

RECORDATION FORM COVER SHEET
PATENTS ONLY

To the Director of the U.S. Patent and Trademark Office: Please record the attached documents or the new address(es) below.

1. Name of conveying party(ies)

Aprilis, Inc.

Additional name(s) of conveying party(ies) attached? ☐ Yes ☒ No

3. Nature of conveyance/Execution Date(s):

Execution Date(s) October 14, 2005

- ☐ Assignment ☐ Merger
☐ Security Agreement ☐ Change of Name
☐ Joint Research Agreement
☐ Government Interest Assignment
☐ Executive Order 9424, Confirmatory License
☒ Other Third Amended And Restated Collateral Assignment Of Patents

2. Name and address of receiving party(ies)

Name: Dow Corning Enterprises, Inc., as collateral agent

Internal Address: _____

Street Address: 2200 West Salzburg Road

City: Midland

State: Michigan

Country: US Zip: 48686

Additional name(s) & address(es) attached? ☐ Yes ☒ No

4. Application or patent number(s):

☐ This document is being filed together with a new application.

A. Patent Application No.(s)

08/970088 10/166582 60/415846 60/476812 60/510914
08/376820 10/290068 60/436521 60/480008 60/519792
08/427721 09/304809 60/436517 60/495678 60/520176
09/260523 60/228121 10/761142 60/509983 60/523068
60/529013 60/532795 60/533296 60/563041 08/376820

Additional numbers attached? ☒ Yes ☐ No

B. Patent No.(s)

5759721 5477347 5519617 5566387 5665791 5883880
6489065 5481523 5519651 5621549 5694488 5896210
5377176 5488494 5526337 5627664 5696613 5940537
5377179 5511058 5529861 5638193 5756648 5982513

5. Name and address to whom correspondence concerning document should be mailed:

Name: Dave Cornelius

Internal Address: Dow Corning Enterprises, Inc.

Street Address: 2200 West Salzburg Road

City: Midland

State: Michigan

Zip: 48686

Phone Number: (989) 496-3265

Fax Number: (989) 496-8824

Email Address: dave.cornelius@dowcorning.com

6. Total number of applications and patents involved: 70

7. Total fee (37 CFR 1.21(h) & 3.41) \$ 2,800.00

- ☐ Authorized to be charged by credit card
☒ Authorized to be charged to deposit account
☐ Enclosed
☐ None required (government interest not affecting title)

8. Payment Information

a. Credit Card Last 4 Numbers _____
Expiration Date _____

b. Deposit Account Number 501432 (267690095002)

Authorized User Name Kathie J. Kopczyk

9. Signature:

Kathie J. Kopczyk
Signature

February 17, 2006

Date

Kathie J. Kopczyk
Name of Person Signing

Total number of pages including cover sheet, attachments, and documents: 19

Documents to be recorded (including cover sheet) should be faxed to: (571) 273-0140, or mailed to:
Mail Stop Assignment Recordation Services, Director of the USPTO, P.O. Box 1450, Alexandria, V.A. 22313-1450

CH \$2560.00 501432 08970066

Supplemental List of Patent Applications and Patents

Applications:

60/728,941

Patents:

6,057,703
6,055,174
5,111,445
5,339,305
5,438,439
5,453,969
5,483,365
5,550,779
5,671,073
5,949,558
5,959,747
5,978,112
6,904,491
6,881,464
6,784,300
6,992,805
6,904,491
6,881,464
6,784,300
6,992,805

THIRD AMENDED AND RESTATED COLLATERAL ASSIGNMENT OF PATENTS

This **THIRD AMENDED AND RESTATED COLLATERAL ASSIGNMENT OF PATENTS** (the "Collateral Assignment of Patents") is made as of May 18, 2005, by and between Aprilis, Inc., a Delaware corporation, with a business address at 5 Clock Tower Place, Suite 200, Maynard, MA 01754 ("Assignor"), and Zero Stage Capital VII, L.P., as Collateral Agent ("Assignee") for the benefit of (a) the several Secured Parties pursuant to the terms of that certain Note and Warrant Agreement, dated as of May 18, 2005 (the "Note Agreement"), and (b) the several Prior Lenders pursuant to the terms of those certain Note and Warrant Agreements, dated as of August 5, 2004, October 13, 2004 and January 24, 2005 (the "Prior Note Agreements"). All capitalized terms used in this Collateral Assignment of Patents and not otherwise defined herein shall have the same meanings herein as in that certain Note Agreement.

WHEREAS, , pursuant to the Note Agreement and the Prior Note Agreements, the Assignor granted a security interest in all of its assets, including all patents and patent applications, whether United States or foreign, that are owned by Assignor or in which Assignor has any right, title or interest, as of the date hereof or in the future (the "Patents"), including but not limited to, (a) those patents and patent applications listed on Schedule A hereto, (b) all letters patent of the United States or any other country, and all applications for letters patent of the United States or any other country, (c) all re-issues, continuations, divisions, continuations-in-part, renewals or extensions thereof, (d) the inventions disclosed or claimed therein, including the right to make, use, practice and/or sell (or license or otherwise transfer or dispose of) the inventions disclosed or claimed therein, and (e) the right (but not the obligation) to make and prosecute applications for such patents; and the inventions disclosed and claimed in the Patents ("Inventions"), to secure Assignor's obligations under the Note Agreement, the other Loan Documents and the Prior Loan Documents;

WHEREAS, Assignor is the owner of the Patents and the Inventions; and

WHEREAS, Assignor has defaulted on its obligations under the terms of the Note Agreement and the Prior Note Agreements and certain promissory notes issued in connection therewith.

NOW, THEREFORE, for good and valuable consideration, receipt of which is hereby acknowledged, Assignor hereby transfers, assigns and conveys to Assignee (for the benefit of certain secured lenders), effective as of the date of filing of this Assignment of Patents with the United States Patent and Trademark Office, free and clear of all liens, charges, encumbrances and rights of others, BY WAY OF COLLATERAL SECURITY, all of Assignor's rights, title and interest in and to the Patents (including, without limitation, those Patents identified on Schedule A hereto and in and to any foreign patents or patent applications which correspond to, or are based upon, or claim priority from, any of the Patents identified in Schedule A hereto) and the Inventions, and any and all reissues, extensions, continuations-in-whole or continuations-in-part of any of the Patents, together with the right to sue and recover for, and the right to profits or damages due or accrued, arising out of or in connection with, any and all past, present or future infringements of the Patents or the Inventions.

At such time as all of the Assignor's obligations under the Loan Documents and the Prior Loan Documents have been finally paid and satisfied in full, this Collateral Assignment of Patents shall terminate and the Collateral Agent shall, upon the written request and at the expense of the Assignor, execute and deliver to the Assignor all deeds, assignments and other instruments as may be necessary or proper to reassign and reconvey to and re-vest in the Assignor the entire right, title and interest to the

Patents and Inventions previously granted, assigned, transferred and conveyed to the Collateral Agent and the Holders by the Assignor pursuant to this Collateral Assignment of Patents, as fully as if this Collateral Assignment of Patents had not been made, subject to any disposition of all or any part thereof which may have been made by the Collateral Agent and the Holders pursuant hereto or any of the other Loan Documents or the Prior Loan Documents.

-3-

IN WITNESS WHEREOF, the Assignor, by its duly authorized officer, has executed this Collateral Assignment of Patents, as an instrument under seal, effective as of this ____ day of May 2005.

APRILIS, INC.

By: John Berg
Name: John Berg
Title: President

CERTIFICATE OF ACKNOWLEDGMENT
COMMONWEALTH OR STATE OF Massachusetts
COUNTY OF Middlesex) ss.

Frances French
NOTARY PUBLIC
My commission expires Dec. 4, 2009

On this 12 day of May, 2005, before me, the undersigned notary public, personally appeared John Berg, proved to me through satisfactory evidence of identification, which were MA Dr. License to be the person whose name is signed on the preceding or attached document, and acknowledged to me that he signed it voluntarily for its stated purpose (as President for Aprilis, Inc., a Delaware corporation).

The foregoing Collateral Assignment of Patents by the Assignor to the Assignee is hereby accepted as of this 5 day of May, 2005.

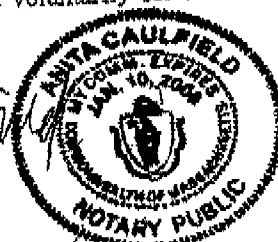
ZERO STAGE CAPITAL VII, L.P., as
Collateral Agent

By: Paul M. Kelley
Paul M. Kelley

CERTIFICATE OF ACKNOWLEDGMENT
COMMONWEALTH OR STATE OF Massachusetts
COUNTY OF Middlesex) ss.

On this 17 day of May, 2005, before me, the undersigned notary public, personally appeared Paul M. Kelley, proved to me through satisfactory evidence of identification, which were MA Drivers License to be the person whose name is signed on the preceding or attached document, and acknowledged to me that he signed it voluntarily for its stated purpose (as Collateral Agent for certain secured lenders).

Anta Caulfield



8USDOCS/1487874.4

SCHEDULE A

U.S. Patent and Trademark Office Patent and Patent Application

US Patent No.	US Appl. No.	US Prov. Appl. No.	Title
US 5,759,721			HOLOGRAPHIC MEDIUM AND PROCESS FOR USE THEREOF
US 6,489,065 B1	US 08/649,823		HOLOGRAPHIC MEDIUM AND PROCESS FOR USE THEREOF
	US 08/970,066		HOLOGRAPHIC MEDIUM AND PROCESS FOR USE THEREOF (MULTIFUNCTIONAL MEDIUM)
			POLYSILOXANE-CONTAINING HOLOGRAPHIC MEDIUM HAVING ENHANCED PHOTSENSITIVITY
			HOLOGRAMS FORMED FROM MONOMERS WITH DIFFERING REFRACTIVE INDICES
			HOLOGRAPHIC MEDIUM USING SURFACTANT AS BINDER
			RED-SENSITIZED HOLOGRAPHIC MEDIUM AND PROCESS
			GREEN-SENSITIZED HOLOGRAPHIC MEDIUM AND PROCESS
			RED-SENSITIZED MEDIUM AND PROCESS
			GREEN-SENSITIZED MEDIUM AND PROCESS
			HOLOGRAPHIC GRATING FOR DISPERSION COMPENSATION IN CHIRPED-PULSE AMPLIFICATION SYSTEM
			HOLOGRAPHIC RECORDING WITH PLAYBACK AT LONGER WAVELENGTH
			DEPOLYMERIZATION VOLUME HOLOGRAM
			RECORDING SERVO TRACKING SIGNALS IN PHOTOPOLYMER DISKS
			HOLOGRAPHIC MEDIA CONTAINING PHOTOCHROMIC DYES
			PROCESS FOR PRODUCING HOLOGRAPHIC DISKS USING FLYING SPOT SCANNER
			PRODUCTION OF PURE EPOXY MONOMERS FOR HOLOGRAPHIC RECORDING MEDIA
			HOLOGRAPHIC MEDIUM INCORPORATING GELATOR
			HOLOGRAPHIC MEDIA USING NOVEL EPOXY MONOMERS
			HOLOGRAPHIC MEDIUM CONTAINING CARBON BLACK
			HOLOGRAPHIC RECORDING MEDIUM CONTAINING FRAGMENTING COMPOUND
			RED LIGHT SENSITIZERS FOR USE IN CROP HOLOGRAPHIC MEDIA
			HOLOGRAPHIC MEDIA USING 1-PHENYLNAPHTHALENE AS BINDER
			HOLOGRAPHIC MEDIUM WITH REDUCING CO-SENSITIZER

US Patent No.	US Appl. No.	US Prov. Appl. No.	Title
	10/116,684		HYBRID DATA STORAGE SYSTEM
	10/146,497	60/290,743	METHOD FOR PRODUCING OPTICAL RECORDING MEDIA WITH ACCURATELY PARALLEL SURFACES ²
	10/170,007	60/297,307	HOLOGRAPHIC FILTER WITH A WIDE ANGULAR FIELD OF VIEW AND A NARROW SPECTRAL BANDWIDTH
	10/166,562	60/297,416	TEMPERATURE COMPENSATION OF BRAGG REFLECTION GRATINGS
	10/290,068	60/332,889	NOVEL READ INHIBIT AGENTS
	US 09/941,166	US 60/206,370	DATA STORAGE MEDIUM COMPRISING COLLOIDAL METAL AND PREPARATION PROCESS THEREOF
		US 60/228,121	HOLOGRAPHIC STORAGE MEDIUM COMPRISING POLYFUNCTIONAL EPOXY MONOMERS CAPABLE OF UNDERGOING CATIONIC POLYMERIZATION
		US 60/415,846	LAYER-SHIFT MULTIPLEXING
		US 60/436,521	FLUOROARYLSULFONIUM PHOTOACID GENERATORS
		US 60/436,517	SENSITIZER DYES FOR PHOTOACID GENERATING SYSTEMS
	10/761,142	US 60/441,122	NOVEL IMPLEMENTATION OF AZIMUTHAL AND ANGLE MULTIPLEXING USING ELLIPSOIDAL REFLECTOR
		US 60/476,812	APPARATUS AND METHOD FOR HIGH AREAL DENSITY HOLOGRAPHIC DATA STORAGE SYSTEM
		US 60/480,008	APPARATUS AND METHOD FOR HIGH RESOLUTION FINGERPRINT CAPTURE AND IDENTIFICATION
		US 60/495,678	METHOD FOR ENCAPSULATING HOLOGRAPHIC MEDIA AND ARTICLE THEREOF
		US 60/509,983	METHOD AND APPARATUS FOR PHASE SLM BASED HOMOGENIZED FT HOLOGRAPHIC STORAGE AND DATA RECOVERY USING HOLOGRAPHIC INTERFEROMETRY
		US 60/510,914	SYSTEM AND METHOD FOR ACCESSING MEDIA IN A DATA STORAGE SYSTEM
		US 60/519,792	METHOD FOR HIGH RESOLUTION FINGERPRINT CAPTURE AND IDENTIFICATION
		US 60/520,176	HOLOGRAPHIC DATA STORAGE MEDIA WITH STRUCTURED SURFACES
		US 60/523,068	APPARATUS AND METHOD FOR HIGH RESOLUTION FINGERPRINT CAPTURE AND IDENTIFICATION
		US 60/529,013	METHOD AND APPARATUS FOR FIXING OF HOLOGRAPHIC MEDIA AND HOLOGRAPHIC STORAGE SYSTEMS
		US 60/532,795	METHOD AND APPARATUS FOR PHASE SLM BASED HOMOGENIZED FT HOLOGRAPHIC DATA STORAGE AND DATA RECOVERY
		US 60/533,296	REPLICATION OF MEDIA FOR HOLOGRAPHIC DATA STORAGE SYSTEMS
		US 60/563,041	CALIBRATION MARKS FOR HOLOGRAPHIC MEDIA

US Patent No.	US Appl. No.	US Prov. Appl. No.	Title
US 5,377,176			METHOD AND APPARATUS FOR ISOLATING DATA STORAGE REGIONS IN A THICK HOLOGRAPHIC STORAGE MEDIA
US 5,377,179			METHOD AND APPARATUS FOR ENHANCING THE UTILITY OF PHOTOPOLYMER RECORDING MEDIA FOR HOLOGRAPHIC DATA RECORDING
5,477,347			METHOD AND APPARATUS FOR ISOLATING DATA STORAGE REGIONS IN A THIN HOLOGRAPHIC STORAGE MEDIA.
5,481,523			A GANTRY FOR POSITIONING A READ/WRITE HEAD OF A HOLOGRAPHIC INFORMATION STORAGE SYSTEM.
5,488,494			PACKAGING SYSTEM FOR HOLOGRAPHIC STORAGE MEDIA.
5,511,058			DISTORTION CORRECTION OF A RECONSTRUCTED HOLOGRAPHIC DATA IMAGE.
5,519,517			METHOD AND APPARATUS FOR HOLOGRAPHICALLY RECORDING AND REPRODUCING IMAGES.
5,519,651			HIGH CAPACITY HOLOGRAPHIC STORAGE SYSTEM.
5,526,337			HOLOGRAPHIC STORAGE MEDIA PACKAGE.
5,529,861			METHOD FOR ENHANCING THE UTILITY OF A PHOTOPOLYMER RECORDING MEDIA FOR HOLOGRAPHIC DATA RECORDING.
5,566,387			DIAMOND SHAPED HOLOGRAPHIC STORAGE REGIONS ORIENTED ALONG A COMMON RADIAL COLUMN LINE FOR HIGHER STORAGE CAPACITY.
5,621,549			METHOD AND APPARATUS FOR POSITIONING A LIGHT BEAM ON A HOLOGRAPHIC MEDIA.
5,627,664			HOLOGRAPHIC STORAGE WITH COMBINED ORTHOGONAL PHASE CODES AND RANDOM PHASE CODES.
5,638,193			METHOD AND APPARATUS FOR AZIMUTHAL MULTIPLEXING OF HOLOGRAMS.
5,665,791			PHOTOSENSITIVE POLYMER FILMS AND THEIR METHOD OF PRODUCTION.
5,694,488			METHOD AND APPARATUS FOR PROCESSING OF RECONSTRUCTED HOLOGRAPHIC IMAGES OF DIGITAL DATA PATTERNS.
5,696,613			METHOD AND APPARATUS FOR MULTIPLEXING DATA IN DIFFERENT PLANES OF INCIDENCE OF A THIN HOLOGRAPHIC STORAGE MEDIA.
5,756,648			PHOTOSENSITIVE POLYIMIDE MATERIALS FOR ELECTRONIC PACKAGING APPLICATIONS.
5,883,880			DISK POSITIONING DEVICE FOR DEFINING PRECISE RADIAL LOCATION.
5,896,210			MOLDED BLOCK OPTICAL SYSTEM FOR VOLUME HOLOGRAPHIC STORAGE.
5,940,537			METHOD AND SYSTEM FOR COMPENSATING FOR GEOMETRIC DISTORTION OF IMAGES.
	08/376,820		RANDOM PHASE MASK / SPATIAL LIGHT MODULATOR

US Patent No.	US Appl. No.	US Prov. Appl. No.	Title
US 5,982,513			Method and System to Align Holographic Images
US 6,057,703			Re-configurable Programmable Logic Devices
US 6,055,174			Solid State Holographic Read-Only Memory
			Multiplexed Hologram Copying System and Method
US 5,111,445			Holographic Information Storage Systems
US 5,339,305			Disk-Based Optical Correlator and Method
US 5,438,439			Non-Destructive Readout Mechanism for Volume Holograms Using Two Wavelengths
US 5,435,969			Optical Memory with Pit Depth Encoding
US 5,483,365			Method for Multiplexing Hologram by In-Plane Grating Rotation
US 5,550,779			Angle and Spatially Multiplexed Volume Holographic Storage in the 90 Degree Geometry Using Non-Mechanical Beam Steering and Fractal Geometry
	08/427,721		Apparatus and Method for Storing and/or Reading Data on an Optical Disk
US 5,671,073			Holographic Storage Unit Using Shift Multiplexing
US 5,949,558			Holographic Storage Unit Using Shift Multiplexing
US 5,959,747			Method for Implementing a Learning Device Compact Architecture for Holographic Systems
	09/304,809		Compact Architecture for Holographic Systems
US 5,978,112			Non-Volatile Readout of Shift Multiplexed Holograms
	09/260,523		pMOS EEPROM Non-Volatile Data Storage Non-Volatile Holographic Storage in Doubly-Doped Crystals

FOURTH AMENDMENT TO NOTE AND WARRANT AGREEMENT

THIS FOURTH AMENDMENT, effective as of October 14, 2005 ("Fourth Amendment"), amends that certain Note and Warrant Agreement, dated as of May 18, 2005, as amended by that certain First Amendment to Note and Warrant Agreement, dated as of August 1, 2005, as further amended by that certain Second Amendment to Note and Warrant Agreement, dated as of August 25, 2005, as further amended by that certain Third Amendment to Note and Warrant Agreement, dated as of September 15, 2005 (as may be further amended from time to time, the "Agreement"), by and among (i) Aprilis, Inc., a Delaware corporation (the "Company"), (ii) each of the lenders set forth on Schedule 1 attached thereto (as such schedule may be amended from time to time), a copy of which is attached hereto for reference, and (iii) Zero Stage Capital VII, L.P., as Collateral Agent for the Secured Parties. Capitalized terms used herein without definition shall have the respective meanings for such terms set forth in the Agreement.

WHEREAS, pursuant to the terms of the Agreement the Company was authorized to request up to \$1,700,000 minus the aggregate Loan amounts from the Initial Closing and each prior Additional Closing in additional funds from the Secured Parties through October 14, 2005;

WHEREAS, the parties hereto desire to amend certain provisions of the Agreement as set forth herein to permit the Company to request additional Loan amounts through December 9, 2005; and

WHEREAS, the Secured Parties also desire to appoint a new Collateral Agent to deal with the Collateral on behalf of the Secured Parties and the Prior Lenders.

NOW, THEREFORE, in consideration of the foregoing and the mutual promises made herein, and for other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, the parties agree to amend the Agreement in accordance with Section 11.2 thereof as follows:

1. Amendment and Replacement of Party. The Agreement is hereby amended as follows:

The party name "Zero Stage Capital VII, L.P., as Collateral Agent" is hereby replaced in the preamble, in Sections 2.0 and 9.1 and in Exhibit B with the party name "Dow Corning Enterprises".

2. Amendment of Section 1.2. Section 1.2 of the Agreement is hereby amended as follows:

(a) The first sentence of Section 1.2 of the Agreement is hereby amended by deleting the date "October 14, 2005" appearing therein and substituting in lieu thereof the date "December 9, 2005".

(b) The first sentence of Section 1.2 of the Agreement is hereby further amended by deleting the dollar amount "\$1,700,000" appearing therein and substituting in lieu thereof the dollar amount "\$2,200,000".

3. Amendment of Section 9.0. Section 9.0 of the Agreement is hereby amended as follows:

The first sentence of Section 9.0 of the Agreement is hereby amended by deleting the text "Zero Stage Capital VII, L.P. to act as collateral agent" appearing therein and substituting in lieu thereto the text "Dow Coming Enterprises to act as collateral agent".

4. Amendment of Section 10.3. Section 10.3 of the Agreement is hereby amended as follows:

The first sentence of Section 10.3 of the Agreement is hereby amended by deleting the text "extended from September 16, 2005 to October 14, 2005 and that from and after the date hereof, each Prior Note shall become due and payable on or prior to October 14, 2005" appearing therein and substituting in lieu thereof the text "extended from October 14, 2005 to December 9, 2005 and that from and after the date hereof, each Prior Note shall become due and payable on or prior to December 9, 2005".

5. Amendment to Add Section 10.4. The Agreement is hereby amended by amending Section 10.4 to read in its entirety as follows:

"Notwithstanding anything to the contrary express or implied herein and pursuant to Section 11.2 hereof, the Secured Parties hereby agree that the Maturity Date (as defined in each of the Secured Notes) be and hereby is extended from October 14, 2005 to December 9, 2005."

6. Confirmation of Section 11.2. The following text follows the existing first sentence of Section 11.2 of the Agreement:

"Notwithstanding anything to the contrary set forth in the Secured Notes or the Prior Notes, neither the Secured Notes, the Prior Notes nor any part thereof may be changed, waived, or amended except by an instrument in writing signed by Debtor and the Holders holding in the aggregate at least a majority of the principal amount then outstanding under the Secured Notes and the Prior Notes; and waiver on one occasion shall not operate as a waiver on any other occasion, provided, however, that in the event such change, waiver or amendment materially adversely affects the rights of a Holder (or their permitted transferees of their rights hereunder) in a manner that is materially different than all of the other Holders at the time of such waiver or amendment, then such waiver or amendment shall further require the approval of such materially adversely affected Holder (or their permitted transferees of their rights hereunder)."

7. Waiver. Any and all prior Events of Default are hereby expressly waived.

8. No Other Amendments. Except to the extent amended hereby, all of the definitions, terms, provisions and conditions set forth in the Agreement are hereby ratified and confirmed and shall remain in full force and effect. The Agreement and this Fourth Amendment shall be read and construed together as a single agreement and the term "Agreement" shall henceforth be deemed a reference to the Agreement as amended by this Fourth Amendment. This Fourth Amendment may be signed in any number of counterparts, each of which shall be deemed to be an original and all of which together shall constitute one and the same instrument. In making proof of this Fourth Amendment, it shall not be necessary to produce or account for more than one such counterpart.

[The remainder of this page is intentionally left blank.]

IN WITNESS WHEREOF, the undersigned have executed this Fourth Amendment to Note and Warrant Agreement as of the day and year first above written.

DEBTOR:

APRILIS, INC.

By: _____
Name:
Title:

COLLATERAL AGENT:

ZERO STAGE CAPITAL VII, L.P. ^(See below)

By: Paul M. Kelley
Name:
Title: PRESIDENT

SECURED PARTIES:

ZERO STAGE CAPITAL VII, L.P. ☒

By: Paul M. Kelley
Name:
Title: PRESIDENT

BY ZERO STAGE CAPITAL ASSOCIATES VII, LP,
ITS GENERAL PARTNER,

BY ZERO STAGE CAPITAL GP VII, INC.,
ITS GENERAL PARTNER,

ZERO STAGE CAPITAL (CAYMAN) VII, L.P. ☒

By: Paul M. Kelley
Name:
Title: PRESIDENT

BY ZERO STAGE CAPITAL GP VII, INC. (CAYMAN),
ITS GENERAL PARTNER,

ZERO STAGE CAPITAL SBIC VII, L.P. ☒

By: Paul M. Kelley
Name:
Title: PRESIDENT

BY ZERO STAGE CAPITAL ASSOCIATES SBIC VII,
ITS GENERAL PARTNER,

BY ZERO STAGE CAPITAL GP VII, INC.,
ITS GENERAL PARTNER,

DOW CORNING ENTERPRISES, INC.

By: _____
Name:
Title:

IN WITNESS WHEREOF, the undersigned have executed this Fourth Amendment to Note and Warrant Agreement as of the day and year first above written.

DEBTOR:

APRILIS, INC.

By: _____
Name:
Title:

COLLATERAL AGENT:

ZERO STAGE CAPITAL VII, L.P.

By: _____
Name:
Title:

SECURED PARTIES:

ZERO STAGE CAPITAL VII, L.P.

By: _____
Name:
Title:

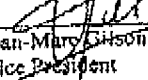
ZERO STAGE CAPITAL (CAYMAN) VII, L.P.

By: _____
Name:
Title:

ZERO STAGE CAPITAL SBIC VII, L.P.

By: _____
Name:
Title:

DOW CORNING ENTERPRISES, INC. *DM*

By:  _____
Name: Jean-Marc Gibson
Title: Vice President

BUSDOCS1605322

Schedule 1

Secured Parties

Initial Closing:

<u>Secured Party</u>	<u>Date of Promissory Note</u>	<u>Loan Amount</u>
Zero Stage Capital VII, L.P.	May 19, 2005	\$63,822.00
Zero Stage Capital (Cayman) VII, L.P.	May 19, 2005	\$23,538.00
Zero Stage Capital SBIC VII, L.P.	May 19, 2005	\$12,640.00
Dow Corning Enterprises	May 18, 2005	\$100,000.00
		\$200,000.00

TOTAL:

Additional Closing:

<u>Secured Party</u>	<u>Date of Promissory Note</u>	<u>Loan Amount</u>
Zero Stage Capital VII, L.P.	June 7, 2005	\$79,777.00
Zero Stage Capital (Cayman) VII, L.P.	June 7, 2005	\$29,423.00
Zero Stage Capital SBIC VII, L.P.	June 7, 2005	\$15,800.00
Dow Corning Enterprises	June 8, 2005	\$125,000.00
Zero Stage Capital VII, L.P.	July 1, 2005	\$63,822.00
Zero Stage Capital (Cayman) VII, L.P.	July 1, 2005	\$23,538.00
Zero Stage Capital SBIC VII, L.P.	July 1, 2005	\$12,640.00
Dow Corning Enterprises	July 5, 2005	\$100,000.00
Dow Corning Enterprises	July 22, 2005	\$75,000.00
Dow Corning Enterprises	August 1, 2005	\$175,000.00
Zero Stage Capital VII, L.P.	August 26, 2005	\$79,777.00
Zero Stage Capital (Cayman) VII, L.P.	August 26, 2005	\$29,423.00
Zero Stage Capital SBIC VII, L.P.	August 26, 2005	\$15,800.00
Dow Corning Enterprises	August 26, 2005	\$125,000.00
Zero Stage Capital VII, L.P.	September 14, 2005	\$31,911.00
Zero Stage Capital (Cayman) VII, L.P.	September 14, 2005	\$11,769.00
Zero Stage Capital SBIC VII, L.P.	September 14, 2005	\$6,320.00
Dow Corning Enterprises	September 13, 2005	\$50,000.00
Zero Stage Capital VII, L.P.	September 27, 2005	\$63,822.00
Zero Stage Capital (Cayman) VII, L.P.	September 27, 2005	\$23,538.00
Zero Stage Capital SBIC VII, L.P.	September 27, 2005	\$12,640.00
Dow Corning Enterprises	September 27, 2005	\$100,000.00
Dow Corning Enterprises	October 14, 2005	\$75,000.00
		\$1,325,000.00

TOTAL:

Table I. Summary of Aprilis Intellectual Property Portfolio
*Color coded with green for those expected for assignment
in purchase of Biometrics assets*

1.	US 5,111,445	Holographic Information Storage System
2.	US 5,339,305	Disk-Based Optical Correlator and Method
3.	US 5,377,176	Method and apparatus for isolating data storage regions in a thick holographic storage media
4.	US 5,377,179	Method and apparatus for enhancing the utility of photopolymer recording media for holographic data recording
5.	US 5,438,439	Non-Destructive Readout Mechanism for Volume Holograms Using Two Wavelengths
6.	US 5,453,969	Optical Memory with Pit Depth Encoding
7.	US 5,477,347	Method and apparatus for isolating data storage regions in a thin holographic storage media.
8.	US 5,481,523	A gantry for positioning a read/write head of a holographic information storage system.
9.	US 5,483,365	Method for holographic storage using peristrophic multiplexing.
10.	US 5,488,494	Packaging system for holographic storage media.
11.	US 5,511,058	Distortion correction of a reconstructed holographic data image.
12.	US 5,519,517	Method and apparatus for holographically recording and reproducing images.
13.	US 5,519,651	High capacity holographic storage system.
14.	US 5,526,337	Holographic storage media package.
15.	US 5,529,861	Method for enhancing the utility of a photopolymer recording media for holographic data recording.
16.	US 5,550,779	Holographic memory with angle, spatial and out-of-plane multiplexing
17.	US 5,566,387	Diamond shaped holographic storage regions oriented along a common radial column line for higher storage capacity.
18.	US 5,621,549	Method and apparatus for positioning a light beam on a holographic media.
19.	US 5,627,664	Holographic storage with combined orthogonal phase codes and random phase codes.
20.	US 5,638,193	Method and apparatus for azimuthal multiplexing of holograms.
21.	US 5,665,791	Photosensitive polymer films and their method of production.
22.	US 5,671,073	Holographic Storage Using Shift Multiplexing
23.	US 5,694,488	Method and apparatus for processing of reconstructed holographic images of digital data patterns.
24.	US 5,696,613	Method and apparatus for multiplexing data in different planes of incidence of a thin holographic storage media.
25.	US 5,756,648	Photosensitive polyimide materials for electronic packaging applications.
26.	US 5,759,721	Holographic Medium and Process For Use Thereof
27.	US 5,883,880	Disk positioning device for defining precise radial location.
28.	US 5,896,210	Molded block optical system for volume holographic storage.
29.	US 5,940,537	Method and system for compensating for geometric distortion of images.
30.	US 5,949,558	Holographic Storage Using Shift Multiplexing
31.	US 5,959,747	Compact Architecture for Holographic Systems
32.	US 5,978,112	Non-Volatile Readout of Shift Multiplexed Holograms
33.	US 5,982,513	Method and System to Align Holographic Images
34.	US 6,055,174	Solid State Holographic Memory
35.	US 6,057,703	Re-configurable Programmable Logic Devices

36.	US 6,072,608	Compact Architecture for Holographic Systems
37.	US 6,157,470	Non-volatile holographic storage in doubly-doped photorefractive material
38.	US 6,222,755	Solid State Holographic Memory
39.	US 6,272,095	Apparatus and Method for Storing and/or Reading Data on an Optical Disk
40.	US 6,489,065	Holographic Medium and Process for Use Thereof
41.	EP 0 853 774 B1	Holographic Medium and Process
42.	EP 0 898 735 B1	Holographic Medium and Process
43.	EP 1 029 258 B1	Holographic Medium and Process
44.	US 6,784,300	Holographic storage medium comprising polyfunctional epoxy monomers capable of undergoing cationic polymerization
45.	US 2002/015376	Apparatus and method for storing and/or reading data on an optical disk
46.	US 2003/157414 A1	Holographic Medium and Process
47.	JP 3604700 B2	Holographic Medium and Process
48.	JP 3473950 B2	Holographic Medium and Process for Use Thereof
49.	JP 3727070 B2	Holographic Medium and Process for Use Thereof
50.	WO 02/19040 A2 EP 1317498 A2	Holographic storage medium comprising polyfunctional epoxy monomers capable of undergoing cationic polymerization
51.	Taiwan 90121147	Holographic storage medium comprising polyfunctional epoxy monomers capable of undergoing cationic polymerization
52.	S. Korea 2003-7003021	Holographic storage medium comprising polyfunctional epoxy monomers capable of undergoing cationic polymerization
53.	JP 2004 507513 T	Holographic storage medium comprising polyfunctional epoxy monomers capable of undergoing cationic polymerization
54.	CA 2,424,366	Holographic storage medium comprising polyfunctional epoxy monomers capable of undergoing cationic polymerization
55.	Singapore 200301738-1	Holographic storage medium comprising polyfunctional epoxy monomers capable of undergoing cationic polymerization
56.	US 2004/0249181 A1	Holographic storage medium comprising polyfunctional epoxy monomers capable of undergoing cationic polymerization; {Divisional}
57.	EP 1 292 859 B1	Data Storage Medium Comprising Colloidal Metal and Preparation Process Thereof
58.	EP 1 598 699 A2	Data Storage Medium Comprising Colloidal Metal and Preparation Process Thereof {Divisional EPO application}
59.	US-2003/0152842-A1	Data Storage Medium Comprising Colloidal Metal and Preparation Process Thereof
60.	JP 2003 534569T T	Data Storage Medium Comprising Colloidal Metal and Preparation Process Thereof
61.	WO 02/093571 A2	Method and Apparatus For Producing Optical Recording Media With Accurately Parallel Surfaces
62.	US 6,881,464	Method and Apparatus For Producing Optical Recording Media With Accurately Parallel Surfaces
63.	S. Korea 2003-7014762	Method and Apparatus For Producing Optical Recording Media With Accurately Parallel Surfaces
64.	JP 2004 523057 T	Method and Apparatus For Producing Optical Recording Media With Accurately Parallel Surfaces
65.	US 6,898,167 B2	Techniques for Writing and Reading Data on an Optical Disk Which Include Information of Holographic Optical Gratings in Plural Locations on the Optical Disk; Divisional of US 6,272,095
66.	WO 02/082457 A2	Hybrid Data Storage System
67.	US 6,904,491 B2	Hybrid Data Storage System
68.	S. Korea 2003-7013044	Hybrid Data Storage System
69.	JP 2004 536379 T	Hybrid Data Storage System

70.	US 6,992,805	Holographic Filter with a Wide Angular Field of View and a Narrow Spectral Bandwidth
71.	US 11/295,392	Holographic Filter with a Wide Angular Field of View and a Narrow Spectral Bandwidth (Divisional)
72.	US 2003/0007250 A1	Temperature Compensation of Bragg Reflection Gratings
73.	WO 2003/041058 A2 EP 1446801 A2	Optical Disk, Card, or Media And Method for Coating of Said Optical Disk, Card Or Media
74.	US 2005/0213488 A1	Novel Reading Inhibit Agents
75.	CA 2 465 787 A1	Optical Disk, Card, or Media And Method for Coating of Said Optical Disk, Card Or Media
76.	WO 2004/058699 A2 EP 1583740 A2	Fluoroarylsulfonium Photoacid Generators
77.	US 10/945,151	Fluoroarylsulfonium Photoacid Generators
78.	WO 2004/059389 A2 EP 1578870 A2	Sensitizer Dyes for Photoacid Generating Systems
79.	US 11/158,922	Sensitizer Dyes for Photoacid Generating Systems
80.	WO 2004/066035 A2 EP 1588097 A2	Method and Apparatus for Azimuthal Holographic Multiplexing Using Elliptical Reflector
81.	US 2004/0223200 A1	Method and Apparatus for Azimuthal Holographic Multiplexing Using Elliptical Reflector
82.	WO 2004/112045 A2	Apparatus and Method for High Area Density Holographic Data Storage System
83.	US 2003/0476812P	Apparatus and Method for High Area Density Holographic Data Storage System
84.	S. Korea 2005-7023498	Apparatus and Method for High Area Density Holographic Data Storage System
85.	US 2005/0081235 A1	System and Method for Accessing Media in a Data Storage System
86.	WO 2005/038607 A2	System and Method for Accessing Media in a Data Storage System
87.	WO 2005/050627 A2	Holographic Data Storage Media with Structured Surfaces
88.	US 2005/0105150 A1	Holographic Data Storage Media with Structured Surfaces
89.	US 2003/0529013P	Method and Apparatus for the Fixing of Holographic Media in Holographic Storage Systems
90.	WO 2005/059902 A2	Method and Apparatus for the Fixing of Holographic Media in Holographic Storage Systems
91.	WO 2005/001783 A1	Apparatus and Method for Accessing Media in a Data Storage System
92.	US 2005/0180008P	Apparatus and Method for Accessing Media in a Data Storage System
93.	WO 2005/001782 A2	Method and Apparatus for the Fixing of Holographic Media in Holographic Storage Systems
94.	US 2003/051342P	Method and Apparatus for the Fixing of Holographic Media in Holographic Storage Systems
95.	EP 1493190	Apparatus and Method for Accessing Media in a Data Storage System
96.	PGPUS05/036957	Apparatus and Method for Accessing Media in a Data Storage System
97.	11/251362	Apparatus and Method for Accessing Media in a Data Storage System
98.	PGPUS05/036957	Apparatus and Method for Accessing Media in a Data Storage System
99.	WO 2005/036539 A2	Method and Apparatus for Phase-Encoded Homogenized Fourier Transform Holographic Data Storage and Recovery
101.	US 2005/0134948 A1	Method and Apparatus for Phase-Encoded Homogenized Fourier Transform Holographic Data Storage and Recovery
102.	60/495,678	Method for Encapsulating Holographic Media and Article Thereof
103.	60/542,419	Method and Apparatus of Incorporating Phase Spatial Light Modulators in Holographic Data Storage Systems
104.	60/533402	Method for Encapsulating Holographic Media and Article Thereof
105.	PGPUS05/036957	Apparatus and Method for Accessing Media in a Data Storage System
106.	US 2003/0533296P	Replication of Media for Holographic Data Storage Systems

107.	WO 2005/066939 A2	Replication of Media for Holographic Data Storage Systems
108.	US 2004/0563041P	Calibration Marks for Holographic Media
109.	WO 2005/103842 A2	Calibration Of Holographic Data Storage Systems Using Holographic Media Calibration Features
110.	US 2005/0728941P	Photopolymerizable Medium Comprising Siloxane Compounds That Support Cationic Polymerization

JONES DAY

NORTH POINT • 901 LAKESIDE AVENUE • CLEVELAND, OHIO 44114-1190
TELEPHONE: 216-586-3939 • FACSIMILE: 216-579-0212

Direct Number: (216) 586-1097
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267690-095002

March 24, 2006

VIA FACSIMILE
(571) 273-0140

Mail Stop Assignment Services Division
P.O. Box 1450
Alexandria, VA 22313-1450

Re: Recordation of Assignment of Batch 606322

Dear Sir or Madam:

Enclosed please find the facsimile transmission of the recorded assignment for the above-referenced batch number. Please issue a corrected notice indicating the correct name of the Assignee, Aprilis, Inc.

Also, please record the assignment for the following applications and patents, which were identified on the cover sheet, but were not recorded:

08/376820
60/728941
5519651
5959747

In addition, please correct the numbers of the patents indicated as follows:

5759751	should be	5759721
5377117	should be	5377176
5488449	should be	5488494
5519817	should be	5519517
5638119	should be	5638193
569613	should be	5696613
5886210	should be	5896210
5486365	should be	5483365

CLI-1398019v1

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IRVING • LONDON • LOS ANGELES • MADRID • MENLO PARK • MILAN • MOSCOW • MUNICH • NEW DELHI • NEW YORK • PARIS
PITTSBURGH • SAN DIEGO • SAN FRANCISCO • SHANGHAI • SINGAPORE • SYDNEY • TAIPEI • TOKYO • WASHINGTON

PATENT

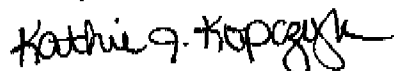
REEL: 017480 FRAME: 0311

JONES DAY

Mail Stop Assignment Recordation Services
March 24, 2006
Page 2

We look forward to receiving the corrected recorded assignment in due course.
If you have any questions, please contact me at the telephone number listed above.

Very truly yours,

A handwritten signature in black ink, appearing to read "Kathie J. Kopczyk". The signature is fluid and cursive, with the first name "Kathie" being more prominent.

Kathie J. Kopczyk
Patent and Trademark Assistant

Enclosure



UNITED STATES PATENT AND TRADEMARK OFFICE

UNDER SECRETARY OF COMMERCE FOR INTELLECTUAL PROPERTY AND
DIRECTOR OF THE UNITED STATES PATENT AND TRADEMARK OFFICE

MARCH 15, 2006

PTAS

700244759A

700244759A

DAVE CORNELLUS
DOW CORNING ENTERPRISES, INC.
2200 WEST SALZBURG ROAD
MIDLAND MICHIGAN 48686

UNITED STATES PATENT AND TRADEMARK OFFICE
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PLEASE REVIEW ALL INFORMATION CONTAINED ON THIS NOTICE. THE INFORMATION CONTAINED ON THIS RECORDATION NOTICE REFLECTS THE DATA PRESENT IN THE PATENT AND TRADEMARK ASSIGNMENT SYSTEM. IF YOU SHOULD FIND ANY ERRORS OR HAVE QUESTIONS CONCERNING THIS NOTICE, YOU MAY CONTACT THE EMPLOYEE WHOSE NAME APPEARS ON THIS NOTICE AT 571-272-3350. PLEASE SEND REQUEST FOR CORRECTION TO: U.S. PATENT AND TRADEMARK OFFICE, MAIL STOP: ASSIGNMENT SERVICES BRANCH, P.O. BOX 1450, ALEXANDRIA, VA 22313.

RECORDATION DATE: 02/17/2006

REEL/FRAME: 017303/0484
NUMBER OF PAGES: 19

BRIEF: THIRD AMENDED AND RESTATED COLLATERAL ASSIGNMENT OF PATENTS

ASSIGNOR:
APRLLIS, INC.

DOC DATE: 10/14/2005

ASSIGNEE:
DOW CORNING ENTERPRISES, INC. AS
COLLATERAL AGENT
2200 WEST SALZBURG ROAD
MIDLAND, MICHIGAN 48686

SERIAL NUMBER: 08970066

FILING DATE: 11/13/1997

PATENT NUMBER:

ISSUE DATE:

TITLE: HOLOGRAPHIC MEDIUM AND PROCESS FOR USE THEREOF

017303/0484 PAGE 2

SERIAL NUMBER: 08427721
PATENT NUMBER: 6272095
TITLE: HOLOGRAPHIC CD-ROM

FILING DATE: 04/21/1995
ISSUE DATE: 08/07/2001

SERIAL NUMBER: 09260523
PATENT NUMBER: 6157470
TITLE: NON-VOLATILE HOLOGRAPHIC STORAGE IN DOUBLY-DOPED PHOTOREFRACTIVE MATERIAL

FILING DATE: 02/25/1999
ISSUE DATE: 12/05/2000

SERIAL NUMBER: 60529013
PATENT NUMBER:
TITLE: METHODS AND APPARATUS FOR THE FIXING OF HOLOGRAPHIC MEDIA IN HOLOGRAPHIC DATA STORAGE SYSTEMS

FILING DATE: 12/12/2003
ISSUE DATE:

SERIAL NUMBER: 10166562
PATENT NUMBER:
TITLE: TEMPERATURE COMPENSATION OF BRAGG REFLECTION GRATINGS

FILING DATE: 06/10/2002
ISSUE DATE:

SERIAL NUMBER: 10290068
PATENT NUMBER:
TITLE: NOVEL READING INHIBIT AGENTS

FILING DATE: 11/06/2002
ISSUE DATE:

SERIAL NUMBER: 09304809
PATENT NUMBER: 6072608
TITLE: COMPACT ARCHITECTURE FOR HOLOGRAPHIC SYSTEMS

FILING DATE: 05/03/1999
ISSUE DATE: 06/06/2000

SERIAL NUMBER: 60228121
PATENT NUMBER:
TITLE: HOLOGRAPHIC STORAGE MEDIUM COMPRISING POLYFUNCTIONAL EPOXY MONOMERS CAPABLE OF UNDERGOING CATIONIC POLYMERIZATION

FILING DATE: 08/28/2000
ISSUE DATE:

SERIAL NUMBER: 60532795
PATENT NUMBER:
TITLE: METHOD AND APPARATUS FOR PHASE SLM BASED HOMOGENIZED FT HOLOGRAPHIC DATA STORAGE AND DATA RECOVERY

FILING DATE: 12/24/2003
ISSUE DATE:

SERIAL NUMBER: 60415846
PATENT NUMBER:
TITLE: LAYER-SHIFT MULTIPLEXING

FILING DATE: 10/03/2002
ISSUE DATE:

SERIAL NUMBER: 60436521
PATENT NUMBER:
TITLE: FLUOROARYLSULFONIUM PHOTOACID GENERATORS

FILING DATE: 12/23/2002
ISSUE DATE:

SERIAL NUMBER: 60436517
PATENT NUMBER:
TITLE: SENSITIZER DYES FOR PHOTOACID GENERATING SYSTEMS

FILING DATE: 12/23/2002
ISSUE DATE:

SERIAL NUMBER: 10761142
PATENT NUMBER:
TITLE: METHOD AND APPARATUS FOR AZIMUTHAL HOLOGRAPHIC MULTIPLEXING USING

FILING DATE: 01/20/2004
ISSUE DATE:

017303/0484 PAGE 3

SERIAL NUMBER: 60533296 FILING DATE: 12/30/2003
PATENT NUMBER: ISSUE DATE:
TITLE: REPLICATION OF MEDIA FOR HOLOGRAPHIC DATA STORAGE SYSTEMS

SERIAL NUMBER: 60476812 FILING DATE: 06/07/2003
PATENT NUMBER: ISSUE DATE:
TITLE: APPARATUS AND METHOD FOR HIGH AREAL DENSITY HOLOGRAPHIC DATA
STORAGE SYSTEM

SERIAL NUMBER: 60480008 FILING DATE: 06/21/2003
PATENT NUMBER: ISSUE DATE:
TITLE: APPARATUS AND METHOD FOR HIGH RESOLUTION FINGERPRINT CAPTURE AND
IDENTIFICATION

SERIAL NUMBER: 60495678 FILING DATE: 08/16/2003
PATENT NUMBER: ISSUE DATE:
TITLE: METHOD FOR ENCAPSULATING HOLOGRAPHIC MEDIA AND ARTICLE THEREOF

SERIAL NUMBER: 60509983 FILING DATE: 10/08/2003
PATENT NUMBER: ISSUE DATE:
TITLE: APPARATUS AND METHOD FOR PHASE SLM BASED HOMOGENIZED FT HOLOGRAPHIC
STORAGE AND DATA RECOVERY USING HOLOGRAPHIC INTERFEROMETRY

SERIAL NUMBER: 60563041 FILING DATE: 04/16/2004
PATENT NUMBER: ISSUE DATE:
TITLE: CALIBRATION OF HOLOGRAPHIC DATA STORAGE SYSTEMS USING HOLOGRAPHIC
MEDIA CALIBRATION FEATURES

SERIAL NUMBER: 60510914 FILING DATE: 10/14/2003
PATENT NUMBER: ISSUE DATE:
TITLE: SYSTEM AND METHOD FOR ACCESSING MEDIA IN A DATA STORAGE SYSTEM

SERIAL NUMBER: 60519792 FILING DATE: 11/13/2003
PATENT NUMBER: ISSUE DATE:
TITLE: METHOD FOR HIGH RESOLUTION FINGERPRINT CAPTURE AND IDENTIFICATION

SERIAL NUMBER: 60520176 FILING DATE: 11/14/2003
PATENT NUMBER: ISSUE DATE:
TITLE: HOLOGRAPHIC DATA STORAGE MEDIA WITH STRUCTURED SURFACES

SERIAL NUMBER: 60523068 FILING DATE: 11/18/2003
PATENT NUMBER: ISSUE DATE:
TITLE: APPARATUS AND METHOD FOR HIGH RESOLUTION FINGERPRINT CAPTURE AND
IDENTIFICATION

SERIAL NUMBER: 08376820 FILING DATE: 01/20/1995
PATENT NUMBER: ISSUE DATE:

SERIAL NUMBER: 08795631 FILING DATE: 02/06/1997
PATENT NUMBER: 5759751 ISSUE DATE: 06/02/1998
TITLE: METHOD OF PEELING PHOTO-RESIST LAYER WITHOUT DAMAGE TO METAL WIRING

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SERIAL NUMBER: 08649823 FILING DATE: 05/17/1996
PATENT NUMBER: 6489065 ISSUE DATE: 12/03/2002
TITLE: HOLOGRAPHIC MEDIUM AND PROCESS FOR USE THEREOF

SERIAL NUMBER: 08084613 FILING DATE: 07/01/1993
PATENT NUMBER: 5377117 ISSUE DATE: 12/27/1994
TITLE: NUMERICAL CONTROL APPARATUS HAVING A THREE-DIMENSIONAL GRAPHIC
DISPLAY FUNCTION

SERIAL NUMBER: 08139284 FILING DATE: 10/19/1993
PATENT NUMBER: 5377179 ISSUE DATE: 12/27/1994
TITLE: METHOD AND APPARATUS FOR ENHANCING THE UTILITY OF A PHOTOPOLYMER
RECORDING MEDIA FOR HOLOGRAPHIC DATA RECORDING

SERIAL NUMBER: 08091620 FILING DATE: 07/14/1993
PATENT NUMBER: 5477347 ISSUE DATE: 12/19/1995
TITLE: METHOD AND APPARATUS FOR ISOLATING DATA STORAGE REGIONS IN A THIN
HOLOGRAPHIC STORAGE MEDIA

SERIAL NUMBER: 08173368 FILING DATE: 12/23/1993
PATENT NUMBER: 5481523 ISSUE DATE: 01/02/1996
TITLE: A GANTRY FOR POSITIONING A READ/WRITE HEAD OF A HOLOGRAPHIC STORAGE
SYSTEM

SERIAL NUMBER: 08180082 FILING DATE: 01/11/1994
PATENT NUMBER: 5488449 ISSUE DATE: 01/30/1996
TITLE: INFINITE-DISTANCE DETECTING CIRCUIT FOR AN AUTO-FOCUS SYSTEM

SERIAL NUMBER: 08173668 FILING DATE: 12/23/1993
PATENT NUMBER: 5511058 ISSUE DATE: 04/23/1996
TITLE: DISTORTION CORRECTION OF A RECONSTRUCTED HOLOGRAPHIC DATA IMAGE

SERIAL NUMBER: 08019707 FILING DATE: 02/19/1993
PATENT NUMBER: 5519817 ISSUE DATE: 05/21/1996
TITLE: METHOD AND APPARATUS FOR SEARCHING LINE DATA IN GRAPHIC DATA BASE
SYSTEM

SERIAL NUMBER: 08269374 FILING DATE: 06/30/1994
PATENT NUMBER: 5526337 ISSUE DATE: 06/11/1996
TITLE: HOLOGRAPHIC STORAGE MEDIA PACKAGE

SERIAL NUMBER: 08217255 FILING DATE: 03/24/1994
PATENT NUMBER: 5529861 ISSUE DATE: 06/25/1996

FOR HOLOGRAPHIC DATA RECORDING

SERIAL NUMBER: 08228114 FILING DATE: 06/15/1994
PATENT NUMBER: 5566387 ISSUE DATE: 10/15/1996
TITLE: DIAMOND SHAPED HOLOGRAPHIC STORAGE REGIONS ORIENTED ALONG A COMMON
LINE FOR HIGHER STORAGE DENSITY

017303/0484 PAGE 5

SERIAL NUMBER: 08517462 FILING DATE: 08/21/1995
PATENT NUMBER: 5621549 ISSUE DATE: 04/15/1997
TITLE: METHOD AND APPARATUS FOR POSITIONING A LIGHT BEAM ON A HOLOGRAPHIC
MEDIA

SERIAL NUMBER: 08267969 FILING DATE: 06/29/1994
PATENT NUMBER: 5627664 ISSUE DATE: 05/06/1997
TITLE: HOLOGRAPHIC STORAGE WITH COMBINED ORTHOGONAL PHASE CODES AND RANDOM
PHASE CODES

SERIAL NUMBER: 07920302 FILING DATE: 08/17/1992
PATENT NUMBER: 5638119 ISSUE DATE: 06/10/1997
TITLE: DEVICE FOR INCREASING THE DYNAMIC RANGE OF A CAMERA

SERIAL NUMBER: 08531521 FILING DATE: 09/21/1995
PATENT NUMBER: 5665791 ISSUE DATE: 09/09/1997
TITLE: PHOTSENSITIVE POLYMER FILMS AND THEIR METHOD OF PRODUCTION

SERIAL NUMBER: 08604263 FILING DATE: 02/21/1996
PATENT NUMBER: 5694488 ISSUE DATE: 12/02/1997
TITLE: METHOD AND APPARATUS FOR PROCESSING OF RECONSTRUCTED HOLOGRAPHIC
IMAGES OF DIGITAL DATA PATTERNS

SERIAL NUMBER: FILING DATE:
PATENT NUMBER: 569613 ISSUE DATE:
TITLE:

SERIAL NUMBER: 08548282 FILING DATE: 10/25/1995
PATENT NUMBER: 5756648 ISSUE DATE: 05/26/1998
TITLE: PHOTSENSITIVE POLYIMIDE MATERIALS FOR ELECTRONIC PACKAGING
APPLICATIONS

SERIAL NUMBER: 08734711 FILING DATE: 10/21/1996
PATENT NUMBER: 5883880 ISSUE DATE: 03/16/1999
TITLE: DISK POSITIONING DEVICE FOR DEFINING PRECISE RADIAL LOCATION

SERIAL NUMBER: 08876211 FILING DATE: 06/16/1997
PATENT NUMBER: 5886210 ISSUE DATE: 03/23/1999
TITLE: METHOD FOR PREPARING AROMATIC COMPOUNDS

SERIAL NUMBER: 08586058 FILING DATE: 01/16/1996
PATENT NUMBER: 5940537 ISSUE DATE: 08/17/1999
TITLE: METHOD AND SYSTEM FOR COMPENSATING FOR GEOMETRIC DISTORTION OF IMAGES

SERIAL NUMBER: 09020469 FILING DATE: 02/09/1998
PATENT NUMBER: 5982513 ISSUE DATE: 11/09/1999
TITLE: METHOD AND SYSTEM TO ALIGN HOLOGRAPHIC IMAGES

SERIAL NUMBER: 08916843 FILING DATE: 08/22/1997
PATENT NUMBER: 6057703 ISSUE DATE: 05/02/2000
TITLE: RECONFIGURABLE PROGRAMMABLE LOGIC DEVICES

017303/0484 PAGE 6

SERIAL NUMBER: 09327146 FILING DATE: 06/07/1999
PATENT NUMBER: 6055174 ISSUE DATE: 04/25/2000
TITLE: SOLID STATE HOLOGRAPHIC MEMORY

SERIAL NUMBER: 07438576 FILING DATE: 11/17/1989
PATENT NUMBER: 5111445 ISSUE DATE: 05/05/1992
TITLE: HOLOGRAPHIC INFORMATION STORAGE SYSTEM

SERIAL NUMBER: 07930095 FILING DATE: 08/14/1992
PATENT NUMBER: 5339305 ISSUE DATE: 08/16/1994
TITLE: DISK-BASED OPTICAL CORRELATOR AND METHOD

SERIAL NUMBER: 08106288 FILING DATE: 08/13/1993
PATENT NUMBER: 5438439 ISSUE DATE: 08/01/1995
TITLE: NON-DESTRUCTIVE READOUT MECHANISM FOR VOLUME HOLOGRAMS USING TWO WAVELENGTHS

SERIAL NUMBER: 08238756 FILING DATE: 05/04/1994
PATENT NUMBER: 5453969 ISSUE DATE: 09/26/1995
TITLE: OPTICAL MEMORY WITH PIT DEPTH ENCODING

SERIAL NUMBER: 08272043 FILING DATE: 07/08/1994
PATENT NUMBER: 5486365 ISSUE DATE: 01/23/1996
TITLE: CALCIUM HYDROGEN PHOSPHATE, A METHOD FOR PREPARING IT, AND AN EXCIPIENT UTILIZING IT

SERIAL NUMBER: 08326783 FILING DATE: 10/20/1994
PATENT NUMBER: 5550779 ISSUE DATE: 08/27/1996
TITLE: HOLOGRAPHIC MEMORY WITH ANGLE, SPATIAL AND OUT-OF-PLANE MULTIPLEXING

SERIAL NUMBER: 08389890 FILING DATE: 02/15/1995
PATENT NUMBER: 5671073 ISSUE DATE: 09/23/1997
TITLE: HOLOGRAPHIC STORAGE USING SHIFT MULTIPLEXING

SERIAL NUMBER: 08889797 FILING DATE: 07/08/1997

TITLE: HOLOGRAPHIC STORAGE USING SHIFT MULTIPLEXING

SERIAL NUMBER: 08753403

FILING DATE: 11/25/1996

PATENT NUMBER: 5978112

ISSUE DATE: 11/02/1999

TITLE: NON-VOLATILE READOUT OF SHIFT MULTIPLEXED HOLOGRAMS

SERIAL NUMBER: 10116684

FILING DATE: 04/04/2002

PATENT NUMBER: 6904491

ISSUE DATE: 06/07/2005

TITLE: HYBRID DATA STORAGE SYSTEM

SERIAL NUMBER: 10146497

FILING DATE: 05/14/2002

PATENT NUMBER: 6881464

ISSUE DATE: 04/19/2005

TITLE: METHOD AND APPARATUS FOR PRODUCING OPTICAL RECORDING MEDIA WITH
ACCURATELY PARALLEL SURFACES

017303/0484 PAGE 7

SERIAL NUMBER: 09941166

FILING DATE: 08/28/2001

PATENT NUMBER: 6784300

ISSUE DATE: 08/31/2004

TITLE: HOLOGRAPHIC STORAGE MEDIUM COMPRISING POLYFUNCTIONAL EPOXY MONOMERS
CAPABLE OF UNDERGOING CATIONIC POLYMERIZATION

SERIAL NUMBER: 10170007

FILING DATE: 06/11/2002

PATENT NUMBER: 6992805

ISSUE DATE: 01/31/2006

TITLE: HOLOGRAPHIC FILTER WITH A WIDE ANGULAR FIELD OF VIEW AND A NARROW
SPECTRAL BANDWIDTH

SHARON BROOKS, EXAMINER
ASSIGNMENT SERVICES BRANCH
PUBLIC RECORDS DIVISION