

SECURITIES AND EXCHANGE COMMISSION
Washington, D.C. 20549

FORM 10-Q

X QUARTERLY REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE
SECURITIES EXCHANGE ACT OF 1934

For the quarterly period ended September 30,
2000
or

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

For the transition period from NA to NA.

Commission File Number 0-16106

APA Optics, Inc.
(Exact name of Registrant as specified in its
charter)

Minnesota 41-1347235
(State or other jurisdiction of (I.R.S. Employer
Identification
No.)
incorporation or organization)

2950 N.E. 84th Lane, Blaine, Minnesota 55449
(Address of principal executive offices and zip
code)

(763) 784-4995
(Registrant's telephone number, including area
code)

Indicate by check mark whether the registrant (1) has filed all
reports
required to be filed by Section 13 or 15 (d) of the Securities
Exchange
Act of 1934 during the preceding 12 months (or for such shorter
period
that the registrant was required to file such reports), and (2)
has
been
subject to the filing requirement for the past 90 days.

Yes X No

Indicate the number of shares outstanding of each of the
issuer's
classes
of common stock, as of the latest practicable date:

Class:	Outstanding at
October 23, 2000	
Common stock, par value \$.01	
11,908,506	

PART I. FINANCIAL INFORMATION
ITEM 1. FINANCIAL STATEMENTS

APA OPTICS, INC.
CONDENSED BALANCE SHEETS

September 30,
March
31,
2000

ASSETS

CURRENT ASSETS:

Cash and short-term investments	\$39,280,873
\$5,941,906	
Accounts receivable	87,179
209,337	
Inventories:	
Raw materials	172,841
146,841	
Work-in-process & finished goods	127,174
129,684	
Prepaid expenses	12,036
19,803	
Bond reserve funds	32,500
65,000	
TOTAL CURRENT ASSETS	39,712,603
6,512,571	

PROPERTY AND EQUIPMENT NET	2,406,881
2,459,760	

OTHER ASSETS	640,588
638,060	

TOTAL ASSETS	\$42,760,072
\$9,610,391	

LIABILITIES AND SHAREHOLDERS' EQUITY

CURRENT LIABILITIES:

Current portion of long-term debt	\$379,483
\$140,871	
Accounts payable	89,681
82,412	
Accrued expenses	175,815
172,672	
TOTAL CURRENT LIABILITIES	644,979
395,955	

LONG-TERM DEBT	2,538,238
2,908,387	

SHAREHOLDERS' EQUITY:

Undesignated shares; 4,999,500 shares authorized - none issued	
Preferred stock; \$.01 par value, 500 shares authorized:	
Issued and outstanding shares -	
none on September 30, 2000	
and 500 on March 31, 2000	-
5	
Common stock, \$.01 par value; 50,000,000 shares authorized:	
Issued & outstanding shares -	
11,908,506 shares on September 30, 2000 and 8,997,992 shares on March 31, 2000	119,085
89,980	
Paid-in capital	51,189,880
16,408,446	
Retained earnings (deficit)	(11,732,110)
(10,192,382)	
TOTAL SHAREHOLDERS' EQUITY	39,576,855
6,306,049	

TOTAL LIABILITIES AND SHAREHOLDERS' EQUITY	\$42,760,072
\$9,610,391	

APA OPTICS, INC.
CONDENSED STATEMENTS OF OPERATIONS

Three Months Ended Six
Months
Ended September 30,
September 30,

2000 1999

2000
1999

REVENUES \$123,462 \$36,029
\$174,979
\$102,626

COSTS AND EXPENSES:

Cost of sales	609,720	531,771
1,015,792		
1,029,549		
Research and development	293,303	212,579
573,661		
421,749		
Selling, administrative and general	414,092	227,011
781,978		
499,295		
1,317,115	971,361	
2,371,431		
1,950,593		
LOSS FROM OPERATIONS	(1,193,653)	(935,332)
(2,196,452)		
(1,847,967)		

OTHER INCOME (EXPENSE) :

Interest income	615,440	15,744
751,842		
47,957		
Interest expense	(18,536)	(35,674)
(61,564)		
(71,592)		
596,904	(19,930)	
690,278		
(23,635)		
LOSS BEFORE INCOME TAXES	(596,749)	(955,262)
(1,506,174)		
(1,871,602)		
INCOME TAXES	250	250
500		
500		
NET LOSS	\$ (596,999)	\$ (955,512)
\$ (1,506,674)	\$ (1,872,102)	

NET LOSS PER SHARE:

Basic and diluted (\$0.05) (\$0.11)
(\$0.14)
(\$0.22)

WEIGHTED AVERAGE SHARES

OUTSTANDING:

Basic and diluted 11,694,715 8,522,741
10,451,022
8,517,508

APA OPTICS, INC.
CONDENSED STATEMENTS OF CASH FLOWS

Six Months Ended

September 30,

2000 1999

OPERATING ACTIVITIES:

Net income (loss)	\$ (1,506,674)
\$(1,872,102)	
Adjustments to reconcile net income to net cash	
used in operating activities:	
Depreciation and amortization	192,563
214,157	
Changes in operating assets and liabilities:	
Accounts receivable	122,158
3,184	
Inventories and prepaid expenses	(15,723)
(129,513)	
Accounts payable and accrued expenses	10,412
25,117	
Other	(67,472)
(10,509)	
Net cash used in operating activities	(1,264,736)
(1,769,666)	

INVESTING ACTIVITIES:

Property and equipment additions, net	(97,685)
(89,164)	
Net cash used in investing activities	
(89,164)	

FINANCING ACTIVITIES:

Proceeds from the sale of common stock	39,810,534
1,252,700	
Redemption of preferred stock	(5,000,000)
--	
Repayment of long term debt	(131,537)
(105,191)	
Dividend on preferred stock	(33,054)
--	
Bond reserve funds	55,445
(3,718)	
Net cash provided by financing activities	34,701,388
1,143,791	
INCREASE (DECREASE) IN CASH	33,338,967
(715,039)	

CASH AND CASH EQUIVALENTS,
beginning of period 5,941,906
2,812,849

CASH AND CASH EQUIVALENTS,
end of period \$39,280,873
\$2,097,810

NOTES TO CONDENSED FINANCIAL STATEMENTS

Note 1. Basis of Presentation

The accompanying condensed financial statements have been prepared pursuant to the rules and regulations of the Securities and Exchange Commission. Accordingly, they do not include all of the information and footnotes required by generally accepted accounting principles for complete financial statements. For further information, refer to the financial statements and footnotes thereto included in the Company's annual report on Form 10-K for the year ended March 31, 2000.

In the opinion of management, all adjustments (consisting of normal recurring accruals) considered necessary for a fair presentation have been included. Certain reclassifications of previously reported amounts have been made to conform that presentation to the current period presentation. The reclassifications had no impact on losses previously reported.

Note 2. Shareholders' Equity

On July 18, 2000 the Company redeemed all 500 shares of its outstanding 2% preferred stock for a total of \$5,000,000 plus \$33,055 in accrued dividends.

During the three-month period ended September 30, 2000, the Company sold 1,757,778 shares of its common stock to various institutional investors under a Registration Statement on Form S-3. Net proceeds from the sales totaled \$24,689,657. During the six months ended September 30, 2000, the Company sold a total of 2,845,868 shares of its common stock. Net proceeds to the company were \$39,585,257.

ITEM 2. MANAGEMENT'S DISCUSSION
AND ANALYSIS OF FINANCIAL CONDITION
AND RESULTS OF OPERATIONS

General

Prior to 1998, APA Optics, Inc. ("APA") generated significant revenues by providing research and development services in connection with projects sponsored by various government agencies. In fiscal 1998, APA determined to shift its emphasis from research and development to product development in an effort to capitalize on the proprietary technology it had developed. In so doing, APA realized this shift would significantly reduce revenues and

increase losses until APA generates revenues from the sale of its products.

APA focuses on two product areas for development:

Fiber Optic Components. APA manufactures and markets DWDM (Dense Wavelength Division Multiplexing) multiplexer/demultiplexer components.

These components enable DWDM systems to increase the bandwidth of

a single optical fiber between 8 and 80 times its original capacity.

Based on patented and patent pending diffraction grating

technology, these products address current and next generation DWDM networking

requirements including:

- o High channel counts (up to 80 in a single component),
- o Narrow channel spacing (to 50 GHz),
- o High data transmission rates (10 Gb/sec),
- o Add/drop multiplexing (patent pending), and
- o Fiber free communications (single mode and multimode).

Gallium Nitride (GaN) Semiconductors. APA is a research pioneer

in

GaN,

a next generation semiconductor material. APA manufactures GaN Ultraviolet Radiation (UV) detectors and has integrated this technology

into products including the UV Power Meter, UV Lamp monitor, Detector/Amplifier module and SunUVWatch™.

Results of Operations

Operating revenues for the three-month and six-month periods ended

September 30, 2000, were \$123,462 and \$174,979, reflecting 243% and

71%

increases, respectively, over the comparable periods in fiscal 2000.

The

majority of the increase occurred in sales of DWDM components that

totaled \$88,950 and \$103,150 for the three-month and six-month periods ended

September 30, 2000, respectively.

Cost of sales increased for the three-month period ended September

30, 2000 to \$609,720, reflecting a 15% increase over the comparable

period in fiscal 2000. For the six-month period ended September 30,

2000,

cost of sales decreased \$13,757 or 1% from the comparable period

in fiscal 2000. Gross margins for sales were negative in both periods.

The

fluctuation in cost of sales and the negative gross margins are influenced by the low unit production and sales levels relative to

the

capital equipment and personnel committed to production in the early

phases of market penetration of the Company's products. The

Company expects to continue to experience negative gross margins until there

is a

significant increase in sales and production levels.

Research and development expenses increased by \$80,724 and \$151,912

for the three and six-month periods ended September 30, 2000.

These

amounts represent increases of 38% and 36% over research and development expenses in the comparable periods of fiscal 2000. The increases result from the Company's continued investment in the development of its DWDM and GaN technologies. The Company plans to continue to pursue research and product development and will continue to incur expenses related to these activities.

Selling, general and administrative expenses increased \$187,081 and \$282,683 for the three-month and six-month periods ended September 30, 2000, reflecting 82% and 57% increases, respectively, over the comparable periods in fiscal 2000. The increases were primarily due to an increase in personnel as the Company prepares to meet anticipated demand for its products and costs associated with moving the listing of the Company's stock from the NASDAQ Small Cap Market to the NASDAQ National Market.

Other income and expense increased \$616,834 and \$713,913 for the three-month and six-month periods ended September 30, 2000, respectively, over the comparable periods in fiscal 2000. The increases were due to the increased cash balance over the periods resulting from the issuance of common stock by the Company that netted \$39.6 million. See Note 2 to the Financial Statements.

The net loss was \$596,999 (or \$.05 per basic and diluted share) for the three months ended September 30, 2000, a decrease of \$358,513 or 38% from the loss reported for the same period in fiscal 2000. For the six months ended September 30, 2000, the net loss was \$1,506,674 (or \$.14 per basic and diluted share), a decrease of \$365,428 or 20% from the loss reported for the same period in fiscal 2000. The smaller net loss is attributable to the increase in interest income partially offset by the increase in the operating expenses described above.

Liquidity and Capital Resources

APA's cash and short-term investments primarily consist of certificates of deposits, US Government instruments or commercial paper with maturities of less than one year. The balance of cash and short-term investments at September 30, 2000 is \$39,280,873 compared to \$5,941,906 at March 31, 2000. The increase in cash and short-term

investments primarily results from the sale of 2,845,868 shares of APA's common stock under a Registration Statement on Form S-3 for \$100 million worth of common stock, of which approximately \$41.5 million had been sold on or before September 30, 2000. The funds will be used for the capital expenditures described below, product development and marketing, the addition of personnel and to fund operations. APA believes that it has sufficient funds for operations in fiscal 2001 and beyond.

For the six months ended September 30, 2000, APA used \$1,264,736 of cash for operating activities, of which the most significant cause was the net loss of \$1,506,674. APA used \$97,865 net cash in investing activities in the same period, all for the purchase of equipment, primarily for the Aberdeen facility.

APA anticipates a total of approximately \$4 million in capital expenditures in fiscal 2001, primarily for equipment. This is an increase of \$2 million over the amount previously reported by APA. The majority of the capital expenditures relate to the expansion and automation of the Company's production facilities and will be made in phases to meet demand for its products and to allow the Company to respond to new business opportunities.

Forward Looking Statements

Statements in this Report with respect to future sales prospects and other matters to occur in the future are forward looking statements and are subject to uncertainties from factors, many of which are beyond APA's control. These factors include, but are not limited to, the continued development of APA's products, acceptance of those products by potential customers, APA's ability to sell such products at a profitable price, and APA's ability to fund its operations.

ITEM 3. Quantitative and Qualitative Disclosures about Market Risk.

APA's operations are not currently subject to market risks for interest rates, foreign rates, commodity prices or other market price risks of a material nature.

Part II

ITEM 1. Not applicable

ITEM 2. Changes in Securities and Use of Proceeds.

During the six months ended September 30, 2000, the Company issued an aggregate of 64,646 shares of common stock to four investors upon the exercise of outstanding warrants. Three of these warrants, for 56,000 shares, had been issued to the placement agent as consideration for services in a private placement of the Company's securities and the fourth, for 8,646 shares, had been issued to NE Venture, Inc. as consideration for the partial forgiveness of a loan made to the Company as part of the financing of its Aberdeen facility. The Company received net proceeds of \$253,230. No underwriter was involved in these sales. The Company relied upon the exemptions provided by Section 4(2) and 4(6) of the Securities Act of 1933 in connection with these sales.

ITEM 3. Not Applicable

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

(a) The Company held its Annual Shareholders' meeting on August 16, 2000.

(b) (1) The election of 5 directors to serve for one-year terms was approved.

Name	Affirmative Votes	Voting Authority
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Withheld

Anil K. Jain	8,889,999
7,056	
Kenneth A. Olsen	8,888,599
7,056	
Gregory J. Von Wald	8,890,099
7,056	
William R. Franta	8,890,099
7,056	
Michael A. Gort	8,890,099
7,056	

(2) The amendment and restatement of the Company's Articles of Incorporation to increase the authorized common stock from 15,000,000 to 50,000,000 shares was approved. The vote was 8,773,474 shares in favor, 94,991 shares against and 13,790 abstentions. There were no broker non-votes.

ITEM 5. Not Applicable

ITEM 6. Exhibits and Reports on Form 8-K.

Exhibits:

3.1 Restated Articles of Incorporation, including all amendments to date.

27 Financial Data Schedule

Reports:

There were no reports on Form 8-K filed during the three months ended September 30, 2000.

Signatures

Pursuant to the requirements of the Securities Exchange Act of

1934,

the

Registrant has duly caused this report to be signed on its

behalf

by

the

APA OPTICS, INC.

11/10/00 /s/ Anil K. Jain

Date

Anil K. Jain
President and
Principal Execut

undersigned, thereunto duly authorized.ive

Officer

11/10/00 /s/ Robert M.

Ringstad

Date

Robert M. Ringstad
Chief Financial

Officer

WARNING: THE EDGAR SYSTEM ENCOUNTERED ERROR(S) WHILE PROCESSING THIS SCHEDULE.

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</TABLE>

CERTIFICATE OF RESTATED
ARTICLES OF INCORPORATION
OF
APA OPTICS, INC.

The undersigned, Anil K. Jain and Kenneth A. Olsen, do hereby certify that they are the President and Secretary, respectively, of APA Optics, Inc.; that APA Optics, Inc. is organized under Minnesota Statutes, Chapter 302A; that by unanimous action of all of the shareholders of said corporation effective as of November 3, 1983, the following resolutions were adopted; and that the following Restated Articles of Incorporation supersede and take the place of the existing Articles of Incorporation and all amendments thereto:

RESOLVED: That the following Restated Articles of Incorporation are hereby adopted and shall supersede and take the place of the existing Articles of Incorporation and all amendments thereto:

RESTATED ARTICLES OF INCORPORATION
OF
APA OPTICS, INC.

ARTICLE I

The name of the Corporation shall be APA Optics, Inc.

ARTICLE II

The registered office of this Corporation is located at 877 Third Street S.W., Suite 3, New Brighton, Minnesota 55112.

ARTICLE III

3.01. The aggregate number of shares of capital stock which this Corporation shall have the authority to issue is 10,000,000 shares, which shall consist of 5,000,000 shares of Common Stock, par value \$.01 per share, and 5,000,000 undesignated shares.

3.02. The Board of Directors may, from time to time, establish by resolution from the undesignated shares different classes or series of shares and may fix the relative rights and preferences of said shares in any class or series.

3.03. The Board of Directors shall have the authority to issue shares of the Common Stock to the holders of shares of any class or series of the undesignated shares and it may issue shares of any class or series of the undesignated shares to the holders of shares of the Common Stock, in either case, for any purpose.

3.04. No shareholder of the Corporation shall have any preemptive rights.

3.05. No shareholder shall be entitled to any cumulative voting rights.

3.06. The shareholders shall take action by the affirmative vote of the holders of a majority of the voting power of all voting shares represented at a duly held meeting of the shareholders, except where a larger proportion is required by law, these Articles, or a shareholder control agreement.

ARTICLE IV

Any action required or permitted to be taken by the Board of Directors of this Corporation may be taken by written action signed by the number of directors that would be required to take the same action at a meeting of the Board at which all directors are present, except as to those matters requiring shareholder approval, in which case the written action must be signed by all members of the Board of Directors then in office.

ARTICLE V

The names and addresses of the Board of Directors are:

Anil K. Jain
90 13th Avenue S.W.
New Brighton, MN 55112

Kenneth A. Olsen
10911 69th Street North
Stillwater, MN 55082

IN WITNESS WHEREOF, the undersigned have hereunto

affixed their signatures this 3rd day of November, 1983.

/s/ Anil K.
Jain
Anil K. Jain,
President

/s/ Kenneth A.
Olsen
Kenneth A. Olsen,
Secretary

STATE OF MINNESOTA)
) ss.
COUNTY OF HENNEPIN)

The foregoing instrument was acknowledged before me this 3rd day of November, 1983, by Anil K. Jain, President of APA Optics, Inc., a Minnesota corporation, on behalf of the corporation.

/s/ Deanne M.
Greco
Notary Public
My Commission
Expires: January 6,
1987

STATE OF MINNESOTA)
) ss.
COUNTY OF HENNEPIN)

The foregoing instrument was acknowledged before me this 3rd day of November, 1983, by Kenneth A. Olsen, Secretary of APA Optics, Inc., a Minnesota corporation, on behalf of the corporation.

/s/ Deanne M.
Greco

Notary Public
My Commission
Expires: January 6,
1987

ARTICLES OF AMENDMENT OF

APA OPTICS, INC.

The undersigned, Anil K. Jain and Kenneth A. Olsen, do hereby certify that they are the President and Secretary, respectively, of APA Optics, Inc., a Minnesota corporation (the "Company"), and in order to amend the Articles of Incorporation of the Company under the Minnesota Statutes, Chapter 302A, hereby adopt the following Amendment to the Articles of Incorporation of the Company, effective this 9th day of December, 1983:

ARTICLE III
3.01. through 3.02. Sections 3.01 through 3.2 of Article III remain unchanged.

3.03. The Board of Directors shall have the authority to issue shares of the Common Stock to the holders of shares of the Common Stock and to the holders of shares of any class or series of the undesignated shares and to issue shares of any class or series of the undesignated shares to the holders of shares of the Common Stock and to the holders of shares of any class or series of the undesignated shares, in any case, for any purpose.

3.04. through 3.06. Sections 3.04 through 3.06 of Article III remain unchanged.

IN WITNESS WHEREOF, the undersigned have hereunto affixed their signatures.

/s/ Anil K.
Jain
Anil K. Jain,
President

/s/ Kenneth A.

Olsen

Kenneth A. Olsen,
Secretary

STATE OF MINNESOTA)
) ss.
COUNTY OF HENNEPIN)

On this 9th day of December, 1983, Anil K. Jain and Kenneth A. Olsen, to me known to be the President and Secretary, respectively, of APA Optics, Inc., the corporation described in, executed the foregoing instrument and acknowledged that it was executed on behalf of the corporation as its free act and deed.

/s/ Susan K. Anderson
Notary Public
My Commission
Expires: November 20,
1985

CERTIFICATE OF AMENDMENT TO
ARTICLES OF INCORPORATION OF
APA OPTICS, INC.

The undersigned, Anil K. Jain and Kenneth A. Olsen, being of full age, do hereby certify that they are the President and Secretary, respectively, of APA optics, Inc.; that APA Optics, Inc. is organized under the Minnesota Business Corporation Act, Minnesota Statutes, Chapter 302A; that a duly called meeting of the shareholders of APA Optics, Inc. was held on July 30, 1987, at the Company's offices at 2950 N.E. 84th Lane, Blaine, Minnesota 55432; and that at such meeting, the holders of a majority of the outstanding shares of the Company present in person or by proxy adopted the following resolutions:

RESOLVED: That the Articles of Incorporation of the Company shall be amended by adding the following Article VI:

ARTICLE VI

To the fullest extent permitted by the Minnesota Business Corporation Act as the same exists or may hereafter be amended, a director of this corporation shall not be liable to this corporation or its stockholders for monetary damages for breach of fiduciary duty as a director.

RESOLVED FURTHER: That the officers of the Company are hereby authorized and directed to take all necessary and appropriate steps, including filing a certificate of amendment with the Minnesota Secretary of State, to effect the foregoing resolution.

IN WITNESS WHEREOF, the undersigned have hereunto affixed their signatures this 30th day of July, 1987.

/s/ Anil K.
Jain

Anil K. Jain, President

/s/ Kenneth A.
Olsen
Kenneth A. Olsen,
Secretary

STATE OF MINNESOTA)
) ss.
COUNTY OF HENNEPIN)

On this 30th day of July, 1987, before me personally appeared Anil K. Jain and Kenneth A. Olsen, to me known to be the President and Secretary, respectively, of the corporation described herein, and who executed the foregoing instrument and acknowledged that it was executed on behalf of said Corporation as its free act and deed.

/s/ Deanne M.
Greco

Notary Public
My Commission
Expires: January 6,
1993

STATEMENT
REGARDING ESTABLISHMENT OF CLASS OF SHARES OF
APA OPTICS, INC.
The undersigned, the President and Secretary, respectively, of

APA Optics, Inc., a Minnesota corporation (the "Company"), pursuant to Minnesota Statutes Section 302A.401, subd. 3(b), for the purpose of establishing a class of stock, setting the designation of the class, and fixing the relative rights and preferences of the class, do hereby certify as follows:

FIRST: The name of the corporation is APA Optics, Inc.

SECOND: The following resolutions establishing a class of shares was adopted by the Company's Board of Directors:

WHEREAS, Minnesota Statutes Section 302A.401, subd.

3, authorizes the Board of Directors by resolution approved by the affirmative vote of the majority of the directors present to establish a class of shares, setting forth the designation of the class and fixing the relative rights and preferences of the class; and

WHEREAS, the Company's Restated Articles of

Incorporation authorize the Company to issue 10,000,000 shares, consisting of 5,000,000 shares of Common Stock, par value \$0.01 per share, and 5,000,000 undesignated shares, and further authorize the Board of Directors to establish by resolution from the undesignated shares different classes or series of shares and to fix the relative rights and preferences of said shares in any class or series; and

WHEREAS, the Board of Directors deems it desirable and in the Company's best interests to designate as Common Stock, par value \$0.01 per share, 3,000,000 of the undesignated shares, such newly designated shares of Common Stock to have the same rights and preferences, including voting rights, as the currently authorized Common Stock;

NOW, THEREFORE, IT IS:

RESOLVED: That 3,000,000 of the 5,000,000 undesignated shares authorized by the Company's Restated Articles of Incorporation are hereby designated to be Common Stock, par value \$0.01 per share, all of such shares to have the same rights and preferences, including voting rights, as the currently authorized Common Stock.

RESOLVED FURTHER: That the officers of the Company are hereby authorized and directed to prepare, execute, acknowledge, and file a statement with the Secretary of State of the State of Minnesota setting forth the information required under Minnesota Statutes Section 302A.401 (subd. b).

RESOLVED FURTHER: That the officers of the Company are hereby authorized and directed to prepare, execute, acknowledge, and file any other documents or instruments and to take or cause to be taken any other action necessary to carry out the intent of the foregoing resolutions.

THIRD: The foregoing resolutions were adopted by a majority of the members of the Board of Directors of the Company at a meeting duly called and held on March 13, 1989, at which a quorum of the Board of Directors was present and acting.

IN WITNESS WHEREOF, we have executed this statement on March 22, 1989.

/s/ Anil K.
Jain

Anil K. Jain, President

/s/ Kenneth A.
Olsen

Kenneth A. Olsen,
Secretary

MINNESOTA SECRETARY OF STATE

AMENDMENT OF ARTICLES OF INCORPORATION

CORPORATE NAME: APA Optics, Inc.

This amendment is effective on the day it is filed with the Secretary of State, unless you indicate another date, no later than 30 days after filing with the Secretary of State.

The following amendment of articles regulating the above corporation were adopted:

ARTICLE III

3.01 The aggregate number of shares of capital stock which this Corporation shall have the authority to issue is 20,000,000 shares, which shall consist of 15,000,000 shares of common stock, par value \$.01 per share, and 5,000,000 undesignated shares, par value \$.01 per share.

This amendment has been approved pursuant to Minnesota Statutes chapter 302A or 317A. I certify that I am authorized to execute this amendment and I further certify that I understand that by signing this amendment, I am subject to the penalties of perjury as set forth in section 609.48 as if I had signed this amendment under oath.

/s/ Anil K.
Jain
Anil K. Jain

Filed: September
14, 1994

STATE OF MINNESOTA
OFFICE OF THE SECRETARY OF STATE
ARTICLES OF AMENDMENT
OF
APA OPTICS, INC.

Pursuant to the provisions of Minnesota Statutes Section 302A.135, the following amendment to the Articles of Incorporation of APA Optics, Inc., a Minnesota corporation, was approved and adopted pursuant to Minnesota Statutes Chapter 302A.

Paragraph 3.01 of Article III of the Articles of Incorporation of APA Optics, Inc. is hereby amended in its entirety to read as follows:

3.01. The aggregate number of shares of capital stock which this Corporation shall have the authority to issue is 55,000,000 shares, which shall consist of 50,000,000 shares of common stock, par value \$0.01 per share, and 5,000,000 undesignated shares, par value \$0.01 per share. Prior to the effective date of this amended Section 3.01, the board of directors utilized a portion of the undesignated shares to establish a series of capital stock and such series of capital stock shall not be affected in any respect by this amended Section 3.01, regardless of whether a statement with respect to such capital stock has heretofore been filed with the office of the Minnesota Secretary of State pursuant to Minnesota Statutes Section 302A.401, Subd. 3(b).

I swear that the foregoing is true and accurate and that I have authority to sign this document on behalf of the corporation.

APA OPTICS, INC.

By /s/ Anil K.
Jain _____
Anil K. Jain
Its Chief
Executive Officer

Filed: August 17,
2000

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