

MERIX CORP

FORM 10-K (Annual Report)

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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 May 27, 2000

OR

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

Commission file number 0-23818

MERIX CORPORATION

(Exact name of registrant as specified in its charter)

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

93-1135197
*(I.R.S. Employer
Identification Number)*

1521 Poplar Lane, Forest Grove, Oregon
(Address of principal executive offices)

97116
(Zip Code)

(503) 359-9300
(Registrant's telephone number)

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

Securities registered pursuant to Section 12(g) of the Act:
Common Stock, no par value
Series A Preferred Stock Purchase Rights

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

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

The aggregate market value of the voting stock held by non-affiliates of the Registrant as of August 3, 2000 was \$440.0 million based upon the composite closing price of the Registrant's Common Stock on the Nasdaq National Market System on that date.

The number of shares of the Registrant's Common Stock outstanding as of August 3, 2000 was 8,996,844 shares.

DOCUMENTS INCORPORATED BY REFERENCE

Portions of the registrant's proxy statement in connection with its 2000 Annual Meeting of Shareholders are incorporated by reference into Part III.

MERIX CORPORATION FORM 10-K

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PART I

ITEM 1. BUSINESS.

In this report, the terms "Merix," "Company," "we," "us," and "our" refer to Merix Corporation. We are a leading manufacturer of technologically advanced electronic interconnect solutions for use in sophisticated electronic equipment. Our principal products are complex multilayer printed circuit boards, which are the platforms used to interconnect microprocessors, integrated circuits and other components that are essential to the operation of electronic products and systems. We focus on providing our solutions to manufacturers of technologically advanced electronic products within selected high growth segments of the electronics industry, including communications, computing, and test and measurement. We provide our customers with an integrated interconnect manufacturing solution that includes quick-turn prototypes, pre-production and volume production of printed circuit boards and backplanes and backplane assemblies. Our major and emerging customers include leading original equipment manufacturers, or OEMs, and contract manufacturers in the electronics industry.

We were incorporated in March 1994 to succeed to the business conducted by the Circuit Board Division of Tektronix. All of the business of the Circuit Board Division of Tektronix, together with \$17.5 million in cash, was transferred to us immediately prior to the consummation of

our initial public offering in May 1994 in exchange for 6,000,000 shares of our common stock. Tektronix continues to own 506,500 shares of common stock and a note in the principal amount of \$10.0 million, of which \$1.2 million remained outstanding as of the date of this report.

Industry Overview

Printed circuit boards consist of patterns of electrical circuitry etched from copper that has been laminated on a board of insulating material. They are the platforms used to interconnect microprocessors, integrated circuits and other components that are essential to the operation of electronic products and systems. Printed circuit boards are customized for specific electronic applications and are sold to OEMs and contract manufacturers in volumes that range from several units for prototypes to small quantities for pre-production to large quantities for volume production. Quick-turn prototypes are used in the design, test and launch phases of new electronic products and require rapid manufacturing, with delivery times ranging from as little as 24 hours to as long as 10 days. Larger volumes of printed circuit boards are needed as a product progresses past the testing and design phases and into pre-production and then volume production.

Printed circuit boards are used in virtually all electronic equipment from consumer products, such as personal computers, cellular telephones and televisions, to high-end commercial electronic equipment, such as data communication routers and switches, wireless base stations, computer workstations and network servers. Typically, printed circuit boards used in consumer electronic products are less technologically sophisticated, employing lower layer counts and lower performance materials and requiring less manufacturing sophistication than printed circuit boards used in high-end commercial equipment.

High-end commercial equipment manufacturers require more complex multilayer interconnect solutions with advanced materials, narrow line widths and separations of copper traces, precision cavities and small diameter vias and through-holes to connect internal circuitry. We manufacture complex multilayer printed circuit boards primarily for use in high-end commercial equipment within the communications, computing and test and measurement segments of the electronics industry. These industry segments are characterized by high growth, rapid technological change and short product life-cycles as OEMs continually develop new and technologically superior products.

Manufacturing increasingly sophisticated electronic interconnect products requires substantial investment in advanced production facilities, engineering and manufacturing expertise and process

technology. These capital and technology requirements have led to consolidation in recent years, reducing the number of printed circuit board manufacturers in the United States from approximately 950 in 1992 to approximately 650 in 1999. Despite this consolidation, the printed circuit board market remains fragmented, and we expect consolidation to continue. Of the approximately 650 printed circuit board manufacturers in the United States in 1999, only ten independent manufacturers had revenues in excess of \$100 million, and these manufacturers comprised 52% of the domestic printed circuit board market.

There are several significant trends within the electronic interconnect industry. These include:

Increasing Complexity of Electronic Equipment. The increasing complexity of electronic equipment drives technological advancements in interconnect products. OEMs are continually designing more complex and high performance electronic equipment, which requires printed circuit boards that accommodate higher speeds, component densities, frequencies and operating temperatures. We believe this trend is increasing the demand for interconnect manufacturers with superior manufacturing process techniques and engineering support.

Expanding and Emerging Markets. The demand for more complex multilayer printed circuit boards is being driven by the expansion of traditional markets for high-end commercial electronic equipment, such as computing, communications and test and measurement. In addition, we have seen the emergence of several new high growth electronic markets, such as wireless communications and Internet infrastructure. These emerging markets are growing rapidly as a result of technological changes, demands for wider variety of electronic product features, greater bandwidth and increasingly powerful electronic components.

Shorter Product Life-Cycles for Electronic Products. Rapid advances in technology have significantly shortened the life-cycles of complex electronic products and placed increased pressure on OEMs to develop new products in shorter periods of time. The time-to-market demands of OEMs have increased emphasis on the engineering and quick-turn production of small unit volumes of printed circuit boards in the prototype development stage. In addition, the success of first-to-market products has heightened the demand for manufacturing expertise and process controls that enable manufacturers to quickly proceed to volume production.

Increased Demand for Integrated Products and Services. The accelerated time-to-market and time-to-volume needs of OEMs of high-end equipment have resulted in increased collaboration with interconnect providers that can offer design and engineering support and manufacturing scalability throughout the product life-cycle. Many OEMs are limiting their vendor base to a smaller number of technically qualified providers that are able to offer a broad range of interconnect products and services.

Products and Services

We offer a broad range of products and services designed to meet our customers' needs for complex multilayer printed circuit boards, backplanes and backplane assemblies. Our products and services span the period from product conception through volume production and include the following:

Design Assistance and Engineering Services. We provide design assistance and engineering services in the early stages of product development to ensure that mechanical and electrical elements are integrated to achieve a high quality and cost-effective product. We also evaluate customer designs for manufacturability and, when appropriate, recommend design changes to reduce manufacturing costs and lead times or increase manufacturing yields and the quality of finished printed circuit boards. We believe this cooperative process shortens the time in transition from the development of the prototype design to volume manufacturing and facilitates the delivery of high quality products in a timely fashion.

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By working closely with our customers throughout the design and manufacturing process, we gain insight into their future product requirements.

Quick-Turn Prototype and Pre-Production Services. We produce quick-turn prototypes with lead times of three to fifteen days for the product development groups of our customers. We also produce prototypes in pre-production quantities with lead times of ten to fifteen days for these customers. We offer volume production and prototypes within the same facility. By using the same processing lines to manufacture prototypes, our prototypes more accurately represent our volume products. This allows us to shorten the time in transition from the development of prototype designs to volume manufacturing and facilitates the volume delivery of high quality complex printed circuit boards in a timely fashion.

Volume Production. Volume production is characterized by standard lead times of seven to eight weeks, as printed circuit boards move to full-scale commercial production. At this stage of production, quality, on-time delivery, process capability and price are the factors most important to our customers. Our engineering capability enables us to produce, in volume, technologically sophisticated printed circuit boards of 34 layers utilizing high performance materials and leading edge fabrication techniques. In addition, our manufacturing process controls enable us to meet the accelerated time-to-market and time-to-volume requirements of our customers. Our proprietary computer-integrated manufacturing system tracks shop-floor production in real time, delivering critical information to every decision point using online statistical process control tools and helps us analyze and continually improve our products and processes.

Backplanes and Backplane Assemblies. We produce backplanes and provide backplane assemblies to our customers. Backplanes are generally larger and thicker printed circuit boards on which connectors are mounted to interconnect printed circuit boards, integrated circuits and other electronic components. Backplane assemblies are printed circuit boards on which various electronic components, such as integrated circuits, capacitors, microprocessors and resistors, have been mounted. In addition to providing backplane fabrication and assembly services, we also perform radio frequency testing services to evaluate the performance of backplane circuits across a spectrum of frequencies.

Markets and Customers

The following table shows, for the periods indicated, the percentage of our net sales to the principal market segments we serve:

	Fiscal Years		
	2000	1999	1998
Market Segments:			
Communications	51.7%	37.9%	26.2%
Computing	21.3	32.8	27.9
Test and Measurement	24.2	25.4	42.1
Other	2.8	3.9	3.8
Total	100.0%	100.0%	100.0%

Our five largest OEM customers during fiscal 2000 were Cisco Systems, Intel, Motorola, Tektronix and Teradyne. Our five largest OEM customers comprised 67.5%, 67.8% and 75.1% of our net sales during fiscal 2000, 1999 and 1998, respectively. In fiscal 2000, Cisco Systems, Motorola and Teradyne each accounted for more than 10% of our net sales. Cisco Systems, Hewlett-Packard, Motorola and Tektronix each accounted for more than 10% of our net sales in fiscal 1999. Hewlett-Packard, Motorola and Tektronix each accounted for more than 10% of our net sales in fiscal 1998. We expect to continue to depend upon a small number of customers for a significant portion of our net sales for the

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foreseeable future. The loss of or decrease in orders from one or more major customers could reduce our revenues.

We also manufacture and sell our products to contract manufacturers that assemble components on our products for resale to OEMs. Approximately 54.8%, 31.2% and 23.7% of our net sales were through our contract manufacturing customers in fiscal 2000, 1999 and 1998, respectively.

Sales and Marketing

We market our products through a field-based direct sales force, field application engineers, manufacturers' representative firms and customer service personnel. We employ field application engineers in regions across the U.S., who serve as the technical interface between Merix and customers' design engineering teams. Our field application engineers integrate into the customers' design teams as technical experts, providing information and modeling data to assure that the final printed circuit board design meets electrical performance requirements, cost goals, and design guidelines for manufacturability. We are also represented by independent manufacturers' representative firms in the United States.

Our sales force develops close relationships with our OEM customers beginning at the earliest development and design phases and continuing throughout all stages of production. In addition, because contract manufacturers are increasingly being given discretionary authority from OEMs to award business to printed circuit board manufacturers, we also target contract manufacturers as well as OEMs and leverage our relationships with OEMs to access new business with contract manufacturers.

Supplier Relationships

We have entered into strategic relationships with certain suppliers of laminates, raw materials and services to reduce lead times and inventory carrying costs, enhance the quality and reliability of the supply of raw materials and reduce transportation and other logistics costs. For example, Matsushita Electronics Materials, a key laminate supplier, operates a factory producing standard and high performance laminates adjacent to our facility. Isola Laminate Systems Corp., another laminate supplier, utilizes an independent warehouse distribution center adjacent to our facility to offer just-in-time delivery of high-performance raw materials. In addition, Mania Technologie, Inc. USA provides on-site electrical test services at our facility.

We rely on our suppliers for laminates and raw materials, which may not timely meet our supply demands. We order raw materials and laminates to complete our customers' purchase orders. Although we work with our customers and suppliers to minimize the impact of shortages in materials, we have occasionally experienced short-term effects due to price fluctuations and delayed shipments. If a significant shortage of raw materials or laminates were to occur, our operating results would be materially adversely affected. We also depend on a small number of suppliers for many of the raw materials and laminates that we use in our business. If we were unable to continue to purchase these raw materials and laminates from our suppliers, our operating results would be materially adversely affected.

Manufacturing and Technology

The increasing complexity of electronic products has driven technological advancements in interconnect products and has placed increasingly more difficult demands on the manufacturing process. We have invested in production technology to manufacture dense multilayer printed circuit boards utilizing advanced fabrication processes and high performance materials in volume production. We employ numerous advanced manufacturing techniques and systems, including dry-film imaging, automated optical inspection, computer controlled lamination, computer controlled drilling and routing, multi-purpose metal plating, photoimageable solder mask processing, dual-access electrical testing and

surface coating. Our execution of these techniques enables us to manufacture complex printed circuit boards of consistent quality in high-volume and on a timely basis.

In general, we receive circuit designs directly from our customers in the form of computer data files, which we review to ensure data accuracy and product manufacturability. Using these computer files, we generate images of the circuit patterns that we develop on individual layers using advanced photographic processes. Through a variety of plating and etching processes, we selectively add and remove conductive materials forming horizontal layers of thin traces or circuits, which are separated by insulating material. A finished multilayer printed circuit board laminates together a number of layers of circuitry, using intense heat and pressure under vacuum. Vertical connections between layers are achieved by plating through small holes called vias. Vias are made by highly specialized drilling equipment capable of achieving extremely fine tolerances with high accuracy. We specialize in high layer printed circuit boards with extremely fine geometries and tolerances. Because of the tolerances involved, we use clean rooms in certain manufacturing processes where tiny particles might otherwise create defects on the circuit patterns and use automated optical inspection systems to ensure consistent quality.