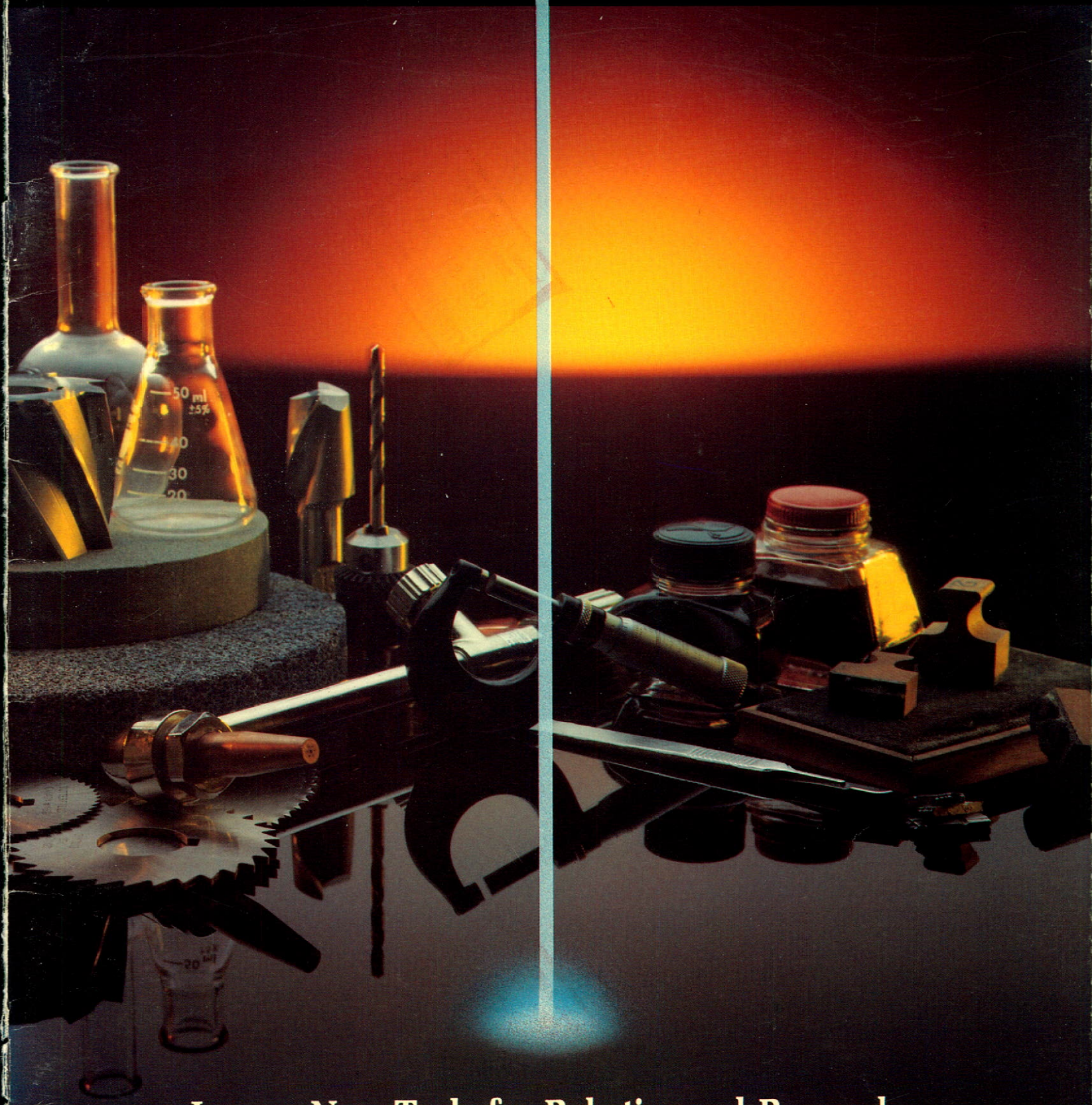
Lumonics Inc. Annual Report 1982



Lasers: New Tools for Robotics and Research

5-Year Financial Summary

	1982	1981	1980	1979	1978
			(thousands of dollars)		
Operating results:					
Sales	**$14,607**	$ 9,088	$ 7,357	$5,864	$3,866
Net earnings	**2,119**	1,520	1,037	749	536
Earnings per share (dollars)	**.70**	.56	.46	.37	.27
Research and development gross spending	**2,863**	1,770	940	1,301	1,153
Financial data:					
Working capital	**12,037**	9,466	8,188	1,736	1,185
Current ratio	**4.7:1**	4.9:1	8.9:1	2.1:1	2.3:1
Fixed assets – net	**4,088**	2,109	2,140	1,588	857
Shareholders' equity	**22,160**	11,648	10,128	2,607	1,830
Share data:*					
Average number of outstanding common shares (thousands)	**3,036**	2,691	2,256	2,030	1,997

*After giving retroactive effect to a 2 for 1 split on July 10, 1980.

The Company

Lumonics Inc. develops and manufactures a variety of lasers for industrial, medical and scientific uses. Founded in 1970, Lumonics is now the world's third largest company specializing in laser products. Product lines are based on both gas and solid state technologies.

Lumonics scientific lasers are used for various applications including photochemistry, spectroscopy, plasma physics and materials interaction research. Lumonics also engages in contract R & D and is currently doing initial design work for an Area Detection System for the U.S. Military.

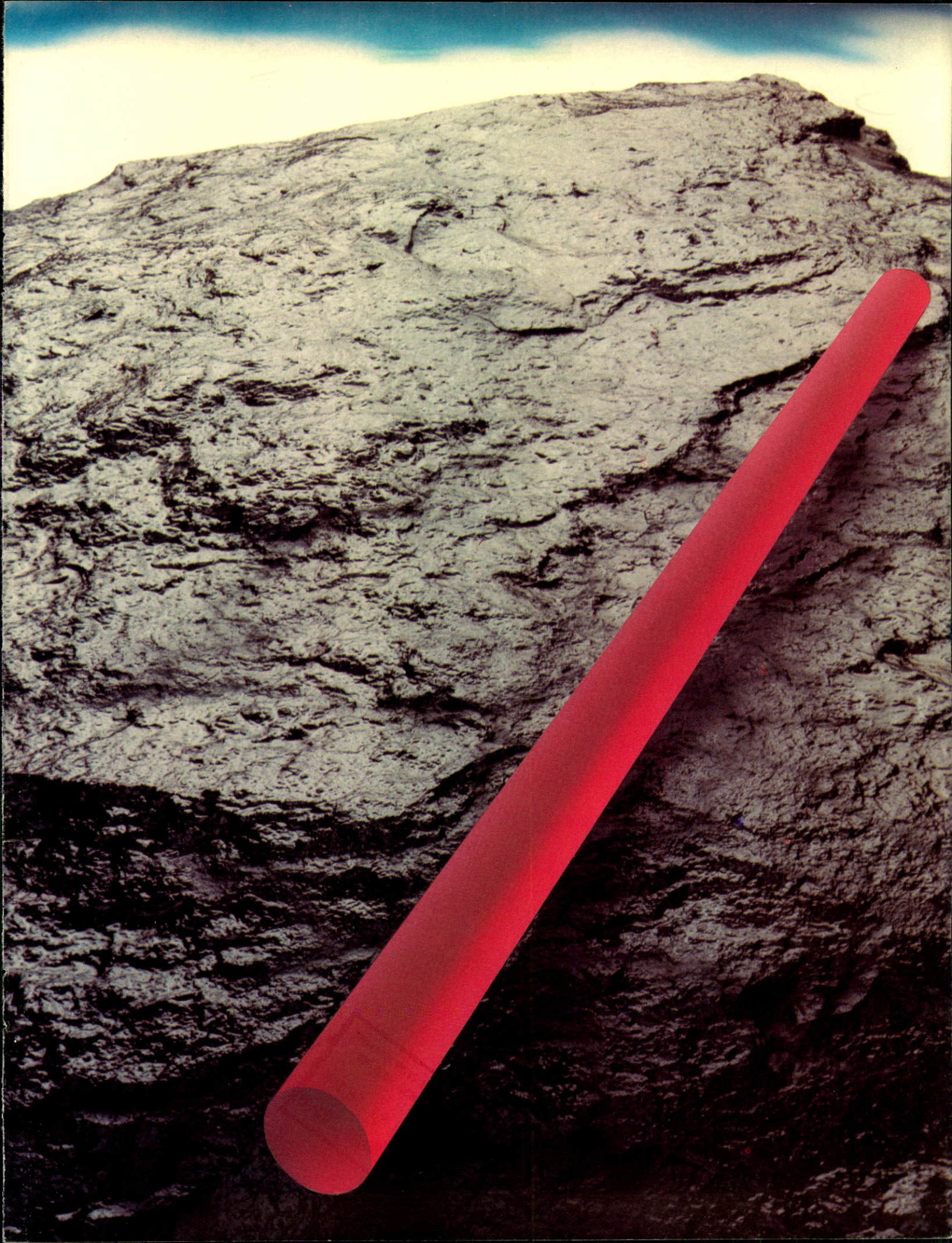
Industrial products include LaserMark®, a high speed, non-contact marking system used to code electronic and semiconductor components, packaged foods, beverages, toiletries, pharmaceuticals and automotive parts. Lumonics also manufactures industrial laser systems for cutting, welding and drilling of precision metal and non-metal parts for a variety of industries including aerospace.

In addition to its head office and facility in Kanata (Ottawa), Lumonics owns and operates plants in Rugby, England and Phoenix, Arizona through two subsidiaries, JK Lasers Limited and Lumonics Corporation. JK Lasers is an established manufacturer of solid state lasers for scientific, industrial and medical applications. The Lumonics Corporation plant in Phoenix, is now the assembly and main distribution centre for LaserMark® systems in North America. The components of the LaserMark® system, lasers and standard beam delivery modules, continue to be manufactured in the Kanata (Ottawa) plant.

Cover:
The energy of the laser is increasingly being harnessed in scientific research, medical and industrial applications. The laser's combination of precision and concentrated energy at high-repetition rates makes it an ideal tool for marking, measuring, drilling, cutting, welding and soldering in fully-automated systems.

Opposite:
Symbol of solid state laser technology: a lasing rod made from a complex, artificially-grown crystal known as Neodymium doped Yttrium Aluminum Garnet (Nd. YAG).YAG lasers are revolutionizing many industrial, scientific and medical processes.

Contents



Report to Shareholders

"Businessmen will have to learn to build and manage a human group that is capable of anticipating the new, capable of converting its vision into technology, products and processes . . ."
Peter Drucker

Once again, Lumonics Inc. had an excellent year in 1982 with a 61% increase in sales and 39% increase in earnings over 1981. A portion of this growth is attributable to the consolidation of the July through December results of JK Lasers Limited. Traditional Lumonics product lines accounted for 29% of the sales increase. For a detailed review of the financial results see the Corporate Overview, Management's Financial Review section on page 4.

Two events stand out as historically important for 1982: the merger of common interests with JK Lasers Limited of Rugby, England; and the commencement and initial operation of Lumonics Corporation, a wholly-owned United States subsidiary in its new facility in Phoenix, Arizona.

The basic objective underlying the expansion and diversification undertaken in 1982 has been to prepare Lumonics for accelerated growth. We believe the Company is now well positioned in international markets to achieve this objective; still we must always be cognizant of the external environment such as fluctuating foreign currencies and other variables in the general economy which make short-term forecasting difficult and can affect performance in a given period.

One of the many immediate benefits of the merger between Lumonics and JK Lasers has been the availability of two JK Lasers Limited Directors to join the Lumonics Board. Dr. J.K. Wright, Managing Director and founder of JK Lasers, is a physicist with an outstanding record in the laser industry; Mr. Roy Noon is an executive of General Electric Company, England. We expect to welcome both of these gentlemen to the Lumonics Board following shareholder approval at the forthcoming Annual General Meeting of the Shareholders.

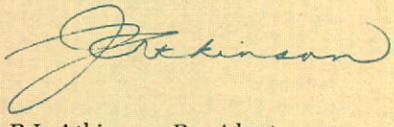
In new product development, the highlight for 1982 was the introduction of a low-cost LaserMark® system designed to capture a larger share of the low production rate market for on-line marking devices. Shipments of this product will commence during 1983.

For some months, in the latter part of 1982, significant interest on the part of institutional investors in acquiring blocks of Lumonics common shares had been brought to our attention by our fiscal agents. In spite of an excellent working capital position, our Board of Directors felt that offering a maximum of 500,000 treasury shares to such private investors would broaden the shareholder base of the Company, enhance the Company's acquisition opportunities and finance anticipated facility expansions. Accordingly, just over $10 million was added to the Company's cash reserves in late January 1983, with an anticipated positive impact on earnings per share after dilution.

Planned expenditures associated with the rationalization and integration of new subsidiaries, new product introductions and exploitation of new markets will have some impact on earnings for the first half of 1983; however, the Company anticipates record sales and earnings for the full year.

We wish to point out that the progress in 1982 was due to the efforts, dedication, understanding and cooperation of our employees, shareholders and business associates around the world and to them we express our thanks.

Sincerely,

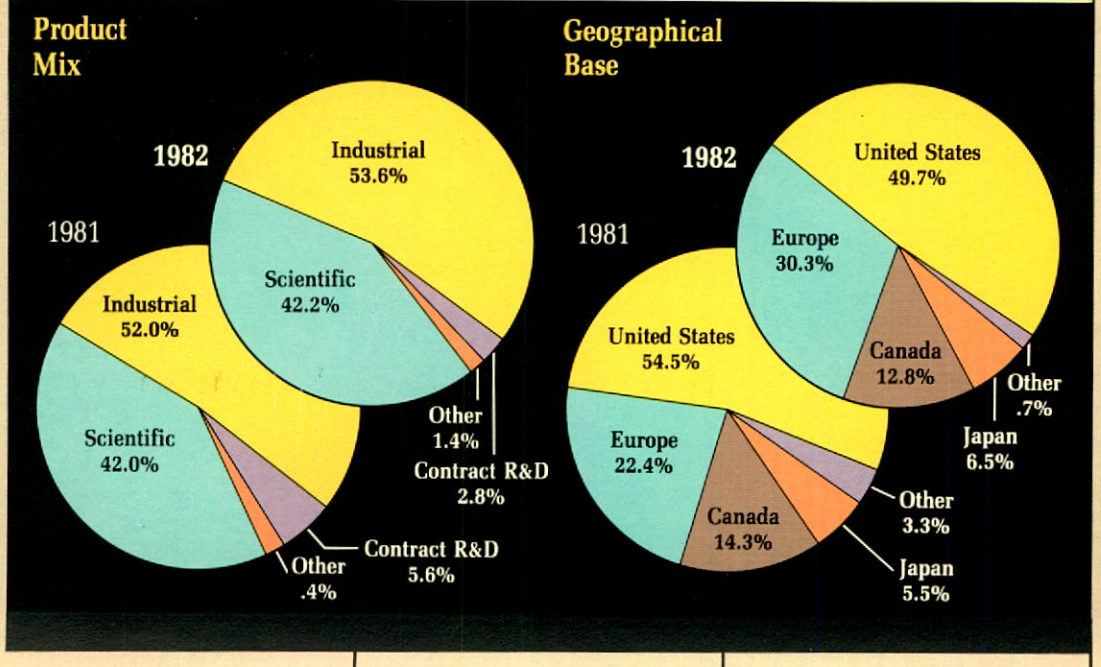


R.J. Atkinson, President

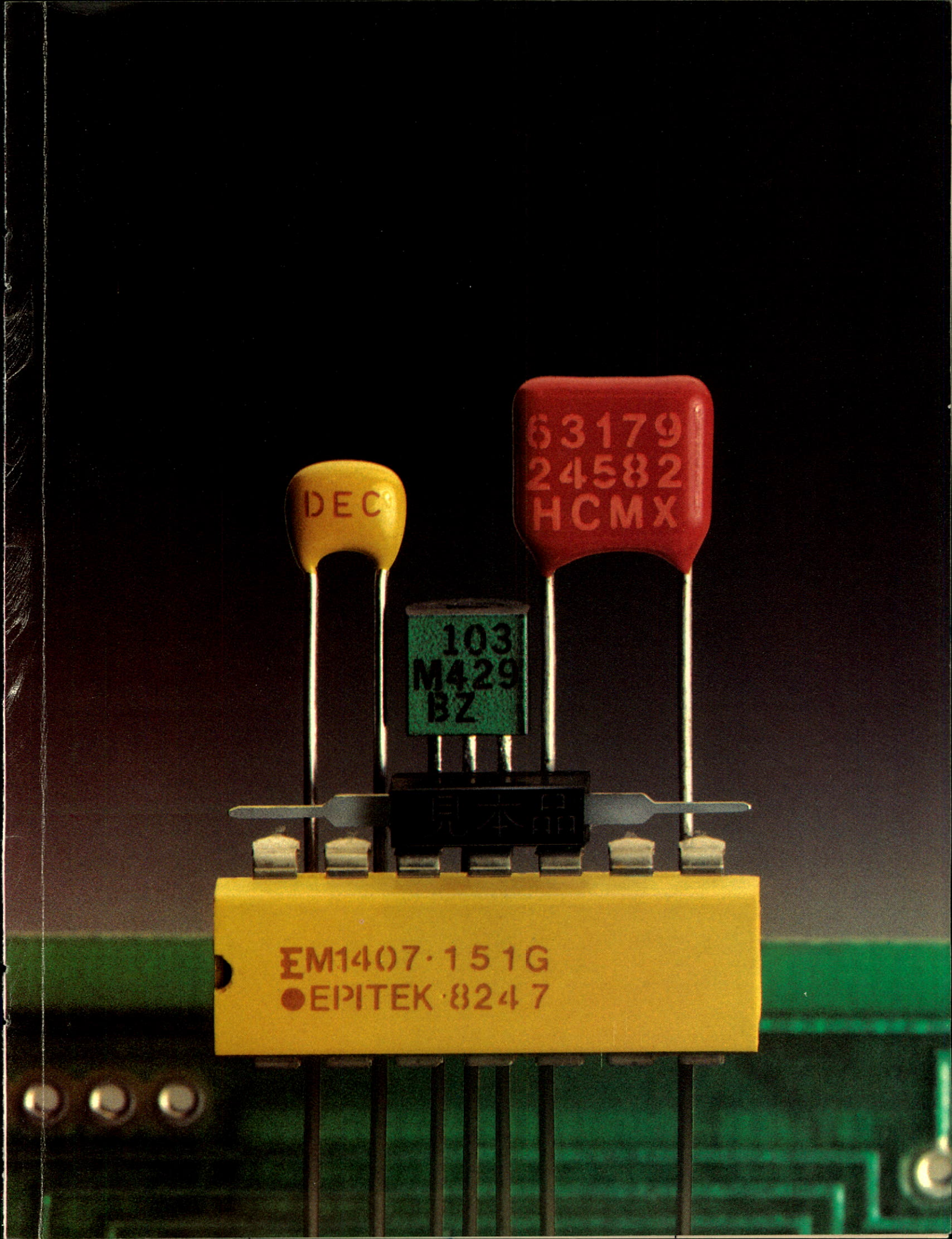
A.R. Buchanan, Chairman

March, 1983

Sales



Opposite:
A close up look at why LaserMark® systems are making strong inroads into the electronic component marking industry. Besides improving mark quality, LaserMark® also improves productivity.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Corporate Overview

Why Lumonics?

"An expanding economy, like a rising tide, raises all boats . . ." Dunn's Business Month.

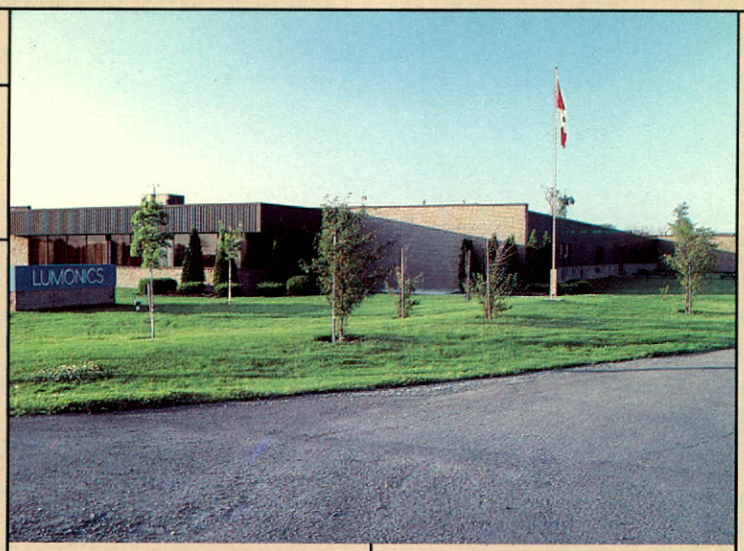
Fortunately, a few "boats" still rise in a contracting economy. Why is Lumonics one of these few? There are clear and specific answers to this question, some of which are fairly obvious. The Company has basic strengths which are readily apparent:

- very low staff turnover and dedicated, competent employees
- dramatic technological leads in chosen product areas
- diversified customer base with established representation world wide
- proven stable management team with good balance between technology, marketing and financial management
- excellent internal control systems
- strong Balance Sheet including substantial cash resources.

Other reasons are as important but less obvious:

- Lumonics potential success is far more closely related to its ability to develop new laser products and new laser applications than to the state of the economy at any particular time.
- Even in a weak economy, industrial customers can frequently obtain funding for capital equipment, such as LaserMark®, when it can provide a rapid return on investment. Scientific customers can obtain funds for state-of-the-art research equipment in major research organizations. The availability of funds in both cases is less dependent on the state of the economy than is the case for more conventional capital investment.

Management's goal is to maintain and build on these strengths in the future.



Kanata facility and corporate centre.

Management's Financial Review

This is the first Lumonics Annual Report to consolidate the results of operations at each of our wholly-owned subsidiary companies, Lumonics Corporation, Tempe (Phoenix), Arizona and JK Lasers Limited, Rugby, England. Both companies commenced operations with the Lumonics Group in July 1982 and the results of their activities for the six months are included in this report.

The consolidated results also absorbed planned costs associated with the rationalization and integration of these new subsidiaries. Some of these costs, particularly those associated with new product introductions and the exploitation of new markets, will continue during the first half of 1983.

Sales

Sales reached a record level of $14,607,000 during 1982, up 61% over 1981 sales of $9,088,000. Of the increase, 32% resulted from consolidation of new operations and 29% from the sales in traditional Lumonics product lines. The latter increase is mainly attributable to greater product penetration in the market place.

Cost of Goods Sold

Cost of goods sold as a percentage of sales was unchanged at 74% from 1981. Cost of sales was $10,748,000 compared to $6,686,000 in 1981. A 60% higher investment in the company's North American marketing and selling and a modest increase in general and administrative expense in setting up Lumonics Corporation in the United States are also reflected.

Gross Profit

Gross profit was $3,859,000 up by 61% from $2,402,000 in 1981. This represents 26% of sales for both years.

Research and Development

Gross expenditures on research and development were up in the year by 62% at $2,863,000 compared to $1,770,000 in 1981. This included six months of expenditure by JK Lasers Limited. The increased spending was primarily attributed to introducing our new, less expensive, LaserMark® product and improved versions of our scientific and industrial excimer and dye lasers.

Government support to our development continued at 25% of gross expenditures.

Net research and development costs were up by 93% from $1,032,000 in 1981 to $1,995,000. The company maintains the policy of deferring development costs only where a clearly defined, near term, market exists. The company adopted a conservative approach to deferment of development costs deferring only 16% of total R&D expenses compared to 24% in 1981.

Interest Income

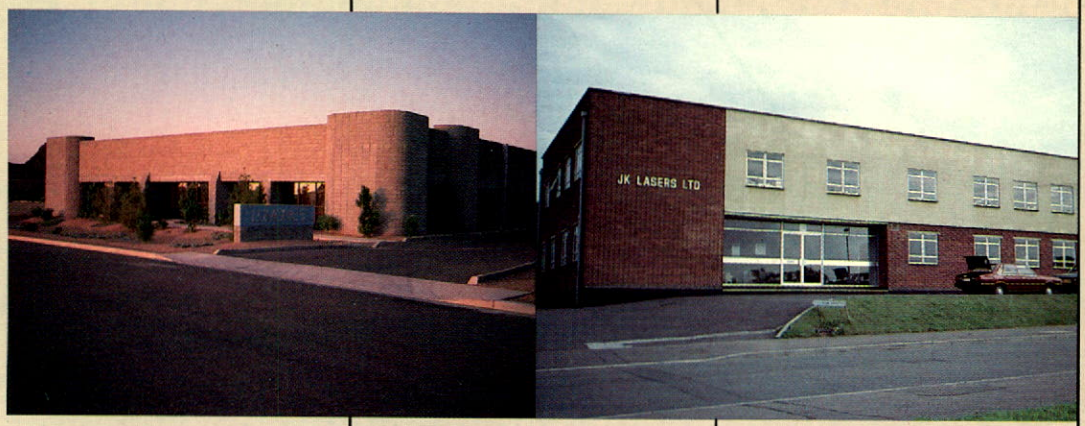
Interest income of $841,000 is down 22% from last year's level of $1,081,000. This is due to a reduction in cash resulting from the acquisition of JK Lasers Limited and our investment in inventories to start up Lumonics Corporation in the United States. Our interest income was earned from investment in low risk commercial paper, bankers acceptances and bank term deposits. Interest income was also down because of declining interest rates. Lower interest rates are forecasted for most of 1983. The proceeds of $10,200,000 from our private placement of 500,000 treasury common shares in January 1983 will generate additional interest income in 1983 until required for expansion of company activities.

Sales by product line	1982	1981
	(thousands of dollars)	
Industrial	$ 6,161	$ 4,721
Scientific	7,826	3,825
Contract R&D and Other	620	542
Total Corporate	$14,607	$ 9,088

Corporate Overview

New Lumonics Corporation facility in Tempe, a suburb of Phoenix, Arizona.

JK Lasers plant in Rugby, England.



Income Taxes

The provision for income taxes was adjusted downward in our fourth quarter. In Canada, higher research and development investment increased both business investment tax credits and the 50% scientific research allowances. Lower effective tax rates on our foreign operations also contributed to this adjustment.

Net Income

Net income increased by 39% to $2,119,000 from $1,520,000 in 1981. Earnings per share, based on the average number of outstanding common shares amounted to $.70 compared to $.56 in 1981.

The average number of shares outstanding of 3,035,664 reflected 50% of the dilution effect of the 677,402 shares issued on acquisition of JK Lasers Limited. Earnings in the early part of 1983 will be affected by the full dilution impact of this transaction and by the 500,000 shares issued in the private placement in January 1983.

Share Data

The common shares of the company are listed on The Toronto Stock Exchange (Symbol LUM). At January 31, 1983, there were 1,418 common shareholders holding 3,886,658 shares.

Exchange

The company absorbed a $109,000 exchange loss in the fourth quarter on translation of foreign currencies. This was caused almost entirely by the drop in value of the UK pound sterling. This amounted to 3% of gross profit and .75% of sales. This drop in value of the pound is having a favourable impact on JK Lasers Limited operations due to their high percentage of export sales.

Working Capital

The company's working capital position is very strong at $12,037,000, up 27% from $9,466,000 in 1981. The current ratio is 4.7:1. The private share issue in January 1983 which generated $10,200,000 in cash will increase this position by a further 85%. It puts the company in an excellent position to finance new products, acquisitions and facilities expansion.

Inventories

Our inventory investment reached $4,540,000 at year end. This is an increase of $3,098,000 from the $1,442,000 at December 1981. An increase of $1,878,000 results from the acquisition of JK Lasers and a subsequent build up in their inventories to meet shipments against a high backlog. Another $700,000 can be attributed to the start up inventory at Lumonics Corporation including the required duplication of common parts in Kanata. A general volume increase of the business and the anticipated higher sales volume in 1983 accounts for the balance of $520,000.

Capital Equipment

The company spent $2,323,000 on fixed assets during the year. The JK Lasers acquisition accounted for $1,288,000. An additional $787,000 was invested in land, building and equipment to set up Lumonics Corporation in the United States and $248,000 for equipment at Lumonics Inc., Kanata plant. The capital expenditures in Phoenix were financed through an Industrial Development Bond in the amount of $906,000.

The price range of the shares in 1982 compared to 1981

	1982	1981
High	$21.00	$22.00
Low	12.00	11.50
Close (December 31)	20.00	15.75
Volume	1,035,813	1,178,382

Synergy With JK Lasers Limited

The highlight of 1982 was the acquisition of JK Lasers Limited. Exploratory discussions about a possible corporate relationship took place over a lengthy period of time and after six months of intensive negotiations, a successful agreement was reached. It became clear that there was obvious potential for highly constructive synergism:

- Both companies develop and sell pulsed lasers internationally with JK Lasers specializing in solid state lasers and Lumonics in gas lasers.
- Both companies are leaders in their product technology.
- JK Lasers is strong in Europe and Lumonics in North America with each company equipped to help the other.
- Each company offers lasers for both scientific and industrial applications.
- The products of the two companies are compatible without being competitive. Scientific applications are similar, but users require a range of different wavelengths of radiation output and therefore require a range of different lasers. Industrial applications are quite different with Lumonics specializing in laser marking and JK Lasers specializing in precision laser welding, drilling, cutting, soldering, brazing and slitting.
- Employees of both companies are enthusiastic, competent and highly motivated.
- A major thrust of both companies separately – and now combined – is the application of laser systems to improve the productivity of selected industrial processes through automation.

Corporate Overview

Management

A result of the merger with JK Lasers and the establishment of Lumonics Corporation was the need to develop a management structure which would take advantage of the synergism in the European and North American operations. A "Corporate Management" structure has been established with a single point responsibility for each company reporting to the Corporate President. An Executive Committee has been established to maximize the efficiency of the considerable interaction of the three companies. Initial members of the Committee are R.J. Atkinson (Chairman), A.R. Buchanan, G.A. Mauchel, H.R. Noon, J.K. Wright.

Industrial Marketing Highlights

A strong increase in LaserMark® sales in the United States and Japan, resulted in a 39% overall increase over 1981. Weak economies in Europe softened sales in all countries except England. In addition to increased unit sales, a trend towards more sophisticated and expensive system requirements by the electronic components industry has developed. As well, past users are now tending to order in larger quantities.

Along with the establishment of the Tempe, Arizona facility as the centre of United States LaserMark® activity, new sales offices were opened in New York and Los Angeles and the sales staff was increased in Chicago.

Lumonics has recognized for some time that LaserMark® markets could be expanded – particularly in the packaging industry – with a lower-cost system. The Model 300 introduced late in the year was the Company's response to this market need and it has generated an encouraging level of early interest.

As was announced in November, 1982, a quantity order for solid state lasers worth about $1.15 million was received from a manufacturer of medical systems used in ophthalmic surgery. This business, representing the first order for lasers intended for medical applications, was a direct result of the acquisition of JK Lasers Limited.

Along with new product introductions and staff expansion, our general promotional efforts have also been considerably expanded. During 1982 Lumonics displayed LaserMark® systems at the two largest electronic trade shows and the largest packaging exhibition in North America. These shows produced a great number of valuable "leads" to new sales opportunities – and served to continue the process of educating potential users. Our European and Japanese distributors also participated in major local trade shows.

A public relations program for industrial products has been under way for several years. Through our Manhattan agency, considerable editorial attention was focussed on LaserMark® in the leading trade journals. Articles appeared featuring specific LaserMark® applications in plants of Kraft, Pfizer, Union Carbide, Latrobe Brewery and S.C. Johnson.

Scientific Marketing Highlights

1982 was a year which saw a 38% increase in orders booked for Lumonics Kanata Scientific Products. This result represented an increased market acceptance of the newly introduced EPD-330 dye laser and improved Excimer laser models.

The merger with JK Lasers provided three new European Sales/Service offices in Rugby, Brussels and Munich, covering areas previously handled by distributors. As a result, market share is expected to significantly increase against fairly strong European competition.

Because certain applications of Lumonics scientific lasers are considered "sensitive", it has proven difficult to obtain export permits for East Bloc and certain other countries. Had this not been the case, sales would have been some 20% higher in 1982. Representations are currently underway with the appropriate authorities which could result in more favourable treatment in some areas in 1983.

Patent Litigation

A positive development in this ongoing legal contest took place in December, 1982. The United States Patent Office agreed to re-examine the patent under litigation in Chicago. This agreement was achieved as a result of applications to the United States Patent Office by Lumonics Inc. and General Motors Corporation based on new information presented by both companies.

The Canadian action is proceeding towards discovery of witnesses, but no trial date has been set as yet.

The formal Company position with respect to materiality is discussed as note 14 to the Financial Statements.

Outlook

1982 was a year of accomplishment and places Lumonics in a strong position for future profitable growth. The establishment of two new affiliated organizations in England and Arizona, the substantial expansion of the marketing organization and its activities, and the introduction of over $10 million in additional working capital, are all intended to increase the Company's momentum. Prospects for both long and short term are very encouraging.

Below:
The highly visible LaserMark® display at Chicago's P.M.M.I. packaging industry showcase featured a demonstration of laser coding and actual samples of products coded with LaserMark® systems.

The Many Uses of Lasers

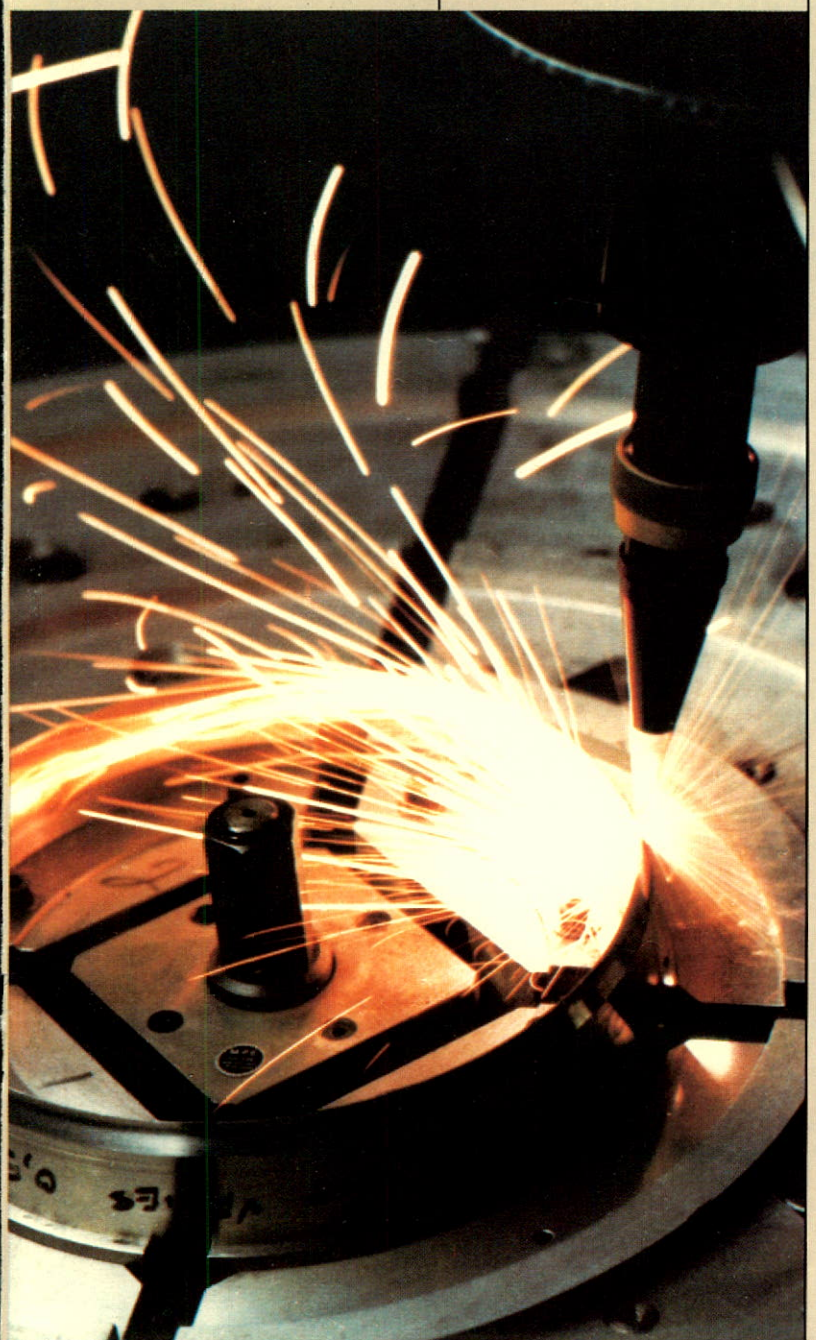
The ability of lasers to deliver intense amounts of light energy to a small surface area, to carry information at unprecedented data rates and to transmit light in virtually straight lines has led to growing markets for laser technology in both research and industry.

Lumonics Inc., with its broad product range of pulsed gas, pulsed solid state and liquid dye lasers, is well positioned to address a number of these growing markets and to maintain its position as one of the world's leading laser manufacturers.

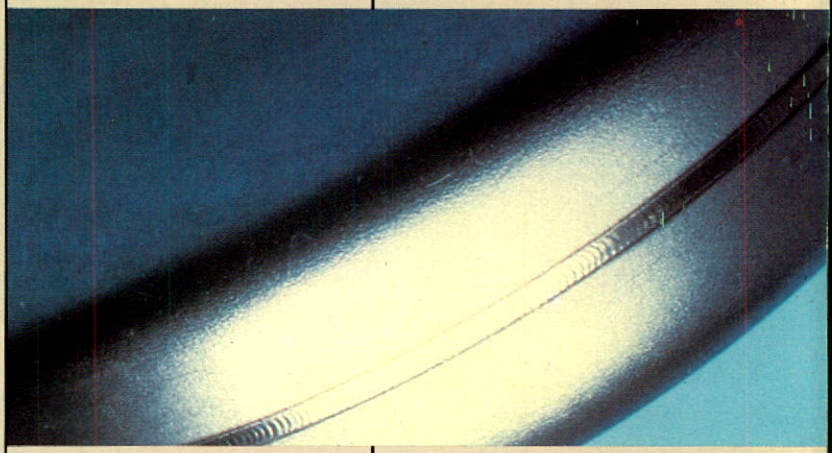
Industrial

Product Marking

In 1976, Lumonics introduced LaserMark®, a product marking/package coding system that accurately, clearly and permanently marks products and packaging materials with laser energy. LaserMark® is now the leading laser coding system in the packaging industry and sales continue to grow at significant rates as package goods manufacturers and other high-volume product manufacturers seek to improve their efficiency and productivity.



Left:
A JK Lasers high-powered industrial laser drills holes in ultra-hard jet engine components with speed and fully-automated accuracy.



LaserMark® contributes to production efficiency through automation of the marking and, in many cases, the material handling process. High-speed marking rates, minimal downtime, reduced operating costs, easy interface with existing production equipment and reduced product or label waste, all result in rapid pay-back on the cost of a LaserMark® system.

LaserMark® sales to the semiconductor and electronic components industry are also on the increase. The clear, permanent, accurately-placed marks and the non-contact, contamination-free marking process have led to much higher production efficiencies and less product waste or recycling. The curing cycle for inks and associated labour costs are eliminated. The process also permits the high production rates for which the industry is striving, with virtually zero rejects. Future sales will continue to be tied to the long-term growth of semiconductor and miniature passive component industries.

Materials Processing

Laser materials processing is the general name given to such diverse industrial tasks as heat treatment, welding, drilling and cutting, when the heat provided for the process is provided by a laser beam. The industrial range of solid state lasers and systems offered by JK Lasers has been specifically developed to accomplish such tasks on a routine basis. Each process is selected and carefully controlled by optimising the laser beam characteristics of total energy, power density at the work piece, pulse duration and pulse repetition rate. In 1979, JK Lasers introduced a unique patented laser power supply which enabled all these parameters to be directly and instantaneously controlled by computer input. This facility can be interfaced with Computer Numerical Control (CNC) systems, which control the work-handling equipment needed to precisely position the work piece relative to the laser beam focus. Further developments will include the use of robotics to integrate automated laser materials processing into complete Flexible Manufacturing Systems (FMS) which will populate the factory of the future.

Many of the advantages of laser materials processing stem from the same 'non-contact' aspects which makes LaserMark® attractive for automated production lines. In addition, there are many specific technical advantages, which laser processing

Above:
The seam of a heart pacemaker welded by a YAG laser from JK Lasers. Such demanding manufacturing operations can be repeated with great accuracy using computer controlled lasers.

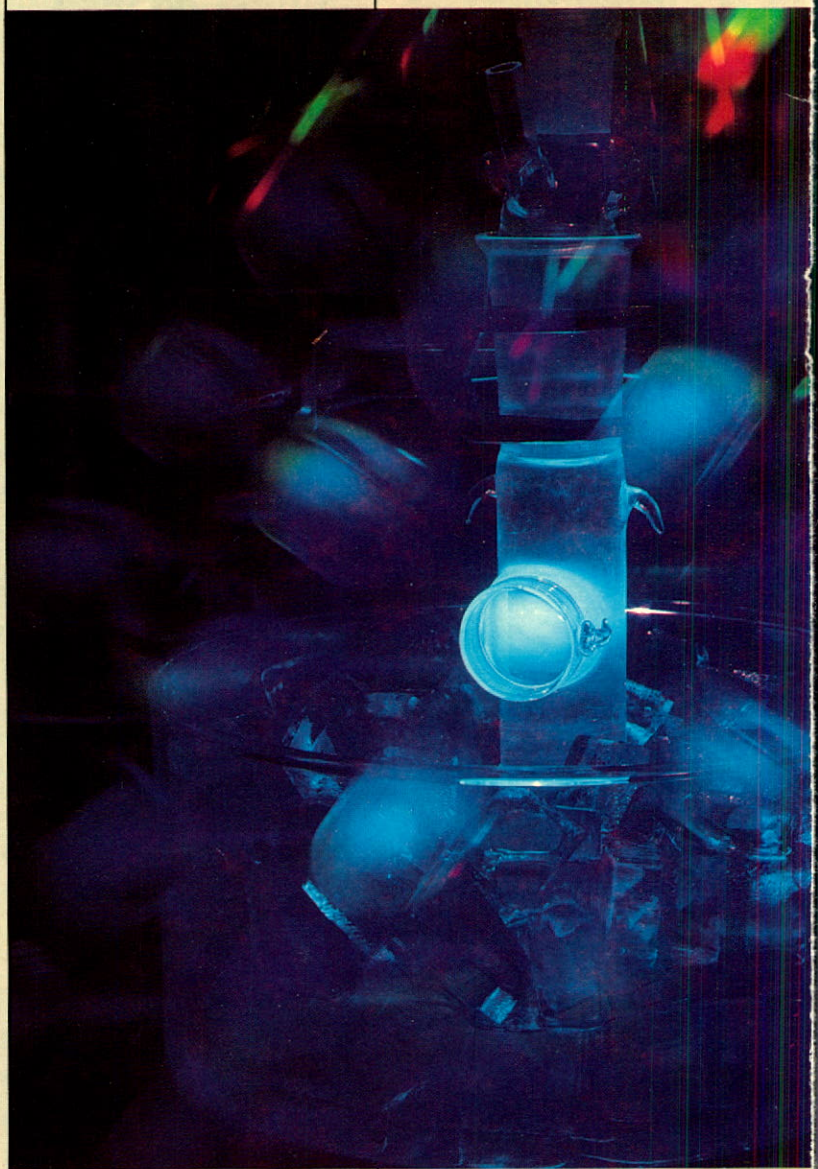
The Many Uses of Lasers

brings to a myriad of applications. These include:

- welding of dissimilar materials
- welding dissimilar sections with negligible distortion
- minimized bulk heat input when seam welding sensitive packages like heart pacemaker enclosures
- welding in controlled atmospheres
- welding or cutting inside glass enclosures (e.g. T.V. tubes)
- cutting and drilling of hard materials such as diamonds and carbides
- drilling fine holes accurately at large, inclined angles to the surface
- drilling fine holes with preprogrammed shapes (i.e. not necessarily round)
- heat treating precise small areas of a product
- removal of material for dynamic balancing of rotors whilst the rotor is in motion.

This diversity of benefits has led to the installation of JK Lasers industrial products in industries ranging from microelectronics to aerospace, and light bulbs to jewelry. Furthermore, early installations have shown that laser material processing is not only a better but frequently a cheaper method than conventional processing techniques. This realization has enormous implications on the size of the potential market for such equipment.

The application of lasers to the processing of electronic semiconductor circuits includes scribing of wafers into chips, trimming resistors to exact values, and various types of marking. Potential future applications in the semiconductor industry include the processing of solar cells, high resolution photolithography to increase component density, surface annealing to eliminate the distortions caused by furnace annealing following ion implantation, photo etching to eliminate steps in the manufacturing process, and other more sophisticated processes still at the research level.



Right:
Previtamin D synthesis through laser photochemistry: a Lumonics excimer laser illuminates a reaction vessel, cooled with ice. Special filters create multiple images of the resulting fluorescence.

Below:
A selection of the many packaged goods that are now date and batch coded with LaserMark®. Permanency, mark quality and marking efficiency have made LaserMark® an industry leader.

Scientific Applications

Spectroscopy and Photochemistry

Most Lumonics scientific lasers are used in the fields of spectroscopy and photochemistry. Spectroscopy is used to measure the structure of molecules by directing laser energy at a sample and measuring the absorption or emission of radiation from the sample. As each chemical bond responds to a different frequency of laser radiation, an analysis of the chemical structure of the molecule can be made by varying the frequency of the incident laser radiation.

Photochemistry is similar to spectroscopy except that the laser used is much more powerful, and can produce desired chemical changes by tuning the laser to a specific frequency. Although the science of photochemistry is still in its infancy, there are many potential applications, including separation of uranium isotopes, production of deuterium (heavy water) and purification of silicon for semiconductors.

Previtamin D

Recent photochemistry research using Lumonics lasers, undertaken by Canada's National Research Council, has resulted in a breakthrough in previtamin D production. Previtamin D is an important component of animal feed, particularly for poultry or other farm animals raised in enclosures with little or no sunlight. When ingested, it quickly converts to vitamin D, preventing the development of misshapen, brittle bones or rickets.

Using pulsed gas and solid state Nd:YAG lasers, NRC scientists developed a two-stage photochemistry process that triples the efficiency of previtamin D synthesis.

NRC scientists believe the breakthrough "may herald the introduction of a whole range of laser applications in industrial chemistry."

Plasma Research

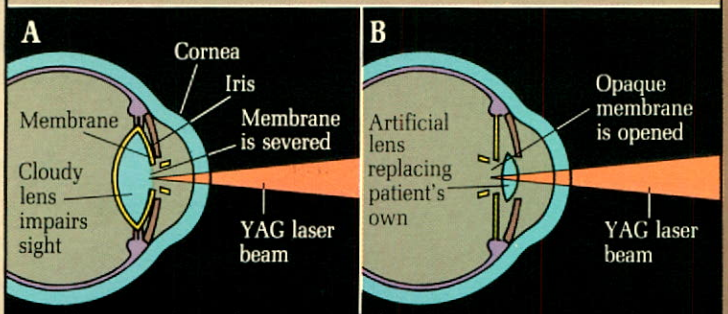
High energy Lumonics lasers have also been used in plasma physics research. Plasma, known as the fourth state of matter, contains electrons and ions in sufficient concentrations to have significant electrical conductivity. Plasmas can be found in many places, from fluorescent tubes and neon signs to the surface and interior of stars.

The pulse of a powerful laser can produce plasmas at extreme temperatures for short periods of time, greatly exceeding the surface temperature of the sun.

One motivation of plasma research is the initiation of nuclear fusion, the fusing together of light atoms with the subsequent release of energy. As an energy source, fusion has the potential to replace nuclear fission without the accompanying hazards of radioactive waste products and with much cheaper fuel. So far, scientists have been able to stimulate fusion with laser pulses, but have yet to create a self-sustaining fusion reaction. Research continues.

The Many Uses of Lasers

Revolutionizing cataract surgery with the YAG laser



YAG lasers can be used at two stages in cataract surgery: firstly, (A) to sever membranes in front of a cloudy eye lens allowing removal and implantation of an artificial lens; secondly, (B) to sever membranes behind the new lens that often become opaque after cataract surgery. This last operation can be performed as an outpatient procedure in a matter of minutes, replacing delicate surgery that once took up to four hours.

Medical Applications

Lasers have been used in medical research and surgical techniques for close to 20 years. The best known application is in retinal photocoagulation. As laser technology evolves, the types of lasers used and the variety of applications is increasing.

The solid state YAG laser is now being used in cataract surgery to sever and to cut away eye membranes that become opaque after traditional cataract surgery.

The YAG concentrates light energy into very short, intense pulses that create tiny 1/10 mm cuts. The light passes through the lens of the eye without damaging it. This technique reduces what was once a four-hour operation to an outpatient procedure that can be performed in minutes without anaesthetic. The sale in 1982 of a quantity of one hundred JK Lasers solid state YAG lasers attests to the potential in this area.

Lasers are also used for photocoagulation of blood, inner ear surgery, neurosurgery, tumor detection and the unblocking of Fallopian tubes. The ability to sharply focus lasers is particularly useful in surgery, as is the laser's ability to cauterize blood vessels, reducing bleeding as it cuts.

Military

During the past two years, it has become clear that the larger military powers are interested in pulsed gas CO_2 lasers for a variety of potential applications, many of which are classified. Lumonics plans to exploit its position of strength in this technology by becoming a sub-contractor to major United States military prime contractors.

A start in this direction was achieved in 1982 by the receipt of a small research and development contract from GTE Products Corporation, Sylvania Systems Group, Western Division, in California, for work towards a field portable Area Detection System. According to High Technology magazine (January 1983) an Area Detection System is designed to detect the presence of vapour or aerosol clouds and analyse them remotely to detect the presence of chemical warfare agents.

Given success in passing a series of ever more demanding field trials over a period of a few years, Lumonics would hope that the longer term result could be a substantial multi-year procurement of lasers for area detection systems for military inventory.

Technical Notes

Gas Laser:

A laser in which the lasing medium (material which produces laser light) is a gas or a mixture of gases. The carbon dioxide laser used in the Lumonics LaserMark® system is an example of one of many types of gas lasers.

Solid State Laser:

A laser in which the lasing medium is a solid material such as the ruby rod used in the first laser ever operated. JK Lasers Limited produces ruby and other types of solid state lasers, but their highest volume product is a line of lasers incorporating a complex solid crystal grown artificially and known as Neodymium doped Yttrium Aluminum Garnet (Nd:YAG).

Dye Laser:

A laser in which the liquid lasing medium produces a broad range of wavelengths (colours) in the visible part of the electromagnetic spectrum. Different dyes produce different colours. Dye lasers can be "excited" (made to lase) by very bright flash lamps or, more commonly, by another laser such as an Excimer laser.

Excimer:

The term "excimer" derives from "excited dimer" (e.g. krypton fluorine). Such molecules are briefly formed in an electrical discharge through a gas, which typically lases in the Ultra-Violet part of the electromagnetic spectrum.

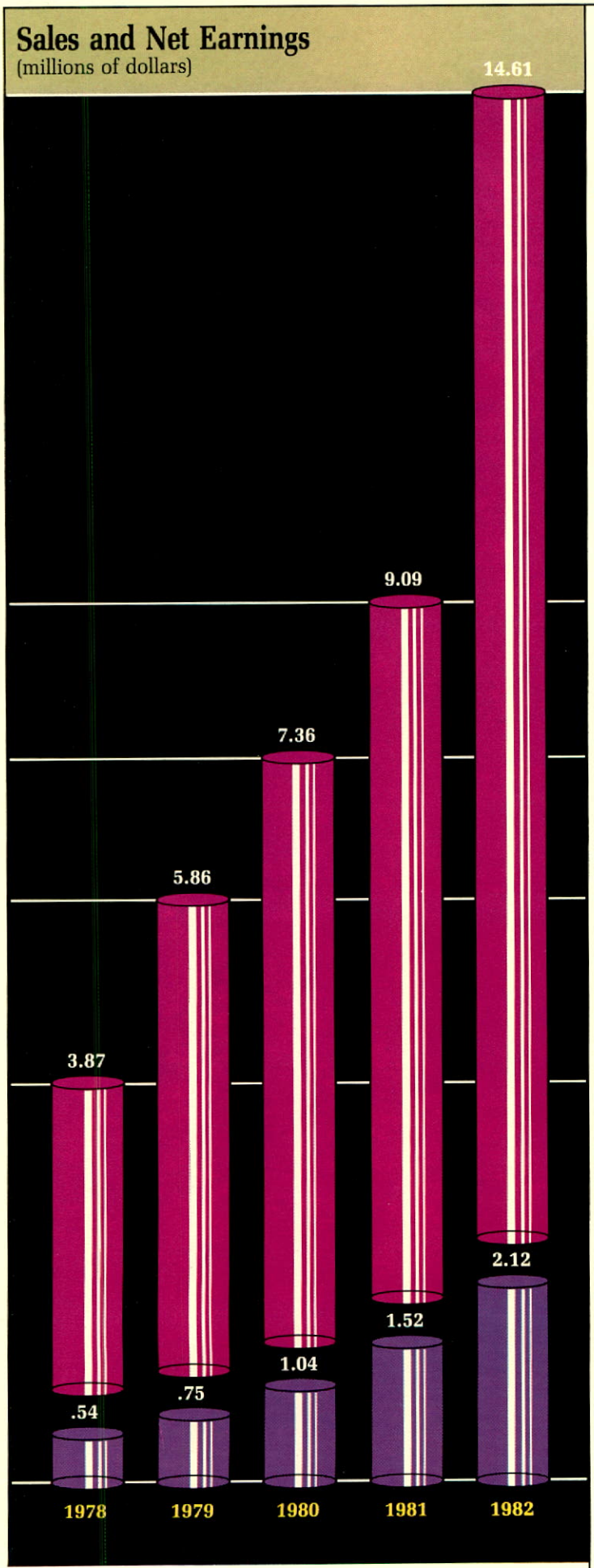
Why Different Lasers:

Laser users require different laser radiation wavelengths for different tasks. Since most lasers deliver only a single or a few wavelengths, different lasers are required.

Tunable Lasers:

Any one laser type tends to operate at a specific wavelength. Using special optical elements (such as a diffraction grating) it is possible to "tune" the output over a narrow range of the electromagnetic spectrum. For example, a carbon dioxide gas laser will preferentially operate at 10.6 micrometers wavelength. Using a tuning attachment, the laser can be forced to operate at a large number of other wavelengths between 9 and 11 micrometers, thereby greatly expanding the usefulness of the laser. For dye lasers, the tuning is continuous. By using a series of different dyes most of the visible and ultra violet spectrum can be covered.

Consolidated Financial Statements



Auditors' Report

To the Shareholders of
Lumonics Inc.:

We have examined the consolidated balance sheet of Lumonics Inc. as at December 31, 1982 and the consolidated statements of income and retained earnings and of changes in financial position for the year then ended. Our examination was made in accordance with generally accepted auditing standards, and accordingly included such tests and other procedures as we considered necessary in the circumstances.

In our opinion, these consolidated financial statements present fairly the financial position of the company as at December 31, 1982 and the results of its operations and the changes in its financial position for the year then ended in accordance with generally accepted accounting principles applied on a basis consistent with that of the preceding year.

Deloitte Haskins & Sells
Chartered Accountants
Ottawa, Ontario

February 17, 1983

Consolidated Balance Sheet

Lumonics Inc.

December 31, 1982	1982	1981
		(thousands of dollars)
Assets		
Current assets		
Cash	**$ 235**	$ 150
Short-term investments – at cost	**4,767**	7,092
Accounts receivable	**5,681**	3,146
Inventories (Note 4)	**4,540**	1,442
Prepaid expense	**39**	57
	15,262	11,887
Notes receivable	**127**	176
Property, plant and equipment (Note 5)	**4,088**	2,109
Deferred development costs (Note 6)	**788**	624
Excess cost of subsidiary over net assets acquired – less amortization	**7,223**	—
	$27,488	$14,796
Liabilities		
Current liabilities		
Accounts payable and accrued charges	**$ 3,027**	$ 1,780
Income taxes	**70**	631
Current portion of long-term debt	**128**	10
	3,225	2,421
Long-term debt (Note 7)	**931**	158
Deferred income taxes	**1,172**	569
	5,328	3,148
Shareholders' Equity		
Share capital (Note 8)	**15,851**	7,458
Contributed surplus	**126**	126
Retained earnings	**6,183**	4,064
	22,160	11,648
	$27,488	$14,796

Approved by the Board: A.V. Castledine, Director

R.J. Atkinson, Director

Consolidated Statement of Income and Retained Earnings

Year ended December 31, 1982	1982	1981
		(thousands of dollars)
Sales	**$14,607**	$ 9,088
Cost of goods sold	**10,748**	6,686
Gross profit	**3,859**	2,402
Research and development costs (Note 9)	**1,995**	1,032
Income from operations	**1,864**	1,370
Interest income (Note 10)	**841**	1,081
Income before income taxes	**2,705**	2,451
Income taxes (Note 11)	**586**	931
Net income	**2,119**	1,520
Retained earnings, beginning of year	**4,064**	2,544
Retained earnings, end of year	**$ 6,183**	$ 4,064
Earnings per common share		
Net income	**$ 2,119**	$ 1,520
Average number of common shares outstanding (thousands)	**3,036**	2,691
Earnings per common share (dollars)	**$ .70**	$ .56

Consolidated Statement of Changes in Financial Position

Year ended December 31, 1982	1982	1981
		(thousands of dollars)
Sources of working capital		
Operations		
Net income	**$ 2,119**	$ 1,520
Items not affecting working capital		
Depreciation and amortization	**647**	321
Amortization of excess cost of subsidiary over net assets acquired	**90**	—
Deferred income taxes	**98**	54
Gain on disposal of equipment	**—**	(2)
	2,954	1,893
Issue of common shares	**8,393**	—
Increase in long-term debt	**934**	—
Decrease in notes receivable	**49**	29
Proceeds on disposal of equipment	**—**	24
	12,330	1,946
Uses of working capital		
Additions to property, plant and equipment	**1,171**	216
Deferred development costs	**467**	432
Net non-current assets of acquired business (Note 2)	**7,811**	—
Reduction in long-term debt	**310**	19
	9,759	667
Increase in working capital	**2,571**	1,279
Working capital, beginning of year	**9,466**	8,187
Working capital, end of year	**$12,037**	$ 9,466

December 31, 1982

1. Significant accounting policies

The consolidated financial statements have been prepared in accordance with generally accepted accounting principles, and reflect the following policies:

Basis of consolidation

The consolidated financial statements include the accounts of the Company and its wholly-owned subsidiaries JK Lasers Limited and Lumonics Corporation.

Inventories

Inventories are valued on the following basis:

Finished goods – at the lower of cost and net realizable value.
Work-in-process and raw materials – at the lower of cost and replacement cost.

Property, plant and equipment

Property, plant and equipment are stated at cost. Buildings, machinery and equipment are depreciated using the diminishing-balance method.

Research and development costs

Development costs relating to specific products that in the company's view have a clearly defined future market are deferred and amortized on a straight-line basis over three years, commencing in the year following the year in which the new product development was completed.

Except as disclosed above, research and development costs (except for capital assets) are charged against income in the year incurred. Capital assets are treated as equipment purchases.

Excess cost of subsidiary over net assets acquired

The excess cost of subsidiary over net assets acquired is amortized on a straight-line basis over a period of forty years from date of acquisition.

Government assistance

Grant amounts resulting from government incentive programs are recorded in the accounts on the following basis:

Capital grants related to capital expenditures are reflected as a reduction of the costs of such assets.

Operating grants related to current period expenditures on research and development are recorded as a reduction of expenses at the time the eligible expenses are incurred.

Translation of foreign currencies

Foreign currency accounts in these financial statements are translated to Canadian dollars on the following basis:

Monetary assets and monetary liabilities – at the rate of exchange prevailing at the year end. Non-monetary assets (and related depreciation and amortization) and non-monetary liabilities – at the rates of exchange prevailing when the assets were acquired or the liabilities assumed. Revenue and expenses (other than depreciation and amortization) – at a rate approximating the rates of exchange prevailing on the dates of the transactions. Gains and losses on translation of foreign currencies are included in income.

2. Acquisition of JK Lasers Limited

On July 2, 1982, the Company acquired all of the outstanding shares of JK Lasers Limited, a British based company engaged in the development, manufacture and sale of solid state lasers. The results of operations of the company for the six month period ended December 31, 1982 are included in the Consolidated Statement of Income. Details of the acquisition which has been accounted for by the purchase method are as follows:

	(thousands of dollars)
Working capital	**$2,120**
Net non-current assets	
Excess cost of subsidiary over net assets acquired	**7,313**
Property, plant and equipment	**1,152**
Long-term debt	**(149)**
Deferred income taxes	**(505)**
	7,811
Total purchase price	**$9,931**

The total purchase price was satisfied by $1,717,000 cash and the issuance of 677,402 common shares valued at $8,214,000.

3. Commencement of United States subsidiary, Lumonics Corporation

During the year, the Company incorporated a United States of America subsidiary, Lumonics Corporation. The results of operations of the Company from the date of commencement of business on July 1, 1982 to December 31, 1982 are included in the Consolidated Statement of Income.

4. Inventories

	1982	1981
	(thousands of dollars)	
Finished goods	**$ 304**	$ 142
Work-in-process and raw materials	**4,236**	1,300
	$4,540	$1,442

5. Property, plant and equipment

	Rates	**1982**	1981
		(thousands of dollars)	
Land	—	**$ 293**	$ 57
Buildings	1–5%	**2,763**	1,783
Machinery and equipment	20–25%	**2,466**	971
		5,522	2,811
Less accumulated depreciation		**1,434**	702
		$4,088	$2,109

Depreciation of plant and equipment expensed during the current year amounted to $344,000 (1981 – $225,000).

December 31, 1982

6. Deferred development costs

	1982	1981
	(thousands of dollars)	
Deferred development costs, beginning of year	**$ 624**	$ 288
Development costs deferred in the year	**467**	432
Development costs amortized in the year	**(303)**	(96)
	$ 788	$ 624

7. Long-term debt

	1982	1981
	(thousands of dollars)	
8% Ontario Development Corporation mortgage. Paid during the year in accordance with the terms of the agreement.	**$ —**	$ 168
15% Industrial and Commercial Finance Corporation Limited loan negotiated in pound sterling, due in equal annual instalments of $22,000 through to 1988, secured by land and building with a book value of $611,000.	**153**	—
Industrial Development Authority promissory note negotiated in United States dollars due in instalments of $5,000 and $3,570 each month through to March 31, 1992 and March 31, 1989 respectively secured by land, building and equipment with a book value of $758,000. Interest is payable monthly at 75% of the prime rate of the First Interstate Bank of Arizona, N.A.	**906**	—
	1,059	168
Less current portion	**128**	10
	$ 931	$ 158

Principal amounts due in each of the next five years are $125,000 annually.

8. Share capital

Authorized:

Preferred – 190,500, 5% non-cumulative, non-voting preferred shares redeemable at the par value of $1.

Common – 20,000,000 common shares of no par value.

	1982	1981
	(thousands of dollars)	
Issued and fully paid:		
Preferred – 90,500 shares	**$ 90**	$ 90
Common – 3,384,811 shares	**15,761**	7,368
	$15,851	$ 7,458

During the year common shares were issued as follows:

	1982	1981
	(thousands of dollars)	
Exercise of Employee Stock Options – 16,089 shares	**$ 179**	$ —
Acquisition of JK Lasers Limited – 677,402 shares	**8,214**	—
	$8,393	$ —

Stock Options

On May 11, 1982, a notice was accepted for filing by the Toronto Stock Exchange of the Resolution of the Board of Directors to reserve 135,000 common shares pursuant to the employee stock option plans. In addition, at the time of acquisition of JK Lasers Limited, 45,860 shares were reserved for employees in accordance with the acquisition agreement, bringing the total amount now reserved to 315,860 shares.

As at December 31, 1982, options to employees to purchase 245,400 common shares had been granted under these plans and were exercisable at prices ranging from $6.38 to $17.95 for a total consideration of $2,798,870.

Of the stock options granted, 90,285 shares may be purchased in 1983 and 44,605 shares in each of the calendar years 1984 through 1986 and 21,300 in calendar 1987.

9. Research and development costs

	1982	1981
	(thousands of dollars)	
Research and development costs	**$2,863**	$1,770
Amortization of deferred development costs	**303**	96
	3,166	1,866
Development costs deferred	**(467)**	(432)
	2,699	1,434
Government assistance	**(704)**	(402)
	$1,995	$1,032

10. Interest income

	1982	1981
	(thousands of dollars)	
Interest income	**$ 921**	$1,094
Interest on long-term debt	**(80)**	(13)
	$ 841	$1,081

11. Income taxes

The effective tax rate differs from the statutory Federal and Provincial combined rates due to the manufacturing and processing tax reduction, business investment tax credits and the scientific research allowance.

December 31, 1982

The company has available at December 31, 1982, investment tax credits of approximately $119,000 for reduction of future Federal income taxes, which expire in 1987.

The company also had at that date capital losses carried forward for income tax purposes of approximately $110,000 which may be deducted from any future taxable capital gains.

No recognition has been given in these financial statements to the potential tax savings which may result from these items.

Deferred income taxes relate primarily to claiming capital cost allowances for income tax purposes in excess of depreciation and amortization charged in the financial statements, and to claiming deferred development costs for income tax purposes in the year they are incurred.

12. Remuneration of directors and senior officers

Remuneration of the company's directors, senior officers and senior personnel for the year ended December 31, 1982 was $440,535 (1981 – $422,250).

13. Segmented information

The Company's activities represent one industry segment, manufacture and sale of lasers, and are conducted in three geographic segments, Canada, United States and Europe. For the year ended December 31, 1981 the Company's activities were conducted entirely in Canada.

Export sales of the Canadian operation are as follows:

	1982	1981
	(thousands of dollars)	
United States	**$6,580**	$4,950
Europe	**1,795**	2,040
Other	**1,044**	798
	$9,419	$7,788

14. Litigation

The company is currently the defendant in two actions alleging patent infringement, one in Canada and one in the United States. In both cases, the plaintiffs are various persons including Gordon Gould, Refac International Limited, and Patlex Corporation. Both Refac and Patlex have an interest in certain patents originally issued to Mr. Gould.

It is the Company's opinion that neither patent under litigation is valid and that recent developments have been favourable to this position. In the event of an adverse judgement in either or both actions, it is reasonable to believe that license arrangements could be negotiated which would have no material effect on the Company.

15. Subsequent events

On January 26, 1983, the Company issued 500,000 common shares from treasury for the sum of $10,200,000, after deducting share issue expense of $250,000.

The Company is committed to capital expenditures for the purchase of land in Kanata and Tempe (Phoenix) for the sum of $550,000.

Segmented information

	Canada	United States	Europe	Eliminations	Consolidated
			(thousands of dollars)		
Sales to customers outside the enterprise	$ 9,121	$ 2,581	$ 2,905	$ —	$14,607
Transfers between geographic segments	2,172	—	—	(2,172)	—
Total revenue	$11,293	$ 2,581	$ 2,905	$ (2,172)	$14,607
Segment operating profit	$ 3,867	$ 64	$ 297	$ (369)	$ 3,859
Research and development					(1,995)
Interest income					841
income taxes					(586)
Net income					$ 2,119
Total assets	$25,029	$ 3,320	$ 4,812	$ (5,673)	$27,488

Corporate Information

Directors

Robert J. Atkinson
President and Chief Executive Officer
Lumonics Inc.

Allan R. Buchanan
Chairman
Lumonics Inc.

Douglas C. Cameron
Vice President
James Maclaren Industries Inc.

Allan V. Castledine
Chairman
Davidson Partners Limited

Charles J. Gardner, Q.C.
Partner
Goldberg, Shinder, Gardner, Kronick & Tavel

R. Timothy Kenny
President and Chief Executive Officer
James Maclaren Industries Inc.

Gordon A. Mauchel
Vice President
Lumonics Inc.

James K. Wright
Managing Director
JK Lasers Limited

Officers

Allan R. Buchanan
Chairman

Robert J. Atkinson
President and Chief Executive Officer

Gordon A. Mauchel
Vice President

Douglas J. James
Vice President, Operations (Kanata)

Richard E. Hall
Secretary and Treasurer

Auditors

Deloitte Haskins & Sells
Ottawa, Ontario

Arthur Andersen & Co.
Birmingham, England

Transfer Agents

The Canada Trust Company
Toronto, Ontario

Stock Exchange Listing

The Toronto Stock Exchange
Symbol — LUM

Solicitors

Goldberg, Shinder, Gardner, Kronick & Tavel
Ottawa, Ontario

Tory, Tory, DesLauriers & Binnington
Toronto, Ontario

Bankers

Canadian Imperial Bank of Commerce
Ottawa, Ontario

Locations

Corporate Centre

Lumonics Inc.
105 Schneider Road
Kanata (Ottawa), Ontario
Canada K2K 1Y3
(613) 592-1460
Telex 053-4503
Fax (613) 596-5706

Corporate Facilities

North America

Lumonics Inc.
105 Schneider Road
Kanata (Ottawa), Ontario
Canada K2K 1Y3
(613) 592-1460
Telex 053-4503
Fax (613) 596-5706

Lumonics Corporation
2905 South Potter Road
Tempe (Phoenix),
Arizona 85282
U.S.A.
(602) 894-1460
Telex 165801
Fax (602) 894-5571

3450 E. Spring Street
Suite 207
Long Beach,
California 90806
U.S.A.
(213) 598-8387

1205 Franklin Avenue
Garden City,
New York 11530
(516) 746-2226
Telex 144507

2300 E. Devon Avenue
Suite 155
Des Plaines,
Illinois 60018
(312) 299-4077
Telex 282525
Fax (312) 299-7856

Europe

JK Lasers Limited
23 Somers Road
Rugby, Warwickshire
CV22 7DG
England
(0788) 70321
Telex 311540

JK Lasers Limited
Av. A.J. Slegers 180 B
1200 Brussels, Belgium
(02) 762 79 46
Telex 4664348

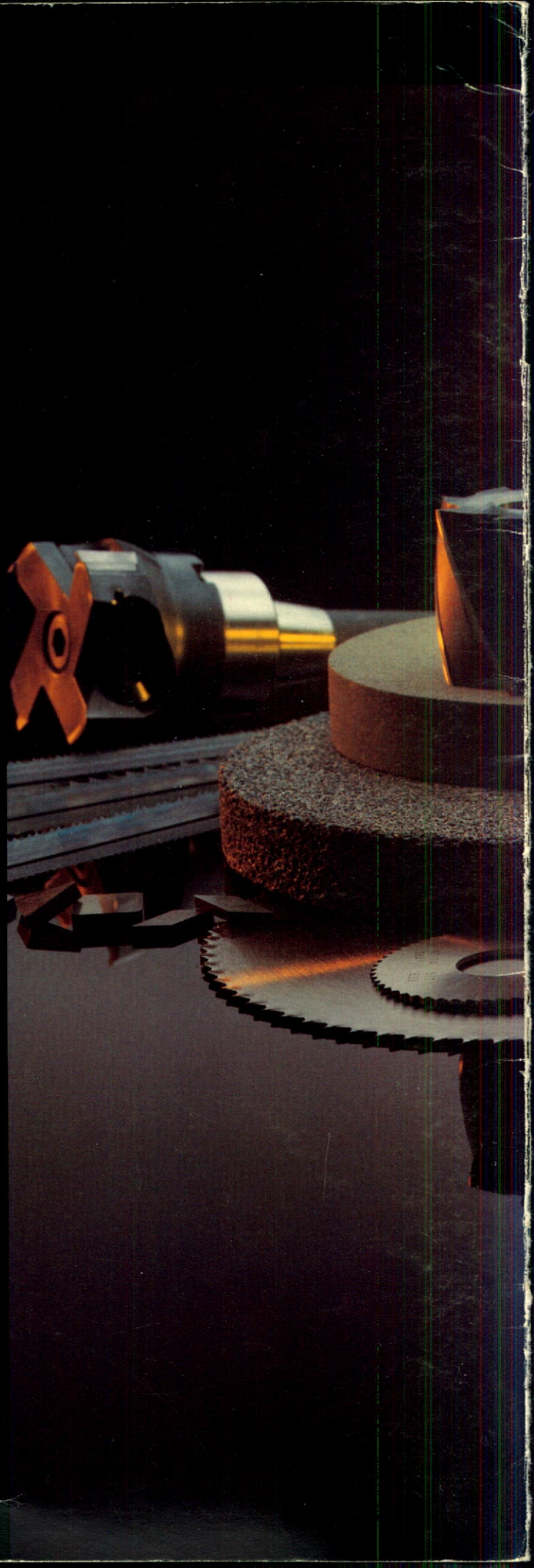
JK Lasers Deutschland GmbH
Bodenseestrasse 235
D-800 Muenchen 60,
West Germany
(089) 871 10 39

Other

Contact the Corporate Centre for authorized Lumonics sales representatives and distributors throughout the world.

The Annual Meeting of Shareholders of Lumonics Inc. will be held at 4:00 p.m. on Monday, May 9, 1983, in the Rideau Room of the Four Seasons Hotel, Ottawa, Ontario, Canada.

LUMONICS



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