

AXT INC  
Form 10-K405  
March 26, 2002

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**UNITED STATES SECURITIES AND EXCHANGE COMMISSION**

Washington, D.C. 20549

**Form 10-K**

(Mark one)

**ANNUAL REPORT PURSUANT TO SECTION 13 OR 15(d)  
OF THE SECURITIES EXCHANGE ACT OF 1934  
For the fiscal year ended December 31, 2001**  
or

**TRANSITION REPORT PURSUANT TO SECTION 13 OR 15(d)  
OF THE SECURITIES EXCHANGE ACT OF 1934  
For the transition period from to**

Commission file Number: 0-24085

**AXT, Inc.**

*(Exact name of registrant as specified in its charter)*

**Delaware**

*(State or other jurisdiction of  
incorporation or organization)*

**94-3031310**

*(I.R.S. Employer  
Identification No.)*

**4281 Technology Drive, Fremont, California**

*(Address of principal executive offices)*

**94538**

*(Zip Code)*

**Registrant's telephone number, including area code: (510) 683-5900**

**Securities registered pursuant to Section 12(b) of the Act: None**

**Securities registered pursuant to Section 12(g) of the Act: Common Stock, \$.001 par value**

Indicate by checkmark whether the registrant (1) has filed all reports required to be filed by Section 13 or 15 (d) of the Securities Exchange Act of 1934 during the preceding 12 months (or for such shorter period that the registrant was required to file such reports), and (2) has been subject to such filing requirements for the past 90 days. Yes  No

Indicate by checkmark if disclosure of delinquent filers pursuant to Item 405 of Regulation S-K is not contained herein, and will not be contained, to the best of registrant's knowledge, in definitive proxy or information statements incorporated by reference in Part III of this Form 10-K or any amendment to this Form 10-K.

The aggregate market value of the voting stock held by non-affiliates of the registrant, based upon the closing sale price of the common stock on December 31, 2001 as reported on the Nasdaq National Market, was approximately \$272,076,813. Shares of common stock held by each officer, director and by each person who owns 5% or more of the outstanding common stock have been excluded in that such persons may be deemed to be affiliates. This determination of affiliate status is not a conclusive determination for other purposes.

As of January 31, 2002, 22,386,622 shares, \$.001 par value, of the registrant's common stock were outstanding.

**DOCUMENTS INCORPORATED BY REFERENCE**

Portions of the definitive proxy statement for the registrant's 2002 annual meeting of stockholders to be filed with the Commission pursuant to Regulation 14A not later than 120 days after the end of the fiscal year covered by this form are incorporated by reference into Part III of this Form 10-K report.

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**PART I**

*This report includes forward-looking statements that reflect our current views with respect to future events and our potential financial performance. These forward-looking statements are subject to certain risks and uncertainties, including those discussed in Business , Management s Discussion and Analysis of Financial Condition and Results of Operations , and elsewhere in this report, that could cause actual results to differ materially from historical results or those anticipated. In this report, the words anticipates, believes, expects, intends, future similar expressions identify forward-looking statements. Readers are cautioned not to place undue reliance on these forward-looking statements, which speak only as of the date of this report.*

**Item 1. Business**

**Overview**

We design, develop, manufacture and distribute high-performance compound semiconductor substrates, as well as opto-electronic semiconductor devices, such as high-brightness light emitting diodes, or HBLEDs, and laser diodes including vertical cavity surface emitting lasers, or VCSELs, and edge-emitting laser diodes. Our substrate products are used primarily in fiber optic communications, wireless communications and lighting display applications. We believe our proprietary vertical gradient freeze, or VGF, technique for manufacturing compound semiconductor substrates provides significant benefits over traditional methods and has enabled us to become a leading manufacturer of compound semiconductor substrates. We pioneered the commercial use of VGF technology to manufacture gallium arsenide, or GaAs, substrates and have used VGF technology to manufacture substrates from other materials, such as indium phosphide, or InP, and germanium, or Ge. Customers for our substrates include Alpha Industries, Agilent Technologies, EMCORE, Nortel Networks, RF Micro Devices, SDL and Sumitomo Chemical. Our acquisition of Lyte Optronics provided us with expertise in epitaxial processes for manufacturing opto-electronic semiconductor devices. We have used these capabilities to make blue, green and cyan HBLEDs and laser diodes. Our opto-electronic semiconductor devices are used in a wide range of applications, such as solid-state lighting and fiber optic communications. We have recently undertaken an initiative to reduce the cost of our substrate manufacturing operations by moving much of our manufacturing operations to China and by investing in sources of low cost raw materials. We are also expanding our HBLED manufacturing capacity in response to an increase in customer demand.

We were incorporated in California in December 1986 and reincorporated in Delaware in May 1988. We changed our name from American Xtal technology, Inc. to AXT, Inc. in July 2000. Our principal offices are located at 4281 Technology Drive, Fremont, California 94538, and our telephone number at this address is (510) 683-5900. Our web site is [www.axt.com](http://www.axt.com); however, the information on our web site does not constitute a part of this annual report on Form 10-K and is not incorporated herein.

**Industry Background**

Historically, most semiconductor devices were created on a single crystal base material, or substrate, of silicon. Today, however, a growing number of electronic and opto-electronic devices are being developed with requirements that exceed the capabilities of silicon. Many of these devices address the continually increasing demand to send, receive and display information on high-speed wireless and wireline networks. This demand has created a growing need for power-efficient high-performance systems that can operate at high frequencies and can be produced cost-effectively in high volumes. These systems enable the growth and development of a wide range of end-user applications. For example, Dataquest, Inc., expects worldwide cellular/PCS handset production to grow from 347 million units in 2001 to approximately 681 million units by 2005.

Other examples of applications for these systems include:

fiber optic networks and optical systems within these networks;

new voice and high-speed wireless data systems;

infrared emitters and optical detectors in computer systems;

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solid-state lighting, including exterior and interior automobile lighting; and  
  
satellite communications systems.

As a result of the limitations of silicon-based technologies, semiconductor device manufacturers are increasingly using compound semiconductor substrates to improve the performance of semiconductor devices and to enable these new applications. This shift is occurring even though these compound semiconductor substrates are more expensive. Compound semiconductor substrates are composed of multiple elements that include a metal, such as gallium, aluminum or indium, and a non-metal, such as arsenic, phosphorus or nitrogen. The resulting compounds include gallium arsenide, indium phosphide and gallium nitride. Advantages of devices manufactured on compound substrates over devices manufactured using silicon substrates include:

- operation at higher speeds;
- lower power consumption;
- less noise and distortion; and
- opto-electronic properties that enable devices to emit and detect light.

A key step in producing a compound semiconductor substrate is to grow a crystal of the materials. Historically, two processes have been used to grow crystals: the Liquid Encapsulated Czochralski, or LEC, technique and the Horizontal-Bridgeman, or HB, technique. We believe two trends are reducing the appeal of these techniques: more semiconductor devices are being formed using an epitaxial process and semiconductor device manufacturers are switching their production lines to six-inch diameter substrates. The LEC and HB techniques each have difficulties producing six-inch, high quality, low-cost compound semiconductor substrates for epitaxial processing. We introduced our VGF technique in 1986 to respond to the limitations inherent in the LEC and HB techniques.

Compound semiconductor substrates enable the development of a wide range of electronic products including power amplifiers and radio frequency integrated circuits used in wireless handsets. Compound substrates can also be used to create opto-electronic products including HBLEDs and VCSELs used in solid-state lighting and fiber optic communications.

HBLEDs are solid-state compound semiconductor devices that emit light. The global demand for HBLEDs is experiencing rapid growth because HBLEDs have a long useful life, consume approximately 10% of the power consumed by incandescent or halogen lighting and improve display visibility. Applications where HBLEDs are increasingly used include wireless handset displays, automotive displays, full color video displays, traffic lights and various consumer applications. According to Strategies Unlimited, an independent industry analyst, the market for HBLEDs is expected to grow from \$1.2 billion in 2001 to approximately \$3.0 billion by 2006.

VCSELs are semiconductor lasers that emit light in a cylindrical beam and offer significant advantages over traditional laser diodes, including greater control over beam size and wavelength, reduced manufacturing complexity and packaging costs, lower power consumption and higher frequency performance. Electronics and computing systems manufacturers are using VCSELs in a broad range of end-market applications, including fiber optic switching and routing, such as Gigabit Ethernet for communications networks and Fibre Channel for storage area networks. According to ElectroniCast, an independent industry analyst, the market for VCSELs is expected to grow from 5.0 million units in 2000 to approximately 50.0 million units, with a value of \$4.9 billion, in 2005.

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### **The AXT Advantage**

We are a leading developer and supplier of high-performance compound semiconductor substrates and opto-electronic semiconductor devices, including HBLEDS and VCSELS. There are four key causes of our success:

*Our VGF technology is a competitive advantage for our substrate business.* We pioneered the commercial use of VGF technology to manufacture GaAs substrates and we believe that through the use of VGF we have become the leading worldwide supplier of GaAs substrates. Our VGF process produces substrates with high mechanical strength and physical and chemical uniformity, as well as a low defect rate. The following changes in our customers' technologies are increasing demand for substrates with these features:

*Greater use of epitaxy rather than ion implantation.* Many of the newest generation of high-performance semiconductor devices for fiber optic and wireless communications applications, including heterojunction bipolar transistors, or HBTs, and pseudomorphic high electron mobility transistors, or PHEMTs, are popular because they offer lower power consumption and better device linearity than their predecessors. These devices are created using epitaxial processed substrates. Our VGF substrates are more suitable for these applications than are our competitors' products manufactured using LEC and HB technologies.

*Switch to six-inch diameter wafers.* Many of our semiconductor device manufacturing customers are switching their GaAs production lines to six-inch diameter substrates in order to reduce unit costs and increase capacity. Our VGF technique is better suited to developing six-inch substrates than are competing methods.

*Introduction of InP substrates.* Even GaAs cannot meet the requirements for increasing system performance and network bandwidth of some applications, including SONET OC-768 applications that will operate at speeds up to 40 gigabits per second. Manufacturers of these devices are turning to Indium Phosphide (InP) substrates that can support these features. We have successfully used our VGF technique to develop InP and we were among the first to offer four-inch diameter InP substrates.

In addition, VGF technology gives us further benefits.

*Customer technology independence.* Our semiconductor device manufacturing customers often compete among themselves. For example, several of our customers compete for technological leadership in the wireless handset market. These customers or end-users all require devices made on GaAs substrates. We are, therefore, largely immune from the effects of such competition and benefit from an overall need for faster, more power efficient electronic and opto-electronic devices.

*Faster and less expensive capacity expansion.* We build our own crystal growing equipment rather than ordering it from third-party vendors. This capability, coupled with the fact that our equipment is less expensive and simpler to manufacture than LEC equipment, enables us to increase our capacity faster and at lower cost than our competitors. This ability is particularly beneficial in periods of rapid growth for six-inch GaAs and all InP substrates. Retaining the equipment manufacturing process within AXT also helps protect our proprietary technology.

*Some customers specify VGF substrates.* Our wafers are qualified with most of the key suppliers of GaAs and InP semiconductor devices. The qualification process, which is lengthy and must be repeated for each customer, can be a barrier to entry for a new material or supplier. Furthermore, certain of our customers now specify that they will only accept VGF-grown substrates for their manufacturing processes. As the businesses of these customers grow, we are well positioned to grow with them as a key supplier.

*Our low-cost manufacturing is an advantage.* We use our technology and economics of scale to be a low-cost manufacturer. Our current effort to move much of our substrate manufacturing operations to China and our investment in sourcing of raw materials provides us with a combination of lower costs for facilities, labor and materials than we encounter in the United States.

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*We entered the opto-electronic semiconductor device market quickly through our acquisition of Lyte Optronics.* Our acquisition of Lyte Optronics provided us with expertise in epitaxial processes for manufacturing high-volumes of opto-electronic semiconductor devices. High-quality epitaxy is a key requirement for most of today's advanced opto-electronic semiconductor devices, such as HBLEDs and VCSELs. Since acquiring Lyte Optronics, we have developed opto-electronic products that are among the more difficult to create using epitaxy, including blue and green HBLEDs and VCSELs. We have filed five patent applications for our approach to fabricating HBLEDs. We believe that we can be an important additional domestic source of these devices.

### **The AXT Strategy**

Our goals are to strengthen our position as the leading developer and supplier of high-performance compound semiconductor substrates and to develop a leading position in the market for opto-electronic semiconductor devices. Key elements of our strategy include:

*Decreasing our substrate manufacturing cost structure.* We are moving much of our substrate manufacturing operations to China and investing in sources of key raw material supplies in order to lower unit production costs.

*Strengthen our leadership position in the InP market.* We believe that there will be growth in demand for the next generation of high-speed fiber optic devices, such as devices used in SONET OC-768 applications. These products are manufactured on InP substrates and we are positioning ourselves to be the leading supplier of InP substrates. Our sales of InP substrates during the year ended December 31, 2001 grew 102.0% compared to our sales of InP substrates during 2000.

*Advance VGF technology leadership.* We believe that our ability to produce high-quality substrates using VGF technology continues to provide us with a competitive advantage in the compound semiconductor substrate markets. We intend to continue our investment in research and development in order to expand our leadership position in the commercial use of VGF technology. For example, we intend to leverage our existing knowledge in growing six-inch GaAs substrates to grow longer crystals, which will further reduce our costs. We are also launching an effort to develop six-inch diameter InP substrates in response to customer requests.

*Enhance our opto-electronic semiconductor devices.* We intend to further penetrate the HBLED market through continued investment in research and development and expansion of production capacity. We expanded our manufacturing capacity by adding metal-organic chemical vapor deposition, or MOCVD, reactors and are modifying our epitaxial process to improve device performance and yield. We have invested in the research and infrastructure required to grow our own sapphire substrates, which are used in producing blue, green and cyan LEDs.

*Leverage existing customer relationships.* We currently sell our GaAs substrates to more than 400 customers and believe that we are a qualified provider to most of the significant users worldwide of GaAs substrates. We intend to capitalize on our relationships with our customers in order to both expand sales of GaAs substrates and sell other compound substrates, such as InP. We also intend to establish alliances and joint development arrangements with customers in emerging high growth markets to develop new products, increase manufacturing efficiencies and more effectively serve our customers' needs.



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### **Technology**

Our core technologies include our proprietary VGF technique used to produce high quality crystals that are processed into compound substrates, and our epitaxy technologies that enable us to manufacture blue, green and cyan HBLEDs, VCSELs and edge-emitting laser diodes.

Our VGF technique is designed to control the crystal-growth process with minimal temperature variation and is the technique we use to produce our GaAs, InP and Ge substrates. Unlike traditional techniques, our VGF technique places the hot compound melt above the cool crystal, thereby reducing the turbulence at the interface of the melt and the solid crystal, compared with the LEC technique in which the melt and crystal are inverted. The temperature gradient between the melt and the crystal in the VGF technique is significantly lower than in traditional techniques. These aspects of the VGF technique enable us to grow crystals that have a relatively low defect density and high uniformity. The crystal and the resulting substrate are mechanically strong, resulting in lower breakage rates during a customer's manufacturing process. Since the temperature gradient is controlled electronically rather than by physical movement, the sensitive crystal is not disturbed. In addition, the melt and growing crystal are contained in a closed chamber, which isolates the crystal from the outside environment to reduce potential contamination. This substrate isolation allows for more precise control of the gallium-to-arsenic ratio, resulting in better consistency and uniformity of the crystals.

Our VGF technique offers several benefits when compared to traditional crystal growing technologies. The Liquid Encapsulated Czochralski, or LEC, technique is the traditional method for producing semi-insulating GaAs substrates for electronic applications. During the LEC process, the crystal is grown by dipping a seed crystal through molten boric oxide into a melt and slowly pulling the seed up into the cool zone above the boric oxide where the crystal hardens. Unlike the VGF technique, the LEC technique is designed so that the hotter GaAs melt is located beneath the cooler crystal, resulting in greater turbulence in the melt, and at a temperature gradient that is significantly higher than the VGF technique. The turbulence and high temperature cause LEC-grown crystals to have a higher dislocation density than VGF-grown crystals, resulting in a higher rate of breakage during the device manufacturing process. As an open process, the LEC technique also results in greater propensity for contamination and difficulty controlling the ratio of gallium to arsenic. It requires large, complex electro-mechanical systems that are expensive and require highly skilled personnel to operate.

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Our VGF technique also offers advantages over the Horizontal-Bridgeman, or HB, technique, for producing semi-conducting GaAs substrates for opto-electronic applications. The HB technique holds the GaAs melt in a semi-cylindrical container, causing crystals grown using the HB method to have a semi-circular, or D-shaped, cross-section. Accordingly, more crystal material is discarded when the D-shaped substrate is subsequently trimmed to a round shape. In addition, crystals grown using the HB technique have a higher defect density than VGF-grown crystals. The HB technique cannot be used cost-effectively to produce substrates greater than three inches in diameter. The HB technique houses the GaAs melt in a quartz container during the growth process, which can contaminate the GaAs melt with silicon impurities, making it unsuitable for producing semi-insulating GaAs substrates.

The following table provides a comparison of these three techniques:

	VGF	HB	LEC
Substrate applications	Electronic and opto-electronic	Opto-electronic	Electronic
Largest wafer size available	6	3	6
Stress/defect levels	Very Low	Low	High
Crystal purity	Good	Poor	Good
Applicability to multiple materials	GaAs, InP, Ge	GaAs	GaAs, InP, GaP
Equipment and labor cost	Very Low	Low	High
Amount of waste material	Very Low	High	Low
Equipment flexibility	Versatile	Limited	Limited
Equipment downtime	Minimal	Moderate	High
Number of competitors	Several	Many	Many

VCSEL devices include single lasers as well as one- and two-dimensional arrays of lasers. Array products are more highly valued than single lasers because they provide greater bandwidth, but are harder to form because they require epitaxial structures that possess very high uniformity in chemical composition and low variation in thickness. These features are hard to achieve because the epitaxial process used to make a VCSEL device places approximately 200 layers of epitaxial structure on a substrate, as compared to the less than 10 layers of material deposited on a substrate to make an HBLD. Our epitaxial process, which includes proprietary in situ monitoring techniques, allows us to manufacture highly reliable VCSEL wafers that demonstrate comparatively low threshold currents and high output power and are sufficiently uniform to produce one- and two-dimensional VCSEL devices. We employ both ion implantation and oxidation processes to produce VCSEL devices from our wafers.

We create our opto-electronic semiconductor devices using MOCVD, which is an epitaxial technique to synthesize compound semiconductor thin films onto substrates. MOCVD reactors are available from multiple sources and wafers fabricated using MOCVD generally possess a better combination of uniformity and optical and electronic properties and are easier to produce cost-effectively in high volumes than wafers manufactured by other methods, such as molecular beam epitaxy, vapor phase epitaxy or liquid phase epitaxy. As a result, MOCVD reactors have become the choice of the opto-electronic industry for fabricating devices such as LEDs, VCSELs and laser diodes. We modify our MOCVD reactors to improve their performance and use a proprietary growth recipe that controls temperature, material impurity, defect density, material thickness and layer composition while allowing for multiple wafer batch replication.

**Table of Contents****Products**

We design, develop, manufacture and distribute high-performance semiconductor substrates, as well as opto-electronic devices, such as HBLEDs, VCSELs and laser diodes. The table below sets forth our products and selected applications:

Product	Applications	
<b>Substrates</b>	<b>Electronic</b>	<b>Opto-electronic</b>
GaAs	Cellular phones Direct broadcast television High-performance transistors Satellite communications	LEDs Lasers Optical couplers Displays
InP	Fiber optic communications Satellite communications High-performance transistors Automotive collision avoidance radars	Fiber optic communications Lasers
Ge	Satellite solar cells	
<b>Opto-electronics</b>		
Blue, green and cyan HBLEDs	Full color displays Lighting for the interior and exterior of automobiles Traffic signals Back lighting for cellular phones and instrument panels White light for general illumination	
VCSELs	Fiber optic and wireless communications	
Laser Diodes	Fiber optic and wireless communications	

*Substrates.* We currently sell compound substrates manufactured from GaAs and InP, as well as single-element substrates manufactured from Ge. We supply GaAs substrates in two-, three-, four-, five- and six-inch diameters. We manufacture InP substrates in two-, three- and four-inch diameters and Ge substrates in four-inch diameters. We developed and intend to initiate production of sapphire substrates.

*Opto-electronics.* We sell blue, green and cyan HBLED products in wafer and chip form. We began selling blue HBLED products in the first quarter of 2000 and in 2001 began shipping green and cyan HBLEDs. We introduced our first VSCSEL product in August 2000.

**Customers**

We sell our compound semiconductor substrates worldwide to leading semiconductor device manufacturers. Our substrate customers include:

Agilent Technologies	Kopin	RF Micro Devices
Alpha Industries	Motorola	SDL
Alpha Photonics	Nortel Networks	Spectrolab
EMCORE	Osram	Sumitomo Chemical
Epistar	Picogiga	TRW Space & Defense
Eptaxial Products	Precision Opto Wafer	Visual Photonics Epitaxy
Epitronics	Quantum Epitaxial Designs	

We sell our HBLED products primarily to customers that incorporate them into lighting products. Our HBLED customers include Agilent, Harvatek, Liteon, Kindwin, and King Brite.

Historically, we have sold a significant portion of our products in any particular period to a limited number of customers. Our five largest customers accounted for 28.3% of our total revenue from continuing operations in 2001, 26.1% in 2000 and 24.8% in 1999. No customer accounted for more than 10% of our total revenue in 2001, 2000 or 1999. We expect that sales to certain customers will continue to comprise a

significant portion of our net sales in the future.

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### **Manufacturing, Raw Materials and Supplies**

We believe that our success is partially due to our manufacturing efficiency and high product yields and we continually emphasize quality and process control throughout our manufacturing operations. We perform our substrate manufacturing operations at our facilities in Fremont, California and Beijing, China. As part of our plan to reduce manufacturing costs, we are shifting most of our processes to our facilities in China, where costs are generally lower. We intend to transfer much of our substrate manufacturing operations to China by the end of 2002. We believe that our capital investment and subsequent operating costs are lower for our manufacturing facilities in China relative to the U.S. Many of our manufacturing operations are fully automated and computer monitored or controlled, enhancing reliability and yield. We use proprietary equipment in our substrate manufacturing operations to protect our intellectual property and control the timing and pace of capacity additions. By assembling our own substrate manufacturing equipment, we can quickly increase capacity without incurring delays caused by ordering additional equipment or converting older equipment to new technologies. Our epitaxial wafer production is located in El Monte, California. All of our manufacturing facilities are ISO 9001 or 9002 certified.

Although we purchase supply parts, components and raw materials from several domestic and international suppliers, we depend on a single or limited number of suppliers for certain critical materials used in the production of our substrates. We generally purchase these materials through standard purchase orders and not pursuant to long-term supply contracts. Although we seek to maintain sufficient inventory levels of certain materials to guard against interruptions in supply and to meet our near term needs, and have to date been able to obtain sufficient supplies of materials in a timely manner, there may be shortages of certain key materials, such as gallium. Accordingly, to help ensure continued supply of materials, we have formed strategic alliances with suppliers of key raw materials required to manufacture our products. We believe that these alliances will be advantageous in procuring materials to support our growth.

We use MOCVD equipment to manufacture our opto-electronic devices. We installed several new MOCVD reactors during the past twelve months and may add additional capacity as demand warrants. The substrate materials and raw wafers used in our visible emitter products are purchased from our substrate division and other sources.

### **Sales and Marketing**

Each of our divisions is responsible for its own sales and marketing activities, and each maintains its own sales and marketing personnel. In addition, each of our divisions advertises in trade publications, distributes promotional materials, publishes technical articles, conducts marketing programs and participates in industry trade shows and conferences in order to raise market awareness of our products.

*Substrates.* We sell our substrate products through our direct sales force in the U.S. and Japan and through independent sales representatives in France, Japan, South Korea, Taiwan and the United Kingdom. Our direct sales force consists of sales engineers who are knowledgeable in the manufacture and use of compound and single-element substrates. Our sales engineers work with customers during all stages of the substrate manufacturing process, from developing the precise composition of the substrate through manufacturing and processing the substrate to the customer's exact specifications. We believe that maintaining a close relationship with customers and providing them with ongoing technical support improves customer satisfaction and will provide us with a competitive advantage in selling other substrates to our customers. The substrate division launched a program in late 2000 with selected customers in which we guaranteed that certain volumes of six-inch GaAs and other substrates will be delivered on specific dates and the customer made a prepayment for part of the value of its order. Several major customers participate in this program which we expect will conclude during 2002.

*Opto-electronics.* We sell our HBLEED products through our direct sales force in the U.S. and Taiwan and through independent sales representatives to lamp package manufacturers in Asia. We intend to expand sales of these products in the U.S. and Europe primarily using our direct sales force. We sell our VCSEL and edge emitting laser diodes through our direct sales force and through independent sales representatives.

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*International Sales.* International sales are an important part of our business. In the year ended December 31, 2001, sales to customers outside of the United States accounted for 50.4% of our revenue, as compared to 48.2% in 2000 and 51.6% in 1999. The primary markets for sales of our products outside of the United States include countries in Asia and Western Europe. Our ability to sustain and increase our international sales involves significant risks, including volatile political, social and economic instabilities abroad, possible fluctuations in currency exchange rates, and changes in tariffs, import restrictions or other trade barriers.

## **Research and Development**

To maintain and improve our competitive position, we focus our research and development efforts on designing new proprietary processes and products, improving the performance of existing products and reducing manufacturing costs. We have assembled a multi-disciplinary team of highly skilled scientists, engineers and technicians to meet our research and development objectives. As a result of our ongoing research and development activities, we believe that we offer superior quality products. For example, some customers now qualify substrates manufactured using our VGF technique as the only acceptable material in their design specifications.

Our current substrate research and development activities focus on continued development and enhancement of six-inch GaAs crystals, including improved yield, greater substrate strength and increased crystal length. We continue to develop other compound substrates, such as InP and a low boron version of our standard GaAs substrates and are initiating research into development of six-inch InP products. We developed and intend to initiate production of sapphire substrates.

We are focusing on all three major stages of HBLED development: epitaxy, wafer fabrication and die fabrication. Our goal is to improve brightness and yield, create specific colors and enhance uniformity of product, both within and across production runs. Specific colors are created by controlling the indium content of the epitaxial layers, which we achieve, in part, from modifications that we make to our MOCVD reactors. The wafer and die fabrication experience we gained in our Lyte Optronics laser diode operation has helped us develop similar techniques for HBLEDs.

We began research in 1999 to develop VCSEL devices with uniform epitaxy structures on three-inch wafers and announced VCSEL wafer products in August 2000. We continue to improve their performance characteristics and developed one-dimensional VCSEL arrays. We also developed edge-emitting laser diodes with emission wavelengths of 980nm, 1.3 microns and 1.5 microns.

We historically funded a significant portion of our research and development efforts through contracts with the U.S. government and customer funded research projects, although we do not have any projects underway currently. Under our contracts, we retain rights to the VGF and wafer fabrication technology that we have developed. The U.S. government retains the rights to utilize the technologies we develop for government purposes only. In 1999 these contracts amounted to \$1.6 million. Currently, our research and development is internally funded.

Research and development expenses were \$8.2 million in 2001, as compared to \$8.8 million in 2000 and \$2.6 million in 1999.

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### **Competition**

The semiconductor industry is characterized by rapid technological change and price erosion, as well as intense foreign and domestic competition. We believe we currently have a leading position in the existing markets for compound semiconductor substrates primarily as a result of our expertise in VGF technology. However, we believe we face actual and potential competition from a number of established domestic and international companies.

We believe that the primary competitive factors in the markets in which our products compete are:

quality;

price;

performance;

meeting customer specifications;

customer support and satisfaction; and

customer investment in competing technologies.

Our ability to compete in target markets also depends on factors such as:

the timing and success of the development and introduction of new products by us and our competitors;

the availability of adequate sources of raw materials; and

protection of our products by effective use of intellectual property laws and general economic conditions.

Our primary competition in the market for compound semiconductor substrates includes Freiberger, Hitachi Cable, Japan Energy and Sumitomo Electric. In addition, we also face competition from compound semiconductor device manufacturers that produce substrates for their own internal use, and from companies such as IBM and Motorola that are actively developing alternative compound semiconductor materials.

Our primary competition in the market for HBLED products include Cree, LumiLED, Nichia Chemicals, Toyoda Gosei and United Epitaxy. In general, HBLED manufacturers in Taiwan and China have a competitive pricing advantage due to low overhead and small research and development investments. Cree, Nichia Chemicals, Sony and Toyoda Gosei have significant patent portfolios that other competitors, including us, must either design around or license.

We primarily compete with EMCORE, Honeywell, Trulight, Picolight, Zarlink, Infineon, Cielo and E2O in the market for VCSEL devices and with Mitsubishi for edge-emitting laser diodes.

### **Protection of our Intellectual Property**

Our success and the competitive position of our VGF technique depend on our ability to maintain trade secrets and other intellectual property protections. We rely on a combination of patents, copyrights, trademark and trade secret laws, non-disclosure agreements and other intellectual property protection methods to protect our proprietary technology. We believe that, due to the rapid pace of technological innovation in the markets for our products, our ability to establish and maintain a position of technology leadership depends as much on the skills of our development personnel as upon the legal protections afforded our existing technologies. To protect our trade secrets, we take certain measures to ensure their secrecy, such as executing non-disclosure agreements with our employees, customers and suppliers. However, reliance on trade secrets is only an effective business practice insofar as trade secrets remain undisclosed and a proprietary product or process is not reverse engineered or independently developed.

To date, we have been issued four U.S. patents and have two patent applications pending, which relate to our VGF products and processes. We have five U.S. patent applications pending which relate to our HBLED or laser diode technology, and have patent applications pending in Europe, Canada, China, Japan and Korea which are based on one of our U.S. patents that relates to our VGF processes. We have no issued

foreign patents.



**Table of Contents****Environmental Regulations**

We are subject to federal, state and local environmental laws and regulations. These laws, rules and regulations govern the use, storage, discharge and disposal of hazardous chemicals during manufacturing, research and development and sales demonstrations. If we fail to comply with applicable regulations, we could be subject to substantial liability for clean-up efforts, personal injury and fines or suspension or cessation of our operations. We cooperated with the California Occupational Safety and Health Administration, or Cal-OSHA, in an investigation primarily regarding impermissible levels of potentially hazardous materials in certain areas of our manufacturing facility in Fremont, California. In May 2000, Cal-OSHA levied a fine against us in the amount of \$313,655 for alleged health and safety violations. In March 2001, we settled this claim in the amount of \$200,415, and have put in place engineering, administrative and personnel protective equipment programs to address these issues. On May 1, 2001, the Santa Clara Center for Occupational Safety and Health filed a complaint for injunctive relief and civil penalties against us alleging violations of California Business Professions Code 17200 et seq., and Health and Safety Code section 25249 et seq. as a result of our use of arsenic and inorganic arsenic compounds in our workplace. See *Legal Proceedings* below.

**Employees**

As of December 31, 2001, we had 1,308 full-time employees, of whom 1,107 were principally engaged in manufacturing, 161 in sales and administration and 40 in research and development. Of these employees, 641 are located in the U.S., 666 in China and 1 in Japan. As a result of shifting more of our substrate manufacturing to China, we have implemented headcount reductions in our Fremont, California facilities. Our success is in part dependent on our ability to attract and retain highly skilled workers. Our employees are not represented by a union and we have never experienced a work stoppage. Although moral has been affected by our workforce reductions, we consider our relations with our employees to be good.

**Item 2. Properties**

Our principal properties as of March 15, 2002 are as follows:

<b>Location</b>	<b>Square Feet</b>	<b>Principal Use</b>	<b>Ownership</b>
Fremont, CA	58,000	Production and Administration	Owned
Fremont, CA	80,000	Production	Owned
Fremont, CA	20,292	Administration	Operating lease, expires May 2005
Fremont, CA	9,280	Warehouse	Operating lease, expires June 2005
Fremont, CA	24,100	Warehouse	Operating lease, expires July 2006
Monterey Park, CA	22,000	Production and Administration	Owned
Torrance, CA	6,674	Administration	Operating lease, expires May 2003
Torrance, CA	15,027	Production	Operating lease, expires May 2003
El Monte, CA	26,652	Production	Owned
El Monte, CA	6,281	Production	Operating lease, expires Dec. 2006
Beijing, China	31,000	Production and Administration	Owned
Beijing, China	31,000	Production	Owned
Beijing, China	32,000	Production	Owned

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Beijing, China	16,000	Housing	Owned
Xiamen, China	14,000	Production	Operating lease, expires Dec. 2002

We consider each facility to be in good operating condition and adequate for its present use, and believe that each facility has sufficient plant capacity to meet its current and anticipated operating requirements.

**Table of Contents****Item 3. *Legal Proceedings***

On May 1, 2001, the Santa Clara Center for Occupational Safety and Health filed a complaint for injunctive relief and civil penalties against us in the Superior Court of California, County of Alameda, Hayward Division, Case No. H218237-5. The Complaint alleges violations of California Business and Professions Code section 17200 et seq., and Health and Safety Code section 25249 et seq. as a result of our use of arsenic and inorganic arsenic compounds in our workplace. Mediation is scheduled for June 2002. We believe that we have meritorious defenses against the alleged claims, and intend to defend ourselves vigorously. However, due to the nature of litigation and fact that the case is still in its early stages, we cannot determine the possible loss, if any, that may ultimately be incurred either in the context of a trial or as a result of a negotiated settlement. We may also incur substantial legal fees in this matter. However, we do not believe that this action is likely to have a material adverse effect on our business, financial condition, cash flows or results of operation.

From time to time we are involved in judicial or administrative proceedings concerning matters arising in the ordinary course of our business. We do not expect that any of these matters, individually or in the aggregate, will have a material adverse effect on our business, financial condition, cash flows or results of operation.

**Item 4. *Submission of Matters to a Vote of Security Holders***

None

**PART II****Item 5. *Market for Registrant's Common Equity and Related Stockholder Matters***

Our common stock has been trading publicly on the Nasdaq National Market under the symbol AXTI since May 20, 1998, the date we consummated our initial public offering. The following table sets forth, for the periods indicated, the range of quarterly high and low closing sales prices for our common stock on the Nasdaq National Market.

	<u>High</u>	<u>Low</u>
Fiscal 2001		
First Quarter ended March 31, 2001	\$44.560	\$ 14.500
Second Quarter ended June 30, 2001	\$40.670	\$ 13.720
Third Quarter ended September 30, 2001	\$26.700	\$ 10.200
Fourth Quarter ended December 31, 2001	\$ 16.850	\$ 10.300
Fiscal 2000		
First Quarter ended March 31, 2000	\$45.750	\$ 14.500
Second Quarter ended June 30, 2000	\$46.000	\$ 21.250
Third Quarter ended September 30, 2000	\$44.375	\$ 31.125
Fourth Quarter ended December 31, 2000	\$41.688	\$ 24.500

As of December 31, 2001, there were 93 registered holders of record of our common stock. Because many shares of AXT's common stock are held by brokers and other institutions on behalf of stockholders, we are unable to estimate the total number of stockholders represented by these registered holders.

We have never paid or declared any cash dividends on our common stock and do not anticipate paying cash dividends in the foreseeable future. We are restricted in our ability to pay dividends under the terms of our credit facility with our bank. Dividends accrue on our preferred stock at the rate of \$0.20 per annum.

**Table of Contents****Item 6. Selected Consolidated Financial Data**

The following selected consolidated financial data should be read in conjunction with, and are referenced to, our consolidated financial statements and related notes and Management's Discussion and Analysis of Financial Condition and Results of Operations.

	Years Ended December 31,				
	2001	2000	1999	1998	1997
(In thousands, except per share data)					
<b>Income Statement Data:</b>					
Revenue	\$ 119,530	\$ 121,503	\$ 75,372	\$ 49,074	\$ 25,335
Cost of revenue, including restructuring costs of \$1,844 in 2000	82,191	73,684	50,026	29,003	15,227
Gross profit	37,339	47,819	25,346	20,071	10,108
Operating expenses:					
Selling, general, and administrative	21,487	18,041	10,474	6,019	2,959
Research and development	8,204	8,769	2,566	2,504	1,289
Restructuring costs		6,409			
Acquisition costs			2,810		
Total operating expenses	29,691	33,219	15,850	8,523	4,248
Income from operations	7,648	14,600	9,496	11,548	5,860
Interest expense	2,081	3,616	2,201	875	570
Other (income) and expense	13,373	(28,432)	(1,423)	(715)	34
Income (loss) from continuing operations before provision for income taxes	(7,806)	39,416	8,718	11,388	5,256
Provision for income taxes	(2,810)	14,978	4,380	4,668	1,216
Income (loss) from continuing operations	(4,996)	24,438	4,338	6,720	4,040
Discontinued operations:					
Loss from discontinued operations, net of tax benefits		(1,487)	(3,658)	(2,436)	(3,220)
Loss on disposal, net of tax benefits		(1,341)			
Extraordinary item, net of tax benefits			(508)		
Net income (loss)	\$ (4,996)	\$ 21,610	\$ 172	\$ 4,284	\$ 820
Basic income (loss) per share:					
Income (loss) from continuing operations	\$ (0.23)	\$ 1.24	\$ 0.23	\$ 0.42	\$ 1.09
Loss from discontinued operations		(0.14)	(0.19)	(0.15)	(0.87)
Extraordinary item			(0.03)		
Net income (loss)	(0.23)	1.10	0.01	0.27	0.22
Diluted income (loss) per share:					
Income (loss) from continuing operations	\$ (0.23)	\$ 1.16	\$ 0.22	\$ 0.41	\$ 0.30
Loss from discontinued operations		(0.13)	(0.18)	(0.15)	(0.24)
Extraordinary item			(0.03)		
Net income (loss)	(0.23)	1.03	0.01	0.26	0.06
Shares used in per share calculations:					
Basic	22,278	19,677	18,655	16,076	3,697
Diluted	22,278	21,059	19,771	16,325	13,598



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	December 31,				
	2001	2000	1999	1998	1997
	(In thousands)				
<b>Balance Sheet Data:</b>					
Cash and cash equivalents	\$ 37,538	\$ 68,585	\$ 6,062	\$ 16,438	\$ 3,199
Working capital	117,196	140,387	40,462	41,644	12,612
Total assets	235,260	250,220	115,762	102,983	37,796
Long-term capital lease, net of current portion	10,002	7,278	6,853	3,854	
Long-term debt, net of current portion	14,342	15,123	15,254	18,416	7,728
Stockholders' equity	186,322	185,347	62,459	61,164	17,387

Income statement data from our substrate division and discontinued consumer products division is included in all periods presented. Income statement data from our opto-electronics division is included from the time of the acquisition of Alpha Photonics by Lyte Optronics on September 29, 1998. All periods have been restated to reflect the accounting for discontinued operations. As a result, the discontinued consumer products division has been eliminated from continuing operations in the income statements.

**Item 7. Management's Discussion and Analysis of Financial Condition and Results of Operations**

The following discussion and analysis of our financial condition and results of operations should be read in conjunction with Selected Consolidated Financial Data and our consolidated financial statements and related notes included elsewhere in this Form 10-K. In addition to historical information, the discussion in this Form 10-K contains forward-looking statements that involve risks and uncertainties that could cause our actual results to differ materially from those projected. The statements contained in the Report on Form 10-K that are not purely historical are forward looking statements within the meaning of Section 27A of the Securities Act and Section 21E of the Exchange Act, including, without limitation, statements regarding our expectations, beliefs, intentions or strategies regarding the future. All forward-looking statements included in this Report on Form 10-K are based on information available to us on the date hereof, and we assume no obligation to update any such forward-looking statements. These statements involve known and unknown risks, uncertainties and other factors, which may cause our actual results to differ materially from those implied by the forward-looking statements. In some cases, you can identify forward-looking statements by terminology such as may, will, should, expects, plans, anticipates, believes, estimates, predicts, potential, or other negative of these terms or other comparable terminology. Factors that might cause or contribute to such differences include, but are not limited to, those set forth under Risk Factors and elsewhere in this Form 10-K.

**Overview**

We were founded in 1986 to commercialize and enhance our proprietary VGF technique for producing high-performance compound semiconductor substrates. We currently operate two divisions: our substrate division and our opto-electronics division. We made our first substrate sales in 1990 and our substrate division currently sells GaAs and InP substrates to manufacturers of semiconductor devices for use in applications such as fiber optic and wireless telecommunications, LEDs and lasers. We also sell germanium substrates for use in satellite solar cells. We acquired Lyte Optronics, Inc., on May 28, 1999, and currently operate part of Lyte's historical business as our opto-electronics division. The opto-electronics division manufactures HBLEDs, VCSELs and laser diodes for the illumination markets, including full-color displays, automobile lighting and traffic signals, as well as fiber optic communications. We previously operated the consumer products division, discontinued in December 2000, which had focused on the design and manufacture of laser-pointing and alignment products for the consumer, commercial and industrial markets.

Our total revenue from continuing operations was \$119.5 million for 2001, \$121.5 million for 2000 and \$75.4 million for 1999. In 2001 we incurred a loss from continuing operations of \$5.0 million compared to income of \$24.4 million for 2000 and income of \$4.3 million for 1999.

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Several non-recurring events occurred that had a substantial impact on our performance and financial results for the quarters and years-ended December 31, 2001 and 2000. In 2001, we realized a net \$15.6 million non-cash loss as a result of writing down our investment in Finisar Corporation common stock. This loss is included in other expense. In 2000, we realized a \$27.3 million non-cash gain as a result of acquiring Finisar Corporation common stock in connection with Finisar Corporation's acquisition of Demeter Technologies, a company in which we held warrants to purchase preferred stock. This gain is included in other income. On December 14, 2000, the Board of Directors approved our plan to discontinue our unprofitable consumer products division. As a result of discontinuing the consumer products division, we incurred a pre-tax loss on disposal of \$2.2 million. The results of operations of the consumer products division have been segregated from continuing operations and are reported separately as discontinued operations in the income statements. In 2000 we exited our unprofitable 650nm laser diode product line at the opto-electronics division. As a result of exiting this product line, we incurred a restructuring charge of \$8.2 million, of which \$1.8 million has been classified as cost of goods sold and \$6.4 million has been classified as operating expense.

Our business, particularly sales of our substrate products, are dependant on the semiconductor industry, which is highly cyclical and has historically experienced downturns both as a result of economic changes and of overcapacity. Following a strong period during the first half of 2001, we are now in the midst of a significant and prolonged downturn, and, together with other industry participants, have experienced lower revenues, slower bookings, push outs and cancellation of orders. We cannot predict the severity or duration of the downturn, but it has impacted our ability to sell our products and operate profitably. If demand for our products remains depressed for an extended period, our business will be harmed as a result.

In the second half of 2001, we experienced a \$43.2 million, or 53.1% decrease in revenue compared to the first half as a result of the rapid decline in the mobile and fiber optic telecommunications markets. As such, we recorded losses in the third and fourth quarters. In reaction to the economic downturn, we have initiated an aggressive effort to reduce substrate manufacturing costs. This includes moving much of our substrate manufacturing operations to China, reducing capacity in our Fremont, CA facility and developing and investing in key low cost raw material sources. We expect that the cost reduction efforts should allow us to operate profitably again by the end of 2002 and will position us well for future growth. During the second half of 2001, we obtained orders from several large customers for HBLEDs at the opto-electronics division. As a result, the division is operating at full capacity for some critical functions. We expect to expand the HBLED manufacturing operations in 2002 as a result of the increased demand for these products. We expect that this product line will also be profitable by the end of 2002.

During 2001, we raised approximately \$4.8 million from the sale of common stock through our employee stock compensation programs. During 2000, we raised approximately \$96.0 million from the sale of common stock in a private offering, a registered public offering and employee stock compensation programs.

Our five largest customers accounted for 28.3% of our total revenue from continuing operations in 2001, 26.1% in 2000 and 24.8% in 1999. No customer accounted for more than 10% of our total revenue in 2001, 2000 or 1999.

In connection with our acquisition of Lyte Optronics and its subsidiaries, we issued approximately 2,023,000 shares of common stock and 883,000 shares of preferred stock, with a 5.0% annual dividend rate and \$4 per share liquidation preference over common stock, as adjusted for claims made against shares held in escrow, in exchange for all of the issued and outstanding shares of capital stock of Lyte Optronics. The acquisition was accounted for as a pooling of interests. In connection with the acquisition, we reported a charge of \$2.8 million in the second quarter of 1999 to reflect transaction costs and other one-time charges.

Each of our divisions is responsible for its own sales and marketing activities, and each maintains its own sales and marketing personnel. We sell our substrate products through our direct sales force in the U.S. and through independent sales representatives in France, Japan, South Korea, Taiwan and the United Kingdom. We sell our HBLED and laser diode products through our direct sales force and through independent sales representatives.

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**Critical Accounting Policies and Estimates**

We have prepared our consolidated financial statements in accordance with accounting principals generally accepted in the United States. As such, we have made estimates and judgments that affect the preparation of these statements based upon historical experience and on other assumptions that are believed to be reasonable under the circumstances. Actual results may differ from these estimates under different assumptions or conditions. The discussion and analysis of our results of operations and financial condition are based upon these statements. We have identified the policies below as critical to our business operations and understanding of our financial condition and results of operations.

We recognize revenue upon shipment of products to our customers provided that we have received a signed purchase order, the price is fixed, title has transferred, collection of resulting receivables is probable, product returns are reasonably estimable, there are no customer acceptance requirements and there are no remaining significant obligations. We assess the probability of collection based on a number of factors including past history with the customer and credit worthiness. We provide for future returns based on historical experience, current economic trends and changes in customer demand at the time revenue is recognized. Except for sales in Japan and some sales in Taiwan, which in both cases are denominated in Japanese yen, we denominate and collect our international sales in U.S. dollars.

We periodically review the collectability of our accounts receivable balances and provide an allowance for doubtful accounts receivable based primarily upon the age of these accounts. We provide a 100% allowance for U.S. receivables in excess of 90 days and for foreign receivables in excess of 120 days. At December 31, 2001 our accounts receivable balance was \$15.7 million net of an allowance for doubtful accounts of \$6.7 million.

Inventories are stated at the lower of cost or net realizable value. Cost is determined using the weighted average cost method. Finished goods and work-in-process inventories include material, labor and manufacturing overhead costs. We routinely evaluate the levels of our inventory in light of current market conditions in order to identify excess and obsolete inventory and we provide a valuation allowance for certain inventories based upon the age and quality of the product. The lives of our substrate products are relatively long and accordingly, obsolescence has historically not been a significant factor. We also review our inventory to ensure costs can be realized upon ultimate sale to our customers. If we determine that the value of any items in ending inventory exceeds the estimated sales value plus any estimated selling costs, a reserve is established for the difference.

Our industry requires substantial investments in property and equipment in order to meet demand and changes in technology. In addition, we occasionally make investments in companies, which are developing promising relevant technologies. We review the carrying value of our long-lived assets and investments in order to identify any impairment. Long-lived assets are written down when the carrying value of an asset exceeds their related undiscounted future cash flows. Key assumptions in estimating future cash flows include estimates of sales volumes, changes in selling prices, cost of materials, etc. It is possible that actual results will differ from these estimates and such differences may be material and require future adjustments to the carrying value of our long-lived assets. We have not recorded long-lived asset impairment charges during 2001. We record investment impairment charges when we believe that an investment has experienced a decline in market value that is other than temporary. A net impairment charge of \$15.6 million to write-down our investment in Finisar Corporation common stock is included in the income statement for the period ended December 31, 2001.



**Table of Contents****Results of Operations**

The following table sets forth certain operating data as a percentage of total revenues for the periods indicated.

	Years Ended December 31,		
	2001	2000	1999
Revenue	100.0%	100.0%	100.0%
Cost of revenue, including restructuring costs in 2000	68.8%	60.6%	66.4%
Gross profit	31.2%	39.4%	33.6%
Operating expenses:			
Selling, general, and administrative	18.0%	14.8%	13.9%
Research and development	6.9%	7.2%	3.4%
Restructuring costs	0.0%	5.3%	0.0%
Acquisition costs	0.0%	0.0%	3.7%
Total operating expenses	24.9%	27.3%	21.0%
Income from operations	6.3%	12.1%	12.6%
Interest expense	1.7%	3.0%	2.9%
Other (income) and expense	11.2%	(23.4)%	(1.9)%
Income (loss) from continuing operations before provision for income taxes	(6.6)%	32.5%	11.6%
Provision for income taxes	(2.4)%	12.3%	5.8%
Income (loss) from continuing operations	(4.2)%	20.2%	5.8%
Discontinued operations:			
Loss from discontinued operations, net of tax benefits	0.0%	(1.2)%	(4.9)%
Loss on disposal, net of tax benefits	0.0%	(1.1)%	0.0%
Extraordinary item, net of tax benefits	0.0%	0.0%	(0.7)%
Net income (loss)	(4.2)%	17.9%	0.2%

**Year Ended December 31, 2001 Compared to Year Ended December 31, 2000**

*Revenue from continuing operations.* Revenue decreased \$2.0 million, or 1.6%, to \$119.5 million in 2001 compared to \$121.5 million in 2000. Revenue from our substrate division, which represents 91.0% of total revenue for the year ended 2001, decreased \$4.6 million, or 4.0%, to \$108.8 million compared to \$113.4 million in 2000. Total GaAs substrate revenue decreased \$22.6 million, or 23.1%, to \$75.3 million in 2001 compared to \$97.9 million in 2000. Sales of 5 and 6 diameter GaAs substrates was unchanged at \$19.8 million for 2001 and 2000. InP substrate revenue increased \$14.3 million, or 102.0%, to \$28.3 million in 2001 compared to \$14.0 million in 2000. While our substrate division experienced sequential quarter over quarter revenue growth during the first half of 2001, substrate revenue declined substantially in the second half due to a decline in the wireless and fiber optic telecommunication markets. Substrate revenue in the first half of 2001 was \$76.9 million compared to \$31.9 million in the second half of 2001. While we cannot predict the duration or severity of this downturn, we expect substrate revenues to remain at current levels in the near term.

Revenue from our opto-electronics division, which represents 9.0% of total revenue for 2001, increased \$2.6 million, or 32.0%, to \$10.7 million in 2001, compared to \$8.1 million in 2000. The increase was a result of higher sales volume of HBLED products. HBLED revenue increased \$5.4 million, or 263.9%, to \$7.4 million in 2001 compared to \$2.0 million in 2000. VCSEL revenue increased \$816,000, or 418.5% to \$1.0 million in 2001 compared to \$195,000 in 2000. Laser diode sales decreased \$3.8 million, or 61.9%, to \$2.4 million in 2001 compared to \$6.2 million in 2000. The decrease in laser diode sales was primarily due to the exit of our unprofitable 650 nm laser diode product line.



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International revenue increased to 50.4% of total revenue in 2001 compared to 48.2% of total revenue in 2000. The increase was primarily due to increased sales of HBLED products to customers in Asia.

*Gross margin.* Gross margin decreased to 31.2% of revenue in 2001 compared to 39.4% in 2000. Gross margin at the substrate division decreased to 38.0% of revenue in 2001 compared to 45.9% in 2000. The decrease was primarily due to lower unit sales and average sales prices of GaAs substrates in the second half of 2001. As a result, we have initiated manufacturing cost reductions in order to align our costs with lower expected sales volumes and prices. We are currently shifting much of our substrate manufacturing to China and reducing capacity in our Fremont, California facility. Gross margin at the opto-electronics division increased to negative 37.0% of revenue for 2001 compared to negative 51.6% for 2000. The increase was primarily due to increased unit sales of blue HBLED products.

*Selling, general and administrative expenses.* Selling, general and administrative expenses increased \$3.5 million, or 19.1%, to \$21.5 million in 2001 compared to \$18.0 million in 2000. As a percentage of total revenue, selling, general and administrative expenses were 18.0% in 2001 compared to 14.8% in 2000. The increase was due to the addition of personnel and facilities in anticipation of increased revenues. Due to the decline in substrate revenue in the second half of 2001, we have initiated cost reductions in this area.

*Research and development expenses.* Research and development expenses decreased \$565,000, or 6.4%, to \$8.2 million in 2001 compared to \$8.8 million in 2000. As a percentage of total revenue, research and development expenses were 6.9% in 2001 compared to 7.2% in 2000. We believe that continued investment in product development is critical to attaining our strategic objectives of maintaining and increasing our technology leadership, and as a result, we expect research and development expenses to remain at current levels.

*Interest expense.* Interest expense decreased \$1.5 million, or 42.5%, to \$2.1 million in 2001 compared to \$3.6 million in 2000. The decrease was primarily due to the repayment of outstanding short-term debt with equity financing proceeds in September 2000.

*Other income and expense.* Other expense was \$13.4 million in 2001 compared to income of \$28.4 million in 2000. The balance in 2001 includes the realization of a net \$15.6 million non-cash loss from the write-down to market value of our investment in Finisar common stock in accordance with SFAS 115. The balance in 2000 includes the realization of a \$27.3 million non-cash gain on Demeter Technology warrants that were exchanged for Finisar Corporation common stock as a result of Finisar Corporation's acquisition of Demeter Technology in 2000.

*Provision for income taxes.* Our effective tax rate decreased to 36.0% in 2001 compared to 38.0% in 2000. The decrease was primarily the result of shifting certain substrate manufacturing operations to China.

**Year Ended December 31, 2000 Compared to Year Ended December 31, 1999**

*Revenue from continuing operations.* Revenue increased \$46.1 million, or 61.2%, to \$121.5 million in 2000 compared to \$75.4 million in 1999. Revenue from our substrate division which represents 93.3% of total revenue for the year ended 2000, increased \$56.6 million, or 99.8%, to \$113.4 million compared to \$56.7 million in 1999. Total GaAs substrate revenue increased \$52.0 million, or 113.3%, to \$97.9 million in 2000 compared to \$45.9 million in 1999. Sales of 5 and 6 diameter GaAs substrates increased \$19.2 million, or 3,308.8%, to \$19.8 million in 2000 compared to \$581,000 in 1999. InP substrate revenue increased \$11.1 million, or 373.8%, to \$14.0 million in 2000 compared to \$3.0 million in 1999. The increase in GaAs and InP substrate sales was a result of increased sales volume to existing and new customers due in part to strong growth in the fiber optic and wireless telecommunication markets. Revenue from our opto-electronics division, which represents 6.7% of total revenue for 2000, decreased \$10.5 million, or 56.4%, to \$8.1 million in 2000, compared to \$18.6 million in 1999. The decrease was a result of lower laser diode sales volume and a decrease in prices. HBLED revenue increased \$773,000, or 80.6%, to \$1.7 million compared to \$959,000 in 1999. In the second half of 2000, we introduced our first VCSEL products that generated \$189,000 in revenue.

International revenue decreased to 48.2% of total revenue in 2000 compared to 51.6% of total revenue in 1999.

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*Gross margin.* Gross margin increased to 39.4% of revenue in 2000 compared to 33.6% in 1999. The gross margin at the substrate division increased to 45.9% of revenue in 2000 compared to 41.0% in 1999. The increase was primarily due to higher sales volume and the realization of lower labor and manufacturing costs as a result of expanding our wafer production capacity in China. The gross margin at the opto-electronics division decreased to negative 51.6% of revenue for 2000 compared to 11.1% for 1999. The decrease was primarily due to increased costs associated with the start-up of blue HBLED and VCSEL product production, lower laser diode sales prices and volume and a restructuring charge to write-off obsolete laser diode inventory as part of our plan to exit the unprofitable 650nm laser diode product line.

*Selling, general and administrative expenses.* Selling, general and administrative expenses increased \$7.6 million, or 72.2%, to \$18.0 million in 2000 compared to \$10.5 million in 1999. The increase in selling, general and administrative expenses was primarily due to increases in personnel and related expenses required to support current and future increases in sales volume. As a percentage of total revenue, selling, general and administrative expenses were 14.8% in 2000 compared to 13.9% in 1999.

*Research and development expenses.* Research and development expenses increased \$6.2 million, or 241.7%, to \$8.8 million in 2000 compared to \$2.6 million in 1999. The increase was primarily the result of increases in personnel and related expenses and materials to support HBLED and VCSEL research and development at the opto-electronics division. As a percentage of total revenue, research and development expenses were 7.2% in 2000 compared to 3.4% in 1999.

*Restructuring costs.* On December 14, 2000, our board of directors approved management's plan to exit our unprofitable 650 nm laser diode product line within our opto-electronics division. As a result, during the fourth quarter of 2000, we recorded a pre-tax restructuring charge of \$8.2 million. The restructuring charge includes \$1.8 million to write-off laser diode inventory, which has been classified as a component of cost of goods sold. The restructuring charge also includes \$3.4 million to write-off net assets included in property, plant and equipment. These assets consist of laser diode processing equipment that could not be utilized for HBLED or VCSEL processing. These assets have been taken out of service and will be sold or discarded. The restructuring charge also includes \$848,000 to write-down a portion of goodwill attributable to the laser diode product line. The restructuring charge also includes \$2.1 million for incremental costs and contractual obligations for such items as leasehold termination payments and other facility exit costs incurred as a direct result of this plan.

*Interest expense.* Interest expense increased \$1.4 million, or 64.3%, to \$3.6 million in 2000 compared to \$2.2 million in 1999. The increase was primarily due to using short-term debt to finance the short-term liquidity needs resulting from our increased sales volume as well as the addition of certain capital leases to finance equipment purchases.

*Other income and expense.* Other income and expense increased \$27.0 million to \$28.4 million in 2000 compared to \$1.4 million in 1999. The increase was primarily the result of a \$27.3 million non-cash gain on Demeter Technology warrants that were exchanged for Finisar Corporation common stock as a result of Finisar Corporation's acquisition of Demeter Technology.

*Provision for income taxes.* The effective tax rate was 38.0% in 2000. In 1999, the effective tax rate was 38% adjusted for the non-deductible acquisition costs of approximately \$2.8 million.

**Liquidity and Capital Resources**

Cash and cash equivalents decreased \$31.1 million to \$37.5 million at December 31, 2001 compared to \$68.6 million at December 31, 2000.

Net cash provided by operating activities of \$17.1 million for the year ended December 31, 2001 was comprised primarily of our net loss adjusted for non-cash items of \$23.1 million, consisting primarily of the write-down of our investment in Finisar, and by a \$1.0 million net change in assets and liabilities. The net change in assets and liabilities resulted primarily from an increase in inventory, a decrease in accounts payable and accrued liabilities, offset by decreases in accounts receivable and prepaid expenses.

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Accounts receivable decreased \$12.1 million, or 43.5%, to \$15.7 million at December 31, 2001 compared to \$27.8 million at December 31, 2000. The change reflects lower sales volume, a decrease in gross accounts receivable of \$7.6 million and an increase in our allowance for doubtful accounts of \$4.5 million. Inventories increased \$3.7 million, or 6.7% to \$55.6 million at December 31, 2001 compared to \$51.8 million at December 31, 2000. The increase in inventory was due to lower substrate unit sales in the second half of 2001. Due to the decline in unit sales in the second half of 2001 and an uncertain outlook for 2002, we have initiated plans to reduce inventory levels.

During 2001 a significant portion of our cash inflows were generated by our operations. If our sales continue to decrease, our ability to generate cash from operations will be adversely affected which could adversely affect our future liquidity and cause us to seek additional capital, if available.

Net cash used in investing activities of \$47.7 million for the year ended December 31, 2001 includes purchases of property and equipment of \$25.8 million primarily used to increase wafer processing capacity in China for the substrate division and to increase HBLED and VCSEL epitaxy growth and wafer processing capacity at the opto-electronics division. It also includes \$20.6 million in purchases of high grade investment securities with maturities of less than two years. We also invested \$1.3 million in joint ventures in China to provide certain key raw materials and other investments.

We are currently investing in certain equipment to expand HBLED production. We are also constructing minor improvements to our existing production facilities in China and California. We expect to invest approximately \$16.0 million in additional facilities and equipment over the next 12 months.

Net cash used in financing activities of \$522,000 consisted of proceeds of \$4.8 million from the sale of common stock through our employee stock compensation programs and \$3.1 million from new capital leases, offset by payments of \$1.4 million to reduce our short-term borrowings, \$2.8 million for principal and interest payments on long-term debt and \$4.3 million for capital lease payments.

We have a \$5.0 million bank line of credit that expires on September 30, 2003. The line of credit is secured by our operating assets, excluding assets in China. Borrowings bear interest at 2.25% above LIBOR that was 4.13% at December 31, 2001. The interest rate for future borrowings compared to LIBOR is dependent on the company's financial performance. No amounts were outstanding under the line of credit at December 31, 2001 and 2000.

We generally finance equipment purchases through secured equipment loans and capital leases over four or five-year terms at interest rates ranging from 5.6% to 8.8% per annum. Our main Fremont manufacturing facility is financed by long-term borrowings, which were refinanced by taxable variable rate revenue bonds in 1998. These bonds mature in 2023 and bear interest at 2.0% below the prime rate. The bonds are traded in the public market. Repayment of principal and interest under the bonds is supported by a letter of credit from our bank and is paid on a quarterly basis. We have the option to redeem the bonds in whole or in part during their term. At December 31, 2001, \$9.7 million was outstanding under these bonds.

The credit facility that we have with our bank includes the line of credit, term loans in the amount of \$5.2 million and the letter of credit supporting repayment of our bonds. The credit facility is subject to certain financial covenants regarding current financial ratios and cash flow requirements that have all been met as of December 31, 2001. If we fail to comply with these covenants in the future and are unable to obtain a waiver from our bank, the amounts due under this credit facility would become immediately due and payable. The total amount outstanding under the credit facility at December 31, 2001 was \$14.9 million.

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Outstanding contractual obligations as of December 31, 2001 are summarized below (in thousands):

	Debt	Capital Leases	Operating Leases	Total
2002	\$ 2,336	\$ 5,369	\$ 991	\$ 8,696
2003	1,548	5,267	906	7,721
2004	1,277	3,307	855	5,439
2005	1,240	1,908	591	3,739
2006	1,238	550	220	2,008
Thereafter	9,039			9,039
	<u>\$ 16,678</u>	<u>\$ 16,401</u>	<u>\$ 3,563</u>	<u>\$ 36,642</u>

We anticipate that the combination of existing working capital and the borrowings available under our current credit agreements will be sufficient to fund working capital and capital expenditure requirements for the next 12 months. However, our future capital requirements will be dependent on many factors including the rate of revenue growth, our profitability, the timing and extent of spending to support research and development programs, the expansion of our manufacturing facilities, the expansion of our selling and marketing and administrative activities and market acceptance of our products. We may need to obtain additional equity and debt financing in the future, which may not be available on acceptable terms or at all.

**Recent Accounting Pronouncements**

In July 2001, the FASB issued Statement of Financial Accounting Standards No. 141 and No. 142, or SFAS 141, *Business Combinations*, and SFAS 142, *Goodwill and Other Intangible Assets*. Under SFAS 141, all business combinations must be accounted for using the purchase method of accounting; use of the pooling-of-interests (pooling) method is prohibited. The provisions of the statement will apply to all business combinations initiated after June 30, 2001. SFAS 142 will apply to all acquired intangible assets whether acquired singly, as a part of a group, or in a business combination. The statement will supersede APB Opinion No. 17, *Intangible Assets*, and will carry forward provisions in APB Opinion No. 17 relating to internally developed intangible assets. Adoption of SFAS 142 will result in ceasing amortization of goodwill. All of the statement should be applied in fiscal years beginning after December 31, 2001 to all goodwill and other intangible assets recognized in an entity's statement of financial position at that date, regardless of when those assets were initially recognized. We will test all goodwill and intangible assets for impairment upon adoption of SFAS 142 and will record any impairment charge as accumulative effect of an accounting change at that time. We believe adoption of the provisions of SFAS 141 and SFAS 142 will not have a material effect on the Company's financial position or results of operations.

In October 2001, the FASB issued Statement of Accounting Standards No. 144, *Accounting for Impairment or Disposal of Long-Lived Assets* (SFAS 144). SFAS 144 supercedes SFAS 121 *Accounting for the Impairment of Long-Lived Assets and for Long-Lived Assets to be Disposed of*. SFAS 144 applies to all long-lived assets (including discontinued operations) and consequently amends Accounting Principles Board Opinion No. 30 (APB 30), *Reporting Results of Operations Reporting the Effects of Disposal of a Segment of a Business*. SFAS 144 develops one accounting model for long-lived assets that are to be disposed of by sale. SFAS 144 requires the long-lived assets that are to be disposed of by sale be measured at the lower of book value or fair value less cost to sell. Additionally, SFAS 144 expands the scope of discontinued operations to include all components of the entity with operations that (1) can be distinguished from the rest of the entity and (2) will be eliminated from the ongoing operations of the entity in a disposal transaction. SFAS 144 is effective for the Company for all financial statements issued in fiscal 2002. We believe adoption of the provisions of SFAS 144 will not have a material effect on the Company's financial position or results of operations.

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### **Risks Related to Our Business**

***The semiconductor industry is cyclical and is currently experiencing a severe and prolonged downturn which has adversely impacted our operating results.***

Our business depends in significant part upon manufacturers of electronic and opto-electronic semiconductor devices, as well as the current and anticipated market demand for such devices and products using such devices. The semiconductor industry is highly cyclical. The industry has in the past, and will likely in the future, experience periods of oversupply that result in significantly reduced demand for semiconductor devices and components, including our products, both as a result of general economic changes and overcapacity. When these periods occur, our operating results and financial condition are adversely affected. Inventory buildups in telecommunications products and slower than expected sales of computer equipment have resulted in overcapacity and led to reduced sales by our customers. During periods of declining demand such as those experienced over the past year, customers typically reduce purchases, delay delivery of products and/or cancel orders of component parts such as our products. Increased price competition may result, causing pressure on our net sales, gross margin and net income. We have over the past year experienced cancellations, delays and push outs of orders, which have resulted in reduced revenues. If the economic downturn continues, further order cancellations, reductions in order size or delays in orders will materially adversely affect our business and results of operations. Although we have taken actions to reduce our costs, if our actions are insufficient to align our structure with prevailing business conditions, we may be required to undertake additional cost-cutting measures, and may be unable to invest in marketing, research and development and engineering at the levels we believe are necessary to maintain our competitive position. Our failure to make these investments could seriously harm our business.

***The impact of changes in global economic conditions on our customers may cause us to fail to meet expectations, which would negatively impact the price of our stock.***

Our operating results can vary significantly based upon the impact of changes in global economic conditions on our customers. More specifically, the macro-economic environment that we have faced in the second half of 2001 and are continuing to face in 2002 is more uncertain than in prior periods and has materially and adversely affected us and our operating results and may continue to do so. The revenue growth and profitability of our business depends on the overall demand for our substrates, light-emitting diodes and laser diodes, and we are particularly dependant on the market conditions for the fiber optics and telecommunications industries. Because our sales are primarily to major corporate customers whose businesses fluctuate with general economic and business conditions, a softening of demand for products that use our substrates, LEDs and laser diodes caused by a weakening economy may result in decreased revenues. Customers may find themselves facing excess inventory from earlier purchases, and may defer or reconsider purchasing products due to the downturn in their business and in the general economy.

***Unpredictable fluctuations in our operating results could disappoint analysts or our investors, which could cause our stock price to decline.***

We have not over the past year been able to sustain our historical growth rate, and may not be able to return to historic growth levels in the current economic environment. We have and may continue to experience significant fluctuations in our revenue and earnings. Our quarterly and annual revenue and operating results have varied significantly in the past and may vary significantly in the future due to a number of factors, including:

decline in general economic conditions or downturns in the industry in which we compete;

fluctuations in demand for our products;

expansion of our manufacturing capacity;

expansion of our operations in China;

limited availability and increased cost of raw materials;

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the volume and timing of orders from our customers, and cancellations, push outs and delays of customer orders;

fluctuation of our manufacturing yields;

decreases in the prices of our competitors' products;

costs incurred in connection with any future acquisitions of businesses or technologies;

increases in our expenses, including expenses for research and development; and

our ability to develop, manufacture and deliver high quality products in a timely and cost-effective manner.

Due to these factors, we believe that period-to-period comparisons of our operating results may not be a meaningful indicator of our future performance. Our operating results have over the past year at times been below the expectations of securities analysts or investors. If this occurs again in future periods, the price of our common stock would likely decline or fluctuate.

A substantial percentage of our operating expenses are fixed in the short term and we may be unable to adjust spending to compensate for an unexpected shortfall in revenues. As a result, any delay in generating revenue could cause our operating results to be below the expectations of market analysts or investors, which could also cause our stock price to fall.

The lead-time for customer orders is generally shorter than it was a year ago. As a result, our visibility regarding future financial performance is uncertain and we may provide investors with financial guidance that we cannot meet. As a result, our operating results could be below the expectations of market analysts or investors, which could also cause our stock price to fall.

***If the economy recovers and we are again in a period of high demand for our products, if we fail to expand our manufacturing capacity, we may not be able to meet increased demand, lower our costs or increase revenue.***

Although we are currently in a period of overcapacity, if the economy recovers, demand may increase rapidly as it has in prior years. In order to meet increased demand and maintain our market share, we may need to increase production, which could require us to build new facilities, expand our existing facilities, purchase additional manufacturing equipment, and add qualified staff. If we do not expand our manufacturing capacity, we will be unable to increase production, adversely impacting our ability to reduce unit costs, margins and improve our operating results.

We are currently constructing facilities in California and China. Our construction activities subject us to a number of risks, including:

unforeseen environmental or engineering problems;

unavailability or late delivery of production equipment;

delays in completing new facilities;

delays in bringing production equipment on-line;

work stoppages or delays;

inability to recruit and train qualified staff;

unanticipated cost increases and restrictions imposed by requirements of local, state or federal regulatory agencies.

If any of these risks occurs, construction may be costlier than anticipated and completion could be delayed, which could hurt our ability to expand capacity and increase our sales. In addition, if we experience delays in expanding our manufacturing capacity, we might not be able to timely meet customer requirements, and we could lose future sales. We are also making substantial investments in equipment and facilities as part





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of our capacity expansion. To offset the additional fixed operating expenses, we must increase our revenue by increasing production and improving yields. If demand for our products does not grow or if our yields do not improve as anticipated, we may be unable to offset these costs against increased revenue, which would adversely impact our operating results.

***Our results of operations may suffer if we do not effectively manage our inventory.***

To achieve commercial success with our products, we will need to manage our inventory of component parts and finished goods effectively to meet changing customer requirements. Some of our products and supplies have in the past and may in the future become obsolete while in inventory due to changing customer specifications, excess inventory or decreased demand for our products. We have in the past had to take inventory valuation and impairment charges. If we are not successfully able to manage our inventory, we may need to write off unsaleable, obsolete or excess inventory, which could adversely affect our results of operations.

***Our HBLED and VCSEL products are in their early stages, and we may not be able to achieve anticipated sales of these products.***

We are continuing to ramp production and sale of our HBLED and VCSEL products, and we may be unable to successfully market and increase sales of these products. To market and increase sales of our HBLED and VCSEL products, we will have to continue to develop additional distribution channels. We must also continue our research and development efforts to apply our proprietary VGF and other crystal growth techniques to new substrate products and successfully introduce and market new opto-electronic semiconductor devices, including enhancements to our HBLED and VCSEL products.

***If we do not successfully develop new products to respond to rapidly changing customer requirements, our ability to generate sales and obtain new customers may suffer.***

Our success depends on our ability to offer new products that incorporate leading technology and respond to technological advances. In addition, our new products must meet customer needs and compete effectively on quality, price and performance. The life cycles of our products are difficult to predict because the markets for our products are characterized by rapid technological change, changing customer needs and evolving industry standards. If our competitors introduce products employing new technologies, our existing products could become obsolete and unmarketable. If we fail to offer new products, we may not generate sufficient revenue to offset our development costs and other expenses or meet our customers' requirements. Other companies, including IBM and Motorola, are actively developing substrate materials that could be used to manufacture devices that could provide the same high-performance, low-power capabilities as GaAs-based devices at competitive prices. If these substrate materials are successfully developed and semiconductor device manufacturers adopt them, demand for our GaAs substrates could decline and our revenue could suffer.

The development of new products can be a highly complex process, and we may experience delays in developing and introducing new products. Any significant delays could cause us to fail to timely introduce and gain market acceptance of new products. Further, the costs involved in researching, developing and engineering new products could be greater than anticipated.

***Our operating results depend in large part on further customer acceptance of our existing substrate products and on our ability to develop new products based on our core VGF technology.***

A large share of GaAs substrates are manufactured from crystals grown using the traditional Liquid Encapsulated Czochralski, or LEC, or Horizontal-Bridgeman, or HB, techniques. In order to expand sales of our products, we must continue to promote our VGF technique as a preferred process for producing substrates, and we must offer products with superior prices and performance on a timely basis and in sufficient volumes. If we fail to gain increased market acceptance of our VGF technique, we may not achieve anticipated revenue growth.

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To shift more of our substrate manufacturing operations to China successfully, we will need our customers to qualify products manufactured in China. If we are unable to achieve qualifications for these products, our China facility will be underutilized, our investments in China will not be recouped and we will be unable to lower our costs by moving to China. All of these events could reduce our revenue but increase our cost structure.

### ***Intense competition in the markets for our products could prevent us from increasing revenue and sustaining profitability.***

The markets for our products are intensely competitive. We face competition for our substrate products from other manufacturers of substrates, such as Freiberger, Hitachi Cable, Japan Energy and Sumitomo Electric and from semiconductor device manufacturers that produce substrates for their own use, and from companies, such as IBM and Motorola, that are actively developing alternative materials to GaAs and some semiconductor devices are being marketed using these materials. We believe that at least one of our competitors is shipping GaAs substrates manufactured using a technique similar to our VGF technique. Other competitors may develop and begin using similar technology. If we are unable to compete effectively, our revenue may not increase and we may not continue to be profitable. We face many competitors that have a number of significant advantages over us, particularly in our compound semiconductor device products, including:

greater experience in the business;

more manufacturing experience;

extensive intellectual property;

broader name recognition; and

significantly greater financial, technical and marketing resources.

Our competitors could develop new or enhanced products that are more effective than the products that we have developed or may develop. For example, some competitors in the HBLED market offer devices that are brighter than our HBLEDs. Some of our competitors may also develop technologies that enable the production of commercial products with characteristics similar to or better than ours, but at a lower cost.

The level and intensity of competition has increased over the past year and we expect competition to continue to increase in the future. Competitive pressures caused by the current economic conditions have resulted in reductions in the prices of some of our products, and continued or increased competition could reduce our market share, require us to further reduce the prices of our products, affect our ability to recover costs or result in reduced gross margins.

### ***If we have low product yields, the shipment of our products may be delayed and our operating results may be adversely impacted.***

Our products are manufactured using complex technologies, and the number of usable substrates and devices we can produce can fluctuate as a result of many factors, including:

impurities in the materials used;

contamination of the manufacturing environment;

substrate breakage;

equipment failure, power outages or variations in the manufacturing process; and

performance of personnel involved in the manufacturing process.

Because many of our manufacturing costs are fixed, our revenue could decline if our yields decrease. We have experienced product shipment delays and difficulties in achieving acceptable yields on both new and older products, and delays and poor yields have adversely affected our operating results. We may experience



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similar problems in the future and we cannot predict when they may occur or their severity. In addition, many of our manufacturing processes are new and are still being refined, which can result in lower yields, particularly as we focus on producing higher diameter substrates and new opto-electronic semiconductor devices. For example, we recently made substantial investments in equipment and facilities to manufacture blue, green and cyan HBLEDs and VCSELs. If we are unable to produce adequate quantities of our high-brightness LEDs and VCSELs, we may not be able to meet customer demand and our revenue may decrease.

***Demand for our products may decrease if our customers experience difficulty manufacturing, marketing or selling their products.***

Our products are used as components in our customers' products. Accordingly, demand for our products is subject to factors affecting the ability of our customers to successfully introduce and market their products, including:

the competition our customers face in their particular industries;

the technical, manufacturing, sales and marketing and management capabilities of our customers;

the financial and other resources of our customers; and

the inability of our customers to sell their products if they infringe third party intellectual property rights.

If demand for the products offered by our customers decreases, our customers may reduce purchases of our products.

As inventory of telecommunication products and computer equipment has increased in the past year, resulting in overcapacity in the market, our customers have reduced sales of their products, causing them to reduce purchases of our products. As a result, our revenues have declined and may fail to recover until the overcapacity has been depleted and demand for our customers' products once again increase.

***We purchase critical raw materials from single or limited sources, and could lose sales if these sources fail to fill our needs.***

We depend on a limited number of suppliers for certain raw materials, components and equipment used in manufacturing our products, including key materials such as gallium, arsenic and quartz. We generally purchase these materials through standard purchase orders and not pursuant to long-term supply contracts and none of our suppliers guarantees supply of raw materials to us. If we lose any of our key suppliers, our manufacturing efforts could be significantly hampered and we could be prevented from timely producing and delivering products to our customers. We have experienced delays obtaining critical raw materials, including gallium, due to shortages of these materials. We may experience delays due to shortages of materials and may be unable to obtain an adequate supply of materials. These shortages and delays could result in higher materials costs and cause us to delay or reduce production of our products. If we have to delay or reduce production, we could fail to meet customer delivery schedules, and our revenue and operating results could suffer.

***If we fail to comply with environmental and safety regulations, we may be subject to significant fines or cessation of our operations.***

We are subject to federal, state and local environmental and safety laws and regulations. These laws, rules and regulations govern the use, storage, discharge and disposal of hazardous chemicals during manufacturing, research and development and sales demonstrations. If we fail to comply with applicable regulations, we could be subject to substantial liability for clean-up efforts, personal injury and fines or suspension or cessation of our operations. In March 2001, we settled a claim made by the California Occupational Safety and Health Administration, or Cal-OSHA, in an investigation primarily regarding impermissible levels of potentially hazardous materials in certain areas of our manufacturing facility in Fremont, California for \$200,415. Although we have put in place engineering, administrative and personnel protective equipment programs to

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address these issues, our ability to expand or continue to operate our present locations could be restricted or we could be required to acquire costly remediation equipment or incur other significant expenses. In addition, existing or future changes in laws or regulations may require us to incur significant expenditures or liabilities, or may restrict our operations.

On May 1, 2001 the Santa Clara Center for Occupational Safety and Health filed a complaint for injunctive relief and civil penalties against us in the Superior Court of California, alleging violations of California Business and Professions Code section 17200 et seq., and Health and Safety Code section 25249 et seq. as a result of our use of arsenic and inorganic arsenic compounds in our workplace. We believe that we have meritorious defenses against the alleged claims, and intend to defend ourselves vigorously. However, due to the nature of the litigation and fact that the case is still in its early stages, we cannot determine the possible loss, if any, that may ultimately be incurred either in the context of a trial or as a result of a negotiated settlement. We may also incur substantial legal fees in this matter. However, we do not believe that this action is likely to have a material adverse effect on our business, financial condition or results of operations.

### ***The loss of one or more of our key substrate customers would significantly hurt our operating results.***

A small number of substrate customers have historically accounted for a substantial portion of our total revenue. Five customers accounted for 28.3% of our total revenue for 2001, 26.1% in 2000 and 24.8% in 1999. No one customer accounted for greater than 10% of total revenue in 2001, 2000 and 1999. Our substrate revenue accounted for 91.0% of our total revenue in 2001, 93.3% in 2000 and 75.3% in 1999. We expect that a significant portion of our future revenue will continue to be derived from a limited number of substrate and HBLED customers. Our HBLED revenue is currently concentrated with one customer. Our customers are not obligated to purchase a specified quantity of our products or to provide us with binding forecasts of product purchases. In addition, our customers may reduce, delay or cancel orders at any time without any significant penalty, and during the past year, we have experienced slower bookings, significant push outs and cancellation of orders. If we lose a major customer or if a customer cancels, reduces or delays orders, our revenue would decline. In addition, customers that have accounted for significant revenue in the past may not continue to generate revenue for us in any future period. Any delay in scheduled shipments of our products could cause net sales to fall below our expectations and the expectations of market analysts or investors, causing our stock price to decline.

### ***Defects in our products could diminish demand for our products.***

Our products are complex and may contain defects. In the past we have experienced quality control problems with some of our products, which caused customers to return products to us. If we continue to experience quality control problems, or experience these problems in new products, customers may cancel or reduce orders or purchase products from our competitors. Defects in our products could cause us to incur higher manufacturing costs and suffer product returns and additional service expenses, all of which could adversely impact our operating results.

We are also developing new products and product enhancements, including substrates and compound semiconductor device products. If our new products contain defects when released, our customers may be dissatisfied and we may suffer negative publicity or customer claims against us, lose sales or experience delays in market acceptance of our new products.

### ***Our substrate and opto-electronic semiconductor device products have a long sales cycle that makes it difficult to plan our expenses and forecast our results.***

Customers typically place orders with us for our substrate and opto-electronic semiconductor device products three months to a year or more after our initial contact with them. The sale of our products may be subject to delays due to our customers' lengthy internal budgeting, approval and evaluation processes. During this time, we may incur substantial expenses and expend sales, marketing and management efforts while the customers evaluate our products. These expenditures may not result in sales of our products. If we do not achieve anticipated sales in a period as expected, we may experience an unplanned shortfall in our revenue. As

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a result, we may not be able to cover expenses, causing our operating results to vary. In addition, if a customer decides not to incorporate our products into its initial design, we may not have another opportunity to sell products to this customer for many months or even years. In this difficult economic climate, the average sales cycle for our products has lengthened even further and is expected to continue to make it difficult to accurately forecast our future sales. We anticipate that sales of any future substrate and opto-electronic semiconductor device products under development will also have lengthy sales cycles and will, therefore, be subject to risks substantially similar to those inherent in the lengthy sales cycle of our current substrate and opto-electronic semiconductor device products.

***If we fail to manage our potential growth, our operations may be disrupted.***

In the past, we have experienced periods of rapid growth and expansion that have strained our management and other resources, and we may experience rapid growth in the future. Our acquisition of Lyte Optronics, together with expansion of our manufacturing capacity, has placed and continues to place a significant strain on our operations and management resources. If we fail to manage our growth effectively, our operations may be disrupted. To manage our growth effectively, we must implement additional and improved management information systems, further develop our operating, administrative, financial and accounting systems and controls, add experienced senior level managers, and maintain close coordination among our executive, engineering, accounting, marketing, sales and operations organizations.

If necessary, we will spend substantial sums to support our future growth and may incur additional unexpected costs. Our systems, procedures or controls may not be adequate to support our operations, and we may be unable to expand quickly enough to exploit potential market opportunities. Our future operating results will also depend on expanding sales and marketing, research and development and administrative support. If we cannot attract qualified people or manage growth effectively, our business and operating results could be adversely affected.

***If we fail to manage periodic contractions, we may utilize our cash balances.***

We have experienced a period of rapid contraction in our business that caused us to reduce our costs in order to conserve our cash resources. If we fail to manage our contractions successfully we may draw down our cash reserves, which would reduce our value and may impinge our ability to raise debt and equity funding in the future. As part of our effort to reduce costs, we may lose key staff, production resources, and technology that we will need to grow when end markets recover. These events could reduce our ability to grow profitably as markets recover.

***As a result of the difficult economic conditions, we have implemented restructuring and workforce reductions, which may adversely affect the moral and performance of our personnel and our ability to hire new personnel.***

In connection with our efforts to streamline operations, reduce costs and bring staffing and structure in line with current demand for our products, we implemented a restructuring of our company last year and reduced our workforce, shifted production activities to China and reduced capital expenditures. Our restructuring may yield unanticipated consequences, such as attrition beyond our planned reduction in workforce and loss of employee moral and decreased performance. In addition, the recent trading levels of our stock have decreased the value of our stock options granted to employees under our stock option plan. As a result of these factors, our remaining personnel may seek employment with larger, more established companies or companies that they perceive as having less volatile stock prices. Continuity of personnel can be very important factors in the sales and production of our products and completion of our research and development efforts.

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***Any future acquisitions may disrupt our business, dilute stockholder value or distract management attention.***

As part of our strategy, we may consider acquisitions of, or significant investments in, businesses that offer products, services and technologies complementary to ours, such as our acquisition of Lyte Optronics in May 1999. Acquisitions entail numerous risks, including:

we may have difficulty assimilating the operations, products and personnel of the acquired businesses;

our ongoing business may be disrupted;

we may incur unanticipated costs;

our management may be unable to manage the financial and strategic position of acquired or developed products, services and technologies;

we may be unable to maintain uniform standards, controls and procedures and policies; and

our relationships with employees and customers may be impaired as a result of any integration.

For example, we incurred substantial costs in connection with our acquisition of Lyte Optronics, including the assumption of approximately \$10.0 million of debt, much of which has been repaid or renegotiated, resulting in a decline of cash available. We incurred one-time charges and merger-related expenses of \$2.8 million and an extraordinary item of \$508,000 relating to the early extinguishment of debt in the quarter ended September 30, 1999 as a result of the acquisition.

To the extent that we issue shares of our stock or other rights to purchase stock in connection with any future acquisitions, dilution to our existing stockholders will result and our earnings per share may suffer. Any future acquisitions may not generate additional revenue or provide any benefit to our business.

***If any of our facilities is damaged by actions such as fire, explosion, or natural disaster, we may not be able to manufacture our products.***

The ongoing operation of our manufacturing and production facilities in California and China is critical to our ability to meet demand for our products. If we are not able to use all or a significant portion of our facilities for prolonged periods for any reason, we will not be able to manufacture products for our customers. For example, a natural disaster, fire or explosion caused by our use of combustible chemicals and high temperatures during our manufacturing processes would render some or all of our facilities inoperable for an indefinite period of time. Actions outside of our control, such as earthquakes, could also damage our facilities, rendering them inoperable. All of our crystal growth is currently performed at our Fremont, California facilities, which are located very near to an active seismic fault line. If we are unable to operate our facilities and manufacture our products, we will lose customers and revenue and our business will be harmed.

***If we lose key personnel or are unable to hire additional qualified personnel as necessary, we may not be able to successfully manage our business or achieve our objectives.***

Our success depends upon the continued service of Morris S. Young, Ph.D., our president, chairman of the board and chief executive officer, as well as other key management and technical personnel. We do not have long-term employment contracts with, or key person life insurance on, any of our key personnel.

We believe our future success will also depend in large part upon our ability to attract and retain highly skilled managerial, engineering, sales and marketing, finance and manufacturing personnel. The competition for these employees is intense, especially in Silicon Valley, and we cannot assure you that we will be successful in attracting and retaining new personnel. The loss of the services of any of our key personnel, the inability to attract or retain qualified personnel in the future or delays in hiring required personnel, particularly engineers, could make it difficult for us to manage our business and meet key objectives, including the timely introduction of new products.





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### ***If we are unable to protect our intellectual property, we may lose valuable assets or incur costly litigation.***

We rely on a combination of patents, copyrights, trademark and trade secret laws, non-disclosure agreements and other intellectual property protection methods to protect our proprietary technology. However, we believe that, due to the rapid pace of technological innovation in the markets for our products, our ability to establish and maintain a position of technology leadership also depends on the skills of our development personnel.

Despite our efforts to protect our intellectual property, a third party could develop products or processes similar to ours. Our means of protecting our proprietary rights may not be adequate and our competitors may independently develop similar technology, duplicate our products or design around our patents. We believe that at least one of our competitors has begun to ship GaAs substrates produced using a process similar to our VGF technique. Our competitors may also develop and patent improvements to the VGF, LED and VCSEL technologies upon which we rely, and thus may limit any exclusivity we enjoy by virtue of our patents.

It is possible that pending or future United States or foreign patent applications made by us will not be approved, that our issued patents will not protect our intellectual property, or that third parties will challenge the ownership rights or the validity of our patents. In addition, the laws of some foreign countries may not protect our proprietary rights to as great an extent as do the laws of the United States and it may be more difficult to monitor the use of our intellectual property. Our competitors may be able to legitimately ascertain non-patented proprietary technology embedded in our systems. If this occurs, we may not be able to prevent the development of technology substantially similar to ours.

We may have to resort to costly litigation to enforce our intellectual property rights, to protect our trade secrets or know-how or to determine their scope, validity or enforceability. Enforcing or defending our proprietary technology is expensive, could cause us to divert resources and may not prove successful. Our protective measures may prove inadequate to protect our proprietary rights, and if we fail to enforce or protect our rights, we could lose valuable assets.

### ***We might face intellectual property infringement claims that may be costly to resolve and could divert management attention.***

Other companies may hold or obtain patents on inventions or may otherwise claim proprietary rights to technology necessary to our business. The markets in which we compete are comprised of competitors who in some cases hold substantial patent portfolios covering aspects of products that could be similar to ours. We could become subject to claims that we are infringing patent, trademark, copyright or other proprietary rights of others, and are currently in discussions with one company concerning alleged patent infringement. Litigation to determine the validity of alleged claims could be time-consuming and result in significant expense to us and divert the efforts of our technical and management personnel, whether or not the litigation is ultimately determined in our favor. If a lawsuit is decided against us, we could be subject to significant liabilities, requiring us to seek costly licenses or preventing us from manufacturing and selling our products. We may not be able to obtain required licensing agreements on terms acceptable to us or at all.

### ***We derive a significant portion of our revenue from international sales, and our ability to sustain and increase our international sales involves significant risks.***

Our revenue growth depends in part on the expansion of our international sales and operations. International sales represented 50.4% of our total revenue in 2001, 48.2% in 2000 and 51.6% in 1999. We expect that sales to customers outside the U.S. will continue to represent a significant portion of our revenue.

Our dependence on international sales involves a number of risks, including:

changes in tariffs, import or export restrictions and other trade barriers;

unexpected changes in regulatory requirements;

longer periods to collect accounts receivable;

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changes in export license requirements;

political and economic instability;

unexpected changes in diplomatic and trade relationships; and

foreign exchange rate fluctuations.

Our sales are denominated in U.S. dollars, except for sales to our Japanese and some Taiwanese customers, which are denominated in Japanese yen. Thus, increases in the value of the U.S. dollar could increase the price of our products in non-U.S. markets and make our products more expensive than competitors' products in these markets. Also, denominating some sales in Japanese yen subjects us to fluctuations in the exchange rates between the U.S. dollar and the Japanese yen. The functional currencies of our Japanese and Chinese subsidiaries are the local currencies. We incur transaction gains or losses resulting from consolidation of expenses incurred in local currencies for these subsidiaries, as well as in translation of the assets and liabilities of these assets at each balance sheet date. If we do not effectively manage the risks associated with international sales, our revenue, cash flows and financial condition could be adversely affected.

***If our expansion in China is more costly than we expect, our operating results will suffer.***

As part of our planned expansion of our manufacturing capacity, we are building new facilities and expanding existing facilities in China. If we are unable to build and expand our Chinese facilities in a timely manner, we may not be able to increase production of our products and increase revenue as planned. If our expansion in China proves more costly than we anticipate or we incur greater ongoing costs than we expect, our operating results would be adversely affected. If we do not realize expected cost savings once our expansion is complete in China, our margins may be negatively impacted and our operating results may suffer.

***Changes in China's political, social and economic environment may affect our financial performance.***

Our financial performance may be affected by changes in China's political, social and economic environment. The role of the Chinese central and local governments in the Chinese economy is significant. Chinese policies toward economic liberalization, and laws and policies affecting technology companies, foreign investment, currency exchange rates and other matters could change, resulting in greater restrictions on our ability to do business and operate our manufacturing facilities in China. Any imposition of surcharges or any increase in Chinese tax rates could hurt our operating results. The Chinese government could revoke, terminate or suspend our license for national security and similar reasons without compensation to us. If the government of China were to take any of these actions, we would be prevented from conducting all or part of our business. Any failure on our part to comply with governmental regulations could result in the loss of our ability to manufacture our products in China.

China has from time to time experienced instances of civil unrest and hostilities. Confrontations have occurred between the military and civilians. Events of this nature could influence the Chinese economy, result in nationalization of foreign-owned operations such as ours, and could negatively affect our ability to operate our facilities in China.

***The effect of terrorist threats on the general economy could decrease our revenues.***

On September 11, 2001, the United States was subject to terrorist attacks at the World Trade Center buildings in New York and the Pentagon in Washington D.C. The potential near- and long-term impact these attacks may have in regards to our suppliers, customers and markets for our products and the U.S. economy, are uncertain. There may be other potential adverse effects on our operating results due to this significant event that we cannot foresee.

***Our stock price has been and may continue to be volatile.***

Our stock price has fluctuated significantly since we began trading on the Nasdaq National Market. For the 12 months ended December 31, 2001, the high and low closing sales prices of our common stock were

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\$44.56 and \$10.20. A number of factors could cause the price of our common stock to continue to fluctuate substantially, including:

- actual or anticipated fluctuations in our quarterly or annual operating results;
- changes in expectations about our future financial performance or changes in financial estimates of securities analysts;
- announcements of technological innovations by us or our competitors;
- new product introduction by us or our competitors;
- large customer orders or order cancellations; and
- the operating and stock price performance of comparable companies.

In addition, the stock market in general has experienced extreme volatility that often has been unrelated to the operating performance of particular companies. These broad market and industry fluctuations may adversely affect the trading price of our common stock, regardless of our actual operating performance.

***We may need additional capital to fund expansion of our manufacturing capacity and our future operations, which may not be available.***

We may need additional capital to fund expansion of our manufacturing and production capacity and our future operations or acquisitions. If we raise additional capital through the sale of equity or debt securities, the issuance of such securities could result in dilution to existing stockholders. These securities could have rights, preferences and privileges that are senior to those of holders of our common stock. For example, in December 1998 we issued debt securities for the purchase and improvement of our facilities in Fremont, California.

If we require additional capital in the future, it might not be available on acceptable terms, or at all. If we are unable to obtain additional capital when needed, we may be required to reduce the scope of our planned expansion of our manufacturing capacity or of our product development and marketing efforts, which could adversely affect our business and operating results.

***Provisions in our charter, bylaws or Delaware law may delay or prevent a change in control of our company.***

Provisions in our amended and restated certificate of incorporation and bylaws may have the effect of delaying or preventing a merger, acquisition or change of control of us, or changes in our management. These provisions include:

- the division of our board of directors into three separate classes, each with three year terms;
- the right of our board to elect a director to fill a space created by a board vacancy or the expansion of the board;
- the ability of our board to alter our bylaws;
- the ability of our board to authorize the issuance of up to 2,000,000 shares of blank check preferred stock; and
- the requirement that only our board or the holders of at least 10% of our outstanding shares may call a special meeting of our stockholders.

Furthermore, because we are incorporated in Delaware, we are subject to the provisions of Section 203 of the Delaware General Corporation Law. These provisions prohibit large stockholders, in particular those owning 15% or more of the outstanding voting stock, from consummating a merger or combination with a corporation unless:

- 66 2/3% of the shares of voting stock not owned by these large stockholders approve the merger or combination, or

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the board of directors approves the merger or combination or the transaction which resulted in the large stockholder owning 15% or more of our outstanding voting stock.

***We have adopted certain anti-takeover measures that may make it more difficult for a third party to acquire us.***

Our board of directors has the authority to issue up to 2,000,000 shares of preferred stock and to determine the price, rights, preferences and privileges of those shares without any further vote or action by the stockholders. The rights of the holders of common stock will be subject to, and may be adversely affected by, the rights of the holders of any preferred stock that may be issued in the future. The issuance of shares of preferred stock, while potentially providing desirable flexibility in connection with possible acquisitions and for other corporate purposes, could have the effect of making it more difficult for a third party to acquire a majority of our outstanding voting stock. We have no present intention to issue shares of preferred stock. Further, on April 24, 2001, our board of directors adopted a preferred stock purchase rights plan intended to guard against certain takeover tactics. The adoption of this plan was not in response to any proposal to acquire us, and the board is not aware of any such effort. The existence of this plan could also have the effect of making it more difficult for a third party to acquire a majority of our outstanding voting stock. In addition, certain provisions of our certificate of incorporation may have the effect of delaying or preventing a change of control, which could adversely affect the market price of our common stock.

***The financial condition of our customers may affect their ability to pay amounts owed to us.***

Many of our customers are facing business downturns that have reduced their cash balances and their prospects. We frequently allow our customers to pay for products we ship to them within 30 to 90 days after delivery. Subsequent to our shipping a product some customers have been unable to make payments as due, reducing our cash balances and causing us to incur charges to allow for a possibility that some accounts might not be paid. At least one customer that owed us a significant amount has filed for bankruptcy protection and we are unlikely to receive a substantial portion of the amount owed to us as part of a bankruptcy settlement. Other customers may also be forced to file for bankruptcy. If our customers do not pay their accounts when due, we will be required to incur charges that would reduce our earnings.

**Item 7A. *Qualitative and Quantitative Disclosures About Market Risk***

***Foreign Currency Risk***

Since our Japanese and some Taiwanese invoices are denominated in Japanese yen, doing business in Japan subjects us to fluctuations in exchange rates between the U.S. dollar and the Japanese yen. We incurred a foreign transaction exchange loss of \$357,000 in 2001, a loss of \$552,000 in 2000, and a gain of \$652,000 in 1999. We purchase foreign exchange contracts to hedge against certain trade accounts receivable in Japanese yen. Under these contracts, increases or decreases in currency commitments and balance sheet positions, as translated into U.S. dollars, are primarily offset by realized gains or losses on the hedging contracts. The outstanding commitments with respect to such foreign exchange contracts had a total contract value of approximately \$1.5 million as of December 31, 2001. Many of the contracts were entered into six months prior to the due date and the dates coincide with the receivable terms on customer invoices. By matching the receivable collection date and contract due date, we attempt to economically minimize the impact of foreign exchange fluctuations.

**Table of Contents****Interest Rate Risk**

Cash and cash equivalents earning interest and certain variable rate debt instruments are subject to interest rate fluctuations. The following table sets forth the probable impact of a 10% change in interest rates (in thousands):

Instrument	Balance December 31, 2001	Current Interest Rate	Current Interest Income/ (Expense)	Proforma 10% Interest Rate Decline Income/(Expense)	Proforma 10% Interest Rate Increase Income/(Expense)
Cash and cash equivalents	\$ 37,538	3.80%	\$ 1,426	\$ 1,284	\$ 1,569
Bonds (see Note 10)	9,720	5.60%	(544)	(490)	(599)
Notes (see Note 10)	5,185	5.75%	(298)	(268)	(328)
			<u>\$ 584</u>	<u>\$ 526</u>	<u>\$ 642</u>

**Equity Risk**

We also maintain minority investments in private and publicly traded companies. These investments are reviewed for other than temporary declines in value on a quarterly basis. Reasons for other than temporary declines in value include whether the related company would have insufficient cash flow to operate for the next twelve months, significant changes in the operating performance and changes in market conditions. As of December 31, 2001, the minority investments we continue to hold totaled \$15.4 million at estimated fair value. In 2001, we realized a net \$15.6 million non-cash loss as a result of writing down our investment in Finisar Corporation common stock. This loss is included in other expense. In 2000, we realized a \$27.3 million non-cash gain as a result of acquiring Finisar Corporation common stock in connection with Finisar Corporation's acquisition of Demeter Technologies, a company in which we held warrants to purchase preferred stock.

**Item 8. Consolidated Financial Statements and Supplementary Data****Selected Quarterly Results of Operations**

The following table sets forth unaudited quarterly results in dollars and percentages for the eight quarters ended December 31, 2001. We believe that all necessary adjustments, consisting only of normal recurring

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adjustments, have been included in the amounts stated below to present fairly such quarterly information. The operating results for any quarter are not necessarily indicative of results for any subsequent period.

	Quarters ended							
	Dec. 31, 2001	Sept. 30, 2001	June 30, 2001	Mar. 31, 2001	Dec. 31, 2000	Sept. 30, 2000	June 30, 2000	Mar. 31, 2000
Revenue	\$ 15,371	\$22,783	\$41,272	\$40,104	\$ 38,167	\$33,132	\$27,939	\$22,265
Cost of revenue	15,892	17,423	25,067	23,810	25,072	18,435	16,883	13,294
Gross profit	(521)	5,360	16,205	16,294	13,095	14,697	11,056	8,971
Operating expenses:								
Selling, general and administrative	4,382	5,826	5,412	5,867	5,414	5,134	4,286	3,207
Research and development	1,370	1,701	2,430	2,703	1,793	3,267	1,800	1,909
Restructuring costs					6,409			
Total operating expenses	5,752	7,527	7,842	8,570	13,616	8,401	6,086	5,116
Income (loss) from operations	(6,273)	(2,167)	8,363	7,724	(521)	6,296	4,970	3,855
Interest expense	444	493	515	629	936	762	1,149	769
Other (income) and expense	14,915	(488)	(345)	(709)	(27,964)	16	(298)	(186)
Income (loss) from continuing operations before provision for income taxes	(21,632)	(2,172)	8,193	7,804	26,507	5,518	4,119	3,272
Provision for income taxes	(7,788)	(782)	2,949	2,810	10,062	2,097	1,575	1,244
Income (loss) from continuing operations	(13,844)	(1,390)	5,244	4,994	16,445	3,421	2,544	2,028
Discontinued operations:								
Loss from discontinued operations, net of tax benefits					(721)	(519)	(191)	(56)
Loss on disposal, net of tax benefits					(1,341)			
Net income (loss)	\$(13,844)	\$ (1,390)	\$ 5,244	\$ 4,994	\$ 14,383	\$ 2,902	\$ 2,353	\$ 1,972

	Quarters ended							
	Dec. 31, 2001	Sept. 30, 2001	June 30, 2001	Mar. 31, 2001	Dec. 31, 2000	Sept. 30, 2000	June 30, 2000	Mar. 31, 2000
Revenue	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Cost of revenue	103.4%	76.5%	60.7%	59.4%	65.7%	55.6%	60.4%	59.7%
Gross profit	(3.4)%	23.5%	39.3%	40.6%	34.3%	44.4%	39.6%	40.3%
Operating expenses:								
Selling, general and administrative	28.5%	25.6%	13.1%	14.6%	14.2%	15.5%	15.3%	14.4%
Research and development	8.9%	7.5%	5.9%	6.7%	4.7%	9.9%	6.4%	8.6%
Restructuring costs	0.0%	0.0%	0.0%	0.0%	16.8%	0.0%	0.0%	0.0%
Total operating expenses	37.4%	33.0%	19.0%	21.4%	35.7%	25.4%	21.8%	23.0%
Income (loss) from operations	(40.8)%	(9.5)%	20.3%	19.3%	(1.4)%	19.0%	17.8%	17.3%
Interest expense	2.4%	2.2%	1.2%	1.6%	2.4%	2.3%	4.1%	3.5%
Other (income) and expense	97.0%	(2.1)%	(0.8)%	(1.8)%	(73.3)%	0.0%	(1.1)%	(0.8)%

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Income (loss) from continuing operations before provision for income taxes	(140.7)%	(9.5)%	19.9%	19.5%	69.5%	16.7%	14.7%	14.7%
Provision for income taxes	(50.7)%	(3.4)%	7.1%	7.0%	26.4%	6.3%	5.6%	5.6%
Income (loss) from continuing operations	(90.1)%	(6.1)%	12.7%	12.5%	43.1%	10.3%	9.1%	9.1%
Discontinued operations:								
Loss from discontinued operations, net of tax benefits	0.0%	0.0%	0.0%	0.0%	(1.9)%	(1.6)%	(0.7)%	(0.3)%
Loss on disposal, net of tax benefits	0.0%	0.0%	0.0%	0.0%	(3.5)%	0.0%	0.0%	0.0%
Net income (loss)	(90.1)%	(6.1)%	12.7%	12.5%	37.7%	8.8%	8.4%	8.9%

Other Consolidated Financial Statements and Supplementary Data required by this item are set forth at the pages indicated at Item 14(a).



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**Item 9. *Changes in and Disagreements with Accountants on Accounting and Financial Disclosures***

None.

**PART III**

The SEC allows us to include information required in this report by referring to other documents or reports we have already or will soon be filing. This is called Incorporation by Reference. We intend to file our definitive proxy statement pursuant to Regulation 14A not later than 120 days after the end of the fiscal year covered by this report, and certain information therein is incorporated in this report by reference.

**Item 10. *Directors and Executive Officers of the Registrant.***

The information required by this Item is incorporated herein by reference to information set forth in our definitive proxy statement to be filed in connection with our annual meeting of stockholders to be held on May 21, 2002, under the section entitled Proposal No. 1 Election of Directors.

The information required by this Item with respect to compliance with Section 16(a) of the Securities Exchange Act of 1934 is incorporated herein by reference to information set forth in the definitive Proxy statement to be filed in connection with our annual meeting of stockholders to be held on May 21, 2002, under the heading Executive Compensation and Other matters.

We have revised our Insider Trading Policy to allow our directors, officers and other employees covered under the policy to establish, under limited circumstances contemplated by Rule 10b5-1 under the Securities Exchange Act of 1934, written programs that permit automatic trading of our stock or trading of our stock by an independent person (such as an investment bank) who is not aware of material inside information at the time of the trade. As of January 31, 2002, none of our officers have adopted Rule 10b5-1 trading plans. The Company believes that some of our directors or officers may establish such programs in future periods.

**Item 11. *Executive Compensation.***

The information required by this Item is incorporated herein by reference to information set forth in our definitive Proxy statement to be filed in connection with our annual meeting of stockholders to be held on May 21, 2002, under the section entitled Executive Compensation and Other matters.

**Item 12. *Security Ownership of Certain Beneficial Owners and Management.***

The information required by this Item is incorporated herein by reference to information set forth in our definitive Proxy statement to be filed in connection with our annual meeting of stockholders to be held on May 21, 2002, under the section entitled Security Ownership of Certain Beneficial Owners and Management.

**Item 13. *Certain Relationships and Related Transactions***

Since January 1999, there has not been, nor is there currently proposed, any transaction or series of similar transactions to which we were or are to be a party in which the amount involved exceeds \$60,000, and in which any director, executive officer or holder of more than 5% of any class of our voting securities or members of that person's immediate family had or will have a direct or indirect material interest other than the transactions described below.

Equipment & Materials, a California corporation engaged in international trading and quartzware fabrication, supplies us with various raw materials from China and has manufactured quartzware for us. Christina X. Li, the sole shareholder and president of Equipment & Materials, is

the wife of Davis Zhang, the president of our substrate division. Purchases from Equipment & Materials were approximately \$4.7 million for the year ended December 31, 2001, \$8.9 million for 2000 and \$3.6 million for 1999. There was no balance due to Equipment & Materials at December 31, 2001.

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We have entered into an operating lease for warehouse space in Fremont, CA with 4160 Business Center, LLC, a real estate holding company, in which Davis Zhang, the president of our substrate division, is the sole shareholder. Lease payments to 4160 Business Center, LLC were approximately \$188,000 for the year ended December 31, 2001.

In August 2000, we entered into a business transfer and acquisition agreement with Demeter Technologies, Inc., a Delaware corporation founded by Theodore S. Young, the former president of our fiber optic division and a former member of our board of directors, and Robert Shih, the former chief technology officer of our opto-electronics division. Under this agreement, we agreed to transfer certain non-core rights to Demeter relating to our research and development activities in the field of fiber optics. We have entered into non-compete agreements with Messrs. Shih and Young that prohibit them from certain activities, including the manufacture of certain VCSEL devices. We have leased to Demeter a portion of our owned facility in El Monte, California, subleased a portion of our rented facility in El Monte, California, leased certain equipment, including an MOCVD machine, and sold certain inventory relating to fiber optics. In exchange, Demeter granted to us a warrant to purchase up to 4.5 million shares of its Series A convertible preferred stock at a price of \$0.5714 per share which we exercised in November 2000.

**PART IV****Item 14. Exhibits, Financial Statement Schedules, and Reports on Form 8-K**

(a) The following documents are filed as part of this report:

(1) *Financial Statements:*

**INDEX TO CONSOLIDATED FINANCIAL STATEMENTS**

	<b>Page</b>
Report of Independent Accountants	38
Consolidated Balance Sheets	39
Consolidated Income Statements	40
Consolidated Statements of Stockholders' Equity	41
Consolidated Statements of Cash Flows	42
Notes to Consolidated Financial Statements	43-59

(2) *Financial Statement Schedules*

All schedules have been omitted because the required information is not present or not present in amounts sufficient to require submission of the schedules or because the information required is included in the Consolidated Financial Statements or Notes thereto.

(3) *Exhibits*

See Index to Exhibits on pages 61 and 62 hereof. The exhibits listed in the accompanying Index to Exhibits are filed as part of, or incorporated by reference into, this report on Form 10K.

(b) *Reports on Form 8-K*

None

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**REPORT OF INDEPENDENT ACCOUNTANTS**

To the Board of Directors and Stockholders of AXT, Inc.

In our opinion, based on our audits, the accompanying consolidated balance sheets and the related consolidated statements of income, of stockholders' equity and of cash flows present fairly, in all material respects, the financial position of AXT, Inc. and its subsidiaries at December 31, 2001 and 2000, and the results of their operations and their cash flows for each of the three years in the period ended December 31, 2001 in conformity with accounting principles generally accepted in the United States of America. These financial statements are the responsibility of the Company's management; our responsibility is to express an opinion on these financial statements based on our audits. We conducted our audits of these statements in accordance with auditing standards generally accepted in the United States of America, which require that we plan and perform the audit to obtain reasonable assurance about whether the financial statements are free of material misstatement. An audit includes examining, on a test basis, evidence supporting the amounts and disclosures in the financial statements, assessing the accounting principles used and significant estimates made by management, and evaluating the overall financial statement presentation. We believe that our audits provide a reasonable basis for our opinion.

PRICEWATERHOUSECOOPERS LLP

San Jose, California

February 8, 2002

**Table of Contents****AXT, INC.****CONSOLIDATED BALANCE SHEETS**

	December 31,	
	2001	2000
(In thousands, except per share data)		
<b>ASSETS</b>		
Current assets		
Cash and cash equivalents	\$ 37,538	\$ 68,585
Short-term investments	25,673	30,852
Accounts receivable	15,684	27,773
Inventories	55,587	51,846
Prepaid expenses and other current assets	3,577	3,603
Deferred income taxes	2,458	
	<u>          </u>	<u>          </u>
Total current assets	140,517	182,659
Property, plant and equipment	82,573	63,401
Other assets	4,511	3,312
Goodwill	1,107	848
Long term investments	6,552	
	<u>          </u>	<u>          </u>
Total assets	\$235,260	\$250,220
	<u>          </u>	<u>          </u>
<b>LIABILITIES AND STOCKHOLDERS EQUITY</b>		
Current liabilities		
Short-term bank borrowing	\$	\$ 1,353
Accounts payable	2,943	10,009
Accrued liabilities	13,670	16,651
Deferred income taxes		3,847
Current portion of long-term debt	2,336	4,355
Current portion of capital lease obligation	4,372	6,057
	<u>          </u>	<u>          </u>
Total current liabilities	23,321	42,272
Long-term debt, net of current portion	14,342	15,123
Long-term capital lease, net of current portion	10,002	7,278
Other long-term liabilities	1,273	200
	<u>          </u>	<u>          </u>
Total liabilities	48,938	64,873
	<u>          </u>	<u>          </u>
Commitments and Contingencies (Note 17)		
Stockholders equity:		
Preferred stock, \$.001 par value; 2,000 shares authorized; 883 shares issued and outstanding	3,532	3,532
Common stock, \$.001 par value; 70,000 shares authorized; 22,383 and 21,952 shares issued and outstanding	153,635	145,748
Deferred compensation		(107)
Retained earnings	28,984	33,980
Other comprehensive income	171	2,194
	<u>          </u>	<u>          </u>
Total stockholders equity	186,322	185,347
	<u>          </u>	<u>          </u>

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Total liabilities and stockholders' equity	\$ 235,260	\$ 250,220
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The accompanying notes are an integral part of these consolidated financial statements.

**Table of Contents****AXT, INC.****CONSOLIDATED INCOME STATEMENTS**

	Years Ended December 31,		
	2001	2000	1999
	(In thousands, except per share data)		
Revenue	\$ 119,530	\$ 121,503	\$ 75,372
Cost of revenue, including restructuring costs of \$1,844 in 2000	82,191	73,684	50,026
Gross profit	37,339	47,819	25,346
Operating expenses:			
Selling, general and administrative	21,487	18,041	10,474
Research and development	8,204	8,769	2,566
Restructuring costs		6,409	
Acquisition costs			2,810
Total operating expenses	29,691	33,219	15,850
Income from operations	7,648	14,600	9,496
Interest expense	2,081	3,616	2,201
Other (income)/expense, net	13,373	(28,432)	(1,423)
Income (loss) from continuing operations before provision for income taxes	(7,806)	39,416	8,718
Provision for income taxes	(2,810)	14,978	4,380
Income (loss) from continuing operations	(4,996)	24,438	4,338
Discontinued operations:			
Loss from discontinued operations, net of tax benefits of \$912 and \$2,241		(1,487)	(3,658)
Loss on disposal, net of tax benefits of \$822		(1,341)	
Extraordinary item, net of tax benefits of \$311			(508)
Net income (loss)	\$ (4,996)	\$ 21,610	\$ 172
Basic income (loss) per share:			
Income (loss) from continuing operations	\$ (0.23)	\$ 1.24	\$ 0.23
Loss from discontinued operations		(0.14)	(0.19)
Extraordinary item			(0.03)
Net income (loss)	(0.23)	1.10	0.01
Diluted income (loss) per share:			
Income (loss) from continuing operations	\$ (0.23)	\$ 1.16	\$ 0.22
Loss from discontinued operations		(0.13)	(0.18)
Extraordinary item			(0.03)
Net income (loss)	(0.23)	1.03	0.01
Shares used in per share calculations:			
Basic	22,278	19,677	18,655
Diluted	22,278	21,059	19,771

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





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## AXT, INC.

## CONSOLIDATED STATEMENT OF STOCKHOLDERS EQUITY

	Preferred Stock		Common Stock		Deferred Compensation	Retained Earnings	Other Comprehensive Income	Total	Comprehensive Income/(loss)
	Shares	Amount	Shares	Amount					
(In thousands)									
Balance at December 31, 1998	981	\$4,000	18,393	\$ 45,266	\$(327)	\$12,198	\$ 27	\$ 61,164	\$ 4,508
Common stock options exercised			201	648				648	
Repurchase of shares of common stock in connection with the early extinguishment of debt			(21)	(211)				(211)	
Acquisition costs paid by shareholders		(10)		(139)				(149)	
Issuance of Employee Stock Purchase Plan stock			86	776				776	
Amortization of deferred compensation					110			110	
Comprehensive income									
Net income						172		172	172
Currency translation adjustment							(51)	(51)	(51)
Balance at December 31, 1999	981	\$3,990	18,659	\$ 46,340	\$(217)	\$12,370	\$ (24)	\$ 62,459	\$ 121
Common stock options exercised			711	6,038				6,038	
Issuance of Employee Stock Purchase Plan stock			63	648				648	
Reacquisition and retirement on common stock and Series A preferred stock in connection with merger of Lyte Optronics	(98)	(458)	(225)	458					
Issuance of common stock in private placement			234	8,507				8,507	
Issuance of common stock in follow on public offering			2,510	80,812				80,812	
Income tax benefit from stock option exercises				2,945				2,945	
Amortization of deferred compensation					110			110	
Comprehensive income									
Net income						21,610		21,610	21,610
Unrealized gain on marketable securities							2,185	2,185	2,185
							33	33	33

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Currency translation adjustment									
Balance at December 31, 2000	883	\$ 3,532	21,952	\$ 145,748	\$ (107)	\$ 33,980	\$ 2,194	\$ 185,347	\$ 23,828
Common stock options exercised			388	3,862				3,862	
Issuance of Employee Stock Purchase Plan stock			43	900				900	
Income tax benefit from stock option exercises				3,125				3,125	
Amortization of deferred compensation					107			107	
Comprehensive income (loss)									
Net income (loss)						(4,996)		(4,996)	(4,996)
Unrealized gain (loss) on marketable securities							(2,052)	(2,052)	(2,052)
Currency translation adjustment							29	29	29
Balance at December 31, 2001	883	\$ 3,532	22,383	\$ 153,635	\$	\$ 28,984	\$ 171	\$ 186,322	\$ (7,019)

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

**Table of Contents****AXT, INC.****CONSOLIDATED STATEMENTS OF CASH FLOWS**

	Years Ended December 31,		
	2001	2000	1999
	(In thousands)		
<b>Cash flows from operating activities:</b>			
Net income (loss)	\$ (4,996)	\$ 21,610	\$ 172
Adjustments to reconcile net income (loss) to cash provided by (used in) operations:			
Depreciation	8,538	6,854	5,444
Deferred income taxes	(5,041)	5,718	(758)
Amortization of goodwill	324	548	599
Stock compensation	107	110	110
Stock option tax benefits	3,125	2,945	
Non cash restructuring costs		6,249	
Non cash (gain)/loss on marketable securities	15,636	(27,328)	
Bond premium/discount amortization	230		
Loss (gain) on disposal of property, plant and equipment	229	(183)	
Changes in assets and liabilities:			
Accounts receivable	11,939	(10,212)	(4,433)
Inventories	(3,741)	(18,220)	(10,170)
Prepaid expenses	1,240	5,282	(5,674)
Other assets	(454)	(369)	522
Accounts payable	(7,013)	1,715	444
Accrued liabilities	(2,967)	9,187	2,222
Other long-term liabilities	(12)	(210)	(194)
Net cash provided by (used in) operating activities	17,144	3,696	(11,716)
<b>Cash flows from investing activities:</b>			
Purchases of property, plant and equipment	(25,834)	(26,278)	(2,758)
Investment in marketable securities	(21,591)		
Investment in other assets	(1,307)	(1,599)	
Proceeds from sale of marketable securities	1,034		
Proceeds from sale of property plant and equipment		1,805	
Net cash used in investing activities	(47,698)	(26,072)	(2,758)
<b>Cash flows from financing activities:</b>			
Proceeds from (payments of):			
Issuance of common stock	4,762	96,005	1,064
Capital lease payments	(4,274)	(3,850)	(1,958)
Capital lease borrowings	3,143		
Short-term bank borrowings	(1,353)	(9,945)	9,370
Long-term debt borrowings		6,000	
Long-term debt payments	(2,800)	(3,344)	(4,327)
Net cash provided by (used in) financing activities	(522)	84,866	4,149

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Effect of exchange rate changes	29	33	(51)
	<u>          </u>	<u>          </u>	<u>          </u>
Net increase (decrease) in cash and cash equivalents	(31,047)	62,523	(10,376)
Cash and cash equivalents at the beginning of the period	68,585	6,062	16,438
	<u>          </u>	<u>          </u>	<u>          </u>
Cash and cash equivalents at the end of the period	\$ 37,538	\$ 68,585	\$ 6,062
	<u>          </u>	<u>          </u>	<u>          </u>
Non cash activity:			
Purchases of property, plant and equipment through capital leases	\$ 2,170	\$ 8,170	\$ 5,927
Exchange of Finisar shares for Demeter shares	\$	\$ 27,328	\$
<b>Supplemental Disclosures:</b>			
Interest paid	\$ 2,081	\$ 3,597	\$ 2,288
Income taxes paid	\$ 305	\$ 4,645	\$ 6,268

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

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**AXT, INC.**

**NOTES TO CONSOLIDATED FINANCIAL STATEMENTS**

**Note 1. The Company and Summary of Accounting Policies**

***The Company***

AXT, Inc. designs, develops, manufactures, and distributes high-performance compound semiconductor substrates, as well as opto-electronic semiconductor devices, such as high-brightness light-emitting diodes, or HBLEDs, laser diodes including vertical cavity surface emitting lasers, or VCSELs, and edge-emitting laser diodes for telecommunications applications.

AXT expanded its markets in 1999 through the acquisition of Lyte Optronics, Inc., (see Note 4). Lyte Optronics operates as the Opto-electronics division, which focuses on manufacturing HBLEDs and laser diodes.

The Company officially changed its name from American Xtal Technology, Inc. to AXT, Inc. on July 7, 2000.

***Use of Estimates***

The preparation of financial statements in conformity with generally accepted accounting principles requires management to make estimates and assumptions that affect the reported amounts of assets and liabilities and disclosure of contingent assets and liabilities at the date of the financial statements and the reported amounts of revenues and expenses during the reporting period. Actual results could differ from these estimates.

***Principles of Consolidation***

The consolidated financial statements include the accounts of the Company and its majority-owned subsidiaries. All significant intercompany accounts and transactions have been eliminated. Investments in business entities in which AXT does not have control, but has the ability to exercise significant influence over operating and financial policies (generally 20-50% ownership), are accounted for by the equity method.

***Foreign Currency Translation***

The functional currencies of the Company's Japanese and Chinese subsidiaries are the local currencies. Transaction gains and losses resulting from transactions denominated in currencies other than the U.S. dollar for the Company or in the local currencies for the subsidiaries are included in other income for the periods presented.

The assets and liabilities of the subsidiaries are translated at the rates of exchange on the balance sheet date. Revenue and expense items are translated at the average rate of exchange for the period. Gains and losses from foreign currency translation are included in other comprehensive income in stockholders' equity.

***Revenue Recognition***

The Company recognizes revenue upon the shipment of its products to the customer provided that the Company has received a signed purchase order, the price is fixed, title has transferred, collection of resulting receivables is probable, product returns are reasonably estimable, there are no customer acceptance requirements and there are no remaining significant obligations. The Company provides for future returns based on historical experience at the time revenue is recognized.

***Fair Value of Financial Instruments***

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The reported amounts of certain of the Company's financial instruments including cash and cash equivalents, accounts receivable, accounts payable and accrued liabilities approximate fair value due to their

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**AXT, INC.**

**NOTES TO CONSOLIDATED FINANCIAL STATEMENTS (Continued)**

short maturities. The reported amounts of short-term bank borrowings, loans payable and capital lease obligations approximate fair value due to the market interest rates which these debts bear.

***Concentration of Credit Risk***

Financial instruments which potentially subject the Company to concentration of credit risk consist primarily of trade accounts receivable. The Company performs ongoing credit evaluations of its customers' financial condition, and limits the amount of credit extended when deemed necessary, but generally does not require collateral. The Company invests primarily in money market accounts and commercial paper instruments. Cash equivalents are maintained with high quality institutions and their composition and maturities are regularly monitored by management

No customer represented greater than 10% of Product revenues for the years ended December 31, 2001, 2000 and 1999.

No customer accounted for 10% or more of the trade accounts receivable balance as of December 31, 2001 and 2000.

***Cash Equivalents***

The Company considers all highly liquid debt instruments purchased with an original maturity of three months or less to be cash equivalents.

***Investments***

The Company classifies its investment securities as available-for-sale securities as prescribed in Financial Accounting Standard No. 115, Accounting for Certain Investments in Debt and Equity Securities. All investments are carried at fair market value, which is determined based on quoted market prices, with net unrealized gains and losses included in comprehensive income, net of tax.

***Inventories***

Inventories are stated at the lower of cost or net realizable value. Cost is determined using the weighted average cost method. Finished goods and work-in-process inventories include material, labor and manufacturing overhead costs.

***Property, Plant and Equipment***

Property, plant and equipment are stated at cost less accumulated depreciation computed using the straight-line method over the estimated economic lives of the assets, which vary from three to ten years. Leasehold improvements are amortized over the shorter of the estimated useful life or the term of the lease. We generally depreciate computers and software over 3 years, automobiles over 5 years, office equipment, furniture and fixtures over 3 years, machinery and equipment over 7 years, leasehold improvements over 10 years, and buildings over 27.5 years.

***Goodwill***

Goodwill, the excess of cost over the fair value of net assets acquired, is being amortized over 5 years.

***Impairment of Long-Lived Assets***

Pursuant to Statement of Financial Accounting Standard No. 121, Accounting for the Impairment of Long-Lived Assets and for Long-Lived Assets to be Disposed of, the Company reviews long-lived assets





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**AXT, INC.**

**NOTES TO CONSOLIDATED FINANCIAL STATEMENTS (Continued)**

based upon a gross cash flow basis and will reserve for impairment whenever events or changes in circumstances indicate the carrying amount of the assets may not be fully recoverable.

***Stock-Based Compensation***

The Company accounts for stock-based employee compensation arrangements using the intrinsic value method as prescribed in Accounting Principles Board Opinion No. 25, *Accounting for Stock Issued to Employees* and related Interpretations thereof. Accordingly, compensation costs for stock options is measured as the excess, if any, of the market price of the Company's stock at the date of grant over the stock option exercise price. In addition, the Company complies with the disclosure provisions of Statement of Financial Accounting Standard No. 123, *Accounting for Stock-Based Compensation*.

***Research and Development***

Research and development costs are expensed as incurred.

***Income Taxes***

The Company accounts for deferred income taxes using the liability method, under which the expected future tax consequences of timing differences between the book and tax basis of assets and liabilities are recognized as deferred tax assets and liabilities. Valuation allowances are established when necessary to reduce deferred tax assets when management estimates, based on available objective evidence, that it is more likely than not that the benefit will not be realized for the deferred tax assets.

***Comprehensive Income***

Comprehensive income is defined as the change in equity of a company during a period from transactions and other events and circumstances excluding transactions resulting from investment by owners and distribution to owners. The difference between net income and comprehensive income for the Company relates to foreign currency translation adjustments and unrealized gains and losses on investment securities. Comprehensive income for the years ended December 31, 2001, 2000 and 1999 is disclosed in the Consolidated Statement of Stockholders' Equity.

***Basic and Diluted Net Income (Loss) Per Share***

Basic income (loss) per share is computed by dividing the income (loss) available to holders of common stock for the period by the weighted average number of shares of common stock outstanding during the period. The calculation of diluted income (loss) per share excludes potential common stock if the effect of such stock is antidilutive. Potential common stock consists of common shares issuable upon the exercise of stock options.

***Recent Accounting Pronouncements***

In July 2001, the FASB issued Statement of Financial Accounting Standards No. 141 and No. 142, or SFAS 141, *Business Combinations*, and SFAS 142, *Goodwill and Other Intangible Assets*. Under SFAS 141, all business combinations must be accounted for using the purchase method of accounting; use of the pooling-of-interests (pooling) method is prohibited. The provisions of the statement will apply to all business combinations initiated after June 30, 2001. SFAS 142 will apply to all acquired intangible assets whether acquired singly, as a part of a group, or in a business combination. The statement will supersede APB Opinion No. 17, *Intangible Assets*, and will carry forward provisions in APB Opinion No. 17 relating to internally developed intangible assets. Adoption of SFAS 142 will result in ceasing amortization of goodwill. All of the statement should be applied in fiscal years beginning after December 31, 2001 to all goodwill and other intangible assets recognized in an entity's statement of financial position at that date, regardless of when

**Table of Contents****AXT, INC.****NOTES TO CONSOLIDATED FINANCIAL STATEMENTS (Continued)**

those assets were initially recognized. We will test all goodwill and intangible assets for impairment upon adoption of SFAS 142 and will record any impairment charge as accumulative effect of an accounting change at that time. We believe adoption of the provisions of SFAS 141 and SFAS 142 will not have a material effect on the Company's financial position or results of operations.

In October 2001, the FASB issued Statement of Accounting Standards No. 144, Accounting for Impairment or Disposal of Long-Lived Assets (SFAS 144). SFAS 144 supercedes SFAS 121 Accounting for the Impairment of Long-Lived Assets and for Long-Lived Assets to be Disposed of. SFAS 144 applies to all long-lived assets (including discontinued operations) and consequently amends Accounting Principles Board Opinion No. 30 (APB 30), *Reporting Results of Operations Reporting the Effects of Disposal of a Segment of a Business*. SFAS 144 develops one accounting model for long-lived assets that are to be disposed of by sale. SFAS 144 requires the long-lived assets that are to be disposed of by sale be measured at the lower of book value or fair value less cost to sell. Additionally, SFAS 144 expands the scope of discontinued operations to include all components of the entity with operations that (1) can be distinguished from the rest of the entity and (2) will be eliminated from the ongoing operations of the entity in a disposal transaction. SFAS 144 is effective for the Company for all financial statements issued in fiscal 2002. We believe adoption of the provisions of SFAS 144 will not have a material effect on the Company's financial position or results of operations.

**Note 2. Discontinued Operations**

On December 14, 2000, the Company's Board of Directors approved management's plan to exit the Company's unprofitable consumer products business. The plan was substantially complete at December 31, 2001.

Certain information with respect to discontinued operations is summarized below (in thousands):

	<b>January 1, 2000 through December 14, 2000</b>	<b>Year Ended 1999</b>
Revenue	\$ 4,832	\$ 6,149
Cost of revenue	4,311	7,343
Gross profit	521	(1,194)
Operating expenses:		
Selling, general and administrative	2,899	3,543
Research and development	160	520
Total operating expenses	3,059	4,063
Income from operations	(2,538)	(5,257)
Interest expense	0	526
Other (income) expense	(139)	116
Income (loss) before provision for income taxes	(2,399)	(5,899)
Income tax benefit	(912)	(2,241)
Loss from discontinued operations	\$(1,487)	\$(3,658)

**Table of Contents****AXT, INC.****NOTES TO CONSOLIDATED FINANCIAL STATEMENTS (Continued)**

The charge in 2000 for loss on disposal of the consumer products business includes the following:

Carrying value of net assets in excess of anticipated proceeds	\$ 1,060
Expenses of asset disposal and anticipated operating loss for the period December 15, 2000 through the estimated date of disposal	1,103
	<u>          </u>
Loss on disposal before taxes	2,163
Income tax benefit	(822)
	<u>          </u>
Loss on disposal	\$ 1,341
	<u>          </u>

**Note 3. Restructuring Costs**

On December 14, 2000, the Company's Board of Directors approved management's plan to exit its unprofitable 650nm laser diode product line within its opto-electronics division. As a result, during the fourth quarter of 2000, the Company recorded a pre-tax restructuring charge of \$8.2 million. The restructuring charge included \$2.1 million for incremental costs and contractual obligations for such items as leasehold termination payments and other facility exit costs incurred as a direct result of this plan.

Certain information with respect to restructuring costs is summarized below (in thousands):

	Reserve	Utilized		Balance December 31, 2001
		Cash	Non-cash	
Inventory write-off	\$ 1,844	\$	\$ 1,844	\$
Property, plant and equipment write-off	3,436		3,436	
Goodwill write-off	848		848	
Other restructuring costs	2,124	382	121	1,621
	<u>          </u>	<u>          </u>	<u>          </u>	<u>          </u>
	\$ 8,252	\$ 382	\$ 6,249	\$ 1,621
	<u>          </u>	<u>          </u>	<u>          </u>	<u>          </u>

The fair value of assets determined to be impaired in accordance with the guidance for assets to be disposed of in SFAS No. 121, Accounting for the Impairment of Long-Lived Assets and for Long-Lived Assets to be Disposed of, were the result of management estimates. The above noted exit costs were determined in accordance with EITF No. 94-3, Liability Recognition for Certain Employee Termination Benefits and Other Costs to Exit an Activity. The restructuring actions, as outlined by the plan, are substantially complete. The remaining costs, which relate to the clean up of a leased facility, are expected to be executed to completion in 2002.

**Note 4. Acquisition*****Merger of the Company with Lyte Optronics, Inc.***

On May 28, 1999, the Company completed a merger with Lyte Optronics, Inc., or Lyte, a Nevada corporation and all of its subsidiaries, including Alpha Photonics, Inc., Lyte Optronics Ltd. (a United Kingdom company) and Advanced Semiconductor (a Xiamen, China company). Lyte and its subsidiaries manufactured and distributed semiconductor laser diode chips, high-brightness LEDs and laser pointers.

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Under the terms of the merger agreement, the Company issued approximately 2,023,000 shares of its common stock in exchange for all the outstanding shares of Lyte's common stock as well as the outstanding shares of Lyte's Series A preferred stock. The Company also issued approximately 883,000 shares of Series A preferred stock in exchange for all the outstanding shares of Lyte's Series B preferred stock. In addition, the Company assumed and converted Lyte's options and warrants representing approximately 115,000 shares of the Company's common stock.

**Table of Contents****AXT, INC.****NOTES TO CONSOLIDATED FINANCIAL STATEMENTS (Continued)**

The merger has been accounted for as a pooling of interests; accordingly, all prior period consolidated financial statements have been restated to include the combined results of operations, financial position and cash flows of Lyte.

The Company incurred costs of approximately \$2.8 million associated with the merger, which were charged to operations during the quarter ended June 30, 1999, the period in which the merger was consummated.

**Note 5. Gain on Demeter Warrants**

The Company received approximately 1.1 million shares of Finisar Corporation common stock as a result of the acquisition by Finisar Corporation of all of the outstanding capital stock of Demeter Technologies. AXT held a warrant in Demeter that it received in exchange for certain leases and transferred technology in August 2000. On November 21, 2000, a gain of \$27.3 million was recorded in other income as a result of the transaction. On December 10, 2001, the Company received approximately 86,000 additional shares of Finisar Corporation that had been held in escrow in accordance with the terms of the acquisition agreement between Demeter and Finisar. A gain of \$1.1 million was recorded in other income as a result of receiving these additional shares. On December 31, 2001, the Company concluded that the decline in market value of the Finisar stock was other than temporary. Accordingly, the Company wrote its investment in the common stock of Finisar Corporation down to current market value, in accordance with SFAS 115, resulting in a loss of \$16.7 million recorded in other income. The investment in the Finisar Corporation shares is classified as a short-term investment.

**Note 6. Investments**

The Company classifies its investment securities as available-for-sale securities as prescribed by Statement of Financial Accounting Standards No. 115 or SFAS 115, Accounting for Certain Investments in Debt and Equity Securities. All investments carried at fair market value, which is determined based on quoted market prices, with net unrealized gains and losses included in comprehensive income, net of tax. The components of investments at December 31, 2001 are summarized below (in thousands):

Available for Sale	Cost	Aggregate Fair Value	Realized Gain/(Loss)	Unrealized Gain/(Loss)
Money market	\$ 5,400	\$ 5,400	\$	\$
Corporate bonds	15,816	15,991		175
Government agency bonds	4,511	4,543		32
Corporate equity securities	28,409	11,691	(16,718)	
	<u>\$54,136</u>	<u>\$37,625</u>	<u>\$(16,718)</u>	<u>\$207</u>
Recorded as:				
Cash equivalents	\$ 5,400			
Investments due within one year	25,673			
Investments due in over one year	6,552			
	<u>\$37,625</u>			

**Table of Contents****AXT, INC.****NOTES TO CONSOLIDATED FINANCIAL STATEMENTS (Continued)****Note 7. Corporate Affiliates**

The Company's corporate affiliates are summarized below (in thousands):

Affiliate	Investment Balance December 31, 2001	Investment Balance December 31, 2000	Accounting Method	Ownership Percentage
Xilingol Tongli Ge Co. Ltd.	\$ 810	\$ 302	Equity	25%
Emeishan Jia Mei High Pure Metals Co., Ltd.	629		Equity	25%
Beijing Ji Ya Semiconductor Material Co., Ltd.	1,599	1,599	Consolidated	51%
Nanjing Jin Mei Gallium Co., Ltd.	700	700	Consolidated	88%

Undistributed retained earnings relating to the Company's corporate affiliates was \$679,000 at December 31, 2001. Net income recorded from the Company's corporate affiliates was \$701,000 for the year ended December 31, 2001.

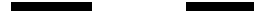
**Note 8. Stockholder Rights Plan.**

In April 2001, the Company adopted a Stockholder Rights Plan (the "Plan") designed to enable all stockholders to realize the full value of their investment and to provide for fair and equal treatment for all stockholders in the event that an unsolicited attempt is made to acquire the Company. Under the Plan, stockholders received one Right to purchase one one-thousandth of a share of a new series of Preferred Stock for each outstanding share of Common Stock held of record at the close of business on May 30, 2001 at \$131.00 per Right, when someone acquires 15 percent or more of the Company's Common Stock or announces a tender offer which could result in such person owning 15 percent or more of the Common Stock. Each one one-thousandth of a share of the new Preferred Stock has terms designed to make it substantially the economic equivalent of one share of Common Stock. Prior to someone acquiring 15 percent, the Rights can be redeemed for \$0.001 each by action of the Board of Directors. Under certain circumstances, if someone acquires 15 percent or more of the Common Stock, the Rights permit the stockholders other than the acquiror to purchase the Company's Common Stock having a market value of twice the exercise price of the Rights, in lieu of the Preferred Stock. Alternatively, when the Rights become exercisable, the Board of Directors may authorize the issuance of one share of Common Stock in exchange for each Right that is then exercisable. In addition, in the event of certain business combinations, the Rights permit the purchase of the Common Stock of an acquiror at a 50 percent discount. Rights held by the acquiror will become null and void in both cases. The Rights expire on April 24, 2011.

**Table of Contents****AXT, INC.****NOTES TO CONSOLIDATED FINANCIAL STATEMENTS (Continued)****Note 9. Balance Sheet Detail**

The components of selected balance sheet accounts are summarized below (in thousands):

	<b>December 31,</b>	
	<b>2001</b>	<b>2000</b>
<b>Accounts receivable:</b>		
Accounts receivable, gross	\$ 22,353	\$ 29,903
Allowance for doubtful accounts	(6,669)	(2,130)
	<u>\$ 15,684</u>	<u>\$ 27,773</u>
<b>Inventories:</b>		
Raw materials	\$ 21,308	\$ 20,886
Work-in-process	30,265	28,988
Finished goods	17,368	12,931
Valuation allowance	(13,354)	(10,959)
	<u>\$ 55,587</u>	<u>\$ 51,846</u>
<b>Prepaid expenses:</b>		
Income tax receivable	\$ 3,577	\$ 1,389
Other	3,577	2,214
	<u>\$ 3,577</u>	<u>\$ 3,603</u>
<b>Property, plant and equipment:</b>		
Land	\$ 2,447	\$ 2,447
Building	26,990	19,747
Machinery and equipment	60,984	40,002
Leasehold improvements	3,821	4,079
Construction in progress	11,478	14,694
	<u>105,720</u>	<u>80,969</u>
Less: accumulated depreciation and amortization	(23,147)	(17,568)
	<u>\$ 82,573</u>	<u>\$ 63,401</u>
<b>Accrued liabilities:</b>		
Accrued compensation and other	\$ 2,026	\$ 3,186
Customer prepayments	6,477	5,402
Accrued restructuring costs	1,621	1,991
Accrued discontinued operation costs	619	1,103
Income tax payable	308	
Other	2,619	4,969
	<u>\$ 13,670</u>	<u>\$ 16,651</u>





**Table of Contents****AXT, INC.****NOTES TO CONSOLIDATED FINANCIAL STATEMENTS (Continued)****Note 10. Debt*****Short-Term Bank Borrowing***

The Company has a \$5.0 million bank line of credit that expires on September 30, 2003. The line of credit is secured by the Company's operating assets, excluding assets in China. Borrowings bear interest at 2.25% above LIBOR that was 4.13% at December 31, 2001. In subsequent periods the interest rate will vary above LIBOR depending on the company's financial performance compared to a set of performance measures. No amounts were outstanding under this line of credit at December 31, 2001 and 2000.

The credit facility that we have with our bank includes the line of credit, term loans in the amount of \$5.2 million and the letter of credit supporting repayment of our bonds. The credit facility is subject to certain financial covenants regarding current financial ratios and cash flow requirements that have all been met as of December 31, 2001. If we fail to comply with these covenants in the future and are unable to obtain a waiver from our bank, the amounts due under this credit facility would become immediately due and payable. The total amount outstanding under the credit facility at December 31, 2001 was \$14.9 million.

***Long-Term Debt***

The components of long-term debt are summarized below (in thousands):

	<b>December 31,</b>	
	<b>2001</b>	<b>2000</b>
Various notes payable to banks, secured by certain equipment, bearing interest at fixed rates between 7.69% and 8.84%, maturing between February 2001 and May 2003	\$ 916	\$ 2,035
Debenture loan to Bay Area Employment Development Company, guaranteed by the U.S. Small Business Administration, bearing interest at a fixed rate of 7.27%, maturing October 2016	857	888
Taxable revenue bonds, secured by a letter of credit from a bank, bearing interest at the H15 30 day bond yield for commercial paper that was 5.60% on December 31, 2000, maturing December 2023	9,720	10,555
Mortgage notes payable to a bank, secured by property, bearing interest at 150 basis points above the prime rate that was 5.75% on December 31, 2000, maturing May 2003	5,185	6,000
	<u>16,678</u>	<u>19,478</u>
Less current portion	(2,336)	(4,355)
	<u>\$ 14,342</u>	<u>\$ 15,123</u>

Maturities of long-term debt at December 31, 2001 were as follows:

2002	\$ 2,336
2003	1,548
2004	1,277

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2005	1,240
2006	1,238
Thereafter	9,039
	<hr/>
	\$16,678
	<hr/>

**Table of Contents****AXT, INC.****NOTES TO CONSOLIDATED FINANCIAL STATEMENTS (Continued)**

Following the merger with Lyte Optronics in 1999, the Company prepaid Lyte Optronics debt. The prepayment resulted in an extraordinary loss in the amount of \$508,000, net of tax benefits.

**Note 11. Income Taxes**

The components of the provision for income taxes are summarized below (in thousands):

	Years Ended December 31,		
	2001	2000	1999
Current:			
Federal	\$ 1,917	\$ 7,738	\$4,201
State		948	690
Foreign	314	155	247
Total current	2,231	8,841	5,138
Deferred:			
Federal	(3,481)	5,489	(663)
State	(1,560)	648	(95)
Total deferred	(5,041)	6,137	(758)
Total provision from continuing operations before discontinued operations	\$(2,810)	\$ 14,978	\$4,380

A reconciliation of the effective income tax rates and the U.S. statutory federal income tax rate is summarized below:

	Years Ended December 31,		
	2001	2000	1999
Statutory federal income tax rate	(35.0)%	35.0%	34.0%
State income taxes, net of federal tax benefits	(5.0)%	3.3%	4.8%
Foreign sales corporation benefit	0.0%	(1.4)%	(3.0)%
Acquisition costs	0.0%	0.0%	11.0%
Other	4.0%	1.1%	3.4%
Effective tax rate	(36.0)%	38.0%	50.2%

**Table of Contents****AXT, INC.****NOTES TO CONSOLIDATED FINANCIAL STATEMENTS (Continued)**

Deferred tax assets and liabilities are summarized below (in thousands):

	<b>Years Ended December 31,</b>	
	<b>2001</b>	<b>2000</b>
<b>Deferred tax assets:</b>		
Accruals and reserves not yet deductible	\$ 10,151	\$ 8,529
State taxes	(291)	288
Net operating loss		867
Credits	997	165
	<u>\$ 10,857</u>	<u>\$ 9,849</u>
<b>Deferred tax liabilities:</b>		
Unrealized appreciation on Finisar marketable securities	(75)	(1,339)
Gain on receipt of Finisar marketable securities	(3,664)	(9,945)
Unrepatriated Foreign Earnings	(967)	
Depreciation	(3,693)	(2,412)
	<u>\$ (8,399)</u>	<u>\$ (13,696)</u>
<b>Net deferred tax assets (liabilities)</b>	<u>\$ 2,458</u>	<u>\$ (3,847)</u>

At December 31, 2001, the Company had state tax credits of approximately \$997,000 which begins to expire in 2007.

**Note 12. Net Income per Share**

A reconciliation of the numerators and denominators of the basic and diluted net income per share calculations is as follows (in thousands, except per share data):

	<b>Years Ended December 31,</b>		
	<b>2001</b>	<b>2000</b>	<b>1999</b>
<b>Numerator:</b>			
Net income (loss)	\$ (4,996)	\$ 21,610	\$ 172
Less: Preferred stock dividends	(177)		
	<u>\$ (5,173)</u>	<u>\$ 21,610</u>	<u>\$ 172</u>
<b>Denominator:</b>			
Denominator for basic net income per share weighted average common shares	22,278	19,677	18,655
Effect of dilutive securities:			
Common stock options		1,382	1,116

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Denominator for dilutive net income per share	22,278	21,059	19,771
Basic earnings per share	\$ (0.23)	\$ 1.10	\$ 0.01
Diluted earnings per share	\$ (0.23)	\$ 1.03	\$ 0.01
Options excluded from diluted net income per share	2,708	118	415

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**AXT, INC.**

**NOTES TO CONSOLIDATED FINANCIAL STATEMENTS (Continued)**

**Note 13. Stockholders Equity**

In May 1998, the Company completed its initial public offering, and issued 2,875,000 shares of its common stock at \$10.00 per share, including the shares from the underwriters' exercise of the over-allotment option. The Company received cash of approximately \$25.8 million net of underwriting discounts, commissions and IPO expenses. Upon the closing of the IPO, all outstanding shares of the Company's then convertible preferred stock were automatically converted into shares of common stock.

On May 28, 1999, the Company completed its acquisition of Lyte Optronics, Inc. Under the terms of the acquisition, the Company issued approximately 2,023,000 shares of common stock and 883,000 shares of non-voting and non-convertible preferred stock with a 5.0% cumulative annual dividend rate payable when declared by the board of directors of the Company and \$4 per share liquidation preference over common stock, in exchange for all of the issued and outstanding shares of capital stock of Lyte.

On July 25, 2000 the Company completed a private securities offering, raising approximately \$8.5 million in exchange for 234,115 shares of common stock.

On September 19, 2000, the Company sold pursuant to an underwritten public offering, 2,510,000 shares of its common stock at a price of \$34.25 per share, including the shares from the underwriters' exercise of the over-allotment option. The Company received cash of approximately \$80.8 million net of underwriting discounts, commissions and expenses. Following the public offering, proceeds were used to repay its line of credit and for general corporate purposes.

**Note 14. Employee Benefit Plans**

***Stock Option Plans***

In 1993, the Company adopted the 1993 Stock Option Plan ( 1993 Plan ) which provides for granting of incentive and non-qualified stock options to employees and directors of the Company. Under the 1993 Plan, 880,000 shares of common stock have been reserved for issuance as of December 31, 1998. Options granted under the 1993 Plan are generally for periods not to exceed ten years and are granted at the fair market value of the stock at the date of grant as determined by the board of directors. Options granted under the 1993 Plan generally vest 25.0% upon grant and 25.0% each year thereafter, with full vesting occurring on the third anniversary of the grant date.

In May 1997, the Company adopted the 1997 Stock Option Plan ( 1997 Plan ) which provides for granting of incentive and non-qualified stock options to employees and directors of the Company. Under the 1997 Plan, 5,899,939 shares of common stock have been reserved for issuance as of December 31, 2001. Options granted under the 1997 Plan are generally for periods not to exceed ten years (five years if the option is granted to a 10.0% stockholder) and are granted at the fair market value of the stock at the date of grant as determined by the board of directors. Options granted under the 1997 Plan generally vest 25.0% at the end of one year and 2.1% each month thereafter, with full vesting after four years. Some Options issued under this plan during 2001 have vesting schedules that began on January 31, 2002 and conclude in 2006.

**Table of Contents****AXT, INC.****NOTES TO CONSOLIDATED FINANCIAL STATEMENTS (Continued)**

The following summarizes the Company's stock option activity under the 1993 Plan and the 1997 Plan, and related weighted average exercise price within each category for each of the years ended December 31, 1999, 2000, and 2001:

	<b>Options Outstanding</b>			
	<b>Options Available For Grant</b>	<b>Number of Shares</b>	<b>Exercise Price per Share</b>	<b>Weighted Average Exercise Price per Share</b>
Balance at December 31, 1998	1,711,488	1,531,076		\$ 5.44
Additional shares authorized	1,000,000			
Granted	(1,504,350)	1,504,350	\$ 9.12 - 24.96	18.21
Exercised		(200,679)	1.20 - 8.25	4.64
Cancelled	154,645	(154,645)	\$ 1.90 - 22.69	13.82
Balance at December 31, 1999	1,361,783	2,680,102		\$ 12.18
Additional shares authorized	2,101,501			
Granted	(1,202,550)	1,202,550	15.06 - 47.00	30.21
Exercised		(711,259)	0.20 - 22.69	8.49
Cancelled	677,427	(677,427)	\$ 1.90 - 47.00	17.29
Balance at December 31, 2000	2,938,161	2,493,966		\$ 20.46
Additional shares authorized				
Granted	(1,693,070)	1,693,070	10.30 - 43.88	16.71
Exercised		(388,617)	5.00 - 39.00	9.94
Cancelled	478,696	(478,696)	\$ 5.00 - 44.25	22.14
Balance at December 31, 2001	1,723,787	3,319,723		\$ 19.63

Information about stock options outstanding at December 31, 2001 is summarized below:

<b>Options Outstanding</b>			<b>Options Exercisable</b>	
<b>Range of Exercise Prices</b>	<b>Number Outstanding</b>	<b>Weighted Average Remaining Contractual Life</b>	<b>Number Outstanding</b>	<b>Weighted Average Exercise Price</b>
\$ 5.00 - 9.13	378,666	6.25	284,146	\$ 6.24
10.04 - 12.10	68,000	8.36	14,583	10.04
12.12 - 12.12	554,220	9.85		
12.38 - 14.89	693,980	9.24	6,100	13.40
15.00 - 21.19	438,636	8.29	124,443	19.05
21.25 - 26.00	379,438	8.23	56,111	23.66
26.04 - 31.63	333,683	8.71	25,668	30.33
31.88 - 38.94	334,350	8.76	53,970	34.86
39.13 - 43.88	138,250	8.86	23,853	41.12

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\$44.38 - 44.38	<u>500</u>	<u>8.13</u>	<u>229</u>	<u>44.38</u>
	<u>3,319,723</u>	<u>8.63</u>	<u>589,103</u>	<u>\$ 15.87</u>



**Table of Contents****AXT, INC.****NOTES TO CONSOLIDATED FINANCIAL STATEMENTS (Continued)*****Stock-Based Compensation Under APB No. 25***

In connection with certain stock option grants, the Company recorded deferred compensation costs totaling \$203,000 for the year ended December 31, 1998 and \$322,000 for the year ended December 31, 1997. Compensation cost is the difference between the exercise price and the deemed fair value at the date of grant. Compensation cost is being amortized over the vesting period relating to these options, of which approximately \$107,000 was amortized for the year ended December 31, 2001, \$110,000 for 2000 and \$110,000 for 1999.

***Certain Pro Forma Disclosures***

Pro forma information regarding net income and net income per share is required by SFAS No. 123, which also requires that information be determined as if the Company had accounted for its employee stock options granted under the fair value method. The fair value for these options was estimated using the Black-Scholes option pricing model.

The Company calculated the fair value of each option grant on the date of grant using the Black-Scholes option pricing model as prescribed by SFAS No. 123 using the following assumptions:

	Years Ended December 31,		
	2001	2000	1999
Risk free interest rate	3.9%	5.8%	5.6%
Expected life (in years)	5.0	5.0	5.0
Dividend yield	0.0%	0.0%	0.0%
Volatility	104.0%	124.0%	96.0%

The weighted average grant-date fair value of options granted during the year ended December 31, 2001 was \$12.97, \$25.73 in 2000 and \$13.09 in 1999.

Had compensation cost for the Company's options been determined based on the fair value at the grant dates, as prescribed in SFAS 123, the Company's pro forma net income and net income per share would have been as summarized below (in thousands except per share data):

	Years Ended December 31,		
	2001	2000	1999
Net income (loss):			
As reported	\$ (4,996)	\$ 21,610	\$ 172
Pro forma net income	(12,042)	16,417	(2,747)
Net income (loss) per share:			
As reported:			
Basic	\$ (0.23)	\$ 1.10	\$ 0.01
Diluted	(0.23)	1.03	0.01
Pro forma net income (loss):			
Basic	\$ (0.54)	\$ 0.83	\$ (0.15)
Diluted	(0.54)	0.78	(0.15)

Because additional option grants are expected to be made each year, the above pro forma disclosures are not representative of pro forma effects on reported net income for future years.

***Employee Stock Purchase Plan***

In February 1998, the Company's board of directors approved the 1998 Employee Stock Purchase Plan (the 1998 Purchase Plan). The Company's stockholders approved the 1998 Purchase Plan in March 1998.

**Table of Contents****AXT, INC.****NOTES TO CONSOLIDATED FINANCIAL STATEMENTS (Continued)**

At December 31, 2001 a total of 900,000 shares of the Company's common stock were reserved for issuance under the 1998 Purchase Plan. A total of 191,000 shares were purchased as of December 31, 2001. The 1998 Purchase Plan permits eligible employees to acquire shares of the Company's common stock through payroll deductions. The common stock purchase price is determined as 85.0% of the lower of the market price of the common stock at the purchase date or the date of offer to the employee.

**Retirement Savings Plan**

The Company has a 401(k) Savings Plan (the Savings Plan) which qualifies as a thrift plan under Section 401(k) of the Internal Revenue Code. All full-time U.S. employees are eligible to participate in the Savings Plan after 90 days from the date of hire. Participants may contribute up to 10.0% of their earnings to the Savings Plan with a discretionary matching amount provided by the Company. The Company's contributions to the Savings Plan were \$456,000 for the year ended December 31, 2001, \$236,000 for 2000 and \$146,000 for 1999. Employees are provided with several investment options, none of which is a direct investment in AXT stock.

**Note 15. Segment and Foreign Operations Information**

The Company has three reportable segments: substrates, visible emitters and discontinued consumer products. The segments in which the Company operates are subject to rapid technological change and significant competition. Also, the number of suppliers of certain materials used by the Company and the number of customers are limited.

Selected financial information by business segment is summarized below (in thousands):

	Years Ended December 31,		
	2001	2000	1999
<b>Substrates Division</b>			
Net revenues from external customers	\$ 108,800	\$ 113,374	\$ 56,732
Gross profit	41,306	52,013	23,286
Operating income	20,222	34,087	12,275
Identifiable assets	194,243	215,527	88,579
<b>Visible Emitter Division</b>			
Net revenues from external customers	\$ 10,730	\$ 8,129	\$ 18,640
Gross profit (loss)*	(3,967)	(4,194)	2,060
Operating income (loss)*	(12,574)	(19,487)	(2,779)
Identifiable assets	41,017	33,181	23,423
<b>Discontinued Consumer Products Division</b>			
Identifiable assets	\$	\$ 1,512	\$ 3,760
<b>Total</b>			
Net revenues from external customers	\$ 119,530	\$ 121,503	\$ 75,372
Gross profit	37,339	47,819	25,346
Operating income	7,648	14,600	9,496
Identifiable assets	235,260	250,220	115,762

\* Includes restructuring charge of \$1.8 million in gross profit and \$8.2 million in operating loss in 2000.

**Table of Contents****AXT, INC.****NOTES TO CONSOLIDATED FINANCIAL STATEMENTS (Continued)**

The Company sells its substrates in the United States and in other parts of the world. Also, the Company has operations in Japan and China. Revenues by geographic location based on the country of the customer were as follows (in thousands):

	Years Ended December 31,		
	2001	2000	1999
Net revenues:			
United States	\$ 59,300	\$ 62,905	\$36,497
Europe	22,008	12,743	8,175
Canada	6,679	6,661	2,221
Taiwan	12,975	13,610	
Japan	8,473	10,934	5,426
Asia Pacific	10,094	14,650	23,053
	<hr/>	<hr/>	<hr/>
Consolidated	\$ 119,529	\$ 121,503	\$75,372
	<hr/>	<hr/>	<hr/>

Property, plant and equipment by geographic location is summarized below (in thousands):

	Years Ended December 31,	
	2001	2000
Property, plant and equipment, net:		
United States	\$67,978	\$58,022
China	14,595	5,379
	<hr/>	<hr/>
	\$82,573	\$63,401
	<hr/>	<hr/>

**Note 16. Related Party Transactions**

Equipment & Materials, a California corporation engaged in international trading and quartzware fabrication, supplies us with various raw materials from China and has manufactured quartzware for us. Christina X. Li, the sole shareholder and president of Equipment & Materials, is the wife of Davis Zhang, the president of our substrate division. Purchases from Equipment & Materials were approximately \$4.7 million for the year ended December 31, 2001, \$8.9 million for 2000 and \$3.6 million for 1999. There was no balance due to Equipment & Materials at December 31, 2001.

4160 Business Center, LLC, a real estate holding company, leases us a 24,100 sq. ft. warehouse in Fremont, California. Davis Zhang, the president of our substrate division, is the sole shareholder of 4160 Business Center, LLC. Lease payments to 4160 Business Center, LLC were approximately \$188,000 for the year ended December 31, 2001.

**Note 17. Commitments and Contingencies**

From time to time the Company is involved in litigation in the normal course of business. Management believes that the outcome of matters to date will not have a material adverse effect on the Company's financial position or results of operations.

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On May 1, 2001, the Santa Clara Center for Occupational Safety and Health filed a complaint for injunctive relief and civil penalties against AXT in the Superior Court of California, County of Alameda, Hayward Division, Case No. H218237-5. The Complaint alleges violations of California Business and Professions Code section 17200 et seq., and Health and Safety Code section 25249 et seq. as a result of AXT's use of arsenic and inorganic arsenic compounds in its workplace. We believe that we have meritorious defenses against the alleged claims, and intend to defend ourselves vigorously. However, due to the nature of litigation

**Table of Contents****AXT, INC.****NOTES TO CONSOLIDATED FINANCIAL STATEMENTS (Continued)**

and fact that the case is still in its early stages, we cannot determine the possible loss, if any, that may ultimately be incurred either in the context of a trial or as a result of a negotiated settlement. We may also incur substantial legal fees in this matter. However, we do not believe that this action is likely to have a material adverse effect on our business, financial condition or results of operation.

The Company has entered into contracts to supply several large customers with GaAs wafers. The contracts guarantee the delivery of a certain number of wafers between January 1, 2001 and December 31, 2002 with a current contract value of \$25.2 million. The contract sales prices are subject to review quarterly and can be adjusted in the event that raw material prices change. In the event of non-delivery of the determined wafer quantities in any monthly delivery period, the Company could be subject to non-performance penalties of between 5% and 10% of the value of the delinquent monthly deliveries. Partial prepayments received for these supply contracts totaling \$6.5 million are included in accrued liabilities at December 31, 2001. As of December 31, 2001 the Company has met all of its delivery obligations under these contracts.

The Company leases certain office space, manufacturing facilities and property and equipment under long-term operating leases expiring at various dates through December 2006. Total rent expense under these operating leases was approximately \$779,000 for the year ended December 31, 2001.

Included in property, plant and equipment is equipment that is leased under non-cancelable leases accounted for as capital leases. These leases were approximately \$14 million at December 31, 2001 and \$13 million at December 31, 2000. These leases expire at various dates through 2006.

Total minimum lease payments under the above leases as of December 31, 2001, are summarized below (in thousands):

	<b>Capital Leases</b>	<b>Operating Leases</b>	<b>Total</b>
	_____	_____	_____
2002	\$ 5,369	\$ 991	\$ 6,360
2003	5,267	906	6,173
2004	3,307	855	4,162
2005	1,908	591	2,499
2006	550	220	770
Thereafter			
	_____	_____	_____
	\$ 16,401	\$ 3,563	\$ 19,964
	_____	_____	_____
Less amounts representing interest at 5.6% to 8.8%	(2,027)		
	_____		
	14,374		
Less short-term portion	(4,372)		
	_____		
Long-term portion	\$ 10,002		
	_____		

**Note 18. Foreign Exchange Contracts and Transaction Losses**

The Company uses short-term forward exchange contracts for hedging purposes to reduce the effects of adverse foreign exchange rate movements. The Company has purchased foreign exchange contracts to hedge against certain trade accounts receivable denominated in Japanese yen. The change in the fair value of the forward contracts is recognized as part of the related foreign currency transactions as they occur. As of December 31, 2001, the Company's outstanding commitments with respect to the foreign exchange contracts, which were commitments to sell Japanese yen, had a total contract value of approximately \$1.5 million.

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The Company incurred a foreign transaction exchange loss of \$357,000 for the year ended December 31, 2001, a loss of \$552,000 in 2000 and a gain of \$652,000 in 1999.

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Pursuant to the requirements of Section 13 or 15(d) of the Securities Exchange Act of 1934, the registrant has caused this report to be signed on its behalf by the undersigned, thereto duly authorized.

AXT, INC.

By: /s/ MORRIS S. YOUNG

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Morris S. Young,  
*Chief Executive Officer and President*

Date: March 26, 2002

**POWER OF ATTORNEY**

KNOW ALL PERSONS BY THESE PRESENTS, that each person whose signature appears below hereby constitutes and appoints Morris S. Young and Donald L. Tatzin, and each of them, his true and lawful attorney-in-fact and agent, with full power of substitution, each with power to act alone, to sign and execute on behalf of the undersigned any and all amendments to this Report on Form 10-K, and to perform any acts necessary in order to file the same, with all exhibits thereto and other documents in connection therewith with the Securities and Exchange Commission, granting unto said attorney-in-fact and agent full power and authority to do and perform each and every act and thing requested and necessary to be done in connection therewith, as fully to all intents and purposes as he might or could do in person, hereby ratifying and confirming all that said attorney-in-fact and agent, or their or his or her substitutes, shall do or cause to be done by virtue hereof.

Pursuant to the requirements of the Securities Exchange Act of 1934, this report has been signed below by the following persons on behalf of the registrant and in the capacities and on the dates indicated.

Signature	Title	Date
/s/ MORRIS S. YOUNG _____ Morris S. Young	President, Chief Executive Officer and Chairman of the Board	March 26, 2002
/s/ DONALD L. TATZIN _____ Donald L. Tatzin	Senior Vice President, Chief Financial Officer	March 26, 2002
/s/ JOHN E. DRURY _____ John E. Drury	Corporate Controller	March 26, 2002
/s/ DAVID C. CHANG _____ David C. Chang	Director	March 26, 2002
/s/ JESSE CHEN _____ Jesse Chen	Director	March 26, 2002
/s/ B.J. MOORE _____ B.J. Moore	Director	March 26, 2002



**Table of Contents****AXT, Inc.****EXHIBITS TO FORM 10-K ANNUAL REPORT****For the Year Ended December 31, 2001**

Exhibit Number	Description
2.1(1)	Agreement and Plan of Merger between American Xtal Technology, a California corporation, and American Xtal Technology Delaware Corporation, a Delaware corporation.
2.2(4)	Agreement and Plan of Reorganization dated May 27, 1999 (which is incorporated herein by reference to Exhibit 2.1 to the registrant's form 8-K dated May 28, 1999).
2.3(4)	Certificate of Merger dated May 27, 1999, filed with the Secretary of State of the State of Delaware on May 28, 1999 (which is incorporated herein by reference to Exhibit 2.1 to the registrant's form 8-K dated May 28, 1999).
2.4(4)	Articles of Merger dated May 27, 1999, filed with the Secretary of State of Nevada on May 28, 1999 (which is incorporated herein by reference to Exhibit 2.1 to the registrant's form 8-K dated May 28, 1999).
2.5(4)	Agreement and Plan of Reorganization by and among American XTAL Technology, Inc., Monterey Acquisition Corp., Lyte Optronics, Inc. and certain stockholders of Lyte Optronics, Inc. dated May 27, 1999
3.1(3)	Restated Certificate of Incorporation
3.2(4)	Certificate of Designation, Preferences and Rights of Series A Preferred Stock, as filed with the Secretary of State of the state of Delaware on May 27, 1999 (which is incorporated herein by reference to Exhibit 2.1 to the registrant's form 8-K dated May 28, 1999).
3.3(4)	By Laws
4.1(4)	Rights Agreement
4.2(5)	Rights Agreement
10.1(1)	Form of Indemnification Agreement for directors and officers.
10.2(1)	1993 Stock Option Plan and forms of agreements thereunder.
10.3(1)	1997 Stock Option Plan and forms of agreements thereunder.
10.4(1)	1997 Employee Stock Purchase Plan and forms of agreements thereunder.
10.5(1)	1998 Employee Stock Purchase Plan and forms of agreements thereunder.
10.6(1)	Loan Agreement between U.S. Bank National Association and us dated March 4, 1998.
10.7(2)	Purchase and Sale Agreement by and between Limar Realty Corp. #23 and us dated April 1998.
10.8(3)	Loan Agreement between U.S. Bank National Association and us dated September 18, 1998
10.9(3)	Letter of Credit and Reimbursement Agreement between U.S. Bank National Association and us dated December 1, 1998.
10.10(3)	Bond Purchase Contract between Dain Rauscher Incorporated and us dated December 1, 1998.
10.11(3)	Remarketing Agreement between Dain Rauscher Incorporated and us dated December 1, 1998.
10.12(6)	Loan Agreement between U.S. Bank National Association and us dated August 28, 2000.
10.13	Modification to Loan Agreement between U.S. Bank National Association and us dated December 31, 2001.
21.1(1)	List of Subsidiaries.
24.1	Power of Attorney (see signature page).

(1) As filed with the SEC in our Registration Statement on Form S-1 on March 17, 1998.

(2) As filed with the SEC in our Registration Statement on Amendment No. 2 to Form S-1 on May 11, 1998.

(3) As filed with the SEC in our Annual Report on Form 10-K for the year ended December 31, 1998

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- (4) As filed with the SEC in our Form 8-K on June 14, 1999
- (5) As filed with the SEC in our Form 8-K on May 30, 2001
- (6) As filed with the SEC in our Annual Report on Form 10-K for the year ended December 31, 2000

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