

TRADEMARK ASSIGNMENT COVER SHEET

Electronic Version v1.1
Stylesheet Version v1.2

ETAS ID: TM552901

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|-----------------------------------|---|-----------------------|-----------------------|
| SUBMISSION TYPE: | NEW ASSIGNMENT | | |
| NATURE OF CONVEYANCE: | Amended and Restated U.S. Patent and Trademark Security Agreement | | |
| CONVEYING PARTY DATA | | | |
| Name | Formerly | Execution Date | Entity Type |
| DigitalGlobe, Inc. | | 12/11/2019 | Corporation: DELAWARE |
| RECEIVING PARTY DATA | | | |
| Name: | Royal Bank of Canada, as Collateral Agent | | |
| Street Address: | 20 King Street West, 4th Floor | | |
| City: | Toronto, Ontario | | |
| State/Country: | CANADA | | |
| Postal Code: | M5H 1C4 | | |
| Entity Type: | Chartered Bank: CANADA | | |
| PROPERTY NUMBERS Total: 23 | | | |
| Property Type | Number | Word Mark | |
| Registration Number: | 2136168 | DIGITALGLOBE | |
| Registration Number: | 2264047 | DIGITALGLOBE | |
| Registration Number: | 2484701 | DIGITALGLOBE | |
| Registration Number: | 2653714 | DIGITALGLOBE | |
| Registration Number: | 4653570 | DIGITALGLOBE | |
| Registration Number: | 2487069 | DIGITALGLOBE.COM | |
| Registration Number: | 4180489 | FIRSTLOOK | |
| Registration Number: | 5341290 | GEOHIVE | |
| Registration Number: | 3614695 | IMAGECONNECT | |
| Registration Number: | 2039409 | ORBIMAGE | |
| Registration Number: | 2091116 | ORBVIEW | |
| Registration Number: | 2593257 | PHOTOMAPPER | |
| Registration Number: | 3482049 | ROADTRACKER | |
| Registration Number: | 2470721 | SECONDS ON ORBIT | |
| Registration Number: | 5465351 | SECUREWATCH | |
| Registration Number: | 5192964 | SEE A BETTER WORLD | |
| Registration Number: | 4653569 | SEEING A BETTER WORLD | |
| Registration Number: | 2385734 | SOO | |
| Registration Number: | 5586842 | SPACENET | |

OP \$590.00 2136168

| Property Type | Number | Word Mark |
|----------------------|---------|---------------------------|
| Registration Number: | 4816466 | WORLDVIEW |
| Registration Number: | 4816469 | WORLDVIEW |
| Registration Number: | 4816472 | WORLDVIEW |
| Registration Number: | 4585810 | WORLDVIEW GLOBAL ALLIANCE |

CORRESPONDENCE DATA

Fax Number: 2138918763
Correspondence will be sent to the e-mail address first; if that is unsuccessful, it will be sent using a fax number, if provided; if that is unsuccessful, it will be sent via US Mail.
Email: rhonda.deleon@lw.com
Correspondent Name: Latham & Watkins LLP
Address Line 1: 355 South Grand Avenue
Address Line 4: Los Angeles, CALIFORNIA 90071-1560

| | |
|--------------------------------|-----------------|
| ATTORNEY DOCKET NUMBER: | 061398-0031 |
| NAME OF SUBMITTER: | Rhonda DeLeon |
| SIGNATURE: | /Rhonda DeLeon/ |
| DATE SIGNED: | 12/11/2019 |

Total Attachments: 42

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**AMENDED AND RESTATED U.S. PATENT
AND TRADEMARK SECURITY AGREEMENT**

This AMENDED AND RESTATED U.S. PATENT AND TRADEMARK SECURITY AGREEMENT, dated as of December 11, 2019 (as amended, amended and restated, supplemented or otherwise modified from time to time, this **Agreement**), is made by each of the undersigned entities, each an MDA Obligor (each such entity, a **Grantor**, and collectively, the **Grantors**), in favor of ROYAL BANK OF CANADA, in its capacity as collateral agent (in such capacity, the **Collateral Agent**), for the benefit of the Secured Parties, in accordance with the Restated Credit Agreement dated as of October 5, 2017 among Maxar Technologies Inc. (the **US Borrower**), MDA Systems Holdings Ltd. (the **Cdn. Borrower** and, together with the US Borrower, the **Borrowers**), Royal Bank of Canada, as administrative agent and Collateral Agent, and the lenders from time to time party thereto (the **Lenders**), as amended by each of that certain First Amending Agreement, dated as of December 21, 2018, that certain Second Amending Agreement, dated as of December 21, 2018 (as amended by that certain Amending Agreement in respect of such Second Amending Agreement, dated as of January 15, 2019), that certain Third Amending Agreement dated as of November 4, 2019, and that certain Fourth Amending Agreement to be dated as of the date hereof (to become effective upon the satisfaction of the conditions precedent set out therein), and as supplemented by that certain Assumption and Novation Agreement dated as of January 1, 2019 (as so amended and supplemented, and as may be further amended, restated or amended and restated, the **Credit Agreement**).

WITNESSETH:

WHEREAS, as required by the Credit Agreement, pursuant to an Amended and Restated Security Agreement and an amended and Restated Pledge and Security Agreement, each dated as of the date hereof between, inter alios, the Grantors party thereto and the Collateral Agent (the **GSAs**), each Grantor has granted to the Collateral Agent a security interest in substantially all of such Grantor's property, including, without limitation, the Collateral (as defined below) referred to in Section 1 below;

WHEREAS, in connection with the Credit Agreement, certain Grantors (the **Existing IP Grantors**) party hereto have previously agreed to secure such Grantor's obligations under the Credit Agreement and the MDA Obligor Guarantee in accordance with the terms of each of the existing U.S. Patent and Trademark Security Agreements listed in Schedule C attached hereto (collectively, the **Existing IP Security Agreements**) to which it is a party;

WHEREAS, each Existing IP Grantor party hereto and the Collateral Agent desires to amend and restate each of the Existing IP Security Agreements to which it is a party in the manner set forth herein; and

WHEREAS, pursuant to the Credit Agreement, each Grantor has agreed to execute this Agreement in respect of its Collateral for recording with the United States Patent and Trademark Office and any other office in which a security interest in the Collateral may be recorded under the laws of any other applicable jurisdiction.

NOW, THEREFORE, in consideration of the premises and the mutual covenants and agreements hereinafter set forth, each Grantor and the Collateral Agent agree as follows:

1 Grant of Security

Each Grantor hereby grants to the Collateral Agent for the benefit of the Secured Parties, a security interest in and to all of such Grantor's right, title and interest in and to its Patents and Trademarks (each as defined below), whether or not such interest is joint or in common with one or more third parties or another Grantor, including the following (the **Collateral**):

- (a) all present and future United States of America and foreign patents, design patents and certificates of invention that may be developed or acquired by or on behalf of such Grantor, or similar industrial property rights, and applications for any of the foregoing, including, but not limited to, the patents set forth in Schedule A hereto opposite the name of such Grantor, as Schedule A may be supplemented from time to time by supplements to the Security and this Agreement which shall be executed and delivered by such Grantor to the Collateral Agent from time to time, and all reissues, divisions, continuations, continuations-in-part, renewals, extensions and re-examinations thereof and amendments thereto (the **Patents**);
- (b) all present and future United States of America and foreign trademarks, trade names, corporate names, company names, business names, fictitious business names, internet domain names, service marks, certification marks, collective marks, logos, other source or business identifiers, designs and general intangibles of a like nature, all registrations and applications for any of the foregoing including, but not limited to, the trademark and service mark registrations, applications, and licenses set forth in Schedule B hereto opposite the name of such Grantor, as Schedule B may be supplemented from time to time by supplements to the Security and this Agreement which shall be executed and delivered by such Grantor to the Collateral Agent from time to time, together with the goodwill connected with the use thereof and symbolized thereby and all extensions and renewals thereof (the **Trademarks**);
- (c) all rights of any kind whatsoever of such Grantor accruing under any of the foregoing provided by applicable law of any jurisdiction, by international treaties and conventions and otherwise throughout the world;
- (d) any and all royalties, fees, income, payments and other proceeds now or hereafter due or payable with respect to any and all of the foregoing; and
- (e) any and all claims and causes of action with respect to any of the foregoing, whether occurring before, on or after the date hereof, including all rights to and claims for damages, restitution and injunctive and other legal and equitable relief for past, present and future infringement, dilution, misappropriation, violation, misuse, breach or default, with the right but no obligation to sue for such legal and equitable relief and to collect, or otherwise recover, any such damages.

2 Security for Obligations

This Agreement secures, and the Collateral is collateral security for, with respect to each Grantor, the prompt and complete payment and performance in full when due, whether at stated maturity, by required prepayment, declaration, acceleration, demand or otherwise of the Secured Obligations (as such term is defined in the GSAs, as applicable).

3 Scope of Security Interest

To the extent that the creation of the security interest would result in the termination of any agreement, license or permit of the Grantors or to the extent any such Patent or Trademark would otherwise constitute Excluded Collateral (each, a **Restricted Asset**), the security interest will not attach to the Restricted Asset for so long as it remains a Restricted Asset. Notwithstanding anything in this Section 3 to the contrary, each Grantor shall grant to the Collateral Agent a security interest in any Collateral that ceases to be a Restricted Asset as a result of obtaining the consent of the other party or otherwise.

Notwithstanding Section 1, no security interest is or will be granted pursuant hereto in any right, title or interest of any Grantor in, to or under any Excluded Collateral.

In addition to the preceding paragraph, the guarantee, security and perfection requirements under this Agreement shall be subject to the Agreed Security Principles.

4 Recordation

Each Grantor authorizes and agrees that it will, at its own expense, cause this Agreement, and any supplements or amendments thereto, to be recorded at the United States Trademark and Patent Office (and any successor office and any similar office in any United States state). Each Grantor authorizes the United States Commissioner for Patents, the United States Commissioner for Trademarks and any other government officials to record and register this Agreement.

5 Supplemental Security

This Agreement is in addition to and without prejudice to all other security now held or which may hereafter be held by the Collateral Agent.

6 Execution in Counterparts

This Agreement may be executed in any number of counterparts, each of which when so executed shall be deemed to be an original and all of which taken together shall constitute one and the same agreement.

7 Grants, Rights and Remedies

This Agreement has been entered into in conjunction with the provisions of the Credit Agreement. Each Grantor does hereby acknowledge and confirm that the grant of the security interest hereunder to, and the rights and remedies of, the Collateral Agent with respect to the Collateral are more fully set forth in the Credit Agreement, the terms and provisions of which are incorporated herein by reference as if fully set forth herein.

8 Governing Law

This Agreement shall be governed by, and construed in accordance with, the laws of the State of New York, without regard to conflict of laws principles.

9 US Secured Obligations

Notwithstanding any other provision of this Agreement, the Obligations of each Grantor, to the extent that it is a Tax Excluded Subsidiary, shall not include the US Secured Obligations; provided that the US Borrower may, by notice to the Administrative Agent, provide that the Obligations of any such Grantor include all US Secured Obligations.

10 Amendment and Restatement

This Agreement amends, restates and replaces each Existing IP Security Agreement in its entirety, but does not extinguish the obligations outstanding thereunder or otherwise discharge or release the Existing IP Grantors from their respective obligations arising thereunder, the Liens created thereby or the priority of any pledge, security agreement or any other security therefor. Nothing herein contained shall be construed as a substitution or novation of the obligations outstanding under the Existing IP Security Agreements, which shall remain in full force and effect, except as expressly amended and restated hereby.

11 Intercreditor Agreement

Notwithstanding anything herein, the Liens and Security Interest granted to the Collateral Agent pursuant to this Agreement and the exercise of any right or remedy by the Collateral Agent hereunder are subject to the terms of the First Lien Intercreditor Agreement, dated as of December 11, 2019 (as amended, restated, amended and restated or otherwise modified from time to time, the **First Lien Intercreditor Agreement**), among Royal Bank of Canada, as Administrative Agent, the Collateral Agent, and the Wilmington Trust, N.A, in its capacity as collateral agent pursuant to the Indenture, dated as of December 2, 2019 (the **Base Indenture**), by and among SSL Robotics LLC, a Delaware limited liability company and a wholly-owned subsidiary of the US Borrower (the **Escrow Issuer**), Wilmington Trust, National Association, as trustee (in such capacity, the **Trustee**) and Wilmington Trust, National Association, as collateral agent, and (y) that certain Supplemental Indenture, dated as of December 11, 2019 (the **Supplemental Indenture** and together with the Base Indenture, the **Indenture**), by and among the US Borrower, the other Grantors party thereto, as subsidiary guarantors, and the Trustee. In the event of any conflict between the terms of the First Lien Intercreditor Agreement and this Agreement, the terms of the First Lien Intercreditor Agreement shall govern and control.

12 Conflict of Terms

In the event of any conflict between the provisions of this Agreement and the provisions of the Credit Agreement which cannot be resolved by both provisions being complied with, the provisions contained in the Credit Agreement will prevail to the extent of such conflict.

13 Defined Terms

Capitalized terms used and not otherwise defined in this Agreement have the meanings given to them in the Credit Agreement.

14 Successors, etc.

In this Agreement:

- (a) reference to any body corporate or partnership shall include successors thereto, whether by way of amalgamation or otherwise;
- (b) references to any statute, enactment or legislation or to any section or provision thereof include a reference to any order, ordinance, regulation, rule or by-law or proclamation made under or pursuant to that statute, enactment or legislation and all amendments, modifications, consolidations, re-enactments or replacements thereof or substitutions therefor from time to time; and
- (c) reference to any agreement (including without limitation any definitions in or portions of an agreement incorporated herein by reference), instrument, Permit or other document shall include reference to such agreement, instrument, Permit or other document as the same may from time to time be amended, supplemented, replaced or restated.

[Signatures follow]

IN WITNESS WHEREOF the parties hereto have executed this by their respective officers thereunto duly authorized, as of the date first above written.

MAXAR TECHNOLOGIES ULC, as a Grantor

DIGITALGLOBE, INC., as a Grantor

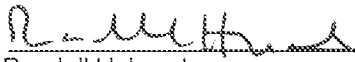
SPACE SYSTEMS/LORAL, LLC, as a Grantor

MACDONALD, DETTWILER AND ASSOCIATES
INC., as a Grantor

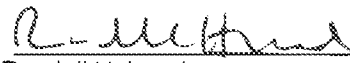
MACDONALD, DETTWILER AND ASSOCIATES
CORPORATION, as a Grantor

MDA GEOSPATIAL SERVICES INC., as a Grantor

NEPTEC DESIGN GROUP LTD., as a Grantor

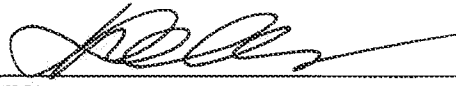
By: 
Name: Randall H. Lynch
Title: President and Treasurer

RADIANT GEOSPATIAL SOLUTIONS LLC, as a
Grantor

By: 
Name: Randall H. Lynch
Title: Vice President and Treasurer

ROYAL BANK OF CANADA, as Collateral Agent

By:



Name: Helena Sudowski
Title: Manager, Agency

[Signature Page to US Patent and Trademark Security Agreement (MDA Obligors)]

SCHEDULE A

PATENT REGISTRATIONS AND PATENT APPLICATIONS

| | Assignee | Patent Title | Serial No. | Filing Date | Patent No. | Issue Date |
|-----|--------------------|---|-------------------|--------------------|-------------------|-------------------|
| 1. | DigitalGlobe, Inc. | Apparatuses and methods for mapping image coordinates to ground coordinates | 0984662 1 | 05/01/200 1 | 6735348 | 05/11/200 4 |
| 2. | DigitalGlobe, Inc. | Method for using remotely sensed data to provide agricultural information | 1004742 3 | 01/15/200 2 | 7068816 | 06/27/200 6 |
| 3. | DigitalGlobe, Inc. | Tonal balancing of multiple images | 1042372 0 | 04/25/200 3 | 7236646 | 06/26/200 7 |
| 4. | DigitalGlobe, Inc. | Image warp | 1068429 5 | 10/10/200 3 | 7269299 | 09/11/200 7 |
| 5. | DigitalGlobe, Inc. | Estimation of coefficients for a rational polynomial camera model | 1084927 6 | 05/18/200 4 | 7421151 | 09/02/200 8 |
| 6. | DigitalGlobe, Inc. | Method and apparatus for determination of water pervious surfaces | 1090869 5 | 05/23/200 5 | 7660430 | 02/09/201 0 |
| 7. | DigitalGlobe, Inc. | Tonal balancing of multiple images | 1175327 2 | 05/24/200 7 | 7317844 | 01/08/200 8 |
| 8. | DigitalGlobe, Inc. | Semi-automatic extraction of linear features from image data | 1176476 5 | 06/18/200 7 | 7653218 | 01/26/201 0 |
| 9. | DigitalGlobe, Inc. | Image warp | 1183516 9 | 08/07/200 7 | 7613362 | 11/03/200 9 |
| 10. | DigitalGlobe, Inc. | Method and apparatus for enhancing a digital image | 1246379 7 | 05/11/200 9 | 7715651 | 05/11/201 0 |
| 11. | DigitalGlobe, Inc. | Semi-automatic extraction of linear features from image data | 1260691 8 | 10/27/200 9 | 8155391 | 04/10/201 2 |
| 12. | DigitalGlobe, Inc. | Advanced cloud cover assessment | 1311258 3 | 05/20/201 1 | 8594375 | 11/26/201 3 |
| 13. | DigitalGlobe, Inc. | Semi-automatic extraction of linear features from image data | 1341756 8 | 03/12/201 2 | 8488845 | 07/16/201 3 |

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| 14. | DigitalGlobe, Inc. | Pan sharpening digital imagery | 1345274 1 | 04/20/201 2 | 8761506 | 06/24/201 4 |
| 15. | DigitalGlobe, Inc. | Hyperspherical pan sharpening | 1345276 8 | 04/20/201 2 | 8737733 | 05/27/201 4 |
| 16. | DigitalGlobe, Inc. | Automated metric information network | 1376235 5 | 02/07/201 3 | 9251419 | 02/02/201 6 |
| 17. | DigitalGlobe, Inc. | Using parallax in remote sensing to determine cloud feature height | 1383580 4 | 03/15/201 3 | 9001311 | 04/07/201 5 |
| 18. | DigitalGlobe, Inc. | Automated geospatial image mosaic generation | 1383847 5 | 03/15/201 3 | 9042674 | 05/26/201 5 |
| 19. | DigitalGlobe, Inc. | System and method for geolocation of social media posts | 1384017 3 | 03/15/201 3 | 9032000 | 05/12/201 5 |
| 20. | DigitalGlobe, Inc. | Atmospheric compensation in satellite imagery | 1384074 3 | 03/15/201 3 | 9396528 | 07/19/201 6 |
| 21. | DigitalGlobe, Inc. | Automated geospatial image mosaic generation with automatic source selection | 1395244 2 | 07/26/201 3 | 9202259 | 12/01/201 5 |
| 22. | DigitalGlobe, Inc. | Automated geospatial image mosaic generation with automatic cutline generation | 1395246 4 | 07/26/201 3 | 9135505 | 09/15/201 5 |
| 23. | DigitalGlobe, Inc. | Automatic generation of built-up layers from high resolution satellite image data | 1395526 8 | 07/31/201 3 | 9230168 | 01/05/201 6 |
| 24. | DigitalGlobe, Inc. | Advanced cloud cover assessment for panchromatic images | 1395542 9 | 07/31/201 3 | 8913826 | 12/16/201 4 |
| 25. | DigitalGlobe, Inc. | Crowdsourced search and locate platform | 1401045 0 | 08/26/201 3 | 9122708 | 09/01/201 5 |
| 26. | DigitalGlobe, Inc. | Automatic extraction of built-up footprints from high resolution overhead imagery through manipulation of alpha-tree data structures | 1401390 4 | 08/29/201 3 | 9031325 | 05/12/201 5 |

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| 27. | DigitalGlobe, Inc. | Automated and scalable object and feature extraction from imagery | 1402439 9 | 09/11/201 3 | 9141872 | 09/22/201 5 |
| 28. | DigitalGlobe, Inc. | Classification of land based on analysis of remotely-sensed earth images | 1402441 8 | 09/11/201 3 | 9147132 | 09/29/201 5 |
| 29. | DigitalGlobe, Inc. | Crowdsourced image analysis platform | 1404918 9 | 10/08/201 3 | 9560092 | 01/31/201 7 |
| 30. | DigitalGlobe, Inc. | Crowdsourced search and locate platform | 1404919 9 | 10/08/201 3 | 9128959 | 09/08/201 5 |
| 31. | DigitalGlobe, Inc. | Techniques for identifying parking lots in remotely-sensed images by identifying parking rows | 1405333 2 | 10/14/201 3 | 9275297 | 03/01/201 6 |
| 32. | DigitalGlobe, Inc. | Generation of high resolution population density data sets through exploitation of high resolution overhead imagery data and low resolution population density data sets | 1406330 9 | 10/25/201 3 | 9230169 | 01/05/201 6 |
| 33. | DigitalGlobe, Inc. | Automatic extraction of built-up footprints from high resolution overhead imagery through manipulation of alpha-tree data structures | 1408940 5 | 11/25/201 3 | 8682079 | 03/25/201 4 |
| 34. | DigitalGlobe, Inc. | System and method for multi resolution and multi temporal image search | 1409141 2 | 11/27/201 3 | 9529824 | 12/27/201 6 |
| 35. | DigitalGlobe, Inc. | Oil tank farm storage monitoring | 1409560 8 | 12/03/201 3 | 9195876 | 11/24/201 5 |
| 36. | DigitalGlobe, Inc. | Automated remote car counting | 1409563 7 | 12/03/201 3 | 9122930 | 09/01/201 5 |
| 37. | DigitalGlobe, Inc. | Automated compound structure characterization in overhead imagery | 1416300 8 | 01/24/201 4 | 9639755 | 05/02/201 7 |
| 38. | DigitalGlobe, Inc. | Automated sliver removal in orthomosaic generation | 1421988 4 | 03/19/201 4 | 9367895 | 06/14/201 6 |

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| 39. | DigitalGlobe, Inc. | Automated geospatial image mosaic generation with multiple zoom level support | 1430730 7 | 06/17/201 4 | 9396391 | 07/19/201 6 |
| 40. | DigitalGlobe, Inc. | Bathymetric techniques using satellite imagery | 1434038 9 | 07/24/201 4 | 9336441 | 05/10/201 6 |
| 41. | DigitalGlobe, Inc. | Multi-spectral image labeling with radiometric attribute vectors of image space representation components | 1449944 0 | 09/29/201 4 | 9619711 | 04/11/201 7 |
| 42. | DigitalGlobe, Inc. | Crowdsourced feature identification and orthorectification | 1468049 5 | 04/07/201 5 | 10078645 | 09/18/201 8 |
| 43. | DigitalGlobe, Inc. | System and method for large scale crowdsourcing of map data cleanup and correction | 1468066 5 | 04/07/201 5 | 10083186 | 09/25/201 8 |
| 44. | DigitalGlobe, Inc. | Advanced semi-automated vector editing in two and three dimensions | 1468104 3 | 04/07/201 5 | 10133928 | 11/20/201 8 |
| 45. | DigitalGlobe, Inc. | Automated tonal balancing | 1470812 9 | 05/08/201 5 | 9589334 | 03/07/201 7 |
| 46. | DigitalGlobe, Inc. | Some automated and semi-automated tools for linear feature extraction in two and three dimensions | 1473017 6 | 06/03/201 5 | 9727784 | 08/08/201 7 |
| 47. | DigitalGlobe, Inc. | System and methods for semi-automated editing of ortho-mosaics built from remotely-sensed imagery | 1473022 7 | 06/03/201 5 | 9600740 | 03/21/201 7 |
| 48. | DigitalGlobe, Inc. | Spectral data analytic cube classifier (SPADACC) for continuous wide area geospatial modeling using normalized and highly dimensional multispectral raster data | 1478865 1 | 06/30/201 5 | 10121106 | 11/06/201 8 |
| 49. | DigitalGlobe, Inc. | Automated seamline construction for high- | 1478987 7 | 07/01/201 5 | 9858645 | 01/02/201 8 |

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|-----|--------------------|--|--------------|----------------|----------|----------------|
| | | quality high-resolution orthomosaics | | | | |
| 50. | DigitalGlobe, Inc. | Automated conversion of two-dimensional hydrology vector models into valid three-dimensional hydrology vector models | 1478989 3 | 07/01/201 5 | 9626565 | 04/18/201 7 |
| 51. | DigitalGlobe, Inc. | Integrated architecture for near-real-time satellite imaging applications | 1480064 4 | 07/15/201 5 | 10014928 | 07/03/201 8 |
| 52. | DigitalGlobe, Inc. | System and method for combining geographical and economic data extracted from satellite imagery for use in predictive modeling | 1480174 0 | 07/16/201 5 | | |
| 53. | DigitalGlobe, Inc. | Global-scale object detection using satellite imagery | 1481038 2 | 07/27/201 5 | 9922265 | 03/20/201 8 |
| 54. | DigitalGlobe, Inc. | Object detection with textural to spectral domain adaptation | 1481983 9 | 08/06/201 5 | 9495618 | 11/15/201 6 |
| 55. | DigitalGlobe, Inc. | Automated and scalable object and feature extraction from imagery | 1482674 0 | 08/14/201 5 | 9569690 | 02/14/201 7 |
| 56. | DigitalGlobe, Inc. | Broad area geospatial object detection using autogenerated deep learning models | 1483573 6 | 08/26/201 5 | 9589210 | 03/07/201 7 |
| 57. | DigitalGlobe, Inc. | Classification of land based on analysis of remotely-sensed earth images | 1483762 8 | 08/27/201 5 | 9619734 | 04/11/201 7 |
| 58. | DigitalGlobe, Inc. | Global-scale damage detection using satellite imagery | 1494150 4 | 11/13/201 5 | 9858479 | 01/02/201 8 |
| 59. | DigitalGlobe, Inc. | Generation of high resolution population density data sets through exploitation of high resolution overhead imagery data and low | 1497640 0 | 12/21/201 5 | 9672424 | 06/06/201 7 |

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| | | resolution population density data sets | | | | |
| 60. | DigitalGlobe, Inc. | Automated metric information network | 14984613 | 12/30/2015 | 9875404 | 01/23/2018 |
| 61. | DigitalGlobe, Inc. | Automated Registration Of Three-Dimensional Vectors To Three-Dimensional Linear Features In Remotely-Sensed Data | 14993074 | 01/11/2016 | 10223828 | 03/05/2019 |
| 62. | DigitalGlobe, Inc. | Automated sliver removal in orthomosaic generation | 15040780 | 02/10/2016 | 9916640 | 03/13/2018 |
| 63. | DigitalGlobe, Inc. | Automated remote car counting | 15064609 | 03/09/2016 | 9619710 | 04/11/2017 |
| 64. | DigitalGlobe, Inc. | Enhanced crowdsourced search and locate platform | 15077886 | 03/22/2016 | 10176194 | 01/08/2019 |
| 65. | DigitalGlobe, Inc. | Bathymetric techniques using satellite imagery | 15093040 | 04/07/2016 | 9767361 | 09/19/2017 |
| 66. | DigitalGlobe, Inc. | Atmospheric compensation in satellite imagery | 15186171 | 06/17/2016 | 9990705 | 06/05/2018 |
| 67. | DigitalGlobe, Inc. | Synthesizing training data for broad area geospatial object detection | 15194541 | 06/27/2016 | 9767565 | 09/19/2017 |
| 68. | DigitalGlobe, Inc. | Automated geospatial image mosaic generation with multiple zoom level support | 15204307 | 07/07/2016 | 9940514 | 04/10/2018 |
| 69. | DigitalGlobe, Inc. | Choreographing automated and manual processes in support of mosaic generation | 15228954 | 08/04/2016 | 10120884 | 11/06/2018 |
| 70. | DigitalGlobe, Inc. | Analyzing and viewing social interactions based on personal electronic devices | 15239729 | 08/17/2016 | | |
| 71. | DigitalGlobe, Inc. | Movement intelligence using satellite imagery | 15241034 | 08/18/2016 | 10089528 | 10/02/2018 |
| 72. | DigitalGlobe, Inc. | System and method for large scale crowdsourcing of map | 15262118 | 09/12/2016 | 10346495 | 07/09/2019 |

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| | | data cleanup and correction | | | | |
| 73. | DigitalGlobe, Inc. | Advanced cloud detection using machine learning and optimization techniques | 15362254 | 11/28/2016 | 10083354 | 09/25/2018 |
| 74. | DigitalGlobe, Inc. | System and method for multi resolution and multi temporal image search | 15391786 | 12/27/2016 | 10482122 | 11/19/2019 |
| 75. | DigitalGlobe, Inc. | Automated tonal balancing | 15445949 | 02/28/2017 | 10311557 | 06/04/2019 |
| 76. | DigitalGlobe, Inc. | Broad area geospatial object detection using autogenerated deep learning models | 15452076 | 03/07/2017 | 10013774 | 07/03/2018 |
| 77. | DigitalGlobe, Inc. | System and methods for semi-automated editing of ortho-mosaics built from remotely-sensed imagery | 15465581 | 03/21/2017 | 10121074 | 11/06/2018 |
| 78. | DigitalGlobe, Inc. | Automated conversion of two-dimensional hydrology vector models into valid three-dimensional hydrology vector models | 15490866 | 04/18/2017 | 9922252 | 03/20/2018 |
| 79. | DigitalGlobe, Inc. | System for simplified generation of systems for broad area geospatial object detection | 15608894 | 05/30/2017 | 9904849 | 02/27/2018 |
| 80. | DigitalGlobe, Inc. | Some automated and semi-automated tools for linear feature extraction in two and three dimensions | 15672267 | 08/08/2017 | 10318808 | 06/11/2019 |
| 81. | DigitalGlobe, Inc. | Muddy water detection using normalized semantic layers | 15694353 | 09/01/2017 | | |
| 82. | DigitalGlobe, Inc. | Synthesizing training data for broad area geospatial object detection | 15709252 | 09/19/2017 | 10157479 | 12/18/2018 |
| 83. | DigitalGlobe, Inc. | Techniques for image co-registration | 15716425 | 09/26/2017 | | |

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| 84. | DigitalGlobe, Inc. | Shape-based segmentation using hierarchical image representations for automatic training data generation and search space specification for machine learning algorithms | 1580231 3 | 11/02/201 7 | 10372984 | 08/06/201 9 |
| 85. | DigitalGlobe, Inc. | Anomaly detection using non-target clustering | 1580274 3 | 11/03/201 7 | | |
| 86. | DigitalGlobe, Inc. | Unsupervised land use and land cover detection | 1581212 4 | 11/14/201 7 | | |
| 87. | DigitalGlobe, Inc. | Sensor shift for remote sensing | 1582547 8 | 11/29/201 7 | | |
| 88. | DigitalGlobe, Inc. | Automated seamline construction for high-quality high-resolution orthomosaics | 1586028 1 | 01/02/201 8 | 10346952 | 07/09/201 9 |
| 89. | DigitalGlobe, Inc. | System for simplified generation of systems for broad area geospatial object detection | 1590634 8 | 02/27/201 8 | 10372985 | 08/06/201 9 |
| 90. | DigitalGlobe, Inc. | Atmospheric compensation in satellite imagery | 1600084 4 | 06/05/201 8 | | |
| 91. | DigitalGlobe, Inc. | Broad area geospatial object detection using autogenerated deep learning models | 1602723 5 | 07/03/201 8 | 10395388 | 08/27/201 9 |
| 92. | DigitalGlobe, Inc. | Advanced cloud detection using machine learning and optimization techniques | 1614005 2 | 09/24/201 8 | | |
| 93. | DigitalGlobe, Inc. | Movement intelligence using satellite imagery | 1615017 7 | 10/02/201 8 | | |
| 94. | DigitalGlobe, Inc. | System and methods for semi-automated editing of ortho-mosaics built from remotely-sensed imagery | 1618236 7 | 11/06/201 8 | | |
| 95. | DigitalGlobe, Inc. | Advanced semi-automated vector editing | 1619697 9 | 11/20/201 8 | | |

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| | | in two and three dimensions | | | | |
| 96. | DigitalGlobe, Inc. | Synthesizing training data for broad area geospatial object detection | 1622440 0 | 12/18/201 8 | | |
| 97. | DigitalGlobe, Inc. | Automated registration of three-dimensional vectors to three-dimensional linear features in remotely-sensed data | 1629340 9 | 03/05/201 9 | | |
| 98. | Radiant Geospatial Solutions LLC | Reference-based autofocusing method for ifsar and other applications | 0951056 1 | 02/22/200 0 | 6181270 | 01/30/200 1 |
| 99. | Radiant Geospatial Solutions LLC | System and method for coherent array aberration sensing | 0991642 2 | 07/27/200 1 | 6597304 | 07/22/200 3 |
| 100. | Radiant Geospatial Solutions LLC | Self-calibrating interferometric synthetic aperture radar altimeter | 1043783 6 | 05/14/200 3 | 7218268 | 05/15/200 7 |
| 101. | Radiant Geospatial Solutions LLC | Method and system for providing along-track alignment and formatting of synthetic aperture radar (SAR) data, and SAR image formation algorithms using such method and system | 1061568 7 | 07/09/200 3 | 6873285 | 03/29/200 5 |
| 102. | Radiant Geospatial Solutions LLC | Measurement-diverse imaging and wavefront sensing with amplitude and phase estimation | 1144610 9 | 06/05/200 6 | 7531774 | 05/12/200 9 |
| 103. | Radiant Geospatial Solutions LLC | Methods for two-dimensional autofocus in high resolution radar systems | 1188963 7 | 08/15/200 7 | 7663529 | 02/16/201 0 |
| 104. | Radiant Geospatial Solutions LLC | Methods for two-dimensional autofocus in high resolution radar systems | 1265668 9 | 02/12/201 0 | 7843377 | 11/30/201 0 |
| 105. | Radiant Geospatial Solutions LLC | Methods for two-dimensional autofocus in high resolution radar systems | 1292660 2 | 11/29/201 0 | 8009079 | 08/30/201 1 |

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| 106. | Radiant Geospatial Solutions LLC | Correlated Land Change System and Method | 1309617 4 | 04/28/201 1 | 8548248 | 10/01/201 3 |
| 107. | Radiant Geospatial Solutions LLC | Method for aligning a plurality of sub-apertures of a multiple-aperture imaging system | 1322512 7 | 09/02/201 1 | 8559017 | 10/15/201 3 |
| 108. | Radiant Geospatial Solutions LLC | System and method for aggregating multi-source data and identifying geographic areas for data acquisition | 1534133 8 | 11/02/201 6 | 10346446 | 07/09/201 9 |
| 109. | Radiant Geospatial Solutions LLC | Method and apparatus for imaging the silhouette of an object occluding a light source using a synthetic aperture | 1548891 8 | 04/17/201 7 | 10152802 | 12/11/201 8 |
| 110. | Space Systems/Loral, LLC | Microwave multiplexer with manifold spacing adjustment | 0947788 1 | 01/05/200 0 | 6472951 | 10/29/200 2 |
| 111. | Space Systems/Loral, LLC | Onboard attitude control using reaction wheels | 0947878 7 | 01/06/200 0 | 6285928 | 09/04/200 1 |
| 112. | Space Systems/Loral, LLC | System and method for limiting the effects of actuator saturation to certain body axes of a spacecraft | 0949359 6 | 01/31/200 0 | 6456907 | 09/24/200 2 |
| 113. | Space Systems/Loral, LLC | High efficiency dual polarized horn antenna | 0949703 6 | 02/02/200 0 | 6211838 | 04/03/200 1 |
| 114. | Space Systems/Loral, LLC | Gregorian reflector antenna system having a subreflector optimized for an elliptical antenna aperture | 0949905 2 | 02/04/200 0 | 6243048 | 06/05/200 1 |
| 115. | Space Systems/Loral, LLC | Method of end bonding tubular sections and bonding a flange on the end of tubular sections | 0950337 4 | 02/14/200 0 | 6398902 | 06/04/200 2 |
| 116. | Space Systems/Loral, LLC | Magnetic torquer control with thruster augmentation | 0951268 8 | 02/24/200 0 | 6292722 | 09/18/200 1 |
| 117. | Space Systems/Loral, LLC | Planar magnetic assembly | 0951672 7 | 03/01/200 0 | 6380834 | 04/30/200 2 |

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| 118. | Space Systems/Loral, LLC | Method and apparatus for generating orbital data | 0951692 7 | 03/01/200 0 | 6253125 | 06/26/200 1 |
| 119. | Space Systems/Loral, LLC | Controller and control method for satellite orbit-keeping maneuvers | 0951703 2 | 03/02/200 0 | 6445981 | 09/03/200 2 |
| 120. | Space Systems/Loral, LLC | Automated orbit compensation system and method | 0952847 4 | 03/17/200 0 | 6314344 | 11/06/200 1 |
| 121. | Space Systems/Loral, LLC | Satellite commanding using remotely controlled modulation of satellite on-board telemetry parameters | 0953889 1 | 03/30/200 0 | 6735501 | 05/11/200 4 |
| 122. | Space Systems/Loral, LLC | Spacecraft having a dual reflector holddown for deploying multiple reflectors in a single release event | 0955844 4 | 04/25/200 0 | 6308919 | 10/30/200 1 |
| 123. | Space Systems/Loral, LLC | Closed-loop spacecraft orbit control | 0956583 6 | 05/05/200 0 | 6439507 | 08/27/200 2 |
| 124. | Space Systems/Loral, LLC | Method for using satellite state vector prediction to provide satellite sensor automatic scan inhibit and/or sensor switching | 0957899 2 | 05/25/200 0 | 6317660 | 11/13/200 1 |
| 125. | Space Systems/Loral, LLC | Argument of perigee correction with longitude control for inclined, eccentric, geosynchronous satellites | 0958885 8 | 06/06/200 0 | 6317661 | 11/13/200 1 |
| 126. | Space Systems/Loral, LLC | Spacecraft radiator system using a heat pump | 0962415 1 | 07/24/200 0 | 6883588 | 04/26/200 5 |
| 127. | Space Systems/Loral, LLC | Methods for using satellite state vector prediction to provide three-axis satellite attitude control | 0962748 2 | 07/28/200 0 | 6237876 | 05/29/200 1 |
| 128. | Space Systems/Loral, LLC | Array fed multiple beam array reflector antenna systems and method | 0964093 6 | 08/17/200 0 | 6392611 | 05/21/200 2 |
| 129. | Space Systems/Loral, LLC | Shaped reflector antenna system configuration for | 0964326 9 | 08/22/200 0 | 6411262 | 06/25/200 2 |

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| | | use on a communication satellite | | | | |
| 130. | Space Systems/Loral, LLC | Method and apparatus for rate integration supplement for attitude referencing with quaternion differencing | 0967090 4 | 09/28/200 0 | 6454217 | 09/24/200 2 |
| 131. | Space Systems/Loral, LLC | Stepped waveguide slot array with phase control and satellite communication system employing same | 0968429 9 | 10/06/200 0 | 6304228 | 10/16/200 1 |
| 132. | Space Systems/Loral, LLC | Bent-pipe satellite system which couples a lan to a gateway and uses a dynamic assignment/multiple access protocol | 0970824 9 | 11/07/200 0 | 6400696 | 06/04/200 2 |
| 133. | Space Systems/Loral, LLC | Broadband communication systems and methods using low and high bandwidth request and broadcast links | 0971312 1 | 11/15/200 0 | 6879808 | 04/12/200 5 |
| 134. | Space Systems/Loral, LLC | Spacecraft multi-directional loop heat pipe thermal systems | 0971758 5 | 11/21/200 0 | 6591899 | 07/15/200 3 |
| 135. | Space Systems/Loral, LLC | Spacecraft multiple loop heat pipe thermal system for internal equipment panel applications | 0971818 1 | 11/21/200 0 | 6478258 | 11/12/200 2 |
| 136. | Space Systems/Loral, LLC | Variable beamwidth and zoom contour beam antenna systems | 0975314 8 | 01/02/200 1 | 6414646 | 07/02/200 2 |
| 137. | Space Systems/Loral, LLC | Triple reflector antenna deployment and storage systems | 0981229 8 | 03/20/200 1 | 6448940 | 09/10/200 2 |
| 138. | Space Systems/Loral, LLC | Flexible waveguide with rounded corrugations | 0981848 9 | 03/27/200 1 | 6559742 | 05/06/200 3 |
| 139. | Space Systems/Loral, LLC | Heat transfer of a remote heat source using a loop heat pipe | 0982207 3 | 03/30/200 1 | 7363960 | 04/29/200 8 |

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| 140. | Space Systems/Loral, LLC | Dynamic resource allocation architecture for differentiated services over broadband communication networks | 0982269 1 | 03/30/200 1 | 7219132 | 05/15/200 7 |
| 141. | Space Systems/Loral, LLC | Waveguide slot array capable of radiating shaped beams | 0983579 5 | 04/16/200 1 | 6476772 | 11/05/200 2 |
| 142. | Space Systems/Loral, LLC | Spacecraft radiator system and method using cross-coupled deployable thermal radiators | 0984137 3 | 04/24/200 1 | 6854510 | 02/15/200 5 |
| 143. | Space Systems/Loral, LLC | Thermal harness using encased carbon-based fiber and end attachment brackets | 0984389 8 | 04/27/200 1 | 6367509 | 04/09/200 2 |
| 144. | Space Systems/Loral, LLC | Multiple passband filter | 0985069 5 | 05/08/200 1 | 6583692 | 06/24/200 3 |
| 145. | Space Systems/Loral, LLC | Satellite communication system with gateway switch networks | 0987107 5 | 05/31/200 1 | 6898428 | 05/24/200 5 |
| 146. | Space Systems/Loral, LLC | Voltage tunable patch filter element with dielectrically loaded slot | 0988038 1 | 06/13/200 1 | 6563404 | 05/13/200 3 |
| 147. | Space Systems/Loral, LLC | Method and system for synchronized forward and Aft thrust vector control | 0988362 2 | 06/19/200 1 | 6695251 | 02/24/200 4 |
| 148. | Space Systems/Loral, LLC | Method and apparatus for soft switched AC power distribution | 0988473 4 | 06/19/200 1 | 6583994 | 06/24/200 3 |
| 149. | Space Systems/Loral, LLC | Methods for testing multibeam satellite systems using input power telemetry and output noise power | 0991216 7 | 07/23/200 1 | 8160575 | 04/17/201 2 |
| 150. | Space Systems/Loral, LLC | Dual function subreflector for communication satellite antenna | 0992859 7 | 08/13/200 1 | 6441794 | 08/27/200 2 |
| 151. | Space Systems/Loral, LLC | Spacecraft constellation formation keeping using inter-spacecraft distance measurement | 0993120 5 | 08/16/200 1 | 6553286 | 04/22/200 3 |

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| 152. | Space Systems/Loral, LLC | Electric orbit raising with variable thrust | 0994718 6 | 09/04/200 1 | 6543723 | 04/08/200 3 |
| 153. | Space Systems/Loral, LLC | Dielectric resonator equalizer | 0995773 4 | 09/21/200 1 | 6476686 | 11/05/200 2 |
| 154. | Space Systems/Loral, LLC | Energy managed electric propulsion methods and systems for stationkeeping satellites | 0997783 4 | 10/15/200 1 | 6581880 | 06/24/200 3 |
| 155. | Space Systems/Loral, LLC | Spacecraft having a momentum wheel configuration that prevents zero wheel speeds | 0999501 7 | 11/27/200 1 | 6691955 | 02/17/200 4 |
| 156. | Space Systems/Loral, LLC | Multi-band corrugated antenna feed horn with a hexagonal aperture and antenna array using same | 1000280 8 | 11/15/200 1 | 6501434 | 12/31/200 2 |
| 157. | Space Systems/Loral, LLC | Two-sided deployable thermal radiator system and method | 1000725 6 | 11/11/200 1 | 7028953 | 04/18/200 6 |
| 158. | Space Systems/Loral, LLC | Passive intermodulation free multilayer thermal blanket | 1002070 4 | 10/29/200 1 | 6623826 | 09/23/200 3 |
| 159. | Space Systems/Loral, LLC | Hybrid horn for dual Ka-band communications | 1003634 7 | 10/19/200 1 | 6522306 | 02/18/200 3 |
| 160. | Space Systems/Loral, LLC | Satellite harmonic torque estimator | 1008727 9 | 03/01/200 2 | 6672544 | 01/06/200 4 |
| 161. | Space Systems/Loral, LLC | CDMA code address data routing system and method | 1009489 8 | 03/11/200 2 | 6725277 | 04/20/200 4 |
| 162. | Space Systems/Loral, LLC | Single-receiver multiple-antenna RF autotrack control | 1009767 8 | 03/13/200 2 | 6570535 | 05/27/200 3 |
| 163. | Space Systems/Loral, LLC | Antenna distortion estimation and compensation | 1024494 4 | 09/17/200 2 | 6720918 | 04/13/200 4 |
| 164. | Space Systems/Loral, LLC | Ground-based beamforming for satellite communications systems | 1146749 0 | 08/25/200 6 | 7787819 | 08/31/201 0 |

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| 165. | Space Systems/Loral, LLC | Spacecraft three-axis attitude acquisition from sun direction measurement | 1170961 4 | 02/22/200 7 | 7874519 | 01/25/201 1 |
| 166. | Space Systems/Loral, LLC | Multi-beam satellite network to maximize bandwidth utilization | 1189108 6 | 08/08/200 7 | 7792070 | 09/07/201 0 |
| 167. | Space Systems/Loral, LLC | Radial release device | 1208281 8 | 04/14/200 8 | 8568053 | 10/29/201 3 |
| 168. | Space Systems/Loral, LLC | Redundant radial release apparatus | 1221504 1 | 06/23/200 8 | 8021069 | 09/20/201 1 |
| 169. | Space Systems/Loral, LLC | Satellite system with enhanced payload capacity | 1234406 4 | 12/24/200 8 | 8135338 | 03/13/201 2 |
| 170. | Space Systems/Loral, LLC | Spacecraft payload orientation steering | 1262970 7 | 12/02/200 9 | 9045239 | 06/02/201 5 |
| 171. | Space Systems/Loral, LLC | Antenna tracking profile estimation | 1277987 2 | 05/13/201 0 | 8179313 | 05/15/201 2 |
| 172. | Space Systems/Loral, LLC | Image navigation method using parametric systematic error correction | 1280045 0 | 05/14/201 0 | 8301377 | 10/30/201 2 |
| 173. | Space Systems/Loral, LLC | Ground-based beamforming for satellite communications systems | 1285646 8 | 08/13/201 0 | 8270899 | 09/18/201 2 |
| 174. | Space Systems/Loral, LLC | Satellite orbit raising using electric propulsion | 1292538 6 | 10/20/201 0 | 9108748 | 08/18/201 5 |
| 175. | Space Systems/Loral, LLC | Electrically large stepped-wall and smooth-wall horns for spot beam applications | 1292813 5 | 12/03/201 0 | 9136606 | 09/15/201 5 |
| 176. | Space Systems/Loral, LLC | Satellite Having Multiple Aspect Ratios | 1302617 5 | 02/11/201 1 | 8448902 | 05/28/201 3 |
| 177. | Space Systems/Loral, LLC | Spacecraft payload positioning with respect to a virtual pivot point | 1304427 8 | 03/09/201 1 | 8800935 | 08/12/201 4 |
| 178. | Space Systems/Loral, LLC | Source driver current fold-back protection | 1305308 4 | 03/21/201 1 | 8482894 | 07/09/201 3 |
| 179. | Space Systems/Loral, LLC | Redundant fuse wire release device | 1306865 5 | 05/17/201 1 | 9085377 | 07/21/201 5 |

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| 180. | Space Systems/Loral, LLC | Broadband Satellite with Dual Frequency Conversion and Bandwidth Aggregation | 1309366 9 | 04/25/201 1 | 8660482 | 02/25/201 4 |
| 181. | Space Systems/Loral, LLC | High capacity broadband satellite | 1310194 4 | 05/05/201 1 | 8789796 | 07/29/201 4 |
| 182. | Space Systems/Loral, LLC | Spacecraft momentum management using solar array | 1311537 0 | 05/25/201 1 | 8868263 | 10/21/201 4 |
| 183. | Space Systems/Loral, LLC | Band clamp with redundant load path | 1316441 4 | 06/20/201 1 | 8732916 | 05/27/201 4 |
| 184. | Space Systems/Loral, LLC | RF feed element design optimization using secondary pattern | 1317081 3 | 06/28/201 1 | 8914258 | 12/16/201 4 |
| 185. | Space Systems/Loral, LLC | Current collector bar and grid pattern for a photovoltaic solar cell | 1318935 4 | 07/22/201 1 | 9000288 | 04/07/201 5 |
| 186. | Space Systems/Loral, LLC | Preload releasing fastener and release system using same | 1321522 9 | 08/23/201 1 | 9180982 | 11/10/201 5 |
| 187. | Space Systems/Loral, LLC | Extendable antenna reflector deployment techniques | 1321592 9 | 08/23/201 1 | 9004409 | 04/14/201 5 |
| 188. | Space Systems/Loral, LLC | Reflector deployment techniques for satellites | 1321593 2 | 08/23/201 1 | 9248922 | 02/02/201 6 |
| 189. | Space Systems/Loral, LLC | Unified chemical electric propulsion system | 1322304 1 | 08/31/201 1 | 9145216 | 09/29/201 5 |
| 190. | Space Systems/Loral, LLC | Hold-down mechanism for a spacecraft appendage | 1323776 1 | 09/20/201 1 | 8915473 | 12/23/201 4 |
| 191. | Space Systems/Loral, LLC | Antenna system with multiple independently steerable shaped beams | 1324007 9 | 09/22/201 1 | 9774095 | 09/26/201 7 |
| 192. | Space Systems/Loral, LLC | Dual mode dielectric resonator operating in a HE mode with a Q factor no less than 5000 | 1324724 3 | 09/28/201 1 | 8952769 | 02/10/201 5 |
| 193. | Space Systems/Loral, LLC | Spacecraft momentum management | 1332665 4 | 12/15/201 1 | 9108749 | 08/18/201 5 |

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| 194. | Space Systems/Loral, LLC | Microstrip manifold coupled multiplexer | 1334009 5 | 12/29/201 1 | 9030271 | 05/12/201 5 |
| 195. | Space Systems/Loral, LLC | Methods for testing multibeam satellite systems using input power telemetry and output noise power | 1338561 9 | 02/27/201 2 | 8447296 | 05/21/201 3 |
| 196. | Space Systems/Loral, LLC | Electrostatic discharge control for a multi-cavity microwave filter | 1344225 2 | 04/09/201 2 | 8907742 | 12/09/201 4 |
| 197. | Space Systems/Loral, LLC | Wide beam antenna | 1347408 4 | 05/17/201 2 | 8872714 | 10/28/201 4 |
| 198. | Space Systems/Loral, LLC | Solar panel sequencing mechanism | 1362441 0 | 09/21/201 2 | 8915474 | 12/23/201 4 |
| 199. | Space Systems/Loral, LLC | Frequency and Bandwidth Tunable Microwave Filter | 1364463 2 | 10/04/201 2 | 9019039 | 04/28/201 5 |
| 200. | Space Systems/Loral, LLC | Spacecraft Transfer Orbit Techniques | 1364720 7 | 10/08/201 2 | 8763957 | 07/01/201 4 |
| 201. | Space Systems/Loral, LLC | Roll-up contamination cover | 1366571 7 | 10/31/201 2 | 8973641 | 03/10/201 5 |
| 202. | Space Systems/Loral, LLC | Shape memory alloy pre-loaded deployment hinge | 1366572 2 | 10/31/201 2 | 8876062 | 11/04/201 4 |
| 203. | Space Systems/Loral, LLC | Spacecraft momentum unload and station-keeping techniques | 1368388 7 | 11/21/201 2 | 8998146 | 04/07/201 5 |
| 204. | Space Systems/Loral, LLC | Waveguide T-switch | 1372874 5 | 12/27/201 2 | 9368851 | 06/14/201 6 |
| 205. | Space Systems/Loral, LLC | Flexible array support structure | 1372984 8 | 12/28/201 2 | 8894017 | 11/25/201 4 |
| 206. | Space Systems/Loral, LLC | Satellite system resource allocation optimization | 1379392 2 | 03/11/201 3 | 8996051 | 03/31/201 5 |
| 207. | Space Systems/Loral, LLC | Mode filter | 1380036 5 | 03/13/201 3 | 9531048 | 12/27/201 6 |
| 208. | Space Systems/Loral, LLC | Compact microstrip hybrid coupled input multiplexer | 1387076 1 | 04/25/201 3 | 8761026 | 06/24/201 4 |

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| 209. | Space Systems/Loral, LLC | Antenna Array with Reduced Mutual Coupling Between Array Elements | 1389618 1 | 05/16/2013 | 9537209 | 01/03/2017 |
| 210. | Space Systems/Loral, LLC | Radial release device | 1401291 5 | 08/28/2013 | 9708082 | 07/18/2017 |
| 211. | Space Systems/Loral, LLC | Caging mechanism for a single- or multi-axis positioning mechanism | 1408906 7 | 11/25/2013 | 9677602 | 06/13/2017 |
| 212. | Space Systems/Loral, LLC | Integral corner bypass diode interconnecting configuration for multiple solar cells | 1409277 5 | 11/27/2013 | 9627565 | 04/18/2017 |
| 213. | Space Systems/Loral, LLC | Axially grooved crossing heat pipes | 1409702 0 | 12/04/2013 | 9352856 | 05/31/2016 |
| 214. | Space Systems/Loral, LLC | Side-by-side multiple launch configuration | 1410821 3 | 12/16/2013 | 9242743 | 01/26/2016 |
| 215. | Space Systems/Loral, LLC | Reflective and permeable metalized laminate | 1416134 3 | 01/22/2014 | 9685710 | 06/20/2017 |
| 216. | Space Systems/Loral, LLC | Heat pipe and radiator system with thermoelectric cooler | 1418326 3 | 02/18/2014 | 9714777 | 07/25/2017 |
| 217. | Space Systems/Loral, LLC | Depressurization test method using pressure vessel | 1422213 6 | 03/21/2014 | 9606044 | 03/28/2017 |
| 218. | Space Systems/Loral, LLC | Highly inclined elliptical orbit launch and orbit acquisition techniques | 1430002 7 | 06/09/2014 | 9365299 | 06/14/2016 |
| 219. | Space Systems/Loral, LLC | Highly inclined elliptical orbit de-orbit techniques | 1430003 2 | 06/09/2014 | 9550585 | 01/24/2017 |
| 220. | Space Systems/Loral, LLC | Nondestructive proof loading of honeycomb panels | 1444874 4 | 07/31/2014 | 9523633 | 12/20/2016 |
| 221. | Space Systems/Loral, LLC | Thruster support mechanism for satellite propulsion | 1458006 3 | 12/22/2014 | 9663251 | 05/30/2017 |
| 222. | Space Systems/Loral, LLC | Hinge with spring pre-load transfer mechanism | 1459609 6 | 01/13/2015 | 9546510 | 01/17/2017 |
| 223. | Space Systems/Loral, LLC | Incremental deployment device | 1459610 1 | 01/13/2015 | 10337594 | 07/02/2019 |

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| 224. | Space Systems/Loral, LLC | Spacecraft with aerodynamic control | 1462793 6 | 02/20/201 5 | 9889950 | 02/13/201 8 |
| 225. | Space Systems/Loral, LLC | Dynamic link adaption and/or dynamic allocation of communication resources of a communication system based on external interference information received from external interference information sources | 1463248 2 | 02/26/201 5 | 9628168 | 04/18/201 7 |
| 226. | Space Systems/Loral, LLC | Navigational route selection to mitigate probability mobile terminal loses communication capability | 1463249 2 | 02/26/201 5 | 9476715 | 10/25/201 6 |
| 227. | Space Systems/Loral, LLC | On-orbit assembly of communication satellites | 1464248 6 | 03/09/201 5 | 9878806 | 01/30/201 8 |
| 228. | Space Systems/Loral, LLC | Communication system with multi band gateway | 1465922 2 | 03/16/201 5 | 9967792 | 05/08/201 8 |
| 229. | Space Systems/Loral, LLC | Redundant telemetry transmission path | 1467014 1 | 03/26/201 5 | 10236970 | 03/19/201 9 |
| 230. | Space Systems/Loral, LLC | Dielectric resonator filter and multiplexer having a common wall with a centrally located coupling iris and a larger peripheral aperture adjustable by a tuning screw | 1468192 0 | 04/08/201 5 | 9705171 | 07/11/201 7 |
| 231. | Space Systems/Loral, LLC | Broadband satellite payload architecture | 1468530 2 | 04/13/201 5 | 10270524 | 04/23/201 9 |
| 232. | Space Systems/Loral, LLC | Solid state traveling wave amplifier for space applications | 1472988 3 | 06/03/201 5 | 9641144 | 05/02/201 7 |
| 233. | Space Systems/Loral, LLC | All front contact solar cell | 1473499 6 | 06/09/201 5 | 10096726 | 10/09/201 8 |
| 234. | Space Systems/Loral, LLC | Reverse wireless broadband system | 1482040 8 | 08/06/201 5 | 9979466 | 05/22/201 8 |
| 235. | Space Systems/Loral, LLC | High-frequency cavity resonator filter with | 1486466 9 | 09/24/201 5 | 10056668 | 08/21/201 8 |

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| | | diametrically-opposed heat transfer legs | | | | |
| 236. | Space Systems/Loral, LLC | Brazing of High Temperature Wire to Electrical Contact | 1486807 6 | 09/28/201 5 | | |
| 237. | Space Systems/Loral, LLC | Satellite with transition beam size | 1487549 1 | 10/05/201 5 | 9705586 | 07/11/201 7 |
| 238. | Space Systems/Loral, LLC | Self-Balancing Solar Array | 1491833 7 | 10/20/201 5 | | |
| 239. | Space Systems/Loral, LLC | Flexible propulsion system | 1493720 8 | 11/10/201 5 | 10336475 | 07/02/201 9 |
| 240. | Space Systems/Loral, LLC | Channelizer supplemented spacecraft telemetry and command functionality | 1493943 3 | 11/12/201 5 | 9621255 | 04/11/201 7 |
| 241. | Space Systems/Loral, LLC | High capacity spacecraft | 1493944 5 | 11/12/201 5 | 10183764 | 01/22/201 9 |
| 242. | Space Systems/Loral, LLC | Flexible radiation shield | 1495458 3 | 11/30/201 5 | 9640288 | 05/02/201 7 |
| 243. | Space Systems/Loral, LLC | Spacecraft with rigid antenna reflector deployed via linear extension boom | 1496294 1 | 12/08/201 5 | 10259599 | 04/16/201 9 |
| 244. | Space Systems/Loral, LLC | Digital payload with variable high power amplifiers | 1496562 0 | 12/10/201 5 | 10312995 | 06/04/201 9 |
| 245. | Space Systems/Loral, LLC | Dual-polarized, dual-band, compact beam forming network | 1496872 5 | 12/14/201 5 | 10033099 | 07/24/201 8 |
| 246. | Space Systems/Loral, LLC | Ribbon Cable with Integrated Diode | 1496983 9 | 12/15/201 5 | | |
| 247. | Space Systems/Loral, LLC | Pre and Post Orbit Maneuver Pulses to Reduce Flexural Oscillations | 1497273 6 | 12/17/201 5 | | |
| 248. | Space Systems/Loral, LLC | Battery charge management for geosynchronous spacecraft | 1497318 6 | 12/17/201 5 | 10239477 | 03/26/201 9 |

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| 249. | Space Systems/Loral, LLC | Non-blockings switch matrix | 1498961 2 | 01/06/201 6 | 10109441 | 10/23/201 8 |
| 250. | Space Systems/Loral, LLC | Waveguide hinge | 1499507 0 | 01/13/201 6 | 10103417 | 10/16/201 8 |
| 251. | Space Systems/Loral, LLC | Truss structure optimization techniques | 1505399 3 | 02/25/201 6 | 10112731 | 10/30/201 8 |
| 252. | Space Systems/Loral, LLC | Truss structure | 1505399 8 | 02/25/201 6 | 10227145 | 03/12/201 9 |
| 253. | Space Systems/Loral, LLC | Satellite transmit antenna ground-based pointing | 1509241 3 | 04/06/201 6 | 9608716 | 03/28/201 7 |
| 254. | Space Systems/Loral, LLC | Flexible Bandwidth Assignment To Spot Beams | 1514448 7 | 05/02/201 6 | 10136438 | 11/20/201 8 |
| 255. | Space Systems/Loral, LLC | Stowage, deployment and positioning of rigid antenna reflectors on a spacecraft | 1516025 8 | 05/20/201 6 | 10053240 | 08/21/201 8 |
| 256. | Space Systems/Loral, LLC | Protected Overlay Of Assigned Frequency Channels | 1516346 5 | 05/24/201 6 | 10305646 | 05/28/201 9 |
| 257. | Space Systems/Loral, LLC | Highly inclined elliptical orbit launch and orbit acquisition techniques | 1516603 3 | 05/26/201 6 | 9533774 | 01/03/201 7 |
| 258. | Space Systems/Loral, LLC | Satellite system using time domain beam hopping | 1517282 5 | 06/03/201 6 | 10111109 | 10/23/201 8 |
| 259. | Space Systems/Loral, LLC | Synchronization for satellite system | 1517285 9 | 06/03/201 6 | 10411362 | 09/10/201 9 |
| 260. | Space Systems/Loral, LLC | Satellite system with different frequency plan at the equator | 1517288 2 | 06/03/201 6 | 10128577 | 11/13/201 8 |
| 261. | Space Systems/Loral, LLC | Satellite systems with single polarization path | 1517296 5 | 06/03/201 6 | | |
| 262. | Space Systems/Loral, LLC | Satellite system with steerable gateway beams | 1517297 8 | 06/03/201 6 | 10418724 | 09/17/201 9 |
| 263. | Space Systems/Loral, LLC | Satellite system having terminals in hopping beams communicating with more than one gateway | 1517303 8 | 06/03/201 6 | 10347987 | 07/09/201 9 |

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| 264. | Space Systems/Loral, LLC | Satellite system with beam hopping plan that takes into account the needs of gateways and subscriber terminals | 1517305 4 | 06/03/201 6 | 10135154 | 11/20/201 8 |
| 265. | Space Systems/Loral, LLC | Satellite system beam to beam handover | 1517308 3 | 06/03/201 6 | 10128578 | 11/13/201 8 |
| 266. | Space Systems/Loral, LLC | Satellite system with handover for multiple gateways | 1517309 7 | 06/03/201 6 | 10381748 | 08/13/201 9 |
| 267. | Space Systems/Loral, LLC | Orthomode transducer | 1518044 4 | 06/13/201 6 | 9947978 | 04/17/201 8 |
| 268. | Space Systems/Loral, LLC | Waveguide to microstrip line N-port power splitter/combiner | 1520120 8 | 07/01/201 6 | 10177726 | 01/08/201 9 |
| 269. | Space Systems/Loral, LLC | Satellite system with rolling wave handovers | 1521800 9 | 07/23/201 6 | 10225002 | 03/05/201 9 |
| 270. | Space Systems/Loral, LLC | Satellite diversity | 1522127 3 | 07/27/201 6 | 10397920 | 08/27/201 9 |
| 271. | Space Systems/Loral, LLC | Digital beamforming architecture | 1522552 5 | 08/01/201 6 | 9917623 | 03/13/201 8 |
| 272. | Space Systems/Loral, LLC | Multi-channel satellite calibration | 1522558 8 | 08/01/201 6 | 9642107 | 05/02/201 7 |
| 273. | Space Systems/Loral, LLC | Cloud mask data acquisition and distribution using geosynchronous communications or broadcast satellites | 1524705 2 | 08/25/201 6 | 10230454 | 03/12/201 9 |
| 274. | Space Systems/Loral, LLC | Highly inclined elliptical orbit de-orbit techniques | 1526169 6 | 09/09/201 6 | 10202207 | 02/12/201 9 |
| 275. | Space Systems/Loral, LLC | Articulation techniques for a spacecraft solar array | 1526320 9 | 09/12/201 6 | 10435182 | 10/08/201 9 |
| 276. | Space Systems/Loral, LLC | Access switch network with redundancy | 1526782 8 | 09/16/201 6 | 10284283 | 05/07/201 9 |
| 277. | Space Systems/Loral, LLC | Low cost launch vehicle fairing | 1527750 5 | 09/27/201 6 | 10214303 | 02/26/201 9 |
| 278. | Space Systems/Loral, LLC | Spacecraft exoskeleton truss structure | 1533654 1 | 10/27/201 6 | 10407189 | 09/10/201 9 |

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| 279. | Space Systems/Loral, LLC | Smallsat Payload Configuration | 1535123 3 | 11/14/201 6 | | |
| 280. | Space Systems/Loral, LLC | Efficient stationkeeping strategy for the three apogee (TAP) orbit | 1535247 1 | 11/15/201 6 | 10364051 | 07/30/201 9 |
| 281. | Space Systems/Loral, LLC | Multiport amplifiers (MPAs) using output filtering to improve performance over life | 1536411 5 | 11/29/201 6 | 10320064 | 06/11/201 9 |
| 282. | Space Systems/Loral, LLC | Flexible Radio Frequency Converters for Digital Payloads | 1537227 6 | 12/07/201 6 | | |
| 283. | Space Systems/Loral, LLC | Enhanced Radiator | 1537452 8 | 12/09/201 6 | | |
| 284. | Space Systems/Loral, LLC | Satellite constellation switching | 1538826 9 | 12/22/201 6 | 9882632 | 01/30/201 8 |
| 285. | Space Systems/Loral, LLC | High throughput satellite system with optical feeder uplink beams and RF service downlink beams | 1539451 2 | 12/29/201 6 | 10075242 | 09/11/201 8 |
| 286. | Space Systems/Loral, LLC | High throughput satellite system with RF service uplink beams and optical feeder downlink beams | 1539460 2 | 12/29/201 6 | 9917646 | 03/13/201 8 |
| 287. | Space Systems/Loral, LLC | Imaging array fed reflector | 1543862 0 | 02/21/201 7 | 10305195 | 05/28/201 9 |
| 288. | Space Systems/Loral, LLC | Inclined geosynchronous orbit spacecraft constellations | 1544103 2 | 02/23/201 7 | | |
| 289. | Space Systems/Loral, LLC | Stationkeeping techniques for spacecraft in inclined geosynchronous orbit | 1544103 7 | 02/23/201 7 | | |
| 290. | Space Systems/Loral, LLC | Efficient orbital storage and deployment for spacecraft in inclined geosynchronous orbit | 1544104 0 | 02/23/201 7 | 10329034 | 06/25/201 9 |
| 291. | Space Systems/Loral, LLC | Channelizer supplemented spacecraft telemetry and command functionality | 1544579 7 | 02/28/201 7 | 10033455 | 07/24/201 8 |

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| 292. | Space Systems/Loral, LLC | Satellite System That Produces Optical Inter-Satellite Link (ISL) Beam Based On Optical Feeder Uplink Beam | 15461369 | 03/16/2017 | 9979465 | 05/22/2018 |
| 293. | Space Systems/Loral, LLC | Satellite System That Produces Optical Inter-Satellite Link (ISL) Beam Based On Optical ISL Received From Another Satellite | 15461372 | 03/16/2017 | 10050699 | 08/14/2018 |
| 294. | Space Systems/Loral, LLC | Satellite System That Produces Optical Inter-Satellite Link (ISL) Beam Based On RF Feeder Uplink Beam | 15461377 | 03/16/2017 | 9923625 | 03/20/2018 |
| 295. | Space Systems/Loral, LLC | Ground Based Subsystems, For Inclusion In Optical Gateway, And That Interface With Optical Networks External To Optical Gateway | 15461381 | 03/16/2017 | 10122456 | 11/06/2018 |
| 296. | Space Systems/Loral, LLC | Spacecraft Design with Multiple Thermal Zones | 15466610 | 03/21/2017 | | |
| 297. | Space Systems/Loral, LLC | Asymmetric thruster gimbal configuration | 15467612 | 03/23/2017 | 10464694 | 11/05/2019 |
| 298. | Space Systems/Loral, LLC | Electric Thruster Waste Heat Recovery During Satellite Orbit Transfer | 15470592 | 03/27/2017 | | |
| 299. | Space Systems/Loral, LLC | Multi-channel satellite antenna calibration | 15470600 | 03/27/2017 | 10044436 | 08/07/2018 |
| 300. | Space Systems/Loral, LLC | Exoskeletal Launch Support Structure | 15480276 | 04/05/2017 | | |
| 301. | Space Systems/Loral, LLC | Rotatable Stacked Spacecraft | 15488166 | 04/14/2017 | 10479534 | 11/19/2019 |
| 302. | Space Systems/Loral, LLC | Deployable propulsion module for spacecraft | 15488179 | 04/14/2017 | 10435183 | 10/08/2019 |
| 303. | Space Systems/Loral, LLC | Articulating Sunshield | 15586076 | 05/03/2017 | | |

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| 304. | Space Systems/Loral, LLC | Satellite system using optical gateways and onboard processing | 1559985 2 | 05/19/201 7 | 10069565 | 09/04/201 8 |
| 305. | Space Systems/Loral, LLC | Ecliptic Sun Acquisition Control Mode For Satellites | 1560328 8 | 05/23/201 7 | | |
| 306. | Space Systems/Loral, LLC | Communication platform with flexible photonics payload | 1560416 5 | 05/24/201 7 | 10219051 | 02/26/201 9 |
| 307. | Space Systems/Loral, LLC | Cross-Feeding Propellant Between Stacked Spacecraft | 1561680 3 | 06/07/201 7 | | |
| 308. | Space Systems/Loral, LLC | Satellite network switching | 1561889 7 | 06/09/201 7 | 10200922 | 02/05/201 9 |
| 309. | Space Systems/Loral, LLC | Lattice structure design and manufacturing techniques | 1562288 8 | 06/14/201 7 | 10326209 | 06/18/201 9 |
| 310. | Space Systems/Loral, LLC | Flexible high throughput satellite system using optical gateways | 1563300 7 | 06/26/201 7 | 10320481 | 06/11/201 9 |
| 311. | Space Systems/Loral, LLC | Spacecraft Radiator System and Method | 1563746 6 | 06/29/201 7 | | |
| 312. | Space Systems/Loral, LLC | Space Based Robotic Assembly of a Modulator Reflector | 1565459 3 | 07/19/201 7 | | |
| 313. | Space Systems/Loral, LLC | Multi-Reflector Hold-Down | 1566947 0 | 08/04/201 7 | | |
| 314. | Space Systems/Loral, LLC | Satellite system using optical gateways and ground based beamforming | 1568278 5 | 08/22/201 7 | 10142021 | 11/27/201 8 |
| 315. | Space Systems/Loral, LLC | Self-assmebling persistent space platform | 1568999 3 | 08/29/201 7 | | |
| 316. | Space Systems/Loral, LLC | Amplifier integrated feed array with modularized feed ele-ments and amplifiers | 1569990 9 | 09/08/201 7 | | |
| 317. | Space Systems/Loral, LLC | High pointing accuracy spacecraft | 1570934 1 | 09/19/201 7 | 10367575 | 07/30/201 9 |

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| 318. | Space Systems/Loral, LLC | Adaptive communication system | 15710740 | 09/20/2017 | | |
| 319. | Space Systems/Loral, LLC | Adaptive Satellite Channelizer | 15725194 | 10/04/2017 | 10341012 | 07/02/2019 |
| 320. | Space Systems/Loral, LLC | Satellite with Regenerative Processor | 15799258 | 10/31/2017 | | |
| 321. | Space Systems/Loral, LLC | Additive manufactured RF module | 15818542 | 11/20/2017 | | |
| 322. | Space Systems/Loral, LLC | Pointing system improvement with imaging array feeds | 15831257 | 12/04/2017 | 10461409 | 10/29/2019 |
| 323. | Space Systems/Loral, LLC | Modularized feed array arrangement | 15831258 | 12/04/2017 | 10263325 | 04/16/2019 |
| 324. | Space Systems/Loral, LLC | Calibration of satellite beamforming channels | 15833351 | 12/06/2017 | 10361762 | 07/23/2019 |
| 325. | Space Systems/Loral, LLC | On-orbit assembly of communication satellites | 15847780 | 12/19/2017 | | |
| 326. | Space Systems/Loral, LLC | Spacecraft with aerodynamic control | 15849289 | 12/20/2017 | | |
| 327. | Space Systems/Loral, LLC | High capacity communication satellite | 15887721 | 02/02/2018 | | |
| 328. | Space Systems/Loral, LLC | Low earth orbiting spacecraft with a dual-use directional antenna | 15900653 | 02/20/2018 | | |
| 329. | Space Systems/Loral, LLC | Flexible signal distribution assisted by tunable optical carrier modulating a desired signal | 15904063 | 02/23/2018 | 10250330 | 04/02/2019 |
| 330. | Space Systems/Loral, LLC | Multipoint amplifier input network with compensation for output network gain and phase frequency response imbalance | 15926186 | 03/20/2018 | 10320349 | 06/11/2019 |
| 331. | Space Systems/Loral, LLC | Satellite system calibration in active operational channels | 15926628 | 03/20/2018 | 10284308 | 05/07/2019 |
| 332. | Space Systems/Loral, LLC | Satellite system using an RF GBBF feeder uplink beam from a gateway to a satellite, and using an | 16111008 | 08/23/2018 | 10432308 | 10/01/2019 |

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| | | optical ISL from the satellite to another satellite | | | | |
| 333. | Space Systems/Loral, LLC | Flexible bandwidth assignment to spot beams | 16163105 | 10/17/2018 | | |
| 334. | Space Systems/Loral, LLC | Ground based subsystems, for inclusion in optical gateway, and that interface with optical networks external to optical gateway | 16168658 | 10/23/2018 | 10476595 | 11/12/2019 |
| 335. | Space Systems/Loral, LLC | Multipoint amplifier input network with compensation for output network gain and phase frequency response imbalance | 16405162 | 05/07/2019 | | |
| 336. | Space Systems/Loral, LLC | Satellite Diversity | 16505937 | 07/09/2019 | | |
| 337. | MacDonald, Dettwiler and Associates | Adaptive Satellite Channelizer | US15725194A | 2017/10/04 | | |
| 338. | MacDonald, Dettwiler and Corporation | High performance multimode horn | US2001833713A | 2001/04/13 | US6396453B2 | 2002/05/28 |
| 339. | MacDonald, Dettwiler and Corporation | Steerable antenna system with fixed feed source | US2001967949A | 2001/10/02 | US6492955B1 | 2002/12/10 |
| 340. | MacDonald, Dettwiler and Corporation | Steerable offset antenna with fixed feed source | US2002265600A | 2002/10/08 | US6747604B2 | 2004/06/08 |
| 341. | MacDonald, Dettwiler and Corporation | Method for improving isolation of an antenna mounted on a structure | US2003747278A | 2003/12/30 | US7138959B2 | 2006/11/21 |
| 342. | MacDonald, Dettwiler and Corporation | Helical antenna | US2004868210A | 2004/06/16 | US7038636B2 | 2006/05/02 |
| 343. | MacDonald, Dettwiler and Corporation | Aperture illumination control membrane | US200548824A | 2005/02/03 | US7183990B2 | 2007/02/27 |

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| 344. | MacDonald, and Corporation | Dettwiler Associates | Electromagnetic bandgap device for antenna structures | US20052 40497A | 2005/10/0 3 | US723614 2B2 | 2007/06/2 6 |
| 345. | MacDonald, and Corporation | Dettwiler Associates | Parasitic element for helical antenna | US20078 19337A | 2007/06/2 7 | US747427 2B2 | 2009/01/0 6 |
| 346. | MacDonald, and Corporation | Dettwiler Associates | Orthomode junction assembly with associated filters for use in an antenna feed system | US13974 640A | 2013/08/2 3 | US905968 2B2 | 2015/06/1 6 |
| 347. | MacDonald, and Corporation | Dettwiler Associates | Wide scan steerable antenna with no key/hole | US13652 680A | 2012/10/1 6 | US909374 2B2 | 2015/07/2 8 |
| 348. | MacDonald, and Corporation | Dettwiler Associates | Antenna pointing system | US13723 844A | 2012/12/2 1 | US917212 8B2 | 2015/10/2 7 |
| 349. | MacDonald, and Corporation | Dettwiler Associates | Wide scan steerable antenna | US14849 919A | 2015/09/1 0 | US964733 4B2 | 2017/05/0 9 |
| 350. | MacDonald, and Corporation | Dettwiler Associates | Compact and lightweight TEM/line network for RF components of antenna systems | US15418 154A | 2017/01/2 7 | US100691 84B2 | 2018/09/0 4 |
| 351. | MacDonald, and Corporation | Dettwiler Associates | Architecture and method for optimal tracking of multiple broadband satellite terminals | US15442 653A | 2017/02/2 5 | | |
| 352. | MacDonald, and Corporation | Dettwiler Associates | Three axis reflector deployment and pointing mechanism | US15480 941A | 2017/04/0 6 | | |
| 353. | MacDonald, and Corporation | Dettwiler Associates | Antenna reflector interchange mechanism | US15623 764A | 2017/06/1 5 | | |
| 354. | MacDonald, and Corporation | Dettwiler Associates | Strut and joint for spaceframe structure assemblies | US15838 585A | 2017/12/1 2 | | |
| 355. | MacDonald, and Corporation | Dettwiler Associates | Calibration system and method for optimizing leakage performance of a multi/port amplifier | US15853 588A | 2017/12/2 2 | | |

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| 356. | MacDonald, Dettwiler and Associates Corporation | RF rotary joint using a matched horn coupler assembly | US16116554A | 2018/08/29 | | |
| 357. | MacDonald, Dettwiler and Associates Corporation | Modular Channelizer | US15729257A | 2017/10/10 | | |
| 358. | MacDonald, Dettwiler and Associates Corporation | Lightweight Deployable Aperture Reflectarray Antenna Reflector | 16/406,349 | 2019/05/08 | | |
| 359. | MacDonald, Dettwiler and Associates Inc. | Gearbox | US2002153600A | 2002/05/24 | US6749533B2 | 2004/06/15 |
| 360. | MacDonald, Dettwiler and Associates Inc. | Surgical robot and robotic controller | US11603352A | 2006/11/20 | US7996110B2 | 2011/08/09 |
| 361. | MacDonald, Dettwiler and Associates Inc. | Surgical robot and robotic controller | US13205524A | 2011/08/08 | US8515576B2 | 2013/08/20 |
| 362. | MacDonald, Dettwiler and Associates Inc. | Spacecraft docking mechanism | US2004890513A | 2004/07/14 | US6969030B1 | 2005/11/29 |
| 363. | MacDonald, Dettwiler and Associates Inc. | 3D imaging system | US2006352399A | 2006/02/13 | US7860301B2 | 2010/12/28 |
| 364. | MacDonald, Dettwiler and Associates Inc. | Method and apparatus for producing 3D model of an underground environment | US2009654451A | 2009/12/18 | US8031909B2 | 2011/10/04 |
| 365. | MacDonald, Dettwiler and Associates Inc. | Method and apparatus for producing an enhanced 3D model of an environment or an object | US2009654452A | 2009/12/18 | US8031933B2 | 2011/10/04 |
| 366. | MacDonald, Dettwiler and Associates Inc. | Method and apparatus for producing 3D model of an environment | US13210275A | 2011/08/15 | US8532368B2 | 2013/09/10 |
| 367. | MacDonald, Dettwiler and Associates Inc. | Traffic management system for a passageway environment | US2006493027A | 2006/07/26 | US7756615B2 | 2010/07/13 |
| 368. | MacDonald, Dettwiler and Associates Inc. | Guidance, navigation, and control system for a vehicle | US2007922706A | 2008/03/19 | US8090491B2 | 2012/01/03 |
| 369. | MacDonald, Dettwiler and Associates Inc. | Guidance, navigation, and control system for a vehicle | US13209247A | 2011/08/12 | US8260483B2 | 2012/09/04 |
| 370. | MacDonald, Dettwiler and Associates Inc. | Surgical manipulator | US2007812094A | 2007/06/14 | US8491603B2 | 2013/07/23 |

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| 371. | MacDonald, Dettwiler and Associates Inc. | Surgical manipulator | US2008318151A | 2008/12/22 | US84444631B2 | 2013/05/21 |
| 372. | MacDonald, Dettwiler and Associates Inc. | Surgical manipulator | US13899300A | 2013/05/21 | US93333041B2 | 2016/05/10 |
| 373. | MacDonald, Dettwiler and Associates Inc. | Satellite refuelling system and method | US200873795A | 2008/03/10 | US8074935B2 | 2011/12/13 |
| 374. | MacDonald, Dettwiler and Associates Inc. | Satellite refuelling system and method | US13196750A | 2011/08/02 | US8181911B1 | 2012/05/22 |
| 375. | MacDonald, Dettwiler and Associates Inc. | Robotic satellite refueling tool | US13323472A | 2011/12/12 | US8196870B2 | 2012/06/12 |
| 376. | MacDonald, Dettwiler and Associates Inc. | Robotic satellite refuelling tool | US13470661A | 2012/05/14 | US8448904B2 | 2013/05/28 |
| 377. | MacDonald, Dettwiler and Associates Inc. | Scalable common interface plate system (SCIPS) | US13028051A | 2011/02/15 | US8702341B2 | 2014/04/22 |
| 378. | MacDonald, Dettwiler and Associates Inc. | Scalable common interface plate system (SCIPS) | US14221946A | 2014/03/21 | US9339935B2 | 2016/05/17 |
| 379. | MacDonald, Dettwiler and Associates Inc. | Dual reflector system for linear lamp illuminators | US2010907685A | 2010/10/19 | US9115867B2 | 2015/08/25 |
| 380. | MacDonald, Dettwiler and Associates Inc. | Robotic servicing multifunctional tool | US13652339A | 2012/10/15 | US9676096B2 | 2017/06/13 |
| 381. | MacDonald, Dettwiler and Associates Inc. | Robotic servicing multifunctional tool | US15620300A | 2017/06/12 | US10005180B2 | 2018/06/26 |
| 382. | MacDonald, Dettwiler and Associates Inc. | Robotic servicing multifunctional tool | US15621362A | 2017/06/13 | US9950424B2 | 2018/04/24 |
| 383. | MacDonald, Dettwiler and Associates Inc. | Propellant transfer system and method for resupply of propellant to on/orbit spacecraft | US13678281A | 2012/11/15 | US8899527B2 | 2014/12/02 |
| 384. | MacDonald, Dettwiler and Associates Inc. | Propellant transfer system and method for resupply of propellant to on/orbit spacecraft | US14554695A | 2014/11/26 | US9260206B2 | 2016/02/16 |
| 385. | MacDonald, Dettwiler and Associates Inc. | Method of real/time tracking of moving/flexible surfaces | US13678162A | 2012/11/15 | US8693730B2 | 2014/04/08 |

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|------|--|--|-------------|------------|-------------|------------|
| 386. | MacDonald, Dettwiler and Associates Inc. | Method of real/time tracking of moving/flexible surfaces | US14221085A | 2014/03/20 | US9101267B2 | 2015/08/11 |
| 387. | MacDonald, Dettwiler and Associates Inc. | Tool for accessing satellite fill/drain valves during propellant resupply | US13706126A | 2012/12/05 | US9108747B2 | 2015/08/18 |
| 388. | MacDonald, Dettwiler and Associates Inc. | System and tool for accessing satellite fill/drain valves during propellant resupply | US14826429A | 2015/08/14 | US9567111B2 | 2017/02/14 |
| 389. | MacDonald, Dettwiler and Associates Inc. | System and tool for accessing satellite fill/drain valves during propellant resupply | US14826444A | 2015/08/14 | US9688422B2 | 2017/06/27 |
| 390. | MacDonald, Dettwiler and Associates Inc. | Spacecraft capture mechanism | US13839529A | 2013/03/15 | US9399295B2 | 2016/07/26 |
| 391. | MacDonald, Dettwiler and Associates Inc. | Spacecraft capture mechanism | US15219017A | 2016/07/25 | US9764478B2 | 2017/09/19 |
| 392. | MacDonald, Dettwiler and Associates Inc. | Wearable object locator and imaging system | US13589957A | 2012/08/20 | US9285481B2 | 2016/03/15 |
| 393. | MacDonald, Dettwiler and Associates Inc. | Spacecraft capture mechanism | US14703709A | 2015/05/04 | US9669950B2 | 2017/06/06 |
| 394. | MacDonald, Dettwiler and Associates Inc. | Payload ejection system | US14716795A | 2015/05/19 | | |
| 395. | MacDonald, Dettwiler and Associates Inc. | System and method for automated artificial vision guided dispensing viscous fluids for caulking and sealing operations | US15645929A | 2017/07/10 | | |
| 396. | MacDonald, Dettwiler and Associates Inc. | Actuated resettable shockless hold down and release mechanism (ARES HDRM) | US15849225A | 2017/12/20 | | |
| 397. | MacDonald, Dettwiler and Associates Inc. | Unobtrusive driving assistance method and system for a vehicle to avoid hazards | US15849427A | 2017/12/20 | | |
| 398. | MacDonald, Dettwiler and Associates Inc. | Low/Profile Manipulator Interface System (MIPS) | 15/829,619 | 2017/12/01 | | |


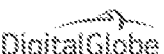
| | | | | | | |
|------|--|--|---------------|------------|-------------|------------|
| 399. | MacDonald, Dettwiler and Associates Inc. | Refueling Tool and System Incorporating The Refueling Tool | 62/782,007 | 2018/12/19 | | |
| 400. | MacDonald, Dettwiler and Associates Inc. | Radial Latch Manipulator Interface System | 62/869,943 | 2019/07/02 | | |
| 401. | MacDonald, Dettwiler and Associates Ltd. ¹ | Satellite communications system for providing global, high quality movement of very large data files | US2003530018A | 2005/04/01 | US7783734B2 | 2010/08/24 |
| 402. | MacDonald, Dettwiler and Associates Ltd. | Satellite communications system for providing global, high quality movement of very large data files | US2010850426A | 2010/08/04 | US8412851B2 | 2013/04/02 |
| 403. | MacDonald, Dettwiler and Associates Ltd. | Satellite communications system for providing global, high quality movement of very large data files | US13853027A | 2013/03/28 | US9369883B2 | 2016/06/14 |
| 404. | MacDonald, Dettwiler and Associates Ltd. | Lightweight space/fed active phased array antenna system | US2007912585A | 2008/05/07 | US7889129B2 | 2011/02/15 |
| 405. | MacDonald, Dettwiler Space and Advanced Robotics Ltd. ² | Hinged scoop end-effector | US1999325640A | 1999/06/04 | US6341933B1 | 2002/01/29 |
| 406. | Neptec | Data collection unit | US29204181 | 2004/04/26 | USD508565S1 | 2005/08/16 |
| 407. | Neptec Design Group Ltd. | Wide angle bistatic scanning optical ranging sensor | US13880938 | 2013/11/26 | US9255790B2 | 2016/02/09 |
| 408. | Neptec Design Group Ltd. | Return pulse shape analysis for falling edge object discrimination of aerosol LIDAR | US13127945 | 2011/08/16 | US8781790B2 | 2014/07/15 |
| 409. | Neptec Design Group Ltd. | High speed 360 degree scanning LIDAR head | US14397155 | 2015/03/16 | US9791555B2 | 2017/10/17 |



¹ MacDonald, Dettwiler and Associates Ltd. changed its name to "Maxar Technologies Ltd." on October 5, 2017 and amalgamated with another company on January 1, 2019, and the name of such amalgamated company is "Maxar Technologies ULC".


² MacDonald, Dettwiler Space and Advanced Robotics Ltd. changed its name to "MacDonald, Dettwiler and Associates Inc." on April 25, 2005.

SCHEDULE B

TRADEMARK REGISTRATIONS AND TRADEMARK APPLICATIONS

| | Owner | Trademark | Serial No. | Filing Date | Reg. No. | Reg. Date |
|-----|--------------------|--|--------------|----------------|----------|----------------|
| 1. | DigitalGlobe, Inc. | DIGITALGLOBE | 7502577 2 | 11/30/199 5 | 2136168 | 02/10/199 8 |
| 2. | DigitalGlobe, Inc. | DIGITALGLOBE | 7531955 7 | 07/03/199 7 | 2264047 | 07/27/199 9 |
| 3. | DigitalGlobe, Inc. | DIGITALGLOBE | 7592364 5 | 02/22/200 0 | 2484701 | 09/04/200 1 |
| 4. | DigitalGlobe, Inc. | DIGITALGLOBE & Design  | 7626596 9 | 05/31/200 1 | 2653714 | 11/26/200 2 |
| 5. | DigitalGlobe, Inc. | DIGITALGLOBE & Design  | 8588037 6 | 03/19/201 3 | 4653570 | 12/09/201 4 |
| 6. | DigitalGlobe, Inc. | DIGITALGLOBE.CO M | 7592367 0 | 02/22/200 0 | 2487069 | 09/11/200 1 |
| 7. | DigitalGlobe, Inc. | FIRSTLOOK | 8530197 3 | 04/22/201 1 | 4180489 | 07/24/201 2 |
| 8. | DigitalGlobe, Inc. | GEOHIVE | 8681770 0 | 11/12/201 5 | 5341290 | 11/21/201 7 |
| 9. | DigitalGlobe, Inc. | IMAGECONNECT | 7741250 8 | 03/04/200 8 | 3614695 | 05/05/200 9 |
| 10. | DigitalGlobe, Inc. | ORBIMAGE | 7465717 1 | 03/17/199 5 | 2039409 | 02/18/199 7 |
| 11. | DigitalGlobe, Inc. | ORBVIEW | 7515041 8 | 08/14/199 6 | 2091116 | 08/26/199 7 |
| 12. | DigitalGlobe, Inc. | PHOTOMAPPER | 7623567 5 | 03/30/200 1 | 2593257 | 07/09/200 2 |
| 13. | DigitalGlobe, Inc. | RoadTracker | 7844173 2 | 06/25/200 4 | 3482049 | 08/05/200 8 |
| 14. | DigitalGlobe, Inc. | SECONDS ON ORBIT | 7579894 3 | 09/13/199 9 | 2470721 | 07/17/200 1 |

| | Owner | Trademark | Serial No. | Filing Date | Reg. No. | Reg. Date |
|-----|-------------------------------------|---|--------------|----------------|----------|----------------|
| 15. | DigitalGlobe, Inc. | SECUREWATCH | 8718155 7 | 09/23/201 6 | 5465351 | 05/08/201 8 |
| 16. | DigitalGlobe, Inc. | SEE A BETTER WORLD | 8707582 5 | 06/17/201 6 | 5192964 | 04/25/201 7 |
| 17. | DigitalGlobe, Inc. | SEEING A BETTER WORLD | 8588034 0 | 03/19/201 3 | 4653569 | 12/09/201 4 |
| 18. | DigitalGlobe, Inc. | SOO | 7584560 2 | 11/10/199 9 | 2385734 | 09/12/200 0 |
| 19. | DigitalGlobe, Inc. | SPACENET | 8723283 7 | 11/10/201 6 | 5586842 | 10/16/201 8 |
| 20. | DigitalGlobe, Inc. | WORLDVIEW | 8644021 6 | 10/30/201 4 | 4816466 | 09/22/201 5 |
| 21. | DigitalGlobe, Inc. | WORLDVIEW | 8644026 6 | 10/30/201 4 | 4816469 | 09/22/201 5 |
| 22. | DigitalGlobe, Inc. | WORLDVIEW | 8644030 2 | 10/30/201 4 | 4816472 | 09/22/201 5 |
| 23. | DigitalGlobe, Inc. | WORLDVIEW GLOBAL ALLIANCE | 8598224 1 | 04/01/201 0 | 4585810 | 08/12/201 4 |
| 24. | Radiant Geospatial Solutions LLC | CROPCAST | 8542934 5 | 09/22/201 1 | 4146215 | 05/22/201 2 |
| 25. | Radiant Geospatial Solutions LLC | EARTHSAT | 7806687 8 | 06/01/200 1 | 2615486 | 09/03/200 2 |
| 26. | Radiant Geospatial Solutions LLC | NATURALVUE | 8682133 6 | 11/16/201 5 | 5006792 | 07/26/201 6 |
| 27. | Radiant Geospatial Solutions LLC | OPTIVISTA | 8697623 7 | 03/11/201 4 | 4766062 | 06/30/201 5 |
| 28. | Radiant Geospatial Solutions LLC | PCM | 8648525 6 | 12/18/201 4 | 4917047 | 03/15/201 6 |
| 29. | Space Systems/Loral, LLC | SSL & Design  | 8584645 2 | 02/11/201 3 | 4973452 | 06/07/201 6 |
| 30. | Space Systems/Loral, LLC | SSL & Design  | 8584645 8 | 02/11/201 3 | 5027390 | 08/23/201 6 |

| | Owner | Trademark | Serial No. | Filing Date | Reg. No. | Reg. Date |
|-----|------------------------------|---|------------|-------------|----------|------------|
| 31. | Space Systems/Loral, LLC | SSL & Design  | 85846470 | 02/11/2013 | 4973453 | 06/07/2016 |
| 32. | MDA Geospatial Services Inc. | EARTHVIEW | 75/012,791 | 10/31/1995 | 2177128 | 7/28/1998 |
| 33. | Neptec Design Group Limited | TRIDAR | 87/863,499 | 4/4/2018 | | |

SCHEDULE C

EXISTING IP SECURITY AGREEMENTS

1. U.S. Patent and Trademark Security Agreement dated as of October 5, 2017 among DigitalGlobe Inc., Maxar Technologies ULC (by its predecessor, MacDonald, Dettwiler and Associates Ltd.), MacDonald Dettwiler and Associates Corporation, MacDonald Dettwiler and Associates Inc., MDA Geospatial Services Inc., Space Systems/Loral, LLC and Radiant Geospatial Solutions LLC, as grantors in favor of Royal Bank of Canada, as Collateral Agent.
2. U.S. Patent and Trademark Security Agreement dated as of October 18, 2019 between Neptec Design Group Ltd., as grantor in favor of Royal Bank of Canada, as Collateral Agent.