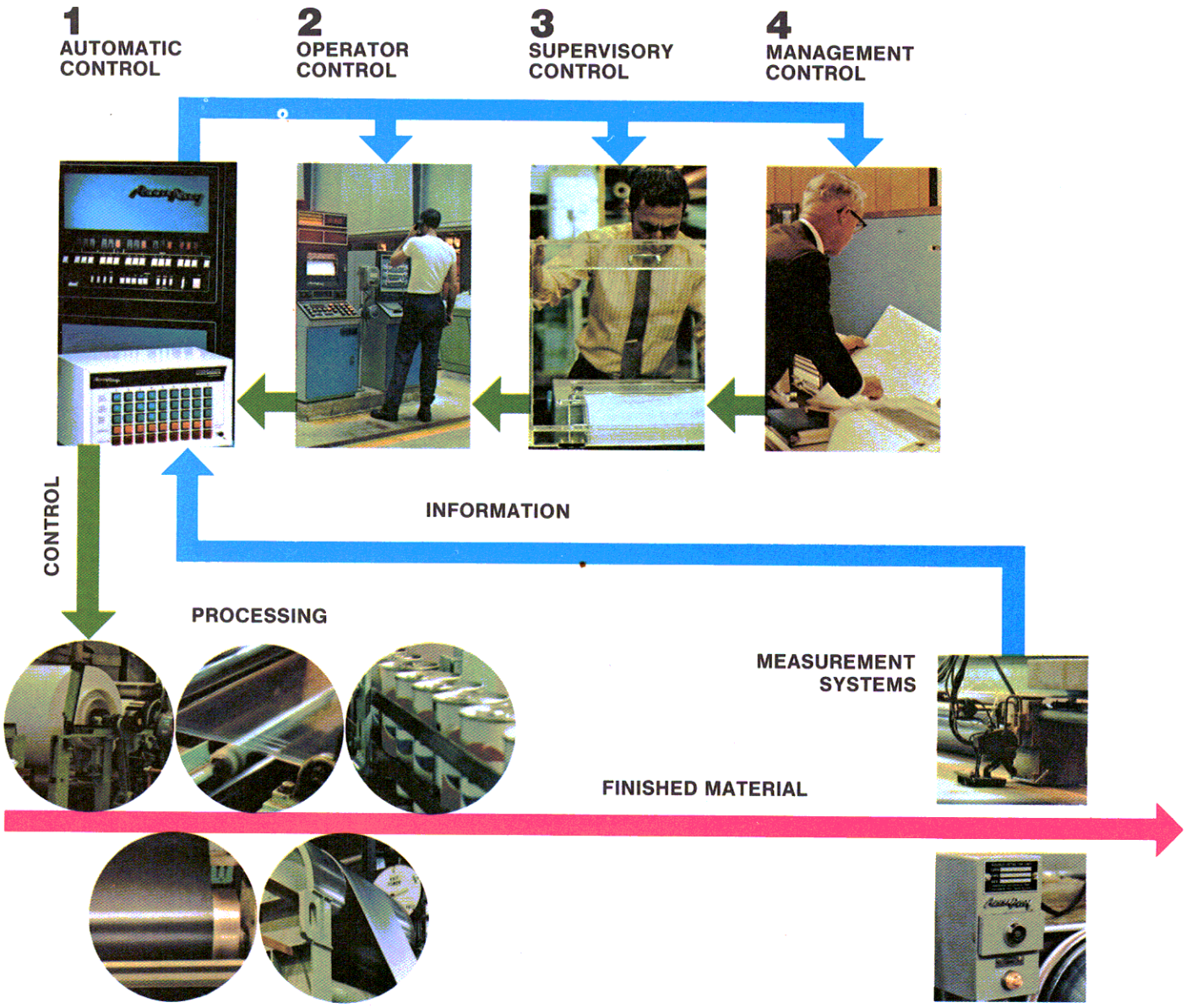
**Control Functions**
AccuRay systems accomplish a high degree of automation based upon real-time continuous measurements of customers' products and processes. They supply various levels of supervision with important information according to a unified, corporate-wide data base. Level 1 represents automatic control of process machinery. Level 2 represents information and control capabilities for the machine operator. Level 3 represents summary data offered supervisory personnel on process performance, production rates, and product quality. Level 4 represents economic and efficiency information generated for management.

# Expansion by system line

**EXPANDED SYSTEM FUNCTIONS** The functions of AccuRay systems fall into two broad categories: (1) automating manufacturing operations, and (2) providing information on costs, performance, and product quality. Control functions generally occur at four levels. Level 1 represents automatic control of process machinery according to preset standards or tolerances. Level 2 represents the various information readouts and control capabilities provided the machine operator at his AccuRay information center. Level 3 represents key information offered supervisory personnel on process performance, production rates, and product quality on a demand or summary basis. Level 4 represents the highest level of control at which information with regard to cost, efficiency, and profits is generated for management. Functional advances were made in AccuRay systems within all four levels of control during 1971.

Control functions at Level 1 have increased steadily to meet customer application needs. Automatic grade change, introduced by Industrial Nucleonics in 1970, demonstrated considerable improvements in process economies in the paper industry in 1971. Over 2600 automatic grade changes were effected by AccuRay systems during the past year with documented savings for the customers. With this feature the AccuRay system automatically makes adjustments to take the customer's machine from one product at a certain speed and weight to a new product at a different speed and weight in a much shorter period of time. Automatic grade change has achieved in certain applications a 50 percent reduction in the time that off-sheet or scrap material is produced during a grade change, thereby increasing the productivity of the machine.

Other innovations at Level 1 include target optimization control and speed optimization control. In the paper industry, as an example, target optimization control automatically adjusts the fiber-moisture content of the sheet for the most economical product of paper or board. Continuous collection of measurement data and calculation of product variance are made so that the program can periodically shift control set points to save fiber and add moisture. This patented control strategy increases yield of product from given raw materials input while keeping off-grade production at a minimum. Like-




wise, speed optimization control adjusts speeds to conform with most advantageous machine conditions.

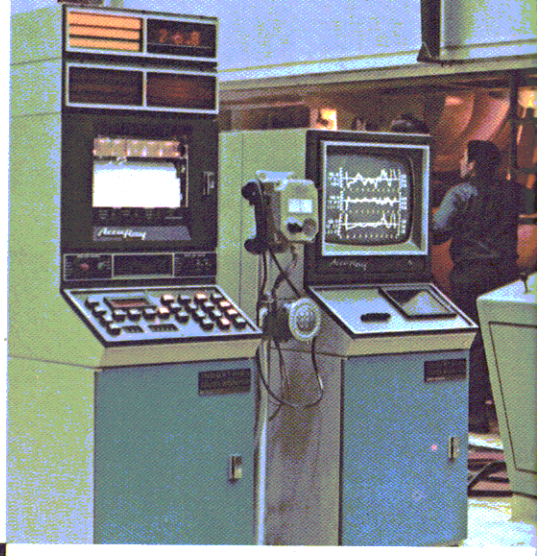
Progress also continued in 1971 in more extensive plant automation systems. In a number of operations, including plastics extrusion, cigarette making, and industrial laminating, multiple machines or lines were integrated into a central control and data processing center. This function allows for each line to be operated independently; yet the customer gains the ability to control his entire operation according to a centralized automation program and receive comprehensive information on his total plant.

Automatic grade change, target and speed optimization controls, and multiline automation all represent extensions of existing Level 1 functions to provide greater economic results for customers. At Levels 2, 3, and 4, functional innovations have concentrated on providing increased quantities of information in more accessible form for the customer's operating, supervisory, and management personnel.

Measured variations in product and process characteristics have been historically presented on chart recorders, graphic plotters, and various data logging devices. Use of the digital computer has allowed summarization of considerable process information in typewritten reports, with color alarm bars, and with numeric display. The latest advancement in information readout is the new AccuRay Video Information Center (VIC) which provides a television display.

The primary function of this new television display is to provide customer personnel with a single data source for managing their total manufacturing operations. Important real-time information is presented instantaneously in an easily readable format. The Video Information Center utilizes multiple channel television to display both graphic and numeric information on the

**Systems Line**
The AccuRay systems line has been broadened to offer each customer the most appropriate combination of equipment, control strategies, information, and services for his particular manufacturing operation. Existing AccuRay 800, 700, and 600 product lines were expanded by function and application while three new lines—the 1000 for tobacco, the 780 for paper, and the 510 for metals—were added to meet special applications needs. This growth in product line has been the result of planned investments in research and engineering begun in 1965.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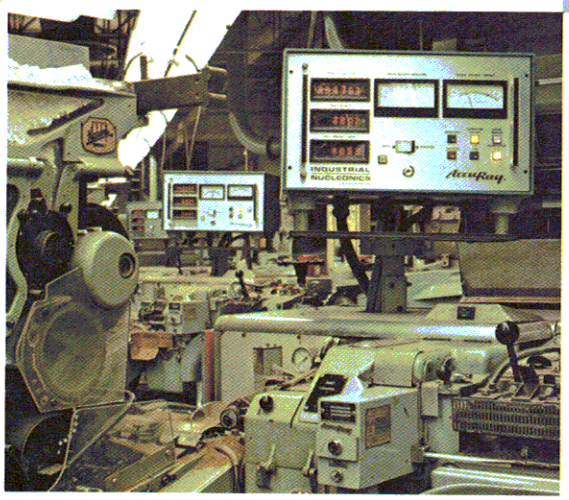
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600

product and the manufacturing process. In addition, television cameras can be positioned throughout the plant and tied into the system for actual viewing of remote processing operations. The VIC eliminates the need for earlier machine room typewriters and makes conventional cathode ray tube memory scopes obsolete by continuous display of key operating information. Printed copy reports, however, are retained for record and study purposes.

Customer interest in the new Video Information Center has been high throughout the paper, tobacco, and plastics industries which have already experienced benefits from this information display. Expansion of the video principle to other industries is expected in the near future. Availability of all process and product information instantaneously at a single station has been a valuable addition to the AccuRay family of systems.

Information and control of customer operations have been extended beyond the Company's traditional process applications. AccuRay systems are now being applied to sequential processing operations such as the bulk moisture control prior to the cigarette making process in the tobacco industry. Information generated from earlier stages of the customer's operation enables plant management to better control business in line with total plant or corporate objectives.

**GROWING PRODUCT LINE** Industrial Nucleonics has expanded its functions and services in line with customer needs for increased productivity, higher quality, and improved economics. The AccuRay systems line has likewise been expanded to offer the most appropriate and economically justifiable combination of equipment, control strategies, information, and services for each customer's particular scope and type of application. At present, Industrial Nucleonics offers nine basic system

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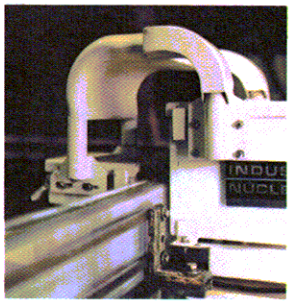
700

1000

SERIES E

780



PROCESS

lines, ranging in price from $20,000 to $1 million per installation. A brief description of these systems follows:

**AccuRay 1000** — Full-scale computer-based system for tobacco industry which combines automatic moisture control in the bulk processing with overall control and information for the cigarette making and packing processes.

**AccuRay 800** — Full-scale automation and information system with an integral digital computer to provide video information, advanced controls, and summary production and management reports.

**AccuRay 780** — Dedicated digital computer control system for the paper industry with multiplexing capability over several machines and video presentation of key production and process data.

**AccuRay 700** — Computer-compatible, digitally based measurement, control, and information system with video information option.

**AccuRay C-700** — High-speed measurement, control, and inspection/rejection system specific to tobacco industry.

**AccuRay 600** — Measurement, control, and data system for the rubber and plastics industries employing digital operations and data presentation.

**AccuRay 510** — Digital measuring system for metals rolling processes with digital operator readout and control settings.

**AccuRay Series E** — Solid-state measurement, control, and data system for closed-loop control of continuous sheet processes.

**Process Industries Applications** — Density, level, and fill-level inspection systems for high-volume, nonsheet processes such as chemicals, petrochemicals, foods and beverages, mining, refining, utilities, and water reclamation.

**Field Services**
Industrial Nucleonics has developed a highly trained field organization to ensure that each customer receives maximum benefit from his AccuRay systems in terms of productivity, product quality, and economics. Account Managers are the front-line contacts with present and future customers. Systems Engineers train customer personnel, analyze their systems needs, and assist in effecting process efficiencies and economies. Service Engineers install, maintain, and service AccuRay systems in the customer's plant.

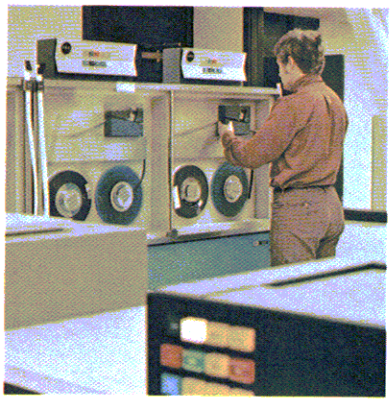
**EXPANDED SERVICES** To ensure that each customer has the opportunity to gain maximum benefit from his AccuRay system in terms of productivity, product quality, and economics, Industrial Nucleonics has developed a highly trained field organization and internal support team. The total field and marketing support organization today numbers over 500 individuals. Working in the field are account and regional managers, systems engineers, service engineers, and installations engineers. The number and variety of support personnel assigned to each installation depend upon the complexity of the system.

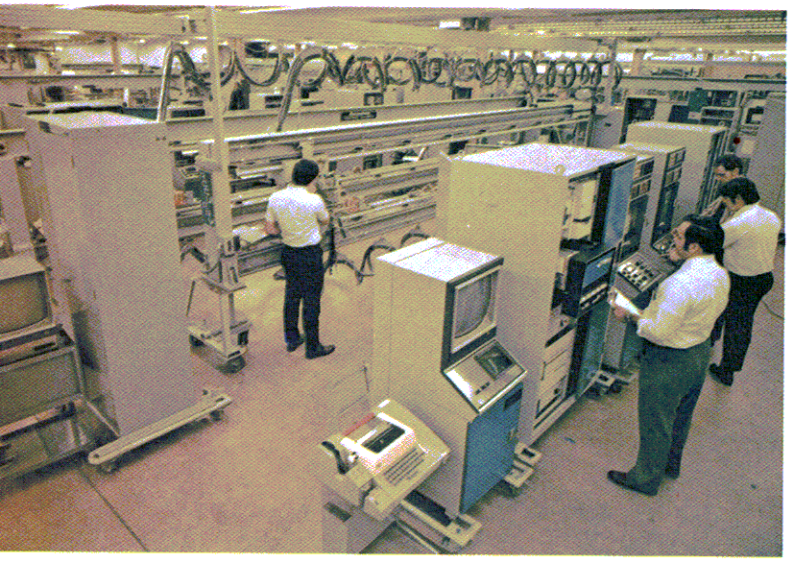
**Account and Regional Managers** maintain close liaison with the customer and home-office personnel to see that the customer's needs are met in the system designed for him. His responsibility and incentive extend well beyond making the initial sale as it is the results of one installation which sells the next. Account Managers are trained in engineering and business and generally serve a given territory within a distinct industry group.

**Systems Engineers,** likewise trained in engineering and business, are assigned the responsibility for making the control system provide the economic benefits for the customer. They train customer personnel, check out system performance, run in-depth analyses of the process, and work with customer management and operating personnel to effect any process efficiencies, quality improvements, and economic benefits.

Responsible for the system installation and maintenance are the **AccuRay Service Engineers.** They see that each new installation is planned and carried out with a minimum disruption to the customer's process. Regular maintenance programs vary according to customer requirements, but in most cases these personnel provide a full program of preventive maintenance, diagnostic and service functions.

In-house support of the field personnel and their



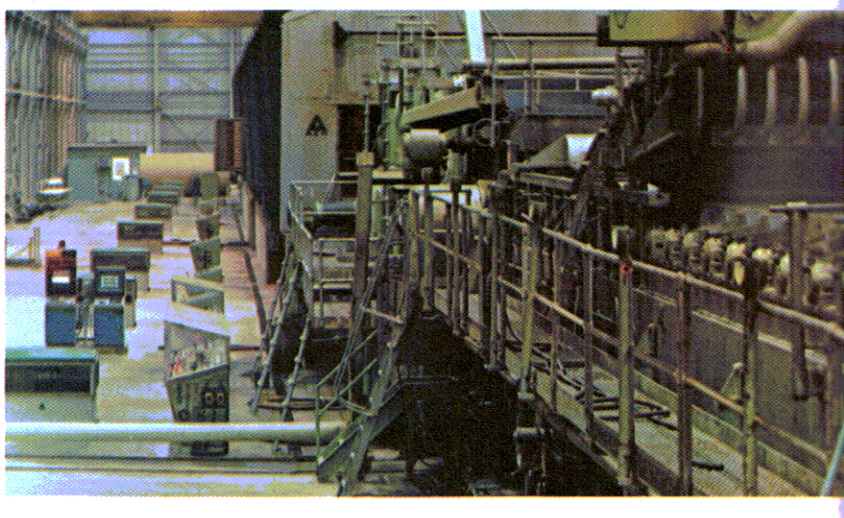


**Supporting Services**
Home office support of field personnel includes applications, control, computer, and management information specialists who are readily available for consultation throughout design, testing, installation, and evaluation. Further, close liaison between engineering and manufacturing personnel assures that each system is completely assembled, tested, and programmed prior to shipment for most efficient and effective system startup.

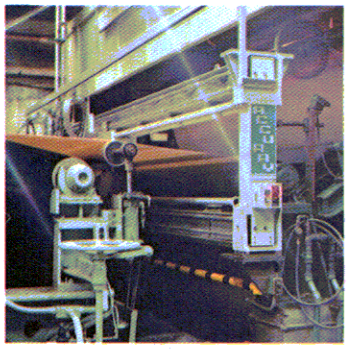
functions includes industry, applications, computer, and management information specialists. Each system is fully tested and programmed prior to shipment to ensure minimum customer down-time during installation. Throughout testing, installation, and the evaluation periods, specialists are readily available for consultation or systems support.

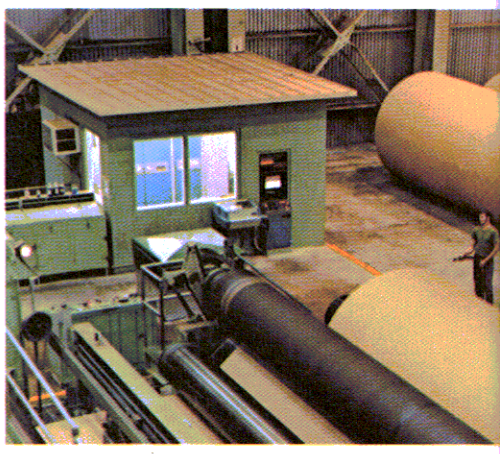
Training programs for both Industrial Nucleonics and customer personnel are another means by which the Company has broadened its services. It is important that AccuRay field personnel be very competent in the latest electronics and computer technology. For this reason, field personnel are periodically returned to the home office to update their technical skills and to learn of latest system functions and hardware available for customer use. In addition, customer personnel visits during the final stages of system production and testing have increased. These visits familiarize customers with the system capabilities so that effective use of the system begins immediately upon installation.

Extending customer services beyond the process or manufacturing level has also been an objective of Industrial Nucleonics. Primarily through the **AccuRay Information Services Division,** customers are offered consulting and design services for establishing company-wide information systems. Accounting, inventory control, general administration, and facilities management are but a few of the data processing and related functions offered. Information Services personnel are trained in computer sciences, systems analysis, business administration, finance, and industrial engineering. The Company's knowledge of the paper, rubber, plastics, metals, tobacco, and other process industries combined with this data processing capability gives Industrial Nucleonics good background for providing analyses and programs for the customer's total business operation.



**Paper**
Standardization programs have been completed for all major types of paper applications including fine writing papers, linerboard, newsprint, and coated papers. This broad line of AccuRay systems available to the paper industry offers customers a great variety of new functions and information readouts such as automatic grade change, target and speed optimization control, and video information display.





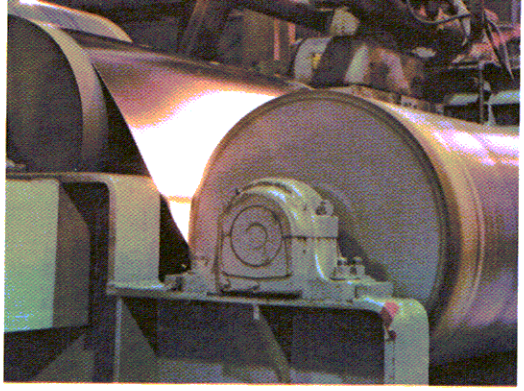
# Expansion by industry

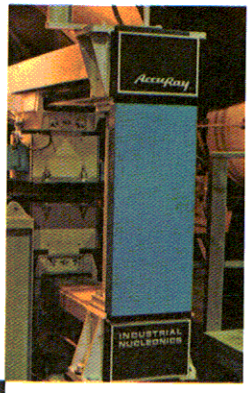
**RANGE OF INDUSTRIES SERVED** Industrial Nucleonics' leadership in the process automation field is perhaps best realized in its broad application of systems across the basic manufacturing industries—paper, rubber, plastics, metals, tobacco, mining, and foods. These industries each have their special needs with regard to process automation and management information systems. Yet they do have the common objective of producing maximum amounts of salable product per unit of raw material, labor, and operating cost. They are generally characterized as raw materials intensive industries with roughly 70 percent of their sales dollars devoted to raw materials and processing costs. AccuRay automation and information systems are designed to improve these two basic economic factors.

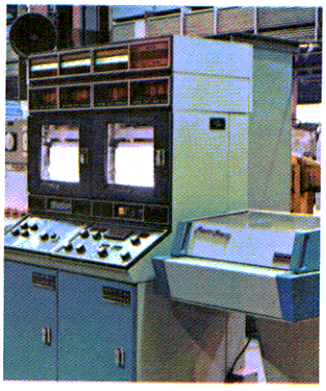
To achieve process economics requires that Industrial Nucleonics' personnel have considerable knowledge of each customer's manufacturing process from raw material inputs to machine operation to desired product characteristics to financial objectives. Over 21 years' experience with these industries gives the Company the ability to assess customer needs and determine the most advantageous system for his application. Organization of the marketing and service groups by industry has allowed concentration of efforts and development of knowledge critical to specific applications and customers.

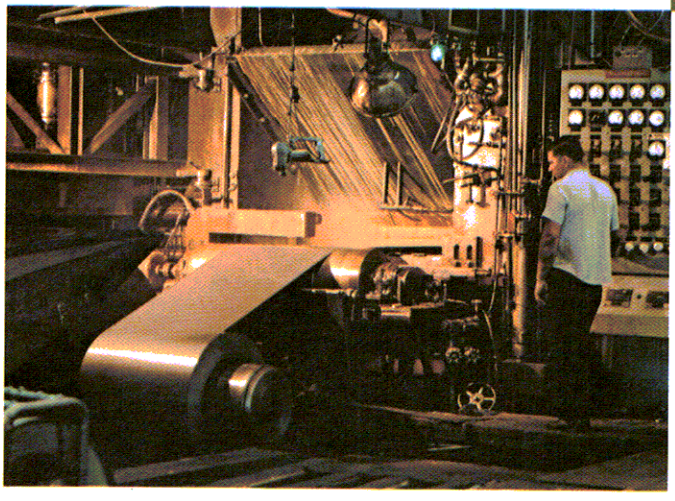
During 1971 delivery of the new line of systems was made to all of the industries served by Industrial Nucleonics. The results of these various industry programs provide good support for continuing penetration of present markets.

In the **paper industry,** the major accomplishment was the standardization of hardware and software programs for all major types of paper applications, such as fine

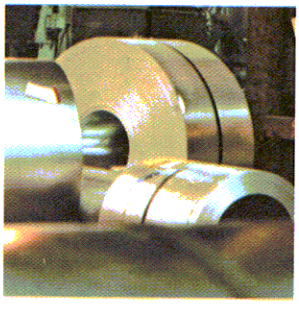






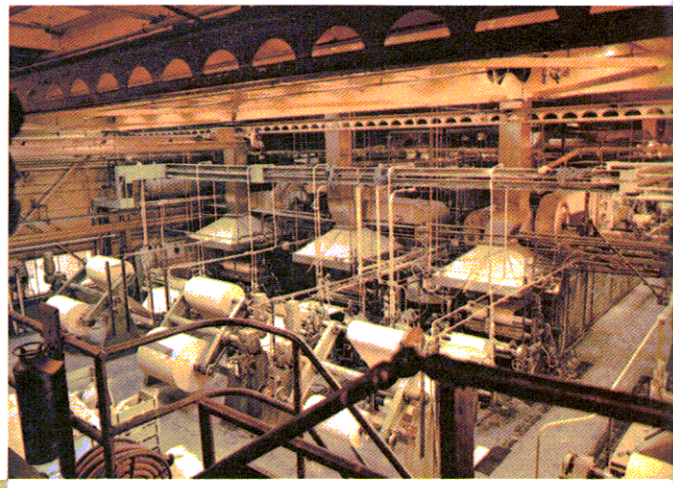
**Metals**
AccuRay computer-based systems are now automatically controlling zinc coating thickness on galvanized sheet with the objective of providing consistent quality and optimum raw materials usage. For metals rolling processes, the new AccuRay 510 system provides critical measurements of sheet thickness in a low cost digital configuration.



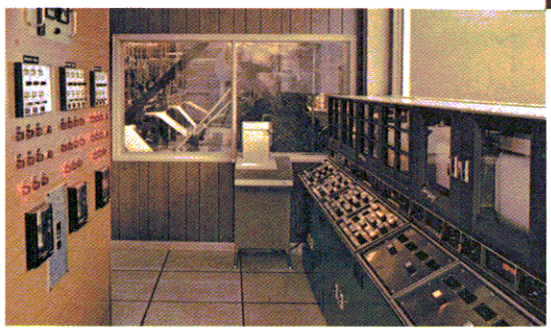
writing papers, kraft paper, linerboard, newsprint, coated papers. These initial design configurations required considerable engineering and programming investments over the past three years. However, repeat manufacture of many of these systems has already proved that improved shipment schedules and profit margins can be expected. Another major highlight of the year for the paper industry was introduction of the intermediate AccuRay 780 system which filled a customer need in function and price midway between the AccuRay 800 systems and the AccuRay 700 systems. It offers computer control capability to customers at a moderate price and thus broadens the alternatives for selection of an economically justifiable system. Also the Video Information Center was introduced to the paper industry along with several advanced control strategies.

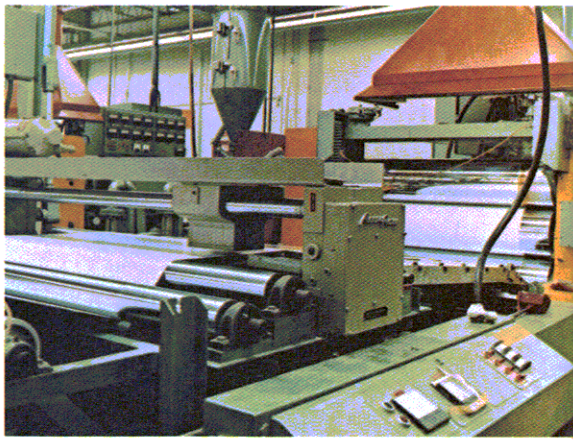
The **rubber industry** saw shipment of the first AccuRay computer-based system for tire fabric calenders. Major results have come from the utilization of target and speed optimization controls, again offered to these industries for the very first time. Also, preliminary developments in measurement of tread stock and fabric for steel belted tires appear to be promising additions to the present calendering program.

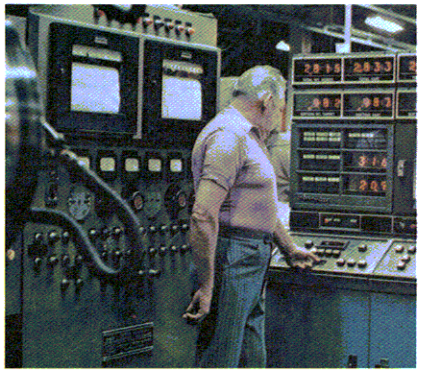
The **metals industry** too saw installation of its first AccuRay 800 system on a galvanizing line. The new x-ray fluorescence principle of measurement, new engineering techniques for automatically controlling the zinc coating thickness, and the availability of critical process information make this a very acceptable alternative for manufacturers of galvanized sheet. The management information system in this case is slanted toward proven quality and controlled consumption of the coating material. Also introduced to the metals industry was the special-purpose AccuRay 510 system for thickness measurements of steel, aluminum, and other ferrous and non-



**Rubber and Plastics**
AccuRay systems control the amount of rubber applied to tire fabric in the calendering process, ensuring efficient production, good economies, and uniform finished products. Newest development by Industrial Nucleonics for the plastics industry is multiline control through centralized automation and management information systems.



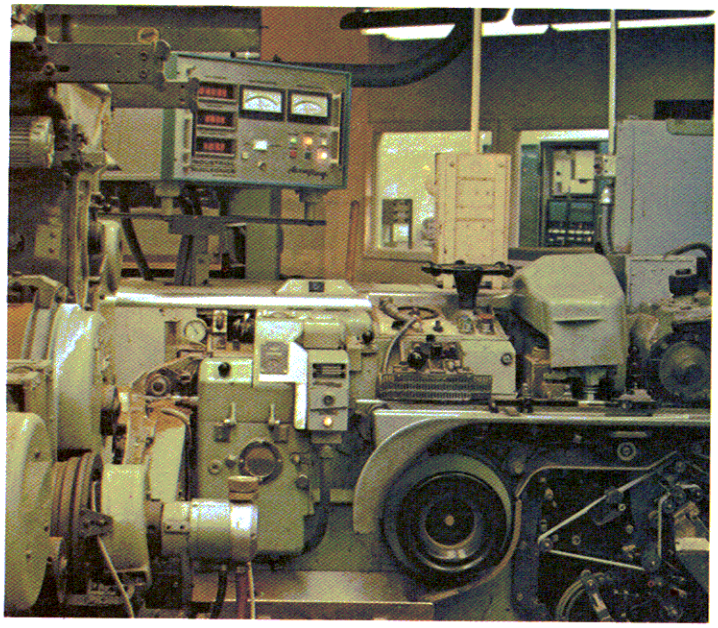


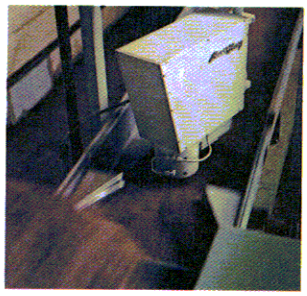


ferrous alloys on rolling mills and processing lines. This new system provides for rolling mills the important measurement functions with meter or recorder readout in a a low cost digital design.

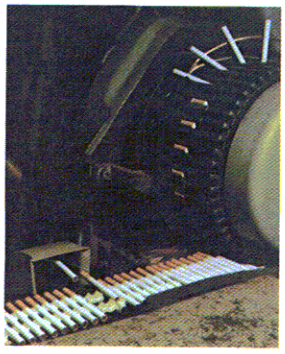
Diversity of applications was the goal within the **plastics industry** as well. AccuRay systems were shipped for extruded plastics, vacuum-formed plastics, and industrial laminates. Because most plastic manufacturers employ a number of lines within a given plant, a secondary goal was development of the multiline concept. By tying several manufacturing lines into a central computerized automation and management information system, the manufacturer was given the advantage of operating his entire plant on the basis of one program or objective. Information about all lines becomes readily available for assessment of production and economic efficiencies, yet independent control of each machine is retained. The multiline system was successfully developed for both extrusion and lamination during the year.

In the **tobacco industry,** the newest achievement was introduction of the AccuRay 1000 system. This system represents an expansion in functions offered to the cigarette manufacturer. For two years multiple C-700 control units have been integrated with a central processing computer and information system. Concentration was on weight per unit length in the cigarette with automatic rejection of those units which did not meet specifications. The AccuRay 1000 system adds the ability to control moisture in the bulk tobacco process to an overall control and information package for the cigarette making and packing processes. This is a good example of Industrial Nucleonics' responsiveness to customer needs at different parts of his process. Moisture control at this early stage of the manufacturing process is expected to provide significant economic benefits to the customer. At the same time, it is expected to expand greatly In-





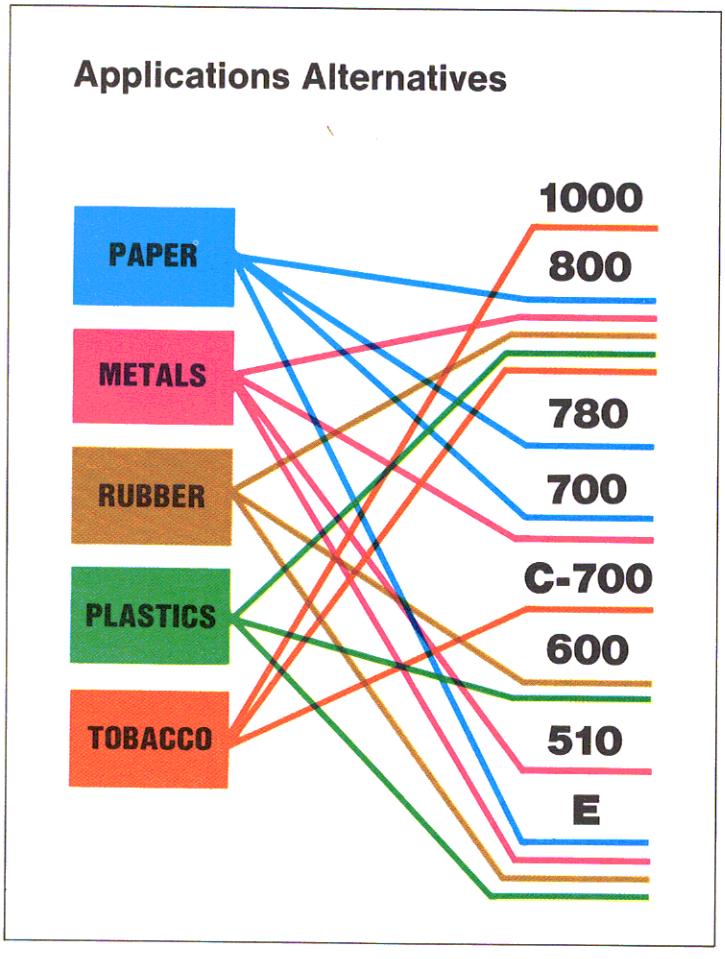
**Tobacco**
Expanded functions throughout the cigarette making process indicate Industrial Nucleonics' understanding of customer processes and responsiveness to his applications needs. The AccuRay 1000 system now integrates moisture measurement, control, and information from the bulk tobacco processing with high-speed inspection-rejection capabilities in the packing and making processes for plant-wide control and information.

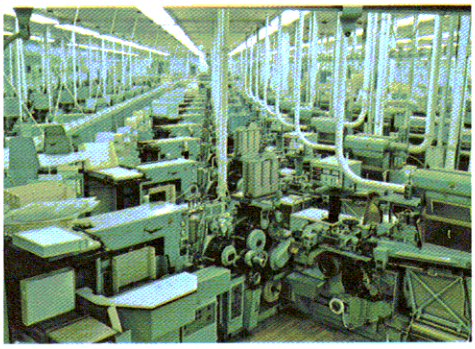


dustrial Nucleonics' potential in the tobacco industry.

Other applications in nonsheet processes implemented during the past year were the new AccuRay FLIR 2000 for inspection of fill-level in canned foods and beverages; an incombustibles meter for detecting hazardous mine dust levels, thus reducing the risk of explosion; and an air pollutant gauge to measure particulate emissions from automobile exhaust.

The broadening availability of AccuRay automation and information systems across existing industry lines, as well as increased applications within these industries, exemplifies the success of both the development and manufacturing programs of the Company. But these present markets have barely been tapped with the new lines of systems. Penetration of these historically strong markets and applications for AccuRay systems will continue to be the primary emphasis of marketing programs in 1972.





**International Markets**
AccuRay systems are now at work in more than 30 different countries outside the continental United States. Applications span a broad cross section of industry including paper, tobacco, rubber, plastics, metals, chemicals, foods, and mining. Industrial Nucleonics' expansion has been planned to take advantage of the great potential for process control and management information systems in the international marketplace.

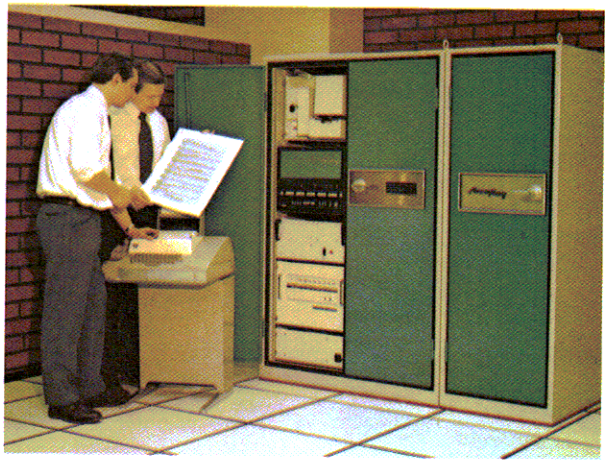

# Expansion by geographical markets

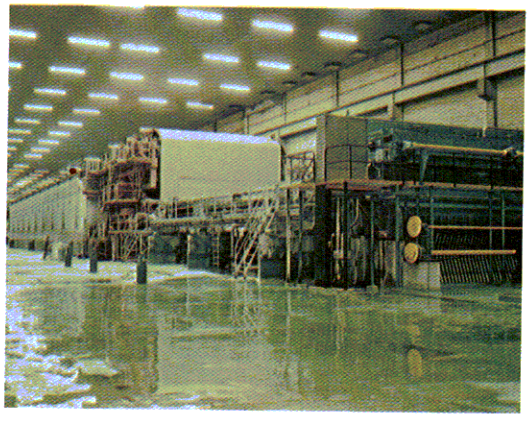
**INTERNATIONAL MARKET POTENTIAL** World markets have been a very important part of Industrial Nucleonics' planning and growth over the past seven years. Operations outside the United States have increased from approximately 4 percent of total revenues four years ago to approximately 20 percent in 1971.

Recognizing that the rapid growth in the process controls market outside the United States will produce potential for AccuRay systems equal to that of the domestic market by 1976, Industrial Nucleonics has invested considerable manpower and effort in the international marketplace. To date, major activity has been concentrated in Canada and Western Europe, but ambitious programs for Australia and Japan are currently under way. A segment of the Australian market has long been one of Industrial Nucleonics' steady customers. While Japan is a relative newcomer to the customer list, it shows an equally attractive growth potential for AccuRay systems and services.

Plans are being implemented for establishing additional, wholly-owned subsidiaries where market activity warrants. These subsidiaries will act as leasing companies for AccuRay systems in particular countries and will employ all AccuRay personnel in those areas.

This expansion program is consistent with the present structure of the international regional management

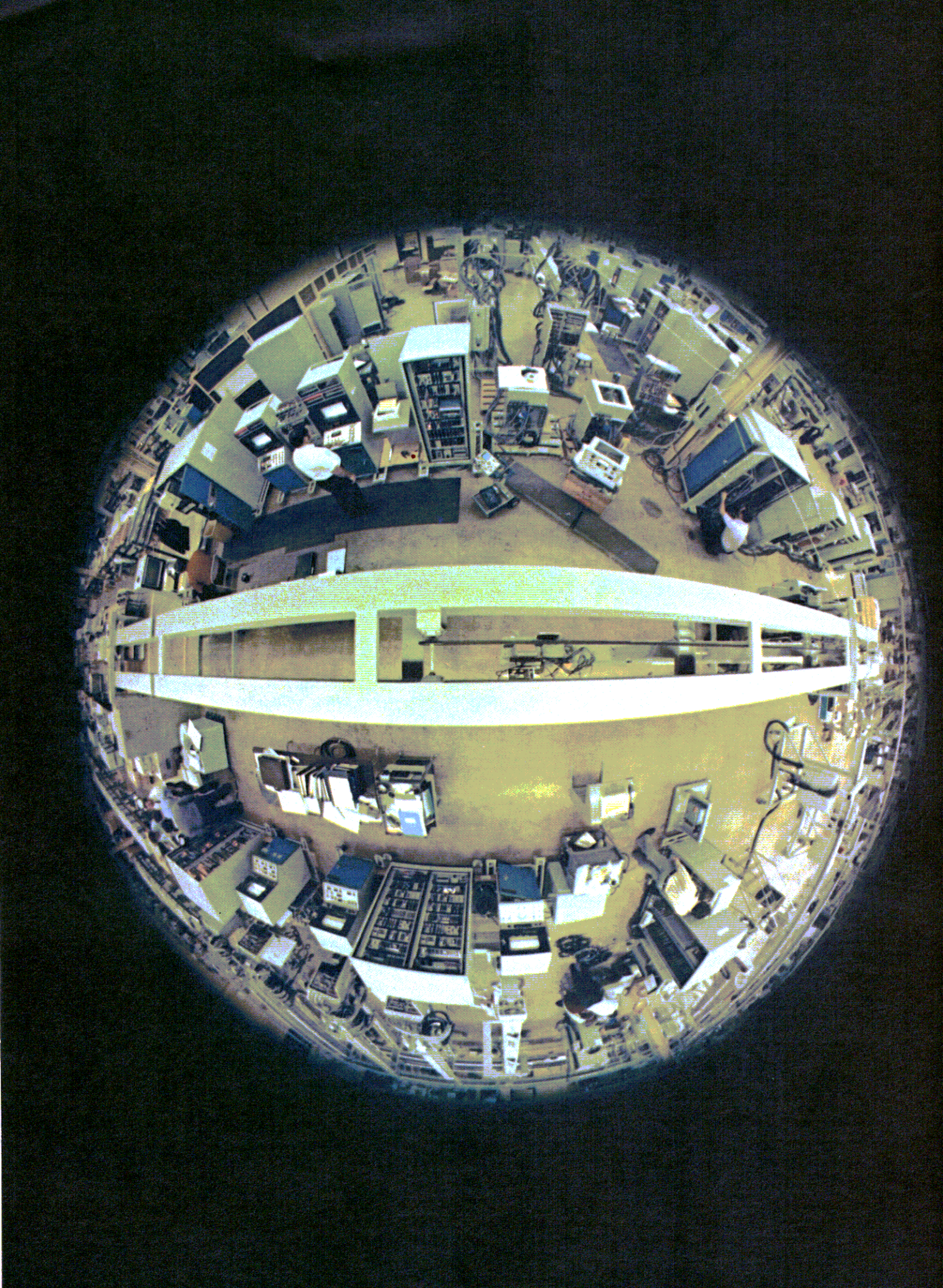


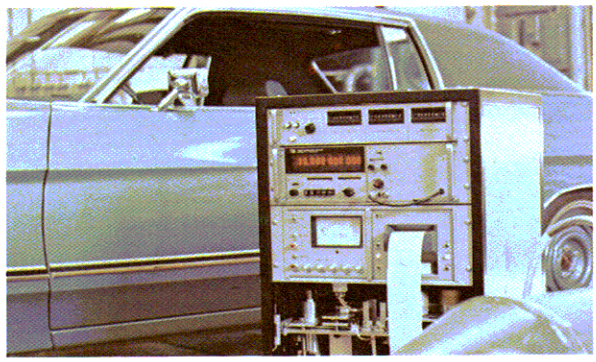


organization. The major advantage to Industrial Nucleonics of this subsidiary program is to increase the availability of operating funds. Each subsidiary becomes a local company doing business with a local customer, and dealing in local currencies with local banks. Borrowing power, as well as flexibility, increases while financing costs are reduced. And finally, Industrial Nucleonics' image and acceptance in these countries is enhanced by establishing a position as an internationally minded Company managed and financed by local concerns.

**ENLARGED INTERNATIONAL FIELD FORCE** Consistent with the growing acceptance of AccuRay systems in the world marketplace, the international field force now numbers more than 115 people. In order to provide each geographic area with the appropriate attention with regard to sales and services, the international forces are organized along regional lines with nearly all personnel being nationals of the countries in which they are serving.

The expansion of the international field force ensures broader coverage of those areas with existing systems and the capability for better achieving the potential that exists outside the States. Sales personnel are carefully selected on the basis of strong technical backgrounds and considerable sales experience. As in the United States, they serve as the front-line contacts with customer management. The majority of international personnel are customer/systems engineers who provide both the systems engineering and service functions. Computer and control specialists have been assigned to Europe to assist the customer/systems engineers with any programming, control, or computer activities. This growing organization of competent, well-trained engineers continues to increase Industrial Nucleonics' full systems capability and results programs in the international marketplace.





have been supplied to the United States Environmental Protection Agency under contract. The incombustibles meter designed to determine dust levels in mines is a highly portable device which has potential usage in virtually every mine safety program.

Industrial Nucleonics has applied technology and applications knowledge in systems combinations to solve major industrial problems. It is expected that expansion efforts to new markets will be concentrated in those industries which have need for the equipment, services, and economic results normally incorporated in a full systems package.

**Financing Flexibility**

Several alternative programs for financing AccuRay systems allow customers to gain the economic benefits of the systems while paying for their usage. Leasing programs, both short-term and long-term, have been an important part of Industrial Nucleonics' business since 1955. The Company has been experiencing a substantial shift to long-term leases in which the customer has the advantage of long-term lease rates over the 5, 8, or 10 year period.

Since 1962 all lease programs have been managed by AccuRay Leasing Corporation, a wholly-owned subsidiary. The total value on an original sales basis of AccuRay systems under lease and rental today exceeds $41 million. Industrial Nucleonics will continue to expand its leasing programs as a means of providing a single source of supply for both equipment and services.

**Manufacturing**

Manufacturing activities during 1971 were directed toward standardization and the expanded production of subsystems and components in order to expedite assembly and test of each system application. Improved economies and efficiencies resulted from larger production lots and improved manufacturing methods, systems, and procedures. Some examples include: (1) increase in production of printed circuit boards from 2,000 to 35,000 boards per year, (2) computer testing of completed boards, (3) thermal shocking of over one million integrated circuits to eliminate marginal ones before assembly, (4) multishift operations in subtest to get better utilization of facilities and capital equipment.

Additional cost reduction and efficiency improvements are in the process of being implemented in 1972. Included is a computerized inventory and production control system to optimize inventory levels, improve customer service, and lower cost of manufacture.

**Personnel and Facilities**

Industrial Nucleonics' total employment reached 1,418 by year-end 1971, a 16 percent increase over the prior year. Physical facilities include four Company-owned buildings and 33 acres of land at the Ackerman Road location plus two leased facilities for a total of 300,000 square feet in Columbus. Seven field sales and service offices are maintained in key locations in the United States, Canada, and Western Europe.

Personnel growth again centered in the engineering and manufacturing sections of the Company. This was responsive to the goals of designing and producing the many new systems and system functions characterizing 1971. Industrial Nucleonics' success is attributed to its competent and dedicated personnel, nearly half of whom have

## Directors and Officers

**Industrial Nucleonics Corporation**
The parent company incorporated in Delaware

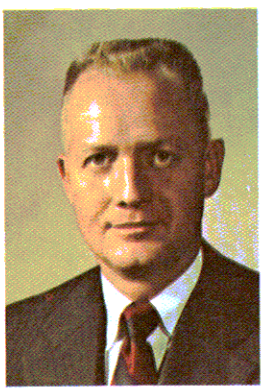
**Edward McC. Blair**
Managing Partner
of William Blair
& Company

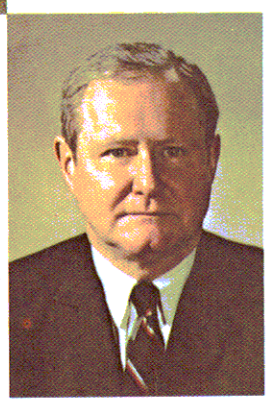
**Gordon B. Carson**
Executive Vice President
Albion College

**H. Roy Chope**
Executive
Vice President
of Industrial Nucleonics
Director of the U. S.
Chamber of Commerce

**John Eckler**
Partner in law firm of
Bricker, Evatt, Barton & Eckler

**David L. Nelson**
President of
Industrial Nucleonics





**George B. Young**
Director of
Chrysler Corporation

**Robert E. Swenson**
Vice President
and Treasurer of
Industrial Nucleonics

# Principal Offices and Subsidiaries

## GENERAL OFFICES
650 Ackerman Road / Columbus, Ohio 43202

## REGIONAL OFFICES
**ALABAMA**
110 Office Park Drive / Suite 108 / Birmingham, Alabama 35223
**ILLINOIS**
7 Salt Creek Lane / Hinsdale, Illinois 60521
**NEW YORK**
250 Park Avenue / New York, New York 10017
**OREGON**
Foyston Building / 6005 N.E. 82nd Avenue / Portland, Oregon 97220
**PENNSYLVANIA**
123 West Lancaster Avenue / Wayne, Pennsylvania 19087

## SUBSIDIARY COMPANIES
**LEASING**
**AccuRay Leasing Corporation /** 650 Ackerman Road / Columbus, Ohio 43202
**CANADA**
**AccuRay of Canada, Ltd. /** 5233 Dundas Street West / Islington 678, Ontario, Canada
**EUROPE**
**AccuRay Europe S.A. /** Place Madou 6 / 1030 Brussels, Belgium
**ENGLAND**
**AccuRay (U.K.) Limited /** Crompton House / 95 Aldwych / London, WC2B4JP, England
**GERMANY***
**AccuRay Deutschland GmbH /** Niddastrasse 42-44 / Frankfurt am Main, West Germany
**ITALY***
**AccuRay Italia S.r.l. /** Via Borgogna 8 / Milan, Italy
**SWEDEN***
**AccuRay Scandinavia A.B. /** Karlavagen 73 / 114 49 Stockholm, Sweden

## AUDITOR
Arthur Andersen & Co. / Columbus, Ohio 43215
## TRANSFER AGENT
First National Bank of Chicago / Chicago, Illinois 60670
## REGISTRAR
Harris Trust and Savings Bank / Chicago, Illinois 60690

*Incorporated in 1972