

572,300 shares of Common Stock of

Amtech Systems, Inc.

This prospectus relates to registering for resale, 60,000 shares of our common stock sold to a selling shareholder in a private transaction in February of 1994, 75,000 shares of our common stock issuable upon exercise of warrants issued by Amtech to the selling shareholders under a financial consulting agreement entered into as of July 1, 1997, and 383,000 shares of our common stock, and 54,300 shares issuable upon exercise of warrants issued by Amtech to the selling shareholders in a private placement completed in September of 2000.

We will not receive any proceeds from the sale of the shares. If all of the warrants we issued to the selling shareholders are exercised, we will receive \$1,271,016 of the warrant exercise price.

Our common stock is quoted on the NASDAQ Small Cap Market under the symbol ASYS. On September 28, 2000, the last sales price of our common stock as reported on the NASDAQ Small Cap Market was \$15.625.

These securities have not been approved or disapproved by the Securities and Exchange Commission or any state securities commission nor has the SEC or any state securities commission passed upon the accuracy or adequacy of this prospectus. Any representation to the contrary is a criminal offense.

Investing in our common stock involves a high degree of risk. See "Risk Factors" beginning on page 6.

The date of this prospectus is October 30, 2000.  
WHERE YOU CAN FIND MORE INFORMATION

We file annual, quarterly and special reports, proxy statements and other information with the SEC. You may read and copy any document we file at the SEC's Public Reference Room at 450 Fifth Street, N.W. in Washington, D.C., 20549, or in Chicago, Illinois or New York, New York. Please call the SEC at 1-800-SEC-0330 for further information on the public reference rooms. Our SEC filings are also available to the public from the SEC's Website at "<http://www.sec.gov>."

Copies of publicly available documents that we have filed with the SEC can also be inspected and copied at the offices of the National Association of Securities Dealers, Inc., 1735 K Street, N.W., Washington, D.C. 20006.

This prospectus is a part of the registration statement that we filed on Form S-3 with the SEC. The registration statement contains more information than this prospectus about us and our common stock, including exhibits and schedules. You should refer to the registration statement for additional information about us and the common stock being offered in this prospectus. Statements that we make in this prospectus relating to any documents filed as an exhibit to the registration statement or by any document incorporated by reference into the registration statement may not be complete and you should review the referenced document itself for a complete understanding of its terms.

The SEC allows us to incorporate by reference the information we file with them, which means that we can disclose important information to you by referring you to those documents. The information incorporated by reference is considered to be part of this prospectus, and later information filed with the SEC will update and supersede this information. We incorporate by reference the documents listed below and any future filings made with the SEC under Sections 13(a), 13(c), 14, or 15(d) of the Securities Exchange Act of 1934 until the offering is completed:

- \* Amtech's Annual Report on Form 10-K for the fiscal year ended September 30, 1999, as amended;
- \* Amtech's Quarterly Report on Form 10-Q for the quarter ended December 31, 1999;
- \* Amtech's Quarterly Report on Form 10-Q for the quarter ended March 31, 2000,
- \* Amtech's Quarterly Report on Form 10-Q for the quarter ended June 30, 2000,
- \* Amtech's definitive proxy statement for its Annual Meeting of Shareholders held on February 25, 2000; and
- \* the description of Amtech's common stock contained in its Registration Statement on Form 8-A filed with the Commission pursuant to Section 12(g) of the Exchange Act.

You may request a copy of these filings, at no cost, by writing or telephoning us at the following address:

Amtech Systems, Inc.  
131 South Clark Drive  
Tempe, Arizona 85281  
Attn: Investor Relations (480) 967-5146

2

You should rely only on the information incorporated by reference or provided in this prospectus or any prospectus supplement to this prospectus. We have not authorized any person to provide you with different information. This prospectus does not constitute an offer of these securities in any state where the offer is not permitted. You should not assume that the information in this prospectus or any prospectus supplement to this prospectus is accurate as of any date other than the date on the front of the document.

We have not authorized any person to provide you with information different from that contained or incorporated by reference in this prospectus. The selling shareholders are offering to sell, and seeking offers to buy, shares of our common stock only in jurisdictions where offers and sales are permitted. The information contained in this prospectus is accurate only as of the date of this prospectus, regardless of the time of delivery of this prospectus or of any sale of common stock.

You should read the following summary together with the more detailed information in other sections of this prospectus. You should also carefully consider the factors described under Risk Factors at page 7 of this prospectus. Throughout this prospectus, we refer to Amtech Systems, Inc. as Amtech, we, our, ours, and us.

3

### PROSPECTUS SUMMARY

We were incorporated in Arizona in October 1981, under the name Quartz Engineering & Materials, Inc. The name of the company was changed to Amtech Systems, Inc. in 1987. We also conduct operations through two wholly owned subsidiaries, Tempres Systems, Inc., a Texas corporation with all its operations in the Netherlands, and P.R. Hoffman Machine Products, Inc., an Arizona corporation, with all of its operations in Carlisle, Pennsylvania.

Our initial business was the manufacture of quartzware implements for use by manufacturers of semiconductor chips. Since 1987, we have been engaged in the manufacture and marketing of several items of capital equipment used by customers in the manufacture of semiconductors. We manufacture and sell horizontal and conveyor diffusion furnaces through Tempres Systems. In addition, we manufacture and sell a Processing/Robotic product line, including, Atmoscan(R), IBAL and load stations, that is designed to:

- \* enable customers to increase the degree of control over their semiconductor chip manufacturing environment,
- \* reduce exposure to contaminants by limiting human contact during the manufacturing process,
- \* and improve employee safety.

In fiscal 1994, we added research and product development of new technologies to our on-going development of new products and product improvements based on existing technologies. From fiscal 1994 through the end of fiscal 1998, the new technology under investigation consisted of photo-assisted CVD (chemical vapor deposition) research conducted by and in conjunction with the University of California at Santa Cruz. In this regard, the University of California at Santa Cruz studied several generations of higher intensity light sources, none of which have yielded results that would enable us to produce a commercially viable product. While this research was partially successful, it was suspended indefinitely effective September 30, 1998, until such time as reliable higher intensity lamps are available and success appears more probable.

In fiscal 1995, we began the complementary business of producing and selling horizontal diffusion furnaces for use in semiconductor fabrication, through Tempres Systems. In fiscal 1998, through Tempres Systems, we began producing and selling conveyor diffusion furnaces for use in precision thermal processing of electronic parts. Tempres Systems conducts all of its operation in the Netherlands.

In July 1997, we acquired substantially all of the assets of P.R. Hoffman Machine Products Corporation. As a result of this acquisition we began developing, manufacturing, marketing and selling double sided precision lapping and polishing machines, replacement parts and related products including carriers and semiconductor polishing templates all through our wholly owned subsidiary, P.R. Hoffman Machine Products, Inc. These products are high throughput precision surface processing systems used in the manufacture of semiconductor wafers, precision optics and other thin wafer materials, such as computer disk media and ceramic components for wireless communication devices.

In the fourth quarter of fiscal 1997, we began offering manufacturing support services to one of our Texas-based customers. These services consist of wet and dry cleaning of semiconductor machine processing parts. We intend to offer manufacturing support services to other customers and third parties as such opportunities become available.

Beginning in fiscal 1999, we began research on a new technology asher. In November 1999, we announced a joint product development agreement with PSK Tech, Inc. to develop a new technology ashing machine using our damage-free technology and PSK Tech's expertise in the design of ashers and asher processes.

Our principal executive offices are located at 131 South Clark Drive, Tempe, Arizona 85281 and our telephone number is (480) 967-5146.

4

THE OFFERING

Securities Offered by the Selling Shareholders ..... A total of 572,300 shares of common stock are covered by this prospectus. These shares represent

\* 60,000 shares sold to a selling shareholder in a private transaction in 1994;

\* 75,000 shares issuable upon the exercise of outstanding warrants held by the selling shareholders that were issued pursuant to a financial consulting agreement dated as of July 1, 1997, and

\* 383,000 shares, and 54,300 shares issuable upon exercise of warrants (of which, 16,000 were issued to a placement agent), all issued in a private placement pursuant to a Stock and Warrant Purchase Agreement, dated as of September 8, 2000.

A description of the terms of the warrants is included in this prospectus under the caption Description of Securities.

Common Stock Outstanding as of September 29, 2000 ..... 2,571,808

Use of Proceeds ..... We will not receive any of the proceeds of sales of common stock by the selling shareholders. We will receive up to \$1,271,016 from the exercise, if any, of the warrants. See Use of Proceeds.

Risk Factors ..... The shares of common stock offered hereby involve a high degree of risk. See Risk Factors on page 7.

NASDAQ Small Cap Market Symbol ..... ASYS

5

FORWARD LOOKING STATEMENTS

THROUGHOUT THIS PROSPECTUS AND THE OTHER DOCUMENTS INCORPORATED BY REFERENCE INTO THIS PROSPECTUS WE MAKE CERTAIN "FORWARD-LOOKING" STATEMENTS (AS SUCH TERM IS DEFINED IN THE PRIVATE SECURITIES LITIGATION REFORM ACT OF 1995). THESE ARE STATEMENTS ABOUT FUTURE EVENTS, RESULTS OF OPERATION, BUSINESS PLANS AND OTHER MATTERS. THESE STATEMENTS CAN BE IDENTIFIED BY THE USE OF FORWARD LOOKING TERMINOLOGY SUCH AS "BELIEVES," "EXPECTS," "MAY," "WILL," "SHOULD," OR "ANTICIPATES," OR THE NEGATIVE THEREOF OR OTHER WRITTEN VARIATIONS THEREOF OR COMPARABLE TERMINOLOGY. THE FORWARD-LOOKING STATEMENTS CONTAINED IN THIS PROSPECTUS ARE BASED ON CURRENT EXPECTATIONS THAT INVOLVE A NUMBER OF RISKS AND UNCERTAINTIES INCLUDING THOSE SET FORTH BELOW UNDER "RISK FACTORS. IN LIGHT OF THE SIGNIFICANT UNCERTAINTIES INHERENT IN THE FORWARD-LOOKING INFORMATION INCLUDED IN THIS PROSPECTUS, THAT FORWARD LOOKING INFORMATION SHOULD NOT BE REGARDED AS A REPRESENTATION BY US, OR ANY OTHER PERSON, THAT OUR OBJECTIVES OR PLANS WILL BE ACHIEVED. WE HAVE NO OBLIGATION TO UPDATE THE FORWARD-LOOKING STATEMENTS MADE IN THIS PROSPECTUS OR INCORPORATED BY REFERENCE HEREIN.

RISK FACTORS

BEFORE PURCHASING ANY OF THE SHARES OF COMMON STOCK BEING OFFERED BY THIS PROSPECTUS, YOU SHOULD CAREFULLY CONSIDER THE FOLLOWING RISK FACTORS WE HAVE

DESCRIBED IN THIS SECTION.

IF THE DEMAND FOR HORIZONTAL DIFFUSION FURNACES AND EQUIPMENT USED IN CONJUNCTION WITH SUCH FURNACES DECLINES, WHICH ACCOUNT FOR MORE THAN ONE-HALF OF CONSOLIDATED REVENUE, OUR REVENUES MAY DECREASE AND OUR BUSINESS OPERATIONS AND FINANCIAL CONDITION COULD BE MATERIALLY ADVERSELY AFFECTED.

The revenue of our semiconductor production equipment segment, which accounts for more than one-half of consolidated revenues, is comprised of horizontal diffusion furnaces and our Processing/Robotic product line. Our Processing/Robot product line is useable only with horizontal diffusion furnaces. There is a trend in the semiconductor industry, related to the trend to produce smaller chips, toward the use in semiconductor manufacturing facilities of newer technology, such as vertical diffusion furnaces. Vertical diffusion furnaces are more efficient to use than the horizontal diffusion furnaces in certain manufacturing processes of smaller chips on larger wafers. Because of this trend, we had expected that demand for our horizontal diffusion furnaces would decline. We believe this trend has not adversely affected us yet primarily because:

- \* we have received significant orders for our horizontal diffusion furnaces from optical component manufacturers, a new market for us;
- \* we have experienced increased demand from manufacturers that do not require the more expensive vertical furnaces, such as from manufacturers of wireless communication chips and micro-controllers used in a number of consumer applications; and
- \* we believe that because of improvements in automation for horizontal diffusion furnaces, such as our robotic product line, horizontal diffusion furnaces may be becoming a more favorable alternative to the vertical furnaces than they previously had been.

However, to the extent that the trend to use vertical diffusion furnaces over horizontal diffusion furnaces continues, our revenues may decline and our ability to generate income may be adversely affected.

6

THE VOLATILITY OF THE SEMICONDUCTOR EQUIPMENT INDUSTRY CAN NEGATIVELY IMPACT OUR OPERATIONS AND OUR ABILITY TO EFFICIENTLY BUDGET OUR EXPENSES, WHICH CAN HAVE AN ADVERSE AFFECT ON OUR RESULTS OF OPERATIONS.

The semiconductor equipment industry is highly cyclical. The purchasing decisions of our customers are highly dependent on the economies of both their domestic markets and the semiconductor industry worldwide. The timing, length and severity of the up-and-down cycles in the semiconductor equipment industry are difficult to predict. For example, demand for our products increased in fiscal 1998 compared to fiscal 1997, but decreased in fiscal 1999, primarily as a result of widespread economic difficulties experienced in Japan and other parts of the Asia Pacific region. This cyclical nature of our marketplace affects our ability to accurately budget our expense levels, which are based in part on our projections of future revenues.

When cyclical fluctuations result in lower than expected revenue levels, operating results may be adversely affected and cost reduction measures may be necessary in order for us to remain competitive and financially sound. For example, during the fourth quarter of fiscal 1998 and the first quarter of fiscal 1999, we implemented a cost reduction plan that required lay-offs within certain operations. During a down cycle, we must be in a position to adjust our cost and expense structure to the prevailing market condition and to continue to motivate and retain our key employees. In addition, during periods of rapid growth, we must be able to increase manufacturing capacity and personnel to meet customer demand. We can provide no assurance that these objectives can be met in a timely manner in response to industry cycles. If we fail to respond to industry cycles, our business could be seriously harmed.

During the most recent down cycle, the semiconductor industry experienced excess production capacity that caused semiconductor manufacturers to decrease capital spending. We do not have long-term volume production contracts with our customers and we do not control the timing or volume of orders placed by our customers. Whether and to what extent our customers place orders for any specific products and the mix and quantities of products included in those orders are factors beyond our control. Insufficient orders will result in under-utilization of our manufacturing facilities and infrastructure and will negatively affect our operating results and financial condition.

WE ARE DEPENDENT ON THE ACTIVE PARTICIPATION OF MR. JONG S. WHANG, THE PRESIDENT AND CHIEF EXECUTIVE OFFICER, FOR BUSINESS DEVELOPMENT, AND IMPORTANT BUSINESS RELATIONSHIPS, AND THE LOSS OF HIS SERVICES WOULD MATERIALLY AND ADVERSELY AFFECT OUR BUSINESS AND FUTURE PROSPECTS.

Amtech is the beneficiary of a life insurance policy on the life of Mr. Whang in the amount of \$1,000,000, but there is no assurance that such amount will be sufficient to cover the cost of finding and hiring a suitable replacement for Mr. Whang. It may not be feasible for any successor to maintain

the same relationships that Mr. Whang has established. If we were to lose the services of Mr. Whang for any reason, it could have a material adverse affect on our business.

In addition, historically, our product development has been accomplished through cooperative efforts with two key customers. Our relationship with one of these customers as well as with our joint development partner for the new technology asher, are substantially dependent on the personal relations established by Mr. Whang. While there can be no assurance that such relationships will continue, such cooperation is expected to continue to be a significant element in our future development efforts.

7

WE RELY ON KEY PERSONNEL FOR PRODUCT DEVELOPMENT AND SALES, AND ANY LOSS OF OUR KEY PERSONNEL TO COMPETITORS OR OTHER INDUSTRIES COULD DRAMATICALLY IMPACT OUR ABILITY TO CONTINUE OPERATIONS.

We depend to a great extent on the management efforts of our officers and other key personnel and on the ability to attract new key personnel and retain existing key personnel. Most of our products, other than the Atmoscan(R) and products acquired in the P.R. Hoffman acquisition, were developed by our own personnel. We presently employ three engineers, including one with a Ph.D., and one in the sales department, and six technicians at our Tempe, Arizona plant. We presently employ eight engineers, one with a Ph.D., and seven technicians in our Netherlands operation. These employees design and support the horizontal diffusion furnace and conveyor furnace product lines manufactured in the Netherlands and the related Process/Robotic products manufactured in Tempe. Two engineers and one technician are employed in our Carlisle, Pennsylvania operation. They design wafer lapping machines and carriers to meet customers' processing requirements. Competition is intense for highly skilled employees. There can be no assurance that we will be successful in attracting and retaining such personnel or that we can avoid increased costs in order to do so. There can be no assurance that employees will not leave Amtech or compete against us. Our failure to attract additional qualified employees or to retain the services of key personnel could negatively impact our operating results and financial condition.

THE TECHNOLOGY WE USE IN OUR PRODUCTS IS CHANGING RAPIDLY AND WE MAY NOT BE ABLE TO TAKE ADVANTAGE OF THESE CHANGES.

Success in the semiconductor equipment industry depends, in part, on continual improvement of existing technologies and rapid innovation of new solutions. For example, the semiconductor industry continues to shrink the size of semiconductor devices. These and other evolving customer needs require us to respond with continued development programs.

Technical innovations are inherently complex and require long development cycles and appropriate professional staffing. Our future business success depends on our ability to develop and introduce new products that successfully address changing customer needs, win market acceptance of these new products and manufacture these new products in a timely and cost-effective manner. If we do not develop and introduce new products and technologies in a timely manner in response to changing market conditions or customer requirements, our business could be seriously harmed. In this environment, we must continue to make investments in research and development in order to enhance the performance and functionality of our products, to keep pace with competitive products and to satisfy customer demands for improved performance, features and functionality. There can be no assurance that revenues from future products or product enhancements will be sufficient to recover the development costs associated with such products or enhancements or that we will be able to secure the financial resources necessary to fund future development. Research and development costs typically are incurred before we confirm the technical feasibility and commercial viability of a product, and not all development activities result in commercially viable products. In addition, we cannot ensure that these products or enhancements will receive market acceptance or that we will be able to sell these products at prices that are favorable to us. Our business could be seriously harmed if we are unable to sell our products at favorable prices or if our products are not accepted by the market in which we operate.

OUR CURRENT CAPITALIZATION COULD DELAY, DEFER OR PREVENT A CHANGE OF CONTROL.

We are authorized to issue up to 100,000,000 shares of common stock and up to 100,000,000 shares of preferred stock. As of September 29, 2000, there were 2,571,808 shares outstanding. Authorized but unissued common stock may be issued for such consideration as the board of directors determines to be adequate. The board of directors may issue preferred stock with such rights and preferences as they determine, without shareholder vote. Although we do not currently intend to

8

issue any shares of our preferred stock there can be no assurance that we will not do so in the future. Shareholders may or may not be given the opportunity to vote thereon, depending upon the nature of any such transactions, applicable law, the rules and policies of the national securities exchange on which the common stock is then trading, if any, and the judgment of the board of directors. Shareholders have no preemptive rights to subscribe for newly issued

shares of our capital stock.

On May 17, 1999, we declared a dividend distribution of one preferred share purchase right for each outstanding share of common stock. The dividend was payable on June 9, 1999, to stockholders of record as of the close of business on that date. Each right entitles the registered holder to purchase one one-hundredth of a share of Series A Participating Preferred Stock, subject to adjustment, at a price of \$8.50 per one one-hundredth of a share of Preferred Stock, subject to adjustment. The rights issuance was adopted as protection against a takeover by a third party.

Having the outstanding rights, and a substantial number of authorized and unreserved shares of common stock and preferred stock could have the effect of making it more difficult for a third party to acquire a majority of our outstanding voting stock. Management could use the additional shares to resist a takeover effort even if the terms of the takeover offer are favored by a majority of the independent shareholders. This could delay, defer, or prevent a change in control.

WE ARE DEPENDENT ON THE USE OF INTELLECTUAL PROPERTY RIGHTS, WHICH ARE EXPENSIVE TO OBTAIN, AND MAINTAIN, AND WE ARE EXPOSED TO THE RISK THAT THIRD PARTIES MAY VIOLATE OUR PROPRIETARY RIGHTS OR ACCUSE US OF INFRINGING UPON THEIR PROPRIETARY RIGHTS, WHICH COULD RESULT IN LOSS OF THE VALUE OF SOME OF OUR INTELLECTUAL PROPERTY OR COSTLY LITIGATION.

Our success is dependent in part on our technology and other proprietary rights. We own various United States and international patents and have additional pending patent applications relating to some of our products and technologies. The process of seeking patent protection is lengthy and expensive, and we cannot be certain that pending or future applications will actually result in issued patents, or that, issued patents will be of sufficient scope or strength to provide meaningful protection or commercial advantage to us. Other companies and individuals, including our larger competitors, may develop technologies that are similar or superior to our technology or design around the patents we own. We also maintain trademarks on certain of our products and claim copyright protection for certain proprietary software and documentation. However, we can give no assurance that our trademarks and copyrights will be upheld or successfully deter infringement by third parties.

While patent, copyright and trademark protection for our intellectual property is important, we believe our future success in highly dynamic markets is most dependent upon the technical competence and creative skills of our personnel. We attempt to protect our trade secrets and other proprietary information through agreements with our customers, suppliers, employees and consultants and through other security measures. We also rely on trade secret protection for our technology, in part through confidentiality agreements with our employees, consultants and third parties. We also maintain exclusive and non-exclusive licenses with third parties for the technology used in certain products. However, these employees, consultants and third parties may breach these agreements, and we may not have adequate remedies for wrongdoing. In addition, the laws of certain territories in which we develop, manufacture or sell our products may not protect our intellectual property rights to the same extent as do the laws of the United States.

As is typical in the semiconductor equipment industry, from time to time we have received communications from other parties asserting the existence of patent rights or other intellectual property rights which they believe cover certain of our products, processes, technologies or information. In such cases, we evaluate our position and consider the available alternatives, which may include seeking licenses to use the technology in question on commercially

9

reasonable terms or defending our position. Based on industry practice and prior experience, we believe that licenses or other rights, if necessary, will be available on commercially reasonable terms for existing or future claims. Nevertheless, we cannot ensure that licenses can be obtained, or if obtained will be on acceptable terms or that litigation or other administrative proceedings will not occur. Defending our intellectual property rights through litigation could be very costly. If we are not able to negotiate the necessary licenses on commercially reasonable terms or successfully defend our position, our financial condition and results of operations could be materially and adversely affected.

OUR RELIANCE ON SALES TO A FEW MAJOR CUSTOMERS AND GRANTING CREDIT TO THOSE CUSTOMER PLACES US AT FINANCIAL RISK.

Receivables from one of our customers comprised 16% of accounts receivable at September 30, 1999. Receivables from three customers comprised 43% of accounts receivable at September 30, 1998, representing a concentration of credit risk. Reliance on such a concentration of our receivables on such a small number of customers places us at risk. If any one or more of our major customers is unable to pay us it could adversely affect our financial condition.

OUR BUSINESS MIGHT BE ADVERSELY AFFECTED BY OUR DEPENDENCE ON FOREIGN BUSINESS.

During our most recent fiscal year, ended on September 30, 1999, 41% of our sales were made to customers outside the United States as follows:

- \* Asia (including Singapore, Indonesia, Malaysia and India) - 5%
- \* Europe (including Israel and Africa) - 29%
- \* Australia - 7%

Because of our significant dependence on international revenues, our operating results could be negatively affected by a continued or additional decline in the economies of any of the countries or regions in which we do business. Each region in the global semiconductor equipment market exhibits unique characteristics that can cause capital equipment investment patterns to vary significantly from period to period. Periodic local or international economic downturns, trade balance issues, political instability and fluctuations in interest and currency exchange rates could negatively affect our business and results of operations.

Foreign sales are expected to increase significantly because of our expansion of horizontal diffusion business in Europe as a result of the new optical component market for certain of our products. We recorded charges of \$98,000 and \$93,000 to shareholders' equity for the first three quarters of Fiscal 2000 and for Fiscal 1999, respectively, as a result of foreign currency translation adjustments. We also had losses from foreign currency transactions of \$83,000 in fiscal 1999. While our business has not been materially affected in the past by foreign business, there is a risk that it may be materially adversely affected in the future. Such risk includes possible losses on account of currency exchange rate fluctuations, possible future prohibitions against repatriation of earnings, or proceeds from disposition of investments, and from possible social and military instability in the case of India, South Korea, Taiwan and possibly elsewhere. Our wholly owned subsidiary, Tempres Systems, has conducted its operations in the Netherlands since fiscal 1995. As a result, such operations are subject to the taxation policies, employment and labor laws, transportation regulations, import and export regulations and tariffs, foreign exchange restrictions, international monetary fluctuations, and other political, economic and legal policies of that nation, the European Economic Union and the other European nations in which it conducts business. Consequently, we might encounter unforeseen or unfamiliar difficulties in conducting our European

10

operations. Changes in such laws and regulations may have a material adverse effect on our revenue and costs.

THE SEMICONDUCTOR EQUIPMENT INDUSTRY IS COMPETITIVE AND WE ARE RELATIVELY SMALL IN SIZE AND HAVE FEWER RESOURCES IN COMPARISON WITH OUR COMPETITORS.

Our industry includes large manufacturers with substantial resources to support customers worldwide. Our future performance depends, in part, upon our ability to continue to compete successfully worldwide. Some of our competitors are diversified companies with greater financial resources and more extensive research, engineering, manufacturing, marketing and customer service and support capabilities than we can provide. We face competition from companies whose strategy is to provide a broad array of products, some of which compete with the products and services that we offer. These competitors may bundle their products in a manner that may discourage customers from purchasing our products. In addition, we face competition from smaller emerging semiconductor equipment companies whose strategy is to provide a portion of the products and services that we offer, using innovative technology to sell products into specialized markets. Loss of competitive position could impair our prices, customer orders, revenues, gross margins, and market share, any of which would negatively affect our operating results and financial condition. Our failure to compete successfully with these other companies would seriously harm our business. There is risk that larger, better-financed competitors will develop and market more advanced products than those that we currently offer, or that competitors with greater financial resources may decrease prices thereby putting us under financial pressure. The occurrence of any of these events could have a negative impact on our revenues.

ALTHOUGH ONLY 5% OF OUR REVENUES WERE GENERATED FROM SALES IN ASIA IN FISCAL 1999, IF THE HEALTH OF THE ASIAN ECONOMIES DO NOT CONTINUE TO IMPROVE, ACHIEVEMENT OF OUR GOALS FOR AGGRESSIVE GROWTH COULD BE ADVERSELY AFFECTED.

In the past we have at times generated a significant portion of our revenue from customers in Asia (SEE Risk Factor - "Our business might be adversely affected by our dependence on foreign business."). Although Asian economies have stabilized to some degree since early to mid-fiscal 1998, Amtech remains cautious about general macroeconomic developments in Asia, particularly in Japan and Taiwan. The economies of Japan and Taiwan are important to the overall financial health of the Asian region and, if they do not continue to improve, the economies of other countries, particularly those in Asia, could also be negatively affected. Negative economic developments in Asia could have a material adverse effect on our ability to reach our aggressive goals for growth.

IF WE MAKE ADDITIONAL ACQUISITIONS IT COULD RESULT IN AN INCREASE IN OUR COSTS OF OPERATIONS, DIVERT MANAGEMENT'S ATTENTION AWAY FROM OTHER OPERATIONAL MATTERS, AND EXPOSE US TO OTHER RISKS ASSOCIATED WITH POTENTIAL ACQUISITIONS.

We are currently evaluating potential acquisitions. We might make acquisitions of, or significant investments in, other businesses with synergistic products, services and technologies. Acquisitions involve numerous risks, including, but not limited to:

- \* difficulties and increased costs in connection with integration of the personnel, operations, technologies and products of acquired companies;
- \* diversion of management's attention from other operational matters;
- \* the potential loss of key employees of acquired companies;

11

- \* lack of synergy, or inability to realize expected synergies, resulting from the acquisition;
- \* the risk that the issuance of Amtech common stock in an acquisition or merger could be dilutive to Amtech stockholders if anticipated synergies are not realized; and
- \* acquired assets becoming impaired as a result of technological advancements or worse-than-expected performance of the acquired company.

IF OUR CRITICAL SUPPLIERS FAIL TO DELIVER SUFFICIENT QUANTITIES OF PRODUCT IN A TIMELY AND COST-EFFECTIVE MANNER IT COULD NEGATIVELY AFFECT OUR BUSINESS.

We use a wide range of materials and services in the production of our products including custom electronic and mechanical components, and we use numerous suppliers to supply materials. We generally do not have guaranteed supply arrangements with our suppliers. Because of the variability and uniqueness of customers' orders, we do not maintain an extensive inventory of materials for manufacturing. Key suppliers include two steel mills capable of holding the type and tolerances that we require, an injection molder that provides plastic insets for steel carriers, an adhesive manufacturer that supplies the critical glue used in the production of the semiconductor polishing templates, and a pad supplier that produces a unique material used to attach semiconductor wafers to the polishing template. We also rely on third parties for laser cutting, machined parts, steel frames and metal panels and other components used particularly in the assembly of semiconductor production equipment.

Although we make reasonable efforts to ensure that parts are available from multiple suppliers, this is not always possible; accordingly, some key parts are being procured from a single supplier or a limited group of suppliers. The semiconductor industry's recent increase in demand for capital equipment has resulted in longer lead-times for many important system components, which could cause delays in meeting shipments to our customers. Because the selling price of some systems exceeds \$1 million, the delay in the shipment of even a single system could cause significant variation in quarterly revenue, operating results and the market value of our stock. We have sought, and will continue to seek, to minimize the risk of production and service interruptions and shortages of key parts by:

- \* selecting and qualifying alternative suppliers for key parts;
- \* monitoring the financial stability of key suppliers; and
- \* maintaining appropriate inventories of key parts.

There can be no assurance that results of operations will not be materially and adversely affected if, in the future, we do not receive in a timely and cost-effective manner a sufficient quantity of parts to meet our production requirements.

WE MIGHT REQUIRE ADDITIONAL FINANCING TO EXPAND OUR OPERATIONS.

On September 13, 2000, we issued 383,000 shares of common stock, and warrants to purchase an aggregate of up to 38,300 shares of common stock, in a private placement pursuant to a Stock and Warrant Purchase Agreement. See RECENT EVENTS. Net proceeds to the company, after deducting fees of the placement agents, but before deduction of legal, accounting and registration fees, were \$4,690,000. The proceeds will be used to fund the company's growth initiatives. While we believe that revenues generated from our operations, as well as the proceeds received from this private placement, are sufficient to provide adequate working capital for the foreseeable future and for a limited number of growth initiatives, additional financing is expected to be required for further implementation of our plans for expansion. There is no assurance that any additional financing will be available if and when required, or, even

12

if available, that it would not materially dilute the ownership percentage of the then existing shareholders.

IF OUR SECURITIES BECOME INELIGIBLE FOR TRADING ON THE NASDAQ SYSTEM, THEY MIGHT



BE SUBJECT TO RULE 15g-9 OF THE SECURITIES EXCHANGE ACT OF 1934, WHICH IMPOSES ADDITIONAL SALES PRACTICE REQUIREMENTS ON BROKER-DEALERS WHO SELL SUCH SECURITIES TO PERSONS OTHER THAN ESTABLISHED CUSTOMERS AND ACCREDITED INVESTORS.

While our common stock is now included on the Nasdaq SmallCap Market, continued inclusion will depend on our ability to meet certain eligibility requirements established for the Nasdaq SmallCap Market. Loss of Nasdaq eligibility could result if we sustain material operating losses or if the market price of our common stock falls below \$1.00 per share. For transactions covered by the rule, the broker-dealer must make a special suitability determination for the purchaser and receive the purchaser's written consent to the transaction prior to the sale. The rule may adversely affect the ability of broker-dealers to sell our securities, and consequently may limit the public market for and the trading price of our common stock.

#### SELLING SHAREHOLDERS

In February of 1994, Alvin Katz purchased 60,000 shares of common stock from Jong S. Whang, our current President and Chief Executive Officer, in a private transaction. As part of that transaction, Mr. Katz succeeded to certain registration rights. Those registration rights have since terminated, however, our board of directors has determined to include registration of Mr. Katz's shares. We are registering these shares in order to permit Mr. Katz to offer the 60,000 shares of common stock.

On July 1, 1997, we issued warrants to purchase an aggregate of up to 150,000 shares of common stock (on a pre-split basis) to the selling shareholders under seven separate Warrants to Purchase Common Stock certificates, relating to the acquisition of certain assets of P.R. Hoffman Machine Products Corporation. These warrants were initially exercisable at a price per share of \$3.00. On March 15, 1999, we conducted a 1 for 2 reverse stock split. As a result, the warrants were automatically adjusted so that they are now, in the aggregate, exercisable for up to 75,000 shares at an exercise price of \$6.00 per share.

In addition, in September of 2000, we issued 383,000 shares of common stock, and warrants to purchase an aggregate of up to 54,300 shares of common stock to the selling shareholders. Of the 54,300 shares issuable upon exercise of warrants, 16,000 were issued to a private placement agent. The shares and the warrants were issued pursuant to a Stock and Warrant Purchase Agreement, dated as of September 8, 2000, and related Warrants to Purchase Common Stock, dated as of September 8, 2000. These warrants are exercisable at a price per share of \$15.12.

13

We are registering shares in order to permit the selling shareholders to offer the 383,000 shares of common stock issued pursuant to the Stock and Warrant Purchase Agreement, as well as the 75,000 shares issuable upon exercise of the warrants dated as of July 1, 1997 and the 54,300 shares issuable upon exercise of the warrants dated as of September 8, 2000.

The following table provides information as of September 28, 2000, with respect to the common stock beneficially owned by the selling shareholders. For purposes of the information set forth in this table we assume that all of the warrants are exercised. We believe that the selling shareholders each have sole voting and investment power with respect to their respective shares of common stock set forth opposite their names.

<TABLE>  
<CAPTION>

Name	Number of Shares Owned Prior to the Offering	Number of Shares being Offered	Number of Shares Owned After the Offering	Percentage Ownership
----	-----	-----	-----	-----
<S>	<C>	<C>	<C>	<C>
Steven N. Bronson	45,450 (1)	45,450 (1)	--	**
James S. Cassel and Mindy Cassel, TBE	23,100 (1)	23,100 (1)	--	**
Bruce C. Barber	1,650 (1)	1,650 (1)	--	**
Eric R. Elliot	1,650 (1)	1,650 (1)	--	**
Barry J. Booth	1,650 (1)	1,650 (1)	--	**
Barry E. Steiner	750 (1)	750 (1)	--	**
Scott E. Salpeter	750 (1)	750 (1)	--	**
Gryphon Partners, L.P.	27,500 (2) *	27,500 (2) *	--	**
Scout Mountain LP	11,000 (3) *	11,000 (3) *	--	**
Scout Capital Partners, LP	44,000 (4) *	44,000 (4) *	--	**
Lancaster Investment Partners, LP	44,000 (5) *	44,000 (5) *	--	**
Robert A. Berlacher	19,800 (6) *	19,800 (6) *	--	**
North Olmsted Partners, LP	110,000 (7) *	110,000 (7) *	--	**
Strong River Investments, Inc.	79,970 (8) *	79,970 (8) *	--	**
Bay Harbor Investments, Inc.	39,022 (9) *	39,022 (9) *	--	**
Managed Risk Trading, LP	31,535 (10) *	31,535 (10) *	--	**
Redwood Partners LLC	7,830 (11) *	7,830 (11) *	--	**
VFT Special Ventures, LP	5,280 (12) *	5,280 (12) *	--	**
RAM Capital Resources, LLC	1,363 (13) *	1,363 (13) *	--	**
Wharton Capital Partners	10,000 (13) *	10,000 (13) *	--	**

Broadband Capital Management	6,000 (13) *	6,000 (13) *	--	**
Alvin Katz++	70,000	60,000	10,000	**

</TABLE>

- - - - -
- (1) Represents shares issuable upon exercise of warrants. Each warrant is currently exercisable to purchase one share of common stock at an exercise price of \$6.00 per share, subject to adjustment. The warrants are exercisable until July 1, 2002.
  - (2) Of this number, 2,500 are issuable upon exercise of warrants.
  - (3) Of this number, 1,000 are issuable upon exercise of warrants.
  - (4) Of this number, 4,000 are issuable upon exercise of warrants.
  - (5) Of this number, 4,000 are issuable upon exercise of warrants.
  - (6) Of this number, 1,800 are issuable upon exercise of warrants.
  - (7) Of this number, 10,000 are issuable upon exercise of warrants.
  - (8) Of this number, 7,270 are issuable upon exercise of warrants.
  - (9) Of this number, 2,722 are issuable upon exercise of warrants.
  - (10) Of this number, 2,535 are issuable upon exercise of warrants.
  - (11) Of this number, 630 are issuable upon exercise of warrants.
  - (12) Of this number, 480 are issuable upon exercise of warrants.
  - (13) All issuable upon exercise of warrants.

\* Of the number of shares represented by warrants, each warrant is currently exercisable to purchase one share of common stock at an exercise price of \$15.12 per share, subject to adjustment. The warrants are exercisable until September 8, 2005.

\*\* This represents less than 1% of the outstanding common stock, assuming all warrants are exercised and all shares offered are sold.

++ Alvin Katz has been a Director of Amtech since May 1, 1995.

14  
DESCRIPTION OF SECURITIES

COMMON STOCK. We are authorized to issue 100,000,000 shares of common stock, \$0.01 par value. Each outstanding share of common stock is entitled to one vote in all matters for which stockholders are entitled to vote. Shares of common stock do not have preemptive rights.

PREFERRED STOCK. We are authorized to issue 100,000,000 shares of preferred stock. No shares of preferred stock are outstanding and the terms of the preferred stock have not been specified.

WARRANTS. On July 1, 1997, we issued warrants to purchase an aggregate of up to 150,000 shares of common stock under seven separate Warrants to Purchase Common Stock certificates, relating to the acquisition of certain assets of P.R. Hoffman Machine Products Corporation. These warrants were initially exercisable at a price per share of \$3.00. On March 15, 1999, we implemented a 1 for 2 reverse stock split. As a result, the warrants were automatically adjusted so that they are now, in the aggregate, exercisable for up to 75,000 shares at an exercise price of \$6.00 per shares. The warrants may be exercised until 5:00 p.m., Miami, Florida Time, on July 1, 2002. Under the Warrants to Purchase Common Stock, the holders are granted certain rights to request that we register the shares underlying the warrants. This prospectus is part of a registration statement filed by us at the request of the holders of the warrants.

In addition, in September of 2000, we issued warrants to purchase an aggregate of up to 38,300 shares of common stock to the selling shareholders. The shares and the warrants were issued pursuant to a Stock and Warrant Purchase Agreement. Eleven warrant certificates outstanding represent warrants to purchase an aggregate of 38,300 shares of common stock. The exercise price of the warrants is \$15.12 per share, subject to typical anti-dilution adjustment. The warrants may be exercised until 11:59 p.m., Eastern Time, on September 8, 2005. Under the Stock and Warrant Purchase Agreement, we are required to use our best efforts to effect the registration of the shares underlying the warrants. See "RECENT EVENTS". This prospectus is part of a registration statement filed by us to effect that registration.

PLAN OF DISTRIBUTION

The sale or distribution of the shares registered by this prospectus may be effected directly to purchasers by the selling shareholder as principal or through one or more underwriters, brokers, dealers or agents from time to time. Such sale or distribution may occur by one or more of the following transactions (which may involve crosses or block transactions):

- on any exchange or in the over-the-counter market,
- in transactions other than in the over-the-counter market, or
- through the writing of options (whether such options are listed on an options exchange or otherwise), or settlement of short sales.

Any of the transactions listed above may be made at market prices

prevailing at the time of sale or otherwise or at negotiated or fixed prices, in each case as determined by the selling shareholder or by agreement between the selling shareholder and underwriters, brokers, dealers, or agents, or purchasers. If the selling shareholder effects such transactions by selling shares to or through underwriters, brokers, dealers or agents, such underwriters, brokers, dealers, or agents may receive compensation in the form of customary or other discounts, concessions or commissions from the selling shareholder or commissions from purchasers of the shares for whom they may act as agent. The selling shareholder and any brokers, dealers or agents that participate in the distribution of the shares may be deemed to be underwriters,

15

and any profit on the sale of shares by them and any discounts, concessions or commissions received by any such underwriters, brokers, dealers or agents may be deemed to be underwriting discounts and commissions under the Securities Act.

Under the securities laws of certain states, the shares may be sold in such states only through registered or licensed brokers or dealers.

We pay all of the expenses incident to the registration, offering and sale of the shares to the public hereunder other than commissions, fees and discounts of underwriters, brokers, dealers and agents. We have agreed to indemnify the selling shareholder and any underwriters against certain liabilities, including liabilities under the Securities Act. We will not receive any of the proceeds from the sale of any of the shares by the selling shareholder.

We have agreed to use our best efforts to keep the registration statement, of which this prospectus constitutes a part, effective until the earlier of (i) such date as all of the shares of common stock have been sold, or (ii) until in the opinion of counsel for Amtech, such shares may be sold without registration under the Securities Act, or (iii) until the warrants expire.

#### USE OF PROCEEDS

The selling shareholders will receive the net proceeds from the sale of their shares of common stock. However, we will receive up to \$1,271,016 for the exercise of all of the outstanding warrants, if exercised. We anticipate using any proceeds received from the exercise of the warrants as general working capital for our operations.

#### LEGAL MATTERS

Certain legal matters have been passed upon for us by Squire, Sanders & Dempsey L.L.P., Phoenix, Arizona 85004.

#### EXPERTS

The consolidated financial statements and schedule incorporated by reference in this prospectus and elsewhere in this registration statement have been audited by Arthur Andersen LLP, independent public accountants, as indicated in their report with respect thereto, and are incorporated by reference herein in reliance upon the authority of said firm as experts in giving said reports.

#### INDEMNIFICATION

Insofar as indemnification for liabilities arising under the Securities Act may be permitted to directors, officers or persons controlling the company, the company has been informed that in the opinion of the Commission such indemnification is against public policy as expressed in the Securities Act and is therefore unenforceable.

16

#### RECENT EVENTS

##### PRIVATE PLACEMENT

On September 8, 2000, we issued 383,000 shares of common stock, and warrants to purchase an aggregate of up to 54,300 shares of common stock, pursuant to a Stock and Warrant Purchase Agreement. Of the warrants issued, warrants to purchase up to 16,000 shares of common stock were issued to a placement agent.

The shares and warrants were sold in a private placement. The 383,000 shares were sold at a price of \$13.75 per share. The warrants are exercisable at a price per share of \$15.12. The warrants may be exercised until 11:59 p.m., Eastern Time, on September 8, 2005. We have agreed to register the resale of the shares issued in the transaction, including those issuable upon exercise of the warrants.

Gross proceeds in the transaction were \$5,266,000. Net proceeds to the company, after deducting fees of the placement agents, but before deduction of legal, accounting and registration fees were \$4,690,000. The proceeds will be used to fund the company's growth initiatives. The first two components of our growth strategy are essentially organic growth, which generally can be financed

with existing resources. We intend to use the funds raised from the private placement to bring the new technology ashier to market and for acquisitions.

In addition, we are also negotiating a bank line of credit to further increase funds available for implementing our growth plan.

LEGAL PROCEEDING

On or about August 31, 2000, we learned that a company named P.R. Hoffman Machine Products was one of 11 companies named in a legal action being brought by North Middleton Township in Carlisle, Pennsylvania, the owner of a landfill allegedly found to be contaminated. This information was reported in a local newspaper. To date, our subsidiary, P.R. Hoffman Machine Products, Inc., has not been served with any lawsuit. We acquired the assets of P.R. Hoffman Machine Products Corporation in an asset transaction consummated on or about July 1, 1997. Under the terms of the Asset Purchase Agreement governing such transaction, the P.R. Hoffman Machine Products Corporation is obligated to indemnify us for any breaches of its representations and warranties in the Asset Purchase Agreement, including representations relating to environmental matters.

17

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WE HAVE NOT AUTHORIZED ANY PERSON TO MAKE A STATEMENT THAT DIFFERS FROM WHAT IS IN THIS PROSPECTUS. IF ANY PERSON DOES MAKE A STATEMENT THAT DIFFERS FROM WHAT IS IN THIS PROSPECTUS, YOU SHOULD NOT RELY ON IT. THIS PROSPECTUS IS NOT AN OFFER TO SELL, NOR IS IT SEEKING AN OFFER TO BUY, THESE SECURITIES IN ANY STATE IN WHICH THE OFFER OR SALE IS NOT PERMITTED. THE INFORMATION IN THIS PROSPECTUS IS COMPLETE AND ACCURATE AS OF ITS DATE, BUT THE INFORMATION MAY CHANGE AFTER THAT DATE.

AMTECH SYSTEMS, INC.

572,300 SHARES OF  
COMMON STOCK

Table of Contents

Where You Can Find More Information..	2
Prospectus Summary.....	4
The Offering .....	6
Risk Factors.....	7
Selling Shareholder.....	13
Description of Securities .....	15
Plan Of Distribution.....	15
Use Of Proceeds.....	16
Legal Matters.....	16
Experts.....	16
Indemnification.....	16
Recent Events.....	17

October 30, 2000

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