

SECURITIES AND EXCHANGE COMMISSION
 Washington, D.C. 20549

 FORM S-3
 REGISTRATION STATEMENT
 UNDER
 THE SECURITIES ACT OF 1933

APA OPTICS, INC.
 (Exact Name of registrant as specified in its charter)

MINNESOTA	3827	41-1347235
(State or other jurisdiction of incorporation)	(Primary Standard Industrial Classification Code Number)	(I.R.S. Employer Identification Number)

 2950 N.E. 84TH LANE, BLAINE, MINNESOTA 55449 (763) 784-4995
 (Address, including zip code and telephone number, including area code of
 registrant's principal executive offices)

 ANIL K. JAIN, CHIEF EXECUTIVE OFFICER
 APA OPTICS, INC.
 2950 N.E. 84TH LANE
 BLAINE, MINNESOTA 55449
 TELEPHONE: (763) 784-4995 TELEFAX: (763) 784-2038
 (Name, address, including zip code, and telephone number, including area code,
 of agent for service)

 COPIES TO:
 JANNA R. SEVERANCE, ESQ.
 MOSS & BARNETT, A PROFESSIONAL ASSOCIATION
 4800 NORWEST CENTER, 90 SOUTH SEVENTH STREET
 MINNEAPOLIS, MINNESOTA 55402-4129
 TELEPHONE: (612) 347-0367

APPROXIMATE DATE OF COMMENCEMENT OF PROPOSED SALE TO THE PUBLIC:
 From time to time, commencing as soon as practicable after the effective
 date of this Registration Statement.

If the only securities being registered on this Form are being offered
 pursuant to dividend or interest reinvestment plans, please check the following
 box: []

If any of the securities being registered on this Form are being
 offered on a delayed or continuous basis pursuant to Rule 415 under the
 Securities Act of 1933, other than securities offered only in connection with
 dividend or interest reinvestment plans, check the following box: [X]

If this Form is filed to register additional securities for an offering
 pursuant to Rule 462(b) under the Securities Act, please check the following box
 and list the Securities Act registration statement number of the earlier
 effective registration statement for the same offering. []

If this Form is a post-effective amendment filed pursuant to Rule
 462(c) under the Securities Act, check the following box and list the Securities
 Act registration statement number of the earlier effective registration
 statement for the same offering. []

If delivery of the prospectus is expected to be made pursuant to Rule
 434, please check the following box. []

CALCULATION OF REGISTRATION FEE

<TABLE>
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TITLE OF EACH CLASS OF SECURITIES TO BE REGISTERED FEE	AMOUNT TO BE REGISTERED(1)	PROPOSED MAXIMUM OFFERING PRICE PER SHARE(2)	PROPOSED MAXIMUM AGGREGATE OFFERING PRICE(2)	AMOUNT OF REGISTRATION
<S> <C>	<C>	<C>	<C>	<C>
Common stock, \$.01 par value	307,500	\$28.375	\$8,725,312.50	\$2,304

</TABLE>

- (1) Represents shares to be sold by the selling shareholders named herein, including:
- * Up to 250,000 shares that may be acquired upon conversion of the registrant's 2% Series A Convertible Preferred Stock, at an assumed conversion price of \$35.00 per share (including 107,114 shares estimated to be issuable if dividends are accreted to stated value rather than paid in cash).
 - * 50,000 shares that may be acquired upon the exercise of warrants issued in connection with the 2% Series A Convertible Preferred Stock.
 - * 7,500 shares that may be acquired upon exercise of warrants issued to the agent who placed the 2% Series A Convertible Preferred Stock.
 - * Also includes an indeterminate number of shares that the selling shareholders may acquire as a result of a stock split, stock dividend or similar transaction involving the common stock pursuant to the anti-dilution provisions of the 2% Series A Convertible Preferred Stock and the warrants.
- * Does not include additional shares that may be acquired by the selling shareholders upon conversion of the 2% Series A Convertible Preferred Stock attributable to the operation of the conversion price formula set forth in the certificate of designation for the 2% Series A Convertible Preferred Stock due to a decline in the market price of the common stock as a result of which the conversion price is less than the assumed conversion price set forth above.
- (2) Calculated solely for the purpose of determining the registration fee pursuant to Rule 457(c) based upon the average of the high and low prices per share of the Company's common stock on the Nasdaq SmallCap Market on March 31, 2000.

THE REGISTRANT HEREBY AMENDS THE REGISTRATION STATEMENT ON SUCH DATES AS MAY BE NECESSARY TO DELAY ITS EFFECTIVE DATE UNTIL THE REGISTRANT SHALL FILE A FURTHER AMENDMENT WHICH SPECIFICALLY STATES THAT THIS REGISTRATION STATEMENT SHALL THEREAFTER BECOME EFFECTIVE IN ACCORDANCE WITH SECTION 8(a) OF THE SECURITIES ACT OF 1933, OR UNTIL THE REGISTRATION STATEMENT SHALL BECOME EFFECTIVE ON SUCH DATE AS THE COMMISSION, ACTING PURSUANT TO SAID SECTION 8(a), MAY DETERMINE.

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307,500 SHARES

APA OPTICS, INC.

COMMON STOCK

This prospectus covers up to 307,500 shares of the common stock, par value \$.01 per share, of APA Optics, Inc., a Minnesota corporation, which may be sold from time to time by certain shareholders named in this prospectus. Our common stock is traded on the Nasdaq SmallCap Market under the symbol APAT. On March 31, 2000, the closing sale price for the common stock as reported on the Nasdaq SmallCap Market was \$29.375 per share.

The shares of common stock offered by this prospectus may be sold by the selling shareholders from time to time in transactions on the open market or in negotiated transactions, in each case at prices satisfactory to them.

SEE "RISK FACTORS" BEGINNING AT PAGE 6 TO READ ABOUT FACTORS YOU SHOULD CONSIDER BEFORE BUYING SHARES OF OUR COMMON STOCK.

THESE SECURITIES HAVE NOT BEEN APPROVED OR DISAPPROVED BY THE SECURITIES AND EXCHANGE COMMISSION OR ANY STATE SECURITIES COMMISSION NOR HAS THE SECURITIES AND EXCHANGE COMMISSION OR ANY STATE SECURITIES COMMISSION PASSED UPON THE ACCURACY OR ADEQUACY OF THIS PROSPECTUS. ANY REPRESENTATION TO THE CONTRARY IS A CRIMINAL OFFENSE.

No person has been authorized by us to give any information or to make any representations about the offering of common stock made by this prospectus other than the information and representations contained in this prospectus. Accordingly, you should not rely on information outside of this prospectus. This prospectus is not an offer to sell or buy any security other than the common stock offered by this prospectus; it is not an offer to sell or buy securities in any jurisdiction in which such offer is not qualified; and it is not an offer to buy or sell securities to any person to whom such offer would be unlawful.

The information in this prospectus is current as of the date of this prospectus. Your receipt of this prospectus does not mean that there has been no change in the affairs of APA Optics, Inc. since the date of this prospectus or that the documents which are incorporated by reference in this prospectus are correct as of any date after the date of such documents.

THE DATE OF THIS PROSPECTUS IS _____, 2000.

THE INFORMATION IN THIS PROSPECTUS IS NOT COMPLETE AND MAY BE CHANGED. THESE SECURITIES MAY NOT BE SOLD UNTIL THE REGISTRATION STATEMENT FILED WITH THE SECURITIES AND EXCHANGE COMMISSION IS EFFECTIVE. THIS PROSPECTUS IS NOT AN OFFER TO SELL THESE SECURITIES AND IT IS NOT SOLICITING AN OFFER TO BUY THESE SECURITIES IN ANY STATE WHERE THE OFFER OR SALE IS NOT PERMITTED.

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WHERE YOU CAN FIND MORE INFORMATION

APA Optics is subject to the informational requirements of the Securities Exchange Act of 1934, and files reports, proxy statements and other information with the Securities and Exchange Commission. These reports, proxy statements and other information can be inspected and copies can be made at:

- * the public reference facilities maintained by the Commission at 450 Fifth Street, N.W., Washington, D.C. 20549
- * the regional offices of the Commission located at 500 West Madison Street, Chicago, Illinois 60601 and at 7 World Trade Center, New York, New York 10048
- * the offices of Nasdaq Operations, 1735 K Street, N.W., Washington, D.C.

These materials may also be accessed electronically by means of the Securities and Exchange Commission's home page on the Internet (<http://www.sec.gov>).

This prospectus is a part of a registration statement on Form S-3 that APA Optics has filed with the Securities and Exchange Commission. You may obtain copies of the registration statement from the Commission at the addresses in the preceding paragraph. This prospectus does not contain all of the information set forth in the registration statement and its exhibits. The registration statement provides further information about us and the shares. While we believe this prospectus provides the material information regarding the contracts and documents described in it, the statements contained in this prospectus about the contents of any contract or any other documents are not necessarily complete and, in each such instance, you should inspect the copy of such contract or document filed as an exhibit to the registration statement.

INCORPORATION OF CERTAIN INFORMATION BY REFERENCE

The following documents filed by APA Optics with the Commission pursuant to the Securities Exchange Act of 1934 (File No. 0-16106) are incorporated by reference in this prospectus, except as otherwise superseded or modified herein:

Our annual report on Form 10-K for the fiscal year ended March 31, 1999.

Our quarterly reports on Form 10-Q for the fiscal quarters ended June 30, 1999, September 30, 1999 and December 31, 1999.

Our registration statement on Form 8-A, dated July 28, 1987, registering our common stock under Section 12(g) of the Securities Exchange Act of 1934.

Our proxy statement on Schedule 14A for our annual shareholders meeting for the fiscal year ended March 31, 1999.

All other reports and documents filed by us pursuant to Sections 13(a), 13(c), 14 or 15(d) of the Exchange Act since March 31, 1999 and prior to the termination of the offering of the common stock, are also deemed to be incorporated by reference into this prospectus.

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Any statement in any document incorporated or deemed to be incorporated by reference is modified or superseded to the extent that a statement in this prospectus or in any other subsequently filed document incorporated by reference modifies or supersedes such statement.

We will furnish you, without charge, with a copy of any or all of the documents referred to above (other than exhibits to such documents). Requests for copies should be directed, orally or in writing, to:

Anil K. Jain, Chief Executive Officer
APA Optics, Inc.
2950 N.E. 84th Lane
Blaine, MN 55434
Telephone: (763) 784-4995

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PROSPECTUS SUMMARY

THE FOLLOWING SUMMARY CONTAINS INFORMATION ABOUT APA OPTICS, INC., SOMETIMES REFERRED TO AS "APA OPTICS" OR THE "COMPANY." IT MAY NOT CONTAIN ALL THE INFORMATION THAT MAY BE IMPORTANT TO YOU. YOU SHOULD READ THE ENTIRE PROSPECTUS, THE DOCUMENTS WHICH ARE INCORPORATED BY REFERENCE IN THE PROSPECTUS, INCLUDING THE FINANCIAL DATA AND RELATED NOTES, AND THE OTHER INFORMATION CONTAINED IN THE FORM S-3 REGISTRATION STATEMENT BEFORE MAKING AN INVESTMENT DECISION. THE REFERENCES TO "WE," "US," AND "OUR" MEAN APA OPTICS, EXCEPT WHERE IT IS CLEAR BY THE CONTEXT THAT THE REFERENCE IS TO SOMEONE ELSE.

THE COMPANY

APA Optics is engaged in the business of designing, manufacturing, and marketing optical components and various optoelectronic products. Currently, we are focused on two product areas: dense wavelength division multiplexer (DWDM) components for fiber optic communications and gallium nitride-based ultraviolet (UV) detectors (both components and integrated detector/electronic/display packages). We selected these areas of concentration because we believe they have significant potential markets and because we have significant expertise and/or patent positions relating to them.

For several years we received significant revenues from providing research and development services in connection with projects sponsored by various government agencies. In fiscal 1998, we determined to shift our emphasis from research and development to product development, realizing that this shift would significantly reduce revenues and increase losses until we realize revenues from our products. If we are successful in manufacturing and marketing our products, we expect to significantly increase revenues and achieve profitability.

APA Optics was incorporated in Minnesota in March 1979 and became a publicly owned company in 1986. Our principal offices are located at 2950 N.E. 84th Lane, Blaine, Minnesota 55434, and our telephone number is (763) 784-4995.

RISK FACTORS

An investment in our common stock involves a high degree of risk and is

not appropriate for persons who cannot afford to lose their entire investment. See "Risk Factors."

THE OFFERING

The shares of common stock which are offered by this prospectus are shares which will be issued to the selling shareholders named in this prospectus if they choose to convert their 2% Series A Convertible Preferred Stock and/or exercise related 5-year warrants for purchase of an aggregate of 50,000 shares of common stock. They acquired the Preferred Stock and warrants in March 2000 for a total purchase price of \$5 million. They may convert their Preferred Stock and exercise their warrants, at their option, at a price of \$35.00 per share (subject to adjustments under certain circumstances). If all shares of the Preferred Stock are converted and all warrants are exercised, at \$35.00 per share, 200,357 shares of common stock will be added to the Company's issued and outstanding common stock (assuming that all Preferred Stock dividends are paid in cash rather than accreted to the stated value of the Preferred Stock). Certain information about the Company's common stock and this offering is summarized below.

Concurrently with this offering we have filed a registration statement for sale of common stock for gross proceeds of \$100 million. As of the date of this prospectus, we do not know whether any shares will be sold or the price at which sales may be made.

Common stock to be issued upon conversion of Preferred Stock(1)..... 142,857 shares

Common stock to be issued upon exercise of warrants..... 57,500 shares

Common stock to be outstanding after conversion of Preferred Stock and exercise of warrants (1) (2)..... 9,198,349

Use of proceeds..... APA will not receive any proceeds from the conversion of the Preferred Stock or the sale of common stock by the selling shareholders. We will receive \$1,750,000 if the warrants are exercised in full. These funds will be used for general corporate purposes.

Nasdaq symbol..... APAT

Transfer Agent and Registrar..... Norwest Shareowner Services, South St. Paul, Minnesota

- (1) Assumes that (a) dividends are paid in cash rather than accreted to stated value and (b) a conversion price of \$35.00 per share. If dividends are accreted to stated value, or if the conversion price is adjusted to a lower price pursuant to the terms of the Preferred Stock, the number of shares of common stock issuable upon conversion will increase.
- (2) Assumes no issuance of common stock other than in connection with this offering and no exercise of any warrants or options for common stock or conversion of any securities convertible to common stock. As of March 15, 2000 we had reserved for issuance:
 - (a) 151,358 shares for various warrants, not including additional warrants in an amount not currently calculable which may be issued in connection with certain bond financing; and
 - (b) 1,246,338 shares under employee benefit plans, a directors option plan, and other options.

SUMMARY FINANCIAL INFORMATION

<TABLE>
<CAPTION>

	Nine Months Ended December 31		Year Ended March 31	
	-----		-----	
	(unaudited)			
Statement of operations data:	1999	1998	1999	1998
	----	----	----	----
<S>	<C>	<C>	<C>	<C>
Net revenues	\$ 239,142	\$ 629,122	\$ 722,030	\$ 2,190,637

Net income (loss)	(2,860,842)	(1,755,353)	(2,513,798)	(967,767)
Net income (loss) per share (basic)	(.33)	(.21)	(.30)	(.12)
Net income (loss) per share (diluted)	(.33)	(.21)	(.30)	(.12)

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<TABLE>
<CAPTION>

	December 31, 1999 ----- (unaudited)	March 31 -----	1999 ----	1998 ----
Balance sheet data:				
<S>	<C>	<C>	<C>	<C>
Working capital	\$ 1,860,158	\$ 2,864,549	\$ 2,864,549	\$ 5,345,480
Total assets	5,741,421	6,804,976	6,804,976	9,629,912
Shareholders' equity	2,408,527	3,389,295	3,389,295	5,859,863

THE COMPANY

Since the founding of APA Optics in 1979, we have focused on leading edge research in sophisticated optoelectronic and optical system areas with the primary goal of developing advanced products for subsequent marketing and fabrication. We currently manufacture DWDM optical components, offer a range of gallium nitride (GaN) based devices and services, and market custom optics products.

For the last several years our goal has been to manufacture and market products and components based on our technology developments. We have selected two product areas based on significant potential markets and our expertise and/or patent positions: dense wavelength division multiplexer (DWDM) components for fiber optic communications and gallium nitride-based ultraviolet (UV) detectors (both components and integrated detector/electronic/display packages). If we are successful in manufacturing and marketing these products, we expect to significantly increase revenues and achieve profitability.

PRODUCTS

Our current products are as follows:

- * Optical Lens Systems. We design and build multi-element lens systems and components, including mounting structures, for precision quality optical needs in many applications, including laser-based systems, imaging systems, inspection systems, display systems, display optics, focusing optics for ultraviolet fire alarms, alignment verification optics for dual magnetic recording heads, and multi-magnification optics systems for optical comparators.
- * Optical Thin Film Coatings. We custom design, develop, and fabricate optical thin film coatings for optical components of lasers, laser systems, optical instruments, and optical devices. We use optical thin film coating services in two major ways: to apply antireflective coatings onto Company-fabricated lens components, and to design, develop and fabricate coatings for lens components supplied by customers.
- * Optoelectronics Devices. We are focusing research and development efforts on several optoelectronic devices. Optoelectronic devices are vital components of communication systems and optical instruments.

Currently, we are developing the following products:

- * Dense Wavelength Division Multiplexer (DWDM). Recently, we demonstrated the feasibility of a DWDM capable of transmitting several channels through a single optical fiber for

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communication applications. We developed the DWDM based on our development of optical modulator (single channel) technology during the early 1990s for fiber optic communication. These modulators have the capability of direct high speed (several billion bits per second) data loading and unloading on laser beams going through optical fibers, either for short distance or long distances. The DWDM, a small part of the modulator, utilizes high frequency halographic gratings. Our new DWDM is a major break-through because

it enables transmission of information on several different channels within a single fiber (a simple analogy is the expansion of a single lane highway to multi-lane throughway). As a result, the DWDM provides higher speed as well as increased and regulated data handling capabilities as compared to a single channel modulator. We are currently performing environmental packaging of the DWDM. We filed the first patent related to the DWDM Optical Modulator in June 1994, which was allowed on May 8, 1995. Since then, we have filed for four additional patents related to DWDM Multiplexer/Demultiplexer devices. We were awarded two of these patents in March 1997 and February 1998. The other two applications are still pending.

- * UV Detector. The UV Detector is a high response solid state detector based on single-crystal gallium nitride (GaN). The GaN detector is expected to have applications in spectrometry, solar radiation measurement, excimer-laser measurement and calibration, biomedical instrumentation, and flame detection and monitoring. The detector is visible blind, which allows detection of UV radiation in the presence of room lights without a filter. We believe the GaN detector has advantages over photomultiplier tubes because of its ruggedness and chemical inertness, which suit it for application in high-vibration and harsh environments as well as high-temperature operation. We have been awarded at least four patents in nitride related technologies.
- * Other Products. We are in the process of introducing several other products by packaging our UV detectors with electronics and displays for many applications. Among these are a solar sensing watch to detect potential cancer causing UV radiation for consumer applications, UV radiation based flame sensors for industrial applications, and UV radiation meters for laboratory and industrial applications. All of these products have significant similarities and, therefore, do not require significant financial resources for development.

MARKETING AND DISTRIBUTION

We delivered a limited number of alpha units of our DWDM to customers during fiscal 1999 and 2000. We have sold several UV detectors to more than 30 customers, as well as a few detector/electronics packages. During this time, we have been aggressively marketing both products by advertising in relevant professional magazines, showcasing our products in trade shows, direct mailing, personal visits, and distributors in various countries, including Japan, Germany, Italy and France. We also maintain product information on our Web page. Our DWDM product manager focuses on sales of DWDM and two persons work on marketing and sales of gallium nitride-based products.

SOURCES OF RAW MATERIALS

Two of the principal materials used in our business are optical glass and optical chips. Optical glass is commercially available through several distributors. We currently use at least two vendors for optical chips and continuously look for additional vendors for these parts. Certain chemicals and other materials necessary for our products are routinely available from several sources.

ENVIRONMENTAL COMPLIANCE

Because we handle a number of chemicals in our operations, we must comply with federal, state and local laws and regulations regarding the handling and disposal of such chemicals. The cost of such compliance is not material.

MAJOR CUSTOMERS

In prior years, we provided research and development services under contracts with various governmental agencies. Currently, we have no material contracts with any of such agencies.

Revenues from the following unrelated customers constituted more than ten percent of our total operating revenues in the last three fiscal years:

Name	Year Ended March 31		
	1999	1998	1997
Air Force	23%	20%	42%
Army	0%	25%	22%
Navy	18%	38%	36%
ARPA	59%	17%	-0%

Total	100%	100%	100%
	====	====	====

COMPETITION

Competition in the optoelectronics and optics fabrication businesses is significant. Many of the companies engaged in these businesses are well-financed and have significantly greater research, development, production, and marketing resources than we do. However, we believe that we have a competitive advantage due to our patents and the uniqueness of our devices. In particular, we believe that our DWDM is the most efficient (lowest insertion loss) and compact device currently available.

RESEARCH AND DEVELOPMENT

During the fiscal years ended March 31, 1999, 1998, and 1997 we spent approximately \$382,000, \$339,000, and \$375,000, respectively, on research and development sponsored by the Company, all of which was related to the DWDM, UV detector and related products. In addition, in each of those years, we spent approximately \$837,000, \$1,431,000, and \$1,610,000, respectively, on research activities sponsored by customers. During the 11 months ended February 29, 2000, we spent approximately \$299,000, on research and development sponsored by the Company, all of which was related to the DWDM, UV detector and related products and approximately \$181,000, on research activities sponsored by customers.

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EMPLOYEES

As of March 15, 2000, we employed 36 full-time employees (including executive officers).

RISK FACTORS

BEFORE YOU INVEST IN THE COMMON STOCK YOU SHOULD CONSIDER THAT THE VALUE OF THE SHARES IN THE SECONDARY MARKET IS SUBJECT TO VARIOUS RISKS, INCLUDING THOSE DESCRIBED BELOW. IF ANY OF THE FOLLOWING RISKS ACTUALLY OCCUR, OUR BUSINESS, RESULTS OF OPERATIONS OR CASH FLOWS COULD BE ADVERSELY AFFECTED. IN THOSE CASES, THE TRADING PRICE OF OUR COMMON STOCK COULD DECLINE, AND YOU MAY LOSE ALL OR PART OF YOUR INVESTMENT. THESE RISKS SHOULD BE EVALUATED TOGETHER WITH ALL OF THE OTHER INFORMATION IN THIS PROSPECTUS BEFORE YOU DECIDE TO PURCHASE ANY OF THE SHARES WHICH ARE OFFERED. SPECIFIC RISK FACTORS WHICH YOU SHOULD CONSIDER INCLUDE THE FOLLOWING:

WE HAVE LIMITED EXPERIENCE IN MANUFACTURING. Although we have been involved in the manufacturing of optical components for several years, and have manufactured limited quantities of UV detectors and alpha DWDMs, we have not engaged in high volume manufacturing of these products. We may be unable to manufacture products that satisfy the volume and quality requirements of our customers, and, as a result, we may not achieve significant revenues or profitability.

WE MAY NOT BE ABLE TO REDUCE OUR MANUFACTURING COSTS SUFFICIENTLY OR PLAN OUR MANUFACTURING EXPANSION accurately. We expect the price of our existing products to decline due to various factors, such as increased competition, including from companies with lower labor and production costs; a limited number of potential customers with significant bargaining leverage; introduction of new products by competitors; and greater economies of scale for higher volume manufacturers. To increase our revenues, we must increase our unit volumes and our manufacturing capacity. Adding capacity increases our fixed costs and the levels of unit shipments we must produce to achieve positive gross margins. As a result, if we are unable to increase our revenues or continuously reduce our manufacturing costs, our gross margins will not improve and we will continue to incur losses.

We are increasing our manufacturing capacity at our existing facilities in Aberdeen, South Dakota. Developing manufacturing capabilities involves significant risks which could materially adversely affect our gross margins and revenues, including:

- * Our inability to qualify a new manufacturing line for all of our customers;
- * unanticipated cost increases;
- * unavailability or late delivery of equipment;
- * unforeseen environmental or engineering problems; and
- * personnel recruitment delays.

Expanding our manufacturing capacity requires substantial time to build out and equip facilities and train personnel. If we receive orders substantially in excess of our planned capacity, we might not be able to fulfill them quickly enough to meet customer requirements. Our inability to deliver products timely could enable competitors to win business from our customers.

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WE MAY NOT BE ABLE TO EFFECTIVELY INCREASE PRODUCTION AND MAINTAIN ACCEPTABLE MANUFACTURING YIELDS, RESULTING IN DELAY OF PRODUCT SHIPMENTS AND IMPAIRMENT OF OUR GROSS MARGINS. Manufacturing our products is highly complex and labor intensive. As we rapidly increase production and hire more people, our manufacturing yield, which is the percentage of our products which meet customer specifications, could decline, resulting in product shipment delays, possible lost revenue opportunities, higher customer returns, and impaired gross margins. Some of our manufacturing lines have experienced lower than expected yields, which could continue in the future. Rapid increases in production levels to meet demand may also result in higher overtime costs and other expenses.

WE HAVE HAD LIMITED SALES AND EXPECT LOSSES. To date, we have had only limited sales of UV detectors and DWDMS. As of December 31, 1999, we had an accumulated deficit of \$9,256,929. We expect operating losses to continue until sales of these products reach a level sufficient to cover operating costs. We may never generate sales at the required levels or become profitable. Our auditors' opinion concerning our financial statements for the fiscal year ended March 31, 1999 states that our accumulated deficit and recurring losses from operations raise substantial doubt about our ability to continue as a going concern.

Our ability to achieve profitability will depend on our ability to develop and bring new proprietary products to market. Our ability to become profitable will also depend upon a variety of other factors, including the following:

- * The price, volume and timing of sales of products;
- * Variations in gross margins of our products, which may be affected by sales mix and competitive pricing pressures;
- * Changes in the level of our research and development; and
- * Acquisitions of products, technology or companies.

Our long-term success will also be affected by expenses, difficulties and delays frequently encountered in developing and commercializing new products, competition, and the regulatory environment in which we operate. We cannot be certain that we will ever achieve significant revenues or profitable operations.

WE MUST CONTINUE TO FUND PRODUCT DEVELOPMENT. The continued existence and the growth and profitability of the Company depend upon the success of our product manufacturing and marketing efforts. In order for new products to be successfully marketed, they must satisfy the needs of potential customers by performing under the conditions in which such customers intend to use the products. We must continue development of these products and their packaging to ensure that these products will meet such requirements. However, our products may not perform as anticipated or as needed by customers.

OUR BUSINESS WILL SUFFER IF WE FAIL TO OBTAIN ADEQUATE FUNDING IN A TIMELY MANNER. We expect that we will need substantial additional funding. Our business, results of operations and cash flows will be adversely affected if we fail to obtain adequate funding in a timely manner. Our funding requirements will depend on many factors, including:

- * The progress of our research and development programs;

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- * Revenue growth, if any;
- * The amount of cash generated, if any, by our operations;
- * The costs involved in preparing, filing, prosecuting, maintaining, enforcing and defending patent claims and other intellectual property rights;
- * Competing technological and market developments; and
- * The need for additional manufacturing facilities to accommodate growth.

We anticipate that our existing capital resources as of the date of this prospectus will be adequate to fund operations and capital expenditures at least through March 31, 2001. However, if we experience unanticipated cash requirements during this period, we could require additional funds much sooner. We may receive funds from the sale of equity securities, or the exercise of outstanding warrants and options to acquire common stock. However, we cannot assure you that any of those fundings will occur, or if they occur, that they will be on terms favorable to us. Also, the dilutive effect of those fundings could adversely affect our results per share.

ASSERTING AND DEFENDING INTELLECTUAL PROPERTY RIGHTS WILL HARM OUR RESULTS OF OPERATIONS REGARDLESS OF SUCCESS. Our business will be harmed if competitors develop substantially equivalent proprietary information and techniques or otherwise gain access to our trade secrets, if our trade secrets are disclosed or if we cannot effectively protect our rights to unpatented trade secrets.

We actively seek patent protection for our proprietary products and technologies. We have a number of United States patents and also have licenses to or assignments of numerous issued United States patents. However, litigation may be necessary to protect our patent position, and we cannot be certain that we will have the required resources to pursue the necessary litigation or otherwise to protect our patent rights. Our efforts to protect our patents may fail. In addition to pursuing patent protection in appropriate cases, we also rely on trade secret protection for unpatented proprietary technology. However, trade secrets are difficult to protect.

Claims may be brought against us in the future based on patents held by others. These persons could bring legal actions against us claiming damages and seeking to enjoin manufacturing and marketing of the affected product. If any of these actions are successful, in addition to any potential liability for damages, we could be required to obtain a license in order to continue to manufacture or market the affected product. We cannot assure you whether we would prevail in any of these actions or that we could obtain any licenses required under any of these patents on acceptable terms, if at all.

We know of no pending patent infringement suits, discussions regarding possible patent infringements or threats of patent infringement litigation either related to:

- * patents held by us; or
- * our products or proposed products.

There could be significant litigation in our industry regarding patent and other intellectual property rights. If we become involved in any litigation, it could consume a substantial portion of our resources, regardless of the outcome of the litigation.

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WE EXPERIENCE STRONG COMPETITION AND CHANGES IN TECHNOLOGY COULD RESULT IN MORE COMPETITION. The business in which we engage is highly competitive. Many of our competitors include large, well-financed and established companies who have far greater marketing, product development, and financial resources than we do.

We may not be able to successfully anticipate changes in technology, industry standards, customer requirements and product offerings, yet our ability to develop and introduce new and enhanced products will impact our position as a leader in the deployment of high-capacity solutions. The accelerating pace of deregulation in the telecommunications industry will likely intensify the competition for improved technology. There has been an increase in the funding of new companies intending to develop new products for the rapidly evolving telecom industry. These companies have time-to-market advantages due to the narrow and exclusive focus of their efforts. New companies may provide additional competition for our existing product lines as well as potential future products. The introduction of new products embodying new technologies or the emergence of new industry standards could render our existing products uncompetitive from a pricing standpoint, obsolete or unmarketable. Any of these outcomes would have a material adverse effect on our business, financial condition and results of operations.

Because many of our competitors have greater financial and other resources than we do, they may be able to more quickly:

- * respond to new technologies or technical standards;
- * react to changing customer requirements and expectations;
- * manufacture, market and sell current products;
- * develop new products or technologies; and

- * deliver competitive products at lower prices.

As a result of these factors, our customers could decide to purchase products from our competitors and reduce their purchases from us.

In addition, our competitors or customers may acquire our suppliers and potential suppliers. Our customers may also develop their own internal sources of supply in competition with us. For example, Corning has announced an expansion of its ability to produce thin film optical filters by a factor of ten as well as the acquisition of Oak Industries, a maker of components used in WDM systems. Lucent Technologies, has announced an investment in privately-held Horizon Photonics, Inc., a provider of automated manufacturing of passive optical components. Lucent has also commented publicly that it sells a large portion of its components on the merchant market in addition to supplying its own needs. Cisco Systems, an emerging player in WDM systems, has announced the acquisition of Pirelli Optical Systems and a strategic investment of \$100 million in Pirelli's optical components and submarine optical transmission system businesses. In addition, Nortel Networks has announced a \$400 million investment in its optical networking and components business, including a new facility for the fabrication of optical components.

WE CURRENTLY HAVE LIMITED MARKETING EXPERTISE AND PERSONNEL AND EXPECT TO INCUR SUBSTANTIAL MARKETING COSTS. Our growth is dependent upon our ability to implement an aggressive, strong, and consistent marketing program for the Company's new products. During fiscal 1999, we hired two

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individuals to serve as marketing and sales managers. In addition, we currently market our products through independent distributors in several foreign countries. We believe that it is necessary to significantly expand our marketing efforts to market our new products successfully. Accordingly, we expect to incur substantial costs in connection with marketing and sales efforts. However, we cannot be sure that our efforts will result in significantly greater product recognition or market penetration, or significantly increased levels of revenues.

ACCEPTANCE OF OUR NEW PRODUCTS IS UNCERTAIN. Although we have received several indications of interest from potential customers, we have not received any significant production orders. Because our products are relatively new in the market and are still being evaluated by potential customers, we cannot predict accurately the volume or timing of any orders.

WE MAY NOT BE ABLE TO SUCCESSFULLY COMPLETE DEVELOPMENT AND ACHIEVE COMMERCIAL ACCEPTANCE OF OUR NEW PRODUCTS. Although we have delivered evaluation units of our DWDM and UV detector products, we do not yet have products that can be manufactured or distributed on a commercial basis. The maturing process from laboratory prototype to commercial acceptance involves a number of steps, including:

- * successful completion of product development;
- * validation of manufacturing methods;
- * extensive quality assurance and reliability testing; and
- * identification and qualification of component suppliers.

Each of these steps in turn presents serious risks of failure, rework or delay, any one of which could materially and adversely affect the speed and scope of product introduction and marketplace acceptance of the products. In addition, unexpected intellectual property disputes, failure of critical design elements, and a host of other execution risks may delay or even prevent the introduction of these products. We have not yet demonstrated commercial acceptance of these products and commercialization may require substantial sales and marketing efforts over lengthy sales cycles. Our best efforts may not be successful in attaining significant commercial acceptance and purchase of our products.

PRODUCT PERFORMANCE PROBLEMS COULD LIMIT OUR SALES PROSPECTS. The production of new fiberoptic systems with high technology content involves occasional problems as the technology and manufacturing methods mature. If significant reliability, quality or monitoring problems develop, a number of material adverse effects could result, including:

- * manufacturing rework costs;
- * high service and warranty expense;
- * high levels of product returns;
- * delays in collecting accounts receivable;

- * reduced orders from existing customers; and
- * declining interest from potential customers.

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Although we maintain accruals for product warranties, actual costs could exceed these amounts.

IF OUR NEW PRODUCT INTRODUCTIONS ARE DELAYED, OR IF OUR NEW PRODUCTS HAVE DEFECTS, OUR REVENUES WOULD BE HARMED AND OUR COSTS COULD INCREASE. If we do not introduce new products in a timely manner, we will not obtain incremental revenues from these products or be able to replace more mature products with declining revenues or gross margins. Customers could decide to purchase components from our competitors, resulting in lost revenue over a longer term. We could also incur unanticipated costs if new product introductions are delayed or we need to fix defective new products.

WE MAY NOT BE ABLE TO SUCCESSFULLY MANAGE RAPID GROWTH. If we are successful in marketing our products, and if we receive orders for volume manufacturing, we will need to develop an infrastructure able to support growth, including comprehensive and reliable management information systems and additional manufacturing and other personnel. We may be unable to develop such systems or locate, hire, train and retain necessary personnel.

WE ARE DEPENDENT ON KEY PERSONNEL. Although we have hired a business manager for fiber optic products, as well as marketing and sales managers, we are still dependent upon the continued services of Dr. Anil K. Jain. The loss of his services could have a significant adverse impact upon the Company's operations and development. We do not have an employment agreement or a noncompete agreement with Dr. Jain, although we maintain \$1,000,000 in key man life insurance on him.

WE MAY NOT BE ABLE TO RECRUIT AND RETAIN THE PERSONNEL WE NEED TO SUCCEED. If we cannot hire and retain technical personnel with advanced skills and experience in the specialized field of fiber optics, our product development programs may be delayed and our customer support efforts may be less effective. If we are unable to hire the necessary managerial, sales and marketing personnel, we may not be able to increase our revenues.

WE ARE DEPENDENT ON SUPPLIERS. We rely on outside vendors to supply certain of the raw materials and other components of our products. For certain components, we may rely on single sources of supply, which could result in the unavailability of or interruptions in delivery of such components, manufacturing delays caused by such unavailability or interruptions, and fluctuations in the quality and price of such components. Delivery delays, quality problems and price increases could hurt our ability to supply our customers with products in a timely manner, which can cause our shipments and revenues to decline.

IF WE ARE UNABLE TO COMPLY WITH ENVIRONMENTAL LAWS AND REGULATIONS, OUR BUSINESS MAY BE HARMED. We are subject to federal, state and local laws and regulations governing the use, manufacture, storage, handling and disposal of hazardous materials and waste products. We currently maintain a supply of several hazardous materials at our facilities. We might be required to incur significant cost to comply with environmental laws and regulations. In the event of an accident, we could be held liable for any damages that result, and the liability could exceed our resources.

BECAUSE CURRENT OFFICERS AND DIRECTORS OWN A LARGE PERCENTAGE OF OUR STOCK, THESE SHAREHOLDERS MAY BE ABLE TO CONTROL APA OPTICS AND ALSO PREVENT POTENTIALLY BENEFICIAL ACQUISITIONS OF APA OPTICS. As of March 15, 2000 our officers and directors beneficially owned approximately 30% of the outstanding shares of our common stock. Beneficial ownership includes shares of our common stock subject to options exercisable within 60 days of March 15, 2000.

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These shareholders, if acting together, may be able to elect all of our directors, and otherwise significantly influence matters requiring approval by our shareholders. This concentration of ownership and the lack of cumulative voting may also delay or prevent a third party from acquiring us.

These shareholders may have interests that differ from other shareholders of APA Optics, particularly in the context of potentially beneficial acquisitions of APA Optics. For example, to the extent that these stockholders are employees of APA Optics, they may be less inclined to vote for acquisitions of APA Optics involving the termination of their employment or diminution of their responsibilities or compensation.

WE DO NOT INTEND TO PAY DIVIDENDS. We intend to use any cash flows from

operations to finance further growth of the Company's business. Accordingly, investors should not purchase the shares with a view towards receipt of dividends.

OUR STOCK PRICE MAY EXHIBIT VOLATILITY AND THE TRADING PRICE OF OUR STOCK MAY DECREASE DUE TO FACTORS BEYOND OUR CONTROL. Our common stock price has experienced substantial volatility in the past and is likely to remain volatile in the future. Volatility can arise as a result of the activities of short sellers and risk arbitrageurs and may have little relationship to our financial results or prospects. The trading prices of our common stock is also affected by the following factors, among others:

- * Variations in anticipated or actual results of operations;
- * Announcements of new products or technological innovations by competitors; and
- * Changes in earnings estimates of operational results by analysts.

Volatility can also result from divergence between our actual or anticipated financial results and/or status of product development or commercialization, and published expectations of analysts and announcements we may make. We attempt to address possible divergence through our public announcements and reports; however, the degree of specificity we can offer in such announcements, and the likelihood that any forward-looking statements we make will prove correct in actual results, can and will vary.

Our revenues and operating results have fluctuated significantly from quarter-to-quarter in the past and may fluctuate significantly in the future as a result of several factors, some of which are outside of our control. These factors include:

- * the size and timing of customer orders;
- * our ability to manufacture and ship our products on a timely basis;
- * our ability to obtain sufficient supplies to meet our product manufacturing needs;
- * our ability to meet customer product specifications and qualifications;
- * long and unpredictable sales cycles of up to a year or more;
- * our ability to sustain high levels of quality across all product lines; changes in our product mix;

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- * customer cancellations or delivery deferrals;
- * seasonality of customer demand; and
- * difficulties in collecting accounts receivable.

Due to these factors, results are difficult to predict and you should not rely on quarter-to-quarter comparisons of our results of operations as an indication of our future performance. It is possible that, in future periods, our results of operations may be below the expectations of public market analysts and investors.

Moreover, the stock market from time to time has experienced extreme price and volume fluctuations, which have particularly affected the market prices for emerging growth companies and which have often been unrelated to the operating performance of these companies. These broad market fluctuations may adversely affect the market price of our common stock.

During the past three years from the date of this prospectus, the market price per share of our common stock has fluctuated between approximately \$3.50 and \$60.

OUR BUSINESS MAY BE HARMED IF WE BECOME SUBJECT TO SECURITIES CLASS ACTION LITIGATION. In the past, following periods of volatility in the market price of a company's common stock, securities class action litigation has been brought against the issuing company. This type of litigation could be brought against us in the future. The litigation could be expensive and divert management's attention and resources, which could adversely affect our business and results of operations whether or not our defense is successful. If the litigation is determined against us, we could also be subject to significant liabilities.

THE MARKET PRICE OF OUR STOCK MAY FALL IF OTHER SHAREHOLDERS SELL THEIR STOCK. If our shareholders sell substantial amounts of our common stock in the

public market following this offering, the market price of our common stock could fall. These sales also might make it more difficult for us to sell equity or equity-related securities in the future at a price we deem appropriate.

As of March 15, 2000 we had 8,997,992 shares of our common stock outstanding. Substantially all of these shares are eligible for sale in the public market. In addition, we are currently registering for public sale 250,000 shares of common stock which may be offered upon conversion of our outstanding 2% Series A Convertible Preferred Stock and related warrants, and an indeterminate number of shares of common stock (but not in excess of \$100 million) offered directly by the Company.

THE VALUE OF YOUR STOCK MAY DECREASE IF OTHER SECURITY HOLDERS EXERCISE THEIR OPTIONS OR WARRANTS OR CONVERT CONVERTIBLE SECURITIES. As of March 15, 2000 we had reserved 1,697,696 shares of our common stock for future issuance upon exercise of outstanding options, warrants and convertible securities. If these securities are exercised or converted, you may experience dilution in the book value and earnings per share of your common stock. This may cause the market price of our common stock to fall.

WE MAY ISSUE ADDITIONAL STOCK WITHOUT YOUR CONSENT. The Company has authorized 20 million shares of common stock, of which 8,997,992 shares are issued and outstanding as of March 15, 2000. We may seek shareholder authorization to increase that amount at our next annual shareholders meeting. The Board of Directors has authority, without action or vote of the shareholders, to issue all or part of the authorized but unissued shares. Additional shares may be issued in connection with future financings,

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acquisitions, employee plans, or otherwise. Any such issuance will dilute the percentage ownership interest of existing shareholders, and may dilute the book value of the common stock. We currently intend to sell up to \$100 million in common stock from time to time at prices related to current market prices (subject to discount in some circumstances) in a registered public offering to institutional investors. We do not know the number or price of shares to be sold, or whether any shares will be sold. In addition, the Company is authorized to issue up to 5 million undesignated shares, of which 1,500 shares have been designated as 2% Series A Convertible Preferred Stock. As of March 15, 2000, 500 shares of 2% Series A Convertible Preferred Stock had been issued and were outstanding. The Board of Directors can issue additional preferred stock in one or more series and fix the terms of such stock without approval by shareholders. Preferred stock may include the right to vote as a series on particular matters, preferences as to dividends and liquidation, conversion and redemption rights and sinking fund provisions. The issuance of preferred stock could affect the rights of the holders of common stock adversely and reduce the value of the common stock. In addition, specific rights granted to holders of preferred stock could be used to restrict the Company's ability to merge with or sell its assets to a third party.

OUR DIRECTORS' LIABILITY IS LIMITED UNDER MINNESOTA LAW. Our Articles of Incorporation, as amended and restated, state that our directors are not liable for monetary damages for breach of fiduciary duty, except for a breach of the duty of loyalty, for acts or omissions not in good faith or which involve intentional misconduct or a knowing violation of law, for dividend payments or stock repurchases illegal under Minnesota law, and for any transaction in which the director derived an improper personal benefit. In addition, our bylaws provide that we shall indemnify our officers and directors to the fullest extent permitted by Minnesota law for all expenses incurred in the settlement of any actions against them in connection with their service as officers or directors of the Company.

ANTI-TAKEOVER PROVISIONS. Minnesota law provides Minnesota corporations with anti-takeover protections. These protective provisions could delay or prevent a change in control of the Company by requiring shareholder approval of significant acquisitions of voting stock of the Company. These provisions operate even when many shareholders may think a takeover would be in their best interests.

FORWARD-LOOKING STATEMENTS

This prospectus and the information which is incorporated by reference in this prospectus include "forward-looking statements" within the meaning of the securities laws. Statements about us and our expected financial position, business and financing plans are forward-looking statements. Forward-looking statements can be identified by, among other things, the use of forward-looking terminology such as "believes," "expects," "may," "will," "should," "seeks," "pro forma," "anticipates," "intends," or other variations or comparable terminology, or by discussions of strategy or intentions. Although we believe that the expectations reflected in our forward-looking statements are reasonable, we cannot assure you that our expectations will prove to be correct. Forward-looking statements are necessarily dependent upon assumptions, estimates and data that may be incorrect or imprecise and involve known and unknown risks,

uncertainties and other factors. Accordingly, you should not consider our forward-looking statements as predictions of future events or circumstances. A number of factors could cause our actual results, performance, achievements or industry results to be materially different from any future results, performance or achievements expressed or implied by our forward-looking statements. These factors include, but are not limited to: the competitive environment in our industry; changes in economic conditions in general and in our business; changes in prevailing interest rates and the availability of and terms of financing to fund our business; our ability to attract and retain qualified personnel; changes in our acquisition and capital expenditure plans; and other factors discussed in this prospectus including, without limitation, those in our filings with the Securities and Exchange Commission. Given these uncertainties,

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you should not rely on our forward-looking statements in making an investment decision. We disclaim any obligation to update you on any factors that may affect the likelihood of realization of our expectations and we do not intend to announce publicly the results of any revisions to any of our forward-looking statements to reflect future events or developments. All written and oral forward-looking statements attributable to us (including statements before and after the date of this prospectus) are expressly qualified by these cautionary statements.

USE OF PROCEEDS

We will not receive any proceeds from the conversion of the Preferred Stock or the sale of common stock by the selling shareholders. We will receive \$1,750,000 in payment of the exercise price if the warrants are exercised in full. Warrant exercise proceeds, if any, will be used for general corporate purposes.

PRICE RANGE OF COMMON STOCK

Our common stock is listed and traded under the symbol "APAT" on the Nasdaq and under the same symbol in the Nasdaq SmallCap Market. The following table shows the high and low closing sale prices as reported by the Nasdaq SmallCap Market during the last two fiscal years ended March 31, 1998 and 1999 and the first three quarters of our fiscal year ending March 31, 2000.

FISCAL YEAR	1998	1998	1999	1999	2000	2000
SALE PRICE	LOW	HIGH	LOW	HIGH	LOW	HIGH
First Quarter	\$5.25	\$6.50	\$5.62	\$6.75	\$5.25	\$8.50
Second Quarter	5.37	6.62	4.25	6.00	3.50	7.93
Third Quarter	6.12	9.25	4.00	5.00	3.88	19.50
Fourth Quarter	5.50	8.00	4.75	10.00	--	--

We have never declared or paid a dividend on our common stock and the Board of Directors currently intends to retain all earnings, if any, for use in the business for the foreseeable future. Any future determination as to declaration and payment of dividends will be made at the discretion of the Board of Directors, subject to covenants in any loan documents restricting the payment of dividends. Our current loan agreements restrict our ability to pay dividends.

SELLING SHAREHOLDERS

On March 15, 2000, Strong River Investments, Inc., Bay Harbor Investments, Inc. and Ampal American-Israel Corporation purchased an aggregate of \$5,000,000 of 2% Series A Convertible Preferred Stock and warrants from APA Optics in a private placement transaction. Strong River, Bay Harbor and Ampal received 300, 100 and 100 shares, respectively, of Preferred Stock which may be converted into our common stock. In addition, Strong River received warrants to acquire 30,000 shares of our common stock, Bay Harbor received warrants to acquire 10,000 shares of our common stock and Ampal received warrants to acquire 10,000 shares of our common stock.

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The warrants issued to Strong River, Bay Harbor and Ampal are exercisable at \$35.00 and expire on March 15, 2005. The Preferred Stock carries a 2% cumulative dividend payable upon conversion in cash or common stock. As of

the date of this prospectus, the Preferred Stock is convertible into shares of our common stock at \$35.00 per share. Beginning September 14, 2000, and each monthly period thereafter while shares of the Preferred Stock are outstanding, the conversion price will reset in accordance with the formula set forth in the Certificate of Designations, Rights, Preferences and Limitations of Series A 2% Convertible Preferred Stock of APA. The conversion price is also subject to adjustment pursuant to the anti-dilution provisions set forth in such certificate.

Any shares of Preferred Stock outstanding three years after the funding date automatically convert into shares of our common stock at the then applicable conversion price. The Preferred Stock is redeemable under certain circumstances as stated in the certificate.

A holder of the Preferred Stock may not convert into shares of common stock if after the conversion, the holder, together with its affiliates, would beneficially own over 9.999% of the outstanding shares of our common stock. This restriction may be waived by a holder on not less than 61 days' notice to us.

In addition, as long as our common stock is listed for trading on Nasdaq, we may not issue common stock on conversion of the Preferred Stock in an amount which exceeds 19.999% of the outstanding common stock immediately prior to the sale of the Preferred Stock without obtaining prior shareholder approval.

Since the number of shares of our common stock issuable upon conversion of the Preferred Stock will change based upon fluctuations of the market price of our common stock prior to a conversion, the actual number of shares of our common stock that will be issued under the Preferred Stock, and consequently the number of shares of our common stock that will be beneficially owned by Strong River, Bay Harbor or Ampal cannot be determined at this time. Because of this fluctuating characteristic, we agreed to register a number of shares of our common stock that exceeds the number of our shares of common stock currently beneficially owned by them. The number of shares of our common stock listed in the table below as being beneficially owned by Strong River, Bay Harbor or Ampal includes the shares of our common stock that are issuable to each of them, subject to the 9.999% limitation, upon conversion of their Preferred Stock and exercise of their warrants. However, the 9.999% limitation would not prevent Strong River, Bay Harbor or Ampal from acquiring and selling in excess of 9.999% of our common stock through a series of conversions and sales under the Preferred Stock and acquisitions and sales under the warrants.

In connection with the March 2000 financing, Wharton Capital Partners, Ltd., received warrants to purchase 7,500 shares of our common stock at \$49.47 per share for its role as placement agent. The 7,500 shares are also being offered to the public by means of this prospectus.

The following table sets forth the name of each person who is offering shares of common stock by this prospectus, the number of shares of common stock owned by each person now, the number of shares of common stock that may be sold in this offering, and the number of shares of common stock each person will own after the offering, assuming they sell all of the shares offered.

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<TABLE>
<CAPTION>

NAME	BENEFICIAL OWNERSHIP PRIOR TO OFFERING		SHARES TO BE SOLD IN OFFERING	BENEFICIAL OWNERSHIP AFTER OFFERING	
	SHARES	PERCENTAGE		SHARES	PERCENTAGE
<S> Strong River Investments, Inc.	115,715 (1)	1.3%	180,000 (2)	0	0
Bay Harbor Investments, Inc.	38,571 (3)	*	60,000 (2)	0	0
Ampal American-Israel Corporation	38,571 (4)	*	60,000 (2)	0	0
Wharton Capital Partners, Inc.	7,500	*	7,500		

</TABLE>

* Less than 1%.

- (1) Consists of the shares of our common stock issuable to Strong River, subject to the 9.999% limitation, upon conversion of its Preferred Stock and exercise of its warrants.
- (2) Pursuant to the agreement with Strong River, Bay Harbor and Ampal, we are required to register such number of shares of common stock equal to the sum of (i) 175% of the number of shares of common stock issuable upon conversion in full of their Preferred Stock, assuming for such purposes that their Preferred Stock is outstanding for three years and that such conversion occurred on April 3, 2000 (which is the date of

filing of this registration statement with the Commission), and (ii) the number of shares of common stock issuable upon exercise in full of the warrants held by Strong River, Bay Harbor and Ampal.

- (3) Consists of the shares of our common stock issuable to Bay Harbor, subject to the 9.999% limitation, upon conversion of its Preferred Stock and exercise of its warrants.
- (4) Consists of the shares of our common stock issuable to Ampal, subject to the 9.999% limitation, upon conversion of its Preferred Stock and exercise of its warrants.
- (5) Consists of the shares of our common stock issuable to Wharton Capital Partners, Inc. if it exercises the warrant it received for placing the Preferred Stock.

PLAN OF DISTRIBUTION

The selling shareholders have advised us that there are presently no underwriting arrangements with respect to the sale of the shares; however, such arrangements may exist in the future.

The selling shareholders and any of their pledgees, assignees and successors-in-interest may, from time to time, sell any or all of their shares of common stock on any stock exchange, market or trading facility on which the shares are traded or in private transactions. These sales may be at fixed or negotiated prices. The selling shareholders may use any one or more of the following methods when selling shares:

- * ordinary brokerage transactions and transactions in which the broker-dealer solicits purchasers;
- * block trades in which the broker-dealer will attempt to sell the shares as agent but may position and resell a portion of the block as principal to facilitate the transaction;
- * purchases by a broker-dealer as principal and resale by the broker-dealer for its account;
- * an exchange distribution in accordance with the rules of the applicable exchange;

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- * privately negotiated transactions;
- * short sales;
- * broker-dealers may agree with the selling shareholders to sell a specified number of such shares at a stipulated price per share;
- * a combination of any such methods of sale; and
- * any other method permitted pursuant to applicable law.

The selling shareholders may also engage in short sales against the box, puts and calls and other transactions in securities of the Company or derivatives of Company securities and may sell or deliver shares in connection with these trades. The selling shareholders may pledge their shares to their brokers under the margin provisions of customer agreements. If a selling shareholder defaults on a margin loan, the broker may, from time to time, offer and sell the pledged shares.

Broker-dealers engaged by the selling shareholders may arrange for other brokers-dealers to participate in sales. Broker-dealers may receive commissions or discounts from the selling shareholders (or, if any broker-dealer acts as agent for the purchaser of shares, from the purchaser) in amounts to be negotiated. The selling shareholders do not expect these commissions and discounts to exceed what is customary in the types of transactions involved.

The selling shareholders and any broker-dealers or agents that are involved in selling the shares may be deemed to be "underwriters" within the meaning of the Securities Act in connection with such sales. In such event, any commissions received by such broker-dealers or agents and any profit on the resale of the shares purchased by them may be deemed to be underwriting commissions or discounts under the Securities Act.

The selling shareholders may also sell shares under Rule 144 under the Securities Act, if available, rather than under this prospectus.

We are required to pay all fees and expenses incident to the registration of the shares, including up to \$5,000 of the fees and disbursements of counsel to the selling shareholders. We have agreed to indemnify the selling

shareholders against certain losses, claims, damages and liabilities, including liabilities under the Securities Act.

EXPERTS AND LEGAL MATTERS

The financial statements of APA Optics, Inc. as of March 31, 1999 and 1998, and for each of the three years in the period ended March 31, 1999, incorporated by reference in this prospectus and in the registration statement of which this prospectus is a part have been audited by Ernst & Young LLP, independent auditors, as set forth in their report thereon (which contains an explanatory paragraph describing conditions that raise substantial doubt about the ability of APA Optics to continue as a going concern, as described in Note 2 to the financial statements) also incorporated by reference herein. Such financial statements have been incorporated by reference in reliance upon such report given on the authority of such firm as experts in accounting and auditing.

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The validity of the shares of common stock offered by this prospectus has been passed upon for the Company by Moss & Barnett, A Professional Association, Minneapolis, Minnesota.

MATERIAL CHANGES

There have been no material changes in the financial condition or business of the Company since its Report on Form 10-Q for the quarter ended December 31, 1999 except for our placement of \$5 million in 2% Series A convertible preferred stock and related warrants for purchase of 50,000 shares of common stock in March 2000.

DISCLOSURE OF COMMISSION POSITION ON INDEMNIFICATION FOR SECURITIES ACT LIABILITIES

Our Articles of Incorporation limit personal liability for breach of the fiduciary duty of our directors, to the fullest extent provided by the Minnesota Business Corporation Act. The Articles eliminate the personal liability of directors for damages occasioned by breach of fiduciary duty, except for liability based on the director's duty of loyalty to APA Optics, liability for acts or omissions not made in good faith, liability for acts or omissions involving intentional misconduct, liability based on payments of improper dividends, liability based on violations of state securities laws, and liability occurring prior to the date such provision was added. Any amendment to or repeal of these provisions will not be applied retroactively to adversely affect any right or protection of a director with respect to any acts or omissions occurring prior to the amendment or repeal. In addition, the Minnesota Business Corporation Act and our Bylaws provide that our officers and directors have the right to indemnification from the Company for liability arising out of certain actions to the fullest extent permissible by law.

This indemnification may be available for liabilities arising in connection with this offering. However, in the opinion of the Securities and Exchange Commission, indemnification for liabilities arising under the Securities Act of 1933 is against public policy as expressed in the Act and is therefore unenforceable.

ANTITAKEOVER STATUTE

Section 302A.671 of the Minnesota Business Corporation Act (the "Minnesota Act") applies, with certain exceptions, to any acquisition of voting stock of APA Optics, including the receipt of a proxy, from a person other than APA Optics, and other than in connection with certain mergers and exchanges to which APA Optics is a party, that results in the beneficial ownership by the acquiring party of 20% or more of the Company's voting stock then outstanding. Under Section 302A.671 any such acquisition must be approved by a majority vote of our shareholders. In general, in the absence of such approval, shares exceeding the threshold are denied voting rights and may be redeemed by us at the then fair market value within 30 days after the acquiring person fails to give a timely information statement to the Company or after the date that shareholders vote not to grant voting rights to the acquiring person's shares.

Section 302A.673 of the Minnesota Act generally prohibits any business combination by a Minnesota company with any shareholder that purchases 10% or more of the company's voting shares (an "interested shareholder") within four years following the interested shareholder's share acquisition date, unless the business combination is approved by a committee of all of the disinterested members of the Board of Directors of the company before the share acquisition.

These statutory provisions could delay or prevent a change in control of APA Optics.

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307,500 SHARES
APA OPTICS, INC.

COMMON STOCK

PROSPECTUS

_____, 2000

PART II. INFORMATION NOT REQUIRED IN PROSPECTUS

ITEM 14. OTHER EXPENSES OF ISSUANCE AND DISTRIBUTION

The estimated expenses in connection with the issuance and distribution of the Common Stock registered hereby, other than underwriting discounts and fees, are set forth in the following table:

SEC registration fee.....	\$ 2,304
Legal fees and expenses.....	10,000
Accounting fees and expenses.....	5,000
Blue Sky fees and expenses.....	1,000
Printing and engraving expenses.....	5,000
Miscellaneous.....	1,000

Total.....	\$24,304
	=====

ITEM 15. INDEMNIFICATION OF DIRECTORS AND OFFICERS

Unless prohibited in a corporation's articles or bylaws, Minnesota Statutes ss.302A.521 requires indemnification of officers, directors, employees and agents, under certain circumstances, against judgments, penalties, fees, settlements and reasonable expenses (including attorneys' fees and disbursements) incurred by such person in connection with a threatened or pending proceeding with respect to the acts or omissions of such person in his or her official capacity. The general effect of Minnesota Statutes ss.302A.521 is to reimburse (or pay on behalf of) directors and officers of the registrant any personal liability that may be imposed for certain acts performed in their capacity as directors and officers of the registrant, except where such persons have not acted in good faith. The Bylaws of the Registrant provide for such indemnification to the maximum extent permitted by Minnesota Statutes.

ITEM 16. EXHIBITS

Exhibit No.	Description of Exhibit
*3.1	Restated Articles of Incorporation, as amended
*3.2	Bylaws, as amended
4.5(a)	Certificate of Designation of 2% Convertible Preferred Stock
4.5(b)	Form of common stock warrant issued in connection with the 2% Series A Convertible Preferred Stock
5.1	Opinion and Consent of Counsel to APA Optics
23.1	Consent of Ernst & Young LLP

* Incorporated by reference to exhibit filed as a part of Form 10-KSB for the fiscal year ended March 31, 1995.

ITEM 17. UNDERTAKINGS

(a) Insofar as indemnification for liabilities arising under the Securities Act of 1933, as amended (the "Act") may be permitted to directors, officers and controlling persons of the issuer pursuant to the foregoing provisions or otherwise, the issuer has been advised that in the opinion of the Commission such indemnification is against public policy as expressed in the Act and is, therefore, unenforceable. In the event that a claim for indemnification against such liabilities (other than the payment by the issuer of expenses incurred or paid by a director, officer or controlling person of the issuer in the successful defense of any action, suit or proceeding) is asserted by such director, officer or controlling person in connection with the securities being registered, the issuer will, unless in the opinion of its counsel the matter has been settled by controlling precedent, submit to a court of appropriate jurisdiction the question whether such indemnification by it is against public policy as expressed in the Act and will be governed by the final adjudication of such issue.

(b) Because the registration statement incorporates Exchange Act documents filed subsequent to the effective date of the registration statement, the Company hereby undertakes that, for purposes of determining any liability under the Securities Act of 1933, each filing of the Company's annual report pursuant to Section 13(a) or Section 15(d) of the Securities Exchange Act of 1934 (and, where applicable, each filing of an employee benefit plan's annual report pursuant to Section 15(d) of the Securities Exchange Act of 1934) that is incorporated by reference in the registration statement shall be deemed to be a new registration statement relating to the securities offered therein, and the offering of such securities at that time shall be deemed to be the initial bona fide offering thereof.

(c) If the Company relies upon Rule 430A under the Act, the Company undertakes that, for determining any liability under the Act, it will:

(1) Treat the information omitted from the form of prospectus filed as part of this registration statement in reliance upon Rule 430A and contained in a form of prospectus filed under Rule 424(b)(1) or (4) or 497(h) under the Act as part of this registration statement as of the time the Commission declared it effective.

(2) Treat each post-effective amendment that contains a form of prospectus as a new registration statement for the securities offered in the registration statement, and that offering of the securities at that time as the initial bona fide offering of those securities.

(d) Insofar as the Company is registering securities under Rule 415 of the Securities Act, the Company will:

(1) file, during any period in which it offers or sells securities, a post-effective amendment to this registration statement to include any additional or changed material information on the plan of distribution.

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(2) for determining liability under the Securities Act, treat each post-effective amendment as a new registration statement of the securities offered, and the offering of the securities at that time to be the initial bona fide offering.

(3) File a post-effective amendment to remove from registration any of the securities that remain unsold at the end of the offering.

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SIGNATURES

In accordance with the requirements of the Securities Act of 1933, the registrant certifies that it has reasonable grounds to believe that it meets all of the requirements for filing on Form S-3 and has duly authorized this registration statement to be signed on its behalf by the undersigned, thereunto duly authorized in the City of Minneapolis, State of Minnesota, on April 3, 2000.

APA OPTICS, INC.

By: /s/ Anil K. Jain

Anil K. Jain, Chief Executive Officer
(Principal executive officer)

POWER OF ATTORNEY

KNOW ALL MEN BY THESE PRESENTS that each individual whose signature appears below constitutes and appoints Anil K. Jain, his true and lawful attorney-in-fact and agent with full power of substitution, for him and in his name, place and stead, in any and all capacities, to sign any and all amendments (including post-effective amendments) to this registration statement, and to sign any registration statement for the same offering covered by Rule 462(b) promulgated under the Securities Act of 1933, as amended, and any and all amendments (including post-effective amendments) thereto, and to file the same, with all exhibits thereto, and all documents in connection therewith, with the Securities and Exchange Commission, granting unto said attorney-in-fact and agent, full power and authority to do and perform each and every act and thing requisite and necessary to be done in and about the premises, as fully to all intents and purposes as he might or could do in person, hereby ratifying and confirming that said attorney-in-fact and agent or his substitute, may lawfully do or cause to be done by virtue hereof.

SIGNATURE -----	TITLE -----	DATE ----
/s/ Anil K. Jain ----- Anil K. Jain	Chief Executive Officer and Chief Financial Officer (Principal executive officer and principal financial officer)	April 3, 2000
/s/ Kenneth A. Olsen ----- Kenneth A. Olsen	Director	April 3, 2000
/s/ Gregory J. Von Wald ----- Gregory J. Von Wald	Director	April 3, 2000
/s/ Michael A. Gort ----- Michael A. Gort	Director	April 3, 2000
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/s/ William R. Franta ----- William R. Franta	Director	April 3, 2000
/s/ Randal J. Becker ----- Randal J. Becker	Principal accounting officer	April 3, 2000

*Executed by the undersigned as attorney-in-fact
for the named signatory

Anil K. Jain

CERTIFICATE OF DESIGNATION OF VOTING POWER,
PREFERENCES AND RELATIVE,
PARTICIPATING, OPTIONAL AND
OTHER SPECIAL RIGHTS
AND QUALIFICATIONS, LIMITATIONS AND RESTRICTIONS

OF

2% SERIES A CONVERTIBLE PREFERRED STOCK

OF

APA OPTICS, INC.

Pursuant to Section 302A.401 of the
Minnesota Business Corporation Act

APA Optics, Inc., a Minnesota corporation (the "Company"), certifies that pursuant to the authority contained in Article 3.03 of its Articles of Incorporation, as amended (the "Articles of Incorporation"), and in accordance with the provisions of Sections 302A.401 and 302A.239 of the Minnesota Business Corporation Act, the Board of Directors of the Company (the "Board of Directors"), pursuant to minutes of action effective March 13, 2000, duly approved and adopted the following resolution which resolution remains in full force and effect on the date hereof:

RESOLVED, that pursuant to the authority vested in the Board of Directors by the Articles of Incorporation, the Board of Directors does hereby designate, create, authorize and provide for the issue of preferred stock having a par value of \$.01 per share, which shall be designated as 2% Series A Convertible Preferred Stock (the "Preferred Stock") consisting of 500 shares, including 1,000 shares reserved for possible future issuance from time to time and shall have the voting powers, preferences and relative participating, optional and other special rights, and qualifications, limitations, and restrictions thereon as follows:

TERMS OF PREFERRED STOCK

Section 1. Designation, Amount and Par Value. The series of preferred stock shall be designated as its 2% Series A Convertible Preferred Stock (the "Preferred Stock") and the number of shares so designated shall be 500 (which shall not be subject to increase without the consent of the holders of the Preferred Stock (each, a "Holder" and collectively, the "Holders")). Each share of Preferred Stock shall have a par value of \$.01 and a stated value equal to the sum of \$10,000 plus all unpaid and accrued dividends to the date of determination to the extent not previously paid in cash in accordance with the terms hereof (the "Stated Value").

Section 2. Dividends.

(a) Holders shall be entitled to receive, out of funds legally available therefor, and the Company shall pay, cumulative dividends at the rate per share (as a percentage of the Stated Value per share) of 2% per annum, payable on each Conversion Date (as defined in Section 5(a)) for such share, in cash or by accretion of the Stated Value. Subject to the terms and conditions herein, the decision whether to accrete dividends hereunder to the Stated Value or to pay for dividends in cash shall be at the discretion of the Company. The Company shall provide the Holders written notice of its intention to accrete dividends hereunder to the Stated Value or pay dividends in cash not less than ten days prior to each Conversion Date for so long as shares of Preferred Stock are outstanding (the Company may indicate in such notice that the election contained in such notice shall continue for later periods until revised). Failure to timely provide such written notice shall be deemed (if permitted hereunder) an election by the Company to accrete dividends hereunder to the Stated Value. Dividends on the Preferred Stock shall be calculated on the basis of a 360-day year, shall accrue daily commencing on the Original Issue Date (as defined in Section 8), and shall be deemed to accrue from such date whether or not earned or declared and whether or not there are profits, surplus or other funds of the Company legally available for the payment of dividends. Except as otherwise provided herein, if at any time the Company pays less than the total amount of dividends then accrued on account of the Preferred Stock, such payment

shall be distributed ratably among the Holders based upon the number of shares of Preferred Stock held by each Holder. Any dividends to be paid in cash hereunder that are not paid within three Trading Days (as defined in Section 8) following a dividend payment date shall continue to accrue and shall entail a late fee, which must be paid in cash, at the rate of 18% per annum or the lesser rate permitted by applicable law (such fees to accrue daily, from the date such dividend is due hereunder through and including the date of payment).

(b) Notwithstanding anything to the contrary contained herein, the Company must pay dividends in cash if:

(i) the number of shares of Common Stock (as defined in Section 8) at the time authorized, unissued and unreserved for all purposes is insufficient to accrete such dividends to the Stated Value to permit conversion in full of all outstanding Stated Value;

(ii) after the Dividend Effectiveness Date (as defined in Section 8), Underlying Shares (as defined in Section 8) (x) are not registered for resale pursuant to an effective Underlying Shares Registration Statement (as defined in Section 8) and (y) may not be

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sold without volume restrictions pursuant to Rule 144 promulgated under the Securities Act (as defined in Section 8), as determined by counsel to the Company pursuant to a written opinion letter, addressed to the Company's transfer agent in the form and substance acceptable to the applicable Holder and such transfer agent (if the Company is permitted and elects to pay dividends in shares of Common Stock under this clause (ii) prior to the Dividend Effectiveness Date and thereafter an Underlying Shares Registration Statement shall be declared effective by the Commission (as defined in Section 8), the Company shall, within three Trading Days after the date of such declaration of effectiveness, exchange such Underlying Shares for shares of Common Stock that are free of restrictive legends of any kind);

(iii) the Common Stock is not then listed or quoted on the Nasdaq SmallCap Market ("NASDAQ"), or on the New York Stock Exchange, American Stock Exchange or Nasdaq National Market (each, a "Subsequent Market"); or

(iv) the accretion of such dividends to the Stated Value and subsequent conversions of all then outstanding Stated Value would result in a violation of Section 5(a)(iii) or the rules of the Nasdaq Stock Market or any other rules and regulations governing any Subsequent Market on which the Common Stock is then listed or quoted for trading.

(c) So long as any Preferred Stock shall remain outstanding, neither the Company nor any subsidiary thereof shall redeem, purchase or otherwise acquire directly or indirectly any Junior Securities (as defined in Section 8), nor shall the Company directly or indirectly pay or declare any dividend or make any distribution (other than a dividend or distribution described in Section 5 or dividends due and paid in the ordinary course on preferred stock of the Company at such times when the Company is in compliance with its payment and other obligations hereunder) upon, nor shall any distribution be made in respect of, any Junior Securities, nor shall any monies be set aside for or applied to the purchase or redemption (through a sinking fund or otherwise) of any Junior Securities or shares pari passu with the Preferred Stock. However, the Company may accept shares of Junior Securities as payment of the exercise price of stock options by the Company's employees, officers and directors.

Section 3. Voting Rights. Except as otherwise provided herein and as otherwise required by law, the Preferred Stock shall have no voting rights. However, so long as any shares of Preferred Stock are outstanding, the Company shall not, without the affirmative vote of the Holders of a majority of the shares of the Preferred Stock then outstanding, (a) alter or change adversely the powers, preferences or rights given to the Preferred Stock or alter or amend this Certificate of Designation, (b) authorize or create any class of stock ranking as to dividends or distribution of assets upon a Liquidation (as defined in Section 4) senior to or otherwise pari passu with the Preferred Stock, (c) amend its certificate or articles of incorporation or other charter documents so as to affect adversely any rights of the Holders, (d) increase the authorized number of shares of Preferred Stock, or (e) enter into any agreement with respect to the foregoing.

Section 4. Liquidation. Upon any liquidation, dissolution or winding-up of the Company, whether voluntary or involuntary (a "Liquidation"), the Holders shall be entitled to receive out of the assets of the Company, whether such assets are capital or surplus, for each share of Preferred Stock an amount equal to the Stated Value per share before any distribution or

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payment shall be made to the holders of any Junior Securities, and if the assets of the Company shall be insufficient to pay in full such amounts, then the entire assets to be distributed to the Holders shall be distributed among the Holders ratably in accordance with the respective amounts that would be payable on such shares if all amounts payable thereon were paid in full. A sale, conveyance or disposition of 50% or more of the assets of the Company or the effectuation by the Company of a transaction or series of related transactions in which more than 33% of the voting power of the Company is disposed of, or a consolidation or merger of the Company with or into any other company or companies into one or more companies not wholly-owned by the Company shall not be treated as a Liquidation, but instead shall be subject to the provisions of Section 5. The Company shall mail written notice of any such Liquidation, not less than 45 days prior to the payment date stated therein, to each record Holder.

Section 5. Conversion.

(a)(i) Conversions at Option of Holder. Each share of Preferred Stock shall be convertible into shares of Common Stock (subject to the limitations set forth in Section 5(a)(iii)), at the Conversion Ratio (as defined in Section 8), at the option of the Holder at any time and from time to time for a period of three years (unless extended pursuant to the terms hereof) from and after the Original Issue Date (the "Initial Conversion Date"). Holders shall effect conversions by surrendering the certificate or certificates representing the shares of Preferred Stock to be converted to the Company, together with the form of conversion notice attached hereto as Exhibit A (a "Conversion Notice"). Each Conversion Notice shall specify the number of shares of Preferred Stock to be converted and the date on which such conversion is to be effected, which date may not be prior to the date the Holder delivers such Conversion Notice pursuant to the terms of Section 5(h) hereof (the "Conversion Date"). If no Conversion Date is specified in a Conversion Notice, the Conversion Date shall be the date that a Conversion Notice is deemed delivered hereunder. If the Holder is converting less than all shares of Preferred Stock represented by the certificate or certificates tendered by the Holder with the Conversion Notice, or if a conversion hereunder cannot be effected in full for any reason, the Company shall promptly deliver to such Holder (in the manner and within the time set forth in Section 5(b)) a certificate representing the number of shares of Preferred Stock not converted.

(ii) Automatic Conversion. Subject to the provisions of this paragraph and Section 5(a)(iii)(B), all outstanding shares of Preferred Stock for which a Conversion Notice has not previously been received or of which redemption has not been made or required hereunder shall be automatically converted on the earlier of (i) the third anniversary of the Original Issue Date at the then applicable Conversion Price (as defined in Section 5(c)(i)), and (ii) the Trading Day, following the date on which the Underlying Shares Registration Statement is declared effective (the "Effective Date") on which the Closing Price (as defined in Section 8) is higher than \$50.00 (subject to equitable adjustment for stock split, combinations and similar events) for 20 consecutive Trading Days. The conversion contemplated by this paragraph shall not occur without the consent of the Holder at such time as (a) (1) an Underlying Shares Registration Statement is not then effective or (2) the Holder is not permitted to resell Underlying Shares pursuant to Rule 144(k) promulgated under the Securities Act, without volume restrictions, as evidenced by an opinion letter of counsel acceptable to the Holder and the transfer agent for the Common Stock; (b) there are not sufficient shares of Common Stock authorized and reserved for issuance upon such conversion; or (c) the Company shall have

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defaulted in any material respect on its covenants and obligations hereunder or under the Purchase Agreement or Registration Rights Agreement (each as defined in Section 7). Notwithstanding the foregoing, the three-year period for conversion under clause (i) of this Section shall be extended (on a day-for-day basis) for any Trading Days after the Effective Date that a Holder is unable to resell Underlying Shares under an Underlying Shares Registration Statement due to (a) the Common Stock not being listed or quoted for trading on the NASDAQ or any Subsequent Market, (b) the failure of such Underlying Shares Registration Statement to be declared effective, or if so declared, to remain effective during the Effectiveness Period (as defined in the Registration Rights Agreement) as to all Underlying Shares, or (c) the suspension of the Holder's right to resell Underlying Shares thereunder. The provisions of Sections 5(a)(iii)(A) and (B) shall not apply to any automatic conversion pursuant to this Section 5(a)(ii).

(iii) Certain Conversion Restrictions.

(A) A Holder may not convert shares of Preferred Stock or receive shares of Common Stock as payment of dividends hereunder to the extent such conversion or receipt of such dividend payment would result in the Holder, together with any affiliate thereof, beneficially owning (as determined in accordance with Section 13(d) of the Exchange Act (as defined in Section 8) and the rules promulgated thereunder) in excess of 9.999% of the then issued and

outstanding shares of Common Stock, including shares issuable upon conversion of, and payment of dividends on, the shares of Preferred Stock held by such Holder after application of this Section. Since the Holder will not be obligated to report to the Company the number of shares of Common Stock it may hold at the time of a conversion hereunder, unless the conversion at issue would result in the issuance of shares of Common Stock in excess of 9.999% of the then outstanding shares of Common Stock without regard to any other shares which may be beneficially owned by the Holder or an affiliate thereof, the Holder shall have the authority and obligation to determine whether the restriction contained in this Section will limit any particular conversion hereunder and to the extent that the Holder determines that the limitation contained in this Section applies, the determination of which portion of the shares of Preferred Stock are convertible shall be the responsibility and obligation of the Holder. If the Holder has delivered a Conversion Notice for shares of Preferred Stock that, without regard to any other shares of Common Stock that the Holder or its affiliates may beneficially own, would result in the issuance of shares of Common Stock in excess of the permitted amount hereunder, the Company shall notify the Holder of this fact and shall honor the conversion for the maximum number of shares of Preferred Stock permitted to be converted on such Conversion Date in accordance with the periods described in Section 5(b) and, at the option of the Holder, either retain shares of Preferred Stock tendered for conversion in excess of the permitted amount hereunder for future conversions or return such excess shares of Preferred Stock to the Holder. The provisions of this Section may be waived by a Holder (but only as to itself and not as to any other Holder) upon not less than 61 days prior notice to the Company. Other Holders shall be unaffected by any such waiver.

(B) If the Common Stock is then listed for trading on the NASDAQ or the Nasdaq National Market and the Company has not obtained the Shareholder Approval (as defined below), then the Company may not issue in excess of 1,749,507 of Common Stock upon conversions of Preferred Stock at a price per share that is less than the Closing Price on the Trading Day immediately preceding the Original Issue Date (such number of shares, the

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"Issuable Maximum"). The Issuable Maximum equals 19.999% of the number of shares of Common Stock outstanding immediately prior to the closing of transactions set forth in the Purchase Agreement. Each Holder shall be entitled to a portion of the Issuable Maximum equal to the quotient obtained by dividing (x) the number of shares of Preferred Stock issued and sold to such Holder on the Original Issue Date by (y) the aggregate number of shares of Preferred Stock issued and sold by the Company on the Original Issue Date. If any Holder shall no longer hold shares of Preferred Stock, then such Holder's remaining portion of the Issuable Maximum shall be allocated pro-rata among the remaining Holders. If on any Conversion Date (A) the shares of Common Stock are listed for trading on the NASDAQ or the Nasdaq National Market, (B) the Conversion Price then in effect is such that the aggregate number of shares of Common Stock that would then be issuable upon conversion in full of all then outstanding shares of Preferred Stock, together with any shares of Common Stock previously issued upon conversion of shares of Preferred Stock, would exceed the Issuable Maximum, and (C) the Company shall not have previously obtained the vote of shareholders (the "Shareholder Approval"), if any, as may be required by the applicable rules and regulations of the Nasdaq Stock Market (or any successor entity) applicable to approve the issuance of shares of Common Stock in excess of the Issuable Maximum pursuant to the terms hereof, then the Company shall issue to the Holder requesting a conversion a number of shares of Common Stock equal to such Holder's pro-rata portion (which shall be calculated pursuant to the terms hereof) of the Issuable Maximum and, with respect to the remainder of the aggregate Stated Value of the shares of Preferred Stock then held by such Holder for which a conversion in accordance with the Conversion Price would result in an issuance of shares of Common Stock in excess of such Holder's pro-rata portion (which shall be calculated pursuant to the terms hereof) of the Issuable Maximum (the "Excess Stated Value"), the converting Holder shall have the option to require the Company to either (1) use its best efforts to obtain the Shareholder Approval applicable to such issuance as soon as is possible, but in any event not later than the 90th day after such request, or (2) pay cash to the converting Holder in an amount equal to the Mandatory Redemption Amount (as defined in Section 8) for the Excess Stated Value. If the converting Holder shall have elected the first option pursuant to the immediately preceding sentence and the Company shall have failed to obtain the Shareholder Approval on or prior to the 90th day after such request, then within three (3) days of such 90th day, the Company shall pay cash to the converting Holder in an amount equal to the Mandatory Redemption Amount for the Excess Stated Value. If the Company fails to pay the Mandatory Redemption Amount in full pursuant to this Section within seven days after the date payable, the Company will pay interest thereon at a rate of 18% per annum or such lesser maximum amount that is permitted to be paid by applicable law, to the converting Holder, accruing daily from the Conversion Date until such amount, plus all such interest thereon, is paid in full. The Company and the Holder understand and agree that shares of Common Stock issued to and then held by the Holder as a result of conversions of Preferred Stock shall not be entitled to cast votes on any resolution to obtain Shareholder Approval pursuant hereto.

(b)(i) Not later than three Trading Days after each Conversion Date, the Company will deliver to the Holder (A) a certificate or certificates which shall be free of restrictive legends and trading restrictions (other than those required by Section 3.1(b) of the Purchase Agreement) representing the number of shares of Common Stock being acquired upon the conversion of shares of Preferred Stock, (B) one or more certificates representing the number of shares of Preferred Stock not converted and (C) a bank check in the amount of accrued and unpaid dividends (if the Company has elected or is required to pay accrued dividends in cash).

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Notwithstanding the foregoing or anything to the contrary contained herein, the Company shall not be obligated to issue certificates evidencing the shares of Common Stock issuable upon conversion of any shares of Preferred Stock until one Trading Day after certificates evidencing such shares of Preferred Stock are delivered for conversion to the Company, or the Holder of such Preferred Stock notifies the Company that such certificates have been lost, stolen or destroyed and provides a bond (or other adequate security) reasonably satisfactory to the Company to indemnify the Company from any loss incurred by it in connection therewith. The Company shall, upon request of the Holder, if available, use its best efforts to deliver any certificate or certificates required to be delivered by the Company under this Section electronically through the Depository Trust Corporation or another established clearing corporation performing similar functions. If in the case of any Conversion Notice such certificate or certificates are not delivered to or as directed by the applicable Holder by the third Trading Day after the Conversion Date, the Holder shall be entitled to elect by written notice to the Company at any time on or before its receipt of such certificate or certificates thereafter, to rescind such conversion, in which event the Company shall immediately return the certificates representing the shares of Preferred Stock tendered for conversion.

(ii) In addition to any other rights available to the Holder, if the Company fails to deliver to the Holder such certificate or certificates pursuant to Section 5(b)(i), by the third Trading Day after the Conversion Date, and if after such third Trading Day the Holder purchases (in an open market transaction or otherwise) Common Stock to deliver in satisfaction of a sale by such Holder of the Underlying Shares which the Holder was entitled to receive upon such conversion (a "Buy-In"), then the Company shall (A) pay in cash to the Holder the amount by which (x) the Holder's total purchase price (including brokerage commissions, if any) for the Common Stock so purchased exceeds (y) the product of (1) the aggregate number of shares of Common Stock that such Holder was entitled to receive from the conversion at issue multiplied by (2) the market price of the Common Stock at the time of the sale giving rise to such purchase obligation and (B) at the option of the Holder, either return the shares of Preferred Stock for which such conversion was not honored or deliver to such Holder the number of shares of Common Stock that would have been issued had the Company timely complied with its conversion and delivery obligations under Section 5(b)(i). For example, if the Holder purchases Common Stock having a total purchase price of \$11,000 to cover a Buy-In with respect to an attempted conversion of shares of Preferred Stock with respect to which the market price of the Underlying Shares on the date of conversion totaled \$10,000, under clause (A) of the immediately preceding sentence the Company shall be required to pay the Holder \$1,000. The Holder shall provide the Company written notice indicating the amounts payable to the Holder in respect of the Buy-In. Nothing herein shall limit a Holder's right to pursue any other remedies available to it hereunder, at law or in equity, including, without limitation, a decree of specific performance and/or injunctive relief with respect to the Company's failure to timely deliver certificates representing shares of Common Stock upon conversion of the shares of Preferred Stock as required pursuant to the terms hereof.

(c)(i) The conversion price (the "Conversion Price") for each share of Preferred Stock shall, subject to adjustment as hereinafter set forth, be as follows:

1. On and after the Initial Conversion Date, the Conversion Price shall equal \$35.00 (the "Fixed Conversion Price").

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2. Commencing September 14, 2000, and during each monthly period thereafter (each, a "Reset Date"), the Conversion Price will equal the lower of (a) the Fixed Conversion Price and (b) the Reset Conversion Price (as defined in Section 8).
3. For any conversion that occurs pursuant to clause (ii) of Section 5(a)(ii), the Conversion Price shall equal the Fixed Conversion Price.

(ii) If the Company, at any time while any shares of Preferred Stock are outstanding, shall (a) pay a stock dividend or otherwise make a distribution or distributions on shares of its Junior Securities or pari passu securities payable in shares of Common Stock, (b) subdivide outstanding shares of Common Stock into a larger number of shares, (c) combine outstanding shares of Common Stock into a smaller number of shares, or (d) issue by reclassification and exchange of the Common Stock any shares of capital stock of the Company, then the Fixed Conversion Price shall be multiplied by a fraction of which the numerator shall be the number of shares of Common Stock outstanding before such event and of which the denominator shall be the number of shares of Common Stock outstanding after such event. Any adjustment made pursuant to this Section 5(c)(ii) shall become effective immediately after the record date for the determination of shareholders entitled to receive such dividend or distribution and shall become effective immediately after the effective date in the case of a subdivision, combination or re-classification.

(iii) If the Company, at any time while any shares of Preferred Stock are outstanding, shall issue rights, warrants or options to all holders of Common Stock entitling them to subscribe for or purchase shares of Common Stock at a price per share less than the Per Share Market Value at the record date mentioned below, then the Conversion Price shall be multiplied by a fraction, the numerator of which shall be the number of shares of Common Stock outstanding immediately prior to the issuance of such rights, warrants or options, plus the number of shares of Common Stock which the aggregate offering price of the total number of shares so offered would purchase at such Per Share Market Value, and the denominator of which shall be the sum of the number of shares of Common Stock outstanding immediately prior to such issuance plus the number of shares of Common Stock offered for subscription or purchase. Such adjustment shall be made whenever such rights or warrants are issued, and shall become effective immediately after the record date for the determination of shareholders entitled to receive such rights or warrants. However, upon the expiration of any right, warrant or option to purchase shares of Common Stock the issuance of which resulted in an adjustment in the Conversion Price pursuant to this Section 5(c)(iii), if any such right, warrant or option shall expire and shall not have been exercised, the Conversion Price shall immediately upon such expiration shall be recomputed and effective immediately upon such expiration shall be increased to the price which it would have been (but reflecting any other adjustments in the Conversion Price made pursuant to the provisions of this Section 5 upon the issuance of other rights or warrants) had the adjustment of the Conversion Price made upon the issuance of such rights, warrants, or options been made on the basis of offering for subscription or purchase only that number of shares of Common Stock actually purchased upon the exercise of such rights, warrants or options actually exercised.

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(iv) If the Company or any subsidiary thereof, as applicable with respect to Common Stock Equivalents (as defined below), at any time while any shares of Preferred Stock are outstanding, shall issue shares of Common Stock or rights, warrants, options or other securities or debt that is convertible into or exchangeable for shares of Common Stock ("Common Stock Equivalents"), entitling any Person to acquire shares of Common Stock at a price per share less than the Conversion Price (if the holder of the Common Stock or Common Stock Equivalent so issued shall at any time, whether by operation of purchase price adjustments, reset provisions, floating conversion, exercise or exchange prices or otherwise, or due to warrants, options or rights issued in connection with such issuance, be entitled to receive shares of Common Stock at a price less than the Conversion Price, such issuance shall be deemed to have occurred for less than the Conversion Price), then the Conversion Price shall be multiplied by a fraction, the numerator of which shall be the number of shares of Common Stock outstanding immediately prior to the issuance of such Common Stock or such Common Stock Equivalents plus the number of shares of Common Stock which the offering price for such shares of Common Stock or Common Stock Equivalents would purchase at the Conversion Price, and the denominator of which shall be the sum of the number of shares of Common Stock outstanding immediately prior to such issuance plus the number of shares of Common Stock so issued or issuable, provided, that for purposes hereof, all shares of Common Stock that are issuable upon conversion, exercise or exchange of Common Stock Equivalents shall be deemed outstanding immediately after the issuance of such Common Stock Equivalents. Such adjustment shall be made whenever such Common Stock or Common Stock Equivalents are issued. However, upon the expiration of any Common Stock Equivalents the issuance of which resulted in an adjustment in the Conversion Price pursuant to this Section, if any such Common Stock Equivalents shall expire and shall not have been exercised, the Conversion Price shall immediately upon such expiration be recomputed and effective immediately upon such expiration be increased to the price which it would have been (but reflecting any other adjustments in the Conversion Price made pursuant to the provisions of this Section after the issuance of such Common Stock Equivalents) had the adjustment of the Conversion Price made upon the issuance of such Common Stock Equivalents been made on the basis of offering for subscription or purchase only that number of shares of the Common Stock actually purchased upon the exercise of such Common Stock Equivalents actually exercised. Notwithstanding anything herein to the contrary, the following shall not be subject to the provisions of

this Section: (1) issuances of any stock or stock options under any employee benefit plan of the Company whether now existing or approved by the Company and its stockholders in the future, (2) the rights, options and warrants outstanding prior to the date hereof and specified in Schedule 2.1(c) to the Purchase Agreement, but not any modifications thereof and (3) the issuance of shares of Common Stock in payment of the purchase price of a Strategic Transaction (as defined below). For purposes of this Section, a "Strategic Transaction" shall mean a transaction or relationship in which the Company issues shares of Common Stock to an entity which is, itself or through its subsidiaries, an operating company in a business related to the business of the Company and in which the Company receives material benefits in addition to the investment of funds, but shall not include a transaction in which the Company is issuing securities primarily for the purpose of raising capital.

(v) If the Company, at any time while shares of Preferred Stock are outstanding, shall distribute to all holders of Common Stock (and not to Holders) evidences of its indebtedness or assets or rights or warrants to subscribe for or purchase any security (excluding

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those referred to in Sections 5(c)(ii)-(iv) above), then in each such case the Conversion Price at which each share of Preferred Stock shall thereafter be convertible shall be determined by multiplying the Conversion Price in effect immediately prior to the record date fixed for determination of shareholders entitled to receive such distribution by a fraction of which the denominator shall be the Per Share Market Value determined as of the record date mentioned above, and of which the numerator shall be such Per Share Market Value on such record date less the then fair market value at such record date of the portion of such assets or evidence of indebtedness so distributed applicable to one outstanding share of Common Stock as determined by the Board of Directors in good faith. In either case the adjustments shall be described in a statement provided to the Holders of the portion of assets or evidences of indebtedness so distributed or such subscription rights applicable to one share of Common Stock. Such adjustment shall be made whenever any such distribution is made and shall become effective immediately after the record date mentioned above.

(vi) All calculations under this Section 5 shall be made to the nearest cent or the nearest 1/100th of a share, as the case may be. The number of shares of Common Stock outstanding at any given time shall not include shares owned or held by or for the account of the Company, and the disposition of any such shares shall be considered an issue or sale of Common Stock.

(vii) Whenever the Fixed Conversion Price or the Conversion Price is adjusted pursuant to Section 5(c)(ii), (iii), (iv) or (v), the Company shall promptly mail to each Holder a notice setting forth the Conversion Price or Fixed Conversion Price (as applicable) after such adjustment and setting forth a brief statement of the facts requiring such adjustment.

(viii) In case of any reclassification of the Common Stock, or any compulsory share exchange pursuant to which the Common Stock is converted into other securities, cash or property (other than compulsory share exchanges which constitute Change of Control Transactions (as defined in Section 8)), the Holders of the Preferred Stock then outstanding shall have the right thereafter to convert such shares only into the shares of stock and other securities, cash and property receivable upon or deemed to be held by holders of Common Stock following such reclassification or share exchange, and the Holders of the Preferred Stock shall be entitled upon such event to receive such amount of securities, cash or property as a holder of the number of shares of Common Stock of the Company into which such shares of Preferred Stock could have been converted immediately prior to such reclassification or share exchange would have been entitled. This provision shall similarly apply to successive reclassifications or share exchanges.

(ix) In case of any merger or consolidation of the Company with or into another Person, or sale by the Company of more than one-half of the assets of the Company (on an as valued basis) in one or a series of related transactions, a Holder shall have the right thereafter to (A) convert its shares of Preferred Stock into the shares of stock and other securities, cash and property receivable upon or deemed to be held by holders of Common Stock following such merger, consolidation or sale, and such Holder shall be entitled upon such event or series of related events to receive such amount of securities, cash and property as the shares of Common Stock into which such shares of Preferred Stock could have been converted immediately prior to such merger, consolidation or sale would have been entitled or (B) in the

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case of a merger or consolidation, (x) require the surviving entity to issue shares of convertible preferred stock or convertible debentures with such aggregate stated value or in such face amount, as the case may be, equal to the

Stated Value of the shares of Preferred Stock then held by such Holder, plus all accrued and unpaid dividends and other amounts owing thereon, which newly issued shares of preferred stock or debentures shall have terms identical (including with respect to conversion) to the terms of the Preferred Stock (except, in the case of debentures, as may be required to reflect the differences between debt and equity) and shall be entitled to all of the rights and privileges of a Holder of Preferred Stock set forth herein and in the agreements pursuant to which the Preferred Stock was issued (including, without limitation, as such rights relate to the acquisition, transferability, registration and listing of such shares of stock or other securities issuable upon conversion thereof), and (y) simultaneously with the issuance of such convertible preferred stock or convertible debentures, shall have the right to convert such instrument only into shares of stock and other securities, cash and property receivable upon or deemed to be held by holders of Common Stock following such merger or consolidation. In the case of clause (B), the conversion price applicable for the newly issued shares of convertible preferred stock or convertible debentures shall be based upon the amount of securities, cash and property that each share of Common Stock would receive in such transaction, the Conversion Ratio immediately prior to the effectiveness or closing date for such transaction and the Conversion Price stated herein. The terms of any such merger, sale or consolidation shall provide the Holders of Preferred Stock the right to receive the securities, cash and property set forth in this Section upon any conversion or redemption following such event. This provision shall similarly apply to successive such events. The rights set forth in this Section 5(c)(ix) shall not alter the rights of a Holder set forth in Section 7, provided, that, a Holder may only exercise the rights set forth in this Section 5(c)(ix) or the rights set forth in Section 7 with respect to a single event giving rise to such rights.

(x) If (a) the Company shall declare a dividend (or any other distribution) on the Common Stock, (b) the Company shall declare a special nonrecurring cash dividend on or a redemption of the Common Stock, (c) the Company shall authorize the granting to all holders of Common Stock rights or warrants to subscribe for or purchase any shares of capital stock of any class or of any rights, (d) the approval of any shareholders of the Company shall be required in connection with any reclassification of the Common Stock, any consolidation or merger to which the Company is a party, any sale or transfer of all or substantially all of the assets of the Company, or any compulsory share exchange whereby the Common Stock is converted into other securities, cash or property, or (e) the Company shall authorize the voluntary or involuntary dissolution, liquidation or winding-up of the affairs of the Company, then the Company shall notify the Holders at their last addresses as they shall appear upon the stock books of the Company, at least 10 calendar days prior to the applicable record or effective date hereinafter specified, a notice stating (x) the date on which a record is to be taken for the purpose of such dividend, distribution, redemption, rights or warrants, or if a record is not to be taken, the date as of which the holders of Common Stock of record entitled to such dividend, distribution, redemption, rights or warrants are to be determined or (y) the date on which such reclassification, consolidation, merger, sale, transfer or share exchange is expected to become effective or close, and the date as of which it is expected that holders of Common Stock of record shall be entitled to exchange their Common Stock for securities, cash or other property deliverable upon such reclassification, consolidation, merger, sale, transfer or share exchange.

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Holders are entitled to convert shares of Preferred Stock during the 20-day period commencing the date of such notice to the effective date of the event triggering such notice.

(d) The Company covenants that it will at all times reserve and keep available out of its authorized and unissued shares of Common Stock solely for the purpose of issuance upon conversion of Preferred Stock, free from preemptive rights or any other actual contingent purchase rights of persons other than the Holders, not less than such number of shares of Common Stock as shall be issuable (taking into account the provisions of Section 5(a) and Section 5(c)) upon the conversion of all outstanding shares of Preferred Stock. The Company covenants that all shares of Common Stock that shall be so issuable shall, upon issuance, be duly and validly authorized and issued and fully paid and nonassessable.

(e) Upon a conversion hereunder the Company shall not be required to issue stock certificates representing fractions of shares of Common Stock, but may, if otherwise permitted, make a cash payment in respect of any final fraction of a share based on the Per Share Market Value at such time. If any fraction of an Underlying Share would, except for the provisions of this Section, be issuable upon a conversion hereunder, the Company shall pay an amount in cash equal to the Conversion Ratio multiplied by such fraction.

(f) The issuance of certificates for Common Stock on conversion of Preferred Stock shall be made without charge to the Holders thereof for any documentary stamp or similar taxes that may be payable in respect of the issue

or delivery of such certificate, provided that the Company shall not be required to pay any tax that may be payable in respect of any transfer involved in the issuance and delivery of any such certificate upon conversion in a name other than that of the Holder of such shares of Preferred Stock so converted.

(g) Shares of Preferred Stock converted into Common Stock or redeemed in accordance with the terms hereof shall be canceled and may not be reissued.

(h) Any and all notices or other communications or deliveries to be provided by the Holders of the Preferred Stock hereunder, including, without limitation, any Conversion Notice, shall be in writing and delivered personally, by facsimile or sent by a nationally recognized overnight courier service, addressed to the attention of the Chief Financial Officer of the Company addressed to 2950 N.E. 84th Lane, Blaine, Minnesota 55449 or to facsimile number 763-784-2038, or to such other address or facsimile number as shall be specified in writing by the Company for such purpose. Any and all notices or other communications or deliveries to be provided by the Company hereunder shall be in writing and delivered personally, by facsimile or sent by a nationally recognized overnight courier service, addressed to each Holder at the facsimile telephone number or address of such Holder appearing on the books of the Company, or if no such facsimile telephone number or address appears, at the principal place of business of the Holder. Any notice or other communication or deliveries hereunder shall be deemed given and effective on the earliest of (i) the date of transmission, if such notice or communication is delivered via facsimile at the facsimile telephone number specified in this Section prior to 6:30 p.m. (New York City time) (with confirmation of transmission), (ii) the date after the date of transmission, if such notice or communication is delivered via facsimile at the facsimile telephone number specified in this Section later than 6:30 p.m. (New York City time) on any date and earlier than 11:59 p.m. (New York City time) on such date (with confirmation of

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transmission), (iii) the next business day, if sent by a nationally recognized overnight courier service, or (iv) upon actual receipt by the party to whom such notice is required to be given.

Section 6. Optional Redemption.

(a) Subject to the provisions of this Section 6, from and after the Original Issue Date, the Company shall have the right, upon 30 calendar days' notice (an "Optional Redemption Notice") to the Holders, to redeem all or any portion of the shares of Preferred Stock which have not previously been redeemed or for which Conversion Notices shall not have been delivered, at a price equal to the Optional Redemption Price (as defined in Section 8). If on the date of the delivery of the Optional Redemption Notice the Conversion Price shall be equal to or greater than \$30.00, then the Company may only deliver an Optional Redemption Notice if: (i) the number of shares of Common Stock at the time authorized, unissued and unreserved for all purposes is sufficient to satisfy the Company's conversion obligations of all shares of Preferred Stock then outstanding, (ii) the Underlying Shares then outstanding are registered for resale pursuant to an effective Underlying Shares Registration Statement pursuant to which the Holders are permitted to sell Underlying Shares or the Underlying Shares may be resold without volume restrictions pursuant to Rule 144(k) promulgated under the Securities Act, and (iii) the Common Stock is listed for trading on the NASDAQ or on a Subsequent Market. If on the date of the delivery of the Optional Redemption Notice the Conversion Price shall be equal to or greater than \$30.00, then each of clauses (i) - (iii) of the immediately preceding sentence must be true during the entire 30 calendar days between the date of delivery of an Optional Redemption Notice and the date of payment of the Optional Redemption Price. The entire Optional Redemption Price shall be paid in cash. If on the date of the delivery of the Optional Redemption Notice the Conversion Price shall be equal to or greater than \$30.00, then a Holder may, subject to Section 5(a)(i) hereof, convert (and the Company shall honor such conversions in accordance with the terms hereof) any or all of the shares of Preferred Stock subject to an Optional Redemption Notice, provided, that the Conversion Notice for such shares is delivered prior to the 27th calendar day following the receipt by such Holder of such an Optional Redemption Notice.

(b) Failure by the Company to pay any portion of the Optional Redemption Price by the 30th calendar day following the date of the delivery by the Company of an Optional Redemption Notice shall result in the invalidation ab initio of the unpaid portion of such optional redemption, and, notwithstanding anything herein to the contrary, the Company shall thereafter have no further rights to optionally redeem any shares of Preferred Stock. In such event, the Company shall, at the option of the Holder, either, (i) not later than three Trading Days from receipt of Holder's request for such election, return to the Holder all of the shares of Preferred Stock for which such Optional Redemption Price has not been paid in full (the "Unpaid Redemption Shares") or (ii) convert all or any portion of the Unpaid Redemption Shares, in which event the Per Share Market Value for such shares shall be the lower of the Per Share Market Value

calculated on the date the payment of the Optional Redemption Price was originally due and the Per Share Market Value as of the Holder's written demand for conversion. If the Holder elects option (ii) above, the Company shall within three Trading Days of its receipt of such election deliver to the Holder the shares of Common Stock issuable upon conversion of the Unpaid Redemption Shares subject to such Holder's conversion demand and otherwise perform its obligations hereunder with respect thereto.

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Section 7. Redemption Upon Triggering Events.

(a) Upon the occurrence of a Triggering Event, each Holder shall (in addition to all other rights it may have hereunder or under applicable law), have the right, exercisable at the sole option of such Holder, to require the Company to redeem all or a portion of the Preferred Stock then held by such Holder for a redemption price, in cash, equal to the sum of (i) the Mandatory Redemption Amount plus (ii) the product of (A) the number of Underlying Shares issued in respect of conversions hereunder and then held by the Holder and (B) the Per Share Market Value on the date such redemption is demanded or the date the redemption price hereunder is paid in full, whichever is greater (such sum, the "Redemption Price"). The Redemption Price shall be due and payable within five Trading Days of the date on which the notice for the payment therefor is provided by a Holder. If the Company fails to pay the Redemption Price hereunder in full pursuant to this Section on the date such amount is due in accordance with this Section, the Company will pay interest thereon at a rate of 18% per annum (or the lesser amount permitted by applicable law), accruing daily from such date until the Redemption Price, plus all such interest thereon, is paid in full. For purposes of this Section, a share of Preferred Stock is outstanding until such date as the Holder shall have received Underlying Shares upon a conversion (or attempted conversion) thereof that meets the requirements hereof.

A "Triggering Event" means any one or more of the following events (whatever the reason and whether it shall be voluntary or involuntary or effected by operation of law or pursuant to any judgment, decree or order of any court, or any order, rule or regulation of any administrative or governmental body):

(i) the failure of an Underlying Shares Registration Statement to be declared effective by the Commission on or prior to the 180th day after the Original Issue Date;

(ii) if, during the Effectiveness Period, the effectiveness of the Underlying Shares Registration Statement lapses for any reason for more than an aggregate of seven Trading Days (which need not be consecutive Trading Days), or the Holder shall not be permitted to resell Registrable Securities under the Underlying Shares Registration Statement for more than an aggregate of seven Trading Days (which need not be consecutive Trading Days);

(iii) the failure of the Common Stock to be listed for trading on the NASDAQ or on a Subsequent Market or the suspension of the Common Stock from trading on the NASDAQ or on a Subsequent Market, in either case, for more than seven Trading Days (which need not be consecutive Trading Days);

(iv) the Company shall fail for any reason to deliver certificates representing Underlying Shares issuable upon a conversion hereunder that comply with the provisions hereof prior to the tenth day after the Conversion Date or the Company shall provide notice to any Holder, including by way of public announcement, at any time, of its intention not to comply with requests for conversion of any shares of Preferred Stock in accordance with the terms hereof;

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(v) the Company shall be a party to any Change of Control Transaction, or shall redeem more than a de minimis number of shares of Common Stock or other Junior Securities (other than redemptions of Underlying Shares);

(vi) an Event (as defined in the Registration Rights Agreement) shall not have been cured to the satisfaction of the Holders prior to the expiration of 60 days from the Event Date (as defined in the Registration Rights Agreement) relating thereto (other than an Event resulting from a failure of an Underlying Shares Registration Statement to be declared effective by the Commission on or prior to the 180th day after the Original Issue Date, which shall be covered by Section 7(a)(i));

(vii) the Company shall fail for any reason to pay in full the amount of cash due pursuant to a Buy-In within seven days after notice therefor is delivered hereunder or shall fail to pay all amounts owed on account of an Event within seven days of the date due;

(viii) the Company shall fail to have available a sufficient number of authorized and unreserved shares of Common Stock to issue to such Holder upon a conversion hereunder; or

(ix) the Company shall fail to observe or perform any other covenant, agreement or warranty contained in, or otherwise commit any breach of the Transaction Documents (as defined in Section 8), and such failure or breach shall not, if subject to the possibility of a cure by the Company, have been remedied within twenty Business Days after the date on which written notice of such failure or breach shall have been given.

Section 8. Definitions. For the purposes hereof, the following terms shall have the following meanings:

"Change of Control Transaction" means the occurrence of any of (i) an acquisition after the date hereof by an individual or legal entity or "group" (as described in Rule 13d-5(b)(1) promulgated under the Exchange Act) of effective control (whether through legal or beneficial ownership of capital stock of the Company, by contract or otherwise) of in excess of 33% of the voting securities of the Company, (ii) a replacement at one time or over time of more than one-half of the members of the Company's board of directors which is not approved by a majority of those individuals who are members of the board of directors on the date hereof (or by those individuals who are serving as members of the board of directors on any date whose nomination to the board of directors was approved by a majority of the members of the board of directors who are members on the date hereof), (iii) the merger of the Company with or into another entity that is not wholly-owned by the Company, consolidation or sale of 50% or more of the assets of the Company in one or a series of related transactions, or (iv) the execution by the Company of an agreement to which the Company is a party or by which it is bound, providing for any of the events set forth above in (i), (ii) or (iii).

"Closing Price" means on any particular date (a) the closing sales price per share of Common Stock on such date on the NASDAQ or on the Subsequent Market on which the Common Stock is then listed or quoted, or if there is no such price on such date, then the closing sales price on the NASDAQ or on such Subsequent Market on the date nearest preceding such

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date, or (b) if the Common Stock is not then listed or quoted on the NASDAQ or on a Subsequent Market, the closing sales price for a share of Common Stock in the over-the-counter market, as reported by the National Quotation Bureau Incorporated (or similar organization or agency succeeding to its functions of reporting prices) at the close of business on such date, or (c) if the Common Stock is not then reported by the National Quotation Bureau Incorporated (or similar organization or agency succeeding to its functions of reporting prices), then the average of the "Pink Sheet" quotes for the relevant conversion period, as determined in good faith by the Holder, or (d) if the Common Stock is not then publicly traded the fair market value of a share of Common Stock as determined by an Appraiser selected in good faith by the Holders of a majority of the shares of the Preferred Stock.

"Commission" means the Securities and Exchange Commission.

"Common Stock" means the Company's common stock, par value \$.01 per share, and stock of any other class into which such shares may hereafter have been reclassified or changed.

"Conversion Ratio" means, at any time, a fraction, the numerator of which is Stated Value (or Excess Stated Value, as the case may be) and the denominator of which is the Conversion Price at such time.

"Dividend Effectiveness Date" means the earlier to occur of (x) the Effectiveness Date (as defined in the Registration Rights Agreement) and (y) the date that an Underlying Shares Registration Statement is declared effective by the Commission.

"Exchange Act" means the Securities Exchange Act of 1934, as amended.

"Junior Securities" means the Common Stock and all other equity securities of the Company other than those securities that are outstanding on the Original Issue Date and which are explicitly senior in rights or liquidation preference to the Preferred Stock.

"Mandatory Redemption Amount" for each share of Preferred Stock means the sum of (i) the greater of (A) 120% of the Stated Value (or Excess Stated Value, as the case may be) and (B) the product of (a) the Per Share Market Value on the Trading Day immediately preceding (x) the date of the Triggering Event or the Conversion Date, as the case may be, or (y) the date of payment in full by the Company of the applicable redemption price, whichever is greater, and (b) the Conversion Ratio calculated on the date of the Triggering

Event, or the Conversion Date, as the case may be, and (ii) all other amounts, costs, expenses and liquidated damages due in respect of such share of Preferred Stock.

"Optional Redemption Price" shall be sum of (i) 100% of the Stated Value of the shares of Preferred Stock to be redeemed pursuant to Section 6 and (ii) any other amounts or liquidated damages due in respect of such shares of Preferred Stock.

"Original Issue Date" shall mean the date of the first issuance of any shares of the Preferred Stock regardless of the number of transfers of any particular shares of Preferred Stock and regardless of the number of certificates which may be issued to evidence such Preferred Stock.

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"Per Share Market Value" means on any particular date (a) the closing bid price per share of Common Stock on such date on the NASDAQ or on the Subsequent Market on which the Common Stock is then listed or quoted, or if there is no such price on such date, then the closing bid price on the NASDAQ or on such Subsequent Market on the date nearest preceding such date, or (b) if the Common Stock is not then listed or quoted on the NASDAQ or on a Subsequent Market, the closing bid price for a share of Common Stock in the over-the-counter market, as reported by the National Quotation Bureau Incorporated (or similar organization or agency succeeding to its functions of reporting prices) at the close of business on such date, or (c) if the Common Stock is not then reported by the National Quotation Bureau Incorporated (or similar organization or agency succeeding to its functions of reporting prices), then the average of the "Pink Sheet" quotes for the relevant conversion period, as determined in good faith by the Holder, or (d) if the Common Stock is not then publicly traded, the fair market value of a share of Common Stock as determined by an Appraiser selected in good faith by the Holders of a majority of the shares of the Preferred Stock.

"Person" means a corporation, an association, a partnership, an organization, a business, an individual, a government or political subdivision thereof or a governmental agency.

"Purchase Agreement" means the Convertible Preferred Stock Purchase Agreement, dated as of the Original Issue Date, to which the Company and the original Holder are parties, as amended, modified or supplemented from time to time in accordance with its terms.

"Registration Rights Agreement" means the Registration Rights Agreement, dated as of the Original Issue Date, to which the Company and the original Holder are parties, as amended, modified or supplemented from time to time in accordance with its terms.

"Reset Conversion Price" means the average of the Per Share Market Values during the five Trading Days preceding the applicable Reset Date; provided, that (1) such five Trading Day period shall be extended for the number of Trading Days during such period in which (A) trading in the Common Stock is suspended by the NASDAQ or a Subsequent Market on which the Common Stock is then listed, or (B) after the date declared effective by the Commission, the Underlying Shares Registration Statement is not effective, or (C) after the date declared effective by the Commission, the Prospectus included in the Underlying Shares Registration Statement may not be used by the Holder for the resale of Underlying Shares; and (2) the Reset Conversion Price that will control during any monthly period shall equal the lowest Reset Conversion Price determined from the initial Reset Date.

"Securities Act" means the Securities Act of 1933, as amended.

"Trading Day" means (a) a day on which the Common Stock is traded on the NASDAQ or on the Subsequent Market on which the Common Stock is then listed or quoted, as the case may be, or (b) if the Common Stock is not listed on the NASDAQ or on a Subsequent Market, a day on which the Common Stock is traded in the over-the-counter market, as reported by the OTC Bulletin Board, or (c) if the Common Stock is not quoted on the OTC Bulletin Board, a day on which the Common Stock is quoted in the over-the-counter market as reported by the National Quotation Bureau Incorporated (or any similar organization or agency

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succeeding to its functions of reporting prices); provided, however, that in the event that the Common Stock is not listed or quoted as set forth in (a), (b) and (c) hereof, then Trading Day shall mean any day except Saturday, Sunday and any day which shall be a legal holiday or a day on which banking institutions in the State of New York or the State of Minnesota are authorized or required by law or other government action to close.

"Transaction Documents" shall have the meaning set forth in the Purchase Agreement.

"Underlying Shares" means, collectively, the shares of Common Stock into which the shares of Preferred Stock are convertible in accordance with the terms hereof.

"Underlying Shares Registration Statement" means a registration statement that meets the requirements of the Registration Rights Agreement and registers the resale of all Underlying Shares by the Holder, who shall be named as a "selling stockholder" thereunder.

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EXHIBIT A

NOTICE OF CONVERSION

(To be Executed by the Registered Holder
in order to Convert shares of Preferred Stock)

The undersigned hereby elects to convert the number of shares of 2% Series A Convertible Preferred Stock indicated below, into shares of common stock, par value \$.01 per share (the "Common Stock"), of APA Optics Inc., a Minnesota corporation (the "Company"), according to the conditions hereof, as of the date written below. If shares are to be issued in the name of a person other than undersigned, the undersigned will pay all transfer taxes payable with respect thereto and is delivering herewith such certificates and opinions as reasonably requested by the Company in accordance therewith. No fee will be charged to the Holder for any conversion, except for such transfer taxes, if any.

Conversion calculations:

Date to Effect Conversion

Number of shares of Preferred Stock to be Converted

Stated Value of shares of Preferred Stock to be Converted

Number of shares of Common Stock to be Issued

Applicable Conversion Price

Signature

Name

Address

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IN WITNESS WHEREOF, the Company has caused this Certificate to be duly executed by the President of the Company this 13th day of March, 2000.

APA OPTICS, INC.

By: /s/ Anil K. Jain

Name: Anil K. Jain
Title: President

[STAMP]
STATE OF MINNESOTA
DEPARTMENT OF STATE
FILED DUP COPY
MAR 15 2000

Mary Kiffmeyer
SECRETARY OF STATE

NEITHER THESE SECURITIES NOR THE SECURITIES INTO WHICH THESE SECURITIES ARE EXERCISABLE HAVE BEEN REGISTERED WITH THE SECURITIES AND EXCHANGE COMMISSION OR THE SECURITIES COMMISSION OF ANY STATE IN RELIANCE UPON AN EXEMPTION FROM REGISTRATION UNDER SECURITIES ACT OF 1933, AS AMENDED (THE "SECURITIES ACT"), AND, ACCORDINGLY, MAY NOT BE OFFERED OR SOLD EXCEPT PURSUANT TO AN EFFECTIVE REGISTRATION STATEMENT UNDER THE SECURITIES ACT OR PURSUANT TO AN AVAILABLE EXEMPTION FROM THE REGISTRATION REQUIREMENTS THEREUNDER AND IN COMPLIANCE WITH APPLICABLE STATE SECURITIES OR BLUE SKY LAWS.

APA OPTICS, INC.

WARRANT

Warrant No. ____ Dated: March 15, 2000

APA Optics, Inc., a Minnesota corporation (the "Company"), hereby certifies that, for value received, [] or its registered assigns ("Holder"), is entitled, subject to the terms set forth below, to purchase from the Company up to a total of 50,000 shares of common stock, \$.01 par value per share (the "Common Stock"), of the Company (each such share, a "Warrant Share" and all such shares, the "Warrant Shares") at an exercise price equal to \$35.00 per share (as adjusted from time to time as provided in Section 8, the "Exercise Price"), at any time and from time to time from and after the date hereof and through and including March 15, 2005 (the "Expiration Date"), and subject to the following terms and conditions:

1. Registration of Warrant. The Company shall register this Warrant, upon records to be maintained by the Company for that purpose (the "Warrant Register"), in the name of the record Holder hereof from time to time. The Company may deem and treat the registered Holder of this Warrant as the absolute owner hereof for the purpose of any exercise hereof or any distribution to the Holder, and for all other purposes, and the Company shall not be affected by notice to the contrary.

2. Registration of Transfers and Exchanges.

(a) The Company shall register the transfer of any portion of this Warrant in the Warrant Register, upon surrender of this Warrant, with the Form of Assignment attached hereto duly completed and signed, to the Transfer Agent or to the Company at the address for notice set forth in Section 12. Upon any such registration or transfer, a new warrant to purchase Common Stock, in substantially the form of this Warrant (any such new warrant, a "New Warrant"), evidencing the portion of this Warrant so transferred shall be issued to the transferee and a New Warrant evidencing the remaining portion of this Warrant not so transferred, if any, shall be issued to the transferring Holder. The acceptance of the New Warrant by the transferee thereof shall be deemed the acceptance by such transferee of all of the rights and obligations of a holder of a Warrant.

(b) This Warrant is exchangeable, upon the surrender hereof by the Holder to the office of the Company at the address for notice set forth in Section 12 for one or more New Warrants, evidencing in the aggregate the right to purchase the number of Warrant Shares which may then be purchased hereunder. Any such New Warrant will be dated the date of such exchange.

3. Duration and Exercise of Warrants.

(a) This Warrant shall be exercisable by the registered Holder on any business day before 6:30 P.M., New York City time, at any time and from time to time on or after the date hereof to and including the Expiration Date. At 6:30 P.M., New York City time on the Expiration Date, the portion of this Warrant not exercised prior thereto shall be and become void and of no value. Prior to the Expiration Date, the Company may not call or otherwise redeem this Warrant without the prior written consent of the Holder.

(b) Subject to Sections 2(b), 5 and 9, upon surrender of this Warrant, with the Form of Election to Purchase attached hereto duly completed and signed, to the Company at its address for notice set forth in Section 12 and upon payment of the Exercise Price multiplied by the number of Warrant Shares that the Holder intends to purchase hereunder, in the manner provided hereunder, all as specified by the Holder in the Form of Election to Purchase, the Company shall promptly (but in no event later than 3 business days after the Date of Exercise (as defined herein)) issue or cause to be issued and cause to be

delivered to or upon the written order of the Holder and in such name or names as the Holder may designate, a certificate for the Warrant Shares issuable upon such exercise, free of restrictive legends except (i) either in the event that a registration statement covering the resale of the Warrant Shares and naming the Holder as a selling shareholder thereunder is not then effective or the Warrant Shares are not freely transferable without volume restrictions pursuant to Rule 144(k) promulgated under the Securities Act of 1933 as amended (the "Securities Act"), or (ii) if this Warrant shall have been issued pursuant to a written agreement between the original Holder and the Company, as required by such agreement. Any person so designated by the Holder to receive Warrant Shares shall be deemed to have become holder of record of such Warrant Shares as of the Date of Exercise of this Warrant. The Company shall, upon request of the Holder, if available, use its best efforts to deliver Warrant Shares hereunder electronically through the Depository Trust Corporation or another established clearing corporation performing similar functions.

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A "Date of Exercise" means the date on which the Company shall have received (i) this Warrant (or any New Warrant, as applicable), with the Form of Election to Purchase attached hereto (or attached to such New Warrant) appropriately completed and duly signed, and (ii) payment of the Exercise Price for the number of Warrant Shares so indicated by the Holder hereof to be purchased.

(c) This Warrant shall be exercisable, either in its entirety or, from time to time, for a portion of the number of Warrant Shares. If less than all of the Warrant Shares which may be purchased under this Warrant are exercised at any time, the Company shall issue or cause to be issued, at its expense, a New Warrant evidencing the right to purchase the remaining number of Warrant Shares for which no exercise has been evidenced by this Warrant.

4. Piggyback Registration Rights. During the Effectiveness Period (as defined in the Registration Rights Agreement, of even date herewith, between the Company and the original Holder), the Company may not file any registration statement with the Securities and Exchange Commission (other than registration statements of the Company filed on Form S-8 or Form S-4, each as promulgated under the Securities Act, pursuant to which the Company is registering securities pursuant to a Company employee benefit plan or pursuant to a merger, acquisition or similar transaction including supplements thereto, but not additionally filed registration statements in respect of such securities) at any time when there is not an effective registration statement covering the resale of the Warrant Shares and naming the Holder as a selling shareholder thereunder, unless the Company provides the Holder with not less than 20 days notice of its intention to file such registration statement and provides the Holder the option to include any or all of the applicable Warrant Shares therein, subject, in the event of an underwritten offering, to customary cutbacks and lock-ups requested by the managing underwriter of all selling stockholders thereunder, on a pro-rata basis with such other selling stockholders. The piggyback registration rights granted to the Holder pursuant to this Section shall continue until all of the Holder's Warrant Shares have been sold in accordance with an effective registration statement or upon the Expiration Date. The Company will pay all registration expenses in connection therewith.

5. Payment of Taxes. The Company will pay all documentary stamp taxes attributable to the issuance of Warrant Shares upon the exercise of this Warrant; provided, however, that the Company shall not be required to pay any tax which may be payable in respect of any transfer involved in the registration of any certificates for Warrant Shares or Warrants in a name other than that of the Holder. The Holder shall be responsible for all other tax liability that may arise as a result of holding or transferring this Warrant or receiving Warrant Shares upon exercise hereof.

6. Replacement of Warrant. If this Warrant is mutilated, lost, stolen or destroyed, the Company shall issue or cause to be issued in exchange and substitution for and upon cancellation hereof, or in lieu of and substitution for this Warrant, a New Warrant, but only upon receipt of evidence reasonably satisfactory to the Company of such loss, theft or destruction and indemnity, if requested, satisfactory to it. Applicants for a New Warrant under such circumstances shall also comply with such other reasonable regulations and procedures and pay such other reasonable charges as the Company may prescribe.

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7. Reservation of Warrant Shares. The Company covenants that it will at all times reserve and keep available out of the aggregate of its authorized but unissued Common Stock, solely for the purpose of enabling it to issue Warrant Shares upon exercise of this Warrant as herein provided, the number of Warrant Shares which are then issuable and deliverable upon the exercise of this entire Warrant, free from preemptive rights or any other actual contingent purchase rights of persons other than the Holder (taking into account the

adjustments and restrictions of Section 8). The Company covenants that all Warrant Shares that shall be so issuable and deliverable shall, upon issuance and the payment of the applicable Exercise Price in accordance with the terms hereof, be duly and validly authorized and issued and fully paid and nonassessable.

8. Certain Adjustments. The Exercise Price and number of Warrant Shares issuable upon exercise of this Warrant are subject to adjustment from time to time as set forth in this Section 8. Upon each such adjustment of the Exercise Price pursuant to this Section, the Holder shall thereafter prior to the Expiration Date be entitled to purchase, at the Exercise Price resulting from such adjustment, the number of Warrant Shares obtained by multiplying the Exercise Price in effect immediately prior to such adjustment by the number of Warrant Shares issuable upon exercise of this Warrant immediately prior to such adjustment and dividing the product thereof by the Exercise Price resulting from such adjustment.

(a) If the Company, at any time while this Warrant is outstanding, (i) shall pay a stock dividend (except scheduled dividends paid on outstanding preferred stock as of the date hereof which contain a stated dividend rate) or otherwise make a distribution or distributions on shares of its Common Stock or on any other class of capital stock payable in shares of Common Stock, (ii) subdivide outstanding shares of Common Stock into a larger number of shares, or (iii) combine outstanding shares of Common Stock into a smaller number of shares, the Exercise Price shall be multiplied by a fraction of which the numerator shall be the number of shares of Common Stock (excluding treasury shares, if any) outstanding before such event and of which the denominator shall be the number of shares of Common Stock (excluding treasury shares, if any) outstanding after such event. Any adjustment made pursuant to this Section shall become effective immediately after the record date for the determination of shareholders entitled to receive such dividend or distribution and shall become effective immediately after the effective date in the case of a subdivision or combination, and shall apply to successive subdivisions and combinations.

(b) In case of any reclassification of the Common Stock or any compulsory share exchange pursuant to which the Common Stock is converted into other securities, cash or property, then the Holder shall have the right thereafter to exercise this Warrant only into the shares of stock and other securities and property receivable upon or deemed to be held by holders of Common Stock following such reclassification or share exchange, and the Holder shall be entitled upon such event to receive such amount of securities or property equal to the amount of Warrant Shares such Holder would have been entitled to had such Holder exercised this Warrant immediately prior to such reclassification or share exchange. The terms of any such reclassification or share exchange shall include such terms so as to continue to give to the Holder the right to receive the securities or property set forth in this Section 8(b) upon any exercise following any such reclassification or share exchange.

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(c) If the Company, at any time while this Warrant is outstanding, shall distribute to all holders of Common Stock (and not to holders of this Warrant) evidences of its indebtedness or assets or rights or warrants to subscribe for or purchase any security (excluding those referred to in Sections 8(a), (b) and (d)), then in each such case the Exercise Price shall be determined by multiplying the Exercise Price in effect immediately prior to the record date fixed for determination of shareholders entitled to receive such distribution by a fraction of which the denominator shall be the Exercise Price determined as of the record date mentioned above and of which the numerator shall be such Exercise Price on such record date less the then fair market value at such record date of the portion of such assets or evidence of indebtedness so distributed applicable to one outstanding share of Common Stock as determined by the Company's independent certified public accountants that regularly examines the financial statements of the Company (an "Appraiser").

(d) If the Company or any subsidiary thereof, as applicable, with respect to Common Stock Equivalents (as defined below), at any time while this Warrant is outstanding, shall issue in excess of an aggregate of 50,000 shares of Common Stock (subject to equitable adjustments for stock splits, recombinations and similar events) or rights, warrants, options or other securities or debt that is convertible into or exchangeable for in excess of an aggregate of 50,000 shares of Common Stock (subject to equitable adjustments for stock splits, recombinations and similar events) ("Common Stock Equivalents"), entitling any person to acquire shares of Common Stock at a price per share less than the Exercise Price (such price per share, the "Trigger Price") (if the holder of the Common Stock or Common Stock Equivalent so issued shall at any time, whether by operation of purchase price adjustments, reset provisions, floating conversion, exercise or exchange prices or otherwise, or due to warrants, options or rights issued in connection with such issuance, be entitled to receive shares of Common Stock at a price less than the Exercise Price, such issuance shall be deemed to have occurred for less than the Exercise Price), then the Exercise Price shall be adjusted to equal the lesser of (i) 115% of the

Trigger Price and (ii) the Exercise Price. Such adjustment shall be made whenever such Common Stock or Common Stock Equivalents are issued. However, upon the expiration of any Common Stock Equivalents the issuance of which resulted in an adjustment in the Exercise Price pursuant to this Section, if any such Common Stock Equivalents shall expire and shall not have been exercised, the Exercise Price shall immediately upon such expiration be recomputed and effective immediately upon such expiration be increased to the price which it would have been (but reflecting any other adjustments in the Exercise Price made pursuant to the provisions of this Section after the issuance of such Common Stock Equivalents) had the adjustment of the Exercise Price made upon the issuance of such Common Stock Equivalents been made on the basis of offering for subscription or purchase only that number of shares of the Common Stock actually purchased upon the exercise of such Common Stock Equivalents actually exercised. Notwithstanding anything herein to the contrary, the following shall not be subject to the provisions of this Section: (1) issuances of any stock or stock options under any employee benefit plan of the Company whether now existing or approved by the Company and its stockholders in the future, (2) the rights, options and warrants outstanding prior to the date hereof and specified in Schedule 2.1(c) to the Purchase Agreement of even date herewith between the original Holder and the Company, but not any modifications thereof and (3) the issuance of shares of Common Stock in payment of the purchase price of a Strategic Transaction (as defined below). For purposes of this Section, a "Strategic Transaction" shall mean a transaction or relationship in which the Company issues shares of Common

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Stock to an entity which is, itself or through its subsidiaries, an operating company in a business related to the business of the Company and in which the Company receives material benefits in addition to the investment of funds, but shall not include a transaction in which the Company is issuing securities primarily for the purpose of raising capital.

(e) In case of any (1) merger or consolidation of the Company with or into another Person, or (2) sale by the Company of more than one-half of the assets of the Company (on a book value basis) in one or a series of related transactions, the Holder shall have the right thereafter to exercise this Warrant for the shares of stock and other securities, cash and property receivable upon or deemed to be held by holders of Common Stock following such merger, consolidation or sale, and the Holder shall be entitled upon such event or series of related events to receive such amount of securities, cash and property as the Common Stock for which this Warrant could have been exercised immediately prior to such merger, consolidation or sale would have been entitled. The terms of any such merger, consolidation or sale shall include such terms so as continue to give the Holder the right to receive the securities, cash and property set forth in this Section upon any conversion or redemption following such event. This provision shall similarly apply to successive such events.

(f) For the purposes of this Section 8, the following clauses shall also be applicable:

(i) Record Date. In case the Company shall take a record of the holders of its Common Stock for the purpose of entitling them (A) to receive a dividend or other distribution payable in Common Stock or in securities convertible or exchangeable into shares of Common Stock, or (B) to subscribe for or purchase Common Stock or securities convertible or exchangeable into shares of Common Stock, then such record date shall be deemed to be the date of the issue or sale of the shares of Common Stock deemed to have been issued or sold upon the declaration of such dividend or the making of such other distribution or the date of the granting of such right of subscription or purchase, as the case may be.

(ii) Treasury Shares. The number of shares of Common Stock outstanding at any given time shall not include shares owned or held by or for the account of the Company, and the disposition of any such shares shall be considered an issue or sale of Common Stock.

(g) All calculations under this Section 8 shall be made to the nearest cent or the nearest 1/100th of a share, as the case may be.

(h) Whenever the Exercise Price is adjusted pursuant to Section 8(c) above, the Holder, after receipt of the determination by the Appraiser, shall have the right to select an additional appraiser (which shall be a nationally recognized accounting firm), in which case the adjustment shall be equal to the average of the adjustments recommended by each of the Appraiser and such appraiser. The Holder shall promptly mail or cause to be mailed to the Company, a notice setting forth the Exercise Price after such adjustment and setting forth a brief statement of the facts

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requiring such adjustment. Such adjustment shall become effective immediately after the record date mentioned above.

If:

- (i) the Company shall declare a dividend (or any other distribution) on its Common Stock; or
- (ii) the Company shall declare a special nonrecurring cash dividend on or a redemption of its Common Stock; or
- (iii) the Company shall authorize the granting to all holders of the Common Stock rights or warrants to subscribe for or purchase any shares of capital stock of any class or of any rights; or
- (iv) the approval of any shareholders of the Company shall be required in connection with any reclassification of the Common Stock, any consolidation or merger to which the Company is a party, any sale or transfer of all or substantially all of the assets of the Company, or any compulsory share exchange whereby the Common Stock is converted into other securities, cash or property; or
- (v) the Company shall authorize the voluntary dissolution, liquidation or winding-up of the affairs of the Company,

then the Company shall cause to be mailed to each Holder at its last address as it shall appear upon the Warrant Register, at least 10 calendar days prior to the applicable record or effective date hereinafter specified, a notice stating (x) the date on which a record is to be taken for the purpose of such dividend, distribution, redemption, rights or warrants, or if a record is not to be taken, the date as of which the holders of Common Stock of record to be entitled to such dividend, distributions, redemption, rights or warrants are to be determined or (y) the date on which such reclassification, consolidation, merger, sale, transfer or share exchange is expected to become effective or close, and the date as of which it is expected that holders of Common Stock of record shall be entitled to exchange their shares of Common Stock for securities, cash or other property deliverable upon such reclassification, consolidation, merger, sale, transfer, share exchange, dissolution, liquidation or winding-up; provided, however, that the failure to mail such notice or any defect therein or in the mailing thereof shall not affect the validity of the corporate action required to be specified in such notice.

9. Payment of Exercise Price. The Holder shall pay the Exercise Price in one of the following manners:

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(a) Cash Exercise. The Holder may deliver immediately available funds; or

(b) Cashless Exercise. The Holder may surrender this Warrant to the Company together with a notice of cashless exercise, in which event the Company shall issue to the Holder the number of Warrant Shares determined as follows:

$$X = Y [(A-B)/A]$$

where: X = the number of Warrant Shares to be issued to the Holder.

Y = the number of Warrant Shares with respect to which this Warrant is being exercised.

A = the average of the closing sale prices of the Common Stock for the five (5) trading days immediately prior to (but not including) the Date of Exercise.

B = the Exercise Price.

For purposes of Rule 144 promulgated under the Securities Act, it is intended, understood and acknowledged that the Warrant Shares issued in a cashless exercise transaction shall be deemed to have been acquired by the Holder, and

the holding period for the Warrant Shares shall be deemed to have been commenced, on the issue date.

10. Certain Exercise Restrictions.

A Holder may not exercise this Warrant to the extent such exercise would result in the Holder, together with any affiliate thereof, beneficially owning (as determined in accordance with Section 13(d) of the Securities Exchange Act of 1934, as amended (the "Exchange Act") and the rules promulgated thereunder) in excess of 9.999% of the then issued and outstanding shares of Common Stock, including shares issuable upon such exercise and held by such Holder after application of this Section. Since the Holder will not be obligated to report to the Company the number of shares of Common Stock it may hold at the time of an exercise hereunder, unless the exercise at issue would result in the issuance of shares of Common Stock in excess of 9.999% of the then outstanding shares of Common Stock without regard to any other shares which may be beneficially owned by the Holder or an affiliate thereof, the Holder shall have the authority and obligation to determine whether the restriction contained in this Section will limit any particular exercise hereunder and to the extent that the Holder determines that the limitation contained in this Section applies, the determination of which portion of this Warrant is exercisable shall be the responsibility and obligation of the Holder. If the Holder has delivered a Form of Election to Purchase for a number of Warrant Shares that, without regard to any other shares that the Holder or its affiliates may beneficially own, would result in the issuance in excess of the permitted amount hereunder, the Company shall notify the Holder of this fact and shall honor the exercise for the maximum portion of this Warrant permitted to be exercised on such Date of Exercise in accordance with the periods described herein and, at the option of the Holder, either keep the portion of the

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Warrant tendered for exercise in excess of the permitted amount hereunder for future exercises or return such excess portion of the Warrant to the Holder. The provisions of this Section may be waived by a Holder (but only as to itself and not to any other Holder) upon not less than 61 days prior notice to the Company. Other Holders shall be unaffected by any such waiver.

11. Fractional Shares. The Company shall not be required to issue or cause to be issued fractional Warrant Shares on the exercise of this Warrant. The number of full Warrant Shares which shall be issuable upon the exercise of this Warrant shall be computed on the basis of the aggregate number of Warrant Shares purchasable on exercise of this Warrant so presented. If any fraction of a Warrant Share would, except for the provisions of this Section, be issuable on the exercise of this Warrant, the Company shall pay an amount in cash equal to the Exercise Price multiplied by such fraction.

12. Notices. Any and all notices or other communications or deliveries hereunder shall be in writing and shall be deemed given and effective on the earliest of (i) the date of transmission, if such notice or communication is delivered via facsimile at the facsimile telephone number specified in this Section prior to 6.30 p.m. (New York City time) on a business day (with confirmation of transmission), (ii) the business day after the date of transmission, if such notice or communication is delivered via facsimile at the facsimile telephone number specified in this Section later than 6:30 p.m. (New York City time) on any date and earlier than 11:59 p.m. (New York City time) on such date (with confirmation of transmission), (iii) the business day following the date of mailing, if sent by a nationally recognized overnight courier service, or (iv) upon actual receipt by the party to whom such notice is required to be given. The addresses for such communications shall be: (i) if to the Company, to 2950 N.E. 84th Lane, Blaine, Minnesota 55449, facsimile number 763-784-2038, attention President, or (ii) if to the Holder, to the Holder at the address or facsimile number appearing on the Warrant Register or such other address or facsimile number as the Holder may provide to the Company in accordance with this Section.

13. Warrant Agent. The Company shall serve as warrant agent under this Warrant. Upon thirty (30) days' notice to the Holder, the Company may appoint a new warrant agent. Any corporation into which the Company or any new warrant agent may be merged or any corporation resulting from any consolidation to which the Company or any new warrant agent shall be a party or any corporation to which the Company or any new warrant agent transfers substantially all of its corporate trust or shareholders services business shall be a successor warrant agent under this Warrant without any further act. Any such successor warrant agent shall promptly cause notice of its succession as warrant agent to be mailed (by first class mail, postage prepaid) to the Holder at the Holder's last address as shown on the Warrant Register.

14. Miscellaneous.

(a) This Warrant shall be binding on and inure to the benefit of the parties hereto and their respective successors and assigns. This Warrant may be amended only in writing signed by the Company and the Holder and their

(b) Subject to Section 14(a), above, nothing in this Warrant shall be construed to give to any person or corporation other than the Company and the Holder any legal or equitable right, remedy or cause under this Warrant. This Warrant shall inure to the sole and exclusive benefit of the Company and the Holder.

(c) The corporate laws of the State of Minnesota shall govern all issues concerning the relative rights of the Company and its shareholders. All other questions concerning the construction, validity, enforcement and interpretation of this Warrant shall be governed by and construed and enforced in accordance with the internal laws of the State of New York, without regard to the principles of conflicts of law thereof. The Company and the Holder hereby irrevocably submit to the exclusive jurisdiction of the state and federal courts sitting in the City of New York, borough of Manhattan, for the adjudication of any dispute hereunder or in connection herewith or with any transaction contemplated hereby or discussed herein, and hereby irrevocably waive, and agree not to assert in any suit, action or proceeding, any claim that they are not personally subject to the jurisdiction of any such court, or that such suit, action or proceeding is improper. Each of the Company and the Holder hereby irrevocably waives personal service of process and consents to process being served in any such suit, action or proceeding by receiving a copy thereof sent to the Company at the address in effect for notices to it under this instrument and agrees that such service shall constitute good and sufficient service of process and notice thereof. Nothing contained herein shall be deemed to limit in any way any right to serve process in any manner permitted by law.

(d) The headings herein are for convenience only, do not constitute a part of this Warrant and shall not be deemed to limit or affect any of the provisions hereof.

(e) In case any one or more of the provisions of this Warrant shall be invalid or unenforceable in any respect, the validity and enforceability of the remaining terms and provisions of this Warrant shall not in any way be affected or impaired thereby and the parties will attempt in good faith to agree upon a valid and enforceable provision which shall be a commercially reasonable substitute therefor, and upon so agreeing, shall incorporate such substitute provision in this Warrant.

[REMAINDER OF PAGE INTENTIONALLY LEFT BLANK,
SIGNATURE PAGE FOLLOWS]

IN WITNESS WHEREOF, the Company has caused this Warrant to be duly executed by its authorized officer as of the date first indicated above.

APA OPTICS, INC.

By: /s/ Anil Jain

Name: Anil K. Jain

Title: President

FORM OF ELECTION TO PURCHASE

(To be executed by the Holder to exercise the right to purchase shares of Common Stock under the foregoing Warrant)

To APA Optics, Inc.:

In accordance with the Warrant enclosed with this Form of Election to Purchase, the undersigned hereby irrevocably elects to purchase _____ shares of common stock, \$.01 par value per share, of APA Optics, Inc. (the "Common Stock") and, if such Holder is not utilizing the cashless exercise provisions set forth in this Warrant, encloses herewith \$_____ in cash, certified or official bank check or checks, which sum represents the aggregate

Exercise Price (as defined in the Warrant) for the number of shares of Common Stock to which this Form of Election to Purchase relates, together with any applicable taxes payable by the undersigned pursuant to the Warrant.

The undersigned requests that certificates for the shares of Common Stock issuable upon this exercise be issued in the name of

PLEASE INSERT SOCIAL SECURITY OR
TAX IDENTIFICATION NUMBER

(Please print name and address)

If the number of shares of Common Stock issuable upon this exercise shall not be all of the shares of Common Stock which the undersigned is entitled to purchase in accordance with the enclosed Warrant, the undersigned requests that a New Warrant (as defined in the Warrant) evidencing the right to purchase the shares of Common Stock not issuable pursuant to the exercise evidenced hereby be issued in the name of and delivered to:

(Please print name and address)

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Dated: _____, ____

Name of Holder:

(Print)

(By:)

(Name:)

(Title:)

(Signature must conform in all respects to name of holder as specified on the face of the Warrant)

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FORM OF ASSIGNMENT

[To be completed and signed only upon transfer of Warrant]

FOR VALUE RECEIVED, the undersigned hereby sells, assigns and transfers unto _____ the right represented by the within Warrant to purchase _____ shares of Common Stock of APA Optics, Inc. to which the within Warrant relates and appoints _____ attorney to transfer said right on the books of APA Optics, Inc. with full power of substitution in the premises.

Dated:

_____, ____

(Signature must conform in all respects to name of holder as specified on the face of the Warrant)

Address of Transferee

In the presence of:

April 3, 2000

APA Optics, Inc.
2950 N.E. 84th Lane
Blaine, MN 55449

Re: Registration Statement on Form S-3

Ladies and Gentlemen:

We have acted as counsel for APA Optics, Inc. (the "Company") in connection with a Registration Statement on Form S-3 (the "Registration Statement") that relates to the issuance of up to 250,000 shares of common stock of the Company upon conversion of the Company's 2% Series A Convertible Preferred Stock and up to 57,500 shares upon exercise of related warrants for purchase of common stock (collectively, the "Shares").

In connection with the registration of the Shares, we have examined such documents, records and matters of law as we have deemed necessary to the rendering of the following opinion. Based upon that review, it is our opinion that upon receipt of payment in full therefor, the Shares being registered, when issued by the Company, will be validly issued, fully paid and non-assessable.

The foregoing opinion is subject to the qualification that the Shares or any of them, when issued, will not when taken together with the then issued and outstanding capital stock of the Company, exceed the authorized capital stock of the Company.

We consent to the use of this opinion as an exhibit to the Registration Statement and further consent to the use of our name wherever it appears in the Registration Statement, including the prospectus constituting a part thereof, and any amendments thereto.

Very truly yours,

MOSS & BARNETT,
A Professional Association

/s/ Janna R. Severance
Janna R. Severance

CONSENT OF INDEPENDENT AUDITORS

We consent to the reference to our firm under the caption "Experts and Legal Matters" in the Registration Statement (Form S-3 No. 333-00000) and related Prospectus of APA Optics, Inc. for the registration of 307,500 shares of its common stock and to the incorporation by reference therein of our report dated May 14, 1999, with respect to the financial statements of APA Optics, Inc. included in its Annual Report (Form 10-K) for the year ended March 31, 1999, filed with the Securities and Exchange Commission.

/s/ ERNST & YOUNG LLP

Minneapolis, Minnesota
April 3, 2000