

.

# THE COMPANY







## FINANCIAL HIGHLIGHTS

	1982	1981	1980
Net sales Income (loss) before	\$28,562,000	\$14,529,000	\$ 4,440,000
extraordinary credit Income (loss) per share before	\$ 3,134,000	\$ 1,904,000	\$ (321,000)
extraordinary credit	\$.58	\$ .46	\$ (.11)
Working capital	\$19,234,000	\$ 3,333,000	\$ 445,000
Total assets	\$27,628,000	\$ 8,568,000	\$ 2,478,000
Total stockholders' equity	\$22,459,000	\$ 4,067,000	\$ 809,000
Number of employees	445	239	87









STOCKHOLDERS' EQUITY Millions of Dollars





'80

'81

'82

'79

'78

On the cover: Incremental construction of a bicycle hub is quickly and easil performed using SOLIDVIEW," Les idata's revolution ary technology for displaying solid images. The last picture in the sequence is constructed of 6,618 polygons. The time to display this image took less than 50 seconds.

### THE COMPANY

Lexidata Corporation designs, manufactures, markets, and services a family of raster graphic display processors and subsystems used in a wide variety of interactive computer applications. These products serve as the information interface between a host computer and the operator. In addition to providing graphic input and output capabilities, Lexidata's products efficiently and cost-effectively ease the picture processing workload of the host computer.

The Company's products are sold primarily to original equipment manufacturers (OEMs) and to sophisticated end-users which incorporate these components into application-oriented systems. These customers generally demand the highest level of quality and have application requirements in which features and performance are of particular importance. The flexibility of Lexidata's products allows the OEM customer to select those features which optimize his application software in an overall cost-effective system.

Recent advances in computer technologies have brought the cost of computer graphics to more affordable levels. Graphics information systems can now be used for manipulating images, just as data processing systems are used for manipulating words and numbers. Lexidata's graphics systems are used mostly for computer-aided design/computer-aided manufacturing (CAD/CAM) to generate color or monochrome engineering designs and drawings. They are also used to enhance photographs and artwork, and to create business graphics which the operator can view and modify. Imaging applications include mapping, military reconnaissance, industrial nondestructive testing, and medical diagnostics.

The Company uses raster scan technology for its computer graphics and imaging displays. Raster scan has become the dominant display technology, combining television technology with digital semiconductor technology. A raster display device has a fixed number of points (called pixels), arranged in a matrix of rows and columns. Images are created by selectively illuminating points within the matrix with an electron beam. The electron beam systematically sweeps the entire screen, generally at either 30 or 60 times per second. This process, known as the refresh cycle, produces an image on a screen that can be changed instantly.

Raster scan graphics offer many advantages not found in other display technologies; an almost unlimited range of colors can be manipulated easily and quickly to highlight data and display life-like pictures. Lines can be displayed without going back to the computer data base, allowing an operator to change designs at high speeds, saving large amounts of time and improving productivity.

Lexidata is proud to be at the leading edge of this significant and exciting technology, and to contribute to what is fast becoming recognized as the second era of the information revolution.

## TO OUR STOCKHOLDERS:



Ralph T. Linsalata

The past twelve months have been the most significant and productive for Lexidata since the Company was established in 1974. During the fiscal year ended September 30, 1982, we achieved another period of record growth, Sales were \$28,561,600 and net income was \$3,134,400 or \$.58 per share for the 1982 fiscal year. The fiscal year results compare with sales of \$14,529,100 and net income of \$2,053,300 (including extraordinary credit from realization of operating loss carryforward of \$149,100) or \$.50 per share for the fiscal year ended September 30, 1981. During the past five years, the Company has experienced a compounded annual growth rate in revenues of 124%. In May of this year, Lexidata was highlighted in "Inc", a business publication, as the seventeenth fastest growing small public company in the United States.

In addition, we had a highly successful initial public offering on December 23, 1981. The offering of 1,185,000 shares of common stock generated proceeds which enabled the Company to repay short-term indebtedness; acquire capital assets consisting principally of engineering and manufacturing equipment; and to expand production capability with a new, 80,000 square-foot facility near its headquarters in Billerica, Massachusetts.

During fiscal 1982, we implemented a major corporate program to strengthen the Company in many functional areas so that we can properly serve a dynamically changing graphics and imaging industry. The program is consistent with our basic strategy to develop and market high-quality, raster graphics processing systems for original equipment manufacturers (OEMs) and large volume sophisticated endusers involved in computer-aided design/computer-aided manufacturing (CAD/CAM). In addition, our four major corporate objectives remain unmodified:

 To be a leading company in the computer graphics industry—a field that is expected to grow rapidly through the end of the century.
To be a technological innovator, committing a high proportion of the Company's resources to the development of technically superior products that have commercial application and offer value added to customers.

 To produce the highest quality products at competitive prices.
To build the Company on a base of success-oriented professionals, bringing together top managers from rapidly growing high-technology companies with Lexidata's own

D

highly competent management team.

Consistent with these corporate objectives, we have continued to focus on product development. During the 1982 fiscal year, substantial progress was made in the technological evolution of the System 3400, reinforcing its leadership position in graphics display processors. As the mainstay of our product line, the System 3400 is highly modular and designed to meet a wide range of graphics and imaging applications which require high-speed processing and high resolutions. It allows our customers to select graphics processor capabilities that economically meet their specific performance and feature requirements. To date, there are more than 3000 installations of this processor, and we believe that advanced generations of the product will greatly expand our customer base

The Company also introduced three major new products during the past year: the System 8000, the System 2000, and SOLIDVIEW.<sup>™</sup> The System 8000 is a distributed graphics processing system that combines the features of the System 3400 with a Motorola MC68000 microprocessor. The System 2000 is a family of intelligent, high performance graphics terminals which offer flexibility, local programming, and low price. SOLIDVIEW is a graphics processor which reduces the time needed to display smooth, shaded images from minutes to seconds. With \$4,496,500 invested during the 1982 fiscal year (which represents 16% of net sales), Lexidata's product development programs should provide a continual stream of new products that will help our customers maintain technological leadership in graphic displays.

During the second half of the 1982 fiscal year, Lexidata established Quality Assurance and Test Engineering functions which we believe are unequalled by any other vendor in the industry. We have extensive programs in the areas of component testing and evaluation, sub-assembly and final test, and full system testing at elevated temperatures. Both the Engineering Technical Documentation and User Documentation groups were greatly expanded and significant investments in automation were initiated for these areas. We are committed to providing our customers with high-quality, technologically advanced products that are dependable and cost competitive.

The beginning of the 1982 fiscal year was marked by optimism in almost all of Lexidata's markets. However, as the year progressed, the impact of the recession contin-

ued to grow, especially in the CAD/CAM industry. Our customers experienced decreasing order rates, and they in turn began to delay their orders. In light of the current economic uncertainty, we expect that Lexidata will be required to function at a lower operating level and with a smaller backlog. Our recently introduced products and our aggressive marketing and sales programs instituted this past year should enable us to withstand the current adverse economic conditions, as well as position Lexidata to take advantage of the economic upturn when it occurs. Although we expect that the nearterm will be difficult, we are confident that the Company will emerge from this recessionary period a leaner and tougher competitor, wellpositioned to maintain rapid growth. As we look forward to the challenges of the future, I would like to thank Lexidata's stockholders, customers, and vendors for their enthusiastic support; and most importantly, our employees for their unusual dedication, consistent contributions, and teamwork—the foundation on which we will build a truly outstanding company.

Minalata

Ralph T. Linsalata President

## **GROWTH MARKETS**

The computer graphics industry has been growing at a substantial rate in recent years. In particular, raster scan technology is experiencing tremendous growth. An industry study by Machover Associates, a leading computer graphics consulting firm, indicates that raster displays captured 57% of a \$510 million computer graphics market in 1981. The study forecasts that by 1986, raster scan technology is expected to represent 80% (\$1.5 billion) of a \$1.9 billion computer graphics market, for a 40% compounded annual growth rate.

The 32-bit minicomputer and the 16-bit microprocessor have helped to bring the costs of computer graphics to affordable levels. Graphics manipulation-particularly color graphics-requires extensive amounts of memory, processing power, and storage. However, semiconductor memory costs have decreased dramatically, and more sophisticated large scale integrated circuits have been introduced. These events have led to the availability of greater amounts of display processing functions which can be off-loaded to graphics processors and workstations. With the help of these new technologies, graphics capability should become as pervasive as the alphanumeric terminal in both the technical and business marketplaces.

When Lexidata was founded in April 1974, its original intent was to manufacture turnkey medical information systems using raster technol-







Lexidata's graphics products provide in-house development capabilities at Honeywell Information Systems, where engineers design printed circuit boards that are used in the company's computer product line.



CAD/CAM, Lexidata's major market, has revolutionized the traditional concepts of product design by automating many tedious tasks associated with the product development cycle. In this integrated circuit design application, an operator uses a turnkey CAD/CAM system from Calma to create, view and modify several layers of information simultaneously.

(Calma Company is a wholly-owned subsidiary of the General Electric Company, U.S.A.) High resolution is an important factor in displaying multiple views of this valve block design. Prime Computer incorporates Lexidata's systems for the display of complex geometric data.

1

5

ogy. Instead, however, the Company focused exclusively on raster technology, and a series of one-board display processors for imaging applications was developed. This experience in imaging provided a tremendous advantage when the Company began to service graphics markets. Unlike traditional graphics companies, imaging vendors have always been concerned about the quality of the display, the spectrum of colors available, and the ability to manipulate the image without going back to the computer data base. Lexidata combined this knowledge of image manipulation with a knowl-

edge of graphics to offer a pioneering line of high performance equipment to new markets.

Lexidata concentrates on the middle-to-high performance segment of the computer graphics industry with a family of raster display processors that interface with host computers. While the Company's customers were at one time working primarily in imaging applications, its current customer base is comprised mostly of OEM producers of computeraided design (CAD) systems.

CAD has revolutionized the traditional concepts of product design. Lexidata's technologically advanced products are used to increase productivity in the electrical design of integrated circuits and printed wiring boards, schematics, architectural engineering, numerical control programming, mechanical design, and finite element modeling.

As the CAD market matures and expands, there is a growing need to extend both ends of the performance spectrum: high functionality systems and low-cost systems. Technologies are advancing to the point where the manufacturing process as well as the design process is computer-assisted. The introduction of CAD/CAM systems is starting



A more unusual graphic arts application is the design of oriental rugs. When patterns and colors have been finalized, a dye-jet sprayer, under computer control,

paints the design onto a white rug. This rug pattern was produced by Advanced Color Technology.



Lexidata's SOLID-VIEW™ has been well-received by people working with virtually any application that deals with threedimensional data. This photo of a bicycle hub illustrates SOLID-VIEW's crosssectioning feature, which allows a designer to check for poorly fitting pieces. to dramatically increase the quality of manufactured goods and further increase the manufacturers' productivity.

A new and extremely exciting area of mechanical CAD is solid modeling. This is an advanced concept that constructs and maintains a true representation of the object in the computer data base instead of using a traditional wireframe representation. The availability of this data enables the designer to look at cross-sections, check for interference or poorly fitting pieces, and to perform real time stress analysis. To display this three-dimensional data



American Science and Engineering displays computerized tomography (CT)

head scans to aid in clinical diagnosis. Lexidata's color lookup tables facilitate the interpretation of a wide variety of medical data. as life-like objects requires the ability to manipulate and display a wide range of colors and shades of color.

Other graphics applications include business graphics and graphic arts. Lexidata's display processors help to create high-quality graphic slides for business presentations; page layout for magazines and newspapers; textile designs for wall and floor coverings; and special effects for movies and commercials.

Lexidata's newer products have allowed the Company to address imaging needs once again. It is generally recognized that techniques for capturing imaging data have reached satisfactory levels of sophistication. However, it is the interpretation of this data which has become critical to the success of medical diagnostic procedures; nondestructive testing; and research in aerial and satellite imaging, military intelligence, remote sensing, and astronomy.

Lexidata's products are designed for use in multiple applications. It is by addressing the needs of many applications that the Company can achieve new levels of performance and functionality to an ever-increasing variety of users of computer graphics equipment.



Satellite imaging provides up-tothe-minute meteorological information. Television

stations use cloud imagery from TASC's SUPER-SAT™ systems to show weather patterns across the United States. b

7

### **PRODUCT DEVELOPMENT**

Lexidata believes that a substantial commitment to research and development has been responsible for its past growth and is critical to its future success. In 1978, the Company introduced the System 3400-a product which uses a basic system architecture of superior design, on which subsequent product families and enhancements have been based. As a result, OEM customers are ensured of Lexidata's product compatibility and maximum software transportability. This minimizes the effort to incorporate newer Lexidata enhancements into their existing systems.

Product performance and flexibility form the basis of Lexidata's product development strategy. It is this strategy that attracts the leading computer graphics vendors to Lexidata for their equipment needs. Lexidata offers a comprehensive set of display attributes which represents the complete range of desirable features in computer graphics equipment. Whether it is high resolution, processing speed, or the number of viewable colors, these attributes are implemented at the highest possible functional level. A wide variety of applications can be served, and regardless of the application, the customer is assured that his own product will be at the leading edge of technology.

In addition, all Lexidata systems are flexible and easy to configure. This benefits the OEM because a configuration can be tailored to meet his specific needs—there is no extraneous product cost or unnecessary product complexity which lead to additional support costs.

Timeliness has substantial value in responding to market requirements.



he System 2000 family provides high resolution, low-cost graphics functionality in either black-andwhite or color. A unique four-way split screen enables users to perform interactive graphics, system dialogue, menu selection, and to log additional messages.





The System 3400, as shown, is the mainstay of Lexidata's product line. Its superior system architecture offers high resolution, high speed, modular design, and ease of integration.

lo remain the technological leader in graphics. Lexidata provides its engineers with an environment that is conducive to solid, relevant product research. Laboratories. such as this one used for SOLID-VIEW projects, are well-equipped to assist in on-going engineering and product development programs.

Lexidata provides the product features, functions, and tools which allow the OEM to integrate the display processor into his overall product in a minimal amount of time. Simultaneously, he can achieve a product uniqueness which enhances the value of his overall graphic solution.

#### THE SYSTEM 3400

The System 3400 Display Processor is an intelligent, high resolution peripheral device attached to a host minicomputer which reduces the computer time required to perform display and image manipulation functions. Because it was designed as a display processor and not based on a general purpose microprocessor, the System 3400 provides extremely fast display writing speeds that are important for user interaction.

A program to update the System 3400 technology was initiated two years ago. This has resulted in the redesign of every printed circuit board, the chassis, and all power supplies. The latest technology and the most advanced components available have been incorporated. The System 3400 being shipped today is far different than the System 3400 units originally shipped in 1978. However, its basic architecture remains the same, for it is this outstanding architecture which has made increased performance and functionality possible.

#### THE SYSTEM 8000

.

The System 8000 extends the upper end of the System 3400's capabilities, by featuring a dual processor architecture and extended CORE graphics software. It combines the performance of Lexidata's raster display processor with the powerful Motorola 16/32-bit MC68000 microprocessor. The System 8000 has been developed primarily for CAD/ CAM applications where interactive manipulation of a large, high resolution data structure is important. The System 8000 has broadened the scope of Lexidata's applications and will assist the Company in penetrating high volume segments of the graphics markets.

#### THE SYSTEM 2000

The System 2000 was developed in response to customer need for low-cost, high resolution raster display terminals which can be used to build low-cost, black-and-white and color systems. It offers a unique, four-way split screen, a high degree of freedom for customer design, and superior ergonomics. These Lexidata features are rapidly defining new industry standards of performance.

#### **SOLIDVIEW™**

SOLIDVIEW is a new technology for viewing solid models. It represents a major breakthrough in the computer graphics industry, because it is the first and only system which allows the user to work with solid modeling software in an interactive environment. The unprecedented power and speed of SOLIDVIEW allow the user to perform incremental construction of solid objects in essentially real time, and drastically improve his solid modeling capabilities with minimal software effort. SOLIDVIEW has the potential to revolutionize the mechanical design segment of the CAD/CAM market and allows for new innovations in other areas such as medical imaging, seismic analysis,

and computer-generated movies and commercials.

#### **IMAGEVIEW™**

Early in the 1983 fiscal year, Lexidata introduced IMAGEVIEW, a lowcost, flexible subsystem for imaging applications. Designed for the OEM, IMAGEVIEW greatly reduces software development time. IMAGE-VIEW introduces the concept of virtual images and virtual lookup tables, which allow the user to display and operate on many images at once. In addition, it features "region of interest" processing for advanced applications.

The resources devoted to the development of these products have been substantial. The Company has acquired the talents of hardware and software engineering personnel in the areas of analog, digital, and signal processing. The Corporate Engineering Department is comprised of qualified, dedicated employees who strive for excellence in extending the limits of technology as well as understanding and meeting the needs of Lexidata's customers.

These people are attracted to Lexidata because they are given the opportunity to develop their skills by taking advantage of an environment which is conducive to solid, relevant product research. It provides ample working space and the most advanced development computers and laboratory equipment available.

The success of Lexidata's product line stems from this combination of talent, equipment, and understanding of the market's needs.

### QUALITY AND PRODUCTIVITY

Lexidata has achieved rapid growth by accurately determining its customers' needs, and meeting these needs with technologically advanced products of the highest quality. The focus on quality is critical to the Company's success, because in addition to being an important customer requirement, it provides the shortest path to increased productivity. The combination of quality and productivity is enabling Lexidata to be recognized worldwide as a leading manufacturer of computer graphics equipment.

The Company's recently completed 80,000 square-foot engineering and manufacturing center is equipped with state-of-the-art automated production equipment and carefully planned computer-based controls. In addition, Lexidata has implemented a unique Quality Assurance Program which assures a consistently high level of quality for all products, down to the subassembly level.

QUALITY IN MANUFACTURING

Before the production process begins, all electrical components are pre-conditioned by an independent test facility which screens out reliability problems. Components are placed onto printed circuit (pc) boards using semi- and fully-automatic insertion equipment. The automation of this process is up to eight times faster than manual insertion, and provides significantly greater accuracy. Components that cannot be placed automatically are inserted by assemblers who are fully trained on all pc board assemblies.

Electrical connections between the inserted components and the pc



Gomputerization is another key to reaching the highest levels of productivity. Lexidata's Information Services Center provides support to all departments via on-line terminals that are located throughout the Company. boards are made using advanced wave soldering technology. Hundreds of pc boards can be soldered in minutes with a high level of integrity. Subsequently, GenRad in-circuit and functional testers are used to test sub-assembly functionality as well as the functionality of all discrete components (i.e., resistors, capacitors, and transistors). The automated test equipment reduces the testing times from hours to minutes

Depending on the customers' requirements, wirewraps and jumpers are installed. Systems are fully integrated by combining the chassis and pc boards with any specified peripheral devices. Extensive computerized diagnostic testing is performed to verify functionality and guarantee that the systems meet customers' specifications.

After each production phase, the Quality Assurance Group examines the work that has been performed. All completed systems are operated at elevated temperatures, during which time full systems tests are conducted.

The Quality Assurance Audit Group performs functional acceptance and compliance reviews on all systems to ensure that Lexidata's workmanship standards and UL compliance (where applicable) have been met. Customer meetings are also held at Lexidata's facilities to assure consistency in testing methods, to meet both Lexidata's and the customers' specifications.

As part of Lexidata's Quality Assurance Program, manufacturing and marketing personnel conduct independent surveys by direct mail and telephone contact. This action expedites identifying and solving initial problems in the field and fosters a better business relationship with customers. In addition, a customer action board meets on a regular basis to review all correspondence that has been directed to it: each action item is closely monitored until the customer receives a satisfactory response.



Fully-automatic insertion equipment helps Lexidata's manufacturing facility increase productivity and quality.

3

### QUALITY IN OPERATIONS

Lexidata's productivity is also reflected in its computerized Management Information System, which has been a significant factor in the Company's ability to maintain rapid growth. In its early stages of development, Lexidata established an information services center and purchased a small data processing system. Later, as the Company grew in size, increased processing was needed to handle all data requirements more effectively. The addition of a larger system has provided greater capabilities for existing and future business applications, predominantly in the areas of manufacturing, finance, and sales.

The computerized Materials Requirements Planning (MRP) program is an invaluable asset in the manufacturing cycle. Inventory levels are monitored, expediting every phase in the planning and control process. Greater manufacturing efficiencies have been achieved, resulting in substantial savings for the customer as well.

People, automation, and controlsthese are the keys to Lexidata's growth formula. Each is a vital ingredient to achieving increased productivity through the highest quality standards.

11

## CUSTOMER SERVICE AND SUPPORT

Lexidata recognizes that a high degree of interaction is essential to build strong customer relations, and has therefore added greater focus and direction to its customer service and support organizations.

#### CUSTOMER SERVICE

The success of Lexidata's field service organization depends on its ability to understand the unique needs of OEM customers. Under the direction of a newly-appointed corporate manager of customer service, a department has been established to define these needs and to initiate the appropriate programs to support them. In addition, the manager serves on new product review teams, where he is instrumental in determining the proper goals to maintain and repair new products.

Lexidata's repair service is conducted on a return-to-depot basis. The Company currently has repair centers in three strategic locations: one depot at the western regional headquarters in Laguna Hills, California; and two in Billerica, Massachusetts for corporate and eastern regional support. In addition, customer service representatives are already in place at two other locations (Santa Clara, California, and Rockville, Maryland), where depots are scheduled to open in the near future. International customers are fully supported by a combined effort from Lexidata's direct technical support representatives and international distributor network.

### TECHNICAL EDUCATION CENTER

Education and training are provided by a recently expanded Technical Education Center. With its flexible curriculum, the center designs courses to satisfy the diverse maintenance philosophies of Lexidata's customers; courses are taught on either the board or component level. Training equipment is closely matched to the customer's system configuration. Technical classes are typically held at Lexidata's corporate headquarters, but arrangements can be made for on-site training.

### LEXUS

LEXUS, the Lexidata Users Society, is comprised of and actively directed by individuals who have purchased, ordered, or currently use Lexidata's products. Meetings are held to discuss application ideas and programs, hardware techniques, and other information related to graphics and image processing that is of common interest to its membership. The objective is to provide an open forum for the exchange of information between Lexidata and its customers, as well as to promote the effective utilization of Lexidata's products.



he Technical **Education Center** provides "handson" training sessions designed to meet customers' needs. Courses include 50% laboratory work and 50% classroom instruction. **Classes** are kept small to allow maximum instructor-student interaction.



Experienced field service technicians help customers fully utilize their Lexidata systems. Repair depots are strategically located to provide technical support in a timely manner.

### DIRECTORS AND OFFICERS

### SALES OFFICES

#### DIRECTORS: Frederick R. Adler

Chairman; Senior Partner, Reavis & McGrath, Attorneys at Law, New York, New York; Managing General Partner, Adler Group, Venture Capital Partnership, New York, New York

Ralph T. Linsalata President, Treasurer, Clerk Lexidata Corporation, Billerica, Massachusetts

Peter J. Dikeman President, Digital Techniques, Inc., Consulting Firm, Burlington, Massachusetts

Allan S. Gordon Managing Partner, Bruan Gordon & Co., Investment Bankers, New York, New York

**Egil G. Ruud** Group Vice President, Textron, Inc. Providence, Rhode Island

James R. Swartz General Partner, Adler Group, Venture Capital Partnership, New York, New York

**R. Courtney Whitin, Jr.** Senior Vice President, American Research and Development, Division of Textron, Inc., Boston, Massachusetts

OFFICERS: Ralph T. Linsalata President, Treasurer, Clerk

Walter M. Anderson Vice President-Corporate Engineering

Lloyd W. Fugate Vice President-Marketing

Paul J. Murphy Vice President-Finance

James L. Repsher Vice President – North American Sales

Christopher D. Robert Vice President–Sales and Field Operations

Clemente J. Russo Vice President–Manufacturing

### CORPORATE HEADQUARTERS:

Lexidata Corporation 755 Middlesex Turnpike Billerica, MA 01865 Telephone: (617) 663-8550

SALES OFFICES: Billerica, Massachusetts Boulder, Colorado Chapel Hill, North Carolina Laguna Hills, California Palatine, Illinois Rockville, Maryland Santa Clara, California White Plains, New York

EUROPEAN HEADQUARTERS: London, England

INTERNATIONAL DISTRIBUTORS: Melbourne, Australia Tel Aviv, Israel Hvidovre, Denmark Munich, W. Germany Paris, France Tokyo, Japan