

ADVANCED ENERGY INDUSTRIES INC

FORM 10-K (Annual Report)

Filed 3/25/2002 For Period Ending 12/31/2001

| | |
|-------------|---|
| Address | 1625 SHARP POINT DR FT COLLINS, Colorado 80525 |
| Telephone | 970-221-4670 |
| CIK | 0000927003 |
| Industry | Electronic Instr. & Controls |
| Sector | Technology |
| Fiscal Year | 12/31 |

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 (FEE REQUIRED).

For the fiscal year ended December 31, 2001.

☐ TRANSITION REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934 (NO FEE REQUIRED).

For the transition period from _____ to _____.

Commission file number: 000-26966

ADVANCED ENERGY INDUSTRIES, INC.

(Exact name of registrant as specified in its charter)

DELAWARE

(State or other jurisdiction of
incorporation or organization)

84-0846841

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

1625 SHARP POINT DRIVE, FORT COLLINS, CO
(Address of principal executive offices)

80525
(Zip Code)

Registrant's telephone number, including area code: (970) 221-4670

Securities registered pursuant to Section 12(b) of the Act:

NONE

Securities registered pursuant to section 12(g) of the Act:

COMMON STOCK, \$0.001 PAR VALUE

(Title of Class)

Indicate by check mark 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 check mark if disclosure of delinquent filers pursuant to Item 405 of Regulation S-K (Section 229.405 of this chapter) 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 | |.

As of March 18, 2002, there were 31,892,670 shares of the Registrant's Common Stock outstanding and the aggregate market value of such stock held by non-affiliates of the Registrant was \$644,805,530.

DOCUMENTS INCORPORATED BY REFERENCE

Portions of the Company's definitive proxy statement for the annual meeting of stockholders to be held on May 8, 2002 are incorporated by reference into Part III of this Form 10-K.

ADVANCED ENERGY INDUSTRIES, INC.
FORM 10-K
TABLE OF CONTENTS

| | | |
|-----------|--|----|
| PART I | | |
| ITEM 1. | BUSINESS | 4 |
| | EXECUTIVE OFFICERS OF THE REGISTRANT | 31 |
| ITEM 2. | PROPERTIES | 33 |
| ITEM 3. | LEGAL PROCEEDINGS | 33 |
| ITEM 4. | SUBMISSION OF MATTERS TO A VOTE OF SECURITY HOLDERS | 34 |
| PART II | | |
| ITEM 5. | MARKET PRICE FOR REGISTRANT'S COMMON STOCK AND RELATED STOCKHOLDER MATTERS | 35 |
| ITEM 6. | SELECTED CONSOLIDATED FINANCIAL DATA | 36 |
| ITEM 7. | MANAGEMENT'S DISCUSSION AND ANALYSIS OF FINANCIAL CONDITION AND RESULTS OF OPERATIONS | 37 |
| ITEM 7.A. | QUANTITATIVE AND QUALITATIVE DISCLOSURES ABOUT MARKET RISK | 54 |
| ITEM 8. | FINANCIAL STATEMENTS AND SUPPLEMENTARY DATA | 56 |
| ITEM 9. | DISAGREEMENTS ON ACCOUNTING AND FINANCIAL DISCLOSURES | 84 |
| PART III | | |
| ITEM 10. | DIRECTORS AND EXECUTIVE OFFICERS OF THE REGISTRANT | 85 |
| ITEM 11. | EXECUTIVE COMPENSATION | 85 |
| ITEM 12. | SECURITY OWNERSHIP OF CERTAIN BENEFICIAL OWNERS AND MANAGEMENT | 85 |
| ITEM 13. | CERTAIN RELATIONSHIPS AND RELATED TRANSACTIONS | 85 |
| PART IV | | |
| ITEM 14. | EXHIBITS, FINANCIAL STATEMENT SCHEDULES AND REPORTS ON FORM 8-K | 86 |

PART I

ITEM 1. BUSINESS

GENERAL

We design, manufacture and support a group of key subsystems for vacuum process systems. Our customers use our products in plasma-based thin-film processing equipment that is essential to the manufacture of semiconductors; compact disks, DVDs and other digital storage media; flat-panel computer and television screens; coatings for architectural glass and optics; and a power supply for advanced technology computer workstations.

Our direct current (DC) and radio frequency (RF) power systems refine, modify and control the raw electrical power from a utility and convert it into power that is uniform and predictable. This allows manufacturing equipment to produce and deposit very thin films at an even thickness on a mass scale. Moreover, through our acquisitions of Engineering Measurements Company in January 2001 and Aera Japan Ltd. in January 2002, which provide gas flow products, and Noah Holdings, Inc. in April 2000 and Sekidenko, Inc. in August 2000, which provide thermal control and measurement products, we are a company that can provide best of breed components and systems that bring together technologies that provide our customers increased precision and productivity.

We market and sell our systems primarily to large, original equipment manufacturers (OEMs) of semiconductor, flat panel display, data storage and other industrial thin film manufacturing equipment. We have sold our systems worldwide to more than 100 OEMs and directly to more than 500 end-users. Our principal customers include Applied Materials, Inc., Axcelis Technologies, Inc., Lam Research Corporation, Novellus Systems, Inc., ULVAC Technologies, Inc. and The Unaxis Corporation. Sales to customers in the semiconductor capital equipment industry comprised 59% of our sales in 2001, 70% in 2000 and 65% in 1999. We sell our systems primarily through direct sales personnel to customers in the United States, Europe and Asia, and through distributors in various regions outside the United States. International sales represented 36% of our sales in 2001, 28% in 2000 and 27% in 1999.

DEVELOPMENT OF COMPANY BUSINESS

We incorporated in Colorado in 1981 and reincorporated in Delaware in 1995. In 1995 we effected the initial public offering of our Common Stock. Unless the context otherwise requires, as used in this Form 10-K, references to "Advanced Energy" refer to Advanced Energy Industries, Inc. and references to "we", "us", or "our" refer to Advanced Energy and its consolidated subsidiaries. Our executive offices are located at 1625 Sharp Point Drive, Fort Collins, Colorado 80525, and our telephone number is 970-221-4670.

PRODUCTS

Our switchmode power conversion and control systems have advanced features, which have enabled our customers to develop new plasma-based processing applications. In 1982 we introduced our first low-frequency switchmode power conversion and control system specifically designed for use in plasma processes. In 1983, we introduced our first direct current (DC) system designed for use in physical vapor deposition (PVD) applications. This DC system is a compact, cost-effective power solution, which greatly reduces stored energy, a major limitation in PVD systems. We introduced a family of accessories for the DC product line in 1993. These pulsed DC products provided major improvements in arc prevention and suppression. We are currently extending the power range of our systems to much higher power levels to enable them to supply products for advanced product applications. We carried this technology further in 1995 when we introduced the Pinnacle series of DC systems, which we updated in 1997 with the Pinnacle-II.

In 1989, we introduced our radio frequency (RF) power delivery systems, including power generators and automatic matching networks that are used to match the impedance of the plasma to the RF generators. In 1991, we introduced the first switchmode RF power conversion and control systems, the RFG / RFX II series, for use in semiconductor etch applications. This product line achieved significant design wins because of its smaller size and its ability to provide more precise control. In 1998, we developed the APEX series of RF generators and Navigator digital match networks, using new technology to further reduce size, more precisely control power delivery and extend the power range of our RF product line.

The acquisition of RF Power Products in 1998 expanded our product line of RF generators and matching networks, so that we now offer solid state generators and matching networks for power requirements up to 10kW and frequencies into the high VHF range. We sell these primarily to capital equipment manufacturers in the semiconductor equipment, flat panel display, thin film and analytical equipment markets. Our RF generators and matching networks have average selling prices similar to our DC products.

The acquisition of Noah Holdings, Inc. in 2000 expanded our product offerings to include solid-state temperature control systems for use in controlling temperatures during semiconductor manufacturing. The acquisition of Sekidenko, Inc. in 2000 expanded our product offerings to include optical fiber temperature measurement and control systems. The acquisition of EMCO in 2001 expanded our product offerings to include electronic and electromechanical precision instruments for measuring and controlling the flow of liquids, steam and gases. Subsequently, the acquisition of Aera in January 2002 expanded our product offerings to include mass flow gas controllers.

We use ion source technology for products that produce a beam of ions for surface modification and other ion beam processes. We have developed a sophisticated pulsing power supply specifically for electroplating processes on semiconductor wafers.

In collaboration with a major microprocessor manufacturer we have developed the Ikor product group of DC-DC converters specifically designed to power the new low voltage, high current microprocessors, application-specific integrated circuits (ASICs), logic and memory chips.

The following chart sets forth our principal products and related information:

| | PRODUCT DESCRIPTION | POWER/CURRENT LEVEL | MAJOR PROCESS APPLICATIONS |
|--|---|------------------------|--|
| DIRECT CURRENT AND LOW FREQUENCY PRODUCTS | Power control and conversion system | 500W - 200kW | CVD PVD -Reactive sputtering -Metal sputtering -Dual magnetron Electroplating Wafer handling |
| | | | |
| RADIO FREQUENCY PRODUCTS | Power control and conversion system | 500W - 10kW | Etch CVD |
| | Metrology | 50W - 10kW | Diagnostic/control |
| FLOW PRODUCTS | Hydro and ultrasonic flow meters | N/A | Flow measurement Non-invasive measurement |
| | Mass flow controllers | N/A | Semiconductor processes Fiber optics CVD CMP |
| TEMPERATURE CONTROL PRODUCTS | Dynamic point-of-use and static thermoelectric chillers | 1.5kW - 4.25kW | Etch Strip Track |
| | Non-contact optical fiber thermometry | N/A | RTP CVD Strip |
| SOURCES PRODUCTS | Closed drift | 1kW - 10kW | PVD Cleaning Surface modification |
| | Inductively coupled plasma source | 1kW - 10kW | Chamber cleaning Abatement |
| IKOR (NPSA) PRODUCTS | Low voltage/high current power conversion | <1kW | Powering of next generation microprocessors and ASICs |

DIRECT CURRENT PRODUCTS

The MDX Series. We introduced our MDX series of products in 1983. These products are most commonly used as DC power supplies for PVD sputtering where precise control, superior arc prevention and suppression and low stored energy characteristics are required. They are also used as bias supplies for RF sputtering, tool coating and some etching systems. The MDX series consists of six different product lines that provide a range of power levels from 500W to 120kW. Our second-generation product, the MDX II, was introduced in 1991 to support higher power levels, to provide wider output range,

and to meet strict European regulatory requirements. A model in the MDX series, the MDX-L, was designed for especially high reliability and was introduced in 1992.

The Pinnacle(TM) Platform. The Pinnacle platform, which we introduced in 1995, and updated with Pinnacle(TM) -II, in 1997, is the most recent general-purpose platform in the DC product line. We developed the Pinnacle primarily for use in DC PVD sputtering processes, and it provides substantial improvements in arc prevention, arc suppression capability, reduced size, higher precision and expanded control capability. The low stored energy of Pinnacle, a basic feature of our DC power conversion equipment, is due to the patented basic circuit topology.

The Pinnacle(TM) Plus Platform. This platform, introduced in 1999, is a pulsed DC power system designed principally for use in reactive sputtering to produce insulating films. It is capable of producing up to 10kW of power in short pulses at frequencies up to 350kHz, for virtual elimination of arcing in difficult processes.

Sparc-le(R) Accessories. Our Sparc-le line of DC accessories, first introduced in 1993 and updated several times since, is designed both to reduce the number of arcs that occur in plasma-based processes and to reduce the energy delivered if arcs do occur. The Sparc-le accessories are especially effective in applications involving the deposition of insulating materials where the reaction between the plasma and target is likely to produce more severe arc conditions. The Sparc-le accessories are most commonly used with the MDX product lines.

Electrostatic Chuck Power Systems. We designed this system of power conversion units for a specific customer for use in wafer handling systems for the semiconductor fabrication market. The electrostatic chuck is a device that uses electric fields to hold or "chuck" a wafer in a vacuum environment without mechanical holding force. This permits more gentle handling of the wafer and simultaneous heating or cooling of the wafer during processing. When our power system applies voltage to the wafer, electric fields are created which hold the wafer in position. Exact control and careful ramping of the voltage permits the wafer to be picked and placed with precision. The system permits multiple power units to be held in a single chassis for ease of integration into the customer's system.

Astral(TM) Products. The Astral products, made in 20kW, 120kW and 200kW versions, offer a new technology, called "current pulsed dual magnetron sputtering." These units are used for development of coatings for CRT and flat panel displays, automotive applications and new types of glass coatings.

Crystal(TM). The Crystal 180kW power conversion unit was developed for use in industrial PVD applications such as architectural glass coating, but is also useful in PECVD (Plasma Enhanced Chemical Vapor Deposition). The latter may be used for deposition of oxygen- and water-vapor-barrier coatings on films used in food packaging.

In PVD the unit is typically used as a powering source for a pair of magnetron sputtering sources in the "dual" configuration in a reactive sputtering system.

The PE Series. We introduced the PE low frequency power systems in 1982. The PE series systems are air cooled and primarily intended for use in certain PVD, chemical vapor deposition (CVD) and industrial surface modification applications, including dual cathode sputtering and printed circuit board de-smearing. The PE series systems range in frequency from 25kHz to 100kHz. The PE-II systems are water cooled and produce 10kW at 40kHz.

The ID Series. The ID power conversion and control systems, introduced in 1981, were the first products we designed. These systems were specifically designed to power broad-beam ion sources. ID series systems are composed of a coordinated set of multiple special purpose power supplies that are used for ion-beam deposition and sputtering, implantation, etching and milling.

The E'Wave(TM). The E'Wave is designed for the semiconductor industry for electroplating copper onto a wafer. The power supply can produce up to four channels of multi-step, bipolar, square waveforms, which permit the copper to be alternatively plated and etched in precisely controlled ways, in order to fill very small cavities on the wafer surface. Each channel can produce 400W continuous and up to 2kW peak, for a total supply output of 1.6kW continuous and 8kW peak.

RADIO FREQUENCY PRODUCTS

RF POWER GENERATORS

LF (low frequency) Generators. The LF-5 is a 500W unit and the LF-10 is a 1kW unit. Both of these units are variable-frequency, microprocessor-controlled systems. With a frequency range extending from 50kHz to 460kHz, these generators are a good complement to the PD and PE series.

PDX Series. The PDX series of mid-frequency power conversion and control systems, introduced in 1990, represented significant technological advancements by applying cost effective, single conversion, switchmode techniques to higher frequencies. Depending upon power levels and application, they are available as air or water cooled generators and are used primarily in semiconductor etch and CVD applications. Unlike the LF series, which is frequency agile, the PDX platform products are supplied at discrete frequencies from 275kHz to 400kHz. Some versions provide pulsed operation.

HFV Series. Three versions of the HFV generator produce 3, 5, or 8kW of power at a variable frequency centered at about 2MHz for powering inductively coupled plasma (ICP) systems through a fixed element matching network. This platform is water cooled and ultra compact, providing up to 8kW of power in a 5-1/4 inch rack mount enclosure 20-1/4 inches deep.

The RFG Series. The RFG and RFXII, introduced in the early 1990s, are water-cooled, full switchmode RF power conversion generators making extensive use of custom hybrid technologies. Versions of the RFG, targeted at OEM installations, and the full-featured microprocessor controlled RFXII, are currently available at frequencies of 4MHz and 13.56MHz, and in power levels up to 5 kW. They are extensively used in semiconductor processes, including CVD, RF sputtering, plasma etching/deposition and reactive ion etching.

Apex Series. During 1998, we developed the Apex series of power control and conversion systems. Featuring extremely high power densities and sophisticated microprocessor control, this product line addresses the latest semiconductor industry trends, associated with 300mm wafer processing, for higher power levels and tighter control. The Apex series is highly configurable for OEM applications and includes models from 1.5kW to 10kW as well as many custom versions, intended for direct tool mounting, which include selectable fixed matches and post-match network RF instrumentation. The instrumentation can be used for plasma, chamber and/or process diagnostics or closed-loop control in conjunction with some of our other integrated system control products.

The RF Series. The RF series products generate power between 500W and 5kW, and are selectively available with frequencies from 2MHz to 40MHz. They use simple, reliable AC transformer front ends and employ linear RF sections, permitting variable frequency and high-speed pulse operation.

The Atlas(TM) Series. The Atlas power systems, introduced in 1998, combine the advantages of a modernized version of the linear RF sections of the RF series with a switchmode AC front end. These systems currently range in power up to 4kW and are targeted at applications requiring agile frequency control in the HF range or fixed frequency VHF operation up to 200MHz. These units complement the Apex series of fixed frequency, high efficiency HF range generators. Our customers can choose to have either the compact package of the fixed frequency Apex or, where required, the frequency agility or VHF capability of the Atlas systems.

RF MATCHING NETWORKS

Analog Control Matching Networks. The AZX, AM and Mercury series, impedance matching networks represent several generations of auto match networks. These match networks are designed as accessories to match the complex electrical impedance of the plasma to the 50-Ohm-output impedance of the generators, to permit maximum power transfer. These networks, utilizing servo motor driven, ceramic envelope, variable vacuum capacitors, are designed for specific impedance ranges, and some models handle input powers up to 30kW. Different mechanical packages and various servo control schemes are employed in the different series, supporting a wide variety of applications.

Fixed and no-moving-part Variable Match Networks. We pioneered the use of fixed element and/or electronically variable element matches for use in load power regulated and frequency agile RF power delivery systems. In the early 1990s, we introduced the RFG 2K2V and Multi-function Adapter with fixed-element matching networks for use in a chamber-mount dielectric CVD system. This system provides significant cost savings and performance enhancements. In 1998, we introduced FTMS (Frequency Transformation Matching System), which is a solid state variable matching network with no moving parts. Used with the Atlas series of generators in a frequency-agile, tuned poly-etch system, this delivery system provides a wide impedance matching range, yet requires no servo controls or moving parts. We use this system in conjunction with our frequency-agile Atlas generators. The extension of this technology continues and is reflected in the incorporation of selectable fixed matches within custom Apex generator packages.

Microprocessor Controlled Matching Networks. The most recent matching network platform we introduced is the Navigator series. This platform is highly modular and employs direct-coupled, microprocessor-controlled stepper motors to drive variable vacuum capacitors. This platform makes provisions for pre- and post-match RF parameter measurements. The microprocessor control enables sophisticated control algorithms to handle tough plasma matching applications that would be impossible with analog control schemes. The provision for post-match RF instrumentation (Navigator Z variations), within the controlled environment at the input to the chamber, has significant potential for improved processes through closed-loop control. Navigator series matching networks are being well received by OEMs for use in their next generation tools.

RF INSTRUMENTATION

Z-Scan(TM) Voltage-Current (V-I) Probe. This unit, first delivered in 1998, replaces the RFZ impedance probe we introduced in 1993. Z-Scan measures the RF properties of a plasma process and provides condensed information through its Z-Ware software. The sensing technology incorporated in the Z-Scan probe allows accurate, real-time measurement of power, voltage, current and impedance levels at both fundamental and harmonic frequencies, under actual powered process conditions. Such measurements not only help our customers design their process systems, but are also used as sensitive detectors of process conditions, including etch endpoint.

FLOW PRODUCTS

Our acquisition of Engineering Measurements Company in 2001 expanded our product offerings to flow meters, providing applications to measure de-ionized (DI), ultra-pure and waste water steams and gases, among other materials. Our acquisition of Aera Japan Limited in January 2002 expanded our offerings to thermal-based, pressure-based and liquid-based mass flow controllers for applications in semiconductor processes, fiber optics, CVD and chemical mechanical planarization (CMP).

TEMPERATURE CONTROL PRODUCTS

Our acquisition of Noah Holdings, Inc. in 2000 expanded our product offerings to temperature control products, including dynamic point-of-use thermoelectric chillers and static thermoelectric chillers with power levels from 500W to 4.25kW for etch, strip and track applications. Our acquisition of Sekidenko, Inc., also in 2000, expanded our offerings to non-contact optical fiber thermometry for rapid thermal processing (RTP), CVD and strip applications.

SOURCES PRODUCTS

Plasma Sources. We introduced our ion sources and inductively coupled plasma (ICP) sources products in 1998. Several versions of the ion sources product include a 12cm round source for the magnetic media and optical markets as well as linear sources up to one meter long for applications in the flat panel display and architectural glass markets. The ICP product, also developed in 1998, allowed us access to reactive deposition and cleaning applications where low energy is critical to prevent substrate damage. This was followed by the development of a toroidal ICP for chamber cleaning with fluorine, called the RAPID-F, and a second toroidal source of activated oxygen for reactive gas processes. All these products feature high reliability, low maintenance designs, and are well suited for the demanding environments in today's production facilities.

IKOR (NEW POWER SUPPLY ARCHITECTURE) PRODUCTS

Ikor - formerly New Power Supply Architecture ("NPSA"). In 1998, we embarked on a program to adapt our high frequency technology to the powering of microprocessors, which now require higher currents at lower voltages, and which require the powering source to be extremely agile (able to handle rapidly changing power drains). Our technology permits smaller, less expensive power regulators, which are stable under high rates of change of current draw, without the use of expensive and unreliable electrolytic capacitors.

MARKETS AND CUSTOMERS

MARKETS

Most of our sales historically have been to customers in the semiconductor capital equipment industry. Sales to customers in this industry represented 59% of our sales in 2001, 70% in 2000 and 65% in 1999. Our power conversion and control systems are also used in the flat panel display, data storage and advanced product applications markets. Following is a discussion of the major markets for our systems:

SEMICONDUCTOR CAPITAL EQUIPMENT MANUFACTURING MARKET. We sell our products primarily to semiconductor capital equipment manufacturers for incorporation into equipment used to make integrated circuits. Our products are currently used in a variety of applications including dielectric and metal film deposition, etch, ion implantation, photo-resist strip and megasonic cleaning. The precise control over plasma-based processes enables the production of integrated circuits with reduced feature sizes and increased speed and performance. We anticipate that the semiconductor capital equipment industry will continue to be a substantial part of our business for the foreseeable future.

DATA STORAGE MANUFACTURING EQUIPMENT MARKETS. We also sell systems to data storage equipment manufacturers and to data storage device manufacturers for use in producing a variety of products, including CDs, CD-ROMs and DVDs and computer hard disks, including both media and thin film heads. These products use a PVD process to produce optical and magnetic thin film layers, as well as a protective wear layer. In this market the trend towards higher recording densities is driving the demand for increasingly dense, thinner and more precise films. The use of equipment incorporating magnetic media to store analog and digital data continues to expand with the growth of the laptop, desktop and workstation computer markets and the consumer electronics audio and video markets.

FLAT PANEL DISPLAY MANUFACTURING EQUIPMENT MARKET. We also sell our systems to manufacturers of flat panel displays and flat panel projection devices, which have fabrication processes similar to those employed in manufacturing integrated circuits. Flat panel technology produces bright, sharp, large, color-rich images on flat screens for products ranging from hand-held computer games to laptop and desktop computer monitors to large-screen televisions. There are three major types of flat panel displays, including liquid crystal displays, field emitter displays and gas plasma displays. There are two types of flat panel projection devices, including liquid crystal projection and digital micro-mirror displays. We sell our products to all five of these markets.

ADVANCED PRODUCT APPLICATIONS MARKETS. We also sell our products to OEMs and producers of end products in a variety of industrial markets. Thin film optical coatings are used in the manufacture of many industrial products including solar panels, architectural glass, eyeglasses, lenses, barcode readers and front surface mirrors. Thin films of diamond-like coatings and other materials are currently applied to products in plasma-based processes to strengthen and harden surfaces on such diverse products as tools, razor blades, automotive parts and hip joint replacements. Other thin film processes that use our products also enable a variety of industrial packaging applications, such as decorative wrapping and food packaging. The advanced thin film production processes allow precise control of various optical and physical properties, including color, transparency and electrical and thermal conductivity. The improved adhesion and high film quality resulting from plasma-based processing make it the preferred method of applying the thin films. Many of these thin film industrial applications require power levels substantially greater than those used in our other markets.

APPLICATIONS

We have sold our products for use in connection with the following processes and applications:

| SEMICONDUCTOR | DATA STORAGE | FLAT PANEL DISPLAY | ADVANCED PRODUCT APPLICATIONS |
|---|--------------------------------|--|---|
| Chemical vapor deposition (CVD) (metal and dielectric) | CD-ROMs CDs | Active matrix LCDs Digital micro-mirror | Automobile coatings Chemical, physical and materials research |
| Plasma-enhanced CVD | Recordable CDs | Field emission displays | Circuit board etch-back and de-smear |
| High-density plasma CVD | DVDs | Large flat panel displays | Consumer product coatings |
| Etch | Hard disk carbon wear coatings | LCD projection | Diamond-like coatings |
| Ion implantation | Hard disk magnetic media | Liquid crystal displays | Food package coatings |
| Magnet field controls | Magneto-optic CDs | Medical applications | Glass coatings |
| Megasonic cleaning | Thin film heads | Plasma displays | Optical coatings |
| Photo-resist stripping | | | Photovoltaics |
| Physical vapor deposition (PVD) | | | Superconductors |
| Solid state temperature controls | | | |
| Optical fiber thermometers | | | |
| Mass flow controllers | | | |

CUSTOMERS

We have sold our systems worldwide to more than 100 OEMs and directly to more than 500 end users. Our ten largest customers accounted for 53% of our total sales in 2001, 72% in 2000 and 67% in 1999. We expect that sales of our products to these customers will continue to account for a high percentage of our sales in the foreseeable future. Representative customers include:

| | |
|------------------------|------------------------|
| Advanced Micro Devices | Mitsubishi |
| Applied Films | Motorola |
| Applied Materials | National Semiconductor |
| Axcelis | Novellus |
| Guardian Glass | Samsung |
| Hewlett-Packard | Singulus |
| IBM | Texas Instruments |
| Intel | Tokyo Electron |
| Intevac | Trikon |
| Lam Research | ULVAC |
| LSI Logic | Unaxis |
| Mattson Technologies | Veeco |

Applied Materials, our largest customer, accounted for 24% of our sales in 2001, 39% in 2000 and 34% in 1999. No other customer exceeded 10%. See Note 16 to our financial statements.

Our backlog was \$16.3 million at December 31, 2001, \$69.7 million at December 31, 2000 and \$34.0 million at December 31, 1999.

MARKETING, SALES AND SERVICE

We sell our systems primarily through direct sales personnel to customers in the United States, Europe and Asia. Our sales personnel are located at our headquarters in Fort Collins, Colorado, and in sales offices in San Jose, California; and Concord, Massachusetts. To serve customers in Asia and Europe, we have offices in Tokyo, Japan; Filderstadt, Germany; Bicester, England; Bundang, South Korea; Taipei Hsien, Taiwan;

and Shenzhen, China. In connection with the acquisition of Aera in 2002, we now have sales offices in Hachioji, Japan; Austin, Texas; Bundang, South Korea; Hsinchu, Taiwan; Dresden and Kirchheim, Germany; and Edinburgh, Scotland. These offices have primary responsibility for sales in their respective markets. We also have distributors outside the United States.

Sales outside the United States represented approximately 36% of our total sales during in 2001, 28% in 2000 and 27% in 1999. We expect sales outside the United States to continue to represent a significant portion of future sales. Although we have not experienced any significant difficulties involving international sales, such sales are subject to certain risks, including exposure to currency fluctuations, the imposition of governmental controls, political and economic instability, trade restrictions, changes in tariffs and taxes and longer payment cycles typically associated with international sales. Our future performance will depend, in part, upon our ability to compete successfully in Japan, one of the largest markets for semiconductor fabrication equipment and flat panel display equipment, and a major market for data storage and other industrial equipment utilizing our systems. The Japanese market has historically been difficult for non-Japanese companies to penetrate. Although a number of our significant non-Japanese customers have established operations in Japan, and we have operations there ourselves that are recently expanded with our acquisition of Aera, there can be no assurance that we or our customers will be able to maintain or improve our competitive positions in Japan.

We believe that customer service and technical support are important competitive factors and are essential to building and maintaining close, long-term relationships with our customers. We maintain customer service offices in Fort Collins, Colorado; Voorhees, New Jersey; Vancouver, Washington; Tokyo, Japan; Filderstadt, Germany; Bundang, South Korea; Taipei Hsien, Taiwan; and Shenzhen, China. Noah and Sekidenko maintain customer service offices in Vancouver, Washington. EMCO has a repair facility in Longmont, Colorado. Aera has customer service offices in most of its principal locations.

We offer warranty coverage for our systems after shipment against defects in design, materials and workmanship, for periods ranging from 12 to 36 months, with the majority of our products having terms ranging from 18 to 24 months.

MANUFACTURING

We have manufacturing locations in Fort Collins and Longmont, Colorado; Voorhees, New Jersey; and Vancouver, Washington. In connection with the acquisition of Aera, we now have manufacturing facilities in Hachioji, Japan; Austin, Texas; Bundang, South Korea; Dresden, Germany; and Edinburgh, Scotland. We generally manufacture different systems at each facility. Our manufacturing activities consist of the assembly and testing of components and subassemblies, which are then integrated into our final products. Once final testing of all electrical and electro-mechanical subassemblies is completed, the

final product is subjected to a series of reliability enhancing operations prior to shipment to customers. We purchase a wide range of electronic, mechanical and electrical components, some of which are designed to our specifications. We outsource some of our subassembly work.

We rely on sole and limited source suppliers for certain parts and subassemblies. This reliance creates a potential inability to obtain an adequate supply of required components, and reduced control over pricing and timing of delivery of components. An inability to obtain adequate supplies would require us to seek alternative sources of supply or might require us to redesign our systems to accommodate different components or subassemblies. We could be prevented from the timely shipping of our systems to our customers if we were forced to seek alternative sources of supply, manufacture such components or subassemblies internally, or redesign our systems.

INTELLECTUAL PROPERTY

We have a policy of seeking patents on inventions governing new products or technologies as part of our ongoing research, development, and manufacturing activities. We currently hold 45 United States patents and 14 foreign patents covering various aspects of our products, and have over 30 patent applications pending in the United States, Europe and Japan. We do not have patent protection for our intellectual property in several countries in which we do business, and we have limited patent protection in certain other countries. The costs of applying for patents in foreign countries and translating the applications into foreign languages require us to select carefully the inventions for which we apply for patent protection and the countries in which we seek such protection. Generally, we have concentrated our efforts to obtain international patents in the United Kingdom, Germany, France, Italy and Japan because there are other manufacturers and developers of power conversion and control systems in those countries, as well as customers for those systems.

Litigation may from time to time be necessary to enforce patents issued to us, to protect trade secrets or know-how owned by us, to defend us against claimed infringement of the rights of others or to determine the scope and validity of the proprietary rights of others. See "Cautionary Statements - Risk Factors - We are highly dependent on our intellectual property but may not be able to protect it adequately" and "-- Intellectual property litigation is costly."

COMPETITION

The markets we serve are highly competitive and characterized by ongoing technological development and changing customer requirements. Significant competitive factors in our markets include product performance, price, quality and reliability and level of customer service and support. We believe that we currently compete effectively with

respect to these factors, although there can be no assurance that we will be able to compete effectively in the future.

The markets in which we compete have seen an increase in global competition, especially from Japanese- and European-based equipment vendors. We have several foreign and domestic competitors for each of our product lines. Some of these competitors are larger and have greater resources than we have. Our ability to continue to compete successfully in these markets depends on our ability to make timely introductions of system enhancements and new products. Our primary competitors are ENI, a subsidiary of MKS Instruments; Applied Science and Technology (ASTeX), another subsidiary of MKS Instruments; Huettinger Elektronik; Shindingen; Kyosan Electric; Comdel; STEC; Kinetics; Mykrolis Corp.; and Daihen Corp. Our competitors are expected to continue to improve the design and performance of their systems and to introduce new systems with competitive performance characteristics. We believe we will be required to maintain a high level of investment in research and development and sales and marketing in order to remain competitive.

OPERATING SEGMENT

We operate and manage our business of supplying products and systems for plasma-based manufacturing processes as one segment.

RESEARCH AND DEVELOPMENT

The market for our subsystems for vacuum process systems and related accessories is characterized by ongoing technological changes. We believe that continued and timely development of new products and enhancements to existing systems to support OEM requirements is necessary for us to maintain a competitive position in the markets we serve. Accordingly, we devote a significant portion of our personnel and financial resources to research and development projects and seek to maintain close relationships with our customers and other industry leaders to remain responsive to their product requirements. Research and development expenses were \$45.2 million in 2001, \$37.0 million in 2000 and \$28.3 million in 1999, representing 23.3% of total sales in 2001, 10.2% in 2000 and 14.0% in 1999. We believe that continued research and development investment and ongoing development of new products are essential to the expansion of our markets, and expect to continue to make significant investments in research and development activities.

NUMBER OF EMPLOYEES

As of December 31, 2001, we had a total of 1,185 employees, of whom 1,164 are full-time continuous employees. There is no union representation of our employees, and we

have never experienced a work stoppage. We utilize temporary employees as a means to provide additional staff while reviewing the performance of the temporary employee. We consider our employee relations to be good. The acquisition of Aera has added approximately 220 people to our workforce.

EFFECTS OF ENVIRONMENTAL LAWS

We are subject to federal, state and local environmental laws and regulations, as well as the environmental laws and regulations of the foreign federal and local jurisdictions in which we have manufacturing facilities. We believe we are in material compliance with all such laws and regulations.

CAUTIONARY STATEMENTS - RISK FACTORS

This Form 10-K includes "forward-looking statements" within the meanings of Section 27A of the Securities Act of 1933 and Section 21E of the Securities Exchange Act of 1934. All statements contained or incorporated by reference in this Form 10-K, other than statements of historical fact, are "forward-looking statements." For example, statements relating to our beliefs, expectations, plans and projections are forward-looking statements, as are statements that specified actions or circumstances will continue or change. In some cases, forward-looking statements can be identified by the inclusion of words such as "believe," "expect," "plan," "anticipate," "estimate" and similar words.

Some of the forward-looking statements in this Form 10-K are expectations or projections relating to:

- customer inventory levels, needs and order levels;
- our future revenues;
- our future gross profit;
- market acceptance of our products;
- research and development expenses;
- selling, marketing, general and administrative expenditures;
- capital resources sufficiency and availability;
- potential acquisitions;
- capital expenditures;
- restructuring activities and expenses; and
- general economic conditions in the U.S. and worldwide.

Our actual results could differ materially from those projected or assumed in our forward-looking statements, because forward-looking statements by their nature are subject to risks and uncertainties. Factors that could contribute to these differences or prove our forward-looking statements, by hindsight, to be overly optimistic or unachievable, include the factors described in this section. Other factors, including factors which we do not now consider material, also might contribute to the differences between our forward-looking statements and our actual results. We assume no obligation to update any forward-looking statement or the reasons why our actual results might differ.

OUR QUARTERLY OPERATING RESULTS ARE SUBJECT TO SIGNIFICANT FLUCTUATIONS, WHICH COULD NEGATIVELY IMPACT THE MARKET PRICES OF OUR SECURITIES.

Our quarterly operating results have fluctuated significantly and we expect them to continue to experience significant fluctuations. Downward fluctuations in our quarterly results historically have resulted in decreases in the price of our common stock. Quarterly operating results are affected by a variety of factors, many of which are beyond our control. These factors include:

- changes or slowdowns in economic conditions in the semiconductor and semiconductor capital equipment industries and other industries in which our customers operate;
- the timing and nature of orders placed by major customers;
- changes in customers' inventory management practices;
- customer cancellations of previously placed orders and shipment delays;
- pricing competition from our competitors;
- component shortages resulting in manufacturing delays;
- the introduction of new products by us or our competitors;
- costs incurred by responding to specific feature requests by customers; and
- declines in macroeconomic conditions.

In addition, companies in the semiconductor capital equipment industry and other electronics companies experience pressure to reduce costs. Our customers exert pressure on us to reduce prices, shorten delivery times and extend payment terms. These pressures could lead to significant changes in our operating results from quarter to quarter. These changes often occur quickly and make it difficult for us to predict our revenues or operating results. For example, our ability to predict future operating results is

quite low given the current uncertainty in virtually all forms of technology spending.

In the past, we have incurred charges and costs related to events such as acquisitions, restructuring and storm damages. In addition, we have from time to time incurred charges and costs related to new technologies that are being developed by others. The occurrence of similar events in the future could adversely affect our operating results in the applicable quarter.

Our operating results in one or more future quarters may fall below the expectations of analysts and investors. In those circumstances, the trading price of our common stock would likely decrease and, as a result, any trading price of our convertible notes may decrease.

THE SEMICONDUCTOR AND SEMICONDUCTOR CAPITAL EQUIPMENT INDUSTRIES ARE HIGHLY VOLATILE, AND OUR OPERATING RESULTS ARE AFFECTED TO A LARGE EXTENT BY EVENTS IN THOSE INDUSTRIES.

The semiconductor industry historically has been highly volatile and has experienced periods of oversupply resulting in significantly reduced demand for semiconductor capital equipment. These reductions, in turn, have significantly reduced demand for our systems. A rapid decrease in demand for our products can occur with limited advance notice because we supply subsystems to equipment manufacturers and make a portion of our shipments on a just-in-time basis. This decrease in demand can adversely impact our business and financial results disproportionately because of its unanticipated nature.

During downturns, some of our customers have drastically reduced their orders to us and have implemented substantial cost reduction programs. The semiconductor industry is currently involved in one of the most significant downturns in its history and there is no reason to believe that this situation will significantly improve in the near term. Sales to customers in the semiconductor capital equipment industry accounted for 59% of our total sales in 2001, 70% in 2000 and 65% in 1999. We expect that our business will continue to depend significantly on the semiconductor and semiconductor capital equipment industries for the foreseeable future.

THE MARKET PRICE OF OUR COMMON STOCK IS HIGHLY VOLATILE, WHICH COULD LEAD TO FLUCTUATING PRICES FOR OUR CONVERTIBLE NOTES, LOSSES FOR INDIVIDUAL INVESTORS AND COSTLY SECURITIES CLASS ACTION LITIGATION.

The market for technology stocks, including our common stock, has experienced significant price and volume fluctuations. These fluctuations often have been unrelated or disproportionate to the operating performance of the companies. From our IPO in November 1995 through March 18, 2002, the closing prices of our common stock on the Nasdaq National Market have ranged from \$3.50 to \$73.25. The market for our common stock, and any market for our convertible notes, likely will continue to be subject to fluctuations. Many factors could cause the trading price of our common stock and notes to fluctuate substantially, including the following:

- future announcements concerning our business, technology, customers or competitors;
- variations in our operating results;
- introduction of new products or changes in product pricing policies by us, our competitors or our customers;
- changes in earnings estimates by securities analysts or announcements of operating results that are not aligned with the expectations of analysts and investors;
- reduced spending for consumer electronic items;
- the economic and competitive conditions in the industries in which our customers operate; and
- general stock market trends.

In the past, following periods of volatility in the market price of a particular company's securities, securities class action litigation often has been brought against that company. Many technology companies have been subject to this type of litigation. We may also become involved in this type of litigation. Litigation is often expensive and diverts management's attention and resources, which could significantly harm our business, financial condition and results of operations.

A SIGNIFICANT PORTION OF OUR SALES IS CONCENTRATED AMONG A FEW CUSTOMERS.

Our ten largest customers accounted for 53% of our total sales in 2001, 72% in 2000 and 67% in 1999. Our largest customer, Applied Materials, accounted for 24% of our total sales in 2001, 39% in 2000 and 34% in 1999. The loss of any of these customers or a material reduction in any of their purchase orders would significantly harm our business, financial condition and results of operations.

THE MARKETS IN WHICH WE OPERATE ARE HIGHLY COMPETITIVE.

We face substantial competition, primarily from established companies, some of which have greater financial, marketing and technical resources than we do. Our primary competitors are ENI, a subsidiary of MKS Instruments; Applied Science and Technology (ASTeX), another subsidiary of MKS Instruments; Huettinger Elektronik; Shindingen; Kyosan Electric; Comdel; STEC; Kinetics; Mykrolis; and Daihen. We expect that our competitors will continue to develop new products in direct competition with ours, improve the design and performance of their systems and introduce new systems with

enhanced performance characteristics.

To remain competitive, we need to continue to improve and expand our systems and system offerings. In addition, we need to maintain a high level of investment in research and development and expand our sales and marketing efforts, particularly outside of the United States. We may not be able to make the technological advances and investments necessary to remain competitive.

New products developed by competitors or more efficient production of their products could increase pressure on the pricing of our systems. In addition, electronics companies, including companies in the semiconductor capital equipment industry, have been facing pressure to reduce costs. Either of these factors may require us to make significant price reductions to avoid losing orders. Further, our current and prospective customers consistently exert pressure on us to lower prices, shorten delivery times and improve the capability of our systems. Failure to respond adequately to these pressures could result in a loss of customers and orders.

WE RECENTLY ACQUIRED A NUMBER OF COMPANIES AND TECHNOLOGIES, AND PLAN TO CONTINUE SEEKING ACQUISITIONS, BUT MIGHT NOT BE ABLE TO INTEGRATE OUR ACQUISITIONS SUCCESSFULLY OR EFFICIENTLY.

We have significantly expanded our product offerings through acquisitions and continue to seek acquisition opportunities actively. Prior to 1997, we did not make any significant acquisitions. In the three years from 1997 through 1999, we acquired five companies. In 2000 and 2001, we acquired three companies and entered into a strategic partnership arrangement with one other company. In January 2002, we acquired Aera Japan Limited, a Japanese corporation with approximately \$110 million in revenues in its fiscal year ended June 2001 and approximately 220 employees in six locations worldwide.

Integrating the companies and technologies that we have acquired has placed substantial demands on our management team. Further, the increased pace of our acquisitions has required us to try to integrate multiple acquisitions simultaneously. This has decreased the time and effort that management can give to integrating each acquisition, while continuing to manage our existing business.

Some of our acquisitions have been in technology and geographic markets in which we have limited experience. We might not be able to compete successfully in these markets or operate the acquired businesses efficiently. While we may be able to reduce some costs through consolidation, such as the elimination of redundant locations and personnel, other unanticipated costs of operating acquired companies or integrating them into our operations may emerge after acquisition. Our business and results of operations could be adversely affected if integrating our acquisitions results in substantial costs, delays or other operational or financial problems.

Future acquisitions could place additional strain on our operations and management. Our ability to manage future acquisitions will depend on our success in:

- evaluating new markets and investments;
- monitoring operations of acquired companies;
- controlling costs and unanticipated expenses of acquired companies;
- integrating acquired operations and personnel;
- retaining existing customers and strategic partners of acquired companies;
- maintaining effective quality controls of acquired companies; and
- expanding our internal management, technical and accounting systems.

FUTURE ACQUISITIONS MAY RESULT IN DILUTION TO EXISTING STOCKHOLDERS, ADVERSELY AFFECT OUR FINANCIAL RESULTS OR THE MARKET PRICE OF OUR SECURITIES OR LIMIT OUR FINANCIAL FLEXIBILITY.

In connection with future acquisitions we may issue equity securities, incur or assume debt, recognize substantial one-time expenses or create goodwill or other intangible assets that could result in significant amortization expense or future charges for impairment. Parties to whom we issue equity securities in acquisitions may seek to liquidate their ownership following an acquisition, which may lead to increased pressure on the market price of our stock and convertible notes. The market price of our securities may also decline upon announcement of an acquisition, if investors do not view it favorably. Also, many acquisition opportunities are for foreign companies or for divisions of larger companies, for whom cash is generally a more attractive consideration than securities. The use of cash for these acquisitions may reduce our future financial flexibility.

WE MIGHT NOT BE SUCCESSFUL IN ACQUIRING THE COMPANIES OR DEVELOPING THE TECHNOLOGIES NECESSARY TO IMPLEMENT OUR BUSINESS STRATEGY.

We continue to look for ways to expand our product offerings to existing customers, to new customers and into new markets through acquisitions, internal development and refinement of technologies, and sales and marketing efforts. However, whether or not we are successful in implementing our goal of becoming a single-source provider of integrated solutions will depend on many factors, several of which are out of our control. For example, we may not be able to identify or acquire companies or develop internally products which complement our present product offerings. If we identify appropriate target companies or technologies, we may not be able to afford to acquire them or may be otherwise unsuccessful in doing so due to market conditions, competition, failure to agree on terms and other circumstances. Implementation of our growth, acquisition and product integration strategy may be delayed or altered as these factors affect management's acquisition and development decisions.

OUR NEWLY ACQUIRED FOREIGN OPERATIONS, AS WELL AS OUR FOREIGN SALES AND SERVICE OFFICES, PRESENT DIFFICULTIES THAT WE HAVE LIMITED EXPERIENCE ADDRESSING.

Our acquisition of Aera Japan Limited significantly increased our operations outside of the United States. In addition to our operations in Japan, we maintain sales and service offices in Germany, South Korea, the United Kingdom, Taiwan and China. In

implementing our business strategy, we may acquire other companies or relocate some of our current domestic operations outside of the United States.

Our foreign operations subject us to risks and uncertainties that we have limited experience addressing. For example, we face greater difficulty outside the United States:

- managing and staffing our offices;
- safeguarding our intellectual property;
- understanding and complying with local business customs and laws; and
- competing for customers and supplies with companies based in the foreign country.

In addition, our foreign operations are subject to risks in each country, including:

- currency controls and exchange rate fluctuations;
- government regulations and controls; and
- political and economic instability.

Our ability to integrate the operations of Aera Japan Limited and our overall financial results might be adversely affected, if we are unable to address these difficulties and risks successfully.

WE MIGHT NOT BE ABLE TO COMPETE SUCCESSFULLY IN INTERNATIONAL MARKETS OR MEET THE SERVICE AND SUPPORT NEEDS OF OUR INTERNATIONAL CUSTOMERS.

Our customers increasingly require service and support on a worldwide basis as the markets in which we compete become increasingly globalized. Our success in competing in international markets is subject to our ability to manage various risks and difficulties, including:

- compliance with product safety requirements and standards that are different from those of the United States;
- barriers to entry;
- import and export requirements and controls;
- trade restrictions;
- collecting past due accounts receivable from foreign customers; and
- changes in tariffs and taxes.

Sales to customers outside the United States accounted for 36% of our total sales in 2001, 28% in 2000 and 27% in 1999. As a result of our acquisition of Aera Japan Limited, we expect international sales to represent a larger portion of our future sales. Providing support services for our systems on a worldwide basis also is subject to various risks, including:

- our ability to hire qualified support personnel;
- maintenance of our standard level of support;
- difficulties managing overseas distributors and representatives; and
- differences in local customs and practices.

Our ability to implement our business strategies and maintain market share will be jeopardized, if we are unable to manage these risks successfully.

FLUCTUATIONS IN THE CURRENCY EXCHANGE RATE BETWEEN THE U.S. DOLLAR AND FOREIGN CURRENCIES COULD ADVERSELY AFFECT OUR OPERATING RESULTS.

A portion of our sales is subject to currency exchange risk as a result of our international operations. Approximately 25% of our revenues in 2001 were subject to this risk. As a result of our expanded international operations and sales, including through the acquisition of Aera Japan Limited, we expect a greater portion of our future revenues to be subject to this risk.

We have experienced fluctuations in foreign currency exchange rates, particularly against the Japanese yen, which have negatively affected our operating results from time to time. We have in the past entered into various forward foreign exchange contracts to mitigate currency fluctuations in the yen and intend to continue to do so. We have not employed derivative techniques with respect to any other currencies. Our current or any future derivative techniques might not protect us adequately against substantial currency fluctuations.

SHORTAGES OF COMPONENTS NECESSARY FOR OUR PRODUCT ASSEMBLY CAN DELAY OUR SHIPMENTS.

Manufacturing our products and control systems for the semiconductor capital equipment industry requires numerous electronic components. Dramatic growth in the electronics industry has significantly increased demand for these components. This demand has resulted in periodic shortages and allocations of needed components, and we expect to experience additional shortages and allocations from time to time. Shortages and allocations could cause shipping delays for our systems, adversely affecting our results of operations. Shipping delays also could damage our relationships with current and prospective customers.

OUR DEPENDENCE ON SOLE AND LIMITED SUPPLIERS COULD AFFECT OUR ABILITY TO MANUFACTURE PRODUCTS AND SYSTEMS.

We rely on sole and limited source suppliers for some of our components and subassemblies that are critical to the manufacturing of our systems. This reliance involves several risks, including the following:

- the potential inability to obtain an adequate supply of required components;
- reduced control over pricing and timing of delivery of components; and
- the potential inability of our suppliers to develop technologically advanced products to support our growth and development of new systems.

We believe that in time we could obtain and qualify alternative sources for most sole and limited source parts or could manufacture the parts ourselves. Seeking alternative sources or commencing internal manufacture of the parts could require us to redesign our systems, resulting in increased costs and likely shipping delays. We may be unable to manufacture the parts internally or redesign our systems, which could result in further costs and shipping delays. These increased costs would decrease our profit margins if we could not pass the costs to our customers. Further, shipping delays could damage our relationships with current and potential customers and have a material adverse effect on our business and results of operations.

OUR CURRENT AND FUTURE INVESTMENTS IN START-UP COMPANIES MIGHT NOT BE ECONOMICALLY OR OTHERWISE REWARDING AND MIGHT CAUSE US TO REALIZE LOSSES.

We have invested in start-up companies that develop products and technologies that we believe may provide us with future benefits. These investments may not provide us with any benefit, and we may not achieve any economic return on any of these investments. Our investments in these start-up companies are subject to all of the risks inherent in investing in companies that are not established. We could lose all or any part of our investments in these companies. Over the last twelve months the implied value of a number of start-up companies has decreased dramatically and a number of technology companies have been forced to write off all or a portion of their investments in these companies. In 2001, we recorded a writedown related to an investment in a start-up company totaling \$6.8 million.

As we make additional investments, we may be required to reflect all or a portion of such investments as a charge against earnings or record our share of the start-up company's income or losses. As of December 31, 2001, the aggregate book value of our investments in start-up companies was \$1.1 million.

WE ARE HIGHLY DEPENDENT ON OUR INTELLECTUAL PROPERTY BUT MAY NOT BE ABLE TO PROTECT IT ADEQUATELY.

Our success depends in part on our proprietary technology. We attempt to protect our intellectual property rights through patents and non-disclosure agreements. However, we might not be able to protect our technology, and competitors might be able to develop similar technology independently. In addition, the laws of some foreign countries might not afford our intellectual property the same protections as do the laws of the United

States. Our intellectual property is not protected by patents in several countries in which we do business, and we have limited patent protection in some other countries. The costs of applying for patents in foreign countries and translating the applications into foreign languages require us to select carefully the inventions for which we apply for patent protection and the countries in which we seek protection. Generally, we have concentrated our efforts to obtain international patents in the United Kingdom, Germany, France, Italy and Japan because there are other manufacturers and developers of similar products and control systems in those countries, as well as customers for those systems. Our inability or failure to obtain adequate patent protection in a particular country could threaten our ability to compete effectively in that country.

Our patents also might not be sufficiently broad to protect our technology, and any existing or future patents might be challenged, invalidated or circumvented. Additionally, our rights under our patents may not provide meaningful competitive advantages.

INTELLECTUAL PROPERTY LITIGATION IS COSTLY.

We do not believe that any of our products are infringing any patents or proprietary rights of others, although infringements may exist or might occur in the future and are currently alleged in a litigation in which we are a defendant. Litigation may be necessary to enforce patents issued to us, to protect our trade secrets or know-how, to defend ourselves against claimed infringement of the rights of others or to determine the scope and validity of the proprietary rights of others. This type of litigation often requires substantial management time and attention, as well as financial and other resources. We currently are in litigation with a subsidiary of MKS Instruments. The litigation involves our inductively coupled plasma source product line, which has represented less than 5% of our total revenues since January 1, 2000. This and other litigation in the future may result in substantial costs and diversion of our efforts.

An adverse determination in any current or future litigation could cause us to lose proprietary rights, subject us to significant liabilities to third parties, require us to seek licenses or alternative technologies from others or prevent us from manufacturing or selling our products and impact future revenue. Any of these events could threaten our business, financial condition and results of operations.

WE MUST CONSTANTLY DEVELOP AND SELL NEW SYSTEMS IN ORDER TO KEEP UP WITH RAPID TECHNOLOGICAL CHANGE.

The markets for our systems and the markets in which our customers compete are characterized by ongoing technological developments and changing customer requirements. We must continue to improve existing systems and to develop new systems that keep pace with technological advances and meet the needs of our customers in order to succeed. We might not be able to continue to improve our systems or develop new systems. The systems we do develop might not be cost-effective or introduced in a

timely manner. Developing and introducing new systems may involve significant and uncertain costs. Our business, financial condition and results of operations, as well as our customer relationships, could be adversely affected if we fail to develop or introduce improved systems and new systems in a timely manner.

WE MUST ACHIEVE DESIGN WINS TO RETAIN OUR EXISTING CUSTOMERS AND TO OBTAIN NEW CUSTOMERS.

The constantly changing nature of semiconductor fabrication technology causes equipment manufacturers to continually design new systems. We often must work with these manufacturers early in their design cycles to modify our equipment to meet the requirements of the new systems. Manufacturers typically choose one or two vendors to provide the power conversion equipment for use with the early system shipments. Selection as one of these vendors is called a design win. It is critical that we achieve these design wins in order to retain existing customers and to obtain new customers.

We typically must customize our systems for particular customers to use in their equipment to achieve design wins. This customization increases our research and development expenses and can strain our engineering and management resources. These investments do not always result in design wins.

Once a manufacturer chooses a power conversion and control system for use in a particular product, it is likely to retain that system for the life of that product. Our sales and growth could experience material and prolonged adverse effects if we fail to achieve design wins. In addition, design wins do not always result in substantial sales or profits.

We believe that equipment manufacturers often select their suppliers based on factors such as long-term relationships. Accordingly, we may have difficulty achieving design wins from equipment manufacturers who are not currently customers. In addition, we must compete for design wins for new systems and products of our existing customers, including those with whom we have had long-term relationships.

OUR EFFORTS TO BE RESPONSIVE TO CUSTOMERS MAY LEAD TO INCURRING COSTS THAT ARE NOT READILY RECOVERABLE.

We may incur manufacturing overhead and other costs, many of which are fixed, to meet anticipated customer demand. Accordingly, operating results could be adversely affected if orders or revenues in a particular period or for a particular system do not meet expectations.

We often require long lead times for development of our systems during which times we must expend substantial funds and management effort. We may incur significant development and other expenses as we develop our systems without realizing corresponding revenue in the same period, or at all.

OUR SUCCESS DEPENDS UPON OUR ABILITY TO ATTRACT AND RETAIN KEY PERSONNEL.

Our success depends upon the continued efforts of our senior management team and our technical, marketing and sales personnel. These employees may voluntarily terminate their employment with us at any time. Our success also depends on our ability to attract and retain additional highly qualified management, technical, marketing and sales personnel. The process of hiring employees with the combination of skills and attributes required to carry out our strategy can be extremely competitive and time-consuming. We may not be able to successfully retain existing personnel or identify, hire and integrate new personnel. If we lose the services of key personnel for any reason, including retirement, or are unable to attract additional qualified personnel, our business, financial condition and results of operations could be materially and adversely affected.

WE CONDUCT MANUFACTURING AT ONLY A FEW SITES AND OUR SITES ARE NOT GENERALLY INTERCHANGEABLE.

We conduct the majority of our manufacturing at our facilities in Fort Collins and Longmont, Colorado; Voorhees, New Jersey; and Vancouver, Washington. In connection with the acquisition of Aera, we now have major manufacturing facilities in Hachioji, Japan and Austin, Texas and smaller sites in Bundang, South Korea; Dresden, Germany; and Edinburgh, Scotland. Each facility generally manufactures different systems and, therefore, is not readily interchangeable. In July 1997, a severe rainstorm in Fort Collins caused substantial damage to our Fort Collins facilities and to some equipment and inventory. The damage caused us to stop manufacturing at that facility temporarily and prevented us from resuming full production there until mid-September 1997. Our insurance policies did not cover all of the costs that we incurred in connection with the rainstorm. Future natural or other uncontrollable occurrences at any of our primary manufacturing facilities that negatively impact our manufacturing processes may not be fully covered by insurance and could cause significant harm to our operations and results of operations.

WE MUST MAINTAIN MINIMUM LEVELS OF CUSTOMIZED INVENTORY TO SUPPORT SOME CUSTOMER DELIVERY REQUIREMENTS.

We must keep a relatively large number and variety of customized systems in our inventory to meet client delivery requirements. Our inventory may become obsolete as we develop new systems and as our customers develop new systems. Inventory obsolescence could have a material adverse effect on our financial condition and results of operations.

WARRANTY COSTS ON CERTAIN PRODUCTS MAY BE EXCESSIVE.

In recent years we have experienced higher than expected levels of warranty costs on certain products. We have been required to repair, rework, and in some cases, replace, the products. Warranty costs in 2001 were higher than expected by more than \$3 million. If such problems persist in the future, our results of operations may be materially adversely affected.

WE ARE SUBJECT TO NUMEROUS GOVERNMENTAL REGULATIONS.

We are subject to federal, state, local and foreign regulations, including environmental regulations and regulations relating to the design and operation of our products and control systems. We must ensure that our systems meet safety and emissions standards,

many of which vary across the states and countries in which our systems are used. For example, the European Union has published directives specifically relating to power supplies. We must comply with these directives in order to ship our systems into countries that are members of the European Union. In the past, we have invested significant resources to redesign our systems to comply with these directives. We believe we are in compliance with current applicable regulations, directives and standards and have obtained all necessary permits, approvals and authorizations to conduct our business. However, compliance with future regulations, directives and standards could require us to modify or redesign some systems, make capital expenditures or incur substantial costs. If we do not comply with current or future regulations, directives and standards:

- we could be subject to fines;
- our production could be suspended; or
- we could be prohibited from offering particular systems in specified markets.

WE LEASE OUR FORT COLLINS, COLORADO FACILITIES AND A CONDOMINIUM FROM ENTITIES IN WHICH TWO INDIVIDUALS WHO ARE INSIDERS AND MAJOR STOCKHOLDERS HAVE FINANCIAL INTERESTS.

We lease our executive offices and manufacturing facilities in Fort Collins, Colorado from Prospect Park East Partnership and from Sharp Point Properties, LLC. Douglas S. Schatz, our Chairman, President and Chief Executive Officer, holds a 26.7% interest in each of the leasing entities. G. Brent Backman, a member of our board of directors, holds a 6.6% interest in each of the leasing entities. Aggregate rental payments under these leases for 2001 totaled approximately \$2.23 million. We also lease a condominium in Breckenridge, Colorado to provide rewards and incentives to our customers, suppliers and employees. We lease the condominium from AEI Properties, a partnership in which Mr. Schatz holds a 60% interest and Mr. Backman holds a 40% interest. Aggregate payments under the condominium lease for 2001 totaled approximately \$47,000. As of December 31, 2001, Mr. Schatz owned approximately 34.7% of our common stock, and Mr. Backman owned approximately 3.8% of our common stock. It is possible that the interests of these individuals may not coincide with our interests with respect to these properties.

OUR EXECUTIVE OFFICERS AND DIRECTORS OWN A SIGNIFICANT PERCENTAGE OF OUR OUTSTANDING COMMON STOCK, WHICH COULD ENABLE THEM TO CONTROL OUR BUSINESS AND AFFAIRS.

Our executive officers and directors owned approximately 39.8% of our common stock outstanding as of December 31, 2001. Douglas S. Schatz, our Chairman, President and Chief Executive Officer, owned approximately 34.7% of our common stock outstanding as of December 31, 2001. These stockholdings give our executive officers and directors collectively, and Mr. Schatz individually, significant voting power. Depending on the number of shares that abstain or otherwise are not voted on a particular matter, our

executive officers collectively may be able to elect all of the members of our board of directors and to control our business affairs for the foreseeable future.

WE RECENTLY HAVE INCREASED OUR LEVERAGE SIGNIFICANTLY.

In August 2001, we issued \$125 million of convertible notes. As a result of this indebtedness, our principal and interest payment obligations increased and such debt increased from \$81.6 million to \$206.6 million at that time. This debt is due in 2006. The degree to which we will be leveraged could adversely affect our ability to obtain financing for working capital, acquisitions or other purposes and could make us more vulnerable to industry downturns and competitive pressures. Our ability to meet our debt service obligations will be dependent upon our future performance, which will be subject to the financial, business and other factors affecting our operations, many of which are beyond our control. Our note holders and other creditors might require us to sell some of our assets, terminate some of our operations or take other actions, including completely liquidating the company, if we are unable to meet our debt service obligations.

ANTI-TAKEOVER PROVISIONS LIMIT THE ABILITY OF A PERSON OR ENTITY TO ACQUIRE CONTROL OF US AND MAY ADVERSELY AFFECT THE VALUE OF OUR COMMON STOCK AND OUR CONVERTIBLE NOTES.

Our certificate of incorporation and bylaws include provisions which:

- allow the board of directors to issue preferred stock with rights senior to those of the common stock without any vote or other action by the holders of the common stock;
- limit the right of our stockholders to call a special meeting of stockholders; and
- impose procedural and other requirements that could make it difficult for stockholders to effect particular corporate actions.

In addition, we are subject to the anti-takeover provisions of the Delaware General Corporation Law. Any of these provisions could delay or prevent a person or entity from acquiring control of us. The effect of these provisions may be to limit the price that investors are willing to pay in the future for our securities. These provisions might also discourage potential acquisition proposals or could diminish the opportunities for our stockholders to participate in a tender offer, even if the acquisition proposal or tender offer is at a price above the then current market price for our common stock.

EXECUTIVE OFFICERS OF THE COMPANY

Our executive officers and their ages as of February 28, 2002 are as follows:

| NAME ---- | AGE --- | POSITION ----- |
|----------------------------|------------|---|
| Douglas S. Schatz | 56 | Chief Executive Officer and Chairman of the Board |
| James F. Gentilcore | 49 | Executive Vice President and Chief Operating Officer |
| Michael El-Hillow | 50 | Senior Vice President of Finance and Administration and Chief Financial Officer |
| Richard P. Beck | 68 | Senior Vice President and Director (former Chief Financial Officer) |
| James R. Gordley | 50 | Vice President and General Manager, Flow Products |
| Joseph R. Monkowski, Ph.D. | 48 | Senior Vice President, Business Development |
| William A. Ruff | 51 | Vice President and General Manager, RF Products |
| Brenda M. Scholl | 45 | Vice President and General Manager, DC Products |
| Richard A. Scholl | 63 | Senior Vice President and Chief Technology Officer |

DOUGLAS S. SCHATZ is a co-founder and has been our Chief Executive Officer and Chairman of the Board since our incorporation in 1981. From our incorporation to July 1999, Mr. Schatz also served as our President. In March 2001 he began serving again as our President. Since December 1995, Mr. Schatz has also served as a director of Advanced Power Technology, Inc., a publicly held company which provides high power, high voltage and high performance semiconductors and power modules.

JAMES F. GENTILCORE became Executive Vice President and Chief Operating Officer in February 2001. He joined us in March 1996 as Vice President of Sales and Marketing. He became Senior Vice President of Sales and Marketing in April 1998 and President of Advanced Energy Voorhees, Inc. in October 1999. In January 2001 he became President of EMCO. From 1990 to 1996 he served with MKS Instruments Inc. and held the position of Vice President, Marketing.

MICHAEL EL-HILLOW joined us in October 2001 as Senior Vice President of Finance and Administration and Chief Financial Officer, replacing Mr. Beck. From April 1997 to July 2001, Mr. El-Hillow was Senior Vice President and Chief Financial Officer at Helix Technology Corporation. He was Senior Vice President and Chief Financial Officer of Spike Broadband Systems, Inc. from July 2001 to October 2001. Prior to Helix he was Vice President, Finance, Treasurer and Chief Financial Officer at A.T. Cross Company and an audit partner at Ernst & Young.

RICHARD P. BECK joined us in March 1992 as Vice President and Chief Financial Officer and became Senior Vice President in February 1998. He joined our board of directors in September 1995. In October 2001, Mr. Beck announced that he will retire in mid-2002 and will work with Mr. El-Hillow through a transition period. In addition to Advanced Energy, Mr. Beck is also Chairman of the Board of Applied Films Corporation, a director of TTM

Technologies, Inc. and a director of Photon Dynamics, Inc., all publicly held companies.

JAMES R. GORDLEY joined us in February 1998 as Vice President of Sales, and became Vice President of Mergers and Acquisitions in August 2000. In January 2002 he became Vice President and General Manager, Flow Products. Prior to joining us, he was Vice President of Sales at Semitool's Thermal Products Division from 1989 to 1998. Prior to Semitool he had various marketing positions with 3M.

JOSEPH R. MONKOWSKI, PH.D. joined RF Power Products, Inc. in February 1998 as Senior Vice President and General Manager of the Electronics Technology Business Group. In October 1998, upon the merger of Advanced Energy and RF Power Products, Dr. Monkowski became our Senior Vice President of Sales and Marketing. In August 2000 he became Senior Vice President, Business Development. Prior to joining RF Power Products, Dr. Monkowski held various executive positions with technology companies, including President of the instruments group of Pacific Scientific Company from 1994 to 1997.

WILLIAM A. RUFF joined us in 1990 as the Product Manager - RF Power Systems. From 1995 to 1997 he was the Business Unit Engineering Manager - Applied Materials Business Unit, and from 1997 to 1999 he was an Engineering Director of Advanced Energy. In 1999 Mr. Ruff became Vice President Engineering, Advanced Energy Voorhees, Inc. In March 2001 he became President, Advanced Energy Voorhees, Inc., and in May 2001 became Vice President and General Manager, RF Products. Prior to joining us, Mr. Ruff held various engineering positions in other technology companies.

BRENDA M. SCHOLL joined us in 1988 as Product Manager for DC products and held several positions in marketing thereafter, until becoming Vice President and General Manager, DC Products in May 2001. Prior to joining us, she held positions in marketing and sales for Varian Associates and LFE Corporation.

RICHARD A. SCHOLL joined us in 1988 as Vice President, Engineering. Mr. Scholl became our Chief Technology Officer in September 1995. Prior to joining us, Mr. Scholl was General Manager, Vacuum Products Division at Varian Associates, Inc., a manufacturer of high-technology systems and components.

ITEM 2. PROPERTIES

Information concerning our principal properties is set forth below:

| LOCATION | TYPE | PRINCIPAL USE | SQ. FOOTAGE | OWNERSHIP |
|----------------------|---------------|---|-------------|-----------|
| ----- | ---- | ----- | ----- | ----- |
| Tempe, AZ | Office | Distribution | 2,000 | Leased |
| Milpitas, CA | Office | Distribution | 9,000 | Leased |
| San Jose, CA | Office | Distribution | 20,000 | Leased |
| Fort Collins, CO | Office, plant | Headquarters, Research and development, Manufacturing, Distribution | 297,000 | Leased |
| Longmont, CO | Office, plant | Research and development, Manufacturing, Distribution | 45,000 | Owned |
| Matthews, NC | Office, plant | Research and development, Manufacturing, Distribution | 10,000 | Leased |
| Voorhees, NJ | Office, plant | Research and development, Manufacturing, Distribution | 78,000 | Leased |
| Beaverton, OR | Office | Distribution | 2,000 | Leased |
| Austin, TX | Office, plant | Manufacturing, Distribution | 26,000 | Leased |
| Dallas, TX | Office | Distribution | 2,000 | Leased |
| Vancouver, WA | Office, plant | Research and development, Manufacturing, Distribution | 32,000 | Leased |
| Shenzhen, China | Office | Distribution | 3,000 | Leased |
| Bicester, England | Office | Distribution | 1,000 | Leased |
| Dresden, Germany | Office, plant | Manufacturing, Distribution | 2,000 | Leased |
| Filderstadt, Germany | Office | Research and development, Distribution | 9,000 | Leased |
| Kirchheim, Germany | Office | Distribution | 2,000 | Leased |
| Hachioji, Japan | Office, plant | Research and development, Manufacturing, Distribution | 50,000 | Owned |
| Tokyo, Japan | Office | Distribution | 8,000 | Leased |
| Edinburgh, Scotland | Office, plant | Manufacturing, Distribution | 2,000 | Leased |
| Bundang, South Korea | Office | Distribution | 6,000 | Leased |
| Bundang, South Korea | Office, plant | Manufacturing, Distribution | 6,000 | Owned |
| Hsinchu, Taiwan | Office | Distribution | 3,000 | Leased |
| Taipei Hsien, Taiwan | Office | Distribution | 12,000 | Leased |

We consider all of the above facilities suitable and adequate to meet our production and office space needs for the foreseeable future. We believe that suitable additional or alternative space will be available in the future on commercially reasonable terms as needed.

In 2001, we phased out our Austin, Texas manufacturing facility, to outsource assembly of certain DC power products, and we began to transition our Voorhees, New Jersey facility from a manufacturing site to a design center. We also closed our manufacturing facility in San Jose, California, to transfer the manufacturing of our solid-state temperature control systems to Vancouver, Washington, to be co-located with the manufacturing of our optical fiber temperature measurement and control systems.

ITEM 3. LEGAL PROCEEDINGS

From time to time, we are party to various legal proceedings relating to our business. We are not currently party to any material legal proceedings, except as described below:

We are the defendant in an action filed by Applied Science and Technology, Inc., a Delaware corporation. The civil action was filed in the U.S. District Court for the District of Delaware on November 30, 2000. Applied Science and Technology, which is a subsidiary of MKS Instruments, Inc., alleges that we are infringing upon its patent by manufacturing and selling reactive gas generators. Applied Science and Technology seeks injunctive relief and damages in an unspecified amount. A trial date has been set for May 13, 2002. We have retained counsel to defend us and we believe we have meritorious defenses to the claim. We have denied the allegation of infringement, claimed the existence of prior art which would invalidate the MKS patent, and believe that we have a reasonable chance of prevailing at trial.

We are also a defendant in an action filed by Sierra Applied Sciences, Inc., a Colorado corporation. The civil action was filed in the U.S. District Court for the District of Colorado on September 17, 2001. The action is a Complaint for Declaratory Judgment. An answer was filed on November 9, 2001. Discovery and Settlement Discussions are in progress. Plaintiffs seek a declaratory judgment from the court that our patent is invalid or that the plaintiffs' products do not infringe on the patent. We are confident that the validity of this patent will be upheld. Based on the information available, we believe there is no potential liability in this action.

An interference action has been filed in the United States Patent Office by Unaxis, wherein Unaxis claims prior invention of one of our concepts, for which we filed a patent application in 1992 and which ultimately resulted in U.S. Patent No. 6,001,224 being issued to us. Should Unaxis prevail, the effective result would be transference of the patent rights over the concept to Unaxis. Unaxis could then choose to license those rights to us, or could block use of this idea, forcing us to drop certain of our products or to limit their sale to noninfringing uses. We have reason to believe that we will prevail in the interference proceeding, and are vigorously defending ourselves before the Board of Interferences in the United States Patent Office."

ITEM 4. SUBMISSION OF MATTERS TO A VOTE OF SECURITY HOLDERS

Not applicable.

PART II

ITEM 5. MARKET PRICE FOR REGISTRANT'S COMMON STOCK AND RELATED STOCKHOLDER MATTERS

Advanced Energy's common stock is traded on the Nasdaq National Market under the symbol AEIS. At March 18, 2002, the number of common stockholders of record was 783, and the last sale price on that day was \$33.560.

Below is a table showing the range of high and low trades for the common stock as quoted (without retail markup or markdown and without commissions) on the Nasdaq National Market; quotations do not necessarily represent actual transactions:

| | High Trade Price | Low Trade Price |
|------------------|------------------|-----------------|
| | ----- | ----- |
| 2000 Fiscal Year | | |
| First Quarter | 77.438 | 42.938 |
| Second Quarter | 72.875 | 35.250 |
| Third Quarter | 63.000 | 32.125 |
| Fourth Quarter | 35.500 | 15.000 |
| 2001 Fiscal Year | | |
| First Quarter | 35.750 | 19.813 |
| Second Quarter | 45.060 | 22.250 |
| Third Quarter | 43.400 | 16.350 |
| Fourth Quarter | 29.250 | 15.400 |

Advanced Energy has not declared or paid any cash dividends on its capital stock since it terminated its election to be treated as an S corporation for tax purposes, effective January 1, 1994. Advanced Energy currently intends to retain all future earnings to finance its business. Accordingly, Advanced Energy does not anticipate paying cash or other dividends on its common stock in the foreseeable future. Furthermore, Advanced Energy's revolving credit facility prohibits the declaration or payment of any cash dividends on its common stock.

ITEM 6. SELECTED CONSOLIDATED FINANCIAL DATA

The following selected consolidated financial data is qualified by reference to, and should be read with, our 2001 Consolidated Financial Statements, related notes and management's discussion included in this Form 10-K. The selected consolidated statement of operations data for the years ended December 31, 2001, 2000 and 1999, and the related consolidated balance sheet data as of and for the years ended December 31, 2001 and 2000, were derived from consolidated financial statements audited by Arthur Andersen LLP, independent accountants, whose related audit report is included in this Form 10-K. The selected consolidated statement of operations data for the years ended December 31, 1998 and 1997, and the related consolidated balance sheet data as of December 31, 1999, 1998 and 1997, were derived from audited consolidated financial statements not included in this Form 10-K.

| | YEARS ENDED DECEMBER 31, | | | | |
|---|---------------------------------------|-----------|--------------|-------------|-----------|
| | 2001 | 2000 | 1999 | 1998 | 1997 |
| | ----- | ----- | ----- | ----- | ----- |
| | (IN THOUSANDS, EXCEPT PER SHARE DATA) | | | | |
| STATEMENT OF OPERATIONS DATA: | | | | | |
| Sales | \$ 193,600 | \$359,782 | \$202,849 | \$ 134,019 | \$188,339 |
| Gross profit | 57,432 | 176,453 | 92,202 | 40,019 | 71,656 |
| Total operating expenses | 104,319 | 91,253 | 62,876 | 54,767 | 49,889 |
| (Loss) income from operations | (46,887) | 85,200 | 29,326 | (14,748) | 21,767 |
| Net (loss) income | \$ (31,379) | \$ 68,034 | \$ 19,066 | \$ (11,025) | \$ 12,931 |
| | ===== | ===== | ===== | ===== | ===== |
| Diluted (loss) earnings per share | \$ (0.99) | \$ 2.10 | \$ 0.62 | \$ (0.38) | \$ 0.48 |
| Diluted weighted-average common shares outstanding | 31,712 | 32,425 | 30,934 | 29,007 | 27,057 |
| | | | DECEMBER 31, | | |
| | 2001 | 2000 | 1999 | 1998 | 1997 |
| | ----- | ----- | ----- | ----- | ----- |
| | (IN THOUSANDS) | | | | |
| BALANCE SHEET DATA: | | | | | |
| Cash, cash equivalents and marketable securities | \$ 271,978 | \$189,527 | \$207,483 | \$ 28,714 | \$ 32,551 |
| Working capital | 350,443 | 277,154 | 257,484 | 63,225 | 77,188 |
| Total assets | 450,195 | 365,835 | 325,433 | 107,736 | 136,545 |
| Total debt | 207,730 | 83,980 | 139,012 | 1,603 | 8,784 |
| Stockholders' equity | 214,345 | 238,798 | 156,989 | 92,163 | 99,969 |

ITEM 7. MANAGEMENT'S DISCUSSION AND ANALYSIS OF FINANCIAL CONDITION AND RESULTS OF OPERATIONS

The following discussion contains, in addition to historical information, forward-looking statements, within the meaning of Section 27A of the Securities Act of 1933, as amended, and Section 21E of the Securities Exchange Act of 1934, as amended. Statements that are other than historical information are forward-looking statements. For example, statements relating to our beliefs, expectations and plans are forward-looking statements, as are statements that certain actions, conditions or circumstances will continue. Forward-looking statements involve risks and uncertainties. As a result, our actual results may differ materially from the results discussed in the forward-looking statements. Factors that could cause or contribute to such differences or prove any forward-looking statements, by hindsight, to be overly optimistic or unachievable, include, but are not limited to the following:

- changes or slowdowns in general economic conditions or conditions in the semiconductor and semiconductor capital equipment industries and other industries in which our customers operate;
- the timing and nature of orders placed by major customers;
- changes in customers' inventory management practices;
- customer cancellations of previously placed orders and shipment delays;
- pricing competition from our competitors;
- component shortages or allocations or other factors that change our levels of inventory or substantially increase our spending on inventory;
- the introduction of new products by us or our competitors;
- costs incurred by responding to specific feature requests by customers;
- declines in macroeconomic conditions;
- timing and challenges of integrating recent and potential future acquisitions and strategic alliances; and
- our ability to attract and retain key personnel.

For a discussion of these and other factors that may impact our realization of our forward-looking statements, see Part I "Cautionary Statements - Risk Factors."

OVERVIEW

We design, manufacture and support a group of key subsystems for vacuum process systems. Our primary subsystems include complex power conversion and control systems. Our products also control the flow of gases into the process chambers and provide thermal control and sensing within the chamber. Our customers use our products in plasma-based thin-film processing equipment that is essential to the manufacture of semiconductors; compact disks, DVDs and other digital storage media; flat-panel computer and television screens; coatings for architectural glass and optics; and a power supply for advanced technology computer workstations. We also sell spare parts and repair services worldwide through our customer service and technical support organization.

We provide solutions to a diversity of markets and geographic regions. However, we are focused on the semiconductor capital equipment industry, which accounted for approximately 59% of our sales in 2001, 70% in 2000 and 65% in 1999. In 1999 and 2000, the semiconductor capital equipment industry was at its historical peak for sales. Conversely, the year 2001 saw the steepest cutback in capital equipment purchases in industry history. These cyclical changes accounted for the 55% reduction in our sales to the semiconductor capital equipment industry between 2000 and 2001. However, during this period, we continued to achieve significant design wins on new equipment at manufacturers, which have resulted in solidifying relationships with our existing customers. We expect future sales to the semiconductor capital equipment industry to represent approximately 55% to 70% of our total revenue, depending upon the strength or weakness of the industry cycles.

In order to provide higher-value products, the semiconductor capital equipment industry is in the midst of significant consolidation. To help insure our continued growth and maintain our competitive advantage, we have done the following:

- In April 2000, we acquired Noah Holdings, Inc., which manufactures solid-state temperature control systems to control process temperatures during semiconductor manufacturing.
- In August 2000, we acquired Sekidenko, Inc., which supplies optical fiber thermometers to the semiconductor capital equipment industry.
- In January 2001, we acquired Engineering Measurements Company, or EMCO, which manufactures electronic and electromechanical precision instruments for measuring and controlling the flow of liquids, steam and gases for the semiconductor and other industries.
- In January 2002, we acquired Aera Japan Limited. Aera primarily supplies the semiconductor capital equipment industry with product lines that include

digital mass flow controllers, pressure-based mass flow controllers, liquid mass flow controllers, ultrasonic liquid flow meters and liquid vapor delivery systems.

These product offerings complement our position as a global leader for complex power conversion and control systems, and process instruments, allowing us to provide best of breed components and develop systems to increase the precision and productivity of our customers' products. It is also possible that we will acquire other companies or form strategic alliances as the industry consolidation continues.

We have taken strategic financing actions to enable us to pursue these investments. In November 1999, we completed two public offerings, one for \$135 million of convertible subordinated notes with a conversion price of \$49.53, due in 2006, and one for 1,000,000 shares of our common stock, at a price of \$39 per share. These offerings provided aggregate net proceeds of approximately \$167.1 million. In the fourth quarter of 2000, we repurchased \$53.4 million of these notes on the open market, leaving us with \$81.6 million outstanding. These purchases resulted in an after-tax net extraordinary gain of \$7.6 million. In August 2001, we completed an additional offering of convertible subordinated notes, providing aggregate net proceeds of approximately \$121.25 million with a conversion price of \$29.83, also due in 2006. These financings are discussed in more detail in the "Liquidity and Capital Resources" section.

We have also taken strategic marketing actions to provide for improved distribution channels. In December 1999, we completed formation of our wholly owned sales and service subsidiary in Taiwan. In October 2000, we opened a representative office in Shenzhen, China, to be responsible for market development, sales and technical support in China. We have also begun developing a sales force focused on selling to end users of our products.

Historically, our sales have primarily been to OEM manufacturers of semiconductor manufacturing equipment, but many of our newer products can be marketed directly to the end user for new or previously installed equipment. In some cases, the end user can direct the OEM to utilize our subsystems rather than our competitors.

RESULTS OF OPERATIONS

SALES

Sales were \$193.6 million in 2001, \$359.8 million in 2000 and \$202.8 million in 1999, representing a decrease of 46% from 2000 to 2001 and an increase of 77% from 1999 to 2000. The changes in the level of our sales were primarily due to changes in demand for our systems from semiconductor capital equipment manufacturers, including many of our largest customers. The volatility in the semiconductor industry impacted overall investment activities, which led to semiconductor manufacturers purchasing less capital

equipment.

While sales of semiconductor capital equipment have grown at a compounded annual growth rate of approximately 19% since 1960, the industry is highly cyclical and is impacted by changes in the macroeconomic environment, changes in semiconductor supply and demand, and rapid technological advances in both semiconductor devices and wafer fabrication processes. Rapid growth and expansion during 1999 and part of 2000 was followed by the most sudden and pronounced slump in industry history, with year-to-year revenues falling approximately 40% throughout the industry from 2000 to 2001. Our sales over the last three years illustrate this cyclicity.

Sales in 1999 and 2000 reflected the recovery in the semiconductor capital equipment industry from the severe downturn of 1998, and resulted from capacity expansion and increased investment in advanced technology by the semiconductor industry. This two-year recovery resulted in record sales for us, driven by sales to the semiconductor capital equipment industry. The decrease in sales in 2001 was due to a worldwide slowdown in demand for semiconductors, which resulted in a sudden and rapid decline in demand for semiconductor manufacturing equipment. Inventory buildups, slower than expected personal computer sales and slower global economic growth resulted in reduced capital investment by semiconductor manufacturers and their suppliers.

The following tables summarize annual net sales, and percentages of net sales, by customer type for each of the three years in the period ended December 31, 2001:

| | YEARS ENDED DECEMBER 31, | | |
|--|--------------------------|-----------|-----------|
| | 2001 | 2000 | 1999 |
| | (IN THOUSANDS) | | |
| Semiconductor capital equipment | \$114,273 | \$252,889 | \$131,395 |
| Data storage | 10,043 | 24,751 | 21,823 |
| Flat panel display | 18,145 | 29,273 | 11,171 |
| Advanced product applications | 35,698 | 37,726 | 28,563 |
| Customer service technical support ... | 15,441 | 15,143 | 9,897 |
| | \$193,600 | \$359,782 | \$202,849 |
| | ===== | ===== | ===== |

| | YEARS ENDED DECEMBER 31, | | |
|--|--------------------------|------|------|
| | 2001 | 2000 | 1999 |
| Semiconductor capital equipment | 59% | 70% | 65% |
| Data storage | 5 | 7 | 11 |
| Flat panel display | 10 | 8 | 5 |
| Advanced product applications | 18 | 11 | 14 |
| Customer service technical support ... | 8 | 4 | 5 |
| | 100% | 100% | 100% |
| | === | === | === |

The following table summarizes annual percentage changes in net sales by customer type for us from 2000 to 2001 and from 1999 to 2000:

| | 2001 CHANGE FROM 2000 | 2000 CHANGE FROM 1999 |
|--|--------------------------|--------------------------|
| Semiconductor capital equipment | (55)% | 92% |
| Data storage | (59)% | 13% |
| Flat panel display | (38)% | 162% |
| Advanced product applications | (5)% | 32% |
| Customer service technical support | 2% | 53% |
| Total sales | (46)% | 77% |

The following tables summarize annual net sales, and percentages of net sales, by geographic region for each of the three years in the period ended December 31, 2001:

| | YEARS ENDED DECEMBER 31, | | |
|--------------------------------|--------------------------|-----------|-----------|
| | 2001 | 2000 | 1999 |
| | ----- | ----- | ----- |
| | (IN THOUSANDS) | | |
| United States and Canada | \$124,746 | \$260,596 | \$148,424 |
| Europe | 28,957 | 52,893 | 32,344 |
| Asia Pacific | 39,038 | 45,874 | 21,583 |
| Rest of world | 859 | 419 | 498 |
| | ----- | ----- | ----- |
| | \$193,600 | \$359,782 | \$202,849 |
| | ===== | ===== | ===== |

| | YEARS ENDED DECEMBER 31, | | |
|--------------------------------|--------------------------|-------|-------|
| | 2001 | 2000 | 1999 |
| | ----- | ----- | ----- |
| United States and Canada | 64% | 72% | 73% |
| Europe | 15 | 15 | 16 |
| Asia Pacific | 21 | 13 | 11 |
| Rest of world | -- | -- | -- |
| | --- | --- | --- |
| | 100% | 100% | 100% |
| | === | === | === |

GROSS MARGIN

Our gross margin was 29.7% in 2001, 49.0% in 2000 and 45.5% in 1999.

The major items affecting the reduction in our margin in 2001 were:

- The adverse impact of much lower sales on the absorption of higher year-over-year fixed overhead. Historically, the rapid changes in industry demand have resulted in significant increases in manufacturing capacity during upturns followed by severe underutilization of these facilities in subsequent downturns. As the semiconductor capital equipment market's expansion of 1999 and 2000 was forecasted to continue into 2001, we increased our manufacturing capacity in Fort Collins, Colorado to meet this continued expected growth. This facility was completed in the first quarter of 2001 when the industry downturn was just beginning. While we understood that there was a risk of opening up a new facility after eight quarters of industry growth, the new facility was necessary to ensure our continued ability to meet demand and maintain our reputation as a leading supplier to the semiconductor capital equipment industry. This new facility also positions us to take advantage of the next up cycle in a much more efficient manner, which should have a positive impact on future operating results.

- The industry is moving to 300mm equipment and smaller line widths. These technology changes require new products that we have developed or are developing. Typical of products early in their life cycle and at low production levels, these products have lower margins than our established products. Margins on these products should improve over the next 12 months.

- We reduced our fixed overhead through headcount reductions in force of some of our manufacturing staff, when we saw our level of sales decline in 2001, though we do retain certain knowledgeable employees with specific skill sets, to be ready for unexpected industry ramp-ups.

- Our cost of sales has also been adversely affected by periodic writedowns of excess and obsolete inventory, often exacerbated by industry cycles, and recent warranty expenses in excess of historical rates related to certain products, which required substantial rework, repair, and in some cases, replacement.

Given the rapid change in technology, we monitor and forecast expected inventory needs based on our constantly changing sales forecast. Inventory is written down or written off when it becomes obsolete, generally because of engineering changes to a product or discontinuance of a product line, or when it is deemed excess. Charges for obsolete and excess inventory were \$6.4 million in 2001, \$654,000 in 2000 and \$1.5 million in 1999, which affected gross margins by 3.3%, 0.2% and 0.8% in these years. The amount of inventory written down in 2001 is primarily attributable to the severe decrease in product sales, which caused a larger than normal amount of inventory to become excess based on recent sales forecasts.

We provide warranty coverage for our systems ranging from 12 to 36 months, with the majority of our products ranging from 18 to 24 months, and estimate the anticipated costs of repairing our systems under such warranties based on the historical average costs of the repairs. We recognized charges for warranty expense of \$7.6 million in 2001, \$4.6 million in 2000 and \$3.1 million in 1999. The assumptions we use to estimate warranty accruals are reevaluated periodically in light of actual experience and, when appropriate, the accruals are adjusted. Our determination of the appropriate level of warranty accrual is subjective, and based on estimates, and actual experience can be different than our expectations.

The improvement in gross margin from 1999 to 2000 was primarily a result of a more favorable absorption of manufacturing costs, which resulted from the higher sales base.

Historically, price competition has not had a material effect on margins. However, competitive pressures may produce a decline in average selling prices for certain products. Any decline in average selling prices not offset by reduced costs could result in declines in our gross margins.

RESEARCH AND DEVELOPMENT

We believe continued investment in the research and development of new systems is critical to our ability to serve new and existing markets, develop new products and improve existing product designs to achieve our vision of convergent technologies. We continue to invest heavily in new product development even during industry downturns,

to be advantageously positioned for turnaround in demand for old and new products, which often occurs during sudden and unpredictable industry upturns. Since our inception, all of our research and development costs have been expensed as incurred.

Our research and development expenses were \$45.2 million in 2001, \$37.0 million in 2000 and \$28.3 million in 1999, representing an increase of 22% from 2000 to 2001 and 31% from 1999 to 2000. As a percentage of sales, research and development expenses increased from 10.2% in 2000 to 23.3 % in 2001 because of the lower sales base, but decreased from 14.0% in 1999 to 10.2% in 2000 because of increased levels of revenue in 2000. The annual increases in expenditures from 1999 to 2001 are primarily due to increases in payroll, materials and supplies and depreciation of equipment used for new product development and partially due to the acquisition of EMCO in 2001.

SALES AND MARKETING EXPENSES

As we continue our worldwide expansion, and expand our product offerings through acquisitions, our sales and marketing efforts have become increasingly complex. We continue to refine our sales and marketing functions as we acquire and integrate new companies. We have begun an effort to market directly to end users of our systems, in addition to our traditional marketing to manufacturers of semiconductor capital equipment and other industries. Our sales and marketing expenses support domestic and international sales and marketing activities that include personnel, trade shows, advertising, and other selling and marketing activities.

Sales and marketing expenses were \$23.8 million in 2001, \$24.1 million in 2000 and \$18.3 million in 1999. This represents a 32% increase from 1999 to 2000, and essentially no change from 2000 to 2001. The increase in expenses from 1999 to 2000 was to support the sales growth during the 2000 upturn in the semiconductor capital equipment industry. As a percentage of sales, sales and marketing expenses increased from 6.7% to 12.3% in 2001 due to the lower sales base in 2001, but decreased from 9.0% in 1999 to 6.7% in 2000 because of the higher sales base in 2000, even while dollars spent increased.

GENERAL AND ADMINISTRATIVE EXPENSES

Our general and administrative expenses support our worldwide corporate legal, patent, tax, financial, administrative, information systems and human resources functions in addition to our general management. General and administrative expenses were \$21.5 million in 2001, \$24.6 million in 2000 and \$16.2 million in 1999. The 12% decrease from 2000 to 2001 is primarily due to lower spending for payroll, primarily employee bonuses, which were eliminated in 2001 due to the decline in operating profitability. The 51% increase from 1999 to 2000 is primarily due to higher spending for payroll, including employee bonuses, and purchased services. As a percentage of sales, general and administrative expenses increased from 6.8% in 2000 to 11.1% in 2001 because of the lower sales base in 2001, and decreased from 8.0% in 1999 to 6.8% in 2000 because of

the higher sales base in 2000. General and administrative expenses in 2001 also included approximately \$500,000 of legal costs in connection with patent infringement litigation.

GOODWILL IMPAIRMENT

During the second quarter of 2001, we terminated the operations of our Tower Electronics, Inc. subsidiary and our Fourth State Technology, or FST, product line, due to significant softening in the projected demand for these products. Revenue contributed by Tower and FST operations for 2001, 2000 and 1999 represented less than five percent of our total revenue in each of these years. As a result of these actions, estimated related future cash flows no longer supported the carrying amounts of related goodwill, and we recorded goodwill impairment charges of \$5.4 million in 2001 related to Tower and FST.

OTHER OPERATING EXPENSES

Beginning in April 2000, we made periodic advances to or investments in Symphony Systems, Inc., a privately held, early-stage developer of equipment productivity management software. In addition to the approximately \$8 million received from us as investments, advances and license payments, Symphony received investments of \$7 million from other parties. In 2000, we obtained an exclusive license, for which we paid \$1.5 million, to use Symphony's products in the semiconductor industry. In connection with certain of our 2001 advances, we obtained a security interest in all of Symphony's intellectual and proprietary property.

Beginning in the third quarter of 2001, and continuing through the end of the year, Symphony's financial situation began to deteriorate significantly, and we determined that due to its need for immediate liquidity, its declining business prospects (including the indefinite postponement of a significant order for its products from a major semiconductor equipment manufacturer) and other factors, the value of our investment in and advances to Symphony had substantially declined. Given the precarious financial condition of Symphony, we valued our investments in and advances to Symphony at December 31, 2001, at approximately \$1 million, which reflects our assessment of the value of the Symphony technology license, which has continuing value to us. The amount of the writedown related to Symphony was \$6.8 million, all of which was recorded in 2001 as an operating expense.

Since Symphony effectively ceased operations in February 2002, we have hired its key employees and we intend to purchase Symphony's remaining assets in a foreclosure, liquidation or bankruptcy sale in the near future. At no time did our percentage ownership in the voting stock of Symphony exceed approximately 1.7%, and we have never had the ability to exercise significant influence over Symphony.

RESTRUCTURING AND MERGER COSTS AND ONE-TIME CREDIT

In April 2000, we acquired Noah in a pooling of interests under the previous rules of Accounting Principles Board (APB) Opinion No. 16. The merger involved the exchange of 687,000 shares of Advanced Energy common stock for the privately held common stock of Noah. As part of the business combination, we took a charge of \$2.3 million in the second quarter of 2000 for merger costs, which cannot be capitalized and which in certain cases were nondeductible for income tax purposes.

In July 2000, we announced the consolidation of our Tower facility in Fridley Minnesota, into our existing facility in Voorhees, New Jersey. We recorded a restructuring charge of \$1.0 million in the third quarter of 2000 related to the consolidation, which was completed during the fourth quarter of 2000.

In August 2000, we acquired Sekidenko in a merger that was accounted for as a pooling of interests. This merger involved the exchange of 2.1 million shares of Advanced Energy common stock for the privately held common stock of Sekidenko. As part of the business combination, we took a charge of \$2.3 million in the third quarter of 2000 for merger costs, which cannot be capitalized and which in certain cases were nondeductible for income tax purposes.

In July 2001, the Financial Accounting Standards Board issued SFAS No. 141, which requires that the purchase method of accounting be used for all business combinations initiated after June 30, 2001.

In the first quarter of 2001, we received a \$1.5 million settlement for recovery of legal expenses pertaining to a patent infringement suit in which we were the plaintiff.

During the second quarter of 2001, in response to the downturn in the semiconductor capital equipment industry, we implemented two reductions in force totaling approximately 135 regular employees and 90 temporary employees and recorded a charge of \$614,000 for restructuring and severance costs, including fringe benefits. We paid cash to the affected employees in this amount during the second quarter of 2001, and at December 31, 2001 the remaining liability was not significant.

During the fourth quarter of 2001, in response to the sustained downturn in the semiconductor capital equipment industry and global economy, we announced and implemented additional cost-reduction measures, and recorded a charge of \$2.5 million. Such measures included a reduction in force of 107 employees; phasing out our Austin, Texas manufacturing facility to begin outsourcing the assembly of certain DC power products; the transition of our Voorhees, New Jersey facility from a manufacturing site to a design center; and the closure of Noah's manufacturing and office facilities in San Jose, California, due to the transfer of Noah's manufacturing to Vancouver, Washington, to be co-located with Sekidenko. These costs included payments required under operating

lease contracts and costs for writing down related leasehold improvements for facilities. At December 31, 2001, approximately \$1.3 million related to the fourth quarter of 2001 restructuring and severance actions was accrued as a current liability.

OTHER (EXPENSE) INCOME

Other (expense) income consists primarily of interest income and expense, foreign exchange gains and losses and other miscellaneous gains, losses, income and expense items.

Interest income was approximately \$6.6 million in 2001, \$10.7 million in 2000 and \$2.2 million in 1999. Our interest income in 2001 was lower than in 2000 due to our use of cash and marketable securities to repurchase a portion of our 5.25% convertible subordinated notes in the fourth quarter of 2000 and because of our purchase of EMCO in January 2001. The lower interest income in 2001 was also due to the decline in interest rates throughout 2001 resulting from the Federal Reserve's lowering of interest rates. In 1999, interest income was earned primarily from earnings on investments made from the proceeds of our initial public offering in 1995 and our underwritten public offering in 1997. In November 1999, our cash and marketable securities increased substantially from the proceeds of additional offerings of convertible subordinated notes and common stock, resulting in higher interest income in 2000.

Interest expense consists principally of accruals of interest on our convertible subordinated notes, on borrowings under our bank credit and capital lease facilities and a state government loan, the latter of which has been repaid. Interest expense was approximately \$7.4 million in 2001, \$7.7 million in 2000 and \$1.4 million in 1999. The increase of interest expense from 1999 to 2000 was primarily due to interest on the convertible subordinated notes.

Our foreign subsidiaries' sales are primarily denominated in currencies other than the U.S. dollar. We recorded net foreign currency losses of \$235,000 in 2001 and \$196,000 in 2000, and a net foreign currency gain of \$1.5 million in 1999. The losses in 2000 and 2001 were due to a weakening of the exchange rate of the Japanese yen to the U.S. dollar, partially offset by the effect of our use of forward foreign exchange contracts. The gain in 1999 was primarily due to strengthening of the exchange rate of the Japanese yen to the U.S. dollar. Since 1997, we have entered into various forward foreign exchange contracts to mitigate currency fluctuations in the Japanese yen. We continue to evaluate various policies to minimize the effect of foreign currency fluctuations. At December 31, 2001, we had \$6.5 million of foreign currency forward contracts outstanding.

Miscellaneous expense items were \$1.0 million in 2001 and \$698,000 in 1999. Miscellaneous income of \$4.7 million in 2000 was primarily due to a \$4.8 million gain on a sale of an investment.

(BENEFIT) PROVISION FOR INCOME TAXES

The income tax benefit of \$17.4 million for 2001 represented an effective rate of 36%. The income tax provision of \$36.8 million in 2000, which included \$4.6 million of provision for an extraordinary item, represented an effective rate of 35%. The income tax provision of \$11.7 million for 1999 represented an effective rate of 38%. Changes in our relative earnings and the earnings of our foreign subsidiaries affect our consolidated effective tax rate. We adjust our income taxes periodically based upon the anticipated tax status of all foreign and domestic entities, and have adopted income tax planning strategies to reduce our worldwide income tax expense.

EXTRAORDINARY GAIN

In the fourth quarter of 2000, we repurchased an aggregate of approximately \$53.4 million principal amount of our convertible subordinated notes in the open market, for a cost of approximately \$40.8 million. These purchases resulted in a pretax extraordinary gain of \$12.2 million, or \$7.6 million after tax, and reduced the level of our fixed cost interest expense until we acquired additional subordinated debt in the third quarter of 2001.

SUMMARY RESULTS OF OPERATIONS

The following table summarizes certain data as a percentage of sales extracted from our statement of operations:

| | YEARS ENDED DECEMBER 31, | | |
|---|--------------------------|--------|--------|
| | 2001 | 2000 | 1999 |
| Sales | 100.0% | 100.0% | 100.0% |
| Cost of sales | 70.3 | 51.0 | 54.5 |
| Gross margin | 29.7 | 49.0 | 45.5 |
| Operating expenses: | | | |
| Research and development | 23.3 | 10.2 | 14.0 |
| Sales and marketing | 12.3 | 6.7 | 9.0 |
| General and administrative | 11.1 | 6.8 | 8.0 |
| Goodwill impairment | 2.8 | -- | -- |
| Other impairments | 3.6 | -- | -- |
| Restructuring charges | 1.6 | 0.3 | -- |
| Merger costs | -- | 1.3 | -- |
| Litigation recovery | (0.8) | -- | -- |
| Total operating expenses | 53.9 | 25.3 | 31.0 |
| (Loss) income from operations | (24.2) | 23.7 | 14.5 |
| Other (expense) income | (1.1) | 2.1 | 0.7 |
| Net (loss) income before income taxes, minority interest and extraordinary item | (25.3) | 25.8 | 15.2 |
| (Benefit) provision for income taxes | (9.0) | 9.0 | 5.8 |
| Minority interest in net (loss) income | (0.1) | -- | -- |
| Net (loss) income before extraordinary item | (16.2) | 16.8 | 9.4 |
| Extraordinary item (net of applicable taxes) | -- | 2.1 | -- |
| Net (loss) income | (16.2)% | 18.9% | 9.4% |

QUARTERLY RESULTS OF OPERATIONS

The following tables present unaudited quarterly results in dollars and as a percentage of sales for each of the eight quarters in the period ended December 31, 2001. We believe that all necessary 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 | | | | | | | |
|---|---------------------------------------|------------------|-------------------|------------------|------------------|------------------|-------------------|------------------|
| | MAR. 31, 2000 | JUNE 30, 2000 | SEPT. 30, 2000 | DEC. 31, 2000 | MAR. 31, 2001 | JUNE 30, 2001 | SEPT. 30, 2001 | DEC. 31, 2001 |
| | (In thousands, except per share data) | | | | | | | |
| Sales | \$ 75,028 | \$ 85,701 | \$ 96,317 | \$102,736 | \$ 74,714 | \$ 46,171 | \$ 38,722 | \$ 33,993 |
| Cost of sales | 38,361 | 43,338 | 49,492 | 52,138 | 43,491 | 38,390 | 27,686 | 26,601 |
| Gross profit | 36,667 | 42,363 | 46,825 | 50,598 | 31,223 | 7,781 | 11,036 | 7,392 |
| Operating expenses: | | | | | | | | |
| Research and development | 8,113 | 8,504 | 9,711 | 10,668 | 12,389 | 11,040 | 10,967 | 10,755 |
| Sales and marketing | 5,867 | 5,373 | 6,232 | 6,629 | 6,629 | 5,963 | 5,694 | 5,498 |
| General and administrative | 5,639 | 5,810 | 6,748 | 6,376 | 6,174 | 5,645 | 4,817 | 4,886 |
| Goodwill impairment | -- | -- | -- | -- | -- | 5,446 | -- | -- |
| Other impairments | -- | -- | -- | -- | -- | -- | 1,221 | 5,625 |
| Restructuring charges | -- | -- | 1,000 | -- | -- | 614 | -- | 2,456 |
| Merger costs | -- | 2,333 | 2,250 | -- | -- | -- | -- | -- |
| Litigation recovery | -- | -- | -- | -- | (1,500) | -- | -- | -- |
| Total operating expenses | 19,619 | 22,020 | 25,941 | 23,673 | 23,692 | 28,708 | 22,699 | 29,220 |
| Income (loss) from operations | 17,048 | 20,343 | 20,884 | 26,925 | 7,531 | (20,927) | (11,663) | (21,828) |
| Other income (expense) | 120 | 731 | 5,598 | 1,036 | 187 | (70) | (711) | (1,484) |
| Net income (loss) before income taxes, minority interest and extraordinary item | 17,168 | 21,074 | 26,482 | 27,961 | 7,718 | (20,997) | (12,374) | (23,312) |
| Provision (benefit) for income taxes .. | 5,947 | 8,023 | 10,195 | 8,076 | 2,689 | (6,553) | (4,704) | (8,873) |
| Minority interest in net (loss) income | (17) | (67) | (2) | 106 | (65) | 105 | (188) | 3 |
| Net income (loss) before extraordinary item | 11,238 | 13,118 | 16,289 | 19,779 | 5,094 | (14,549) | (7,482) | (14,442) |
| Extraordinary item (net of income taxes) | -- | -- | -- | 7,610 | -- | -- | -- | -- |
| Net income (loss) | \$ 11,238 | \$ 13,118 | \$ 16,289 | \$ 27,389 | \$ 5,094 | \$ (14,549) | \$ (7,482) | \$ (14,442) |
| Basic earnings (loss) per share before extraordinary item | \$ 0.36 | \$ 0.42 | \$ 0.52 | \$ 0.63 | \$ 0.16 | \$ (0.46) | \$ (0.24) | \$ (0.45) |
| Diluted earnings (loss) per share before extraordinary item | \$ 0.35 | \$ 0.40 | \$ 0.50 | \$ 0.61 | \$ 0.16 | \$ (0.46) | \$ (0.24) | \$ (0.45) |
| Basic earnings per share from extraordinary item | \$ -- | \$ -- | \$ -- | \$ 0.24 | \$ -- | \$ -- | \$ -- | \$ -- |
| Diluted earnings per share from extraordinary item | \$ -- | \$ -- | \$ -- | \$ 0.22 | \$ -- | \$ -- | \$ -- | \$ -- |
| Basic earnings (loss) per share | \$ 0.36 | \$ 0.42 | \$ 0.52 | \$ 0.87 | \$ 0.16 | \$ (0.46) | \$ (0.24) | \$ (0.45) |
| Diluted earnings (loss) per share | \$ 0.35 | \$ 0.40 | \$ 0.50 | \$ 0.83 | \$ 0.16 | \$ (0.46) | \$ (0.24) | \$ (0.45) |
| Basic weighted-average common shares outstanding | 31,161 | 31,314 | 31,339 | 31,517 | 31,547 | 31,698 | 31,784 | 31,821 |
| Diluted weighted-average common shares outstanding | 32,512 | 32,543 | 32,417 | 34,078 * | 32,187 | 31,698 | 31,784 | 31,821 |

* Includes dilution from subordinated notes

| | QUARTERS ENDED | | | | | | | |
|---|------------------|------------------|-------------------|------------------|------------------|------------------|-------------------|------------------|
| | MAR. 31, 2000 | JUNE 30, 2000 | SEPT. 30, 2000 | DEC. 31, 2000 | MAR. 31, 2001 | JUNE 30, 2001 | SEPT. 30, 2001 | DEC. 31, 2001 |
| Percentage of Sales: | | | | | | | | |
| Sales | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% |
| Cost of sales | 51.1 | 50.7 | 51.4 | 50.7 | 58.2 | 83.1 | 71.5 | 78.3 |
| Gross margin | 48.9 | 49.3 | 48.6 | 49.3 | 41.8 | 16.9 | 28.5 | 21.7 |
| Operating expenses: | | | | | | | | |
| Research and development | 10.8 | 9.9 | 10.0 | 10.4 | 16.6 | 23.9 | 28.3 | 31.6 |
| Sales and marketing | 7.9 | 6.2 | 6.5 | 6.5 | 8.9 | 12.9 | 14.7 | 16.2 |
| General and administrative | 7.5 | 6.8 | 7.0 | 6.2 | 8.3 | 12.2 | 12.4 | 14.4 |
| Goodwill impairment | -- | -- | -- | -- | -- | 11.8 | -- | -- |
| Other impairments | -- | -- | -- | -- | -- | -- | 3.2 | 16.5 |
| Restructuring charges | -- | -- | 1.0 | -- | -- | 1.4 | -- | 7.2 |
| Merger costs | -- | 2.7 | 2.4 | -- | -- | -- | -- | -- |
| Litigation recovery | -- | -- | -- | -- | (2.1) | -- | -- | -- |
| Total operating expenses | 26.2 | 25.6 | 26.9 | 23.1 | 31.7 | 62.2 | 58.6 | 85.9 |
| Income (loss) from operations | 22.7 | 23.7 | 21.7 | 26.2 | 10.1 | (45.3) | (30.1) | (64.2) |
| Other income (expense) | 0.2 | 0.9 | 5.8 | 1.0 | 0.2 | (0.2) | (1.9) | (4.4) |
| Net income (loss) before income taxes, minority interest and extraordinary item | 22.9 | 24.6 | 27.5 | 27.2 | 10.3 | (45.5) | (32.0) | (68.6) |
| Provision (benefit) for income taxes | 7.9 | 9.4 | 10.6 | 7.8 | 3.6 | (14.2) | (12.2) | (26.1) |
| Minority interest in net (loss) income | -- | (0.1) | -- | 0.1 | (0.1) | 0.2 | (0.5) | -- |
| Net income (loss) before extraordinary item | 15.0 | 15.3 | 16.9 | 19.3 | 6.8 | (31.5) | (19.3) | (42.5) |
| Extraordinary item (net of income taxes) | -- | -- | -- | 7.4 | -- | -- | -- | -- |
| Net income (loss) | 15.0% | 15.3% | 16.9% | 26.7% | 6.8% | (31.5)% | (19.3)% | (42.5)% |
| | ===== | ===== | ===== | ===== | ===== | ===== | ===== | ===== |

Due to the cyclical nature of the semiconductor capital equipment industry, and the sudden changes resulting in severe downturns and upturns, we have experienced and expect to continue to experience significant fluctuations in our quarterly operating results. Our levels of operating expenditures are based, in part, on expectations of future revenues that such expenses support. If revenue levels in a particular quarter do not meet expectations, operating results may be adversely affected. A variety of factors have an influence on the level of our revenues in a particular quarter, which include the risk factors listed above in the opening section of this management discussion and analysis.

Our quarterly operating results in 2000 and 2001 reflect the fluctuating demand for our products during this period, principally from manufacturers of semiconductor capital equipment, data storage equipment and flat panel displays, and our ability to adjust our manufacturing capacity to meet this demand. Sales to the semiconductor capital equipment industry increased each quarter throughout 2000 then decreased each quarter throughout 2001 when that industry shifted into a sudden and severe downturn. Data storage sales fluctuated significantly throughout both years. Our revenue from all sectors is heavily influenced by general economic conditions in each of the industries we serve.

Our gross margin maintained a relatively consistent level in each of the quarters in 2000, at approximately 49%. We added new facilities in Fort Collins, Colorado in the first quarter of 2001 to increase our manufacturing capacity to continue meeting this expected growth, which substantially increased our fixed costs. Then, as we entered the sudden and steep decline in volume from the semiconductor capital equipment industry in that quarter, the combination of declining sales and higher fixed costs resulted in lower absorption of fixed overhead and greatly reduced our gross margins throughout 2001. In

addition, the industry slowdown caused more inventory to be deemed excess or obsolete, and warranty costs associated with certain products in excess of historical experience also adversely affected margins, particularly in the second and fourth quarters of 2001.

Research and development, selling and marketing, and general and administrative expenses remained relatively stable throughout the eight quarters of 2000 and 2001, though they generally increased in the second half of 2000. As a percentage of sales, operating expenses have generally declined during periods of rapid sales growth, when sales increased at a rate faster than our need or ability to add personnel and facilities to support the growth. These operating expenses as a percentage of sales have generally increased during periods of flat or decreased sales, when our infrastructure is retained to support strong customer relationships and anticipated future growth.

Other (expense) income consists primarily of interest income and expense, foreign currency gains and losses, and miscellaneous gains, losses, income and expense items. Changes in interest rates and changes in our level of investments in marketable securities drive the quarterly fluctuations in our interest income. Because the interest rates we pay on our long-term debt are fixed, our levels of such debt determine our quarterly interest expense, which decrease when we repurchase such debt and which increase when we make new offerings. Changes in exchange rates and our ability to manage foreign currency exposure determine the quarterly fluctuations in our foreign currency gains and losses. Miscellaneous expense items vary according to the frequency of non-operating events. The largest single item in this category was in the third quarter of 2000 when we recorded a \$4.8 million gain on a sale of an investment.

Our effective rate for income tax provision fluctuated on a quarterly basis throughout 2000 and 2001, varying from 29% to 39%. The fluctuations were due to the timing of certain nondeductible expenses including merger costs, and due to initiatives we implemented in 2000 to reduce our overall rate.

LIQUIDITY AND CAPITAL RESOURCES

Our financing strategy has been to raise capital from debt and equity markets to provide liquidity to enable our investments in acquisitions and alliances, which support our strategic vision of being a single source provider of integrated solutions. We maintain substantial levels of cash and marketable securities to have funding readily available for such investment opportunities when they arise. Since 1995, to better enable such strategic investments, we have attained this liquidity with proceeds from underwritten public offerings of our common stock and, since 1999, offerings of convertible subordinated debt.

Operating activities generated cash of \$7.9 million in 2001, primarily reflecting the impact on net loss of non-cash items and impairments. As part of this net cash provided of \$7.9 million, decreases in accounts receivable and accounts payable provided cash of

\$39.6 million. Operating activities provided cash of \$34.7 million in 2000, primarily as a result of net income exclusive of non-cash charges and credits, reduced by a net increase in working capital other than cash. As part of this net cash provided of \$34.7 million, the net increase in accounts receivable, inventories and accounts payable used cash of \$45.5 million. Operating activities provided cash of \$12.1 million in 1999, reflecting net income adjusted for non-cash charges, offset by approximately \$27.4 million of net increases in receivables, inventories and payables. We expect future receivable and inventory balances to fluctuate with net sales. Any increase in our inventory levels may require the use of cash to finance the inventory. Additionally, we may experience changes in our ability to collect payments from our customers because most of our customers experience the same volatility of the semiconductor capital equipment industry as we.

Investing activities used cash of \$81.2 million in 2001, and consisted of the acquisition of EMCO for \$29.9 million, the net purchase of investments of \$38.8 million and the purchase of property and equipment of \$12.4 million. Investing activities provided cash of \$15.5 million in 2000, and consisted primarily of the purchase of property and equipment of \$14.1 million and the purchase of investments of \$3.5 million, offset by proceeds from the sale of investments and marketable securities of \$33.1 million. Investing activities used cash of \$177.9 million in 1999, and consisted of a net increase in marketable securities of \$170.6 million and the purchase of property and equipment of \$7.2 million. Investing cash flows experience significant fluctuations from year to year as we buy and sell marketable securities, which we convert to cash to fund strategic investments, and as we transfer cash into marketable securities when we attain levels of cash that are greater than needed for current operations.

Financing activities provided cash of \$124.1 million in 2001, and consisted primarily of proceeds from convertible debt of \$121.25 million and proceeds from the exercise of employee stock options and sale of common stock through our employee stock purchase plan, or ESPP, of \$4.0 million. Financing activities used cash of \$37.5 million in 2000, and consisted primarily of open market repurchases of our convertible notes of \$40.8 million, offset by proceeds from the exercise of employee stock options and sale of common stock through our ESPP of \$4.9 million. Financing activities provided cash of \$174.5 million in 1999, and consisted of net proceeds from convertible subordinated debt of \$130.5 million, net proceeds from the sale of common stock of \$37.8 million, proceeds from the exercise of employee stock options and sale of common stock through our ESPP of \$4.5 million, and other proceeds of \$1.7 million.

We plan to spend approximately \$10 million in 2002 for the acquisition of equipment, leasehold improvements and furnishings, with depreciation expense for 2002 projected to be \$12 million. Our planned level of capital expenditures is subject to frequent revisions because our business experiences sudden changes as we move into industry upturns and downturns and expected sales levels change. In January 2002, we used cash of approximately \$44 million, in addition to assuming approximately \$34 million of debt, to purchase the outstanding common stock of Aera. In February 2002, we agreed to

purchase a privately owned, Germany-based provider of power supplies and matching networks, for approximately \$13.5 million to \$20 million. We have also agreed in principle to acquire the remaining 40.5% of LITMAS for approximately 130,000 shares of our common stock. The expected annual capital needs of these acquired companies for 2002 are less than \$3 million.

As of December 31, 2001, we had working capital of \$350.4 million. Our principal sources of liquidity consisted of \$82.0 million of cash and cash equivalents, \$190.0 million of marketable securities, and a credit facility consisting of a \$30.0 million revolving line of credit. Advances under the revolving line of credit bear interest at either the prime rate (4.75% at February 28, 2002) minus 1% or the LIBOR 360-day rate (3.61288% at February 28, 2002) plus 175 basis points, at our option. All advances under this revolving line of credit will be due and payable June 18, 2003. As of December 31, 2001, there was an advance outstanding under this line of credit of \$760,000 to our Japanese subsidiary, Advanced Energy Japan K.K. We are subject to covenants on our line of credit that provide certain restrictions related to working capital, leverage, net worth, and payment and declaration of dividends. We were out of compliance with the maximum loss covenant as of December 31, 2001. We received a written waiver of the covenant and expect to be in compliance with all covenants during 2002. Currently we are restricted from further use of our credit line because the low interest debt of approximately \$34 million that we assumed as part of the Aera acquisition is not subordinated to our line of credit. We are in the process of negotiating a new line of credit. Due to our very liquid balance sheet, we do not expect this restriction, which we believe to be temporary, to impact our operating or financing strategy.

To finance the facilities for our headquarters and main manufacturing, we lease our executive offices and manufacturing facilities in Fort Collins, Colorado from a limited liability partnership consisting of two of our directors, one of whom is an officer, and other individuals. The leases relating to these spaces expire in 2011, 2013 and 2016. We also lease other office and production space from another limited liability partnership consisting of certain of our directors and other individuals.

We believe that our cash and cash equivalents, marketable securities, cash flow from operations and available borrowings, will be sufficient to meet our working capital needs through at least the end of 2002. After that time, we may require additional equity or debt financing to address our working capital, capital equipment or expansion needs. In addition, any significant acquisitions we make may require additional equity or debt financing to fund the purchase price, if paid in cash. There can be no assurance that additional funding will be available when required or that it will be available on terms acceptable to us. In 2006, when our convertible subordinated notes become due, it is possible we may need substantial funds to repay such debt, which was \$206.6 million at December 31, 2001. Our 5.00% convertible subordinated notes of \$125.0 million are due September 1, 2006, and our 5.25% convertible subordinated notes of \$81.6 million are

due November 15, 2006. This could occur if our stock price remains at low levels throughout this period, the prices at which we can effect conversion are not met in the market in which our stock is traded, and the holders of our notes choose not to otherwise convert. In such a situation there can be no assurance that we will be able to refinance the debt.

ITEM 7A. QUANTITATIVE AND QUALITATIVE DISCLOSURES ABOUT MARKET RISK

INTEREST RATE RISK

Our exposure to market risk for changes in interest rates relates primarily to our investment portfolio and long-term debt obligations. We generally place our investments with high credit quality issuers and by policy are averse to principal loss and seek to protect and preserve our invested funds by limiting default risk, market risk and reinvestment risk. As of December 31, 2001, our investments in marketable securities consisted primarily of commercial paper, municipal bonds and notes and mutual funds. These securities are highly liquid and of short maturities. Earnings on our marketable securities are typically invested into similar securities. In 2001, the rates we earned on our marketable securities ranged from as high as 8.7% to 2.0% before tax. As the Federal Reserve repeatedly lowered interest rates throughout 2001, the interest rates we earn on our investments likewise decreased substantially. This, in conjunction with using our available cash and cash reserves for acquisitions, including the EMCO acquisition in early 2001 and the Aera acquisition in early 2002, has greatly reduced our recent and anticipated interest income. The impact on interest income of a 10 percent decrease in the average interest rate would have resulted in approximately \$700,000 less interest income in 2001, \$1.1 million in 2000 and \$200,000 in 1999.

The interest rates on our subordinated debt are at fixed rates, specifically, at 5.25% for the \$81.6 million of our debt due November 2006, and at 5.00% for the \$125.0 million of our debt that is due September 2006. Our offerings of subordinated debt in 1999 and 2001 increased our fixed interest expense upon each issuance, though interest expense was partially reduced temporarily by the repurchase of a portion of the first offering in 2000. Because these rates are fixed, we believe there is no risk of increased interest expense.

FOREIGN CURRENCY EXCHANGE RATE RISK

We transact business in various foreign countries. Our primary foreign currency cash flows are generated in countries in Asia and Europe. We have entered into various forward foreign exchange contracts to hedge against currency fluctuations in the Japanese yen. We will continue to evaluate various methods to minimize the effects of currency fluctuations for when we translate the financial statements of our foreign subsidiaries into US dollars. At December 31, 2001, we held foreign forward exchange contracts in Japan with notional amounts of \$6.5 million and market settlement amounts of \$6.1 million for an unrealized gain position of \$367,000.

OTHER RISK

We have invested in start-up companies and strategic alliances and may in the future make additional investments in such companies that develop products which we believe may provide future benefits. We have written down the majority of the cost of one such investment in 2001, related to a strategic alliance we started in 2000. Such current investments and any future investments will be subject to all of the risks inherent in investing in companies that are not established, or in which, due to our level of investment, we do not exercise significant management control.

We are subject to covenants on our line of credit that provide certain restrictions related to working capital, leverage, net worth, and payment and declaration of dividends. We were out of compliance with the maximum loss covenant as of December 31, 2001. We received a written waiver of the covenant and expect to be in compliance with all covenants during 2002. Currently we are restricted from further use of our credit line because the low interest debt of approximately \$34 million that we assumed as part of the Aera acquisition is not subordinated to our line of credit. We are in the process of negotiating a new line of credit. Due to our very liquid balance sheet, we do not expect this restriction, which we believe to be temporary, to impact our operating or financing strategy.

ITEM 8. FINANCIAL STATEMENTS AND SUPPLEMENTARY DATA

INDEX TO CONSOLIDATED FINANCIAL STATEMENTS

| | |
|---|------|
| | PAGE |
| | ---- |
| Report of Arthur Andersen LLP, Independent Public Accountants..... | 57 |
| Consolidated Balance Sheets as of December 31, 2001 and 2000..... | 58 |
| Consolidated Statements of Operations for the Years Ended December 31, 2001, 2000 and 1999..... | 60 |
| Consolidated Statement of Stockholders' Equity for the Years Ended December 31, 2001, 2000 and 1999.... | 61 |
| Consolidated Statements of Cash Flows for the Years Ended December 31, 2001, 2000 and 1999..... | 62 |
| Notes to Consolidated Financial Statements..... | 63 |
| Schedule II - Valuation and Qualifying Accounts..... | 84 |

REPORT OF INDEPENDENT PUBLIC ACCOUNTANTS

To Advanced Energy Industries, Inc.:

We have audited the accompanying consolidated balance sheets of Advanced Energy Industries, Inc. (a Delaware corporation) and subsidiaries as of December 31, 2001 and 2000, and the related consolidated statements of operations, stockholders' equity and cash flows for each of the three years in the period ended December 31, 2001. These consolidated financial statements and the schedule referred to below are the responsibility of the Company's management. Our responsibility is to express an opinion on these consolidated financial statements and schedule based on our audits.

We conducted our audits in accordance with auditing standards generally accepted in the United States. Those standards 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. An audit also includes assessing the accounting principles used and significant estimates made by management, as well as evaluating the overall financial statement presentation. We believe that our audits provide a reasonable basis for our opinion.

In our opinion, the financial statements referred to above present fairly, in all material respects, the financial position of Advanced Energy Industries, Inc. and subsidiaries as of 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.

Our audits were made for the purpose of forming an opinion on the basic financial statements taken as a whole. The schedule listed in the index to consolidated financial statements is presented for purposes of complying with the Securities and Exchange Commission's rules and is not part of the basic financial statements. This schedule has been subjected to the auditing procedures applied in the audits of the basic financial statements and, in our opinion, fairly states in all material respects the financial data required to be set forth therein in relation to the basic financial statements taken as a whole.

Denver, Colorado, ARTHUR ANDERSEN LLP February 28, 2002.

ADVANCED ENERGY INDUSTRIES, INC. AND SUBSIDIARIES

CONSOLIDATED BALANCE SHEETS
(IN THOUSANDS)

| | | DECEMBER 31, | |
|---|--|--------------|-----------|
| | | 2001 | 2000 |
| | | ----- | ----- |
| ASSETS | | | |
| CURRENT ASSETS: | | | |
| Cash and cash equivalents | | \$ 81,955 | \$ 31,716 |
| Marketable securities - available-for-sale | | 190,023 | 157,811 |
| Accounts receivable -- | | | |
| Trade (less allowances for doubtful accounts of approximately | | | |
| \$1,049 and \$784 at December 31, 2001 and 2000, respectively) | | 26,871 | 72,732 |
| Related parties | | 23 | 38 |
| Other | | 3,918 | 3,775 |
| Income tax receivable | | 15,862 | 74 |
| Inventories | | 45,248 | 45,266 |
| Other current assets | | 4,178 | 2,508 |
| Deferred income tax assets, net | | 11,200 | 7,483 |
| | | ----- | ----- |
| Total current assets | | 379,278 | 321,403 |
| | | ----- | ----- |
| PROPERTY AND EQUIPMENT, at cost, net of accumulated | | | |
| depreciation of \$31,946 and \$24,427 at December 31, | | | |
| 2001 and 2000, respectively | | 31,095 | 24,101 |
| | | ----- | ----- |
| OTHER ASSETS: | | | |
| Deposits and other | | 6,482 | 2,819 |
| Notes receivable | | -- | 2,472 |
| Goodwill and intangibles, net of accumulated amortization of | | | |
| \$6,007 and \$6,061 at December 31, 2001 and 2000, respectively | | 23,072 | 9,890 |
| Demonstration and customer service equipment, net of | | | |
| accumulated depreciation of \$3,115 and \$2,302 at December 31, | | | |
| 2001 and 2000, respectively | | 4,532 | 2,889 |
| Deferred debt issuance costs, net | | 5,736 | 2,261 |
| | | ----- | ----- |
| | | 39,822 | 20,331 |
| | | ----- | ----- |
| Total assets | | \$450,195 | \$365,835 |
| | | ===== | ===== |

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

ADVANCED ENERGY INDUSTRIES, INC. AND SUBSIDIARIES

CONSOLIDATED BALANCE SHEETS
(IN THOUSANDS, EXCEPT PER SHARE DATA[PAR VALUE])

| | DECEMBER 31, | |
|---|--------------|------------|
| | 2001 | 2000 |
| | ----- | ----- |
| LIABILITIES AND STOCKHOLDERS' EQUITY | | |
| CURRENT LIABILITIES: | | |
| Trade accounts payable | \$ 10,231 | \$ 17,775 |
| Accrued payroll and employee benefits | 6,978 | 11,723 |
| Accrued warranty expense | 4,471 | 3,975 |
| Accrued restructuring charges | 1,427 | 475 |
| Other accrued expenses | 1,387 | 408 |
| Customer deposits | 515 | 104 |
| Accrued income taxes payable | -- | 7,923 |
| Capital lease obligations, current portion | 6 | 53 |
| Notes payable, current portion | 1,124 | 1,284 |
| Accrued interest payable on convertible subordinated notes | 2,696 | 529 |
| | ----- | ----- |
| Total current liabilities | 28,835 | 44,249 |
| | ----- | ----- |
| LONG-TERM LIABILITIES: | | |
| Notes payable, net of current portion | -- | 1,043 |
| Convertible subordinated notes payable | 206,600 | 81,600 |
| Deferred income tax liabilities, net | 415 | -- |
| | ----- | ----- |
| | 207,015 | 82,643 |
| | ----- | ----- |
| Total liabilities | 235,850 | 126,892 |
| | ----- | ----- |
| COMMITMENTS AND CONTINGENCIES | | |
| MINORITY INTEREST | -- | 145 |
| | ----- | ----- |
| STOCKHOLDERS' EQUITY: | | |
| Preferred stock, \$0.001 par value, 1,000 shares authorized, none issued and outstanding | -- | -- |
| Common stock, \$0.001 par value, 55,000 and 40,000 shares authorized; 31,848 and 31,537 shares issued and outstanding at December 31, 2001 and 2000, respectively | 32 | 32 |
| Additional paid-in capital | 131,698 | 124,930 |
| Retained earnings | 85,592 | 116,971 |
| Deferred compensation | (1,094) | (1,620) |
| Unrealized holding gains on available-for-sale securities | 1,257 | 1,365 |
| Cumulative translation adjustments | (3,140) | (2,880) |
| | ----- | ----- |
| Total stockholders' equity | 214,345 | 238,798 |
| | ----- | ----- |
| Total liabilities and stockholders' equity | \$ 450,195 | \$ 365,835 |
| | ===== | ===== |

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

ADVANCED ENERGY INDUSTRIES, INC. AND SUBSIDIARIES

CONSOLIDATED STATEMENTS OF OPERATIONS
(IN THOUSANDS, EXCEPT PER SHARE AMOUNTS)

| | YEARS ENDED DECEMBER 31, | | |
|---|--------------------------|------------|------------|
| | 2001 | 2000 | 1999 |
| SALES | \$ 193,600 | \$ 359,782 | \$ 202,849 |
| COST OF SALES | 136,168 | 183,329 | 110,647 |
| Gross profit | 57,432 | 176,453 | 92,202 |
| OPERATING EXPENSES: | | | |
| Research and development | 45,151 | 36,996 | 28,326 |
| Sales and marketing | 23,784 | 24,101 | 18,325 |
| General and administrative | 21,522 | 24,573 | 16,225 |
| Goodwill impairment | 5,446 | -- | -- |
| Impairment of investments and advances | 6,846 | -- | -- |
| Restructuring charges | 3,070 | 1,000 | -- |
| Merger costs | -- | 4,583 | -- |
| Litigation recovery | (1,500) | -- | -- |
| Total operating expenses | 104,319 | 91,253 | 62,876 |
| (LOSS) INCOME FROM OPERATIONS | (46,887) | 85,200 | 29,326 |
| OTHER (EXPENSE) INCOME: | | | |
| Interest income | 6,581 | 10,727 | 2,174 |
| Interest expense | (7,399) | (7,698) | (1,430) |
| Foreign currency (loss) gain | (235) | (196) | 1,504 |
| Other (expense) income, net | (1,025) | 4,652 | (698) |
| | (2,078) | 7,485 | 1,550 |
| Net (loss) income before income taxes, minority interest and extraordinary item | (48,965) | 92,685 | 30,876 |
| (BENEFIT) PROVISION FOR INCOME TAXES | (17,441) | 32,241 | 11,741 |
| MINORITY INTEREST IN NET (LOSS) INCOME | (145) | 20 | 69 |
| NET (LOSS) INCOME BEFORE EXTRAORDINARY ITEM | (31,379) | 60,424 | 19,066 |
| EXTRAORDINARY ITEM (LESS APPLICABLE INCOME TAXES OF \$4,566) (Note 10) | -- | 7,610 | -- |
| NET (LOSS) INCOME | \$ (31,379) | \$ 68,034 | \$ 19,066 |
| NET (LOSS) EARNINGS PER SHARE BEFORE EXTRAORDINARY ITEM: | | | |
| BASIC | \$ (0.99) | \$ 1.93 | \$ 0.64 |
| DILUTED | \$ (0.99) | \$ 1.86 | \$ 0.62 |
| EARNINGS PER SHARE FROM EXTRAORDINARY ITEM: | | | |
| BASIC | \$ -- | \$ 0.24 | \$ -- |
| DILUTED | \$ -- | \$ 0.24 | \$ -- |
| NET (LOSS) EARNINGS PER SHARE: | | | |
| BASIC | \$ (0.99) | \$ 2.17 | \$ 0.64 |
| DILUTED | \$ (0.99) | \$ 2.10 | \$ 0.62 |
| BASIC WEIGHTED-AVERAGE COMMON SHARES OUTSTANDING | 31,712 | 31,336 | 29,706 |
| DILUTED WEIGHTED-AVERAGE COMMON SHARES OUTSTANDING | 31,712 | 32,425 | 30,934 |

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

ADVANCED ENERGY INDUSTRIES, INC. AND SUBSIDIARIES

**CONSOLIDATED STATEMENT OF STOCKHOLDERS' EQUITY
(IN THOUSANDS)**

FOR THE YEARS ENDED DECEMBER 31, 2001, 2000 AND 1999

| | COMMON STOCK | | ADDITIONAL | RETAINED | DEFERRED | ACCUMULATED | TOTAL |
|---|--------------|--------|--------------------|-----------|--------------|---|-------------------------|
| | SHARES | AMOUNT | PAID-IN CAPITAL | EARNINGS | COMPENSATION | OTHER COMPREHENSIVE (LOSS) INCOME | STOCKHOLDERS' EQUITY |
| BALANCES, December 31, 1998 | 29,160 | \$ 29 | \$ 62,677 | \$ 29,871 | \$ -- | \$ (414) | \$ 92,163 |
| Exercise of stock options for cash | 490 | 1 | 4,147 | -- | -- | -- | 4,148 |
| Sale of common stock through employee stock purchase plan | 22 | -- | 345 | -- | -- | -- | 345 |
| Issuance of common stock for intangibles | 227 | -- | 2,335 | -- | -- | -- | 2,335 |
| Tax benefit related to shares acquired by employees under stock compensation plans | -- | -- | 1,422 | -- | -- | -- | 1,422 |
| Sale of common stock through private and public offerings, net of approximately \$2,448 of expenses | 1,070 | 1 | 37,826 | -- | -- | -- | 37,827 |
| Issuance of common stock for services rendered .. | 12 | -- | 136 | -- | -- | -- | 136 |
| Deferred compensation on stock options issued ... | -- | -- | 109 | -- | (109) | -- | -- |
| Amortization of deferred compensation | -- | -- | -- | -- | 23 | -- | 23 |
| Comprehensive income: | | | | | | | |
| Equity adjustment from foreign currency translation | -- | -- | -- | -- | -- | (476) | -- |
| Net income | -- | -- | -- | 19,066 | -- | -- | -- |
| Total comprehensive income | -- | -- | -- | -- | -- | -- | 18,590 |
| BALANCES, December 31, 1999 | 30,981 | 31 | 108,997 | 48,937 | (86) | (890) | 156,989 |
| Exercise of stock options for cash | 488 | 1 | 4,393 | -- | -- | -- | 4,394 |
| Issuance of common stock for services provided and merger costs | 55 | -- | 2,430 | -- | -- | -- | 2,430 |
| Sale of common stock through employee stock purchase plan | 13 | -- | 520 | -- | -- | -- | 520 |
| Tax benefit related to shares acquired by employees under stock compensation plans | -- | -- | 6,595 | -- | -- | -- | 6,595 |
| Deferred compensation on stock options issued ... | -- | -- | 1,995 | -- | (1,995) | -- | -- |
| Amortization of deferred compensation | -- | -- | -- | -- | 461 | -- | 461 |
| Comprehensive income: | | | | | | | |
| Equity adjustment from foreign currency translation | -- | -- | -- | -- | -- | (1,990) | -- |
| Unrealized holding gains | -- | -- | -- | -- | -- | 1,365 | -- |
| Net income | -- | -- | -- | 68,034 | -- | -- | -- |
| Total comprehensive income | -- | -- | -- | -- | -- | -- | 67,409 |
| BALANCES, December 31, 2000 | 31,537 | 32 | 124,930 | 116,971 | (1,620) | (1,515) | 238,798 |
| Exercise of stock options for cash | 273 | -- | 3,342 | -- | -- | -- | 3,342 |
| Sale of common stock through employee stock purchase plan | 38 | -- | 628 | -- | -- | -- | 628 |
| Tax benefit related to shares acquired by employees under stock compensation plans | -- | -- | 1,588 | -- | -- | -- | 1,588 |
| Fair value of stock options assumed in EMCO acquisition | -- | -- | 1,126 | -- | -- | -- | 1,126 |
| Deferred compensation on stock options issued ... | -- | -- | 84 | -- | (84) | -- | -- |
| Amortization of deferred compensation | -- | -- | -- | -- | 610 | -- | 610 |
| Comprehensive income: | | | | | | | |
| Equity adjustment from foreign currency translation | -- | -- | -- | -- | -- | (260) | -- |
| Unrealized holding losses | -- | -- | -- | -- | -- | (108) | -- |
| Net loss | -- | -- | -- | (31,379) | -- | -- | -- |
| Total comprehensive loss | -- | -- | -- | -- | -- | -- | (31,747) |
| BALANCES, December 31, 2001 | 31,848 | \$ 32 | \$131,698 | \$ 85,592 | \$ (1,094) | \$ (1,883) | \$214,345 |

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

ADVANCED ENERGY INDUSTRIES, INC. AND SUBSIDIARIES

CONSOLIDATED STATEMENTS OF CASH FLOWS
(IN THOUSANDS)

| | YEARS ENDED DECEMBER 31, | | |
|---|--------------------------|-----------|-----------|
| | 2001 | 2000 | 1999 |
| | ---- | ---- | ---- |
| CASH FLOWS FROM OPERATING ACTIVITIES: | | | |
| Net (loss) income | \$ (31,379) | \$ 68,034 | \$ 19,066 |
| Adjustments to reconcile net (loss) income to net cash (used in) provided by operating activities - | | | |
| Depreciation of property and equipment | 9,973 | 7,564 | 6,240 |
| Amortization of intangibles and demonstration and customer service equipment | 5,930 | 2,942 | 2,116 |
| Amortization of deferred debt issuance costs | 775 | 616 | 81 |
| Amortization of deferred compensation | 610 | 461 | 23 |
| Minority interest | (145) | 17 | 69 |
| Stock issued for services rendered and merger costs | -- | 2,430 | 136 |
| Provision for deferred income taxes | (3,579) | (3,730) | 851 |
| Provision for excess and obsolete inventory | 6,412 | 654 | 1,520 |
| Impairment of goodwill | 5,446 | -- | -- |
| Impairment of investment | 6,846 | -- | 322 |
| Loss (gain) on disposal of property and equipment | 13 | (54) | (15) |
| Gain on sale of investment | -- | (4,841) | -- |
| Gain on retirement of convertible subordinated notes | -- | (12,176) | -- |
| Changes in operating assets and liabilities - | | | |
| Accounts receivable-trade, net | 45,254 | (28,080) | (28,822) |
| Related parties and other receivables | (128) | (1,994) | (1,306) |
| Inventories | (5,484) | (17,510) | (6,402) |
| Other current assets | (1,752) | (705) | (252) |
| Deposits and other | (180) | (502) | 280 |
| Demonstration and customer service equipment | (2,754) | (1,282) | (563) |
| Trade accounts payable | (5,528) | 2,073 | 9,171 |
| Accrued payroll and employee benefits | (5,099) | 4,117 | 4,467 |
| Accrued warranty expense | 496 | 2,528 | 1,447 |
| Accrued restructuring charges | 952 | 475 | -- |
| Customer deposits and other accrued expenses | 3,134 | (970) | (425) |
| Income taxes payable/receivable, net | (21,949) | 14,631 | 4,088 |
| | ----- | ----- | ----- |
| Net cash provided by operating activities | 7,864 | 34,698 | 12,092 |
| | ----- | ----- | ----- |
| CASH FLOWS FROM INVESTING ACTIVITIES: | | | |
| Purchase of marketable securities | (64,925) | (19,471) | (172,529) |
| Sale of marketable securities | 33,312 | 48,100 | 1,928 |
| Proceeds from sale of investment | -- | 4,464 | -- |
| Proceeds from sale of equipment | -- | 150 | -- |
| Purchase of property and equipment, net | (12,435) | (14,062) | (7,168) |
| Purchase of investments and advances | (7,186) | (3,453) | -- |
| Purchase of LITMAS, net of cash acquired | -- | (250) | (175) |
| Acquisition of Engineering Measurements Company, net of cash acquired | (29,932) | -- | -- |
| | ----- | ----- | ----- |
| Net cash (used) in provided by investing activities | (81,166) | 15,478 | (177,944) |
| | ----- | ----- | ----- |
| CASH FLOWS FROM FINANCING ACTIVITIES: | | | |
| Proceeds from notes payable | 837 | 1,491 | 3,304 |
| Repayment of notes payable and capital lease obligations | (1,973) | (3,123) | (1,637) |
| Proceeds from convertible debt, net | 121,250 | -- | 130,509 |
| Repurchase of convertible debt, net | -- | (40,795) | -- |
| Sale of common stock, net of expenses | -- | -- | 37,827 |
| Sale of common stock through employee stock purchase plan | 628 | 520 | 345 |
| Proceeds from exercise of stock options and warrants | 3,342 | 4,394 | 4,148 |
| | ----- | ----- | ----- |
| Net cash provided by (used in) financing activities | 124,084 | (37,513) | 174,496 |
| | ----- | ----- | ----- |
| EFFECT OF CURRENCY TRANSLATION ON CASH | (543) | (1,990) | (476) |
| | ----- | ----- | ----- |
| INCREASE IN CASH AND CASH EQUIVALENTS | 50,239 | 10,673 | 8,168 |
| CASH AND CASH EQUIVALENTS, beginning of period | 31,716 | 21,043 | 12,875 |
| | ----- | ----- | ----- |
| CASH AND CASH EQUIVALENTS, end of period | \$ 81,955 | \$ 31,716 | \$ 21,043 |
| | ===== | ===== | ===== |
| SUPPLEMENTAL DISCLOSURE OF NON-CASH INVESTING AND FINANCING ACTIVITIES: | | | |
| Tax benefit related to shares acquired by employees under stock option plans | \$ 1,588 | \$ 6,595 | \$ 1,422 |
| | ===== | ===== | ===== |
| Conversion of royalty payable to note payable | \$ -- | \$ -- | \$ 742 |
| | ===== | ===== | ===== |
| Deferred compensation on stock options issued | \$ 84 | \$ 1,995 | \$ 109 |
| | ===== | ===== | ===== |
| SUPPLEMENTAL DISCLOSURE OF CASH FLOW INFORMATION: | | | |
| Cash paid for interest | \$ 4,457 | \$ 7,385 | \$ 459 |
| | ===== | ===== | ===== |
| Cash paid for income taxes, net | \$ 9,572 | \$ 25,791 | \$ 6,221 |
| | ===== | ===== | ===== |

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

ADVANCED ENERGY INDUSTRIES, INC. AND SUBSIDIARIES

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

(1) COMPANY OPERATIONS

Advanced Energy Industries, Inc. (the "Company"), a Delaware corporation, is primarily engaged in the development and production of products and systems critical to plasma-based manufacturing processes, which are used by manufacturers of semiconductors and in industrial thin film manufacturing processes. The Company owns 100% of each of the following subsidiaries: Advanced Energy Japan K.K. ("AE-Japan"), Advanced Energy Industries GmbH ("AE-Germany"), Advanced Energy Industries U.K. Limited ("AE-UK"), Advanced Energy Industries Korea, Inc. ("AE-Korea"), Advanced Energy Taiwan, Ltd. ("AE-Taiwan"), Advanced Energy Industries (ShenZhen) Co., Ltd. ("AE-China"), Advanced Energy Voorhees, Inc. ("AEV"), Tower Electronics, Inc. ("Tower"), Noah Holdings, Inc. ("Noah"), Sekidenko, Inc. ("Sekidenko"), and Engineering Measurements Company ("EMCO"). The Company owns 59.5% of LITMAS. As discussed in Note 3, Noah was merged into the Company on April 6, 2000, Sekidenko was merged into the Company on August 18, 2000, and EMCO was merged into the Company on January 2, 2001. The acquisitions of Noah and Sekidenko were accounted for as a pooling of interests under Accounting Principles Board Opinion No. 16. Accordingly, all prior period consolidated financial statements have been restated to include Noah and Sekidenko as though they had always been part of the Company. The acquisition of EMCO was accounted for under the purchase method of accounting, and EMCO's results of operations are included since the acquisition date.

On January 18, 2002, the Company completed the acquisition of Aera Japan Ltd. ("Aera"), a supplier of digital, pressure-based and liquid mass flow controllers, ultrasonic liquid flow meters and liquid vapor delivery systems to the semiconductor capital equipment industry. The aggregate purchase price for Aera was 5.73 billion Japanese yen (approximately \$44 million, based upon the approximate exchange rate at closing of 130:1), which was funded from the Company's available cash. In addition, the Company assumed approximately \$34 million of Aera's senior debt, most of which is with Japanese banks at rates ranging from 1.4% to 3.3%. For its fiscal year ended June 30, 2001, Aera had sales of approximately \$110 million and operating income of approximately \$17 million, compared with sales of \$84.5 million and operating income of \$7.0 million in the previous fiscal year. As of June 30, 2001, Aera had assets of approximately \$94 million. Aera owns 100% of each of the following subsidiaries:

Aera Corporation, Aera U.K. Ltd., Aera GmbH and Aera Korea Ltd.

The Company is subject to many risks, some of which are similar to other companies in its industry. These risks include significant fluctuations of quarterly operating results, the volatility of the semiconductor and semiconductor capital equipment industries, customer concentration within the markets the Company serves, manufacturing and facilities risks, recent and potential future acquisitions, management of growth, supply constraints and dependencies, dependence on design wins, barriers to obtaining new customers, the high level of customized designs, rapid technological changes, competition, international operating risks, intellectual property rights, governmental regulations, dependence on key personnel and the volatility of the market price of the Company's common stock. A significant change in any of these risk factors could have a material impact on the Company's business.

(2) SIGNIFICANT ACCOUNTING POLICIES

BASIS OF PRESENTATION -- The consolidated financial statements include the accounts of the Company and its wholly owned or controlled subsidiaries. All significant intercompany accounts and transactions have been eliminated in consolidation.

CASH AND CASH EQUIVALENTS -- For purposes of reporting cash flows, the Company considers all amounts on deposit with financial institutions and highly liquid investments with an original maturity of 90 days or less to be cash and cash equivalents.

INVENTORIES -- Inventories include costs of materials, direct labor and manufacturing overhead. Inventories are valued at the lower of market or cost, computed on a first-in, first-out basis.

MARKETABLE SECURITIES -- The Company has investments in marketable equity securities and municipal bonds, which have original maturities of 90 days or more. In accordance with Statement of Financial Accounting Standards ("SFAS") No. 115, "Accounting for Certain Investments in Debt and Equity Securities," the investments are classified as available-for-sale securities and reported at fair value with unrealized gains and losses included in other comprehensive income. Due to the short-term, highly liquid nature of the marketable securities held by the Company, the cost, including accrued interest of such investments, is typically the same as their fair value.

DEMONSTRATION AND CUSTOMER SERVICE EQUIPMENT -- Demonstration and customer service equipment are manufactured products that are utilized for sales demonstration and evaluation purposes. The Company also utilizes this equipment in its customer service function as replacement and loaner equipment to existing customers.

The Company depreciates the equipment based on its estimated useful life in the sales and customer service functions. The depreciation is computed based on a three-year life.

PROPERTY AND EQUIPMENT -- Property and equipment is stated at cost or estimated fair value upon acquisition. Additions, improvements, and major renewals are capitalized. Maintenance, repairs, and minor renewals are expensed as incurred.

Depreciation is provided using straight-line and accelerated methods over three to ten years for machinery and equipment and furniture and fixtures, with computers and communication equipment depreciated over a three-year life. Amortization of leasehold improvements and leased equipment is provided, using the straight-line method over the life of the lease term or the life of the assets, whichever is shorter.

GOODWILL AND INTANGIBLES -- Goodwill and intangibles are recorded at the date of acquisition at their allocated cost. Goodwill represents the excess of the cost of businesses acquired over the aggregate fair value of identifiable tangible and intangible net assets at the dates of acquisition. Amortization is provided over the estimated useful lives ranging from five to seven years for both goodwill and the intangible assets.

CONCENTRATIONS OF CREDIT RISK -- The Company's revenues generally are concentrated among a small number of customers, the majority of which are in the semiconductor capital equipment industry. The Company's foreign subsidiaries sales are primarily denominated in currencies other than the U.S. dollar (see Note 18). The Company establishes an allowance for doubtful accounts based upon factors surrounding the credit risk of specific customers, historical trends and other information.

WARRANTY POLICY -- The Company offers warranty coverage for its products for periods ranging from 12 to 36 months after shipment, with the majority of its products ranging from 18 to 24 months. The Company estimates the costs of repairing products under warranty based on the historical average cost of the repairs. The assumptions used to estimate warranty accruals are reevaluated periodically in light of actual experience and, when appropriate, the accruals are adjusted. Estimated warranty costs are recorded at the time of sale of the related product, and are considered a cost of sale.

FOREIGN CURRENCY TRANSLATION -- The functional currency of the Company's foreign subsidiaries is their local currency. Assets and liabilities of international subsidiaries are translated to U.S.

dollars at year-end exchange rates, and income statement items are translated at average exchange rates during the year. Resulting translation adjustments are recorded as a separate component of equity. Gains and losses resulting from foreign currency transactions are included in income.

Transactions denominated in currencies other than the local currency are recorded based on exchange rates at the time such transactions arise. Subsequent changes in exchange rates result in foreign currency transaction gains and losses which are reflected in income as unrealized (based on period-end translation) or realized (upon settlement of the transactions). Unrealized transaction gains and losses applicable to permanent investments by the Company in its foreign subsidiaries are included as cumulative translation adjustments, and unrealized translation gains or losses applicable to short-term intercompany receivables from or payables to the Company and its foreign subsidiaries are included in income. The Company recognized losses on foreign currency transactions of approximately \$235,000 and \$196,000 for the years ended December 31, 2001 and 2000, respectively, and a gain on foreign currency transactions of \$1,504,000 for the year ended December 31, 1999.

Financial statement activity for AE-China was immaterial in 2001, 2000 and 1999.

REVENUE RECOGNITION -- The Company recognizes revenue upon shipment of its systems and spare parts, at which time title passes to the customer, as its shipping terms are FOB shipping point.

The Company has an arrangement with one of its major customers, a semiconductor capital equipment manufacturer, in which completed systems are shipped to the customer and held by them on a consignment basis. The customer draws systems from this inventory as needed, at which time title passes to the customer and the Company recognizes revenue. The customer is subject to the Company's normal warranty policy for repair of defective systems.

In some instances the Company delivers systems to customers for evaluation purposes. In these arrangements, the customer retains the systems for specified periods of time without commitment to purchase. On or before the expiration of the evaluation period, the customer either rejects the system, and returns it to the Company, or accepts the system. Upon acceptance, title passes to the customer, the Company invoices the customer for the system, and revenue is recognized. Pending acceptance by the customer, such systems are reported on the Company's balance sheet at an estimated value based on the lower of cost or market, and are included in the amount for demonstration and customer service equipment, net of accumulated depreciation.

INCOME TAXES -- The Company accounts for income taxes in accordance with SFAS No. 109, "Accounting for Income Taxes." SFAS No. 109 requires deferred tax assets and liabilities to be recognized for temporary differences between the tax basis and financial reporting basis of assets and liabilities, computed at current tax rates, as well as for the expected tax benefit of net operating loss and tax credit carryforwards. A valuation allowance is recorded to reduce the carrying amounts of deferred tax assets unless it is more likely than not that such assets will be realized.

RESTRUCTURING COSTS -- Restructuring charges include the costs associated with actions taken by the Company in response to the continuing downturn in the semiconductor capital equipment industry and in responses to changes in the Company's strategy. Restructuring charges totaling \$3,070,000 and \$1,000,000 were recorded for 2001 and 2000, respectively. These charges consisted of costs that were incremental to the Company's ongoing operations, and were incurred to exit an activity or cancel an existing contractual obligation, closure of facilities and employee termination related charges. Other related costs, consisting primarily of employee relocation, were expensed as incurred.

STOCK-BASED COMPENSATION -- The Company accounts for employee stock-based compensation using the intrinsic value method prescribed by Accounting Principles Board ("APB") Opinion No. 25, "Accounting for Stock Issued to Employees" and related interpretations. Reference is made to Note 19, for a summary of the pro forma effect of SFAS No. 123 "Accounting for Stock Based Compensation," on the

Company's results of operations for the years ended December 31, 2001, 2000 and 1999.

EARNINGS PER SHARE -- Basic Earnings Per Share ("EPS") is computed by dividing income available to common stockholders by the weighted-average number of common shares outstanding during the period. The computation of diluted EPS is similar to the computation of basic EPS except that the numerator is increased to include certain charges which would not have been incurred, and the denominator is increased to include the number of additional common shares that would have been outstanding (using the treasury stock and if-converted methods), if securities containing potentially dilutive common shares (convertible notes payable, options and warrants) had been converted to such common shares, and if such assumed conversion is dilutive. For the years ended December 31, 2000 and 1999, certain stock options outstanding and conversion of the convertible subordinated notes payable were not included in this calculation because to do so would be anti-dilutive. The anti-dilutive stock options would have increased the weighted-average number of diluted shares by 239,000 and 131,000 in 2000 and 1999, respectively, and the anti-dilutive convertible subordinated notes, if converted, would have increased the number of diluted shares by 2,546,000 and 341,000 in 2000 and 1999, respectively. Due to the Company's net loss for the year ended December 31, 2001, basic and diluted EPS are the same, as the assumed conversion of all potentially dilutive securities would be anti-dilutive. Potential shares of common stock issuable under these securities at December 31, 2001 were approximately 2,200,000 shares of common stock issuable under options and warrants for common stock and 5,838,000 shares of common stock issuable upon conversion of subordinated notes payable.

The following is a reconciliation of the numerators and denominators used in the calculation of basic and diluted EPS for the years ended December 31, 2001, 2000 and 1999:

| | 2001 | | | 2000 | | | 1999 | | |
|--|---------------------------------------|--------|---------------------|---------------|--------|---------------------|---------------|--------|---------------------|
| | NET (LOSS) | SHARES | PER SHARE AMOUNT | NET INCOME | SHARES | PER SHARE AMOUNT | NET INCOME | SHARES | PER SHARE AMOUNT |
| | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- |
| | (IN THOUSANDS, EXCEPT PER SHARE DATA) | | | | | | | | |
| Basic EPS: | | | | | | | | | |
| Net (loss) income attributable to common stock and share amounts | \$(31,379) | 31,712 | \$(0.99) | \$68,034 | 31,336 | \$2.17 | \$19,066 | 29,706 | \$0.64 |
| Dilutive securities: | | | | | | | | | |
| Stock options | -- | -- | -- | -- | 1,089 | -- | -- | 1,228 | -- |
| Convertible subordinated debt | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- |
| Diluted EPS: | | | | | | | | | |
| Net (loss) income attributable to common stock and assumed share amounts | \$(31,379) | 31,712 | \$(0.99) | \$68,034 | 32,425 | \$2.10 | \$19,066 | 30,934 | \$0.62 |
| | ===== | ===== | ===== | ===== | ===== | ===== | ===== | ===== | ===== |

COMPREHENSIVE INCOME (LOSS) -- Comprehensive income (loss) for the Company consists of net income (loss), foreign currency translation adjustments and net unrealized holding gains on available-for-sale marketable investment securities and is presented in the Consolidated Statement of Stockholders' Equity.

SEGMENT REPORTING -- The Company operates in one segment for the manufacture, marketing and servicing of key subsystems for vacuum process systems. In accordance with SFAS No. 131, "Disclosures About Segments of an Enterprise and Related Information," the Company's chief operating decision maker has been identified as the Office of the Chief Executive Officer, which reviews operating results to make decisions about allocating resources and assessing performance for the entire company. All material operating units qualify for aggregation under SFAS No. 131 due to their identical customer base and similarities in: economic characteristics; nature of products and services; and procurement, manufacturing and distribution processes. Since the Company operates in one segment, all financial information required by SFAS No. 131 can be found in the consolidated financial statements.

RECENT ACCOUNTING PRONOUNCEMENTS -- In June 2001, the FASB issued SFAS No. 141, "Business Combinations" and SFAS No. 142, "Goodwill and Other Intangible Assets." These statements

prohibit pooling-of-interests accounting for transactions initiated after June 30, 2001, require the use of the purchase method of accounting for all combinations after June 30, 2001, and establish new standards for accounting for goodwill and other intangibles acquired in business combinations. Goodwill will continue to be recognized as an asset, but will not be amortized as previously required by APB Opinion No. 17, "Intangible Assets." Certain other intangible assets with indefinite lives, if present, may also not be amortized. Instead, goodwill and other intangible assets will be subject to periodic (at least annual) tests for impairment, and recognition of impairment losses in the future could be required based on a new fair value-based methodology for measuring impairments prescribed by these pronouncements. The revised standards include transition rules and requirements for identification, valuation and recognition of a much broader list of intangibles as part of business combinations than prior practice, most of which will continue to be amortized. The Company's prospective financial statements may be significantly affected by the results of future periodic tests for impairment.

In October 2001, the FASB issued SFAS No. 144, "Accounting for the Impairment or Disposal of Long-Lived Assets." SFAS No. 144 supersedes SFAS No. 121, "Accounting for the Impairment of Long-Lived Assets and for Long-Lived Assets to be Disposed Of," and addresses financial accounting and reporting for the impairment of long-lived assets and for long-lived assets to be disposed of. The Company is in the process of assessing the effect of adopting SFAS No. 144, which will be effective for the Company's fiscal year ending December 31, 2002.

DERIVATIVE INSTRUMENTS -- In June 1998, the FASB issued SFAS No. 133, "Accounting for Derivative Instruments and Hedging Activities." The Company adopted SFAS No. 133, as amended by SFAS No. 137, on January 1, 2001. SFAS No. 133 establishes accounting and reporting standards for derivative instruments and for hedging activity by requiring all derivatives to be recorded on the balance sheet as either an asset or liability and measured at their fair value. Changes in the derivative's fair value will be recognized currently in earnings unless specific hedging accounting criteria are met. SFAS No. 133 also establishes uniform hedge accounting criteria for all derivatives. The Company did not seek specific hedge accounting treatment for its foreign currency forward contracts (Note 18). The adoption of SFAS No. 133 did not have a material impact on the Company's financial condition or results of operations.

ESTIMATES AND ASSUMPTIONS -- The preparation of the Company's consolidated financial statements in conformity with generally accepted accounting principles requires the Company's 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 those estimates. Significant estimates are used when accounting for allowances for doubtful accounts, depreciation and amortization, impairment charges, restructuring accruals, warranty reserves, purchase price allocations, income taxes, excess and obsolete inventory and various others items.

ASSET IMPAIRMENTS -- Long-lived assets are comprised of intangible assets and property, plant and equipment. Long-lived assets, including certain identifiable intangibles and the goodwill related to those assets to be held and used, are reviewed by the Company for impairment whenever events or changes in circumstances indicate their carrying amount may not be recoverable. In so doing, the Company estimates the future net cash flows expected to result from the use of the asset and its eventual disposition. If the sum of the expected future net cash flows (undiscounted and without interest charges) is less than the carrying amount of the asset, an impairment loss is recognized to reduce the asset to its estimated fair value. Long-lived assets and certain identifiable intangibles to be disposed of, if any, are reported at the lower of carrying amount or fair value less cost to sell.

During 2001, the Company reviewed certain amounts recorded as goodwill for impairment. Due to declines in the related businesses and changes in the Company's strategy, it was determined that the related expected future cash flows no longer supported the recorded amounts of goodwill, and the Company recorded an impairment in the amount of approximately \$5.4 million. Approximately \$3.6 million of this was related to impairment of goodwill associated with Tower and approximately \$1.8 million was related

to impairment of goodwill associated with the Company's Fourth State Technology ("FST") product line.

RECLASSIFICATIONS -- Certain prior period amounts have been reclassified to conform to the current period presentation.

(3) ACQUISITIONS

EMCO -- On January 2, 2001, Engineering Measurements Company ("EMCO"), a publicly held, Longmont, Colorado-based manufacturer of electronic and electromechanical precision instruments for measuring and controlling the flow of liquids, steam and gases, was merged with a wholly owned subsidiary of the Company. The Company paid the EMCO shareholders cash in an aggregate amount of approximately \$30 million. In connection with the acquisition, the Company issued stock options to purchase approximately 71,000 shares of its common stock for the assumption of outstanding, fully vested options for EMCO common stock. The fair value of the options granted was estimated by the Company (using the Black-Scholes option pricing model) to be approximately \$1.1 million. The acquisition was accounted for using the purchase method of accounting, and the operating results of EMCO are reflected in the accompanying consolidated financial statements prospectively from the date of acquisition. The assets acquired and liabilities assumed were recorded at estimated fair values as determined by the Company's management based on information currently available and on current assumptions as to future operations. The Company has obtained preliminary independent appraisals of the fair values of the acquired property, plant and equipment, and identified intangible assets, and their remaining useful lives. Goodwill and intangibles includes \$20.9 million allocated to goodwill and \$3.4 million allocated to other intangibles.

| | (In thousands) |
|-------------------------------------|----------------|
| Cash and cash equivalents | \$ 459 |
| Marketable securities | 674 |
| Accounts receivable | 1,167 |
| Inventories | 1,678 |
| Deferred income tax assets, current | 584 |
| Other current assets | 88 |
| Fixed assets | 4,596 |
| Goodwill | 20,878 |
| Other intangibles | 3,400 |
| Accounts payable | (355) |
| Accrued payroll | (405) |
| Other accrued expenses | (391) |
| Deferred income tax liability | (856) |
| | ----- |
| | \$ 31,517 |
| | ===== |

There were no transactions between the Company and EMCO prior to the combination. The excess purchase price over the estimated fair value of tangible net assets acquired was allocated to goodwill and other intangibles, which was amortized in 2001 over an average of a seven-year life. In accordance with SFAS No. 141 and 142, the Company ceased amortization of goodwill on January 1, 2002, and will continue to review these assets in the future for impairment. The amount of annual goodwill amortization which will no longer be recorded is approximately \$3.3 million.

Had this combination occurred on January 1, 2000, the pro forma, unaudited, combined results of operations for the Company and EMCO would have generated revenue of approximately \$369.8 million, net income before extraordinary items of approximately \$55.9 million, net income of approximately \$63.5 million, basic earnings per share of \$2.03 and diluted earnings per share of \$1.96.

SEKIDENKO, INC. -- On August 18, 2000, Sekidenko, Inc. ("Sekidenko"), a privately held, Vancouver, Washington-based supplier of optical fiber thermometers to the semiconductor capital

equipment industry, was merged with a wholly owned subsidiary of the Company. The Company issued 2.1 million shares of its common stock to the former shareholders of Sekidenko. In connection with the merger, the Company recorded in the third quarter of 2000 a charge to operating expenses of \$2.3 million for direct merger-related costs.

NOAH HOLDINGS, INC. -- On April 6, 2000, Noah Holdings, Inc. ("Noah"), a privately held, California-based manufacturer of solid state temperature control systems used to control process temperatures during semiconductor manufacturing, was merged with a wholly owned subsidiary of the Company. The Company issued approximately 687,000 shares of its common stock in connection with the acquisition. In addition, outstanding Noah stock options were converted into options to purchase approximately 40,000 shares of the Company's common stock. In connection with the merger, the Company recorded in the second quarter of 2000 a charge to operating expenses of \$2.3 million for direct merger-related costs.

The Sekidenko and Noah mergers have been accounted for as poolings of interests under Accounting Principles Board Opinion No. 16. Accordingly, all prior period consolidated financial statements presented have been restated to include the combined balance sheet, statements of operations and cash flows of Noah and Sekidenko as though each had always been part of the Company. There were no transactions between the Company, Noah and Sekidenko prior to the combinations. Certain reclassifications were made to conform the Noah and Sekidenko financial statements to the Company's presentations. The results of operations for the separate companies and combined amounts presented in the consolidated financial statements follow:

| | YEARS ENDED DECEMBER 31, | |
|--|--------------------------|-----------|
| | 2000 | 1999 |
| | (IN THOUSANDS) | |
| Sales: | | |
| Pre-Noah and Sekidenko mergers (prior to April 6, 2000) | | |
| Advanced Energy | \$ 67,171 | \$183,958 |
| Noah | 3,080 | 7,617 |
| Sekidenko | 4,777 | 11,274 |
| Advanced Energy and Noah combined before Sekidenko merger | 123,190 | -- |
| Sekidenko before Sekidenko merger (April 6 to August 18, 2000) | 7,034 | -- |
| Post-Sekidenko merger (August 18 to December 31, 2000) | 154,530 | -- |
| Consolidated | \$ 359,782 | \$202,849 |
| | ===== | ===== |
| Net income (loss): | | |
| Pre-Noah and Sekidenko mergers (prior to April 6, 2000) | | |
| Advanced Energy | \$ 9,996 | \$ 16,838 |
| Noah | 43 | 184 |
| Sekidenko | 1,199 | 2,044 |
| Advanced Energy and Noah combined before Sekidenko merger | 20,809 | -- |
| Sekidenko before Sekidenko merger (April 6 to August 18, 2000) | 1,367 | -- |
| Noah merger costs | (2,333) | -- |
| Post-Sekidenko merger (August 18 to December 31, 2000) | 39,203 | -- |
| Sekidenko merger costs | (2,250) | -- |
| Consolidated | \$ 68,034 | \$ 19,066 |
| | ===== | ===== |

OTHER INTANGIBLES -- During 1999, prior to its acquisition by the Company, Noah acquired various intangible assets, primarily a license agreement and patents, by issuing approximately 214,000 shares of common stock valued at \$1,950,000. Noah management estimated the value of the common stock, since, as a privately held company, there was no public market for Noah's common stock. The entire purchase price was allocated to other intangibles and is being amortized over a seven-year useful life.

During 1998, prior to the acquisition of Sekidenko by the Company, Sekidenko acquired various intangible assets, primarily a license agreement, by issuing approximately 1,680,000 shares of common stock valued at \$2,096,000. Sekidenko's management estimated the value of the common stock, since, as a

privately held company, there was no public market for Sekidenko's common stock. The entire purchase price was allocated to other intangibles and is being amortized over a five-year useful life.

LITMAS -- During 1998, the Company acquired a 29% ownership interest in LITMAS, a privately held, North Carolina-based early-stage company that designs and manufactures plasma gas abatement systems and high-density plasma sources. The purchase price consisted of \$1 million in cash. On October 1, 1999, the Company acquired an additional 27.5% interest in LITMAS for an additional \$560,000. The purchase price consisted of \$385,000 in the Company's common stock and \$175,000 in cash. The acquisition was accounted for using the purchase method of accounting and resulted in \$523,000 allocated to intangible assets as goodwill. The results of operations of LITMAS are included within the accompanying consolidated financial statements from the date the controlling interest of 56.5% was acquired. On October 1, 2000, the Company acquired an additional 3.0% interest in LITMAS for an additional \$250,000, bringing the Company's ownership interest in LITMAS to 59.5%. Subsequent to year-end, the Company agreed in principle to acquire the remaining 40.5% of LITMAS for approximately 130,000 shares of the Company's common stock. Based on the Nasdaq closing price of the Company's common stock on February 28, 2002 of \$25.100 per share, the purchase price would have been valued at approximately \$3.3 million.

(4) PUBLIC OFFERING OF COMMON STOCK

In November 1999, the Company closed on an additional offering of its common stock. In connection with the offering, 1,000,000 shares of common shares were sold at a price of \$39 per share, providing gross proceeds of \$39,000,000, less \$2,448,000 in offering costs.

(5) MARKETABLE SECURITIES

MARKETABLE SECURITIES consisted of the following:

| | DECEMBER 31, | |
|---------------------------------|----------------|-----------|
| | 2001 | 2000 |
| | (IN THOUSANDS) | |
| Commercial paper | \$172,506 | \$ 85,827 |
| Municipal bonds and notes | 12,622 | 54,022 |
| Mutual funds | 4,895 | 17,962 |
| | \$190,023 | \$157,811 |
| | ===== | ===== |

These marketable securities are stated at period end market value, which are equal to their original costs plus accrued interest income.

(6) ACCOUNTS RECEIVABLE - TRADE

ACCOUNTS RECEIVABLE - TRADE consisted of the following:

| | DECEMBER 31, | |
|---------------------------------------|----------------|-----------|
| | 2001 | 2000 |
| | (IN THOUSANDS) | |
| Domestic | \$ 13,463 | \$ 41,545 |
| Foreign | 14,457 | 31,971 |
| Allowance for doubtful accounts | (1,049) | (784) |
| | \$ 26,871 | \$ 72,732 |
| | ===== | ===== |

(7) INVENTORIES

INVENTORIES consisted of the following:

| | DECEMBER 31, | |
|-------------------------------|----------------|----------|
| | 2001 | 2000 |
| | (IN THOUSANDS) | |
| Parts and raw materials | \$31,273 | \$34,462 |
| Work in process | 2,521 | 3,777 |
| Finished goods | 11,454 | 7,027 |
| Total inventories | \$45,248 | \$45,266 |
| | ===== | ===== |

Inventories include costs of materials, direct labor and manufacturing overhead. Inventories are valued at the lower of market or cost, computed on a first-in, first-out basis. Inventory is expensed as cost of sales upon shipment of product.

(8) PROPERTY AND EQUIPMENT

PROPERTY AND EQUIPMENT consisted of the following:

| | DECEMBER 31, | |
|---|----------------|----------|
| | 2001 | 2000 |
| | (IN THOUSANDS) | |
| Land | \$ 1,127 | \$ -- |
| Building | 1,673 | -- |
| Building equipment | 64 | -- |
| Machinery and equipment | 29,410 | 25,075 |
| Computers and communication equipment | 15,619 | 12,484 |
| Furniture and fixtures | 4,694 | 4,026 |
| Vehicles | 222 | 197 |
| Leasehold improvements | 10,232 | 6,746 |
| | 63,041 | 48,528 |
| Less - accumulated depreciation | (31,946) | (24,427) |
| Total property and equipment | \$31,095 | \$24,101 |
| | ===== | ===== |

(9) NOTES PAYABLE

| | DECEMBER 31, | |
|--|----------------|----------|
| | 2001 | 2000 |
| | (IN THOUSANDS) | |
| Revolving line of credit of \$30,000,000, expiring June 2003, interest at bank's prime rate minus 1% or the LIBOR 360-day rate plus 175 basis points, (3.75% at December 31, 2001). Borrowing base consists of the sum of 80% of eligible accounts receivable plus the lesser of 20% of eligible inventory or \$5,000,000. Loan covenants provide certain financial restrictions related to working capital, leverage, net worth, payment and declaration of dividends and profitability | \$ 760 | \$ 875 |
| Note payable, shareholder, paid in full in 2001 | -- | 356 |
| Note payable, royalties, with interest at 7%, with monthly payments ranging from \$5,000 to \$15,000, including interest, due July 2002. The note is unsecured | 244 | 704 |
| Note payable, other | 120 | 120 |
| Note payable to the New Jersey Economic Development Authority, with interest at 5%, principal and interest due monthly, matures January 2002 and secured by machinery and equipment | -- | 109 |
| Note payable, shareholder, paid in full in 2001 | -- | 163 |
| | 1,124 | 2,327 |
| Less - current portion | (1,124) | (1,284) |
| | \$ -- | \$ 1,043 |
| | ===== | ===== |

The Company is subject to covenants on its line of credit that provide certain restrictions related to working capital, leverage, net worth, and payment and declaration of dividends. The Company was out of

compliance with the maximum loss covenant as of December 31, 2001, and received a written waiver of the covenant and expects to be in compliance with all covenants during 2002. As of December 31, 2001, the Company had an advance of approximately \$760,000 related to AE-Japan and approximately \$350,000 of letters of credit against the line of credit, for total available credit at that time of approximately \$28.9 million.

Currently the Company is restricted from further use of its credit line because the low interest debt of approximately \$34 million that it assumed as part of the Aera acquisition is not subordinated to its line of credit. The Company is in the process of negotiating a new line of credit.

(10) CONVERTIBLE SUBORDINATED NOTES PAYABLE

In November 1999, the Company issued \$135 million of 5.25% convertible subordinated notes. These notes mature November 15, 2006, with interest payable on May 15th and November 15th each year beginning May 15, 2000. Net proceeds to the Company were approximately \$130.5 million, after deducting \$4.5 million of offering costs, which have been capitalized and are being amortized as additional interest expense over a period of seven years. Holders of the notes may convert the notes at any time into shares of the Company's common stock, at \$49.53 per share. The Company may redeem the notes on or after November 19, 2002 at a redemption price of 103.00% times the principal amount, and may redeem at successively lesser amounts thereafter until November 15, 2006, at which time the Company may redeem at a redemption price equal to the principal amount. At December 31, 2001, approximately \$500,000 of interest expense related to these notes was accrued as a current liability.

In October and November 2000, the Company repurchased an aggregate of approximately \$53.4 million principal amount of its 5.25% convertible subordinated notes in the open market, for a cost of approximately \$40.8 million. These purchases resulted in an after-tax extraordinary gain of \$7.6 million. The purchased notes have been cancelled. Approximately \$81.6 million principal amount of the notes remains outstanding. The Company may continue to purchase additional notes in the open market from time to time, if market conditions and the Company's financial position are deemed favorable for such purposes.

In August 2001, the Company issued \$125 million of 5.00% convertible subordinated notes. These notes mature September 1, 2006, with interest payable on March 1st and September 1st of each year beginning March 1, 2002. Net proceeds to the Company were \$121.25 million, after deducting \$3.75 million of offering costs, which have been capitalized and are being amortized as additional interest expense over a period of five years. Holders of the notes may convert the notes at any time before maturity into shares of the Company's common stock at a conversion rate of 33.5289 shares per each \$1,000 principal amount of notes, equivalent to a conversion price of approximately \$29.83 per share. The conversion rate is subject to adjustment in certain circumstances. The Company may redeem the notes, in whole or in part, at any time before September 4, 2004, at specified redemption prices plus accrued and unpaid interest, if any, to the date of redemption if the closing price of the Company's common stock exceeds 150% of the conversion price then in effect for at least 20 trading days within a period of 30 consecutive trading days ending on the trading day before the date of mailing of the provisional redemption notice. Upon any provisional redemption, the Company will make an additional payment in cash with respect to the notes called for redemption in an amount equal to \$150.56 per \$1,000 principal amount of notes, less the amount of any interest paid on the note. The Company may also make this additional payment in shares of its common stock, and any such payment will be valued at 95% of the average of the closing prices of the Company's common stock for the five consecutive trading days ending on the day prior to the redemption date. The Company will be obligated to make an additional payment on all notes called for provisional redemption. The Company may also redeem the notes from September 4, 2004 through August 31, 2005 at 102% times the principal amount, from September 1, 2005 through August 31, 2006 at 101% times the principal amount, and thereafter at 100% of the principal amount. The notes are subordinated to the Company's present and potential future senior debt, and are effectively

subordinated in right of payment to all indebtedness and other liabilities of the Company's subsidiaries. At December 31, 2001, approximately \$2.2 million of interest expense related to these notes was accrued as a current liability.

(11) INCOME TAXES

The income tax benefit of \$17.4 million for 2001 represents an effective rate of 36%. The income tax provision of \$36.8 million in 2000, which included a \$4.6 million provision for an extraordinary item, represented an effective rate of 35%. The income tax provision of \$11.7 million for 1999 represented an effective rate of 38%.

The (benefit) provision for income taxes for the years ended December 31, 2001, 2000 and 1999 was as follows:

| | DECEMBER 31, | | |
|-----------------------|----------------|-----------|-----------|
| | 2001 | 2000 | 1999 |
| | (IN THOUSANDS) | | |
| Federal | \$ (17,468) | \$ 28,869 | \$ 8,087 |
| State and local | (469) | 3,592 | 1,376 |
| Foreign taxes | 496 | 4,346 | 2,278 |
| | ----- | ----- | ----- |
| | \$ (17,441) | \$ 36,807 | \$ 11,741 |
| | ===== | ===== | ===== |
| Current | \$ (13,462) | \$ 40,537 | \$ 10,890 |
| Deferred | (3,979) | (3,730) | 851 |
| | ----- | ----- | ----- |
| | \$ (17,441) | \$ 36,807 | \$ 11,741 |
| | ===== | ===== | ===== |

The following reconciles the Company's effective tax rate to the federal statutory rate for the years ended December 31, 2001, 2000 and 1999:

| | DECEMBER 31, | | |
|---|----------------|-----------|-----------|
| | 2001 | 2000 | 1999 |
| | (IN THOUSANDS) | | |
| Income tax (benefit) expense per federal statutory rate | \$ (17,138) | \$ 36,703 | \$ 10,807 |
| State income taxes, net of federal deduction | (1,259) | 2,232 | 894 |
| Foreign sales corporation | (688) | (2,516) | (331) |
| Nondeductible merger costs | -- | 1,604 | (228) |
| Nondeductible intangible and goodwill amortization | 2,818 | 618 | 553 |
| Other permanent items, net | (1,716) | (2,262) | (137) |
| Effect of foreign taxes | 2 | 578 | 1,000 |
| Change in valuation allowance | 790 | -- | (717) |
| Tax credits | (250) | (150) | (100) |
| | ----- | ----- | ----- |
| | \$ (17,441) | \$ 36,807 | \$ 11,741 |
| | ===== | ===== | ===== |

The Company's deferred income tax assets are summarized as follows:

| | DECEMBER 31, 2001 | CHANGE | DECEMBER 31, 2000 |
|--|-------------------|------------|-------------------|
| | (IN THOUSANDS) | | |
| Employee bonuses and commissions | \$ 386 | \$ (1,465) | \$ 1,851 |
| State net operating loss carryforward | 790 | 790 | -- |
| Warranty reserve | 1,423 | 377 | 1,046 |
| Bad debt reserve | 301 | 72 | 229 |
| Vacation accrual | 948 | (128) | 1,076 |
| Obsolete and excess inventory | 4,011 | 1,578 | 2,433 |
| Investments | 2,476 | 2,081 | 395 |
| Depreciation and amortization | (415) | (727) | 312 |
| Other | 1,655 | 1,514 | 141 |
| Valuation allowance | (790) | (790) | -- |
| | ----- | ----- | ----- |
| | \$ 10,785 | \$ 3,302 | \$ 7,483 |
| | ----- | ----- | ----- |
| Depreciation and amortization acquired in EMCO acquisition | -- | 677 | -- |
| | \$ 10,785 | \$ 3,979 | \$ 7,483 |
| | ===== | ===== | ===== |

The domestic versus foreign component of the Company's net (loss) income before income taxes at December 31, 2001, 2000 and 1999, was as follows:

| | DECEMBER 31, | | |
|----------------|------------------|-----------|-----------|
| | 2001 | 2000 | 1999 |
| | (IN THOUSANDS) | | |
| Domestic | \$ (50,377) | \$ 94,094 | \$ 25,177 |
| Foreign | 1,412 | 10,767 | 5,699 |
| | \$ (48,965) | \$104,861 | \$ 30,876 |
| | ===== | ===== | ===== |

(12) OTHER INCOME AND EXPENSE ITEMS

GAIN ON SALE OF INVESTMENT -- In the third quarter of 2000, the Company exercised warrants of a supplier in a cashless transaction and received 458,000 shares of the supplier's common stock, which is publicly traded. The Company had received the warrants in a series of transactions with the supplier since 1995. Concurrent with the exercise, the Company sold 320,000 shares of the supplier's common stock and recognized a gain of approximately \$4.8 million. The remaining 138,000 shares are valued at approximately \$1.6 million and are included in other long-term assets.

OTHER OPERATING EXPENSES - SYMPHONY -- Beginning in April 2000, the Company made periodic advances to and investments in Symphony Systems, Inc., a privately held, early-stage developer of equipment productivity management software. In addition to the approximately \$8 million from the Company as investments, advances and license payments, Symphony received investments of \$7 million from other parties. In 2000, the Company obtained an exclusive license, for which the Company paid \$1.5 million, to use Symphony's products in the semiconductor industry. In connection with certain of the Company's advances in 2001, it obtained a security interest in all of Symphony's intellectual and proprietary property.

Beginning in the third quarter of 2001, and continuing through the end of the year, Symphony's financial situation began to deteriorate significantly, and the Company determined that due to Symphony's need for immediate liquidity, its declining business prospects (including the indefinite postponement of a significant order for its products from a major semiconductor equipment manufacturer) and other factors, the value of the Company's investment in and advances to Symphony had substantially declined. Given the precarious financial condition of Symphony, the Company valued its investments in and advances to Symphony at December 31, 2001, at approximately \$1 million, which reflects its assessment of the value of the Symphony technology license, which has continuing value to the Company. The amount of the impairment related to Symphony was \$6.8 million, all of which was recorded in 2001 as an operating expense.

Since Symphony effectively ceased operations in February 2002, the Company hired its key employees and intends to purchase Symphony's remaining assets in a foreclosure, liquidation or bankruptcy sale in the near future. At no time did the Company's percentage ownership in the voting stock of Symphony exceed approximately 1.7%, and the Company has never had the ability to exercise significant influence over Symphony.

(13) RETIREMENT PLAN

The Company has 401(k) Profit Sharing Plans which cover most full-time employees who have completed six months of full-time continuous service and are age eighteen or older. Depending on the plan in which a participant is enrolled, participants may defer up to either 10% or 15% of their gross pay up to a maximum limit determined by law. Participants are immediately vested in their contributions.

The Company may make discretionary contributions based on corporate financial results for the fiscal year. Effective January 1, 1998, the Company increased its matching contribution for participants in the 401(k) Plans up to a 50% matching on contributions by employees up to 6% of the employee's compensation. The Company's total contributions to the plans were approximately \$1,433,000, \$1,291,000 and \$848,000 for the years ended December 31, 2001, 2000 and 1999, respectively. Vesting in the profit sharing contribution account is based on years of service, with most participants fully vested after five years of credited service.

The Company also has a Money Purchase Pension Plan, which covers certain employees. This plan was frozen, effective July 1, 1998, and the Company is not required to make contributions to the plan for future years. The Company's contributions to this plan were \$62,000 for 2000. The Company made no contributions in 2001 and 1999.

(14) COMMITMENTS AND CONTINGENCIES

DISPUTES AND LEGAL ACTIONS

The Company is involved in disputes and legal actions arising in the normal course of its business. The Company does not believe that the ultimate resolution of such litigation will have a material adverse effect on the Company's financial position, results of operations or cash flows. The Company accrues loss contingencies in connection with its litigation when it is probable that a loss has occurred and the amount of the loss can be reasonably estimated.

CAPITAL LEASES

The Company finances a portion of its property and equipment under capital lease obligations. The future minimum lease payments under capitalized lease obligations as of December 31, 2001 were approximately \$6,000, all a current liability.

OPERATING LEASES

The Company has various operating leases for automobiles, equipment, and office and production facilities (Note 17). Lease expense under operating leases was approximately \$5,770,000, \$5,155,000 and \$4,926,000 for the years ended December 31, 2001, 2000 and 1999, respectively.

The future minimum rental payments required under noncancelable operating leases as of December 31, 2001 are as follows:

| | (IN THOUSANDS) |
|-----------------|------------------|
| 2002..... | \$ 5,211 |
| 2003..... | 4,194 |
| 2004..... | 3,610 |
| 2005..... | 3,189 |
| 2006..... | 3,018 |
| Thereafter..... | 17,117 |
| | ----- |
| | \$36,339 |
| | ===== |

(15) RESTRUCTURING

The Company recorded \$3,070,000 of restructuring charges in 2001, primarily associated with reductions in force to respond to the downturn in the semiconductor capital equipment industry and the global economy. The Company's restructuring plans and associated costs consisted of \$2,124,000 to terminate 330 employees and \$946,000 to close three facilities. These costs were recorded in the

accompanying consolidated statements of operations as "Restructuring Charges" as a component of operating expenses.

The employee termination costs of \$2,124,000 included severance benefits and notice pay. All terminations and termination benefits were communicated to the affected employees prior to year-end, and severance benefits are expected to be paid in full in 2002. The affected employees were all part of the Company's U.S. operations and included full-time permanent and temporary employees, and consisted primarily of manufacturing and administrative personnel.

The facility related costs of \$946,000 resulted from the phase out the Company's Austin, Texas manufacturing facility to begin outsourcing the assembly of certain DC power products; the transition of its Voorhees, New Jersey facility from a manufacturing site to a design center; and the closure of Noah's manufacturing and office facilities in San Jose, California, due to the transfer of Noah's manufacturing to Vancouver, Washington, to be co-located with Sekidenko. These costs accrued reflect payments required under operating lease contracts and costs for writing down related leasehold improvements of facilities.

At December 31, 2001, outstanding liabilities related to the 2001 restructuring charges were approximately \$1.3 million, and were reported on the consolidated balance sheet.

The Company also recorded a \$1,000,000 restructuring charge in 2000 related to the termination of employees associated with Tower in Fridley, Minnesota, and charges related to closing that facility, resulting from the relocation of Tower's operations to the Company's facility in Voorhees, New Jersey. This restructuring was completed in the fourth quarter of 2000. As of December 31, 2000, approximately \$475,000 related to this restructuring was reported on the Company's consolidated balance sheet as an accrued liability. Approximately \$80,000 of this restructuring charge related to the lease of the facility was still outstanding as of December 31, 2001.

The following table summarizes the components of the restructuring charges, the payments and non-cash charges, and the remaining accrual as of December 31, 2001:

| | EMPLOYEE SEVERANCE AND TERMINATION COSTS | FACILITY CLOSURE COSTS | TOTAL RESTRUCTURING CHARGES |
|--|---|------------------------------|-----------------------------------|
| | ----- | ----- | ----- |
| | (IN THOUSANDS) | | |
| 2000 restructuring charges | \$ 681 | \$ 319 | \$ 1,000 |
| Payments in 2000 | (380) | (145) | (525) |
| | ----- | ----- | ----- |
| Accrual balance December 31, 2000 | \$ 301 | \$ 174 | \$ 475 |
| | ===== | ===== | ===== |
| Second quarter 2001 restructuring charge | 614 | -- | 614 |
| Fourth quarter 2001 restructuring charge | 1,510 | 946 | 2,456 |
| | ----- | ----- | ----- |
| Total restructuring charges 2001 | 2,124 | 946 | 3,070 |
| Payments in 2001 | (1,460) | (658) | (2,118) |
| | ----- | ----- | ----- |
| Accrual balance December 31, 2001 | \$ 965 | \$ 462 | \$ 1,427 |
| | ===== | ===== | ===== |

(16) INDUSTRY SEGMENT, FOREIGN OPERATIONS AND MAJOR CUSTOMERS

SFAS No. 131, "Disclosure about Segments of an Enterprise and Related Information," requires a public business enterprise to report financial and descriptive information about its reportable operating segments. SFAS No. 131, which is based on a management approach to segment reporting, establishes requirements to report selected segment information quarterly and to report annually entity-wide disclosures about products and services, major customers, and the countries in which the entity holds material assets and reports revenue. Operating segments are components of an enterprise about which separate financial information is available that is evaluated regularly by the chief operating decision-maker in deciding how to allocate resources and assess performance. Management operates and manages the

Company's business for the manufacture, marketing and servicing of its products and related systems as one operating segment. All material operating units qualify for aggregation under SFAS No. 131 because all the Company's products and systems have similar economic characteristics, and procurement, production and distribution processes. To report revenues from external customers for each product and service or each group of similar products and services would be impracticable. Since the Company operates in one segment, all financial segment information required by SFAS No. 131 is found in the accompanying consolidated financial statements.

The Company has operations in the U.S., Europe and Asia Pacific. The following is a summary of the Company's operations by region:

| | YEARS ENDED DECEMBER 31, | | |
|---|--------------------------|------------|------------|
| | 2001 | 2000 | 1999 |
| | (IN THOUSANDS) | | |
| Sales: | | | |
| Originating in U.S. and sold to domestic customers | \$ 124,746 | \$ 260,596 | \$ 148,424 |
| Originating in U.S. and sold to foreign customers | 19,687 | 35,504 | 23,996 |
| Originating in Europe to unaffiliated customers | 18,239 | 24,375 | 12,724 |
| Originating in Asia Pacific to unaffiliated customers | 30,928 | 39,307 | 17,705 |
| Transfers between geographic areas | 40,774 | 48,963 | 24,053 |
| Intercompany eliminations | (40,774) | (48,963) | (24,053) |
| | \$ 193,600 | \$ 359,782 | \$ 202,849 |
| | ===== | ===== | ===== |
| (Loss) income from operations: | | | |
| U.S. | \$ (47,532) | \$ 73,508 | \$ 25,390 |
| Europe | 1,517 | 3,805 | 2,379 |
| Asia Pacific | 1,157 | 7,878 | 1,946 |
| Intercompany eliminations | (2,029) | 9 | (389) |
| | \$ (46,887) | \$ 85,200 | \$ 29,326 |
| | ===== | ===== | ===== |
| Identifiable assets: | | | |
| U.S. | \$ 529,465 | \$ 387,953 | |
| Europe | 21,357 | 19,263 | |
| Asia Pacific | 23,633 | 29,281 | |
| Intercompany eliminations | (124,260) | (70,662) | |
| | \$ 450,195 | \$ 365,835 | |
| | ===== | ===== | |

Intercompany sales among the Company's geographic areas are recorded on the basis of intercompany prices established by the Company.

The Company has a major customer (sales in excess of 10% of total sales) that is a manufacturer of semiconductor capital equipment. Sales to this customer accounted for the following percentages of sales for the years ended December 31, 2001, 2000 and 1999:

| | DECEMBER 31, | | |
|-----------------------------|--------------|------|------|
| | 2001 | 2000 | 1999 |
| Applied Materials, Inc..... | 24% | 39% | 34% |
| | === | === | === |

The Company had trade accounts receivable from this customer of approximately \$8.0 million as of December 31, 2000, which was approximately 11.0% of the Company's total trade accounts receivable. The Company had no other trade accounts receivable from any customers in excess of 10% of its total trade accounts receivable as of December 31, 2001 and 2000.

(17) RELATED PARTY TRANSACTIONS

The Company leases its executive offices and manufacturing facilities in Fort Collins, Colorado from a limited liability partnership consisting of certain directors of the Company and other individuals. The leases relating to these spaces expire in 2011, 2013 and 2016, and contain monthly payments of approximately \$52,000, \$52,000 and \$62,000, respectively. The Company also leases other office and production space from another limited liability partnership consisting of certain directors of the Company and other individuals. The lease relating to this space expires in 2002 with a monthly payment of approximately \$28,000.

Approximately \$2,229,000, \$1,637,000 and \$1,693,000 were paid and charged to rent expense attributable to these leases for the years ended December 31, 2001, 2000 and 1999, respectively. In 2000, the Company also paid an additional \$637,000 to one of the partnerships for leasehold improvements made in the normal course of the Company's operations, which are capitalized and reported as leasehold improvements on the balance sheet as part of property and equipment.

The Company leases, for business purposes, a condominium owned by a partnership of certain stockholders. The Company paid the partnership \$47,000, \$36,000 and \$36,000 in 2001, 2000 and 1999, respectively.

The Company charts aircraft from time to time from companies owned by a certain shareholder. Aggregate payments for the use of such aircraft were \$0, \$57,000 and \$238,000 in 2001, 2000 and 1999, respectively.

(18) CONCENTRATIONS OF CREDIT RISK

FORWARD CONTRACTS -- The Company's subsidiary AE-Japan enters into foreign currency forward contracts to buy U.S. dollars to mitigate currency exposure from its payable position arising from trade purchases and intercompany transactions with its parent. Foreign currency forward contracts reduce the Company's exposure to the risk that the eventual net cash outflows resulting from the purchase of products denominated in other currencies will be adversely affected by changes in exchange rates. Foreign currency forward contracts are entered into with a major commercial Japanese bank that has a high credit rating, and the Company does not expect the counterparty to fail to meet its obligations under outstanding contracts. Foreign currency gains and losses under the above arrangements are not deferred. The Company generally enters into foreign currency forward contracts with maturities ranging from four to eight months, with contracts outstanding at December 31, 2001 maturing through July 2002. All forward contracts are held until maturity. At December 31, 2001, the Company held foreign forward exchange contracts with notional amounts of \$6,500,000 and market settlement amounts of \$6,133,000 for an unrealized gain position of \$367,000 that has been included in foreign currency (loss) gain in the accompanying consolidated statement of operations.

OTHER CONCENTRATIONS OF CREDIT RISK -- The Company uses financial instruments that potentially subject it to concentrations of credit risk. Such instruments include cash equivalents, short-term investments, accounts receivable, and foreign currency forward contracts. The Company invests its cash in cash deposits, money market funds, commercial paper, certificates of deposit and readily marketable debt securities. The Company places its investments with high credit quality financial institutions and limits the credit exposure from any one financial institution or instrument. To date, the Company has not experienced significant losses on these investments. The Company performs ongoing credit evaluations of its customers' financial condition and generally requires no collateral. Because the Company's receivables are primarily related to companies in the semiconductor capital equipment industry, the Company is exposed to credit risk generally related to this industry.

(19) STOCK PLANS

1995 EMPLOYEE STOCK OPTION PLAN -- During 1993, the Company adopted an Employee Stock Option Plan (the "Employee Option Plan") that has been amended and restated various times through December 2001. The Employee Option Plan allows issuance of incentive stock options, non-qualified options, and stock purchase rights. The exercise price of incentive stock options shall not be less than 100% of the stock's fair market value on the date of grant. The exercise price of non-qualified stock options shall not be less than 85% of the stock's fair market value on the date of grant. Options the Company (exclusive of acquired subsidiaries) issued under this plan in 2001, 2000 and 1999 were at 100%

of fair market value with typical vesting over three to four years. Under the Employee Option Plan, the Company has the discretion to accelerate the vesting period. The options are exercisable for ten years from the date of grant. The Company has reserved 8,125,000 shares of common stock for the issuance of stock under the Employee Option Plan, which terminates in June 2003.

During 1999, prior to its acquisition by the Company, a shareholder of Sekidenko granted employees options under a preexisting arrangement to purchase shares of his common stock already outstanding at exercise prices below fair market value. Under this agreement, 29,700 and 34,250 of such options were exercised in 1999 and 2000, respectively. These options result in the Company recognizing \$109,000 as compensation expense over the four-year vesting period related to the 1999 purchases, and \$1,995,000 as compensation expense over the four-year vesting period related to the 2000 purchases. Compensation expense of \$526,000, \$461,000 and \$23,000 was recognized in 2001, 2000 and 1999, respectively. These amounts are presented as a reduction of stockholders' equity, and the remaining amount of deferred compensation of \$1,094,000 is being amortized over the four-year vesting period of the related stock options.

EMPLOYEE STOCK PURCHASE PLAN -- In September 1995, stockholders approved an Employee Stock Purchase Plan (the "Stock Purchase Plan") covering an aggregate of 200,000 shares of common stock. Employees are eligible to participate in the Stock Purchase Plan if employed by the Company for at least 20 hours per week during at least five months per calendar year. Participating employees may have up to 15% (subject to a 5% limitation set by the Company) of their earnings or a maximum of \$1,250 per six month period withheld pursuant to the Stock Purchase Plan. Common stock purchased under the Stock Purchase Plan will be equal to 85% of the lower of the fair market value on the commencement date of each offering period or the relevant purchase date. During 2001, 2000 and 1999, employees purchased an aggregate of 37,376, 13,025 and 22,390 shares under the Stock Purchase Plan, respectively.

NON-EMPLOYEE DIRECTORS STOCK OPTION PLAN -- In September 1995, the Company adopted the 1995 Non-Employee Directors Stock Option Plan (the "Directors Plan") covering 50,000 shares of common stock. In May 2001, the plan was amended to increase the number of shares of common stock issuable under such plan to 200,000 shares of common stock. The Directors Plan provides for automatic grants of non-qualified stock options to directors of the Company who are not employees of the Company ("Outside Directors"). Pursuant to the Directors Plan, upon becoming a director of the Company, each Outside Director will be granted an option to purchase 7,500 shares of common stock. Such options will be immediately exercisable as to 2,500 shares of common stock, and will vest as to 2,500 shares of common stock on each of the second and third anniversaries of the grant date. On each anniversary of the date on which a person became an Outside Director, an option for an additional 2,500 shares is granted. Such additional options vest on the third anniversary of the date of grant. Options will expire ten years after the grant date, and the exercise price of the options will be equal to the fair market value of the common stock on the grant date. The Directors Plan terminates September 2005.

2001 EMPLOYEE STOCK OPTION PLAN -- In 2001, the Company adopted the 2001 Stock Option Plan (the "2001 Option Plan"), which was not required to be approved by the Company's stockholders. The 2001 Option Plan is a broad-based plan for employees and consultants in which executive officers and directors of the Company are not allowed to participate. The board of directors currently administers the plan, and makes all decisions concerning which employees and consultants are granted options, how many to grant to each optionee, when options are granted, how the plan should be properly interpreted, whether to amend or terminate the plan, and whether to delegate administration of the plan to a committee. The 2001 Option Plan allows issuance of only non-qualified options. The exercise price of the options shall not be less than 100% of the stock's fair market value on the date of grant, and the options vest over four years. The options are exercisable for ten years from the date of grant. The Company has reserved up to 600,000 shares of common stock under the plan. The 2001 Option Plan will expire in January 2011, unless the administrator of the plan terminates it earlier.

The following summarizes the activity relating to options for the years ended December 31, 2001, 2000 and 1999:

| | 2001 | | 2000 | | 1999 | |
|--|-------------------------------------|---------------------------------------|------------------|---------------------------------------|------------------|---------------------------------------|
| | (IN THOUSANDS, EXCEPT SHARE PRICES) | | | | | |
| | Shares | Weighted-Average Exercise Price | Shares | Weighted-Average Exercise Price | Shares | Weighted-Average Exercise Price |
| | ----- | ----- | ----- | ----- | ----- | ----- |
| Stock options: | | | | | | |
| Employee stock options -- | | | | | | |
| Options outstanding at beginning of period | 1,719 | \$23.39 | 1,850 | \$13.90 | 1,987 | \$ 9.01 |
| Granted | 845 | 25.64 | 461 | 45.45 | 417 | 30.31 |
| Exercised | (273) | 12.13 | (488) | 9.12 | (487) | 8.44 |
| Terminated | (183) | 31.22 | (104) | 19.26 | (67) | 10.44 |
| | ----- | ----- | ----- | ----- | ----- | ----- |
| Options outstanding at end of period | 2,108 | 25.07 | 1,719 | 23.39 | 1,850 | 13.90 |
| | ===== | ===== | ===== | ===== | ===== | ===== |
| Options exercisable at end of period | 938 | 20.45 | 689 | 14.09 | 801 | 9.10 |
| | ===== | ===== | ===== | ===== | ===== | ===== |
| Weighted-average fair value of options granted during the period | \$ 25.61 | | \$ 32.75 | | \$ 18.78 | |
| | ===== | | ===== | | ===== | |
| Price range of outstanding options | \$0.67 - \$64.94 | | \$0.67 - \$60.75 | | \$0.67 - \$44.97 | |
| | ===== | | ===== | | ===== | |
| Price range of options terminated | \$7.50 - \$60.75 | | \$0.83 - \$43.69 | | \$3.88 - \$28.16 | |
| | ===== | | ===== | | ===== | |
| Non-employee directors stock options-- | | | | | | |
| Options outstanding at beginning of period | 75 | \$27.25 | 55 | \$19.04 | 40 | \$12.18 |
| Granted | 15 | 24.44 | 20 | 49.81 | 18 | 32.94 |
| Exercised | -- | -- | -- | -- | (3) | 11.05 |
| Terminated | -- | -- | -- | -- | -- | -- |
| | ----- | ----- | ----- | ----- | ----- | ----- |
| Options outstanding at end of period | 90 | 26.92 | 75 | 27.25 | 55 | 19.04 |
| | ===== | ===== | ===== | ===== | ===== | ===== |
| Options exercisable at end of period | 45 | 16.97 | 32 | 18.65 | 22 | 17.27 |
| | ===== | ===== | ===== | ===== | ===== | ===== |
| Weighted-average fair value of options granted during the period | \$ 24.85 | | \$ 30.83 | | \$ 20.11 | |
| | ===== | | ===== | | ===== | |
| Price range of outstanding options | \$6.13 - \$60.75 | | \$6.13 - \$64.94 | | \$6.13 - \$36.94 | |
| | ===== | | ===== | | ===== | |
| Price range of options terminated | \$ -- | | \$ -- | | \$ -- | |
| | ===== | | ===== | | ===== | |

Statement of Financial Accounting Standards No. 123, "Accounting for Stock-Based Compensation" ("SFAS No. 123"), defines a fair value based method of accounting for employee stock options or similar equity instruments. However, SFAS No. 123 allows the continued measurement of compensation cost for such plans using the intrinsic value based method prescribed by APB Opinion No. 25, "Accounting for Stock Issued to Employees" ("APB No. 25"), provided that pro forma disclosures are made of net income or loss and net income or loss per share, assuming the fair value based method of SFAS No. 123 had been applied. The Company has elected to account for employee stock-based compensation plans under APB No. 25, under which compensation expense, if any, is recognized based on the intrinsic value of stock options and other stock awards, generally measured at the date of grant.

For SFAS No. 123 purposes, the fair value of each option grant is estimated on the date of grant using the Black-Scholes option pricing model with the following weighted-average assumptions:

| | 2001 | 2000 | 1999 |
|-------------------------------|---------|---------|---------|
| | ----- | ----- | ----- |
| Risk-free interest rates | 4.51% | 6.06% | 5.92% |
| Expected dividend yield rates | 0.0% | 0.0% | 0.0% |
| Expected lives | 7 years | 7 years | 7 years |
| Expected volatility | 87.94% | 103.69% | 77.33% |

The total fair value of options granted was computed to be approximately \$17,675,000, \$15,719,000 and \$8,192,000 for the years ended December 31, 2001, 2000 and 1999, respectively. These amounts are amortized ratably over the vesting period of the options. Cumulative compensation cost recognized in pro forma net income or loss with respect to options that are forfeited prior to vesting is adjusted as a reduction of pro forma compensation expense in the period of forfeiture. Pro forma stock-based compensation, net

of the effect of forfeitures and tax, was approximately \$5,413,000, \$4,554,000 and \$2,999,000 for 2001, 2000 and 1999, respectively.

Had compensation cost for these plans been determined consistent with SFAS No. 123, the Company's net income (loss) would have been reduced (increased) to the following pro forma amounts:

| | 2001 | 2000 | 1999 |
|------------------------------------|--|-----------|-----------|
| | ----- | ----- | ----- |
| | (IN THOUSANDS, EXCEPT PER SHARE DATA) | | |
| Net (loss) income: | | | |
| As reported | \$ (31,379) | \$ 68,034 | \$ 19,066 |
| Pro forma | (36,792) | 63,480 | 16,067 |
| Diluted (loss) earnings per share: | | | |
| As reported | \$ (0.99) | \$ 2.10 | \$ 0.62 |
| Pro forma | (1.16) | 1.96 | 0.52 |

The following table summarizes information about the stock options outstanding at December 31, 2001:

| | | Options Outstanding | | Options Exercisable | |
|-----------------------------|-----------------------|--|---|-----------------------|---|
| | | Weighted- Average Remaining Contractual Life | Weighted- Average Exercise Price | Number Exercisable | Weighted- Average Exercise Price |
| Range of Exercise Prices | Number Outstanding | | | | |
| \$ 0.67 to \$ 2.57 | 16,000 | 1.8 years | \$ 1.23 | 16,000 | \$ 1.20 |
| \$ 3.11 to \$ 6.75 | 190,000 | 6.0 years | \$ 5.78 | 149,000 | \$ 5.58 |
| \$ 7.50 to \$ 9.00 | 239,000 | 5.1 years | \$ 8.25 | 184,000 | \$ 8.44 |
| \$ 9.53 to \$ 16.51 | 244,000 | 6.0 years | \$ 13.69 | 227,000 | \$ 13.69 |
| \$17.32 to \$26.63 | 438,000 | 9.1 years | \$ 21.07 | 66,000 | \$ 20.05 |
| \$27.57 to \$40.00 | 665,000 | 8.6 years | \$ 30.86 | 159,000 | \$ 29.60 |
| \$43.69 to \$64.94 | 406,000 | 8.1 years | \$ 47.05 | 182,000 | \$ 46.28 |
| | ----- | ----- | ----- | ----- | ----- |
| | 2,198,000 | 7.7 years | \$ 25.15 | 983,000 | \$ 20.29 |
| | ===== | ===== | ===== | ===== | ===== |

(20) FAIR VALUE OF FINANCIAL INSTRUMENTS

The Company's financial instruments include cash, trade receivables, trade payables, marketable securities, short-term and long-term debt, and foreign currency forward exchange contracts (see Note 18). The fair values of cash, trade receivables, trade payables and short-term debt approximate the carrying values due to the short term nature of these instruments. Marketable securities are stated at fair value (see Note 5). At December 31, 2001 and 2000, the carrying value of long-term debt was \$206.6 million and \$82.6 million, respectively. At December 31, 2001, the estimated fair value of the Company's 5.25% convertible subordinated notes that are due November 15, 2006, was approximately \$72 million, compared to a book value of \$81.6 million. The estimated fair value of the Company's 5.00% convertible subordinated notes that are due September 1, 2006, was approximately \$141 million, compared to a book value of \$125 million.

(21) GOODWILL IMPAIRMENT

During the second quarter of 2001, the Company terminated the operations of Tower and FST, due to significant softening in the projected demand for these products. Revenue contributed by Tower and FST operations for 2001, 2000 and 1999 represented less than five percent of total revenue for each period. Because the expected future cash flows for these products were insignificant after the second quarter of 2001, the Company recognized an impairment charge of \$3.6 million related to the termination of Tower

and a charge of \$1.8 million related to the termination of FST. These amounts represented the carrying values of these assets on June 30, 2001, before the writedown. These charges are disclosed as "Goodwill Impairment" in the Operating Expenses section of the accompanying consolidated statement of operations.

(22) SUBSEQUENT EVENTS

AERA -- On January 18, 2002, the Company completed its acquisition of Aera Japan Limited, a Japanese corporation ("Aera"). The acquisition was effected through AE-Japan, which purchased all of the outstanding stock of Aera. The aggregate purchase price paid by AE-Japan was 5.73 billion Japanese yen (approximately \$44 million, based upon an exchange rate of 130:1), which was funded from the Company's available cash. In connection with the acquisition, AE-Japan assumed approximately \$34 million of Aera's debt. Aera, which is headquartered in Hachioji, Japan, has manufacturing facilities there and manufacturing, sales and service offices in Austin, Texas; Dresden, Germany; Edinburgh, Scotland; and Bundang, South Korea; and sales and service offices in Kirchheim, Germany; and Hsinchu, Taiwan. Aera supplies the semiconductor capital equipment industry with product lines that include digital mass flow controllers, pressure-based mass flow controllers, liquid mass flow controllers, ultrasonic liquid flow meters and liquid vapor delivery systems.

PRIVATE COMPANY -- On February 28, 2002, the Company agreed to purchase a privately owned Germany-based provider of power supplies and matching networks, for a purchase price ranging from \$13.5 million to \$20 million, depending on the outcome of contingencies. The Company is performing due diligence and expects to complete the transaction by April 30, 2002.

LITMAS -- The Company has an agreement in principle to acquire the 40.5% that it currently does not own for approximately 130,000 shares of the Company's common stock. Based on the Nasdaq closing price of the Company's common stock on February 28, 2002 of \$25.100 per share, the purchase price would have been valued at approximately \$3.3 million.

(23) QUARTERLY FINANCIAL DATA

The following table presents unaudited quarterly financial data for each of the eight quarters in the period ended December 31, 2001. The quarters ended March 31, 2000 and June 30, 2000 have been restated to include the combined selected financial data of Noah and Sekidenko as though each had always been part of the Company. The Company believes that all necessary 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 | | | | | | | |
|--|------------------|------------------|---------------------------------------|------------------|------------------|------------------|-------------------|------------------|
| | MAR. 31, 2000 | JUNE 30, 2000 | SEPT. 30, 2000 | DEC. 31, 2000 | MAR. 31, 2001 | JUNE 30, 2001 | SEPT. 30, 2001 | DEC. 31, 2001 |
| | | | | | | | | |
| | | | (IN THOUSANDS, EXCEPT PER SHARE DATA) | | | | | |
| Sales | \$75,028 | \$85,701 | \$96,317 | \$102,736 | \$74,714 | \$ 46,171 | \$ 38,722 | \$ 33,993 |
| Gross profit | 36,667 | 42,363 | 46,825 | 50,598 | 31,223 | 7,781 | 11,036 | 7,392 |
| Income (loss) from operations | 17,048 | 20,343 | 20,884 | 26,925 | 7,531 | (20,927) | (11,663) | (21,828) |
| Net income (loss) before extraordinary item | 11,238 | 13,118 | 16,289 | 19,779 | 5,094 | (14,549) | (7,482) | (14,442) |
| Extraordinary item (net of income taxes) | -- | -- | -- | 7,610 | -- | -- | -- | -- |
| Net income (loss) | \$11,238 | \$13,118 | 16,289 | \$ 27,389 | \$ 5,094 | \$(14,549) | \$ (7,482) | \$(14,442) |
| | ===== | ===== | ===== | ===== | ===== | ===== | ===== | ===== |
| Diluted earnings (loss) per share before extraordinary item | \$ 0.35 | \$ 0.40 | \$ 0.50 | \$ 0.61 | \$ 0.16 | \$ (0.46) | \$ (0.24) | \$ (0.45) |
| | ===== | ===== | ===== | ===== | ===== | ===== | ===== | ===== |
| Diluted earnings per share from extraordinary item | \$ -- | \$ -- | \$ -- | \$ 0.22 | \$ -- | \$ -- | \$ -- | \$ -- |
| | ===== | ===== | ===== | ===== | ===== | ===== | ===== | ===== |
| Diluted earnings (loss) per share ... | \$ 0.35 | \$ 0.40 | \$ 0.50 | \$ 0.83 | \$ 0.16 | \$ (0.46) | \$ (0.24) | \$ (0.45) |
| | ===== | ===== | ===== | ===== | ===== | ===== | ===== | ===== |

The following table presents unaudited quarterly financial data for the two quarters ended June 30, 2000, retroactively combining the selected financial data of Noah and Sekidenko for the periods prior to the periods in which each was merged with the Company.

| | QUARTERS ENDED | |
|----------------------------------|--|------------------|
| | MAR. 31, 2000 | JUNE 30, 2000 |
| | (IN THOUSANDS, EXCEPT PER SHARE DATA) | |
| Sales | \$ 7,857 | \$ 5,115 |
| Gross profit | 4,493 | 3,024 |
| Income from operations | 2,179 | 1,809 |
| Net income | \$ 1,242 | \$ 1,088 |
| | ===== | ===== |
| Diluted earnings per share | \$ 0.01 | \$ -- |
| | ===== | ===== |

The following table presents unaudited quarterly financial data for the Company for the two quarters ended March 31, 2000 and June 30, 2000, as previously reported on the Company's Forms 10-Q for those periods.

| | QUARTERS ENDED | |
|----------------------------------|--|------------------|
| | MAR. 31, 2000 | JUNE 30, 2000 |
| | (IN THOUSANDS, EXCEPT PER SHARE DATA) | |
| Sales | \$67,171 | \$80,586 |
| Gross profit | 32,174 | 39,339 |
| Income from operations | 14,869 | 18,534 |
| Net income | \$ 9,996 | \$12,030 |
| | ===== | ===== |
| Diluted earnings per share | \$ 0.34 | \$ 0.40 |
| | ===== | ===== |

ADVANCED ENERGY INDUSTRIES, INC. AND SUBSIDIARIES

SCHEDULE II -- VALUATION AND QUALIFYING ACCOUNTS

| | BALANCE AT BEGINNING OF PERIOD ----- | ADDITIONS DUE TO ACQUISITION ----- | ADDITIONS CHARGED TO EXPENSE ----- | DEDUCTIONS ----- | BALANCE AT END OF PERIOD ----- |
|---------------------------------------|---|---|---|---------------------|---|
| | (IN THOUSANDS) | | | | |
| Year ended December 31, 1999: | | | | | |
| Inventory obsolescence reserve | \$2,626 | \$ -- | \$1,520 | \$1,842 | \$2,304 |
| Allowance for doubtful accounts | 622 | -- | 101 | 84 | 639 |
| | ----- | ----- | ----- | ----- | ----- |
| | \$3,248 | \$ -- | \$1,621 | \$1,926 | \$2,943 |
| | ===== | ===== | ===== | ===== | ===== |
| Year ended December 31, 2000: | | | | | |
| Inventory obsolescence reserve | \$2,304 | \$ -- | \$ 654 | \$ 705 | \$2,253 |
| Allowance for doubtful accounts | 639 | -- | 145 | -- | 784 |
| | ----- | ----- | ----- | ----- | ----- |
| | \$2,943 | \$ -- | \$ 799 | \$ 705 | \$3,037 |
| | ===== | ===== | ===== | ===== | ===== |
| Year ended December 31, 2001: | | | | | |
| Inventory obsolescence reserve | \$2,253 | \$ 180 | \$6,412 | \$3,214 | \$5,631 |
| Allowance for doubtful accounts | 784 | 100 | 282 | 117 | 1,049 |
| | ----- | ----- | ----- | ----- | ----- |
| | \$3,037 | \$ 280 | \$6,694 | \$3,331 | \$6,680 |
| | ===== | ===== | ===== | ===== | ===== |

ITEM 9. DISAGREEMENTS ON ACCOUNTING AND FINANCIAL DISCLOSURES

Not applicable.

PART III

In accordance with General Instruction G(3) of Form 10-K, the information required by this Part III is incorporated by reference to Advanced Energy's definitive proxy statement relating to its 2002 Annual Meeting of Stockholders (the "Proxy Statement"), as set forth below. The Proxy Statement will be filed with the Securities and Exchange Commission within 120 days after the end of 2001.

ITEM 10. DIRECTORS AND EXECUTIVE OFFICERS OF THE REGISTRANT

The information set forth in the Proxy Statement under the captions "Proposal 1/ Election of Directors--Nominees" and "Section 16(a) Beneficial Ownership Reporting Compliance" and in Part I of this Form 10-K under the caption "Executive Officers of the Company" is incorporated herein by reference.

ITEM 11. EXECUTIVE COMPENSATION

The information set forth in the Proxy Statement under the caption "Executive Compensation" is incorporated herein by reference.

ITEM 12. SECURITY OWNERSHIP OF CERTAIN BENEFICIAL OWNERS AND MANAGEMENT

The information set forth in the Proxy Statement under the caption "Common Stock Ownership by Management and Other Stockholders" is incorporated herein by reference.

ITEM 13. CERTAIN RELATIONSHIPS AND RELATED TRANSACTIONS

The information set forth in the Proxy Statement under the caption "Certain Transactions with Management" is incorporated herein by reference.

PART IV

ITEM 14. EXHIBITS, FINANCIAL STATEMENT SCHEDULES AND REPORTS ON FORM 8-K

| | page ---- |
|--|--------------|
| (a) (i) Financial Statements: | |
| Report of Independent Public Accountants | 57 |
| Consolidated Financial Statements: | |
| Balance Sheets at December 31, 2001 and 2000 | 58 |
| Statements of Operations for each of the three years in the period ended December 31, 2001 | 60 |
| Statement of Stockholders' Equity for each of the three years in the period ended December 31, 2001 | 61 |
| Statements of Cash Flows for each of the three years in the period ended December 31, 2001 | 62 |
| Notes to Consolidated Financial Statements | 63 |
| (ii) Financial Statement Schedules for each of the three years in the period ended December 31, 2001 | |
| Schedule II--Valuation and Qualifying Accounts | 84 |
| (iii) Exhibits: | |
| 2.1 Agreement and Plan of Reorganization, dated as of June 1, 1998, by and among the Company, Warpspeed, Inc., a wholly owned subsidiary of the Company, and RF Power Products, Inc.(1) | |
| 2.2 Stock Purchase Agreement dated November 16, 2001, by and among the Company, Advanced Energy Japan K.K., a wholly owned subsidiary of the Company, Aera Japan Limited and Certain Stockholders of Aera Japan Limited(2) | |
| 2.3 Amendment No. 1 to Stock Purchase Agreement, dated December 25, 2001, by and among the Company, Advanced Energy Japan K.K., a wholly owned subsidiary of the Company, Aera Japan Limited and Certain Stockholders of Aera Japan Limited(3) | |
| 2.4 Forms of Minority Stock Purchase Agreement(3) | |
| 3.1 The Company's Restated Certificate of Incorporation, as amended(4) | |
| 3.2 The Company's By-laws(5) | |
| 4.1 Form of Specimen Certificate for the Company's Common Stock(5) | |
| 4.2 Indenture dated November 1, 1999 between State Street Bank and Trust Company of California, N.A., as trustee, and the Company (including form of 5 1/4% Convertible Subordinated Note due 2006)(6) | |
| 4.3 Indenture dated August 27, 2001 between State Street Bank and Trust Company of California, N.A., as trustee, and the Company (including form of 5.00% Convertible Subordinated Note due September 1, 2006)(7) | |
| 4.4 Registration Rights Agreement dated as of August 22, 2001, between the Company and Goldman, Sachs and Co.(7) | |
| 4.5 The Company hereby agrees to furnish to the SEC, upon request, a copy of the instruments which define the rights of holders of long-term debt of the Company. None of such instruments not included as exhibits herein represents long-term debt in excess of 10% of the consolidated total assets of the Company. | |
| 10.1 Comprehensive Supplier Agreement, dated May 18, 1998, between Applied Materials Inc. | |

and the Company(1)+

- 10.2 Purchase Order and Sales Agreement, dated October 12, 1999, between Lam Research Corporation and the Company(6)
- 10.3 Loan Agreement dated June 18, 2001, by and among Silicon Valley Bank, as Servicing Agent and a Bank, and United Overseas Bank, as a Bank, and the Company, as borrower
- 10.4 Lease, dated June 12, 1984, amended June 11, 1992, between Prospect Park East Partnership and the Company for property in Fort Collins, Colorado(5)
- 10.5 Lease, dated March 14, 1994, as amended, between Sharp Point Properties, L.L.C., and the Company for property in Fort Collins, Colorado(5)
- 10.6 Lease, dated May 19, 1995, between Sharp Point Properties, L.L.C. and the Company for a building in Fort Collins, Colorado(5)
- 10.7 Form of Indemnification Agreement(5)
- 10.8 Employment Agreement, dated June 1, 1998, between RF Power Products, Inc., and Joseph Stach(8)
- 10.9 1995 Stock Option Plan, as amended and restated through February 7, 2001(9)*
- 10.10 1995 Non-Employee Directors' Stock Option Plan, as amended and restated through February 7, 2001(9)*
- 10.11 Lease dated March 20, 2000, between Sharp Point Properties, L.L.C. and the Company for a building in Fort Collins, Colorado(10)
- 10.12 Agreement and Plan of Reorganization, dated April 5, 2000, between the Company, Noah Holdings, Inc. and AE Cal Merger Sub, Inc.(11)
- 10.13 Escrow and Indemnity Agreement, dated April 5, 2000, between the Company, the former stockholders of Noah Holdings, Inc. and Commercial Escrow Services, Inc.(11)
- 10.14 Agreement and Plan of Reorganization, dated July 21, 2000, by and among the Company, Mercury Merger Corporation, a wholly owned subsidiary of the Company, Sekidenko, Inc. and Dr. Ray R. Dils.(12)
- 10.15 Agreement and Plan of Reorganization, dated July 6, 2000, amended and restated as of October 20, 2000, by and among the Company, Flow Acquisition Corporation, a wholly owned subsidiary of the Company, and Engineering Measurements Company(13)
- 21.1 Subsidiaries of the Company
- 23.1 Consent of Arthur Andersen LLP, Independent Accountants
- 24.1 Power of Attorney (included on the signature pages to this Annual Report on Form 10-K)
- 99.1 Assurance Letter pursuant to SEC Release Nos. 33-8070; 34-45590; 35-27503; 39-2395; IA-2018; IC-25464; FR-62; File No. S7-03-02 (filed herewith).

(b) No reports on Form 8-K were required to be filed by the Company during the fourth quarter of the year ended December 31, 2001.

(1) Incorporated by reference to the Company's Quarterly Report on Form 10-Q for the quarter ended June 30, 1998 (File No. 000-26966), filed August 7, 1998.

(2) Incorporated by reference to the Company's Registration Statement on Form S-3 (File No. 333-72748), filed February 8, 2002, as amended.

- (3) Incorporated by reference to the Company's Current Report on Form 8-K (File No. 000-26966), filed February 1, 2002.
- (4) Incorporated by reference to the Company's Quarterly Report on Form 10-Q for the quarter ended June 30, 2001 (File No. 000-26966), filed August 13, 2001.
- (5) Incorporated by reference to the Company's Registration Statement on Form S-1 (File No. 33-97188), filed September 20, 1995, as amended.
- (6) Incorporated by reference to the Company's Annual Report on Form 10-K for the year ended December 31, 1999 (File No. 000-26966), filed March 20, 2000.
- (7) Incorporated by reference to the Company's Current Report on Form 8-K (File No. 000-26966), filed September 10, 2001.
- (8) Incorporated by reference to the Company's Annual Report on Form 10-K for the year ended December 31, 1998 (File No. 000-26966), filed March 24, 1999.
- (9) Incorporated by reference to the Company's Quarterly Report on Form 10-Q for the quarter ended March 31, 2001 (File No. 000-26966), filed May 9, 2001.
- (10) Incorporated by reference to the Company's Annual Report on Form 10-K for the year ended December 31, 2000 (File No. 000-26966), filed March 27, 2001.
- (11) Incorporated by reference to the Company's Registration Statement on Form S-3 (File No. 333-37378), filed May 19, 2000.
- (12) Incorporated by reference to the Company's Quarterly Report on Form 10-Q for the quarter ended June 30, 2000 (File No. 000-26966), filed August 4, 2000.
- (13) Incorporated by reference to the Company's Quarterly Report on Form 10-Q for the quarter ended September 30, 2000 (File No. 000-26966), filed October 30, 2000.

* Compensation Plan

+ Confidential treatment has been granted for portions of this agreement.

SIGNATURES

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

ADVANCED ENERGY INDUSTRIES, INC.

(Registrant)

/s/ Douglas S. Schatz

Douglas S. Schatz

Chief Executive Officer, President and Chairman of the Board

Each person whose signature appears below hereby appoints Douglas S. Schatz and Richard P. Beck, and each of them severally, acting alone and without the other, his true and lawful attorney-in-fact with authority to execute in the name of each such person, and to file with the Securities and Exchange Commission, together with any exhibits thereto and other documents therewith, any and all amendments to this Annual Report on Form 10-K necessary or advisable to enable the registrant to comply with the Securities Exchange Act of 1934, as amended, and any rules, regulations and requirements of the Securities and Exchange Commission in respect thereof, which amendments may make such other changes in the Annual Report on Form 10-K as the aforesaid attorney-in-fact deems appropriate.

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.

| Signatures | Title | Date |
|---|---|----------------|
| /s/ Douglas S. Schatz ----- Douglas S. Schatz | Chief Executive Officer, President and Chairman of the Board (Principal Executive Officer) | March 25, 2002 |
| /s/ Michael El-Hillow ----- Michael El-Hillow | Senior Vice President and Chief Financial Officer (Principal Financial Officer and Principal Accounting Officer) | March 25, 2002 |
| /s/ G. Brent Backman ----- G. Brent Backman | Director | March 25, 2002 |
| /s/ Richard P. Beck ----- Richard P. Beck | Director | March 25, 2002 |
| /s/ Trung Doan ----- Trung Doan | Director | March 25, 2002 |
| /s/ Arthur A. Noeth ----- Arthur A. Noeth | Director | March 25, 2002 |
| /s/ Elwood Spedden ----- Elwood Spedden | Director | March 25, 2002 |
| /s/ Gerald Starek ----- Gerald Starek | Director | March 25, 2002 |
| /s/ Arthur W. Zafiropoulo ----- Arthur W. Zafiropoulo | Director | March 25, 2002 |

INDEX TO EXHIBITS

- 2.1 Agreement and Plan of Reorganization, dated as of June 1, 1998, by and among the Company, Warpspeed, Inc., a wholly owned subsidiary of the Company, and RF Power Products, Inc.(1)
- 2.2 Stock Purchase Agreement dated November 16, 2001, by and among the Company, Advanced Energy Japan K.K., a wholly owned subsidiary of the Company, Aera Japan Limited and Certain Stockholders of Aera Japan Limited(2)
- 2.3 Amendment No. 1 to Stock Purchase Agreement, dated December 25, 2001, by and among the Company, Advanced Energy Japan K.K., a wholly owned subsidiary of the Company, Aera Japan Limited and Certain Stockholders of Aera Japan Limited(3)
- 2.4 Forms of Minority Stock Purchase Agreement(3)
- 3.1 The Company's Restated Certificate of Incorporation, as amended(4)
- 3.2 The Company's By-laws(5)
- 4.1 Form of Specimen Certificate for the Company's Common Stock(5)
- 4.2 Indenture dated November 1, 1999 between State Street Bank and Trust Company of California, N.A., as trustee, and the Company (including form of 5 1/4% Convertible Subordinated Note due 2006)(6)
- 4.3 Indenture dated August 27, 2001 between State Street Bank and Trust Company of California, N.A., as trustee, and the Company (including form of 5.00% Convertible Subordinated Note due September 1, 2006)(7)
- 4.4 Registration Rights Agreement dated as of August 22, 2001, between the Company and Goldman, Sachs and Co.(7)
- 4.5 The Company hereby agrees to furnish to the SEC, upon request, a copy of the instruments which define the rights of holders of long-term debt of the Company. None of such instruments not included as exhibits herein represents long-term debt in excess of 10% of the consolidated total assets of the Company.
- 10.1 Comprehensive Supplier Agreement, dated May 18, 1998, between Applied Materials Inc. and the Company(1)+
- 10.2 Purchase Order and Sales Agreement, dated October 12, 1999, between Lam Research Corporation and the Company(6)
- 10.3 Loan Agreement dated June 18, 2001, by and among Silicon Valley Bank, as Servicing Agent and a Bank, and United Overseas Bank, as a Bank, and the Company, as borrower
- 10.4 Lease, dated June 12, 1984, amended June 11, 1992, between Prospect Park East Partnership and the Company for property in Fort Collins, Colorado(5)
- 10.5 Lease, dated March 14, 1994, as amended, between Sharp Point Properties, L.L.C., and the Company for property in Fort Collins, Colorado(5)
- 10.6 Lease, dated May 19, 1995, between Sharp Point Properties, L.L.C. and the Company for a building in Fort Collins, Colorado(5)
- 10.7 Form of Indemnification Agreement(5)
- 10.8 Employment Agreement, dated June 1, 1998, between RF Power Products, Inc., and Joseph Stach(8)
- 10.9 1995 Stock Option Plan, as amended and restated through February 7, 2001(9)*

- 10.10 1995 Non-Employee Directors' Stock Option Plan, as amended and restated through February 7, 2001(9)*
- 10.11 Lease dated March 20, 2000, between Sharp Point Properties, L.L.C. and the Company for a building in Fort Collins, Colorado(10)
- 10.12 Agreement and Plan of Reorganization, dated April 5, 2000, between the Company, Noah Holdings, Inc. and AE Cal Merger Sub, Inc.(11)
- 10.13 Escrow and Indemnity Agreement, dated April 5, 2000, between the Company, the former stockholders of Noah Holdings, Inc. and Commercial Escrow Services, Inc.(11)
- 10.14 Agreement and Plan of Reorganization, dated July 21, 2000, by and among the Company, Mercury Merger Corporation, a wholly owned subsidiary of the Company, Sekidenko, Inc. and Dr. Ray R. Dils.(12)
- 10.15 Agreement and Plan of Reorganization, dated July 6, 2000, amended and restated as of October 20, 2000, by and among the Company, Flow Acquisition Corporation, a wholly owned subsidiary of the Company, and Engineering Measurements Company(13)
- 21.1 Subsidiaries of the Company
- 23.1 Consent of Arthur Andersen LLP, Independent Accountants
- 24.1 Power of Attorney (included on the signature pages to this Annual Report on Form 10-K)
- 99.1 Assurance Letter pursuant to SEC Release Nos. 33-8070; 34-45590; 35-27503; 39-2395; IA-2018; IC-25464; FR-62; File No. S7-03-02 (filed herewith).

- (1) Incorporated by reference to the Company's Quarterly Report on Form 10-Q for the quarter ended June 30, 1998 (File No. 000-26966), filed August 7, 1998.
- (2) Incorporated by reference to the Company's Registration Statement on Form S-3 (File No. 333-72748), filed February 8, 2002, as amended.
- (3) Incorporated by reference to the Company's Current Report on Form 8-K (File No. 000-26966), filed February 1, 2002.
- (4) Incorporated by reference to the Company's Quarterly Report on Form 10-Q for the quarter ended June 30, 2001 (File No. 000-26966), filed August 13, 2001.
- (5) Incorporated by reference to the Company's Registration Statement on Form S-1 (File No. 33-97188), filed September 20, 1995, as amended.
- (6) Incorporated by reference to the Company's Annual Report on Form 10-K for the year ended December 31, 1999 (File No. 000-26966), filed March 20, 2000.
- (7) Incorporated by reference to the Company's Current Report on Form 8-K (File No. 000-26966), filed September 10, 2001.
- (8) Incorporated by reference to the Company's Annual Report on Form 10-K for the year ended December 31, 1998 (File No. 000-26966), filed March 24, 1999.
- (9) Incorporated by reference to the Company's Quarterly Report on Form 10-Q for the quarter ended March 31, 2001 (File No. 000-26966), filed May 9, 2001.

(10) Incorporated by reference to the Company's Annual Report on Form 10-K for the year ended December 31, 2000 (File No. 000-26966), filed March 27, 2001.

(11) Incorporated by reference to the Company's Registration Statement on Form S-3 (File No. 333-37378), filed May 19, 2000.

(12) Incorporated by reference to the Company's Quarterly Report on Form 10-Q for the quarter ended June 30, 2000 (File No. 000-26966), filed August 4, 2000.

(13) Incorporated by reference to the Company's Quarterly Report on Form 10-Q for the quarter ended September 30, 2000 (File No. 000-26966), filed October 30, 2000.

* Compensation Plan

+ Confidential treatment has been granted for portions of this agreement.

EXHIBIT 10.3

EXECUTION COPY

**LOAN AGREEMENT
ADVANCED ENERGY INDUSTRIES, INC.**

THIS LOAN AGREEMENT (this "Agreement") dated as of June 18, 2001, between SILICON VALLEY BANK, a California-chartered bank with its principal place of business at 3003 Tasman Drive, Santa Clara, CA 95054 and with a loan production office located at 4410 Arapahoe Avenue, Suite 200, Boulder, CO 80303, as Payment Agent ("SVB"), United Overseas Bank Limited, a Singapore banking corporation ("UOB") acting through its Los Angeles Agency located at 911 Wilshire Boulevard, Ground Floor, Los Angeles, CA 90017-3478 ("UOB-LA") and its Tokyo Branch located at Shin Kokusai Bldg., 3-4-1, Marunouchi, Chiyoda-ku, Tokyo 100, Japan ("UOB - Tokyo"; SVB, and UOB are each referred to individually as a "Bank" and collectively, as the "Banks") and ADVANCED ENERGY INDUSTRIES, INC., a Delaware corporation having its principal place of business at 1625 Sharp Point Drive, Fort Collins, CO 80525 ("Borrower"), provides the terms on which Banks will lend to Borrower and Borrower will repay Banks. The parties agree as follows:

1. ACCOUNTING AND OTHER TERMS

Accounting terms not defined in this Agreement will be construed following GAAP. Calculations and determinations must be made following GAAP. The term "financial statements" includes the notes and schedules. The terms "including" and "includes" always mean "including (or includes) without limitation" in this or any Loan Document. Capitalized terms in this Agreement shall have the meanings set forth in Section 12. This Agreement shall be construed to impart upon the Banks severally, and not jointly, a duty to act reasonably at all times.

2. LOAN AND TERMS OF PAYMENT

2.1. CREDIT EXTENSIONS. Borrower will pay Banks the unpaid principal amount of all Credit Extensions and interest on the unpaid principal amount of the Credit Extensions.

2.1.1 REVOLVING ADVANCES.

(a) Each Bank will severally make Advances in accordance with this Section 2.1.1 such that the aggregate amount of Advances outstanding at any time shall not exceed the lesser of (A) (i) \$20,000,000 by SVB and (ii) \$10,000,000 by UOB or (B) (i) the Committed Revolving Line or the Borrowing Base, if applicable, minus (ii) the amount of all outstanding Letters of Credit (including drawn but unreimbursed Letters of Credit), minus (iii) the Foreign Exchange Reserve, minus (iv) the aggregate principal amount of all outstanding Optional Currency Rate Loans, and minus (v) outstanding Cash Management Services Fees. Each Advance shall be made entirely by SVB up to and including the aggregate amount set forth in the preceding sentence and thereafter by UOB up to and including the aggregate amount set forth in the preceding sentence. Amounts borrowed under this Section may be repaid and reborrowed during the term of this Agreement. Notwithstanding the foregoing, the Borrowing Base shall not be applied at any time that the aggregate amount of Credit Extensions outstanding, or that would be outstanding immediately following a requested Advance, are equal to or less than \$10,000,000.

(b) To obtain an Advance, Borrower must notify Payment Agent by facsimile or telephone by 3:00 p.m. Pacific time on the Business Day the Advance is to be made. Borrower must promptly confirm the notification by delivering to Payment Agent the Payment/Advance Form attached as Exhibit B. Payment Agent will credit Advances to Borrower's deposit account.

2.1.2 LETTERS OF CREDIT. The Banks will issue or have issued Letters of Credit for Borrower's account not exceeding (i) the lesser of the Committed Revolving Line or the Borrowing Base minus (ii) the outstanding principal balance of the Advances, but the face amount of outstanding Letters of Credit (including drawn but unreimbursed Letters of Credit and any Letter of Credit Reserve) may not exceed \$5,000,000. Each Letter of Credit will expire no later than 180 days after the Revolving Maturity Date provided Borrower's Letter of

Credit reimbursement obligation is secured by cash on terms acceptable to the Banks at any time after the Revolving Maturity Date if the term of this Agreement is not extended by the Banks.

2.1.3 FOREIGN EXCHANGE SUBLIMIT. If there is availability under the Committed Revolving Line and the Borrowing Base (if applicable), then Borrower may enter in foreign exchange forward contracts with SVB under which Borrower commits to purchase from or sell to SVB a set amount of foreign currency more than one business day after the contract date (the "FX Forward Contract"). The Payment Agent will subtract 20% of each outstanding FX Forward Contract from the foreign exchange sublimit which is a maximum of \$10,000,000 (the "FX Sublimit"). The total FX Forward Contracts at any one time may not exceed 5 times the amount of the FX Sublimit. SVB may terminate the FX Forward Contracts if an Event of Default occurs.

2.1.4 OPTIONAL CURRENCY RATE LOANS.

(a) If there is availability under the Committed Revolving Line and the Borrowing Base (if applicable), then UOB-Tokyo will make Optional Currency Rate Loans in accordance with the LIBOR Supplement to Agreement, attached to this Agreement as Exhibit A. The Payment Agent will subtract 100% of the U.S. Dollar equivalent of such Optional Currency Rate Loans from the Optional Currency Rate Loans Sublimit, which is \$10,000,000.

(b) Borrower irrevocably appoints Advanced Energy Japan K.K., a Japanese corporation all of the outstanding capital stock of which is owned directly by Borrower ("AEI-Japan") to obtain one or more Optional Currency Rate Loans from UOB-Tokyo directly in its own name or in the name of Borrower. Any request by AEI-Japan for an Optional Currency Rate Loan may be submitted directly to UOB-Tokyo in accordance with its customary procedures and this Agreement. Each such Optional Currency Rate Loan shall be a binding obligation of Borrower as though Borrower were a signatory thereto.

2.1.5 CASH MANAGEMENT SERVICES. Borrower may use SVB's Cash Management Services, which may include merchant services, direct deposit of payroll, business credit card, and check cashing services identified in any cash management services agreements (the "Cash Management Services"). All amounts SVB pays for any Cash Management Services will be treated as an Advance under the Committed Revolving Line.

2.1.6 CREDIT EXTENSION REQUESTS. Each Bank may make Credit Extensions in accordance with this Agreement based on instructions from a Responsible Officer or his or her designee or without instructions if the Credit Extensions are necessary to meet Obligations which have become due. Each Bank may rely on any telephone notice given by a person whom Bank believes is a Responsible Officer or designee. Borrower will indemnify each Bank for any loss either Bank suffers due to that reliance.

2.1.7. REVOLVING MATURITY DATE. The Committed Revolving Line terminates on the Revolving Maturity Date, when all Advances and Optional Currency Rate Loans are immediately payable.

2.2. OVERADVANCES. If Borrower's Obligations under Section 2.1 exceed the lesser of either (i) the Committed Revolving Line or (ii) the Borrowing Base, if applicable, Borrower must immediately pay in cash to the Payment Agent the excess; provided, however that to the extent the aggregate amount of outstanding Optional Currency Rate Loans exceeds the Optional Currency Rate Loans Sublimit (the "Optional Currency Rate Loans Excess"), such Optional Currency Rate Loans Excess may be paid directly to UOB-Tokyo.

2.3. INTEREST RATE; PAYMENTS. Advances and Optional Currency Rate Loans accrue interest in accordance with the LIBOR Supplement to Agreement attached hereto as Exhibit A and incorporated herein. The unpaid principal amount of all Advances and Optional Currency

Rate loans outstanding on the Revolving Maturity Date shall be immediately payable on the Revolving Maturity Date. All payments of principal, interest, fees or other amounts payable by Borrower under this Agreement shall be paid to SVB, except that payments of principal, interest, fees or other amounts related solely to any Optional Currency Rate Loans may be paid to UOB-Tokyo.

2.4. FEES. Borrower will pay to SVB:

(a) FACILITY FEE. A fully earned, non-refundable facility fee of \$15,000 due on the Closing Date;

(b) BANK EXPENSES. All Bank Expenses (including reasonable attorneys' fees and expenses incurred through and after the Closing Date when due; and

(c) NON-USAGE FEE. No later than the 30th calendar day following each annual anniversary of the Closing Date, Borrower shall pay to SVB a non-usage fee equal to One Fourth of One Percent (0.25%) of the difference between the Committed Revolving Line and the average daily outstanding balance during the prior year.

2.5 PERCENTAGE SHARE. Except for Optional Rate Currency Loans, which shall be the sole responsibility of UOB-Tokyo, and except as otherwise provided in this Agreement, the rights, interests and obligations of each Bank under this Agreement at any time shall be shared in the ratio of (a) the maximum amount the Bank has committed to advance as set forth on the signature page signed by the Bank to (b) the Committed Revolving Line. Any reference in this Agreement to an allocation between or sharing by the Banks of any right, interest or duty "ratably", "proportionately," "pro rata" or in similar terms shall refer to this ratio. No Bank is obligated to advance any funds in lieu of or for the account of any other Bank if the latter Bank fails to make such Advance.

3. CONDITIONS OF LOANS

3.1. CONDITIONS PRECEDENT TO INITIAL CREDIT EXTENSION. Each Bank's obligation to make the initial Credit Extension is subject to the following conditions precedent:

(a) receipt of the agreements, documents and fees they require;

(b) due diligence inquiry conducted by the Banks to their reasonable satisfaction and which does not result in the discovery of any facts or circumstances which would negatively affect, in the Banks' sole discretion, collectibility of any Credit Extensions; and;

(c) receipt by the Banks of copies of the insurance policies required by Section 5.5.

3.2. CONDITIONS PRECEDENT TO ALL CREDIT EXTENSIONS. Each Bank's obligations to make each Credit Extension, including the initial Credit Extension, is subject to the following:

(a) timely receipt by the Payment Agent of any Payment/Advance Form; and

(b) the representations and warranties in Section 4 must be materially true on the date of the Payment/Advance Form and on the effective date of each Credit Extension and no Event of Default may have occurred and be continuing, or result from the Credit Extension. Each Credit Extension is Borrower's representation and warranty on that date that the representations and warranties in Section 4 remain true.

4. REPRESENTATIONS AND WARRANTIES

Borrower represents and warrants as follows:

4.1. DUE ORGANIZATION AND AUTHORIZATION. Borrower and each Subsidiary is duly existing and in good standing in its state of formation and qualified and licensed to do business in, and in good standing in, any state in which the conduct of its business or its ownership of property requires that it be qualified.

The execution, delivery and performance of the Loan Documents have been duly authorized, and do not conflict with Borrower's formations documents, nor constitute an event of default under any material agreement by which Borrower is bound. Borrower is not in default under any agreement to which or by which it is bound in which the default could cause a Material Adverse Change.

4.2. LITIGATION. Except as shown in the Schedule, there are no actions or proceedings pending or, to Borrower's knowledge, threatened by or against Borrower or any Subsidiary in which an adverse decision could cause a Material Adverse Change.

4.3. NO MATERIAL ADVERSE CHANGE IN FINANCIAL STATEMENTS. All consolidated financial statements for Borrower and any Subsidiary delivered to Bank fairly present in all material respects Borrower's consolidated financial condition and Borrower's consolidated results of operations. There has not been any material deterioration in Borrower's consolidated financial condition since the date of the most recent financial statements submitted to Bank.

4.4. SOLVENCY. Borrower is able to pay its debts (including trade debts) as they mature.

4.5. REGULATORY COMPLIANCE. Borrower is not an "investment company" or a company "controlled" by an "investment company" under the Investment Company Act. Borrower is not engaged as one of its important activities in extending credit for margin stock (under Regulations T and U of the Federal Reserve Board of Governors). Borrower has complied with the Federal Fair Labor Standards Act. Borrower has not violated any laws, ordinances or rules, the violation of which could cause a Material Adverse Change. None of Borrower's or any Subsidiary's properties or assets has been used by Borrower or any Subsidiary or, to the best of Borrower's knowledge, by previous Persons, in disposing, producing, storing, treating, or transporting any hazardous substance other than legally. Borrower and each Subsidiary has timely filed all required tax returns and paid, or made adequate provision to pay, all material taxes. Borrower and each Subsidiary has obtained all consents, approvals and authorizations of, made all declarations or filings with, and given all notices to, all government authorities that are necessary to continue its business as currently conducted.

4.6. SUBSIDIARIES. Borrower does not own any stock, partnership interest or other equity securities except for Permitted Investments.

4.7. FULL DISCLOSURE. No representation, warranty or other statement of Borrower in any certificate or written statement given to Bank contains any untrue statement of a material fact or omits to state a material fact necessary to make the statements contained in the certificates or statements not misleading.

5. AFFIRMATIVE COVENANTS

Borrower will do all of the following:

5.1. GOVERNMENT COMPLIANCE. Borrower will maintain its and all Subsidiaries' corporate existence and good standing in its jurisdiction of incorporation and maintain qualification in each jurisdiction in which the failure to so qualify could have a material adverse effect on Borrower's business or operations. Borrower will comply, and have each Subsidiary comply, with all laws, ordinances and regulations to which it is subject, noncompliance with which could have a material adverse effect on Borrower's business or operations or cause a Material Adverse Change.

5.2. FINANCIAL STATEMENTS, REPORTS, CERTIFICATES.

(a) Borrower will deliver to the Payment Agent: (i) within 5 days of filing with the Securities and Exchange Commission, but no later than 90 days after the end of Borrower's fiscal year, an annual report on Form 10-K together with an unqualified opinion on the financial statements (ii) within 5 days of filing, but no later than 45 days after the end of each of Borrower's first three quarters of each fiscal year, copies of all reports on Form 10-Q filed with the Securities and Exchange Commission, (iii) within 5 days of filing, copies of all statements, reports and notices made available to Borrower's security holders or to any holders of Subordinated Debt and all reports on Form 8-K, filed with the Securities and Exchange Commission; (iv) a prompt report of any legal actions pending or threatened against Borrower or any Subsidiary that could result in damages or costs to Borrower or any Subsidiary of \$500,000 or more; (v) prompt notice of any material change in the composition of the Intellectual Property or knowledge of an event that materially adversely affects the value of the Intellectual Property; and (vi) budgets, sales projections, operating plans or other financial information Payment Agent requests.

(b) Within 30 days after the last day of each month if during such month the aggregate amount of all Credit Extensions outstanding at any time during such month exceed \$10,000,000, Borrower will deliver to Payment Agent a Borrowing Base Certificate signed by a Responsible Officer in the form of Exhibit C, with aged listings of accounts receivable and accounts payable.

(c) Borrower will deliver to the Payment Agent with the quarterly reports on Form 10-Q, as required by Section 5.2(a), a Compliance Certificate signed by a Responsible Officer in the form of Exhibit D.

(d) At any time that the aggregate amount of outstanding Credit Extensions, exclusive of interest thereon, exceed \$10,000,000, the Payment Agent has the right to audit Borrower's Accounts at Borrower's expense, but the audits will be conducted no more often than once every 12 months unless an Event of Default has occurred and is continuing.

5.3. INVENTORY; RETURNS. Borrower will keep all Inventory in good and marketable condition, free from material defects. Returns and allowances between Borrower and its account debtors will follow Borrower's customary practices as they exist at the Closing Date. Borrower must promptly notify the Payment Agent of all returns, recoveries, disputes and claims that involve more than 10% of Borrower's gross sales for any month.

5.4. TAXES. Borrower will make, and cause each Subsidiary to make, timely payment of all material federal, state, and local taxes or assessments and will deliver to the Banks, on demand, appropriate certificates attesting to the payment.

5.5. INSURANCE. Borrower will keep its business insured for risks and in amounts, as Bank requests. Insurance policies will be in a form, with companies, and in amounts that are satisfactory to the Banks. All property policies will have a lender's loss payable endorsement showing Banks as loss payee, and all liability policies will show the Banks as additional insureds and provide that the insurer must give the Banks at least 20 days notice before canceling its policy. At the Banks' request, Borrower will deliver certified copies of policies and

evidence of all premium payments. Proceeds payable under any policy will, at the Banks' option, be payable to the Banks on account of the Obligations.

5.6. PRIMARY ACCOUNTS; REQUEST TO DEBIT ACCOUNTS. Borrower will maintain its primary depository and operating accounts with SVB. Borrower will regularly deposit funds received from its business activities at SVB. Borrower authorizes SVB to debit any of Borrower's accounts with Bank including Account Number 351030170, for interest and principal payments on the loan and any other Borrower obligations to either Bank when due. SVB will notify Borrower of all debits that SVB makes against Borrower's accounts. The debits to Borrower's account are not a setoff.

5.7. FINANCIAL COVENANTS.

Borrower will maintain as of the last day of each of Borrower's fiscal quarters unless otherwise noted:

(a) **QUICK RATIO.** A ratio of Quick Assets to Current Liabilities of at least 2.00 to 1.0.

(b) **DEBT/NET WORTH RATIO.** A ratio of Total Liabilities less Subordinated Debt and less the outstanding principal amount of the 5.25% Convertible Notes to Tangible Net Worth plus Subordinated Debt of not more than 0.65 to 1.0.

(c) **TANGIBLE NET WORTH.** A Tangible Net Worth plus Subordinated Debt plus the outstanding principal amount of the 5.25% Convertible Notes of at least the sum of \$120,000,000 plus 50% of the net profit for such quarter.

(d) **PROFITABILITY.** On a consolidated basis, Borrower shall have a minimum net Profit of at least One Dollar (\$1) for each fiscal quarter; except that Borrower shall have Losses not to exceed \$6,510,000 and \$6,540,000 for each of the second and third fiscal quarters, respectively, of the fiscal year ending December 31, 2001.

5.8. FURTHER ASSURANCES. Borrower will execute any further instruments and take further action as the Banks request to effect the purposes of this Agreement.

6. NEGATIVE COVENANTS

Borrower will not do any of the following without the Banks' written consent, which will not be unreasonably withheld:

6.1. DISPOSITIONS. Convey, sell, lease, transfer or otherwise dispose of (collectively a "Transfer"), or permit any of its Subsidiaries to Transfer, all or any part of its business or property, other than a Transfer (i) of Inventory in the ordinary course of business; (ii) of non-exclusive licenses and similar arrangements for the use of the property of Borrower or its Subsidiaries in the ordinary course of business; or (iii) of worn-out or obsolete Equipment or (iv) other Transfers which constitute liquidation of Investments permitted in Section 6.6(i).

6.2. CHANGES IN BUSINESS, OWNERSHIP, MANAGEMENT OR BUSINESS LOCATIONS. Engage in or permit any of its Subsidiaries to engage in any business other than the businesses currently engaged in by Borrower or have a change in its ownership (other than the sale of Borrower's equity securities in a public offering) of greater than 25% or management. Borrower will not, without at least 30 days prior written notice to Banks, relocate its principal executive office or add any new offices or business locations.

6.3. MERGERS OR ACQUISITIONS. Merge or consolidate, or permit any of its Subsidiaries to merge or consolidate, with any other Person, or acquire, or permit any of its

Subsidiaries to acquire, all or substantially all of the capital stock or property of another Person except a Permitted Acquisition where no Event of Default has occurred and is continuing or would exist after giving effect to such Permitted Acquisition. The Banks shall respond to Borrower's request for consent to any transaction contemplated by this Section 6.3 other than a Permitted Acquisition within 10 days of the receipt of a written request for such consent, which request shall be accompanied by such materials as are reasonably requested by the Banks for the purpose of making a decision regarding such consent. A Subsidiary may merge or consolidate into another Subsidiary or into Borrower.

6.4. **INDEBTEDNESS.** Create, incur, assume, or be liable for any Indebtedness, or permit any Subsidiary to do so, other than Permitted Indebtedness.

6.5. **ENCUMBRANCE.** Create, incur, or allow any Lien on any of its property, or assign or convey any right to receive income, including the sale of any Accounts, or permit any of its Subsidiaries to do so, except for Permitted Liens.

6.6. **INVESTMENTS; DISTRIBUTIONS.** (i) Directly or indirectly acquire or own any Person, or make any Investment in any Person, other than Permitted Investments, or permit any of its Subsidiaries to do so; (ii) pay any dividends or make any distribution or payment or redeem, retire or purchase any capital stock; or (iii) make any loans or other extension of credit, other than trade accounts created in the ordinary course of business and in customary amounts consistent with Borrower's past practices, or permit any of its Subsidiaries to do so.

6.7. **TRANSACTIONS WITH AFFILIATES.** Directly or indirectly enter or permit any material transaction with any Affiliate, except transactions that are in the ordinary course of Borrower's business, on terms no less favorable to Borrower than would be obtained in an arm's length transaction with a non-affiliated Person.

6.8. **SUBORDINATED DEBT.** Make or permit any payment on any Subordinated Debt, except under the terms of the Subordinated Debt, or amend any provision in any document relating to the Subordinated Debt, without Bank's prior written consent.

6.9 **COMPLIANCE.** Undertake as one of its important activities extending credit to purchase or carry margin stock, or use the proceeds of any Advance for that purpose; fail to meet the minimum funding requirements of ERISA, permit a Reportable Event or Prohibited Transaction, as defined in ERISA, to occur; fail to comply with the Federal Fair Labor Standards Act or violate any other law or regulation, if the violation could have a material adverse effect on Borrower's business or operations or cause a Material Adverse Change, or permit any of its Subsidiaries to do so.

7. EVENTS OF DEFAULT

Any one of the following is an Event of Default:

7.1. **PAYMENT DEFAULT.** Borrower fails to pay any of the Obligations within 5 days after their due date. During the additional period the failure to cure the default is not an Event of Default (but no Credit Extensions will be made during the cure period);

7.2. **COVENANT DEFAULT.** Borrower does not perform any obligation in Section 5 or violates any covenant in Article 6 or does not perform or observe any other material term, condition or covenant in this Agreement, any Loan Documents, or in any agreement between Borrower and Bank and as to any default under a term, condition or covenant that can be cured, has not cured the default within 20 days after it occurs, or if the default cannot be cured within 20 days or cannot be cured after Borrower's attempts in the 20 day period, and the default may be cured within a reasonable time, then Borrower has an additional time, (of not more than 30 days) to attempt to cure the default. During the additional period the failure to

cure the default is not an Event of Default (but no Credit Extensions will be made during the cure period);

7.3. MATERIAL ADVERSE CHANGE. (i) Bank determines, based upon information available to it and in its reasonable judgment, that there is a reasonable likelihood that Borrower will fail to comply with one or more of the financial covenants in Section 5 during the next succeeding financial reporting period;

(ii) a material adverse change in the business, operations, or condition (financial or otherwise) of the Borrower occurs; or (iii) a material impairment of the prospect of repayment of any portion of the Obligations occurs;

7.4. ATTACHMENT. (i) Any material portion of Borrower's assets is attached, seized, levied on, or comes into possession of a trustee or receiver and the attachment, seizure or levy is not removed in 30 days; (ii) Borrower is enjoined, restrained, or prevented by court order from conducting a material part of its business; (iii) a judgment or other claim becomes a Lien on a material portion of Borrower's assets; or (iv) a notice of lien, levy, or assessment is filed against any of Borrower's assets by any government agency and not paid within 30 days after Borrower receives notice. These are not Events of Default if stayed or if a bond is posted pending contest by Borrower (but no Credit Extensions will be made during the cure period);

7.5. INSOLVENCY. (i) Borrower becomes insolvent; (ii) Borrower begins an Insolvency Proceeding; or (iii) an Insolvency Proceeding is begun against Borrower and not dismissed or stayed within 30 days (but no Credit Extensions will be made before any Insolvency Proceeding is dismissed);

7.6. OTHER AGREEMENTS. If there is a default in any agreement between Borrower and a third party that gives the third party the right to accelerate any Indebtedness exceeding \$500,000 or that could cause a Material Adverse Change;

7.7. JUDGMENTS. If a money judgment(s) in the aggregate of at least \$500,000 is rendered against Borrower and is unsatisfied and unstayed for 30 days (but no Credit Extensions will be made before the judgment is stayed or satisfied); or

7.8. MISREPRESENTATIONS. If Borrower or any Person acting for Borrower makes any material misrepresentation or material misstatement now or later in any warranty or representation in this Agreement or in any communication delivered to either Bank or to induce either Bank to enter this Agreement or any Loan Document.

8. BANK'S RIGHTS AND REMEDIES

8.1. RIGHTS AND REMEDIES. When an Event of Default occurs and continues the Banks may, without notice or demand, do any or all of the following:

(a) Declare all Obligations immediately due and payable (but if an Event of Default described in Section 7.5 occurs all Obligations are immediately due and payable without any action by Bank);

(b) Stop advancing money or extending credit for Borrower's benefit under this Agreement or under any other agreement between Borrower and Banks;

(c) Settle or adjust disputes and claims directly with account debtors for amounts, on terms and in any order that the Banks consider advisable; and

(d) Apply to the Obligations any (i) balances and deposits of Borrower it holds, or (ii) any amount held by any Bank owing to or for the credit or the account of Borrower.

8.2. POWER OF ATTORNEY. When an Event of Default occurs and continues, Borrower irrevocably appoints Payment Agent as its lawful attorney to: (i) endorse Borrower's name on any checks or other forms of payment or security; (ii) sign Borrower's name on any invoice or bill of lading for any Account or drafts against account debtors, (iii) make, settle, and adjust all claims under Borrower's insurance policies; and (iv) settle and adjust disputes and claims about the Accounts directly with account debtors, for amounts and on terms Bank determines reasonable. Payment Agent may exercise the power of attorney to sign Borrower's name on any documents necessary to perfect or continue the perfection of any security interest regardless of whether an Event of Default has occurred. Payment Agent's appointment as Borrower's attorney in fact, and all of Payment Agent's rights and powers, coupled with an interest, are irrevocable until all Obligations have been fully repaid and performed and the Banks' obligations to provide Credit Extensions terminates.

8.3. ACCOUNTS COLLECTION. When an Event of Default occurs and continues, Payment Agent may notify any Person owing Borrower money of Banks' security interest in the funds and verify the amount of the Account. Borrower must collect all payments in trust for the Banks and, if requested by either Bank, immediately deliver the payments to such Bank in the form received from the account debtor, with proper endorsements for deposit.

8.4. BANK EXPENSES. If Borrower fails to pay any amount or furnish any required proof of payment to third persons either Bank may make all or part of the payment or obtain insurance policies required in Section 5.5, and take any action under the policies such Bank deems prudent. Any amounts paid by either Bank are Bank Expenses and immediately due and payable, bearing interest at the then applicable rate. No payments by either Bank are deemed an agreement to make similar payments in the future or such Bank's waiver of any Event of Default.

8.5. REMEDIES CUMULATIVE. Each Bank's rights and remedies under this Agreement, the Loan Documents, and all other agreements are cumulative. Each Bank has all rights and remedies provided by law, or in equity. Either Bank's exercise of one right or remedy is not an election, and either Bank's waiver of any Event of Default is not a continuing waiver. Either Bank's delay is not a waiver, election, or acquiescence. No waiver is effective unless signed by Bank and then is only effective for the specific instance and purpose for which it was given.

8.6. DEMAND WAIVER. Borrower waives demand, notice of default or dishonor, notice of payment and nonpayment, notice of any default, nonpayment at maturity, release, compromise, settlement, extension, or renewal of accounts, documents, instruments, chattel paper, and guaranties held by either Bank on which Borrower is liable.

9. NOTICES

All notices or demands by any party to this Agreement or any other related agreement must be in writing and be personally delivered or sent by an overnight delivery service, by certified mail, postage prepaid, return receipt requested, or by telefacsimile at the addresses listed at the beginning of this Agreement. A Party may change its notice address by giving the other Party written notice.

10. CHOICE OF LAW, VENUE AND JURY TRIAL WAIVER

Colorado law governs the Loan Documents without regard to principles of conflicts of law. Borrower and Banks each submit to the exclusive jurisdiction of the State and Federal courts in Boulder County, Colorado.

BORROWER, SVB AND UOB BORROWER, SVB AND UOB EACH WAIVE THEIR RIGHT TO A JURY TRIAL OF ANY CLAIM OR CAUSE OF ACTION ARISING OUT OF OR BASED UPON THIS AGREEMENT, THE LOAN DOCUMENTS OR ANY CONTEMPLATED TRANSACTION,

Borrower's
Initial

INCLUDING CONTRACT, TORT, BREACH OF DUTY AND ALL OTHER CLAIMS. THIS WAIVER IS A MATERIAL INDUCEMENT FOR BOTH PARTIES TO ENTER INTO THIS AGREEMENT. EACH PARTY HAS REVIEWED THIS WAIVER WITH ITS COUNSEL.

11. GENERAL PROVISIONS

11.1. **SUCCESSORS AND ASSIGNS.** This Agreement binds and is for the benefit of the successors and permitted assigns of each party. Borrower may not assign this Agreement or any rights or Obligations under it without each Bank's prior written consent which may be granted or withheld in such Bank's discretion. Each Bank has the right, without the consent of or notice to Borrower, to sell, transfer, negotiate, or grant participation in all or any part of, or any interest in, such Bank's obligations, rights and benefits under this Agreement, the Loan Documents or any related agreement.

11.2. **INDEMNIFICATION.** Borrower will indemnify, defend and hold harmless each Bank and its officers, employees and agents against: (a) all obligations, demands, claims, and liabilities asserted by any other party in connection with the transactions contemplated by the Loan Documents; and (b) all losses or Bank Expenses incurred, or paid by such Bank from, following, or consequential to transactions between Bank and Borrower (including reasonable attorneys' fees and expenses), except for losses caused by such Bank's gross negligence or willful misconduct.

11.3. **TIME OF ESSENCE.** Time is of the essence for the performance of all Obligations in this Agreement.

11.4. **SEVERABILITY OF PROVISION.** Each provision of this Agreement is severable from every other provision in determining the enforceability of any provision.

11.5. **AMENDMENTS IN WRITING, INTEGRATION.** All amendments to this Agreement must be in writing signed by both Banks and Borrower. This Agreement and the Loan Documents represent the entire agreement about this subject matter, and supersedes prior or contemporaneous negotiations or agreements. All prior or contemporaneous agreements, understandings, representations, warranties, and negotiations between the parties about the subject matter of this Agreement and the Loan Documents merge into this Agreement and the Loan Documents.

11.6. **COUNTERPARTS.** This Agreement may be executed in any number of counterparts and by different parties on separate counterparts, each of which, when executed and delivered, are an original, and all taken together, are one Agreement.

11.7. **SURVIVAL.** All covenants, representations and warranties made in this Agreement continue in full force while any Obligations remain outstanding. The obligations of Borrower in Section 11.2 to indemnify each Bank will survive until all statutes of limitations for actions that may be brought against such Bank have run.

11.8. **CONFIDENTIALITY.** In handling any confidential information, each Bank will exercise the same degree of care that it exercises for its own proprietary information, but disclosure of information may be made: (i) to such Bank's subsidiaries or affiliates in connection with their present or prospective business relations with Borrower; (ii) to prospective transferees or purchasers of any interest in the Loans; (iii) as required by law, regulation, subpoena, or other order, (iv) as required in connection with such Bank's examination or audit; and (v) as such Bank considers appropriate in exercising remedies under this Agreement. Confidential information does not include information that either: (a) is in the public domain or in such Bank's possession when disclosed to such Bank, or becomes part of the public domain after disclosure to such Bank; or (b) is disclosed to such Bank by a third party, if such Bank does not know that the third party is prohibited from disclosing the information.

11.9. ATTORNEYS' FEES, COSTS AND EXPENSES. In any action or proceeding between Borrower and either or both Banks arising out of the Loan Documents, the prevailing party will be entitled to recover its reasonable attorneys' fees and other costs and expenses incurred, in addition to any other relief to which it may be entitled, whether or not a lawsuit is filed.

12. DEFINITIONS

12.1. DEFINITIONS.

"5.25% CONVERTIBLE NOTES" are those certain outstanding 5.25% convertible notes payable due November 15, 2006.

"ACCOUNTS" are all existing and later arising accounts, contract rights, and other obligations owed Borrower in connection with its sale or lease of goods (including licensing software and other technology) or provision of services, all credit insurance, guaranties, other security and all merchandise returned or reclaimed by Borrower and Borrower's Books relating to any of the foregoing.

"ADVANCE" or "ADVANCES" is a loan advance (or advances) made in U.S. Dollars under the Committed Revolving Line.

"AFFILIATE" of a Person is a Person that owns or controls directly or indirectly the Person, any Person that controls or is controlled by or is under common control with the Person, and each of that Person's senior executive officers, directors, partners and, for any Person that is a limited liability company, that Person's managers and members.

"BANK EXPENSES" are all audit fees and expenses and reasonable costs or expenses (including reasonable attorneys' fees and expenses) for preparing, negotiating, administering, defending and enforcing the Loan Documents (including appeals or Insolvency Proceedings).

"BORROWER'S BOOKS" are all Borrower's books and records including ledgers, records regarding Borrower's assets or liabilities, the business operations or financial condition and all computer programs or discs or any equipment containing the information.

"BORROWING BASE" is (i) 80% of Eligible Accounts plus (ii) the lesser of 20% of the value of Borrower's Eligible Inventory (valued at the lower of cost or wholesale fair market value) or \$5,000,000, as determined by Bank from Borrower's most recent Borrowing Base Certificate.

"BUSINESS DAY" is any day that is not a Saturday, Sunday or a day on which the Payment Agent is closed.

"CASH ACQUISITION" is any acquisition by the Borrower of the assets or capital stock of another entity, the consideration for which consists solely of cash and/or marketable securities.

"CASH MANAGEMENT SERVICES" are defined in Section 2.1.4.

"CASH MANAGEMENT SERVICES FEES" are all amounts paid by SVB for any Cash Management Services.

"CLOSING DATE" is the date of this Agreement.

"COMMITTED REVOLVING LINE" is a Credit Extension of up to \$30,000,000.

"CONTINGENT OBLIGATION" is, for any Person, any direct or indirect liability, contingent or not, of that Person for (i) any indebtedness, lease, dividend, letter of credit or other obligation of another such as an obligation directly or indirectly guaranteed, endorsed, co-made,

discounted or sold with recourse by that Person, or for which that Person is directly or indirectly liable; (ii) any obligations for undrawn letters of credit for the account of that Person; and (iii) all obligations from any interest rate, currency or commodity swap agreement, interest rate cap or collar agreement, or other agreement or arrangement designated to protect a Person against fluctuation in interest rates, currency exchange rates or commodity prices; but "Contingent Obligation" does not include endorsements in the ordinary course of business. The amount of a Contingent Obligation is the stated or determined amount of the primary obligation for which the Contingent Obligation is made or, if not determinable, the maximum reasonably anticipated liability for it determined by the Person in good faith; but the amount may not exceed the maximum of the obligations under the guarantee or other support arrangement.

"CREDIT EXTENSION" is each Advance, Optional Currency Rate Loan, Letter of Credit, FX Forward Contract or any other extension of credit by either Bank for Borrower's benefit.

"CURRENT ASSETS" are amounts that under GAAP should be included on that date as current assets on Borrower's consolidated balance sheet.

"CURRENT LIABILITIES" are the aggregate amount of Borrower's Total Liabilities which mature within one (1) year.

"DEBT SERVICE COVERAGE" is earnings after tax less Capitalized Product Development Costs plus interest and non cash plus or minus, as appropriate, any decrease or increase in Capitalized Product Development Costs for the specified period divided by Current Maturities Long Term Debt and capitalized leases, plus interest.

"ELIGIBLE ACCOUNTS" are Accounts in the ordinary course of Borrower's business that are bona fide, existing obligations, and the service or property has been performed or delivered to the account debtor or its agent for immediate shipment to and unconditional acceptance by the account debtor; and Borrower has no notice of any actual or imminent Insolvency Proceeding of any account debtor whose accounts are an Eligible Account; but Bank may change eligibility standards by giving Borrower 30 days prior written notice. Unless Bank agrees otherwise in writing, Eligible Accounts will not include:

- (a) Accounts that the account debtor has not paid within 90 days of invoice date;
- (b) Accounts for an account debtor, 50% or more of whose Accounts have not been paid within 90 days of invoice date;
- (c) Credit balances over 90 days from invoice date;
- (d) Accounts for an account debtor, including Affiliates, whose total obligations to Borrower exceed 25% of all Accounts, unless Bank approves in writing;
- (e) Accounts for which the account debtor does not have its principal place of business in the United States;
- (f) Accounts for which the account debtor is a federal, state or local government entity or any department, agency, or instrumentality;
- (g) Accounts for which Borrower owes the account debtor, but only up to the amount owed (sometimes called "contra" accounts, accounts payable, customer deposits or credit accounts);

(h) Accounts for demonstration or promotional equipment, or in which goods are consigned, sales guaranteed, sale or return, sale on approval, bill and hold, or other terms if account debtor's payment may be conditional;

(i) Accounts for which the account debtor is Borrower's Affiliate, officer, employee, or agent;

(j) Accounts in which the account debtor disputes liability or makes any claim and Bank believes there may be a basis for dispute (but only up to the disputed or claimed amount), or if the Account Debtor is subject to an Insolvency Proceeding, or becomes insolvent, or goes out of business; or

(k) Accounts for which Bank reasonably determines collection to be doubtful.

"ELIGIBLE INVENTORY" is Borrower's Inventory, including raw materials, located at its principal place of business (or any location permitted under

Section 6.2) that is in all material respects of good and marketable quality, free from material defects, but does not include used, returned, obsolete, consigned, work in progress, demonstrative or custom inventory, supplies, packing or shipping materials.

"EQUIPMENT" is all present and future machinery, equipment, tenant improvements, furniture, fixtures, vehicles, tools, parts and attachments in which Borrower has any interest.

"ERISA" is the Employment Retirement Income Security Act of 1974, and its regulations.

"FX FORWARD CONTRACT" is defined in Section 2.1.3.

"FX RESERVE" is defined in Section 2.1.3.

"GAAP" is generally accepted accounting principles.

"INDEBTEDNESS" is (a) indebtedness for borrowed money or the deferred price of property or services, such as reimbursement and other obligations for surety bonds and letters of credit, (b) obligations evidenced by notes, bonds, debentures or similar instruments, (c) capital lease obligations and (d) Contingent Obligations.

"INSOLVENCY PROCEEDING" is any proceeding by or against any Person under the United States Bankruptcy Code, or any other bankruptcy or insolvency law, including assignments for the benefit of creditors, compositions, extensions generally with its creditors, or proceedings seeking reorganization, arrangement, or other relief.

"INTELLECTUAL PROPERTY" is:

(a) Copyrights, Trademarks, Patents, and Mask Works including amendments, renewals, extensions, and all licenses or other rights to use and all license fees and royalties from the use;

(b) Any trade secrets and any Intellectual Property Rights in computer software and computer software products now or later existing, created, acquired or held;

(c) All design rights which may be available to Borrower now or later created, acquired or held;

(d) Any claims for damages (past, present or future) for infringement of any of the rights above, with the right, but not the obligation, to sue and collect damages for use or infringement of the intellectual property rights above;

All proceeds and products of the foregoing, including all insurance, indemnity or warranty payments.

"INVENTORY" is present and future inventory in which Borrower has any interest, including merchandise, raw materials, parts, supplies, packing and shipping materials, work in process and finished products intended for sale or lease or to be furnished under a contract of service, of every kind and description now or later owned by or in the custody or possession, actual or constructive, of Borrower, including inventory temporarily out of its custody or possession or in transit and including returns on any accounts or other proceeds (including insurance proceeds) from the sale or disposition of any of the foregoing and any documents of title.

"INVESTMENT" is any beneficial ownership of (including stock, partnership interest or other securities) any Person, or any loan, advance or capital contribution to any Person.

"LIEN" is a mortgage, lien, deed of trust, charge, pledge, security interest or other encumbrance.

"LOAN DOCUMENTS" are, collectively, this Agreement, any note, or notes or guaranties executed by Borrower, and any other present or future agreement between Borrower and/or for the benefit of the Banks in connection with this Agreement, all as amended, extended or restated; provided, however that certain Master Agency Agreement, entered into on or about the date of this Agreement, shall govern certain rights and responsibilities among the Banks.

"LOSSES" are losses before depreciation, amortization and other one-time non-cash charges.

"MATERIAL ADVERSE CHANGE" is defined in Section 7.3.

"MATURITY DATE" is the Revolving Maturity Date.

"OBLIGATIONS" are debts, principal, interest, Bank Expenses and other amounts Borrower owes either Bank now or later, including letters of credit and FX Forward Contracts and including interest accruing after Insolvency Proceedings begin and debts, liabilities, or obligations of Borrower assigned to Bank.

"OPTIONAL CURRENCY RATE LOAN" is defined in the LIBOR Supplement to Agreement, attached to this Agreement as Exhibit A and incorporated herein.

"PERMITTED ACQUISITION" is (i) any Cash Acquisition in which the aggregate consideration paid, directly or indirectly, by the Borrower does not exceed the lesser of 15% of Borrower's Tangible Net Worth or 50% of Borrower's aggregate cash and marketable securities immediately prior to such Cash Acquisition, or
(ii) any Stock Acquisition that does not result in a change in ownership of more than 25% of the aggregate voting control of the Borrower outstanding immediately prior to such Stock Acquisition and the consideration paid, directly or indirectly, will not in the aggregate exceed 30% of Borrower's Tangible Net Worth, or (iii) any transaction consisting in part of a Stock Acquisition and in part of a Cash Acquisition, provided that each such portion does not exceed a pro rata portion of the applicable threshold set forth in the preceding clauses
(i) and (ii) as is equal to the percentage of the aggregate consideration paid in such transaction.

"PERCENTAGE SHARE" is defined in Section 2.5.

"PERMITTED INDEBTEDNESS" is:

- (a) Borrower's indebtedness to the Banks under this Agreement or the Loan Documents;
- (b) Indebtedness existing on the Closing Date and shown on the Schedule;
- (c) Subordinated Debt;
- (d) Indebtedness to trade creditors and with respect to surety bonds and similar obligations incurred in the ordinary course of business; and
- (e) Indebtedness secured by Permitted Liens;

"PERMITTED INVESTMENTS" are:

- (a) Investments shown on the Schedule and existing on the Closing Date; and
- (b) marketable direct obligations issued or unconditionally guaranteed by the United States or its agency or any State maturing within 1 year from its acquisition, (ii) commercial paper maturing no more than 1 year after its creation and having the highest rating from either Standard & Poor's Corporation or Moody's Investors Service, Inc., and (iii) either Bank's certificates of deposit issued maturing no more than 1 year after issue;
- (c) Investments accepted in connection with Transfers permitted by Section 6.1;
- (d) Investments of Subsidiaries in or to other Subsidiaries or Borrower and Investments by Borrower in Subsidiaries not to exceed \$30,000,000, of which no more than \$10,000,000 shall be invested in AE Voorhees and Tower Energy, taken together, and no more than \$20,000,000 shall be invested in all other Subsidiaries other than AE Voorhees and Tower Energy, or their respective successors-in interest in the aggregate in any fiscal year;

"PERMITTED LIENS" are:

- (a) Liens existing on the Closing Date and shown on the Schedule or arising under this Agreement or other Loan Documents;
- (b) Liens for taxes, fees, assessments or other government charges or levies, either not delinquent or being contested in good faith and for which Borrower maintains adequate reserves on its Books, if they have no priority over any of either Bank's security interests, if any;
- (c) Purchase money Liens (i) on Equipment acquired or held by Borrower or its Subsidiaries incurred for financing the acquisition of the Equipment, or (ii) existing on equipment when acquired, if the Lien is confined to the property and improvements and the proceeds of the equipment;
- (d) Leases or subleases and licenses or sublicenses granted in the ordinary course of Borrower's business, if the leases, subleases, licenses and sublicenses permit granting either Bank a security interest; and
- (e) Liens incurred in the extension, renewal or refinancing of the indebtedness secured by Liens described in (a) through (c), but any extension, renewal or

replacement Lien must be limited to the property encumbered by the existing Lien and the principal amount of the indebtedness may not increase.

"PERSON" is any individual, sole proprietorship, partnership, limited liability company, joint venture, company, trust, unincorporated organization, association, corporation, institution, public benefit corporation, firm, joint stock company, estate, entity or government agency.

"PROFIT" is earnings before depreciation, amortization and any other one-time non-cash charges.

"QUICK ASSETS" is, on any date, the Borrower's consolidated, unrestricted cash, cash equivalents, net billed accounts receivable and investments with maturities of less than 12 months determined according to GAAP.

"RESPONSIBLE OFFICER" is each of the Chief Executive Officer, the President, the Chief Financial Officer and the Controller of Borrower.

"REVOLVING MATURITY DATE" is June 18, 2003.

"SCHEDULE" is any attached schedule of exceptions.

"STOCK ACQUISITION" is any acquisition by the Borrower of the assets or capital stock of another entity, the consideration for which consists solely of capital stock of the Borrower.

"SUBORDINATED DEBT" is debt incurred by Borrower subordinated to Borrower's debt to Bank (and identified as subordinated by Borrower and Bank.

"SUBSIDIARY" is for any Person, joint venture, or any other business entity of which more than 50% of the voting stock or other equity interests is owned or controlled, directly or indirectly, by the Person or one or more Affiliates of the Person.

"TANGIBLE NET WORTH" is, on any date, the consolidated total assets of Borrower and its Subsidiaries minus, (i) any amounts attributable to (a) goodwill, (b) intangible items such as unamortized debt discount and expense, Patents, trade and service marks and names, Copyrights and research and development expenses except prepaid expenses, and (c) reserves not already deducted from assets, and (ii) Total Liabilities plus Subordinated Debt.

"TOTAL LIABILITIES" is on any day, obligations that should, under GAAP, be classified as liabilities on Borrower's consolidated balance sheet, including all Indebtedness, and current portion Subordinated Debt allowed to be paid, but excluding all other Subordinated Debt.

[Signatures on following page]

BORROWER:

ADVANCED ENERGY INDUSTRIES, INC.

By:
Title:

BANKS:

SILICON VALLEY BANK

By:
Title:
Maximum Committed Amount: \$20,000,000 (66.67%)

UNITED OVERSEAS BANK LIMITED,
acting through its Tokyo Branch

By:
Name:
Title:

ABA No.

Attn:
Phone:
Fax:

Maximum Committed Amount: \$10,000,000 (33.3%), jointly and severally with
UOB-LA.

UNITED OVERSEAS BANK LIMITED,
acting through its Los Angeles Agency

By:
Name:
Title:

ABA No.

Attn:
Phone:
Fax:

Maximum Committed Amount: \$10,000,000 (33.3%), jointly and severally with UOB-Tokyo.

EXHIBIT A

LIBOR SUPPLEMENT TO AGREEMENT

This LIBOR Supplement to Agreement (the "Supplement") is a supplement to the Loan Agreement (the "Loan Agreement") dated as of June 18 between Silicon Valley Bank ("Payment Agent" and a Bank), United Overseas Bank Limited ("UOB"), a Singapore banking corporation ("UOB" and together with SVB, the "Banks") acting through its Los Angeles Agency located at 911 Wilshire Boulevard, Ground Floor, Los Angeles, CA 90017-3478 ("UOB-LA"), and its Tokyo Branch located at Shin Kokusai Bldg., 3-4-1, Marunouchi, Chiyoda-ku, Tokyo 100, Japan ("UOB-Tokyo") and Advanced Energy Industries, Inc., a Delaware corporation ("Borrower"), and forms a part of and is incorporated into the Loan Agreement.

1. Definitions.

"Business Day" means a day of the year (a) that is not a Saturday, Sunday or other day on which banks in the State of California or the City of London are authorized or required to close and (b) on which dealings are carried on in the interbank market in which SVB customarily participates.

"Interest Period" means for each LIBOR Rate Loan, a period of approximately one, two or three months as the Borrower may elect, provided that the last day of an Interest Period for a LIBOR Rate Loan shall be determined in accordance with the practices of the LIBOR interbank market as from time to time in effect, provided, further, in all cases such period shall expire not later than the applicable Maturity Date.

"Interest Rate" shall mean as to: (a) Prime Rate Loans, a rate of 1% per annum below the Prime Rate; (b) LIBOR Rate Loans, a rate of 1.75% per annum in excess of the LIBOR Rate (based on the LIBOR Rate applicable for the Interest Period selected by the Borrower); and (c) Optional Currency Rate Loans, a rate of 1.25% in excess of the Optional Currency Rate.

"LIBOR Base Rate" means, for any Interest Period for a LIBOR Rate Loan, the rate of interest per annum determined by Bank to be the per annum rate of interest as which deposits in United States Dollars are offered to Bank in the London interbank market in which Bank customarily participates at 11:00 a.m. (local time in such interbank market) two (2) Business Days before the first day of such Interest Period for a period approximately equal to such Interest Period and in an amount approximately equal to the amount of such Loan.

"LIBOR Rate" shall mean, for any Interest Period for a LIBOR Rate Loan, a rate per annum (rounded upwards, if necessary, to the nearest 1/16 of 1%) equal to (i) the LIBOR Base Rate for such Interest Period divided by (ii) 1 minus the Reserve Requirement for such Interest Period.

"LIBOR Rate Loans" means any Loans made or a portion thereof on which interest is payable based on the LIBOR Rate in accordance with the terms hereof.

"Optional Currency" means the lawful currency of Japan.

"Optional Currency Rate" means the variable rate of interest per annum, most recently announced by UOB-Tokyo, as the Japanese Short Term Prime Rate.

"Optional Currency Rate Loans" means any Loans made or a portion thereof on which interest is payable based on the Optional Currency Rate in accordance with the terms hereof.

Exhibit A-1

"Prime Rate" means the variable rate of interest per annum, most recently announced by Bank as its "prime rate," whether or not such announced rate is the lowest rate available from Bank. The interest rate applicable to the Prime Rate Loans shall change on each date there is a change in the Prime Rate.

"Prime Rate Loans" means any Loans made or a portion thereof on which interest is payable based on the Prime Rate in accordance with the terms hereof.

"Regulatory Change" means, with respect to Bank, any change on or after the date of this Loan Agreement in United States federal, state or foreign laws or regulations, including Regulation D, or the adoption or making on or after such date of any interpretations, directives or requests applying to a class of lenders including Bank of or under any United States federal or state, or any foreign, laws or regulations (whether or not having the force of law) by any court or governmental or monetary authority charged with the interpretation or administration thereof.

"Reserve Requirement" means, for any Interest Period, the average maximum rate at which reserves (including any marginal, supplemental or emergency reserves) are required to be maintained during such Interest Period under Regulation D against "Eurocurrency liabilities" (as such term is used in Regulation D) by member banks of the Federal Reserve System. Without limiting the effect of the foregoing, the Reserve Requirement shall reflect any other reserves required to be maintained by Bank by reason of any Regulatory Change against (i) any category of liabilities which includes deposits by reference to which the LIBOR Rate is to be determined as provided in the definition of "LIBOR Base Rate" or (ii) any category of extensions of credit or other assets which include Loans.

2. Requests for Loans: Confirmation of Initial Loans. Each LIBOR Rate Loan shall be made upon the irrevocable written request of Borrower received by the Payment Agent not later than 11:00 a.m. (Santa Clara, California time) on the Business Day three (3) Business Days prior to the date such Loan is to be made. Each such notice shall specify the date such Loan is to be made, which day shall be a Business Day; the amount of such Loan, the interest Period for such Loan, and comply with such other requirements as Bank determines are reasonable or desirable in connection therewith.

Each written request for a LIBOR Rate Loan shall be in the form of a LIBOR Rate Loan Borrowing Certificate as set forth on Exhibit A, which shall be duly executed by the Borrower.

Each Prime Rate Loan shall be made upon the irrevocable written request of Borrower received by the Payment Agent not later than 11:00 a.m. (Santa Clara, California time) on the Business Day one (1) Business Day prior to the date such Loan is to be made. Each such notice shall specify the date such Loan is to be made, which day shall be a Business Day and the amount of such Loan, and comply with such other requirements as Bank determines are reasonable or desirable in connection therewith.

Each Optional Currency Rate Loan shall be made upon the irrevocable written request of Borrower received by UOB-Tokyo in accordance with its customary procedures. Each such notice shall specify the date such Loan is to be made, which day shall be a Business Day and the amount of such Loan, and comply with such other requirements as Bank determines are reasonable or desirable in connection therewith.

3. Conversion/Continuation of LIBOR Rate Loans.

(a) Borrower may from time to time submit in writing a request that Prime Rate Loans be converted to LIBOR Rate Loans or that any existing LIBOR Rate Loans continue for an additional Interest Period. Such request shall specify the amount of the Prime Rate Loans

Exhibit A-2

which will constitute LIBOR Rate Loans (subject to the limits set forth below) and the Interest Period to be applicable to such LIBOR Rate Loans. Each written request for a conversion to a LIBOR Rate Loan or a continuation of a LIBOR Rate Loan shall be substantially in the form of a LIBOR Rate Conversion/Continuation Certificate as set forth on Exhibit B, which shall be duly executed by the Borrower. Subject to the terms and conditions contained herein, three (3) Business Days after Bank's receipt of such a request from Borrower, such Prime Rate Loans shall be converted to LIBOR Rate Loans or such LIBOR Rate Loans shall continue, as the case may be provided that:

- (i) no Event of Default or event which with notice or passage of time or both would constitute an Event of Default exists;
- (ii) no party hereto shall have sent any notice of termination of this Supplement or of the Loan Agreement.
- (iii) Borrower shall have complied with such customary procedures as Payment Agent has established from time to time for Borrower's requests for LIBOR Rate Loans;
- (iv) the amount of a LIBOR Rate Loan shall be \$500,000 or such greater amount which is an integral multiple of \$50,000; and
- (v) SVB shall have determined that the Interest Period or LIBOR Rate is available to SVB which can be readily determined as of the date of the request for such LIBOR Rate Loan.

Any request by Borrower to convert Prime Rate Loans to LIBOR Rate Loans or continue any existing LIBOR Rate Loans shall be irrevocable. Notwithstanding anything to the contrary contained herein, SVB shall not be required to purchase United States Dollar deposits in the London interbank market or other applicable LIBOR Rate market to fund any LIBOR Rate Loans, but the provisions hereof shall be deemed to apply as if Bank had purchased such deposits to fund the LIBOR Rate Loans.

(b) Any LIBOR Rate Loans shall automatically convert to Prime Rate Loans upon the last day of the applicable interest Period, unless SVB has received and approved a complete and proper request to continue such LIBOR Rate Loan at least three (3) Business Days prior to such last day in accordance with the terms hereof. Any LIBOR Rate Loans shall, at SVB's option, convert to Prime Rate Loans in the event that (i) an Event of Default, or event which with the notice or passage of time or both would constitute an Event of Default, shall exist, (ii) this Supplement or the Loan Agreement shall terminate, or (iii) the aggregate principal amount of the Prime Rate Loans which have previously been converted to LIBOR Rate Loans, or the aggregate principal amount of existing LIBOR Rate Loans continued, as the case may be, at the beginning of an Interest Period shall at any time during such Interest Period exceeds the lesser of (i) the Committed Revolving Line or the (ii) the Borrowing Base, if applicable. Borrower agrees to pay to SVB, upon demand by SVB (or SVB may, at its option, charge Borrower's loan account) any amounts required to compensate SVB for any loss (including loss of anticipated profits), cost or expense incurred by such person, as a result of the conversion of LIBOR Rate Loans to Prime Rate Loans pursuant to any of the foregoing.

(c) On all Prime Rate Loans and LIBOR Rate Loans, Interest shall be payable by Borrower to Payment Agent monthly in arrears not later than the first (1st) day of each calendar month at the applicable Interest Rate.

(d) On all Optional Currency Rate Loans, Interest shall be payable by Borrower to UOB-Tokyo monthly in arrears not later than the first (1st) day of each calendar month at the applicable Interest Rate.

Exhibit A-3

4. Additional Requirements/Provisions Regarding LIBOR Rate Loans; Etc.

(a) If for any reason (including voluntary or mandatory prepayment or acceleration), the Payment Agent receives all or part of the principal amount of a LIBOR Rate Loan prior to the last day of the Interest Period for such Loan, Borrower shall immediately notify Borrower's account officer at the Payment Agent and, on demand by the Payment Agent, pay the Payment Agent the amount (if any) by which (i) the additional interest which would have been payable on the amount so received had it not been received until the last day of such Interest Period exceeds (ii) the interest which would have been recoverable by the Bank by placing the amount so received on deposit in the certificate of deposit markets or the offshore currency interbank markets or United States Treasury investment products, as the case may be, for a period starting on the date on which it was so received and ending on the last day of such Interest Period at the interest rate determined by the Payment Agent in its reasonable discretion. The Payment Agent's determination as to such amount shall be conclusive absent manifest error.

(b) Borrower shall pay to the Payment Agent, upon demand by the Payment Agent, from time to time such amounts as the Payment Agent may determine to be necessary to compensate it for any costs incurred by the Payment Agent that the Payment Agent determines are attributable to its making or maintaining of any amount receivable by the Payment Agent hereunder in respect of any Loans relating thereto (such increases in costs and reductions in amounts receivable being herein called "Additional Costs"), in each case resulting from any Regulatory Change which:

(i) changes the basis of taxation of any amounts payable to the Payment Agent under this Supplement in respect of any Loans (other than changes which affect taxes measured by or imposed on the overall net income of the Payment Agent by the jurisdiction in which such the Payment Agent has its principal office); or

(ii) imposes or modifies any reserve, special deposit or similar requirements relating to any extensions of credit or other assets of, or any deposits with or other liabilities of the Bank (including any Loans or any deposits referred to in the definition of "LIBOR Base Rate"); or

(iii) imposes any other condition affecting this Supplement (or any of such extensions of credit or liabilities).

The Payment Agent will notify Borrower of any event occurring after the date of the Loan Agreement which will entitle the Payment Agent to compensation pursuant to this section as promptly as practicable after it obtains knowledge thereof and determines to request such compensation. Bank will furnish Borrower with a statement setting forth the basis and amount of each request by Payment Agent for compensation under this Section 4. Determinations and allocations by Payment Agent for purposes of this Section 4 of the effect of any Regulatory Change on its costs of maintaining its obligations to make Loans or of making or maintaining Loans or on amounts receivable by it in respect of Loans, and of the additional amounts required to compensate the Payment Agent in respect of any Additional Costs, shall be conclusive absent manifest error.

(c) Borrower shall pay to Payment Agent, upon the request of Payment Agent, such amount or amounts as shall be sufficient (in the sole good faith opinion of such Payment Agent) to compensate it for any loss, costs or expense incurred by it as a result of any failure by Borrower to borrow a Loan on the date for such borrowing specified in the relevant notice of borrowing hereunder.

(d) If Payment Agent shall determine that the adoption or implementation of any applicable law, rule, regulation or treaty regarding capital adequacy, or any change therein, or

Exhibit A-4

any change in the interpretation or administration thereof by any governmental authority, central bank or comparable agency charged with the interpretation or administration thereof, or compliance by Payment Agent (or its applicable lending office) with any respect or directive regarding capital adequacy (whether or not having the force of law) of any such authority, central bank or comparable agency, has or would have the effect of reducing the rate of return on capital of Payment Agent or any person or entity controlling Payment Agent (a "Parent") as a consequence of its obligations hereunder to a level below that which Payment Agent (or its Parent) could have achieved but for such adoption, change or compliance (taking into consideration its policies with respect to capital adequacy) by an amount deemed by Payment Agent to be material, then from time to time, within 15 days after demand by Payment Agent, Borrower shall pay to Payment Agent such additional amount or amounts as will compensate Payment Agent for such reduction. A statement of Payment Agent claiming compensation under this Section and setting forth the additional amount or amounts to be paid to it hereunder shall be conclusive absent manifest error.

(e) If at any time Payment Agent, in its sole and absolute discretion, determines that: (i) the amount of the LIBOR Rate Loans for periods equal to the corresponding Interest Periods are not available to Payment Agent in the offshore currency interbank markets, or (ii) the LIBOR Rate does not accurately reflect the cost to Bank Payment Agent of lending the LIBOR Rate Loan, then Payment Agent shall promptly give notice thereof to Borrower, and upon the giving of such notice Payment Agent's obligation to make the LIBOR Rate Loans shall terminate, unless Payment Agent and the Borrower agree in writing to a different interest rate Loans shall terminate, unless Payment Agent and the Borrower agree in writing to a different interest rate applicable to LIBOR Rate Loans. If it shall become unlawful for Payment Agent to continue to fund or maintain any Loans, or to perform its obligations hereunder, upon demand by Bank Payment Agent, Borrower shall prepay the Loans in full with accrued interest thereon and all other amounts payable by Borrower hereunder (including, without limitation, any amount payable in connection with such prepayment pursuant to Section 4(a)).

Exhibit A-5

EXHIBIT A to LIBOR SUPPLEMENT TO AGREEMENT

LIBOR RATE LOAN BORROWING CERTIFICATE

The undersigned hereby certifies as follows:

I, _____, am the duly elected and acting _____ of Advanced Energy Industries, Inc. ("Borrower").

This certificate is delivered pursuant to Section 2 of that certain LIBOR Supplement to Agreement together with the Loan Agreement by and between Borrower and Silicon Valley Bank and United Overseas Bank Limited (the "Loan Agreement"). The terms used in this Borrowing Certificate which are defined in the Loan Agreement have the same meaning herein as ascribed to them therein.

Borrower hereby requests on _____, 20__ a LIBOR Rate Loan (the "Loan") as follows:

(a) The date on which the Loan is to be made is _____, 20__.

(b) The amount of the Loan is to be _____ (\$ _____), for an Interest Period of ____ month(s).

All representations and warranties of Borrower stated in the Loan Agreement are true, correct and complete in all material respects as of the date of this request for a loan; provided, however, that those representations and warranties expressly referring to another date shall be true, correct and complete in all material respects as of such date.

IN WITNESS WHEREOF, this Borrowing Base Certificate is executed by the undersigned as of this _____ day of _____, 20__.

By:
Title:

For Internal Bank Use Only

| LIBOR Pricing Date | LIBOR Rate | LIBOR Rate Variance | Maturity Date |
|--------------------|------------|---------------------|---------------|
| | | % | |

Exhibit A-6

EXHIBIT B TO LIBOR SUPPLEMENT TO AGREEMENT

The undersigned hereby certifies as follows:

I, _____, am the duly elected and acting _____ of Advanced Energy Industries, Inc. ("Borrower").

This certificate is delivered pursuant to Section 2 of that certain LIBOR Supplement to Agreement together with the Loan Agreement by and between Borrower and Silicon Valley Bank and United Overseas Bank Limited (the "Loan Agreement"). The terms used in this Borrowing Certificate which are defined in the Loan Agreement have the same meaning herein as ascribed to them therein.

Borrower hereby requests on _____, 20__ a LIBOR Rate Loan (the "Loan") as follows:

- (a) _____ (i) A rate conversion of an existing Prime Rate Loan from a Prime Rate Loan to a LIBOR Rate Loan; or
_____ (ii) A continuation of an existing LIBOR Rate Loan as a LIBOR Rate Loan;

[CHECK (I) OR (II) ABOVE]

(b) The date on which the Loan is to be made is _____, 20__.

(c) The amount of the Loan is to be _____ (\$_____), for an Interest Period of _____ month(s).

All representations and warranties of Borrower stated in the Loan Agreement are true, correct and complete in all material respects as of the date of this request for a loan; provided, however, that those representations and warranties expressly referring to another date shall be true, correct and complete in all material respects as of such date.

IN WITNESS WHEREOF, this LIBOR Rate Conversion/Continuation Certificate is executed by the undersigned as of this _____ day of _____, 20__.

By:
Title:

For Internal Bank Use Only

| LIBOR Pricing Date | LIBOR Rate | LIBOR Rate Variance | Maturity Date |
|--------------------|------------|---------------------|---------------|
| _____ | _____ | _____ | _____ |
| _____ | _____ | _____ | _____ |
| _____ | _____ | _____ | _____ |

Exhibit A-7

EXHIBIT B

LOAN PAYMENT/ADVANCE TELEPHONE REQUEST FORM

DEADLINE FOR SAME DAY PROCESSING IS 3:00 P.M., P.S.T.

TO: CENTRAL CLIENT SERVICE DIVISION DATE:_____

FAX#: (303) 938-0486 TIME:_____

FROM:_____

CLIENT NAME (BORROWER)

REQUESTED BY:_____

AUTHORIZED SIGNER'S NAME

AUTHORIZED SIGNATURE:_____

PHONE NUMBER:_____

FROM ACCOUNT #_____ **TO ACCOUNT #**_____

| REQUESTED TRANSACTION TYPE | REQUEST DOLLAR AMOUNT |
|----------------------------------|-----------------------|
| PRINCIPAL INCREASE (ADVANCE) | \$ _____ |
| PRINCIPAL PAYMENT (ONLY) | \$ _____ |
| INTEREST PAYMENT (ONLY) | \$ _____ |
| PRINCIPAL AND INTEREST (PAYMENT) | \$ _____ |

OTHER INSTRUCTIONS:_____

All Borrower's representations and warranties in the Loan Agreement are true, correct and complete in all material respects on the date of the telephone request for and Advance confirmed by this Borrowing Certificate; but those representations and warranties expressly referring to another date shall be true, correct and complete in all material respects as of that date.

BANK USE ONLY

TELEPHONE REQUEST:

The following person is authorized to request the loan payment transfer/loan advance on the advance designated account and is known to me.

Authorized Requester

Phone #

Received By (Bank)

Phone #

Authorized Signature (Bank)

EXHIBIT C

BORROWING BASE CERTIFICATE

| | | | |
|--|--|------------------------------------|----------|
| Borrower: Advanced Energy Industries, Inc. | | Payment Agent: Silicon Valley Bank | |
| Commitment Amount:\$30,000,000 | | | |
| ===== | | | |
| ACCOUNTS RECEIVABLE | | | |
| 1. | Accounts Receivable Book Value as of _____ | \$ _____ | |
| 2. | Additions (please explain on reverse) | \$ _____ | |
| 3. | TOTAL ACCOUNTS RECEIVABLE | | \$ _____ |
| ACCOUNTS RECEIVABLE DEDUCTIONS (without duplication) | | | |
| 4. | Amounts over 90 days due | \$ _____ | |
| 5. | Balance of 50% over 90 day accounts | \$ _____ | |
| 6. | Credit balances over 90 days | \$ _____ | |
| 7. | Concentration Limits | \$ _____ | |
| 8. | Foreign Accounts | \$ _____ | |
| 9. | Governmental Accounts | \$ _____ | |
| 10. | Contra Accounts | \$ _____ | |
| 11. | Promotion or Demo Accounts | \$ _____ | |
| 12. | Intercompany/Employee Accounts | \$ _____ | |
| 13. | Disputed/Insolvent Accounts | \$ _____ | |
| 14. | Doubtful Accounts | \$ _____ | |
| 15. | Other (please explain on reverse) | \$ _____ | |
| 16. | TOTAL ACCOUNTS RECEIVABLE DEDUCTIONS | | \$ _____ |
| 17. | Eligible Accounts (#3 minus #16) | | \$ _____ |
| 18. | LOAN VALUE OF ACCOUNTS (80% of #17) | | \$ _____ |
| INVENTORY | | | |
| 19. | Inventory Value as of _____ | | \$ _____ |
| 20. | LOAN VALUE OF INVENTORY (lesser of (i) \$5,000,000 or (ii) 20% of #19) | | \$ _____ |
| BALANCES | | | |
| 21. | Maximum Loan Amount | | \$ _____ |
| 22. | Total Funds Available [Lesser of #21 or (#18 plus #20)] | | \$ _____ |
| 23. | Present balance owing on Line of Credit | \$ _____ | |
| 24. | Outstanding Letters of Credit | \$ _____ | |
| 25. | Outstanding Cash Management Services Fees | \$ _____ | |
| 26. | Outstanding Cash Management Services Fees | \$ _____ | |
| 27. | Outstanding under Optional Currency Rate Sublimit | \$ _____ | |
| 28. | Outstanding under FX Sublimit | \$ _____ | |
| 29. | TOTAL OUTSTANDING BORROWINGS (total of #23 through #28) | | \$ _____ |
| 23. | RESERVE POSITION (#22 minus #29) | | \$ _____ |

Exhibit C-1

The undersigned represents and warrants that this is true, complete and correct, and that the information in this Borrowing Base Certificate complies with the representations and warranties in the Loan Agreement between the undersigned and Silicon Valley Bank and United Overseas Bank Limited.

COMMENTS:

By: _____
Authorized Signer

EXHIBIT D

COMPLIANCE CERTIFICATE

TO: SILICON VALLEY BANK

FROM: ADVANCED ENERGY INDUSTRIES, INC.

The undersigned authorized officer of Advanced Energy Industries, Inc.

certifies that under the terms and conditions of the Loan Agreement between Borrower and the Banks (the "Agreement"), (i) Borrower is in complete compliance for the period ending _____ with all required covenants except as noted below and (ii) all representations and warranties in the Agreement are true and correct in all material respects on this date. Attached are the required documents supporting the certification. The Officer certifies that these are prepared in accordance with Generally Accepted Accounting Principles (GAAP) consistently applied from one period to the next except as explained in an accompanying letter or footnotes. The Officer acknowledges that no borrowings may be requested at any time or date of determination that Borrower is not in compliance with any of the terms of the Agreement, and that compliance is determined not just at the date this certificate is delivered.

PLEASE INDICATE COMPLIANCE STATUS BY CIRCLING YES/NO UNDER "COMPLIES"

COLUMN.

| REPORTING COVENANT | REQUIRED | | COMPLIES | |
|---------------------------------|-------------------------------------|-----------|----------|----|
| Annual (CPA Audited) | FYE within 90 days | | Yes | No |
| 10-Q, 10-K and 8-K | Within 5 days after filing with SEC | | Yes | No |
| A/R & A/P Agings | Monthly within 30 days | | Yes | No |
| A/R Audit | Initial and Semi-Annual* | | Yes | No |
| | | | | |
| FINANCIAL COVENANT | REQUIRED | ACTUAL | COMPLIES | |
| Maintain on a Quarterly Basis: | | | | |
| Minimum Quick Ratio | 2:00:1.0 | _____:1.0 | Yes | No |
| Minimum Tangible Net Worth | \$120,000,000 plus | \$_____ | Yes | No |
| | 50% of quarterly profit | | | |
| Maximum Debt/Tangible Net Worth | 0.65:1.0 | _____:1.0 | Yes | No |
| Profitability: | \$1.00 with quarterly | \$_____ | Yes | No |
| | allowance for Losses | | | |
| | of \$0.20/share for Q2 | | | |
| | of 2001 (\$6,510,000) and | | | |
| | Q3 of 2001 (\$6,540,000). | | | |

*A/R Audit only required with respect to any reporting period during which the aggregate Advances exceed \$10,000,000.

COMMENTS REGARDING EXCEPTIONS: See Attached.

Sincerely,

SIGNATURE

TITLE

DATE

BANK USE ONLY

Received by: _____

AUTHORIZED SIGNER

Date: _____

Verified: _____

AUTHORIZED SIGNER

Date: _____

Compliance Status: Yes No

Exhibit D-1

**OFFICER'S CERTIFICATE
FOR HOLLAND & HART LLP LETTER
DATED JUNE 18, 2001
(ADVANCED ENERGY INDUSTRIES, INC.)**

The undersigned is the duly elected or appointed Secretary of Advanced Energy Industries, Inc., a Delaware corporation ("Company"). The undersigned hereby certifies, individually and on behalf of the Company, to Holland & Hart LLP the following matters:

1. Certificate. This Certificate is given in connection with the Loan Agreement by and between the Company and Silicon Valley Bank and United Overseas Bank, dated June 18, 2001 (the "Loan Agreement").
2. Office. I am the duly elected or appointed, qualified, and presently acting Secretary of the Company and, as such, have access to the records of the Company and am familiar with the matters herein contained and certified.
3. Certificate of Incorporation. A true, correct and complete copy of the Company's Restated Certificate of Incorporation, as amended to date, is attached hereto as Exhibit A, (collectively, the "Certificate of Incorporation"). Since May 19, 1999, no amendment to the Restated Certificate of Incorporation of the Company (i) has been filed in the office of the Secretary of State of the State of Delaware or (ii) authorized by the stockholders or by the Board of Directors of the Company.
4. Bylaws. A true, correct and complete copy of the Company's bylaws as in effect on the date hereof is attached hereto as Exhibit B, and consist of Bylaws which were adopted by the Board of Directors of the Corporation as of _____. Since _____, no amendment to the bylaws has been adopted by the Board of Directors of the Company or the holders of the Common Stock of the Company.

The undersigned has executed this Certificate as of the 18th day of June 18, 2001, and acknowledges that Holland & Hart LLP may rely on the accuracy and completeness of this Certificate until notice to the contrary is furnished to Holland & Hart LLP by the undersigned.

By: _____ Name:

Title:

EXHIBIT A

CERTIFICATE OF INCORPORATION

[see attached]

EXHIBIT B

BYLAWS

[see attached]

EXHIBIT C
RESOLUTIONS

[see attached]

CORPORATE BORROWING RESOLUTION

BORROWER: ADVANCED ENERGY INDUSTRIES, INC.

SILICON VALLEY BANK
3003 TASMAN DRIVE
SANTA CLARA, CA 95054

I, the Secretary or Assistant Secretary of Advanced Energy Industries, Inc. ("BORROWER"), certify that Borrower is a corporation existing under the laws of the State of Delaware.

I certify that at a meeting of Borrower's Directors (or by other authorized corporate action) duly held the following resolutions were adopted.

It is resolved that any one of the following officers of Borrower, whose name, title and signature is below:

| NAME ---- | TITLE ----- | SIGNATURE ----- |
|--------------|----------------|--------------------|
| _____ | _____ | _____ |
| _____ | _____ | _____ |
| _____ | _____ | _____ |

may act for Borrower and:

BORROW MONEY. Borrow money from Silicon Valley Bank and United Overseas Bank (each, a "Bank" and collectively, the "Banks").

EXECUTE LOAN DOCUMENTS. Execute any loan documents the Banks require.

NEGOTIATE ITEMS. Negotiate or discount all drafts, trade acceptances, promissory notes, or other indebtedness in which Borrower has an interest and receive cash or otherwise use the proceeds.

LETTERS OF CREDIT. Apply for letters of credit from the Banks.

FOREIGN EXCHANGE CONTRACTS. Execute spot or forward foreign exchange contracts.

FURTHER ACTS. Designate other individuals to request advances, pay fees and costs and execute other documents or agreements (including documents or agreement that waive Borrower's right to a jury trial) they think necessary to effectuate these Resolutions.

Further resolved that all acts authorized by these Resolutions and performed before they were adopted are ratified. These Resolutions remain in effect and each Bank may rely on them until such Bank receives written notice of their revocation.

I certify that the persons listed above are Borrower's officers with the titles and signatures shown following their names and that these resolutions have not been modified are currently effective.

X

***Secretary or Assistant Secretary Date**

X _____
Date _____

If the certifying officer is designated as a signer in these resolutions then another corporate officer must also sign.

EXHIBIT 21.1

SUBSIDIARIES OF THE REGISTRANT

| Name ----- | Jurisdiction of Incorporation or Organization ----- |
|---|---|
| Advanced Energy Japan K.K. (1) | Japan |
| Advanced Energy Industries GmbH | Germany |
| Advanced Energy Industries U.K. Limited | United Kingdom |
| Advanced Energy Industries, FSC Inc. | Virgin Islands |
| Tower Electronics, Inc. | Minnesota |
| Advanced Energy Industries Korea, Inc. | South Korea |
| Advanced Energy Voorhees, Inc. | New Jersey |
| LITMAS | California |
| Advanced Energy Taiwan, Ltd. | Taiwan |
| Noah Holdings, Inc. | California |
| Noah Precision, Inc. | California |
| Sekidenko, Inc. | Washington |
| Engineering Measurements Company | Colorado |
| AEI US Subsidiary, Inc. | Delaware |
| Advanced Energy California, Inc. | California |
| Advanced Energy Nevada, LLC | Nevada |
| Advanced Energy Voorhees Nevada, LLC | Nevada |
| Advanced Energy Industries Texas, L.P. | Texas |
| AEI International Holdings CV | Netherlands |
| Advanced Energy Industries (ShenZhen) Co., Ltd. | China |
| (1) Subsidiaries of Advanced Energy Japan K.K. include: Aera Japan Limited (2) | Japan |

(2) Subsidiaries of Aera Japan Limited include:

Aera Corporation

Texas

Aera U.K. Ltd.

United Kingdom

Aera GmbH

Germany

Aera Korea Ltd.

South Korea

EXHIBIT 23.1

CONSENT OF INDEPENDENT PUBLIC ACCOUNTANTS

As independent public accountants, we hereby consent to the incorporation of our report dated February 28, 2002, included in this Form 10-K for the year ended December 31, 2001, into the Company's previously filed Registration Statements on Form S-8 (File Nos. 333-01616, 333-04073, 333-46705, 333-57233, 333-65413, 333-79425, 333-79429, 333-62760, 333-69148 and 333-69150); Form S-3 (File Nos. 333-37378 and 333-47114).

*Denver, Colorado,
March 25, 2002*

/s/ Arthur Andersen LLP

EXHIBIT 99.1

Advanced Energy Industries, Inc.
1625 Sharp Point Drive
Fort Collins, Colorado 80525

March 25, 2002

Securities and Exchange Commission
450 5th Street, NW
Washington, DC 20549

Ladies and Gentlemen:

Pursuant to Securities and Exchange Commission Release Nos. 33-8070; 34-45590; 35-27503; 39-2395; IA-2018; IC-25464; FR-62; File No. S7-03-02, this letter is to confirm that Advanced Energy Industries, Inc. has received assurance from its independent public accountants, Arthur Andersen LLP ("Arthur Andersen"), that Arthur Andersen's audit of our consolidated financial statements as of December 31, 2001 and for the year then ended (the "Audit") was subject to Arthur Andersen's quality control system for the U.S. accounting and auditing practice to provide reasonable assurance that the engagement was conducted in compliance with professional standards, that there was appropriate continuity of Arthur Andersen personnel working on the Audit, availability of national office consultation, and availability of personnel at foreign affiliates of Arthur Andersen to conduct the relevant portions of the Audit.

/s/ Michael El-Hillow

*Senior Vice President and
Chief Financial Officer*

End of Filing

Powered By **EDGAR**
Online

© 2005 | EDGAR Online, Inc.