

LOGICVISION INC
Form 10-K
March 11, 2003
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UNITED STATES
SECURITIES AND EXCHANGE COMMISSION

Washington, D.C. 20549

FORM 10-K

x **ANNUAL REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES
EXCHANGE ACT OF 1934**

For the fiscal year ended December 31, 2002

OR

.. **TRANSITION REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES
EXCHANGE ACT OF 1934**

For the transition period from _____ to _____

Commission File Number: 0-31773

LOGICVISION, INC.

(Exact name of registrant as specified in its charter)

Delaware

(State or other jurisdiction of
incorporation or organization)

101 Metro Drive, Third Floor

94-3166964
(IRS Employer

Identification No.)

(408) 453-0146

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San Jose, California 95110
(Address of principal executive offices)

(Registrant's telephone number,
including area code)

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

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

Common Stock, par value \$0.0001 per share

Indicate by check mark whether the registrant (1) has filed all reports required 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.

Indicate by check mark whether the registrant is an accelerated filer (as defined in Rule 12b-2 of the Act).

Yes No

The aggregate market value of Common Stock held by non-affiliates of the registrant (based upon the closing sale price on the Nasdaq National Market on June 30, 2002) was approximately \$62.6 million. Shares held by each executive officer, director and by each person who owns 10% or more of the outstanding Common Stock have been excluded in that such persons may be deemed to be affiliates. This determination of affiliate status is not necessarily a conclusive determination for other purposes.

As of February 28, 2003, there were 15,297,965 shares of Common Stock, \$0.0001 per share par value, outstanding.

DOCUMENTS INCORPORATED BY REFERENCE

Items 10 (as to directors and Section 16(a) Beneficial Ownership Reporting Compliance), 11, 12 (as to Beneficial Ownership) and 13 of Part III incorporate by reference information from the registrant's proxy statement to be filed with the Securities and Exchange Commission in connection with the solicitation of proxies for the registrant's 2003 Annual Meeting of Stockholders to be held on May 15, 2003.

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PART I

Item 1. Business

When used in this Report, the words expects, anticipates, intends, estimates, plans, believes, and similar expressions are intended to identify forward-looking statements. These are statements that relate to future periods and include statements about the features, benefits and performance of our current and future products, services and technology, marketing and commercialization of our products under development, our expectations regarding future revenues, fluctuations in future operating results and future expenses, our estimates regarding our capital requirements and our needs for additional financing, use of our working capital, plans for future products and services and for enhancements of existing products and services, our patent applications and licensed technology regarding our products and technology, the adequacy of our facilities, the outcome of litigation, expectations regarding dividends, our efforts to enter into technology development contracts and develop relationships with industry partners, the expected benefits of those contracts and relationships, our competitive position, our ability to attract customers and establish license agreements, and sources of revenue and anticipated revenues, including licenses of our intellectual property and software, technology development and design contracts and postcontract customer support, and the continued viability and duration of those agreements. Forward-looking statements are subject to risks and uncertainties that could cause actual results to differ materially from those projected. These risks and uncertainties include, but are not limited to, those risks discussed below, as well as the seasonality of the buying patterns of our customers, the concentration of sales to large customers, dependence upon and trends in capital spending budgets in the semiconductor industry and fluctuations in general economic conditions, our ability to rapidly develop new technology and introduce new products, our ability to safeguard our intellectual property and the risks set forth below under Item 7, Management's Discussion and Analysis of Financial Condition and Results of Operations Factors That May Affect Results. These forward-looking statements speak only as of the date hereof. The Company expressly disclaims any obligation or undertaking to release publicly any updates or revisions to any forward-looking statements contained herein to reflect any change in the Company's expectations with regard thereto or any change in events, conditions or circumstances on which any such statement is based.

In the sections of this report entitled Business and Management's Discussion and Analysis of Financial Condition and Results of Operations Factors That May Affect Results, all references to LogicVision, we, us, our or the Company mean LogicVision, Inc. and its subsidiaries, except where it is made clear that the term means only the parent company.

LogicVision and the LogicVision logo are our registered trademarks. We also refer to trademarks of other corporations and organizations in this document.

Overview

Our proprietary technologies for embedded test enable the more efficient design and manufacture of complex semiconductors by allowing integrated circuit designers to embed into a semiconductor design test functionality that addresses each key stage of a complex semiconductor's life cycle. We incorporated in July 1992 and engaged principally in research and development activities through 1994. We first generated meaningful commercial revenues from the license of our initial embedded test product in 1995. We believe our solution can reduce a customer's time-to-market, reduce manufacturing costs, improve manufacturing yields and reduce system software complexity. Our solution also allows testing of integrated circuits after they have been assembled onto boards and systems, which enables diagnostic test throughout the product's life cycle. Our embedded test solution has been successfully deployed in complex semiconductors for gigabit switches, voice and data routers, high performance servers and wireless products. Our proprietary technology enables semiconductor companies to embed self-testers into the chip design.

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Our embedded test products generate proprietary circuit structures that are incorporated into an integrated circuit to test and diagnose the chip at full speed, without the signal delay or degradation experienced by external testers. Our proprietary circuits are designed to be modular and reusable, to enable more efficient design and to address time-to-market issues.

We were incorporated as LV Software, Inc. in California in July 1992. In June 1996, we changed our corporate name to LogicVision, Inc. We reincorporated in Delaware in September 2000.

Recent Developments

In June 2002, we introduced a desktop silicon debug solution, the LogicVision Validator, for at-speed debug of silicon chips incorporating our embedded test technologies. We believe the LogicVision Validator in combination with our embedded test technology can save weeks to months in time-to-market by reducing the debug time for our customers' new chips prior to their release to volume production.

In July 2002, we entered into a Business Transfer Agreement with our then distributor in Japan. Pursuant to this agreement, we acquired certain fixed assets, customer lists, transitional services and a covenant not to compete for a period of one year. The aggregate purchase price of the transaction was \$1.9 million.

In July 2002, we established LogicVision Japan KK, a wholly owned subsidiary in Japan to provide direct sales and customer service to our Japanese customers.

In November 2002, we established LogicVision India Private Limited, a wholly owned subsidiary in India to provide customer service and product development.

Technology

Embedded test

We believe that embedded test technology provides significant benefits for the new and complex systems-on-a-chip semiconductor devices being designed and manufactured today. Conventional test is performed with external equipment, while embedded test is performed primarily using circuitry resident in the semiconductor design. By embedding test circuit structures on the semiconductor itself, our embedded test solution eliminates many of the key limitations associated with conventional external testing. Our embedded test design software automatically analyzes the structure of complex circuits to determine requirements for at-speed testing and diagnostics, and creates and integrates our proprietary embedded test circuits with the existing design functions to address these requirements. Our embedded test manufacturing software allows external test equipment to easily operate our proprietary embedded test circuits for pass-fail testing, chip debug or manufacturing datalogging. The LogicVision Validator combines the embedded test manufacturing software with a low-cost rack of test equipment to create a self-contained

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test and debug environment. Our technology also enables board and system level diagnostics, system bring-up and in-field testing and diagnostics.

Design phase

Our embedded test technology is incorporated into integrated circuits in the form of user-configurable circuit structures that provide four functions:

access management necessary scan chains, shared isolation collars, boundary scan and test points to enable access to any point within complex designs;

timing management proprietary functionality for clock skew management, multiple cycle paths and multiple frequencies;

test data generation and analysis proprietary functionality created for each design block to algorithmically generate and analyze circuit test data; and

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external control standard IEEE 1149.1 compliant test access port for access and control of all embedded test circuits.

Manufacturing phase

Because our embedded test circuits are incorporated in semiconductor designs, they are manufactured as part of the semiconductor devices. When the prototypes of a new integrated circuit return from fabrication for debug and characterization, our embedded test circuits and embedded test manufacturing software can be used to accelerate this process and allow lower cost equipment to be utilized, including the LogicVision Validator. Our embedded testers and embedded test manufacturing software also facilitate at-speed test during wafer probe and allow lower-cost test equipment to be used at wafer probe. Semiconductor devices that pass wafer probe test are then packaged, and our embedded testers and embedded test manufacturing software are used again for final test. Our embedded test circuits are designed to be activated with simple external test signals applied through the industry standard IEEE 1149.1 test access port.

Test Development Functions. Using our technology, the bulk of the patterns applied to test the integrated circuit are created on-chip, with only minimal external control needed to achieve a pass-fail test. Our embedded test design and manufacturing software provides the engineer with the ability to easily create pass-fail test patterns, then optimize them for speed, execution time, accuracy, power and results.

Debug and Diagnostic Functions. Our embedded test provides a number of debug and diagnostic modes to facilitate debug, diagnosis and datalogging. These are leveraged using our embedded test manufacturing software.

Implementation technologies

We have developed several technologies to facilitate the mainstream design and manufacturing use of embedded test technology. These include:

design automation algorithms and implementation for embedded test;

hierarchical isolation, access and assembly technologies;

embedded test design verification technologies;

high-performance circuit fault simulation algorithms and automation technologies;

capture-by-domain for multiple-clock timing;

at-speed, multi-frequency, multi-clock logic embedded test technology;

fault-insertion technology for system diagnostics;

at-speed, embedded and external memory test technologies;

at-speed interconnect test technology;

test and measurement technologies for embedded phase-locked-loops;

manufacturing automation for simplified access and control of embedded test circuits on test equipment;

signoff process and handoff database for robust transfer of embedded test information to manufacturing; and

parametric and input/output test technology to facilitate multi-site and reduced pin-count test, debug and datalogging.

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Products

We offer a portfolio of products for the automated development, integration, and deployment of embedded test technology:

Technology products

Embedded Circuit Structures. Our embedded test technology enables our customers to design and manufacture our embedded test circuit structures for a specific design. For a typical design of 1 million gates and above, our embedded testers are less than a few thousand gates and represent only 1% to 2% of chip area. Our user-configurable embedded test circuit structures are designed to test memory, logic, input/outputs, phased-locked-loops, cores, hierarchical blocks and interconnect.

Design Software products

We provide a suite of highly integrated embedded test design software products for embedded test implementation on application specific integrated circuits and system-on-a-chip designs. We provide design software that automatically analyzes the structure of complex circuits to determine requirements for at-speed testing and diagnostics. Our software creates and integrates our proprietary circuits with the existing design circuits to address these requirements. It also assists with the timing analysis and simulation processes necessary for proper verification, by providing timing analysis scripts and simulation test benches.

Manufacturing Software products

We provide embedded test manufacturing software for access and control of embedded test during chip and system test program development, debug, manufacturing test and datalogging. This enables user interaction with the embedded test circuits to evaluate and diagnose chip-level and board-level failures during manufacturing. This includes pass-fail testing, debug and basic failure diagnostics and datalogging. We support a wide set of third-party industry standard test equipment.

LogicVision Validator product

We provide the LogicVision Validator product for use as a prototype chip debug and characterization platform for design engineers. The LogicVision Validator combines computers, power supplies and clock generators with the embedded test manufacturing software to create a complete solution for chip debug. The hardware portion of this product is manufactured and assembled by a third party for LogicVision.

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We currently offer our embedded test circuits, design software and manufacturing software in a variety of product bundles. Our key embedded test products and their capabilities are described below.

Products	Applications
Chip Test Assemble	<p>Embedded test intellectual property for IEEE 1149.1 Test Access Port and Boundary Scan functionality.</p> <p>Automates the integration and control of all embedded test functions in a given integrated circuit. Can support up to 2048 scan chains and 30 embedded test controllers per design.</p> <p>Includes manufacturing tools for integrated circuit and system test and diagnosis of input/outputs.</p>
IC Memory BIST	<p>Provides intellectual property for flexible, area-optimized, at-speed, memory embedded test functionality.</p> <p>Supports single and multiport SRAMs, DRAMs and ROMs.</p> <p>Supports any size memory manufacturable in given technology.</p> <p>Provides manufacturing tools for integrated circuit and system test and diagnosis of embedded memories.</p>
Logic BIST	<p>Provides intellectual property for at-speed, multi-frequency logic self-test and scan test functionality.</p> <p>Automates analysis, generation, assembly and verification of logic test intellectual property.</p> <p>Supports high-speed multiple clock domains, including those in excess of 100 megahertz, pipelining and multi-cycle paths.</p>
Embedded Logic Test	<p>Embedded test intellectual property for hierarchical, at-speed, embedded logic core test functionality.</p> <p>Automates a complete, hierarchical methodology for system-on-a-chip design and test.</p> <p>Supports design partitioning and core reuse for concurrent engineering.</p> <p>Facilitates transportable embedded test for functional block re-use.</p>
Core Test	<p>Provides intellectual property for direct test access and isolation of legacy core functionality.</p> <p>Automates generation, assembly and verification of legacy core test collars and buses.</p> <p>Supports a dedicated test bus per core and sharing of input/output pins for test and diagnosis.</p> <p>Provides manufacturing tools for integrated circuit test and diagnosis of legacy cores.</p>
PLL BIST	<p>Embedded test intellectual property for accurate, specification-driven test of phase-locked-loop functionality.</p> <p>Automates generation, assembly and verification of embedded test circuitry for phase-locked-loops.</p> <p>Supports measurement-based tests of jitter, loop-gain and lock-range specifications.</p> <p>Measurement resolution to 0.125 of a gate delay.</p>

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Products	Applications
Programmable IC Memory BIST	<p>Provides intellectual property for runtime programmable, at-speed, memory embedded test functionality.</p> <p>Supports large, embedded DRAMs and high density, embedded SRAMs.</p> <p>Supports both standard and user-proprietary memory test algorithms.</p> <p>Usable during memory debug/characterization and go/no-go manufacturing test.</p>
External Memory Test	<p>Provides intellectual property for flexible, high-speed, board-level memory module test functionality.</p> <p>Supports timing and algorithms for use with SRAMs, DRAMs, SDRAMs and others.</p> <p>Automates generation, assembly and verification of external memory embedded test controller.</p> <p>Includes manufacturing tools for system-level test and diagnosis of board-level memories.</p>
IC Debug	<p>Provides intellectual property for facilitating interactive debug of integrated circuits by leveraging the embedded test capabilities that were added to the design.</p> <p>Supports interactive pass-fail testing and debug of the I/O, memory, logic and PLLs in the design.</p> <p>Automates the creation, modification and application of test and debug patterns on specified LogicVision-Ready automated test equipment.</p> <p>Provides manufacturing tools that reduce time-to-market for prototype integrated circuits.</p>
LogicVision Validator	<p>Bundles a rack of low-cost test equipment with the IC Debug product to facilitate the interactive debug of integrated circuits.</p> <p>Supports interactive test and debug of the I/O, memory, logic and PLLs in the design</p> <p>Automates the creation, modification and application of test and debug patterns.</p> <p>Integrates equipment for computing, power supplies and clock generation.</p> <p>Provides a complete debug platform that reduces time-to-market for prototype integrated circuits.</p>

Services

Maintenance. We assist our customers with telephone support, bug fixes and upgrade privileges on a when and if available basis.

Design Services. We assist our customers with the design and manufacturing deployment of embedded test. Our design services help our customers analyze, generate, assemble and verify embedded test circuits. Our design services help our customers and partners rapidly adopt our technologies.

Technology Development Contracts. As a part of our strategy to make embedded test technology more applicable to custom designs, we enter into development contracts with industry leaders for specific projects. Our development contracts include developing new embedded test capabilities and appropriate modifications to our standard automation software. These contracts help our customers and partners to rapidly adopt our technologies.

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Customers

We license our proprietary technologies and software products to companies in key markets within the semiconductor and systems industries. Our customers include application specific integrated circuit or system-on-a-chip designers in systems companies, fabless companies and integrated device manufacturers. During the year ended December 31, 2002, Agere Systems, Inc. and Sun Microsystems, Inc. accounted for 12% and 10% of total revenues, respectively. During the year ended December 31, 2001, no customer accounted for 10% or more of total revenues. During the year ended December 31, 2000, LSI Logic Corporation accounted for 15% of total revenues.

Seasonality

Our past operating results have been, and we expect that our future operating results will be, subject to fluctuations due to a number of factors, including seasonality of the buying patterns of our customers, the concentration of sales to large customers, dependence upon capital spending budgets and fluctuations in general economic conditions. The seasonal fluctuations occur in summer and in December, primarily due to vacation seasons and winter holidays.

Research and Development

Our ability to meet customer needs for improved technology, and maintain our technology leadership, depends largely on whether we can continue to rapidly develop and deploy new technology and introduce new products. We have made, and intend to continue to make, significant investments in research and development. In addition to an overall knowledge of test methodologies, embedded test requires an expertise in three diverse areas: integrated circuit design and verification, electronic design automation algorithms and software development, and software development for manufacturing test and test equipment. We have assembled a highly skilled and multi-disciplinary team for this purpose.

As of December 31, 2002 our engineering team comprised 32 employees, 20 of whom have advanced degrees, and most of whom have extensive industry experience in one or more of the aforementioned areas of expertise. Our engineering team is organized into three development groups, each focusing on one of these three areas of expertise, and each contributing the related portion to the bundled product offerings. The development groups are:

Integrated Circuit Design Our integrated circuit design team focuses on the overall embedded test intellectual property architecture and its implementation and verification.

Design Software Our design software team focuses on developing the software that analyzes, generates, assembles, and verifies an integrated circuit design with embedded test.

Manufacturing Software Our manufacturing software team focuses on developing software for enabling test and diagnostic in manufacturing.

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In addition to the three development groups, we have product engineering teams focused on software builds and release, documentation and quality assurance.

Research and development expenses were \$5.0 million, \$5.1 million, and \$5.0 million during the fiscal years ended December 31, 2002, 2001 and 2000, respectively.

Sales and Marketing

The majority of our revenues are generated by our direct sales force. We have sales and service offices located throughout major cities in the United States, including San Jose, Los Angeles, San Diego, Dallas and Boston. Internationally we have a sales and service office and a sales representative in Japan, and sales in other

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countries are handled by distributors or sales representatives in Taiwan, India, Israel and Singapore. International revenues as a percentage of our total revenues were approximately 21%, 27% and 19% for the years ended December 31, 2002, 2001 and 2000. Information regarding geographic areas and operating segments are included in Note 13 to the Consolidated Financial Statements in Item 8. Sales personnel consist of account managers who are responsible for all business aspects of the customer relationship and application engineers who manage all the technical pre-sales and post-sales customer support issues. As of December 31, 2002, we had 48 employees involved in sales and marketing, customer service and operations.

The main goal of our sales force is to work with major systems, consumer electronics and semiconductor companies who have the expertise to implement our technology today. We focus on leading companies because they are influential in setting standards. We focus on developing customer relationships with companies in the areas of cellular, wireline and satellite communications, computer servers and graphics, and consumer electronics. Additionally, as systems companies use our technology, they often require their component suppliers to supply semiconductors with embedded test already designed in for their system use. In this way we can create both push and pull demand for our technology.

Our marketing efforts include product/technical marketing and merchandising, public relations, corporate communications and business development functions. We strive to develop relationships with industry partners such as application specific integrated circuit suppliers, silicon foundries, electronic design automation tool suppliers, hardware tester manufacturers and intellectual property providers.

Sales and marketing expenses are allocated between cost of revenues and sales and marketing expenses. Engineering efforts devoted to revenue-generated design and technology development projects and postcontract customer support activities are recognized as cost of revenues. The balance of sales and marketing expenses incurred for general selling and marketing activities is charged to sales and marketing expenses.

Sales and marketing expenses were \$9.9 million, \$9.9 million, and \$8.9 million during the fiscal years ended December 31, 2002, 2001 and 2000, respectively.

Intellectual Property

We have a portfolio of intellectual property covering the areas of test and diagnosis of logic, memory and mixed-signal circuits with focus on embedded, at-speed and parametric aspects. Both design and manufacturing methods are covered. As of December 31, 2002, our intellectual property portfolio consisted of 18 issued U.S. patents, three allowed U.S. patents, 31 pending U.S. patent applications, eight issued Canadian patents, 12 pending Canadian patent applications and 12 pending Patent Cooperation Treaty, or PCT, patent applications filed with the World Intellectual Property Organization and which serve as the basis of national patent filings in countries of interest. In addition, we have three pending Europe patent applications and three pending Japan patent applications. Generally, the term of patent protection is 20 years from the earliest effective filing date of the patent application. Our issued patents expire at various times between June 2016 and December 2022. Our portfolio also includes two patents for testing embedded memories and digital systems we have licensed from Nortel Networks, for which we completed royalty payments in October 2002. Nevertheless, our license agreement with Nortel may be terminated if we materially violate the terms of the agreement, if a competitor of Nortel acquires a significant percentage of our common stock without first obtaining Nortel's consent or if we bring patent infringement proceedings against Nortel under any patent embodied in, or acquired as a result of access to, the technology we license from Nortel. Our patents, and the Nortel patents we license, cover technology intended to address problems we consider fundamental to embedded test, such as timing, power consumption and parametric testing.

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We generally enter into confidentiality agreements with our employees, industry partners and customers, as well as generally control access to and distribution of our documentation and other proprietary information. Despite this protection, unauthorized parties may copy aspects of our current or future software products or obtain and use information that we regard as proprietary.

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Our existing and future patents may be circumvented, blocked, licensed to others or challenged as to inventorship, ownership, scope, validity or enforceability. We may not receive competitive advantages from the rights granted under our patents. Furthermore, our current or future patent applications may not be issued with the scope of the claims sought by us, if at all. In addition, others may develop technologies that are similar or superior to our proprietary technologies, duplicate our proprietary technologies or design around the patents owned or licensed by us. If our products, patents or patent applications are found to conflict with any patents held by third parties, we could be prevented from selling our products, our patents may be declared invalid or our patent applications may not result in issued patents. In addition, in foreign countries, we may not receive effective patent and trademark protection. We cannot be sure that steps we take to protect our proprietary technologies will prevent misappropriation of our technologies.

Litigation may be necessary to enforce our intellectual property rights or to determine the validity or scope of the proprietary rights of others. As a result of any such litigation, we could lose our proprietary rights and incur substantial unexpected operating costs. We may need to take legal action to enforce our proprietary rights in the future. Any action we take to protect our intellectual property rights could be costly and could absorb significant management time and attention.

The semiconductor industry is characterized by vigorous protection and pursuit of intellectual property rights or positions. There are numerous patents in the semiconductor industry and new patents are being issued at a rapid rate. This often results in significant and often protracted and expensive litigation. From time to time third parties may notify us of intellectual property infringement claims. If it is necessary or desirable, we may seek licenses under these third party patents or intellectual property rights. However, we cannot be sure that third parties will offer licenses to us or that we will find acceptable the terms of any offered licenses.

If we fail to obtain a license from a third party for proprietary technologies that we use, we could incur substantial liabilities, or be compelled suspend sales of our products or our use of processes requiring the technologies. Litigation could cause us to incur significant expenses, harm our sales of the challenged technologies or products and divert the efforts of our technical and management personnel, whether or not a court decides the litigation in our favor. In the event we receive an adverse result in any litigation, we could be required to pay substantial damages, stop selling of infringing products, expend significant resources to develop or acquire non-infringing technology and discontinue the use of processes requiring the infringing technology or obtain licenses to the infringing technology. We may not be successful in the development or acquisition of intellectual property, or the necessary licenses may not be available under reasonable terms, and any development, acquisition or license could require us to expend a substantial amount of time and other resources. Any of these developments would harm our business.

Competition

The semiconductor and systems industries are highly competitive and characterized by rapidly changing technology. The market for embedded test is still evolving and we expect competition to continue to emerge and become more intense in the future.

Design

In the design phase of product development, we face competition from traditional broad line electronic design automation providers like Cadence Design Systems, Inc., Mentor Graphics Corporation and Synopsys, Inc. and from smaller test tool providers such as Syntest Technologies, Inc. These companies provide competing design-for-test technologies and some level of built-in self-test capability. We also face competition from methodologies developed internally at large integrated device manufacturers, systems companies and electronic design

automation providers.

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Manufacturing

Because embedded test has the potential to impact the external test market, we believe traditional hardware tester manufacturers such as Advantest Corporation, Agilent Technologies, Inc., Credence Systems Corporation, LTX Corporation, NP Test Inc., and Teradyne, Inc. all view embedded test and LogicVision as competition. Many of these companies are devoting significant resources to developing external solutions to testing complex integrated circuits, including working closely with some of our current and potential customers. Their efforts may result in the development of solutions that compete with our embedded test solution.

Many of the companies with whom we compete are significantly larger than we are and have greater financial resources. As embedded test is more broadly adopted in the market, we face the potential of one or more larger companies appearing as direct competition. We believe that the principal competitive factors in our market include proven technology, effective intellectual property, deployment automation, comprehensive manufacturing control and customer service. We believe we compete favorably with respect to all these factors.

Employees

As of December 31, 2002, we employed 91 full time employees and one part time employee worldwide of which 62 employees were located in the United States, 20 employees were located in Canada and 10 employees were located in Asia and Europe. This included 48 in sales and marketing, 32 in research and development, and 12 in finance and administration. Our employees are not covered by any collective bargaining agreements, and we consider our relations with our employees to be good.

Available Information

Our Web site is <http://www.logicvision.com>. We make available free of charge, on or through our Web site, our annual, quarterly and current reports, and any amendments to those reports, as soon as reasonably practicable after electronically filing such reports with the Securities and Exchange Commission (SEC). Information contained on our Web site is not part of this report.

Item 2. Properties

Our principal executive offices are currently located in San Jose, California, where we lease approximately 17,690 square feet. We believe that these offices will be adequate to meet our requirements for the next 12 months. We have research and development offices in Montreal and Ottawa, Canada. We have domestic sales and service offices in Del Mar and Pasadena, California; Franklin, Massachusetts; and Addison, Texas. In addition, we have an international sales and service office in Tokyo, Japan, a customer service office in London, the United Kingdom, and an engineering and service office in Bangalore, India.

Item 3. Legal Proceedings

We are not currently a party to any material legal proceedings.

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

None.

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The following table sets forth information regarding our executive officers as of December 31, 2002:

Name	Age	Position
Vinod K. Agarwal	50	President, Chief Executive Officer and a director
John H. Barnet	67	Vice President of Finance and Chief Financial Officer
Michael C. Howells	40	Vice President of Engineering
Mukesh J. Mowji	44	Vice President of Sales and Marketing
Kenji Baba	49	Vice President of Engineering Services

Vinod K. Agarwal, PhD founded LogicVision in 1992 and has served as our President, Chief Executive Officer and a director since 1992. Prior to founding LogicVision, Dr. Agarwal was the Nortel/NSERC Industrial Research Chair Professor at McGill University in Montreal and served as a consultant to Nortel Networks Corporation, Hitachi, Ltd. and Eastman Kodak Company for developing their design-for-test/embedded test environment. In 1992, Dr. Agarwal was elected to be a Fellow of The Institute of Electrical and Electronics Engineers, Inc., or IEEE, for his contributions to built-in self-test and fault-tolerant computing. Dr. Agarwal is a co-inventor of several US patents on embedded test technology. He holds a BE in Electronics from Birla Institute of Technology and Science, Pilani, India, an M.S. in Electrical Engineering from University of Pittsburgh and a PhD in Electrical Engineering from Johns Hopkins University.

John H. Barnet has served as Vice President of Finance and Chief Financial Officer since September 1999, after having served as a financial consultant since January 1999. From 1996 to 1998, Mr. Barnet was Vice President of Finance and Administration and Chief Financial Officer of ESS Technology, Inc., a fabless semiconductor company. From 1992 to 1996, Mr. Barnet served as Executive Vice President, Finance and Chief Financial Officer for Trimble Navigation, Ltd., a manufacturer of global positioning satellite instruments. Prior to 1992, he held Vice President of Finance and Chief Financial Officer positions with Centex Telemanagement, Inc., Philips-Signetics Corporation, Teledyne Semiconductor and Acurex Corporation. Mr. Barnet holds a BS in Industrial Engineering from Stanford University and an MBA from Columbia University.

Michael C. Howells has served as our Vice President of Engineering since 1994 and joined us as our Director of Marketing in 1993. Prior to joining LogicVision, Mr. Howells was a Senior Product Marketing Engineer with Mitsubishi Electronics America in their application specific integrated circuit group. While at Mitsubishi, Mr. Howells was involved in marketing deep sub-micron application specific integrated circuits, as well as development of related design flows and electronic design automation tools, and was also responsible for Mitsubishi's Ottawa application specific integrated circuit design center. He holds a BEng and an MEng in Electrical Engineering from McGill University.

Mukesh J. Mowji has served as our Vice President of Sales and Marketing since April 2002. From January 2002 to March 2002, he served as our Vice President of Marketing. From August 2000 to January 2002, he served as our Vice President of Manufacturing Business and was responsible for business development and marketing in semiconductor manufacturing. From 1988 to 2000 Mr. Mowji held various senior positions in marketing, sales, and field operations at LTX Corporation, and, from 1979 to 1988, Mr. Mowji held various senior positions in engineering, operations and sales with the test equipment division of Schlumberger Limited's test equipment business. He holds a BS in Electrical Engineering from San Francisco State University.

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Kenji Baba has served as our Vice President of Engineering Services since July 2002. From 1977 to 2002, Mr. Baba held various management positions in marketing and engineering at Mitsubishi Electric & Electronics America, Inc. While at Mitsubishi, he served as Director of SLIC Marketing responsible for managing marketing activities for North America division of Mitsubishi. He holds a BSEE and MSEE in Electrical Engineering from Okayama University, Japan.

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PART II

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