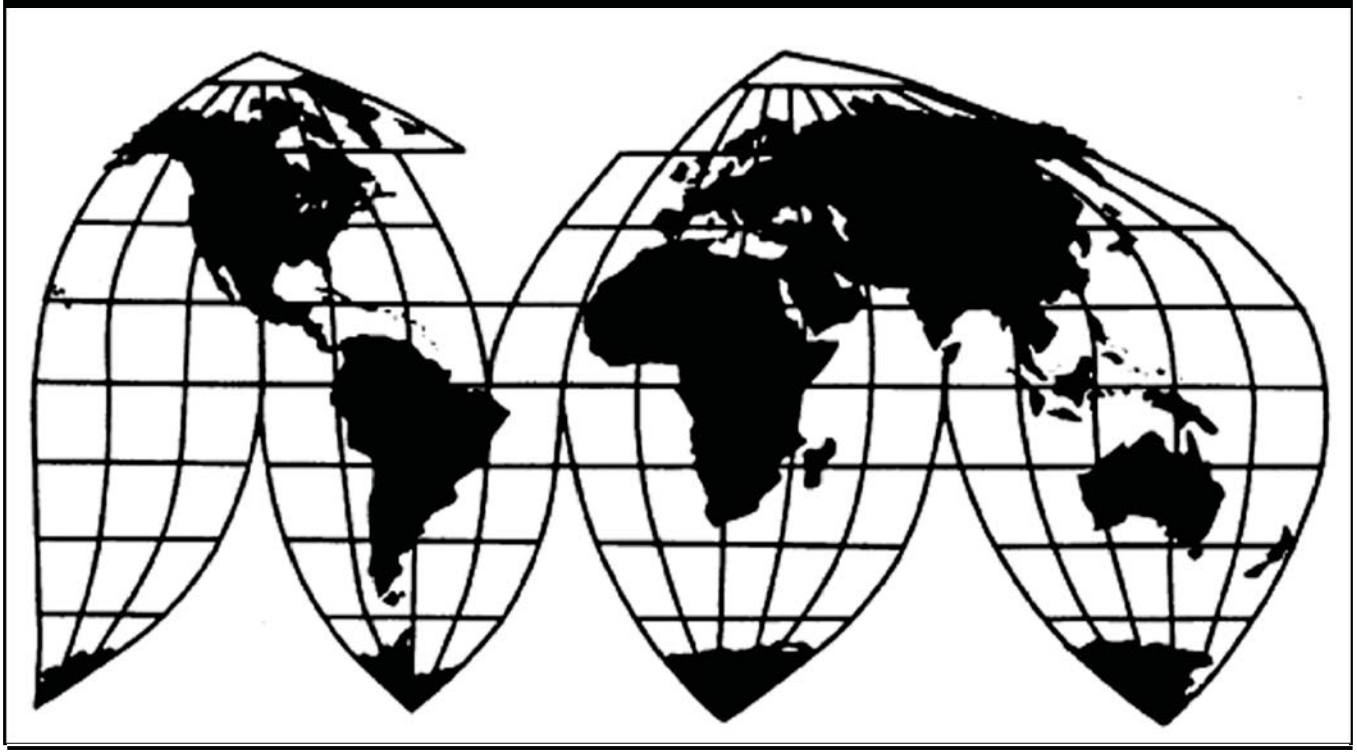
In the Matter of

Certain GPS Devices and Products Containing Same

Investigation No. 337-TA-602

Publication 4137 **March 2010**

U.S. International Trade Commission



Washington, DC 20436

U.S. International Trade Commission

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UNITED STATES INTERNATIONAL TRADE COMMISSION
Washington, D.C. 20436

In the Matter of CERTAIN GPS DEVICES AND PRODUCTS CONTAINING SAME	Investigation No. 337-TA-602

NOTICE OF COMMISSION FINAL DETERMINATION OF VIOLATION OF SECTION 337; TERMINATION OF INVESTIGATION; ISSUANCE OF LIMITED EXCLUSION ORDER AND CEASE AND DESIST ORDERS

AGENCY: U.S. International Trade Commission.

ACTION: Notice.

SUMMARY: Notice is hereby given that the U.S. International Trade Commission has determined that there is a violation of 19 U.S.C. § 1337 by SiRF Technology, Inc. of San Jose, California ("SiRF"); Pharos Science & Applications, Inc. of Torrance, California ("Pharos"); MiTAC International Corp. of Taiwan ("MiTAC"); Mio Technology Ltd., USA of Freemont, California ("Mio"); and E-TEN Information Systems Co., Ltd. of Taiwan ("E-TEN") (collectively, "Respondents") in the above-captioned investigation. The investigation is terminated.

FOR FURTHER INFORMATION CONTACT: Daniel E. Valencia, Office of the General Counsel, U.S. International Trade Commission, 500 E Street, S.W., Washington, D.C. 20436, telephone (202) 205-1999. Copies of non-confidential documents filed in connection with this investigation are or will be available for inspection during official business hours (8:45 a.m. to 5:15 p.m.) in the Office of the Secretary, U.S. International Trade Commission, 500 E Street, S.W., Washington, D.C. 20436, telephone (202) 205-2000. General information concerning the Commission may also be obtained by accessing its Internet server at *http://www.usitc.gov*. The public record for this investigation may be viewed on the Commission's electronic docket (EDIS) at *http://edis.usitc.gov*. Hearing-impaired persons are advised that information on this matter can be obtained by contacting the Commission's TDD terminal on (202) 205-1810.

SUPPLEMENTARY INFORMATION: The Commission instituted this investigation on May 7, 2007, based on a complaint filed by Global Locate, Inc. of San Jose, California ("Global Locate"). 72 *Fed. Reg.* 25777 (May 7, 2007). The complaint alleged violations of section 337 of the Tariff Act of 1930 (19 U.S.C. § 1337) in the importation into the United States, the sale for importation, and the sale within the United States after importation of certain GPS (Global Positioning System) devices and products containing the same by reason of infringement of various claims of United States Patent Nos. 6,417,801 ("the '801 patent"); 6,606,346 ("the '346 patent"); 6,651,000 ("the '000 patent"); 6,704,651 ("the '651 patent"); 6,937,187 ("the '187

patent"); and 7,158,080 ("the '080 patent"). The complaint named SiRF, Pharos, MiTAC, Mio, and E-TEN as respondents. The notice of investigation was subsequently amended to add Broadcom Corporation ("Broadcom") of Irvine, California as a complainant when Broadcom acquired Global Locate (collectively, "Complainants").

On August 8, 2008, the ALJ issued his final ID finding a violation of section 337 in the importation and the sale after importation of certain GPS devices and products containing the same, in connection with the asserted claims of each of the six patents at issue. Respondents and the Commission investigative attorney (IA) each filed petitions for review on August 25, 2008. On September 5, 2008, Complainants and the IA each filed responses to the petitions for review.

On October 9, 2008, the Commission determined to review the ALJ's final ID in part and requested briefing on the issues under review, remedy, the public interest, and bonding. The Commission determined to review: (1) the ID's finding that Global Locate has standing to assert the '346 patent; (2) the ID's finding that SiRF directly infringes claim 1 of the '651 patent through its commercial activities; and (3) the ID's finding that SiRF directly infringes claim 1 of the '000 patent through its commercial activities. On October 27, 2008, the parties filed written submissions on the issues under review, and on November 3, 2008, the parties filed response submissions.

On October 21, 2008, the Commission extended the deadline for receiving written submissions on remedy, the public interest, and bonding until November 13, 2008, in light of the Federal Circuit's recent decision in *Kyocera Wireless Corp. v. ITC*, 545 F.3d 1340 (Fed. Cir. 2008). On November 13, 2008, the parties to the investigation along with non-party Garmin International, Inc. each filed written submissions on remedy, the public interest, and bonding. On November 14, 2008, Nokia Corporation and Nokia Inc. (collectively "Nokia"), also non-parties, filed a motion for leave to file written submissions on remedy, the public interest, and bonding one day late with the submission attached. No party opposed this motion. The Commission has determined to grant Nokia's motion. On November 24, 2008, the parties filed reply submissions on remedy, the public interest, and bonding.

On November 18, 2008, Respondents filed a petition for reconsideration of the Commission's determination not to review the ALJ's finding that claim 1 of the '187 patent and claims 1, 2, and 11 of the '801 patent recite patent-eligible subject matter under 35 U.S.C. §101 in light of the Federal Circuit's *en banc* decision in *In re Bilski*, 545 F.3d 943 (Fed. Cir. 2008). On November 25, 2008, Complainants and the IA each filed responses in opposition to Respondents' petition for reconsideration. Having reviewed the petition for reconsideration and the responses, the Commission has determined to deny the petition for reconsideration.

Having examined the record of this investigation, including the ALJ's final ID, the Commission has determined to modify the following findings in the ID: (i) Global Locate has standing to assert the '346 patent, (ii) SiRF directly infringes the '000 patent through its commercial activities, and (iii) SiRF directly infringes the '651 patent through its commercial activities. These modifications merely clarify the ALJ's findings.

The Commission has determined that the appropriate form of relief is (i) a limited exclusion order prohibiting the unlicensed entry of GPS chips and products incorporating these chips that infringe one or more of claims 4 and 11 of the '346 patent, claims 1, 2, and 22 of the '080 patent, claims 1, 2, and 11 of the '801 patent, claims 1 and 9 of the '187 patent, claims 1 and 2 of the '651 patent, and claims 1, 2, and 5 of the '000 patent and are manufactured abroad by or on behalf of, or imported by or on behalf of, SiRF, E-TEN, Pharos, MiTAC and Mio; and (ii) cease and desist orders against domestic respondents SiRF, Mio, and Pharos.

The Commission further determined that the public interest factors enumerated in section 337(d) and (f)(19 U.S.C. § 1337(d), (f)) do not preclude issuance of the limited exclusion order and the cease and desist orders. Finally, the Commission determined the amount of bond to permit temporary importation during the Presidential review period (19 U.S.C. § 1337(j)) shall be in the amount of one hundred (100) percent of the entered value of the articles that are subject to the order. The Commission's order was delivered to the President and the United States Trade Representative on the day of its issuance.

The authority for the Commission's determination is contained in section 337 of the Tariff Act of 1930, as amended (19 U.S.C. § 1337), and in sections 210.42-50 of the Commission's Rules of Practice and Procedure (19 C.F.R. §§ 210.42-50).

By order of the Commission.

Marilyn R. Abbott
Secretary to the Commission

Issued: January 15, 2009

UNITED STATES INTERNATIONAL TRADE COMMISSION
Washington, D.C. 20436

In the Matter of **CERTAIN GPS DEVICES AND PRODUCTS CONTAINING SAME**	**Inv. No. 337-TA-602**

LIMITED EXCLUSION ORDER

The Commission has determined that there is a violation of section 337 of the Tariff Act of 1930 (19 U.S.C. § 1337) in the unlawful importation, sale for importation, and sale after importation by SiRF Technology, Inc. ("SiRF"); Pharos Science & Applications, Inc. ("Pharos"); MiTAC International Corp. ("MiTAC"); Mio Technology Ltd., USA ("Mio"); and E-TEN Information Systems Co., Ltd. ("E-TEN") of GPS (Global Positioning System) devices and products containing the same that infringe claims 1, 2, and 11 of U.S. Patent No. 6,417,801 ("the '801 patent"); claims 4 and 11 of U.S. Patent No. 6,606,346 ("the '346 patent"); claims 1 and 9 of U.S. Patent No. 6,937,187 ("the '187 patent"); claims 1, 2, and 22 of U.S. Patent No. 7,158,080 ("the '080 patent"); claims 1, 2, and 5 of U.S. Patent No. 6,651,000 ("the '000 patent"); and claims 1 and 2 of U.S. Patent No. 6,704,651 ("the '651 patent").

Having reviewed the record in this investigation, including the written submissions of the parties, the Commission has made its determination on the issues of remedy, the public interest, and bonding. The Commission has determined that the appropriate form of relief is a limited exclusion order prohibiting the unlicensed entry of GPS devices and products containing the same that infringe the '080, '187, '801, '346, '651, and '000 patents and are manufactured abroad by or on behalf of, or imported by or on behalf of, SiRF, Pharos, MiTAC, Mio, and E-TEN. The Commission has also determined that the appropriate form of relief includes cease and desist orders against SiRF, Pharos, and Mio.

The Commission has further determined that the public interest factors enumerated in 19 U.S.C. § 1337(d) do not preclude issuance of the limited exclusion order or cease and desist orders and that the bond during the Presidential review period shall be in the amount of 100% of the entered value of GPS devices and products containing the same that are subject to this Order.

Accordingly, the Commission hereby **ORDERS** that:

1. GPS devices and products containing the same that are covered by one or more of claims 1, 2, and 11 of the '801 patent, claims 4 and 11 of the '346 patent, claims 1 and 9 of the '187 patent, claims 1, 2, and 22 of the '080 patent, claims 1 and 2 of the '651 patent, and claims 1, 2, and 5 of the '000 patent and that are manufactured abroad by or on behalf of, or imported by or on behalf of, SiRF, Pharos, MiTAC, Mio, and E-TEN or any of their affiliated companies, parents, subsidiaries, or other related business entities, or their successors or assigns, are excluded from entry for consumption into the United States, entry for consumption from a foreign-trade zone, or withdrawal from a warehouse for consumption, for the remaining term of the patents except under license of the patent owner as provided by law.

2. Products that are excluded by paragraph 1 of this Order are entitled to entry for consumption into the United States, entry for consumption from a foreign-trade zone, or withdrawal from a warehouse for consumption, under bond in the amount of 100% of entered value pursuant to subsection (j) of section 337 of the Tariff Act of 1930, as amended, 19 U.S.C. § 1337(j), and the Presidential Memorandum for the United States Trade Representative of July 21, 2005 (70 *Fed. Reg.* 43251), from the day after this Order is received by the United States Trade Representative until such time as she notifies the Commission that this action is approved or disapproved but, in any event, not later than 60 days after the date of receipt of this action.

3. At the discretion of U.S. Customs and Border Protection ("CBP") and pursuant to procedures it establishes, persons seeking to import GPS devices and products containing the same that are potentially subject to this Order may be required to certify that they are familiar with the terms of this Order, that they have made appropriate inquiry, and thereupon state that, to the best of their knowledge and belief, the products being imported are not excluded from entry under paragraph 1 of this Order. At its discretion, CBP may require persons who have provided the certification described in this paragraph to furnish such records or analyses as are necessary to substantiate the certification.

4. In accordance with 19 U.S.C. § 1337(l), the provisions of this Order shall not apply to GPS devices and products containing the same that are imported by and for the use of the United States, or imported for, and to be used for, the United States with the authorization or consent of the Government.

5. The Commission may modify this Order in accordance with the procedures described in Rule 210.76 of the Commission's Rules of Practice and Procedure, 19 C.F.R. § 210.76.

6. The Secretary shall serve copies of this Order upon each party of record in this investigation and upon the Department of Health and Human Services, the Department of Justice, the Federal Trade Commission, and CBP.

7. Notice of this Order shall be published in the *Federal Register*.

By Order of the Commission

Marilyn R. Abbott
Secretary to the Commission

Issued: January 15, 2009

UNITED STATES INTERNATIONAL TRADE COMMISSION
Washington, D.C. 20436

In the Matter of CERTAIN GPS DEVICES AND PRODUCTS CONTAINING THE SAME	Inv. No. 337-TA-602

ORDER TO CEASE AND DESIST

IT IS HEREBY ORDERED THAT SiRF Technology, Inc., 217 Devcon Drive, San Jose, California 95112 ("SiRF"), cease and desist from conducting any of the following activities in the United States: importing, testing, selling, marketing, advertising, distributing, offering for sale, transferring (except for exportation), and soliciting U.S. agents or distributors for, GPS (Global Positioning System) devices and products containing the same that infringe one or more of claims 1, 2, and 11 of U.S. Patent No. 6,417,801 ("the '801 patent"); claims 4 and 11 of U.S. Patent No. 6,606,346 ("the '346 patent"); claims 1 and 9 of U.S. Patent No. 6,937,187 ("the '187 patent"); claims 1, 2, and 22 of U.S. Patent No. 7,158,080 ("the '080 patent"); claims 1 and 2 of U.S. Patent No. 6,704,651 ("the '651 patent"); and claims 1, 2, and 5 of U.S. Patent No. 6,651,000 ("the '000 patent"), in violation of section 337 of the Tariff Act of 1930, as amended, 19 U.S.C. § 1337.

I.

Definitions

As used in this Order:

(A) "Commission" shall mean the United States International Trade Commission.

(B) "Complainants" shall mean Global Locate, Inc., 3190 South Bascom Avenue, San Jose, California 95124 and Broadcom Corporation, 5300 California Avenue, Irvine, California 92617.

(C) "Respondent" means SiRF Technology, Inc., 217 Devcon Drive, San Jose, California 95112.

(D) "Person" shall mean an individual, or any non-governmental partnership, firm, association, corporation, or other legal or business entity other than Respondent or its majority owned or controlled subsidiaries, successors, or assigns.

(E) "United States" shall mean the fifty States, the District of Columbia, and Puerto Rico.

(F) The terms "import" and "importation" refer to importation for entry for consumption under the Customs laws of the United States.

(G) The term "covered products" shall mean GPS (Global Positioning System) devices and products containing the same that infringe one or more of claims 1, 2, and 11 of the '801 patent; claims 4 and 11 of the '346 patent; claims 1 and 9 of the '187 patent; claims 1, 2, and 22 of the '080 patent; claims 1 and 2 of the '651 patent; and claims 1, 2, and 5 of the '000 patent.

II.

Applicability

The provisions of this Cease and Desist Order shall apply to Respondent and to any of its principals, stockholders, officers, directors, employees, agents, licensees, distributors, controlled (whether by stock ownership or otherwise) and majority-owned business entities, successors, and assigns, and to each of them, insofar as they are engaging in conduct prohibited by Section III, infra, for, with or otherwise on behalf of Respondent.

III.

Conduct Prohibited

The following conduct of Respondent in the United States is prohibited by the Order. For

the remaining term of the respective patents, Respondent shall not:

(A) import or sell for importation into the United States covered products;

(B) market, test, distribute, offer for sale, sell, or otherwise transfer (except for exportation), in the United States imported covered products;

(C) advertise imported covered products in the United States;

(D) solicit U.S. agents or distributors for imported covered products; and

(E) aid or abet other entities in the importation, sale for importation, sale after importation, transfer, or distribution of covered products.

IV.

Conduct Permitted

Notwithstanding any other provision of this Order, specific conduct otherwise prohibited by the terms of this Order shall be permitted if, in a written instrument, the owner of U.S. Patent Nos. 6,417,801; 6,606,346; 6,651,000; 6,704,651; 6,937,187; and 7,158,080 licenses or authorizes such specific conduct, or such specific conduct, or such specific conduct is related to the importation or sale of covered products by or for the United States.

V.

Reporting

For purposes of this reporting requirement, the reporting periods shall commence on July 1 of each year and shall end on the subsequent June 30. However, the first report required under this section shall cover the period from the date of issuance of this Order through June 30, 2009. This reporting requirement shall continue in force until such time as Respondent will have truthfully reported, in two consecutive timely filed reports, that it has no inventory of covered

products in the United States.

Within thirty (30) days of the last day of the reporting period, Respondent shall report to the Commission the quantity in units and the value in dollars of covered products that Respondent have imported or sold in the United States after importation during the reporting period and the quantity in units and value in dollars of reported covered products that remain in inventory in the United States at the end of the reporting period.

VI.

Record-keeping and Inspection

(A) For the purpose of securing compliance with this Order, Respondent shall retain any and all records relating to the exportation to and importation into the United States and the sale, offer for sale, marketing, or distribution in the United States of covered products, made and received in the usual and ordinary course of business, whether in detail or in summary form, for a period of three (3) years from the close of the fiscal year to which they pertain.

(B) For the purpose of determining or securing compliance with the Order and for no other purpose, and subject to any privilege recognized by the federal courts of the United States, duly authorized representatives of the Commission, upon reasonable written notice by the Commission or its staff, shall be permitted access and the right to inspect and copy in Respondent's principal offices during office hours, and in the presence of counsel or other representatives if Respondent so choose, all books, ledgers, accounts, correspondence, memoranda, and other records and documents, both in detail and in summary form as are required to be retained by subparagraph VI(A) of this Order.

Any failure to make the required report or the filing of any false or inaccurate report shall

constitute a violation of this Order, and the submission of a false or inaccurate report may be referred to the U.S. Department of Justice as a possible criminal violation of 18 U.S.C. §1001.

VII.

Service of Cease and Desist Order

Respondent is ordered to and directed to:

(A) Serve, within fifteen (15) days after the effective date of this Order, a copy of this Order upon each of their respective officers, directors, managing agents, agents, and employees who have any responsibility for the importation, marketing, distribution, or sale of imported covered products in the United States;

(B) Serve, within (15) days after the succession of any persons referred to in subparagraph VII(A) of this Order, a copy of the Order upon each successor; and

(C) Maintain such records as will show the name, title, and address of each person upon whom the Order has been served, as described in subparagraphs VII(A) and VII(B) of this Order, together with the date on which service was made.

The obligations set forth in subparagraphs VII(B) and VII(C) shall remain in effect until the date of expiration of U.S. Patent Nos. 6,417,801; 6,606,346; 6,651,000; 6,704,651; 6,937,187; and 7,158,080.

VIII.

Confidentiality

Any request for confidential treatment of information obtained by the Commission pursuant to Sections V and VI of this Order should be in accordance with Commission Rule 201.6, 19 C.F.R. § 201.6. For all reports for which confidential treatment is sought, Respondent

must provide a public version of such report with confidential information redacted.

IX.

Enforcement

Violation of this Order may result in any of the actions specified in section 210.75 of the Commission's Rules of Practice and Procedure, 19 C.F.R. § 210.75, including an action for civil penalties in accordance with section 337(f) of the Tariff Act of 1930, 19 U.S.C. § 1337(f), and any other action as the Commission may deem appropriate. In determining whether Respondent is in violation of this Order, the Commission may infer facts adverse to Respondent if Respondent fails to provide adequate or timely information.

X.

Modification

The Commission may amend this Order on its own motion or in accordance with the procedure described in section 210.76 of the Commission's Rules of Practice and Procedure, 19 C.F.R. § 210.76.

XI.

Bonding

The conduct prohibited by Section III of this Order may be continued during the sixty (60) days period in which this Order is under review by the United States Trade Representative as delegated by the President, 70 *Fed Reg* 43251 (July 21, 2005), subject to Respondent posting a bond of in the amount of 100% of the imported value per unit for covered products. This bond provision does not apply to conduct that is otherwise permitted by Section IV of this Order. Covered products imported on or after the date of issuance of this Order are subject to the entry

bond as set forth in the limited exclusion order issued by the Commission, and are not subject to this bond provision.

The bond is to be posted in accordance with the procedures established by the Commission for the posting of bonds by complainants in connection with the issuance of temporary exclusion orders. *See* Commission Rule 210.68, 19 C.F.R. § 210.68. The bond and any accompanying documentation is to be provided to and approved by the Commission prior to the commencement of conduct which is otherwise prohibited by Section III of this Order.

The bond is to be forfeited in the event that the United States Trade Representative approves, or does not approve within the review period, this Order, unless the U.S. Court of Appeals for the Federal Circuit, in a final judgment, reverses any Commission final determination and order as to Respondent on appeal, or unless Respondent exports the products subject to this bond or destroys them and provides certification to that effect satisfactory to the Commission.

The bond is to be released in the event the United States Trade Representative disapproves this Order and no subsequent order is issued by the Commission and approved, or not disapproved, by the United States Trade Representative, upon service on Respondent of an order issued by the Commission based upon application therefore made by Respondent to the Commission.

By Order of the Commission.

Marilyn R. Abbott
Secretary to the Commission

Issued: January 15, 2009

UNITED STATES INTERNATIONAL TRADE COMMISSION
Washington, D.C. 20436

In the Matter of **CERTAIN GPS DEVICES AND PRODUCTS CONTAINING THE SAME**	**Inv. No. 337-TA-602**

ORDER TO CEASE AND DESIST

IT IS HEREBY ORDERED THAT Mio Technology Limited, USA, 47988 Fremont Boulevard, Fremont, California 94538, cease and desist from conducting any of the following activities in the United States: importing, selling, marketing, advertising, distributing, offering for sale, transferring (except for exportation), and soliciting U.S. agents or distributors for, GPS (Global Positioning System) devices and products containing the same that infringe one or more of claims 1, 2, and 11 of U.S. Patent No. 6,417,801 ("the '801 patent"); claims 4 and 11 of U.S. Patent No. 6,606,346 ("the '346 patent"); claims 1 and 9 of U.S. Patent No. 6,937,187 ("the '187 patent"); and claims 1, 2, and 22 of U.S. Patent No. 7,158,080 ("the '080 patent"); claims 1 and 2 of U.S. Patent No. 6,704,651 ("the '651 patent"); and claims 1, 2, and 5 of U.S. Patent No. 6,651,000 ("the '000 patent"), in violation of section 337 of the Tariff Act of 1930, as amended, 19 U.S.C. § 1337.

I.

Definitions

As used in this Order:

(A) "Commission" shall mean the United States International Trade Commission.

(B) "Complainants" shall mean Global Locate, Inc., 3190 South Bascom Avenue, San Jose, California 95124 and Broadcom Corporation, 5300 California Avenue, Irvine, California 92617.

(C) "Respondent" means Mio Technology Limited, USA, 47988 Fremont Boulevard, Fremont, California 94538.

(D) "Person" shall mean an individual, or any non-governmental partnership, firm, association, corporation, or other legal or business entity other than Respondent or its majority owned or controlled subsidiaries, successors, or assigns.

(E) "United States" shall mean the fifty States, the District of Columbia, and Puerto Rico.

(F) The terms "import" and "importation" refer to importation for entry for consumption under the Customs laws of the United States.

(G) The term "covered products" shall mean GPS (Global Positioning System) devices and products containing the same that infringe one or more of claims 1, 2, and 11 of the '801 patent, claims 4 and 11 of the '346 patent, claims 1 and 9 of the '187 patent, and claims 1, 2, and 22 of the '080 patent; claims 1 and 2 of the '651 patent; and claims 1, 2, and 5 of the '000 patent.

II.

Applicability

The provisions of this Cease and Desist Order shall apply to Respondent and to any of its principals, stockholders, officers, directors, employees, agents, licensees, distributors, controlled (whether by stock ownership or otherwise) and majority-owned business entities, successors, and assigns, and to each of them, insofar as they are engaging in conduct prohibited by Section III, infra, for, with or otherwise on behalf of Respondent.

III.

Conduct Prohibited

The following conduct of Respondent in the United States is prohibited by the Order. For

the remaining term of the respective patents, Respondent shall not:

(A) import or sell for importation into the United States covered products;

(B) market, distribute, offer for sale, sell, or otherwise transfer (except for exportation), in the United States imported covered products;

(C) advertise imported covered products in the United States;

(D) solicit U.S. agents or distributors for imported covered products; or

(E) aid or abet other entities in the importation, sale for importation, sale after importation, transfer, or distribution of covered products.

IV.

Conduct Permitted

Notwithstanding any other provision of this Order, specific conduct otherwise prohibited by the terms of this Order shall be permitted if, in a written instrument, the owner of U.S. Patent Nos. 6,417,801; 6,606,346; 6,937,187; and 7,158,080 licenses or authorizes such specific conduct, or such specific conduct, or such specific conduct is related to the importation or sale of covered products by or for the United States.

V.

Reporting

For purposes of this reporting requirement, the reporting periods shall commence on July 1 of each year and shall end on the subsequent June 30. However, the first report required under this section shall cover the period from the date of issuance of this Order through June 30, 2009. This reporting requirement shall continue in force until such time as Respondent will have truthfully reported, in two consecutive timely filed reports, that it has no inventory of covered

products in the United States.

Within thirty (30) days of the last day of the reporting period, Respondent shall report to the Commission the quantity in units and the value in dollars of covered products that Respondent have imported or sold in the United States after importation during the reporting period and the quantity in units and value in dollars of reported covered products that remain in inventory in the United States at the end of the reporting period.

VI.

Record-keeping and Inspection

(A) For the purpose of securing compliance with this Order, Respondent shall retain any and all records relating to the exportation to and importation into the United States the sale, offer for sale, marketing, or distribution in the United States of covered products, made and received in the usual and ordinary course of business, whether in detail or in summary form, for a period of three (3) years from the close of the fiscal year to which they pertain.

(B) For the purpose of determining or securing compliance with the Order and for no other purpose, and subject to any privilege recognized by the federal courts of the United States, duly authorized representatives of the Commission, upon reasonable written notice by the Commission or its staff, shall be permitted access and the right to inspect and copy in Respondent's principal offices during office hours, and in the presence of counsel or other representatives if Respondent so choose, all books, ledgers, accounts, correspondence, memoranda, and other records and documents, both in detail and in summary form as are required to be retained by subparagraph VI(A) of this Order.

Any failure to make the required report or the filing of any false or inaccurate report shall

constitute a violation of this Order, and the submission of a false or inaccurate report may be referred to the U.S. Department of Justice as a possible criminal violation of 18 U.S.C. §1001.

VII.

Service of Cease and Desist Order

Respondent is ordered to and directed to:

(A) Serve, within fifteen (15) days after the effective date of this Order, a copy of this Order upon each of their respective officers, directors, managing agents, agents, and employees who have any responsibility for the importation, marketing, distribution, or sale of imported covered products in the United States;

(B) Serve, within (15) days after the succession of any persons referred to in subparagraph VII(A) of this Order, a copy of the Order upon each successor; and

(C) Maintain such records as will show the name, title, and address of each person upon whom the Order has been served, as described in subparagraphs VII(A) and VII(B) of this Order, together with the date on which service was made.

The obligations set forth in subparagraphs VII(B) and VII(C) shall remain in effect until the date of expiration of U.S. Patent Nos. 6,417,801; 6,606,346; 6,937,187; and 7,158,080.

VIII.

Confidentiality

Any request for confidential treatment of information obtained by the Commission pursuant to Sections V and VI of this Order should be in accordance with Commission Rule 201.6, 19 C.F.R. § 201.6. For all reports for which confidential treatment is sought, Respondent must provide a public version of such report with confidential information redacted.

IX.

Enforcement

Violation of this Order may result in any of the actions specified in section 210.75 of the Commission's Rules of Practice and Procedure, 19 C.F.R. § 210.75, including an action for civil penalties in accordance with section 337(f) of the Tariff Act of 1930, 19 U.S.C. § 1337(f), and any other action as the Commission may deem appropriate. In determining whether Respondent is in violation of this Order, the Commission may infer facts adverse to Respondent if Respondent fails to provide adequate or timely information.

X.

Modification

The Commission may amend this Order on its own motion or in accordance with the procedure described in section 210.76 of the Commission's Rules of Practice and Procedure, 19 C.F.R. § 210.76.

XI.

Bonding

The conduct prohibited by Section III of this Order may be continued during the sixty (60) days period in which this Order is under review by the United States Trade Representative as delegated by the President, 70 *Fed Reg* 43251 (July 21, 2005), subject to Respondent posting a bond of in the amount of 100% of the imported value per unit for covered products. This bond provision does not apply to conduct that is otherwise permitted by Section IV of this Order. Covered products imported on or after the date of issuance of this Order are subject to the entry bond as set forth in the limited exclusion order issued by the Commission, and are not subject to

this bond provision.

The bond is to be posted in accordance with the procedures established by the Commission for the posting of bonds by complainants in connection with the issuance of temporary exclusion orders. *See* Commission Rule 210.68, 19 C.F.R. § 210.68. The bond and any accompanying documentation is to be provided to and approved by the Commission prior to the commencement of conduct which is otherwise prohibited by Section III of this Order.

The bond is to be forfeited in the event that the United States Trade Representative approves, or does not approve within the review period, this Order, unless the U.S. Court of Appeals for the Federal Circuit, in a final judgment, reverses any Commission final determination and order as to Respondent on appeal, or unless Respondent exports the products subject to this bond or destroys them and provides certification to that effect satisfactory to the Commission.

The bond is to be released in the event the United States Trade Representative disapproves this Order and no subsequent order is issued by the Commission and approved, or not disapproved, by the United States Trade Representative, upon service on Respondent of an order issued by the Commission based upon application therefore made by Respondent to the Commission.

By Order of the Commission.

Marilyn R. Abbott
Secretary to the Commission

Issued: January 15, 2009

UNITED STATES INTERNATIONAL TRADE COMMISSION
Washington, D.C. 20436

In the Matter of CERTAIN GPS DEVICES AND PRODUCTS CONTAINING THE SAME	Inv. No. 337-TA-602

ORDER TO CEASE AND DESIST

IT IS HEREBY ORDERED THAT Pharos Science & Applications, Inc., 411 Amapola Avenue, Torrance, California 90501-1478, cease and desist from conducting any of the following activities in the United States: importing, selling, marketing, advertising, distributing, offering for sale, transferring (except for exportation), and soliciting U.S. agents or distributors for, GPS (Global Positioning System) devices and products containing the same that infringe one or more of claims 1, 2, and 11 of U.S. Patent No. 6,417,801 ("the '801 patent"); claims 4 and 11 of U.S. Patent No. 6,606,346 ("the '346 patent"); claims 1 and 9 of U.S. Patent No. 6,937,187 ("the '187 patent"); and claims 1, 2, and 22 of U.S. Patent No. 7,158,080 ("the '080 patent"; claims 1 and 2 of U.S. Patent No. 6,704,651 ("the '651 patent"); and claims 1, 2, and 5 of U.S. Patent No. 6,651,000 ("the '000 patent"), in violation of section 337 of the Tariff Act of 1930, as amended, 19 U.S.C. § 1337.

I.

Definitions

As used in this Order:

(A) "Commission" shall mean the United States International Trade Commission.

(B) "Complainants" shall mean Global Locate, Inc., 3190 South Bascom Avenue, San Jose, California 95124 and Broadcom Corporation, 5300 California Avenue, Irvine, California 92617.

(C) "Respondent" means Pharos Science & Applications, Inc., 411 Amapola Avenue, Torrance, California 90501-1478.

(D) "Person" shall mean an individual, or any non-governmental partnership, firm, association, corporation, or other legal or business entity other than Respondent or its majority owned or controlled subsidiaries, successors, or assigns.

(E) "United States" shall mean the fifty States, the District of Columbia, and Puerto Rico.

(F) The terms "import" and "importation" refer to importation for entry for consumption under the Customs laws of the United States.

(G) The term "covered products" shall mean GPS (Global Positioning System) devices and products containing the same that infringe one or more of claims 1, 2, and 11 of the '801 patent, claims 4 and 11 of the '346 patent, claims 1 and 9 of the '187 patent, and claims 1, 2, and 22 of the '080 patent; claims 1 and 2 of the '651 patent; and claims 1, 2, and 5 of the '000 patent.

II.

Applicability

The provisions of this Cease and Desist Order shall apply to Respondent and to any of its principals, stockholders, officers, directors, employees, agents, licensees, distributors, controlled (whether by stock ownership or otherwise) and majority-owned business entities, successors, and assigns, and to each of them, insofar as they are engaging in conduct prohibited by Section III, infra, for, with or otherwise on behalf of Respondent.

III.

Conduct Prohibited

The following conduct of Respondent in the United States is prohibited by the Order. For

the remaining term of the respective patents, Respondent shall not:

(A) import or sell for importation into the United States covered products;

(B) market, distribute, offer for sale, sell, or otherwise transfer (except for exportation), in the United States imported covered products;

(C) advertise imported covered products in the United States;

(D) solicit U.S. agents or distributors for imported covered products; or

(E) aid or abet other entities in the importation, sale for importation, sale after importation, transfer, or distribution of covered products.

IV.

Conduct Permitted

Notwithstanding any other provision of this Order, specific conduct otherwise prohibited by the terms of this Order shall be permitted if, in a written instrument, the owner of U.S. Patent Nos. 6,417,801; 6,606,346; 6,937,187; and 7,158,080 licenses or authorizes such specific conduct, or such specific conduct, or such specific conduct is related to the importation or sale of covered products by or for the United States.

V.

Reporting

For purposes of this reporting requirement, the reporting periods shall commence on July 1 of each year and shall end on the subsequent June 30. However, the first report required under this section shall cover the period from the date of issuance of this Order through June 30, 2009. This reporting requirement shall continue in force until such time as Respondent will have truthfully reported, in two consecutive timely filed reports, that it has no inventory of covered

products in the United States.

Within thirty (30) days of the last day of the reporting period, Respondent shall report to the Commission the quantity in units and the value in dollars of covered products that Respondent have imported or sold in the United States after importation during the reporting period and the quantity in units and value in dollars of reported covered products that remain in inventory in the United States at the end of the reporting period.

VI.

Record-keeping and Inspection

(A) For the purpose of securing compliance with this Order, Respondent shall retain any and all records relating to the exportation to and importation into the United States the sale, offer for sale, marketing, or distribution in the United States of covered products, made and received in the usual and ordinary course of business, whether in detail or in summary form, for a period of three (3) years from the close of the fiscal year to which they pertain.

(B) For the purpose of determining or securing compliance with the Order and for no other purpose, and subject to any privilege recognized by the federal courts of the United States, duly authorized representatives of the Commission, upon reasonable written notice by the Commission or its staff, shall be permitted access and the right to inspect and copy in Respondent's principal offices during office hours, and in the presence of counsel or other representatives if Respondent so choose, all books, ledgers, accounts, correspondence, memoranda, and other records and documents, both in detail and in summary form as are required to be retained by subparagraph VI(A) of this Order.

Any failure to make the required report or the filing of any false or inaccurate report shall

constitute a violation of this Order, and the submission of a false or inaccurate report may be referred to the U.S. Department of Justice as a possible criminal violation of 18 U.S.C. §1001.

VII.

Service of Cease and Desist Order

Respondent is ordered to and directed to:

(A) Serve, within fifteen (15) days after the effective date of this Order, a copy of this Order upon each of their respective officers, directors, managing agents, agents, and employees who have any responsibility for the importation, marketing, distribution, or sale of imported covered products in the United States;

(B) Serve, within (15) days after the succession of any persons referred to in subparagraph VII(A) of this Order, a copy of the Order upon each successor; and

(C) Maintain such records as will show the name, title, and address of each person upon whom the Order has been served, as described in subparagraphs VII(A) and VII(B) of this Order, together with the date on which service was made.

The obligations set forth in subparagraphs VII(B) and VII(C) shall remain in effect until the date of expiration of U.S. Patent Nos. 6,417,801; 6,606,346; 6,937,187; and 7,158,080.

VIII.

Confidentiality

Any request for confidential treatment of information obtained by the Commission pursuant to Sections V and VI of this Order should be in accordance with Commission Rule 201.6, 19 C.F.R. § 201.6. For all reports for which confidential treatment is sought, Respondent must provide a public version of such report with confidential information redacted.

IX.

Enforcement

Violation of this Order may result in any of the actions specified in section 210.75 of the Commission's Rules of Practice and Procedure, 19 C.F.R. § 210.75, including an action for civil penalties in accordance with section 337(f) of the Tariff Act of 1930, 19 U.S.C. § 1337(f), and any other action as the Commission may deem appropriate. In determining whether Respondent is in violation of this Order, the Commission may infer facts adverse to Respondent if Respondent fails to provide adequate or timely information.

X.

Modification

The Commission may amend this Order on its own motion or in accordance with the procedure described in section 210.76 of the Commission's Rules of Practice and Procedure, 19 C.F.R. § 210.76.

XI.

Bonding

The conduct prohibited by Section III of this Order may be continued during the sixty (60) days period in which this Order is under review by the United States Trade Representative as delegated by the President, 70 *Fed Reg* 43251 (July 21, 2005), subject to Respondent posting a bond of in the amount of 100% of the imported value per unit for covered products. This bond provision does not apply to conduct that is otherwise permitted by Section IV of this Order. Covered products imported on or after the date of issuance of this Order are subject to the entry bond as set forth in the limited exclusion order issued by the Commission, and are not subject to

this bond provision.

The bond is to be posted in accordance with the procedures established by the Commission for the posting of bonds by complainants in connection with the issuance of temporary exclusion orders. *See* Commission Rule 210.68, 19 C.F.R. § 210.68. The bond and any accompanying documentation is to be provided to and approved by the Commission prior to the commencement of conduct which is otherwise prohibited by Section III of this Order.

The bond is to be forfeited in the event that the United States Trade Representative approves, or does not approve within the review period, this Order, unless the U.S. Court of Appeals for the Federal Circuit, in a final judgment, reverses any Commission final determination and order as to Respondent on appeal, or unless Respondent exports the products subject to this bond or destroys them and provides certification to that effect satisfactory to the Commission.

The bond is to be released in the event the United States Trade Representative disapproves this Order and no subsequent order is issued by the Commission and approved, or not disapproved, by the United States Trade Representative, upon service on Respondent of an order issued by the Commission based upon application therefore made by Respondent to the Commission.

By Order of the Commission.

Marilyn R. Abbott
Secretary to the Commission

Issued: January 15, 2009

CERTAIN GPS DEVICES AND PRODUCTS CONTAINING SAME **337-TA-602**

CERTIFICATE OF SERVICE

I, Marilyn R. Abbott, hereby certify that the attached **NOTICE OF COMMISSION FINAL DETERMINATION OF VIOLATION OF SECTION 337; TERMINATION OF INVESTIGATION; ISSUANCE OF LIMITED EXCLUSION ORDER AND CEASE AND DESIST ORDERS** has been served by hand upon the Commission Investigative Attorney, Vu Q. Bui, Esq., and the following parties as indicated, on January 15, 2009.

Marilyn R. Abbott, Secretary
U.S. International Trade Commission
500 E Street, SW
Washington, DC 20436

ON BEHALF OF COMPLAINANT GLOBAL LOCATE, INC. AND BROADCOM CORPORATION:

Michael D. Esch, Esq.
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Washington, DC 20006
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( ) Via Overnight Mail
(✓) Via First Class Mail
( ) Other: _____

ON BEHALF OF RESPONDENTS SiRF TECHNOLOGY, INCORPORATED, MIO TECHNOLOGY LIMITED USA, MITAC INTERNATIONAL CORPORATION, PHAROS SCIENCE AND APPLICATIONS AND E-TEN CORPORATION:

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GOVERNMENT AGENCIES:

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PUBLIC VERSION

UNITED STATES INTERNATIONAL TRADE COMMISSION
Washington, D.C.

In the Matter of CERTAIN GPS DEVICES AND PRODUCTS CONTAINING SAME	Investigation No. 337-TA-602

COMMISSION OPINION

The Commission has found a violation of section 337 of the Tariff Act of 1930 (19 U.S.C. § 1337) by reason of infringement of U.S. Patent Nos. 6,417,801 ("the '801 patent"); 6,606,346 ("the '346 patent"); 6,651,000 ("the '000 patent"); 6,704,651 ("the '651 patent"); 6,937,187 ("the '187 patent"); and 7,158,080 ("the '080 patent") by SiRF Technology, Inc. ("SiRF"); E-TEN Corp. ("E-TEN"); Pharos Science & Applications, Inc. ("Pharos"); MiTAC International Corporation ("MiTAC"); and Mio Technology Limited ("Mio")(collectively, "Respondents"). The Commission has determined to modify the administrative law judge's ("ALJ") findings that Global Locate has standing to assert the '346 patent and that SiRF directly infringes the '651 and '000 patents through its commercial activities and to affirm his finding of violation. This opinion sets forth the Commission's reasoning and the appropriate remedy for addressing the violation section 337.

I. BACKGROUND

A. Procedural History

This investigation was instituted on May 7, 2007, based on a complaint filed by Global Locate. 72 *Fed. Reg.* 25777 (2007). The complaint alleged violations of section 337 in the importation into the United States, the sale for importation, or the sale within the United States after importation of certain global positioning system, or "GPS", devices and products containing the

same by reason of infringement of various claims of the '801, '346, '000, '651, '187, and '080 patents. The complaint named SiRF, E-TEN, Pharos, MiTAC, and Mio as respondents. The complaint and the notice of investigation were subsequently amended to add Broadcom Corporation as a complainant when it acquired Global Locate (collectively, "Complainants").

The ALJ held an evidentiary hearing from April 28, 2008, to May 13, 2008, and thereafter received post-hearing briefing from the parties. On August 8, 2008, the ALJ issued his final initial determination ("ID"), and on August 22, 2008, he issued his recommended determination on remedy and bonding ("RD"). In his ID, the ALJ found a violation of section 337 by reason of infringement of all six asserted patents. In addition, the ALJ found that none of the claims of the asserted patents were invalid or unenforceable, that the domestic industry requirement was met, and that Global Locate has standing to assert the '346 patent.

On August 25, 2008, Respondents and the Commission investigative attorney ("IA") each filed petitions for review of the ALJ's ID. On September 5, 2008, Complainants and the IA each filed a response to the petitions for review of the ID.

On October 9, 2008, the Commission determined to review the final ID in part and requested briefing on the issues under review, remedy, the public interest, and bonding. The Commission determined to review: (1) the finding that Global Locate has standing to assert the '346 patent; (2) the finding that SiRF directly infringes claim 1 of the '651 patent through its commercial activities; and (3) the finding that SiRF directly infringes claim 1 of the '000 patent through its commercial activities. In its notice of review, the Commission asked the parties to address the following questions:

1. Whether Global Locate has standing to assert the '346 patent in light of provision 2.1

in RX-286?

2. Does SiRF practice the element "processing satellite signals ..." of the method of claim 1 of the '651 patent vicariously through end users of the accused products? *See BMC Resources, Inc. v. Paymentech, L.P.*, 498 F.3d 1373 (Fed. Cir. 2007) and *Muniauction, Inc. v. Thomson Corp.*, 532 F.3d 1318 (Fed. Cir. 2008).

3. Does SiRF practice the third element ("at the remote receiver, representing said formatted data in a second format supported by the remote receiver") of the method of claim 1 of the '000 patent vicariously through end users of the accused products? *See BMC Resources, Inc. v. Paymentech, L.P.*, 498 F.3d 1373 (Fed. Cir. 2007) and *Muniauction, Inc. v. Thomson Corp.*, 532 F.3d 1318 (Fed. Cir. 2008).

On October 21, 2008, the Commission extended the deadline for written submissions on remedy, the public interest, and bonding in light of the Federal Circuit's recent decision in *Kyocera Wireless Corp. v. ITC*, 545 F.3d 1340 (Fed. Cir. 2008) and the fact that the public version of the ID and RD had not yet issued. On October 27, 2008, Complainants, Respondents, and the IA each filed written submissions regarding the issues on review. On November 3, 2008, each party filed reply submissions. On November 13, 2008, Complainants, Respondents, and the IA each filed written submissions addressing the issues of remedy, the public interest, and bonding. Also on November 13, 2008, Garmin International, Inc. ("Garmin"), an "interested party", filed a written submission on remedy, the public interest, and bonding.

On November 14, 2008, after the deadline for filing submissions had passed, Nokia Corporation and Nokia Inc. (collectively, "Nokia"), filed a motion for leave to file a written submission on remedy, the public interest, and bonding one day late with the submission attached. No party opposed Nokia's motion. The Commission has determined to grant Nokia's motion for good cause shown.

On November 24, 2008, Complainants, Respondents, and the IA filed reply submissions on

remedy, the public interest, and bonding.

On November 18, 2008, Respondents filed a petition for reconsideration of the Commission's determination not to review the ALJ's finding that claim 1 of the '187 patent and claims 1, 2, and 11 of the '801 patent recite patent-eligible subject matter under 35 U.S.C. §101 in light of the Federal Circuit's decision in *In re Bilski*, 545 F.3d 943 (Fed. Cir. 2008)*(en banc)*. On November 25, 2008, Complainants and the IA each filed an opposition opposing Respondents' petition for reconsideration.

B. Patents at Issue

This investigation pertains to GPS devices and products. Although six patents are asserted in the investigation, only the '346 patent, the '651 patent, and the '000 patent were the subject of the Commission's review. The '346 patent, entitled "Method and Apparatus for Computing Signal Correlation," issued on August 12, 2003, based on an application filed on May 18, 2001. The named inventors are Charles Abraham and Donald Fuchs. The '651 patent, entitled "Method and Apparatus for Locating Mobile Receivers Using a Wide Area Reference Network for Propagating Ephemeris," issued on March 9, 2004, based on an application filed on November 20, 2001. The named inventor is Frank van Diggelen. The '000 patent, entitled "Method and Apparatus for Generating and Distributing Satellite Tracking Information in a Compact Format," issued on November 18, 2003, based on an application filed on July 25, 2001. The named inventors are Frank van Diggelen, Charles Abraham, and James LaMance.

C. Products at Issue

The accused products include SiRF's GPS chips, namely SiRFstarIII and InstantGPS, and products incorporating the GPS chips such as portable navigation devices ("PNDs"), personal digital

assistants ("PDAs") and cell phones made by the other respondents. In some instances, the GPS chips and products incorporating them have been accused of infringement in conjunction with GPS services, such as SiRF InstantFix and SiRFLoc, which provide data regarding satellite location to remote GPS receivers.

II. VIOLATION OF SECTION 337

A. Standing to Assert the '346 Patent

A co-owner of a patent cannot pursue an infringement action by itself. Rather, all patent owners must be joined as parties. *See, e.g., Israel Bio-Eng'g Project v. Amgen, Inc.*, 475 F.3d 1256, 1264 (Fed. Cir. 2007). The reason for this rule "is to prevent the possibility of two suits on the same patent against a single infringer." *Vaupel Textilmaschinen KG v. Meccanica Euro Italia S.P.A.*, 944 F.2d 870, 875 (Fed. Cir. 1991). The standing requirements are the same before the Commission: "[I]nfringement actions may only be brought by, or in the name of, all of the owners of the patent in suit or the exclusive licensee of all the rights covered by the patent" because the Commission "strictly read[s] the federal standing precedent" into Rule 210.12(a)(7). *In re Certain Catalyst Components and Catalysts for the Polymerization of Olefins*, Inv. No. 337-TA-307, 1990 ITC LEXIS 224 at *26 (June 25, 1990)(unreviewed initial determination terminating investigation for lack of indispensable party).

The ALJ determined that Magellan Corporation ("Magellan") is not a co-owner of the '346 patent and that Global Locate has standing based on evidence in the record including, among other things, an agreement settling a trade secret litigation between Magellan and Global Locate

("Magellan settlement agreement")(CX-23C)[1] as well as Magellan's failure to assert ownership of the '346 patent. As reflected in its request for briefing, the Commission's review of the ID's finding that Global Locate has standing to assert the '346 patent is focused on the effect of section 2.1 (defining "Inventions") of the "Inventions, Trade Secrets, and Confidential Information Agreement" (RX-286) ("employee inventions agreement"), which the ALJ did not explicitly address in the final ID. For the reasons set forth below, the Commission hereby modifies the ALJ's determination to add that the employee inventions agreement did not automatically assign any rights in the '346 patent to Magellan.

Sections 2.1 and 2.3 of the employee inventions agreement are relevant to the resolution of the ownership issue. Sections 2.1 and 2.3 state:

[

]

The parties do not dispute that Abraham, a named co-inventor of the '346 patent, entered into the employee inventions agreement in 1996 when he was employed by Ashtech, a company which was

[1] [

]

later acquired by Magellan. Nor do the parties dispute that Abraham separated from Magellan in February 2000 and joined Global Locate, [

] At the center of the parties' dispute is whether Abraham's interest in the invention of the '346 patent was automatically assigned to Magellan by operation of the employee inventions agreement.

Respondents, who challenge standing, argue that the invention was automatically assigned to Magellan because Abraham's act of conception while he was employed by Magellan is included within the definition of "Inventions" in section 2.1 of the employee inventions agreement (RX-286) and his invention was both "related to" and "useful in" Magellan's GPS business. Respondents cite (i) Abraham's testimony that Magellan is "in the GPS business" (Abraham Tr. at 3165:2-7); (ii) various passages in the '346 patent that describe why the invention is generally useful; (iii) Abraham's circulation, within Magellan, of documentation relating to conception of the '346 patent; and (iv) Magellan's suit against Global Locate involving technology related to the '346 patent. Respondents' Written Submission on Issues Under Review at 9-10.

The determination of whether an invention is "related to" an employer's business under an invention assignment clause is a fact-intensive inquiry that requires reference to extrinsic evidence, such as the conduct of the parties, the nature of the employer's business, and the nature of the employee's work for the employer. *See DDB Technologies, LLC v. MLB Advanced Media L.P.*, 517 F.3d 1284, 1292 (Fed. Cir. 2008). The Commission finds that Respondents have failed to provide evidence that would demonstrate that the invention of the '346 patent was "related to or useful in" Magellan's business because none of the evidence to which Respondents have cited relates the specific invention of the '346 patent to any particular aspects of Magellan's business. To the

contrary, the factual findings of the ALJ regarding Magellan's conduct demonstrate that Magellan did not consider itself a co-owner of the '346 patent. For example, the ALJ found that "Magellan has never sought to exercise ownership over the patent, even given the public issuance of the patent (in a field doubtlessly monitored by Magellan), or moreover, when Magellan was later subpoenaed in connection with ITC litigation involving the '346 patent." ID at 38. The ALJ also found that even though Magellan was aware of the particulars of Abraham's invention based on Abraham's dissemination of information within Magellan pertaining to the work that he would later use as a basis for the asserted claims of the '346 patent, it did not assert ownership. *Id.* (citing Abraham Tr. 3175-3180, 3200-3204; CX-74C; CX-103C; Braasch Tr. 3344-3350).

Moreover, the ALJ found that language in the settlement agreement that ended the trade secret litigation between Global Locate and Magellan permitted Global Locate to continue using certain technical concepts relating to the subject matter of the '346 patent and, therefore, supported Global Locate's claim of sole ownership of the '346 patent. ID at 39 (citing CX-23C at GL-602-97130-31). This agreement also demonstrates Magellan's failure to assert ownership of the '346 patent despite its detailed knowledge of Global Locate's activities pertaining to the subject matter of the '346 patent.

In light of Magellan's awareness of the invention of the '346 patent and its failure to assert ownership of the invention at any time, the Commission concludes that Magellan itself did not consider the invention of the '346 patent "related to or useful in" its business within the meaning of section 2.1 of the employee inventions agreement. *See DDB Technologies,* 517 F.3d at 1293 (Fed. Cir. 2008). Accordingly, the Commission modifies the ALJ's finding that Global Locate has standing to assert the '346 patent to add that Abraham's interest in the invention of the '346 patent

was never assigned to Magellan under the employee inventions agreement because there is no evidence that the invention of the '346 patent was "related to or useful in" its business within the meaning of section 2.1 of that agreement.

B. Infringement of the '651 and '000 Patents by SiRF's Commercial Activities

Direct infringement of a method claim requires a party to perform each and every step of a claimed method. *Joy Techs.,Inc. v. Flakt, Inc.,* 6 F.3d 770, 773 (Fed. Cir. 1993); *Warner-Jenkinson Co., Inc. v. Hilton Davis Chem. Co.,* 520 U.S. 17, 29 (1997). However, a "defendant cannot . . . avoid liability for direct infringement by having someone else carry out one or more of the claimed steps on its behalf." *BMC Resources, Inc. v. Paymentech, L.P.,* 498 F.3d 1373, 1379 (Fed. Cir. 2007). Where multiple parties each perform a portion of a patented method, one of the parties may be liable for direct infringement if that party either "performs all of the steps of the process," or "control[s] or direct[s]" the performance of those steps. *BMC Resources,* 498 F.3d at 1379; *Muniauction, Inc. v. Thomson Corp.*, 532 F.3d 1318, 1328-30 (Fed. Cir. 2008). If a single party directs or controls all the steps of a method claim "it would be unfair indeed for the mastermind to in such situations to escape liability." *BMC Resources,* 498 F.3d at 1381.

The ALJ found claim 1 of the '651 patent and claim 1 of the '000 patent directly infringed by SiRF's commercial activities despite the fact that the GPS receivers are in possession of end-users when the "processing satellite signals..." ('651 patent) and the "representing said formatted data in a second format..." ('000 patent) steps are performed. ID at 143-44; ID at 130-31.[2] More specifically,

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[2] Claim 1 of the '651 patent and claim 1 of the '000 patent have been reproduced below with emphases on the limitations at issue.

('651): **1.** A method of receiving global positioning system (GPS) satellite signals comprising:
receiving satellite ephemeris at a first location;

the ALJ found that SiRF, through its InstantFix and SiRFLoc services, performs each step in the claims except the final step of claim 1 of the '651 patent, *i.e.*, the "processing" step, and the final step of claim 1 of the '000 patent, *i.e.*, the "representing" step. ID at 126-31; ID at 142-45. The ALJ found that the accused devices, when employed by end users with SiRF InstantFix and SiRFLoc services, perform the claimed "processing" and "representing" steps. *Id.* Although the ALJ found that all the claim limitations are met, he did not explicitly find that all the acts that constitute direct infringement were performed by *a single party*, *i.e.*, SiRF, which is required for a finding of direct infringement.

The Commission finds that SiRF maintains control over the operation of the GPS receivers and thus directly infringes the '651 and '000 patents regardless of who is using the GPS receivers at the time the receivers perform the claimed "processing" and "representing" steps. The parties do not dispute that SiRF controls the operation of its software and the GPS functionality of the SiRFstarIII chips it sells. [

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communication [*sic*] the satellite ephemeris to a mobile GPS receiver at a second location; and
processing satellite signals received at the mobile GPS receiver using the ephemeris to reduce code and frequency uncertainty in the mobile GPS receiver to improve acquisition sensitivity of the mobile GPS receiver.

('000): **1**. A method of creating and distributing compact satellite orbit models comprising:
receiving satellite signals from at least one satellite and at least one receiving station;
extracting at least a portion of the satellite tracking data from said satellite signal, representing said data in a first format;
transmitting the formatted data to a remote receiver; and
at the remote receiver, representing said formatted data in a second format supported by the remote receiver.

]In light of the factual findings in the ID and the evidence of record, the Commission finds that SiRF controls the entire process in the InstantFix and SiRFLoc systems from start to finish, *i.e.*, from the creation of the EE file to the processing and use of the EE file in the GPS receiver to acquire satellite signals.

Respondents argue that SiRF does not perform every step of the asserted method claims of the '651 and '000 patents through its InstantFix services [

] Notwithstanding this lack of privity between SiRF and end users of the GPS receivers in the InstantFix system, we determine that SiRF nevertheless controls the manner in which the GPS receivers are operated and, in so doing, controls end users. That is, SiRF's control over the operation of the GPS receivers extends to end users of the GPS receivers in the InstantFix system [

] Because the Federal Circuit has never held that privity or an agency relationship is required for direct infringement, the fact that end users of the GPS receivers do not have a contractual or agency-type relationship with SiRF is not controlling.

In any event, SiRF's customers do not have control over the manner in which any of the steps of the asserted method claims of the '651 and '000 patents are performed, even when the InstantFix server [

]

In light of the above, the Commission modifies the ALJ's finding that SiRF directly infringes the '651 and the '000 patents through its commercial activities to clarify that SiRF exercises control over end users of the GPS receivers so as to cause infringement of the '651 and the '000 patents.

C. Respondents' Petition for Reconsideration In Light of *In re Bilski*

Citing Commission rule 210.47[3], Respondents petition for reconsideration of the Commission's determination not to review the ALJ's determination that the asserted process claims of the '187 and '801 patents recite patent-eligible subject matter. Respondents argue that the Federal Circuit's decision in *In re Bilski*, 545 F.3d 943 (Fed. Cir. 2008)(*en banc*) creates a "new question" on which they had no opportunity to present arguments regarding whether the asserted process claims in the '187 and '801 patents recite patent eligible subject matter under 35 U.S.C. §101. Respondents' Petition for Reconsideration at 1. In their petition for reconsideration, Respondents

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[3] Commission rule 210.47 provides:

> Within 14 days after service of a Commission determination, any party may file with the Commission a petition for reconsideration of such determination or any action ordered to be taken thereunder, setting forth the relief desired and the grounds in support thereof. Any petition filed under this section must be confined to new questions raised by the determination or action ordered to be taken thereunder and upon which the petitioner had no opportunity to submit arguments. Any party desiring to oppose such a petition shall file an answer thereto within five days after service of the petition upon such party. The filing of a petition for reconsideration shall not stay the effective date of the determination or action ordered to be taken thereunder or toll the running of any statutory time period affecting such determination or action ordered to be taken thereunder unless specifically so ordered by the Commission.

19 C.F.R. § 210.47.

argue that the ALJ relied on the "useful, concrete and tangible result" test for patent eligible subject matter, which was rejected by the Federal Circuit in *Bilski*. *Id.* at 3-4 (citing *Bilski*, 2008 U.S. App. LEXIS 22479, at *40-41). Respondents further argue that the asserted method claims of the '187 and '801 patents do not recite patent-eligible subject matter under *Bilski*. *Id.* at 4.

The Commission has determined to deny Respondents' petition for reconsideration. Respondents' petition was filed on November 18, 2008, or 26 days after the expiration of the 14-day period set forth by Commission rule 210.47.[4] Moreover, the petition is substantively without merit. The "machine-or-transformation" test, adopted by the Federal Circuit in *In re Bilski*, originated from the Supreme Court's decision in *Parker v. Flook*, 437 U.S. 584, 588 n.9 (1978). This test declares a claimed process patent-eligible if it (1) is tied to a particular machine or (2) transforms a particular article into a different state or thing. *Bilski,* 545 F.3d at 954. Although the ALJ cited the "useful, concrete and tangible result" test rejected in *Bilski*, the ALJ also found that the asserted process claims of the '187 and '801 patents meet the first prong of the "machine-or-transformation" test adopted by the Federal Circuit in *Bilski* because these claims are tied to a particular machine. ID at 174-175; 205-206. Indeed, Respondents argued this point before the ALJ as a ground for invalidity under § 101. *See e.g.,* Respondents' Post-Trial Brief at 174. Therefore, we find that the *Bilski* decision does not raise any new questions about the Commission's determination that the asserted process claims of the '187 and '801 patents recite patent-eligible subject matter under 35 U.S.C. § 101. Accordingly, Respondents' petition for reconsideration is denied.

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[4] The Commission determined not to review this aspect of the ALJ's initial determination on October 9, 2008.

III. REMEDY AND BOND

A. Remedy

The Commission has "broad discretion in selecting the form, scope and extent of the remedy" for a violation of section 337. *Viscofan, S.A. v. United States Int'l Trade Comm'n,* 787 F.2d 544, 548 (Fed. Cir. 1986). A limited exclusion order is the usual remedy when a violation of section 337 is found. The statute states that "[i]f the Commission determines, as a result of an investigation under this section, that there is a violation of this section, it shall direct that the articles concerned, imported by any person violating the provisions of this section, be excluded from entry into the United States . . . " 19 U.S.C. § 1337(d)(1). A general exclusion order, conversely, is available only when complainants meet the heightened requirements of section 337(d)(2).[5] *Id.* § 1337(d)(2); *see also Kyocera Wireless Corp. v. ITC*, 545 F.3d 1340, 1356 (Fed. Cir. 2008). In addition to, or in lieu of, issuing a limited or general exclusion order, the Commission may issue a cease and desist order directing any person violating, or believed to be violating, section 337 to cease and desist from engaging in the unfair methods or acts involved. *Id.* § 1337(f)(1).

Respondents argue, that because the ID found that infringement of the method claims in the '187, '801, '000, '080, and '651 patents occurs only when the SiRF chips are used with particular

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[5] Section 337(d)(2) provides:

> The authority of the Commission to order an exclusion from entry of articles shall be limited to persons determined by the Commission to be violating this section unless the Commission determines that--
>
> (A) a general exclusion from entry of articles is necessary to prevent circumvention of an exclusion order limited to products of named persons; or
>
> (B) there is a pattern of violation of this section and it is difficult to identify the source of infringing products.

19 U.S.C. § 1337(d)(2).

software and/or other elements, *e.g.*, the InstantFix service, these claims should not be included in any exclusion order. Respondents' Submission on Remedy ("Resp. Rem. Sub.") at 11-14. Respondents' argument effectively asks the Commission to abandon its longstanding practice of issuing exclusion orders to address violations of section 337 concerning articles that infringe U.S. patents.

Indeed, this longstanding practice is mandated by section 337. Subsection (a)(1)(B) makes unlawful "the importation into the United States, the sale for importation, or the sale within the United States after importation by the owner, importer, or consignee, of articles that infringe a valid and enforceable United States registered copyright or patent." If the Commission finds a violation under this subsection of section 337, subsection (d)(1) directs that the "articles concerned...be excluded from entry into the United States." 19 U.S.C. §1337(d)(2). The fact that certain software components or InstantFix services are required with SiRF's chips for infringement to occur does not change the fact that a violation of section 337 was found based on infringement of the asserted claims. As correctly noted by Complainants, the accused chips include hardware and software that function integrally to cause infringement of these claims. To the extent that Respondents suggest that a limited exclusion order is inappropriate for method claims, the Commission disagrees and views section 337 as equally applicable to articles that infringe method claims as well as apparatus claims. *See Certain Insect Traps,* Inv. No. 337-TA-498, limited exclusion order (December 10, 2004) (ordering exclusion of products covered by method claims).

Accordingly, the Commission has determined to issue a limited exclusion order directing U.S. Customs and Border Protection ("Customs") to exclude all products "covered by" the infringed claims consistent with the statutory language of subsection 337(d)(1). In any event, we have

included a certification provision in the limited exclusion order. Thus, to the extent that Respondents disable certain software features or do not use the accused devices with InstantFix or SiRFLoc services, Customs may allow Respondents to certify and/or submit evidence that these products are not "covered by" the limited exclusion order.

The Commission has further determined to limit the scope of the exclusion order to products of named respondents and to deny Complainant's request for "downstream" relief against non-respondents. The Federal Circuit recently concluded in *Kyocera Wireless Corp.* that the Commission has no authority to issue a limited exclusion order directed to downstream products of non-respondents. *Kyocera*, 545 F.3d at 1356. Accordingly, the Commission will no longer issue such orders.[6]

Complainants nevertheless argue that a general exclusion order that extends to downstream products is appropriate under section 337(d)(2) because such an order "is necessary to prevent circumvention of an exclusion order limited to products of named persons" within the meaning of section 337(d)(2)(A). Complainants' Submission on Remedy at 11. To support their request for a general exclusion order, Complainants point out that the overwhelming majority of infringing SiRF GPS chips enter the United States as components of "downstream" products, rather than as individual chips. *Id.* at 12. Complainants assert that the *EPROM*s factors[7] support the issuance of a

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[6] We do not view the Court's opinion in *Kyocera* as affecting the issuance of LEOs that exclude infringing products made by respondents found to be violating Section 337, but imported by another entity. The exclusionary language in this regard that is traditionally included in LEOs is consistent with 19 U.S.C. § 1337(a)(1)(B) – (D) and 19 U.S.C. § 1337(d)(1).

[7] *See Certain Erasable Programmable Read-Only Memories,* Inv. No. 337-TA-276, USITC Pub. 2196, Comm'n. Op. at 125, 1989 ITC LEXIS 122, at *252-53 (May 1989)("EPROMs")(The Commission set forth factors to be considered when determining whether to issue downstream relief and outlined a policy of balancing "the complainant's interest in obtaining complete protection from all infringing

general exclusion order because these factors incorporate an inquiry into the potential for circumvention of an exclusion order, an inquiry that is closely tied to the required showing for section 337(d)(2)(A). *Id.* at 10-11. Complainants note that the ALJ found, within the context of his own *EPROM*s analysis, that "[w]ithout a downstream exclusion order, third-party manufacturers could continue to import infringing articles in downstream products, thereby undermining an order excluding SiRF chips." *Id.* at 11 (quoting RD at 13).

The Commission finds that Complainants have not made a showing that a general exclusion order against products under section 337(d)(2)(A) is appropriate. Complainants' reliance on the ALJ's *EPROM*s analysis to show that a "general exclusion order . . . is necessary to prevent circumvention of an exclusion order limited to products of named persons" is misplaced. The *EPROM*s factors have been traditionally used in cases involving limited exclusion orders extending to downstream products, and the Commission finds these factors no longer relevant in the case of non-respondents' products in light of the *Kyocera* decision. In any event, non-respondent manufacturers that continue to import products incorporating infringing articles cannot be deemed to have "circumvented" an exclusion order by merely continuing their pre-existing practice. Therefore, the Commission finds that Complainants have not shown that "a general exclusion from entry of articles is necessary to prevent circumvention of an exclusion order limited to products of named persons," within the meaning of 19 U.S.C. § 1337(d)(2)(A).

In *Kyocera,* as in this case, Complainants complained about a risk of "circumvention" if a limited exclusion order did not extend to downstream products of non-respondents. The Federal

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imports by means of exclusion of downstream products, against the inherent potential of even a limited exclusion order, when extended to downstream products, to disrupt legitimate trade in products which were not themselves the subject of a finding of violation of Section 337.").

Circuit stated, however, that such "potential 'circumvention'" must be addressed in one of two ways – either by naming as respondents the manufacturers whose downstream products Broadcom sought to exclude (thus making a limited exclusion order appropriate against those parties), or by seeking a general exclusion order. *See Kyocera*, 545 F.3d at 1357 ("A party concerned about potential 'circumvention of an LEO . . . has the option to bring a case [for a GEO] under either subsection 337(d)(2)(A) or 337(d)(2)(B)."). Here, Complainants did not name the already-identified manufacturers of downstream articles as respondents and did not show a general exclusion order is necessary to prevent circumvention under section 337(d)(2)(A).

The Commission also finds that Complainants are not entitled to an exclusion order against products of non-respondents under section 337(d)(2)(B) because there is no evidence in the record that "there is a pattern of violation of this section and it is difficult to identify the source of infringing products." To the contrary, Complainants conceded that the "manufacturers of downstream products containing SiRF infringing articles are readily identifiable." Complainants' Post-Hearing Br. at 281-82. Because Complainants have not presented evidence that a general exclusion order is warranted under section 337(d)(2), the Commission has determined to limit the scope of the exclusion order to products of named respondents found in violation of section 337, *i.e.*, SiRF, E-TEN, Mio, MiTAC, and Pharos.

Complainants also argue that a certification provision should not be included in the limited exclusion order because such a provision would allow a respondent to "self-certify that a redesigned product no longer infringes" and therefore avoid a determination by Customs or the Commission concerning their non-infringement contentions. Complainants' Reply Submission on Remedy at 21 (citation omitted). The certification provision that we have included in the limited exclusion order is

intended to aid Customs in its enforcement of the order and is not intended to provide a respondent with an absolute right to self-certify that a redesigned chip does not violate the order. It is within Custom's discretion whether to accept a respondent's certification.

Certification provisions are generally intended to minimize the possibility that non-infringing products will be excluded and are included in exclusion orders where Customs is unable to easily determine by inspection whether an imported product violates a particular exclusion order, which is the case here. *See Certain Optical Disk Controller Chips and Chipsets and Products Containing Same, Including DVD Players and PC Optical Storage Devices*, Inv. No. 337-TA-506, Comm'n Op., 2005 ITC LEXIS 881, at *92-94 (September 28, 2005). In this case, E-TEN, Pharos, MiTAC and Mio may decide to incorporate non-infringing chips into their products. In the absence of a certification provision, Customs would be unable to determine whether products manufactured by E-TEN, Pharos, MiTAC, and Mio contain infringing chipsets. Additionally, SiRF may disable the features in its chips that were found to infringe the asserted patents.

The Commission also finds cease and desist orders against domestic respondents SiRF, Mio, and Pharos are appropriate. The Commission generally issues a cease and desist order directed to a domestic respondent when there is a "commercially significant" amount of infringing, imported product in the United States that could be sold so as to undercut the remedy provided by an exclusion order. *See Certain Condensers, Parts Thereof and Products Containing Same, Including Air Conditioners for Automobiles,* Inv. No. 337-TA-334 (Remand), Comm'n Op. at 26-28 (Aug. 27, 1997). The ALJ found that SiRF, Mio, and Pharos maintain commercially significant inventories of the products at issue in this investigation. RD at 21. The parties did not contest issuance of cease and desist orders.

B. Bonding

When the Commission issues an exclusion order, infringing products are entitled nonetheless to entry under bond during the Presidential review period. 19 U.S.C. § 1337(j). The Commission must set the amount of the bond at a level sufficient to protect Complainants from injury. 19 C.F.R. § 210.50(a)(3). When reliable price information is available, the Commission has often set the bond by eliminating the differential between the domestic product and the imported, infringing product. *See Certain Microsphere Adhesives, Processes for Making Same, and Products Containing Same, Including Self-stick Repositionable Notes,* Inv. No. 337-TA-366, USITC Pub. 2949, Comm'n Op., 1996 ITC LEXIS 280, at *44 (1996). In cases where the Commission does not have sufficient evidence upon which to base a determination of the appropriate amount of the bond, the Commission has set a 100% bond. *See Certain Sortation Systems, Parts Thereof, and Products Containing Same*, Inv. No. 337-TA-460, USITC Pub. 3588, Comm'n Op., 2003 ITC LEXIS 176, at *47 (March 2003). We concur with the ALJ's recommended bond of 100% because the record does not contain sufficient evidence to set the bond at any other amount. RD at 22-23.

Respondents argue that because the combination of SiRF's chipsets with certain software that was found to infringe the asserted patents, the bond amount should be set to 10%, which reflects the approximate value of the software necessary to perform the steps of the asserted method claims, citing *Certain Plastic Encapsulated Circuits*, Notice of Issuance of LEO & Cease-and-Desist Orders, Inv. No. 337-TA-315, 1992 ITC LEXIS 738 (Nov. 1992). Resp. Rem. Sub. at 21. Respondents, however, fail to appreciate that the products that are subject to exclusion are in fact products "covered by" the asserted patents because they include the hardware and software necessary for infringement. Thus, the Commission finds Respondents' approach of separating the value of the

software from the hardware for the purposes of calculating the bond amount to be inappropriate. In *Certain Plastic Encapsulated Circuits*, the asserted patent was directed to the packaging of the circuit, not the circuitry, thus the Commission set a bond to reflect the relative value of the packaging to the value of the entire circuit. Therefore, this case is inapposite and does not support Respondents' argument.

C. The Public Interest

When determining whether to issue remedial orders for a violation of section 337, the Commission weighs the effect of the orders on four public interest factors: (1) the public health and welfare, (2) competitive conditions in the U.S. economy, (3) the production of like or directly competitive articles in the U.S., and (4) U.S. consumers. 19 U.S.C. § 1337(d), (f). In order to gather information on potential public interest concerns, the Commission published a notice in the *Federal Register* on October 9, 2008, inviting comment from the parties and members of the public. The parties to the investigation did not raise any public interest concerns. However, Garmin, a non-party, argued in its submission that "[p]ublic interest considerations foreclose any downstream exclusion order because of the heavy reliance that GPS devices play in federal, state, and local government law enforcement and emergency response activities that are critical to the public health, safety and welfare." Garmin's Written Submission on Remedy at 15. Because the Commission has determined to limit the scope of the exclusion order to products of named respondents and to deny Complainant's request for "downstream" relief against non-respondents as set forth in part III.A of this opinion, we find Garmin's concerns about the public interest to have been alleviated.

Accordingly, the Commission finds that there is no evidence of any public interest concerns that would preclude issuance of a limited exclusion order or cease and desist orders against SiRF, Mio, and Pharos.

IV. CONCLUSION

The Commission affirms the final ID as modified in part II of this opinion, and adopts the ID's findings of fact and legal conclusions that are not inconsistent with this opinion. The Commission has also determined to issue a limited exclusion order and cease-and-desist orders, and set a bond amount of 100% of the entered value of infringing products during the period of Presidential review.

By order of the Commission.

Marilyn R. Abbott
Secretary to the Commission

Issued: January 27, 2009

PUBLIC VERSION

UNITED STATES INTERNATIONAL TRADE COMMISSION
Washington, D.C.

In the Matter of **CERTAIN GPS DEVICES AND PRODUCTS CONTAINING SAME**	**Investigation No. 337-TA-602**

ADDITIONAL VIEWS OF CHAIRMAN SHARA L. ARANOFF, VICE CHAIRMAN DANIEL R. PEARSON, AND COMMISSIONER DEANNA TANNER OKUN

We join our colleagues in finding a violation of section 337 of the Tariff Act of 1930 in this investigation. We also join the Commission's Opinion, including the statement that the Commission does not view the Court's opinion in *Kyocera Wireless Corp. v. ITC*, 545 F.3d 1340 (Fed. Cir. 2008) to affect the issuance of Limited Exclusion Orders (LEOs) that exclude infringing products made by respondents found to be violating Section 337, but imported by another entity. In these Additional Views, we explain the basis for our conclusion as to *Kyocera* and LEOs.

The Commission has determined that the instant LEO shall bar from entry infringing GPS devices and products containing infringing GPS devices "that are manufactured abroad by or on behalf of, or imported by or on behalf of, SiRF, Pharos, MiTAC, Mio, and E-TEN" or their affiliates, successors or assigns. Limited Exclusion Order, para. 1. The quoted language was first proposed by the Investigative Attorney in response to a Commission request for comments on the form that the remedy should take in this investigation. No party objected to or otherwise commented on that proposed language, and the Commission has determined to adopt it without modification.

While no party raised an objection, we have considered carefully whether the scope of this exclusion order, which bars the entry of any infringing articles manufactured for or on behalf

of named respondents, who have been determined to violate section 337, is precluded by the Court's decision in *Kyocera*. We have concluded that issuing LEOs that cover the infringing articles manufactured by a respondent found to violate section 337, regardless of who imports such articles, is authorized by section 337 and was not rejected by the Court of Appeals.

The Court in *Kyocera* found in that case that "virtually all putatively infringing articles sold for importation or imported into the United States" were contained in downstream products manufactured by third parties, *i.e.* non-respondents, and that the crux of the appellants' argument was "that the Commission exceeded its statutory authority by issuing an LEO that excludes imports of downstream manufacturers who were not named as respondents . . ." *Kyocera,* 545 F.3d at 1354-55. Consistent with the Court's decision, we have denied, on a number of grounds described in the Commission's Opinion, Global Locate's request for an order excluding downstream products manufactured by non-respondents.

We believe it significant that the Court in *Kyocera* emphasized the statutory distinctions between the circumstances in which LEOs and GEOs might be respectively issued and the underlying reason why a GEO may include articles of non-respondents whereas an LEO may not. In resolving the question presented to it in *Kyocera*, the Court observed that the statute provides for two types of exclusion orders, and that the type of order available depends on the existence of specific circumstances. The Court stated that an LEO is an order "limited to products of named persons." *Kyocera*, 545 F.3d at 1356. In contrast, a GEO, which is broader in scope in that it may cover articles manufactured by non-respondents, is only appropriate where either of the two sets of circumstances provided for in section 337(d)(2) apply. 545 F.3d at 1356. Thus, the Court

directed that "[i]f a complainant wishes to obtain an exclusion order operative against articles of non-respondents, it must seek a GEO by satisfying the heightened burdens of §§ 1337(d)(2)(A) and (B)." 545 F.3d at 1356. Because the complainant in the section 337 investigation underlying the *Kyocera* litigation had named only one respondent, who did not manufacture any of the downstream handsets at issue that were being imported, and also failed to satisfy the conditions for a GEO, the Court ruled that the Commission could not issue an LEO that sought to cover downstream articles manufactured and imported by non-respondents.

In reviewing the Court's *Kyocera* opinion, we acknowledge that certain passages could be construed to mean that a Commission LEO may exclude infringing articles manufactured by or on behalf of a named respondent only if those products are also imported by a named respondent (as opposed to, for example, importation on behalf of a named respondent by another importer). 545 F.3d at, *e.g.*, 1356. Reading the opinion as a whole, however, we understand the Court to address the dispute that was being litigated before it: whether a Commission LEO can exclude the importation of downstream products that were manufactured by non-respondents. In particular, the Court provides that "[a]ny reading of Section 337(d) that would enable LEOs to exclude *articles manufactured by non-respondents* would impermissibly render sections of the statute superfluous." 545 F.3d at 1356 (emphasis added). Likewise, the Court explains that "[t]he statute permits LEOs to exclude only *the violating products of named respondents*." 545 F.3d at 1359 (emphasis added). Similarly, the Court provides that "the trade act has made it clear that a party must meet . . . heightened requirements before the ITC has authority to issue a general exclusion order against *products of non-respondents*." 545 F.3d at 1357 (emphasis

added). In another passage, the Court explains that "[i]f a complainant wishes to obtain an exclusion order operative against *articles of non-respondents*, it must seek a GEO . . ." 545 F.3d at 1356 (emphasis added). In these repeated instances, the Court addresses the product at issue and whether its manufacturer was named as a respondent. At no point does the Court state that an LEO can exclude an infringing product manufactured by a named respondent only if that product is also imported by a named respondent. This is not surprising because that particular fact pattern and issue were not presented by the *Kyocera* litigation.

Moreover, it is doubtful that the Court would have made such a sweeping statement without clearly so indicating its intent, particularly when the issue was not raised by the parties. Were it to have done so, an LEO would be exceedingly easy to evade – the respondent manufacturer of the infringing article could avoid the exclusion by the mere expedient of changing importers. And such evasion would not be susceptible of remedy through means of a GEO because there may not have been either circumvention or a pattern of violation combined with difficulty in identifying the infringers prior to the finding of a violation.

We therefore conclude that *Kyocera* does not provide that an LEO may be used to exclude infringing articles manufactured by a named respondent only if the article is also imported by a named respondent. Accordingly, the language setting the contours of the instant LEO's exclusion – infringing articles "manufactured by or on behalf of, or imported by or on behalf of SiRF, Pharos, MiTAC, Mio, and E-TEN" or their affiliates, successors, or assigns – is not inconsistent with the Court's holding in *Kyocera.*

Issued: January 27, 2009

CERTAIN GPS DEVICES AND PRODUCTS CONTAINING SAME **337-TA-602**

CERTIFICATE OF SERVICE

I, Marilyn R. Abbott, hereby certify that the attached **COMMISSION OPINION AND ADDITIONAL VIEWS (PUBLIC VERSION)** has been served by hand upon the Commission Investigative Attorney, Vu Q. Bui, Esq., and the following parties as indicated, on JAN 27 2009.

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PUBLIC VERSION

UNITED STATES INTERNATIONAL TRADE COMMISSION
Washington, D.C.

In the Matter of CERTAIN GPS DEVICES AND PRODUCTS CONTAINING SAME	Inv. No. 337-TA-602

INITIAL DETERMINATION
Administrative Law Judge Carl C. Charneski

Pursuant to the notice of investigation, 72 Fed. Reg. 25777 (2007), this is the Initial Determination in the matter of *Certain GPS Devices and Products Containing Same*, United States International Trade Commission Investigation No. 337-TA-602. *See* 19 C.F.R. § 210.42(a).

It is held that a violation of section 337 of the Tariff Act of 1930, as amended, 19 U.S.C. § 1337, has occurred in the importation into the United States, the sale for importation, or the sale within the United States after importation of certain global positioning system or "GPS" devices or products containing same by reason of infringement of one or more of claims 1, 2 and 11 of U.S. Patent No. 6,417,801; claims 4 and 11 of U.S. Patent No. 6,606,346; claims 1, 2 and 5 of U.S. Patent No. 6,651,000; claims 1 and 2 of U.S. Patent No. 6,704,651; claims 1 and 9 of U.S. Patent No. 6,937,187; or claims 1, 2 and 22 of U.S. Patent No. 7,158,080.

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The following abbreviations may be used in this Initial Determination:

ALJ	-	Administrative Law Judge
ALJX	-	Administrative Law Judge Exhibit
CDX	-	Complainants' Demonstrative Exhibit
CPX	-	Complainants' Physical Exhibit
CX	-	Complainants' Exhibit
Dep.	-	Deposition
EDIS	-	Electronic Document Imaging System
FF	-	Finding(s) of Fact
JPX	-	Joint Physical Exhibit
JX	-	Joint Exhibit
PCL	-	Proposed Conclusion of Law (CPCL, RPCL or SPCL)
PFF	-	Proposed FF (CPFF, RPFF or SPFF)
PRF	-	Proposed Reply or Rebuttal Finding (CPRF, RPRF or SPRF)
RDX	-	Respondents' Demonstrative Exhibit
RPX	-	Respondents' Physical Exhibit
RX	-	Respondents' Exhibit
SX	-	Commission Investigative Staff Exhibit
Tr.	-	Transcript.

I. Background

A. Institution and Procedural History of This Investigation

By publication of a notice in the *Federal Register* on May 7, 2007, pursuant to subsection (b) of section 337 of the Tariff Act of 1930, as amended, the Commission instituted this investigation to determine:

> [W]hether there is a violation of subsection (a)(1)(B) of section 337 in the importation into the United States, the sale for importation, or the sale within the United States after importation of certain GPS devices or products containing same by reason of infringement of one or more of claims 1 and 17 of U.S. Patent No. 6,417,801; claims 1, 3-5, 8-17, 19-21, and 23 of U.S. Patent No. 6,606,346; claims 1-5, 9, 10, 11-14, 29-31, and 33 of U.S. Patent No. 6,651,000; claims 1 and 2 of U.S. Patent No. 6,704,651; claims 1 and 9 of U.S. Patent No. 6,937,187; and claims 1-3, 12, 15, 16, 19, 20, 22-24, 26, 28-31, and 33-35 of U.S. Patent No. 7,158,080, and whether an industry in the United States exists or is in the process of being established as required by subsection (a)(2) of section 337.

72 Fed. Reg. 25777 (2007).

The notice of investigation named as the complainant: Global Locate, Inc. ("Global Locate") of San Jose, California. *Id.* The following companies were named as the respondents: SiRF Technology, Inc. ("SiRF") of San Jose, California; E-TEN Corp. ("E-TEN") of Taipei, Taiwan; Pharos Science & Applications, Inc. ("Pharos") of Torrance, California; MiTAC International Corporation ("MiTAC") of Taoyuan, Taiwan; and Mio Technology Limited ("Mio"), USA of Fremont, California. *Id.* The Commission Investigative Staff ("Staff") of the Commission's Office of Unfair Import Investigations is also a party in this investigation. *Id.*

Order No. 16 (initial determination) granted Global Locate's motion for leave to amend the complaint to terminate the investigation as to claims 1, 3, 8, 9, 10, and 23 of the '346 patent;

to add to the investigation claims 2, 6, 11, 14, 18, and 19 of the '801 patent; and also to amend the notice of investigation to add Broadcom Corporation ("Broadcom") as a complainant inasmuch as Broadcom acquired Global Locate. *See* Notice of Commission Decision Not to Review an Initial Determination Granting Complainant's Motion to Amend the Complaint and Notice of Investigation (Feb. 25, 2008).

In addition, Order No. 25 granted complainants' motion to withdraw claims 9, 10, 13, 14 and 33 of the '000 patent, and claims 19, 24, 29-31 and 33 of the '080 patent.

Order No. 29 denied complainant's motion for summary determination (Motion No. 602-38) that the importation requirement of 19 U.S.C. § 1337(a)(1)(B) has been satisfied. Nevertheless, pursuant to 19 C.F.R. § 210.18(e), several facts relating to the importation or sale of accused devices were deemed established, which are discussed below in section II (Importation or Sale).

On April 18, 2007, pursuant to the Order No. 17 (scheduling a tutorial), a tutorial session was held, and transcribed for the future reference of the Administrative Law Judge, and the Commission or any other reviewer of the investigation.

Pursuant to Order No. 7 (procedural schedule), a prehearing conference was held on April 28, 2008. The evidentiary hearing in this investigation also commenced on April 28, 2008, immediately following the prehearing conference. The evidentiary hearing concluded on May 13, 2008.

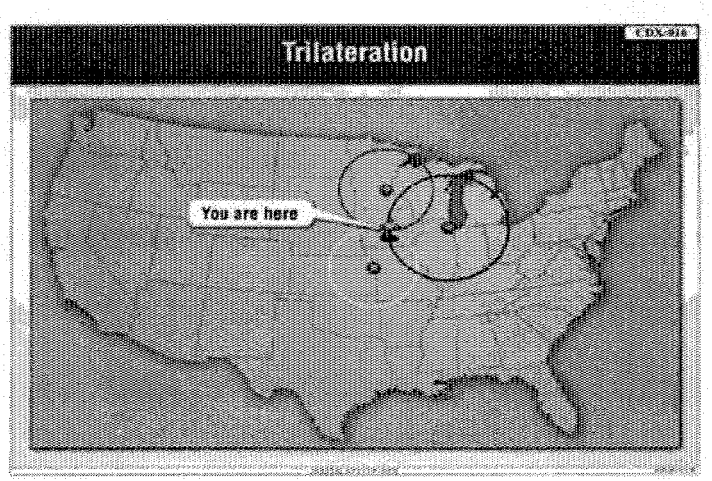
The parties have filed their post-hearing briefs, reply briefs and proposed findings. The issues are ripe for determination.

B. The Patents and Products at Issue

1. Technological Background

A Global Positioning System ("GPS") is a navigation system that relies on 32 satellites that broadcast signals while orbiting almost 13,000 miles above Earth in a pattern called a constellation. The satellites and their orbits are arranged so that at least four satellites are always in a direct line-of-sight to any point on Earth. A GPS receiver is, in effect, a radio receiver that picks up the signals from the satellites when they are in view of the receiver (even if the satellites cannot literally be seen with the eye). Dafesh Tr. 556-557; Tutorial Tr. 63 (Heppe); *see* CDX-11 (GPS Navigation Satellites). The GPS receiver uses the information received from the satellites to compute precisely how far each satellite is from the receiver. It then determines its own position through a process called trilateration. Dafesh Tr. 559-563; *see* CDX-60 (Trilateration with Four Satellites) .

The following illustration from CDX-16 (which is similar to illustrations used during the tutorial) depicts the basic theory behind trilateration.



As shown in the diagram above, if one knew, for example, that one were 225 miles from

Minneapolis, 305 miles from Chicago, and 185 miles from Kansas City, one could determine one's present position, which is the single point on Earth that is the specified distance from each of the aforementioned cities. In the example illustrated above, only a location in central Iowa is exactly at the specified distances from Minneapolis, Chicago, and Kansas City. The same principle is used for GPS receivers, except that the distances used in the trilateration equation are linked to the locations of the satellites as they orbit in their constellation. Tutorial Tr. 9-11 (Pratt).

It has long been appreciated by mathematicians (and taught to students in school) that the distance an object has traveled is the product of speed multiplied by time (*e.g.,* if one knows that one has traveled at 40 miles per hour for two hours, it is clear that one has traveled 80 miles: 40 mph x 2 hours = 80 miles). Thus, to calculate the distance between itself and a particular satellite, a receiver needs to know the time a signal was sent by the satellite, the time the signal was received by the receiver, and the speed the signal was traveling. Dafesh Tr. 563-564; Tutorial Tr. 12 (Pratt); *see* CDX-17 (Distance Calculation). A constant in the equation is the speed of the signal because it is known that radio signals travel at the speed of light, which is approximately 300 kilometers per second. Dafesh Tr. 563-564. The other factors, *i.e.,* the time that a signal was sent and the time that it was received, are subject to variation.

Each satellite transmits a carrier wave with two signals that permit the GPS receivers to perform trilateration. The two signals are: (1) the pseudorandom noise code or "PRN" code, and (2) the NAV message, which contains navigation data. Tutorial Tr. 15 (Pratt); Dafesh Tr. 564-569; *see* CDX-96 (Signal Modulation).

The PRN code (sometimes referred to as the coarse acquisition or "C/A" code) contains

1023 bits of data (sometimes referred to a "chips" rather than "bits"). The entire PRN code is called an "epoch," and it lasts one millisecond. The code is used both to identify the specific satellite that is sending a given signal and to determine some of the information needed to calculate distance. Indeed, to facilitate this process, GPS receivers generate reference codes for each of the 32 satellites that replicate the codes sent by the satellites. Tutorial 15-16 (Pratt), 60 (Heppe); Dafesh Tr. 568; Braasch Tr. 1550.

When a GPS receiver receives a signal from a satellite, it uses a process referred to as "correlation" to match the received signal with one of the locally generated reference codes. Once it has matched the incoming signal with one of the reference codes, the receiver knows the identity of the satellite that sent the received signal. In addition, the time delay between the transmission and reception of a code is known as "code offset" or "code shift." By evaluating the amount that the reference code must be shifted until it matches the received signal, the receiver knows a portion of the information needed to calculate distance. Tutorial Tr. 21 (Pratt); Dafesh Tr. 569-576; *see* CDX-97 ("Comparing PRN Codes," which depicts the code shift in a literal fashion to illustrate the time elapsed between transmission and receipt).

A GPS receiver uses the number of "chips" (or bits) that it slid to match the reference code to the satellite signal. Inasmuch as one chip is broadcast about every millionth of a second, by counting the number of chips that the reference code was slid before it correlated with the satellite's PN code, the receiver can refine the distance to the satellite. This "correlator offset" is then multiplied by the speed of light (186,000 miles per second) to compute the distance between the satellite and the receiver. Tutorial Tr. 64 (Heppe).

This calculation is complicated by a factor known as the "Doppler" effect. Just as the

pitch of a siren on a vehicle may change in frequency as it speeds by someone standing on a sidewalk, so too a radio frequency may shift as, for example, when it is transmitted by a satellite moving in its orbit vis-a-vis a fixed location on Earth. Tutorial Tr. 22 (Pratt); Dafesh Tr. 574. GPS receivers must, therefore, search a range of frequencies to obtain a match between a received signal and a locally generated reference code. Dafesh Tr. 573-575; CDX-95. Each shift of the 1023 chip code represents one potential code offset. When the code is sampled so that there are two samples per chip (as is commonly done in most receivers), there are 2046 potential code offsets per code and per Doppler value. To determine the correct code offset for the correct code at the correct Doppler value, GPS receivers must search tens of thousands of variables. Braasch Tr. 1399-1401.

As indicated above, in addition to the PRN code (also known as the C/A code), the satellite also transmits the NAV message, which contains more information that is used to calculate position. The NAV message contains information regarding when the received signals were sent by the transmitting satellite, information called "ephemeris" data regarding the location and trajectory of the satellite, and information regarding the positions of other satellites in the constellation (referred to as "almanac"). Dafesh Tr. 579-588; *see* CDX-21 (Navigation Message).

Conventional GPS receivers depended on both the PRN code and the NAV message to calculate position. The NAV message, however, can be difficult to acquire in weak-signal environments. It is transmitted at a much slower rate than the PRN code and, consequently, takes longer to acquire. Receiving all of the necessary information from the NAV message can take as long as 18-30 seconds of uninterrupted strong signal reception. Because conventional GPS

technology requires receipt of information from the NAV message, it can be difficult and sometimes even impossible for GPS receivers to calculate position in environments, such as cities, where GPS signals are weak. Dafesh Tr. 588-590; *see* CDX-22 (Weak Signal Environments).

To address the part of the problem of acquiring the NAV message, the industry developed Assisted-GPS in which the NAV message is collected by a receiving station with an unobstructed view of the sky and then transmitted to GPS receivers through the Internet or over a wireless network. Yet, even Assisted-GPS required GPS receivers to be constantly connected to the alternative source of information which often was not possible in urban environments. The result was that GPS receivers continued not to work well in low-signal environments. Dafesh Tr. 590-592; *see* CDX-74 (Assisted GPS System circa 1999).

2. Overview of the Asserted Patents

a. The '346 Patent

United States Patent No. 6,606,346, entitled "Method and Apparatus for Computing Signal Correlation," issued on August 12, 2003, based on an application filed on May 18, 2001. JX-2, cover page. The named inventors are Charles Abraham and Donald Fuchs. *Id.*

The '346 patent is directed to a method and apparatus for computing a full convolution between an input GPS signal and a C/A code reference by generating the convolution result in real time without storing unprocessed signal samples. JX-2, Abstract, 2:48-53. The apparatus comprises a vector multiplier running at high speed to achieve the same result as a vector multiplier sized to process an entire epoch. *Id.*, Abstract, col. 2, ll. 48-53.

Complainants assert claims 4 and 11. *See* Compl. Br. at 14.

b. <u>The '000 Patent</u>

United States Patent No. 6,651,000, entitled "Method and Apparatus for Generating and Distributing Satellite Tracking Information in a Compact Format," issued on November 18, 2003, based on an application filed on July 25, 2001. JX-3, cover page. The named inventors are Frank van Diggelen, Charles Abraham, and James LaMance. *Id.*

The '000 patent is directed to a method and apparatus for creating and distributing satellite tracking data in a compact format to a remote receiver. JX-3, Abstract. At least a portion of the satellite tracking data is extracted from memory, is formatted into a compact format, and is transmitted to the remote receiver via a distribution network. Once this data is received at the remote receiver, it is reformatted into a format that is prescribed by the remote receiver. *Id.*, Abstract, col 2, ll. 7-14.

Complainants assert claims 1, 2 and 5. *See* Compl. Br. at 15.

c. <u>The '080 Patent</u>

United States Patent No. 7,158,080, entitled "Method and Apparatus for Using Long Term Satellite Tracking Data in a Remote Receiver," issued on January 2, 2007, based on an application filed on September 29, 2003. JX-6, cover page. The named inventor is Frank van Diggelen. *Id.*

The '080 patent is directed to a method and apparatus for using long term satellite tracking data in a remote receiver, including using the data to compute acquisition assistance data in the remote receiver, which then uses the acquisition assistance data to acquire satellite signals that may be used to locate the position of the remote receiver. JX-6, Abstract, col. 3, ll. 16-38.

Complainants assert claims 1, 2 and 22. *See, e.g.,* Compl. Br. at 15.

d. <u>The '651 Patent</u>

United States Patent No. 6,704,651, entitled "Method and Apparatus for Locating Mobile Receivers Using a Wide Area Reference Network for Propagating Ephemeris," issued on March 9, 2004, based on an application filed on November 20, 2001. JX-4, cover page. The named inventor is Frank van Diggelen. *Id.*

The '651 patent is directed to a method and apparatus for distribution and delivery of GPS satellite telemetry data through a communication link between a central site and a mobile GPS receiver. JX-4, Abstract, col. 2, ll. 8-12. The central site is connected to a network of reference satellite receivers that send telemetry data from all satellites to the central site. *Id.*, Abstract. The mobile GPS receiver uses the delivered telemetry data to aid its acquisition of the GPS satellite signal. *Id.*, Abstract. The availability of telemetry data enhances the GPS mobile receiver's signal reception sensitivity. *Id.*, Abstract, col. 2, ll. 14-21.

Complainant assert claims 1 and 2. *See* Compl. Br. at 15.

e. <u>The '801 Patent</u>

United States Patent No. 6,417,801, entitled "Method and Apparatus for Time-Free Processing of GPS Signals," issued on July 9, 2002, based on an application filed on November 17, 2000. JX-1, cover page. The named inventor is Frank van Diggelen. *Id.*

The '801 patent is generally directed to a method and apparatus for computing GPS receiver position without using absolute time information transmitted by the satellite or by an alternative source of timing available at the GPS receiver. JX-1, Abstract. The GPS receiver measures satellite pseudoranges and sends the pseudoranges to a server that fits them to a mathematical model in which the GPS receiver position and the absolute time are unknown

parameters. *Id.*, Abstract, col. 3, l. 64 - col. 4, l. 1. The server then computes a position and absolute time that best fit the model, thereby yielding the correct position for the GPS receiver and the absolute time at which the pseudorange measurements were made. *Id.*, Abstract, col. 4, ll. 1-5.

Complainants assert claims 1, 2 and 11. *See* Compl. Br. at 16.

f. <u>The '187 Patent</u>

United States Patent No. 6,937,187, entitled "Method and Apparatus for Forming a Dynamic Model to Locate Position of a Satellite Receiver," issued on August 30, 2005, based on an application filed on June 13, 2003, which is a continuation-in-part of an application, now U.S. Patent No. 6,734,821, which is in turn a continuation-in-part of the application that resulted in the '801 patent. JX-5, cover page. The named inventors are Frank van Diggelen and Charles Abraham. *Id.*

The '187 patent is generally directed to a method and apparatus for locating the position of a satellite signal receiver. JX-5, Abstract. In one embodiment of the invention, pseudoranges are obtained that estimate the range of a satellite signal receiver to a plurality of satellites, absolute time and position are computed using the pseudoranges at a first time, and the absolute time is then used to compute another position at a subsequent time. JX-5, Abstract, col. 4, ll. 16-21. In another embodiment of the invention, a plurality of states associated with a satellite signal receiver are estimated, wherein the plurality of states includes a "time-tag error state," and then a dynamic model is formed to compute the position of the satellite signal receiver. JX-5, Abstract, col. 4, ll. 22-26.

Complainants assert claims 1 and 9. *See* Compl. Br. at 16.

3. The Level of Ordinary Skill in the Art

A person of ordinary skill in the art relevant to the asserted patents would have received a bachelor's degree in engineering, and would have at least two to three years of experience in the GPS field. *See* Dafesh Tr. 744-745; Pratt Tr. 959-960; Braasch Tr. 1395; Heppe Tr. 2371-2372.

4. The Products Accused in This Investigation

Complainants allege that each of the respondents make and, or, sell products that infringe one or more of the six patents asserted in this investigation.

SiRF Products

Complainants accuse the "two basic lines of GPS chips: SiRFstarIII and SiRF InstantGPS." Compl. Br. at 17. The SiRFstarIII chips are accused of infringing five of the asserted patents: the '000, '080, '651, '801, and '187 patents. The SiRF InstantGPS chips are accused of infringing three asserted patents: the '346, '801, and '187 patents.

Complainants also offered evidence at the hearing, and presented arguments in their briefs, concerning the so-called [ ] Complainants admit, however, that the [,] after the issuance of this Initial Determination. *See Id.* at 17-18 & n.3.

SiRFstarIII Chips

The SiRFstarIII line includes, but is not limited to, three stand-alone GPS product families. Each family uses the "SC" designation to indicate a single-chip solution, which means that the chips provide all functionality necessary to compute a GPS position. The three SC families of SiRFstarIII chips are:

- the basic SiRFstarIII family (comprised of GSC3, GSC3e, and GSC3f);
- a low-power SiRFstarIII LP family (comprised of the GSC3e/LP and GSC3f/LP); and
- SiRF's latest "light" (*i.e.,* smaller) SiRFstarIII LT family (comprised of the GSC3LT, GSC3LTf, GSC3LTi, and GSC3LTif).

See Compl. Br.. at 18-19 (citing CX-323C (GNSS Product Summary); CX-324 (GPS Tracker White Paper) at 602SiRF258557; CDX-200C ('801/'187 Accused Products); Pratt Tr. 960-962).

The SiRFstarIII line of chips also includes the GSD3t tracker chip, which complainants characterize as storing "SiRF navigation software on the host processor instead of the SiRFstarIII chip." *Id.* (citing CX-323C; CX-324C).

In summary, the accused SiRFstarIII chips in this case are the GSC3, GSC3e/LP, GSC3f/LP, GSC3f, GSC3LT, GSC3LTf, GSC3LTi, GSC3LTif, GSP3e, GSP3f, and GSD3t. *See Id.* (citing CDX-78C (SiRFstarIII chips and software); CX-323C; CX-324C).

It is noteworthy that complainants link their infringement allegations concerning the aforementioned SiRF chips to the software used to operate the chips. *See, e.g.*, Compl. Br. at 19 (describing the accused SiRF products in tandem with a summary description of the specific software used with the products). They do not accuse the software individually of patent infringement. However, the relationship of the accused devices, the software, and the asserted patent claims is discussed below in the sections containing infringement analysis.

As general matter, complainants argue that SiRFstarIII chips can operate with one of two basic SiRF software platforms, either the GSW3 or SLC3 software. It is further alleged that the

[

] Complainants argue that the GSD3t tracker chip runs with SiRF's SiRFNavIII software. Complainants also argue that the standard SiRFStarIII software is proprietary to SiRF, and is provided by SiRF. *See Id.* at 19 (citing , *inter alia*, SiRF discovery responses and the testimony of respondents' and complainants' expert witnesses).

SiRF InstantFix Products

Complainants argue that "InstantFix" is an "end-to-end SiRFAssisted-GPS system that provides server-generated 3-day and 7-day extended ephemeris ("EE") files to end user devices via the Internet over a wireless or wireline connection," and that it can be used with all current versions of the standard SiRFstarIII software. Complainants further allege that all of the accused SiRFstarIII chips – GSC3, GSC3e/LP, GSC3f/LP, GSC3f, GSC3LT, GSC3LTf, GSC3LTi, GSC3LTif, GSP3e, GSP3f, and GSD3t – operate with GSW or SLC software, and support SiRFInstantFix. *See, e.g.,* Compl. Br. at 19-20.

SiRF InstantGPS

The SiRF "InstantGPS" products are the final group of SiRF products accused by complainants. Complainants argue that there are two primary platforms in the SiRF InstantGPS product line, *i.e.,* the GSCi-4100/4200 and GSCi-5000 series products. Complainants assert that the baseband portion of the SiRF InstantGPS chips incorporate hardware known as a GPS Acquisition Module, which is known by the acronym GAM. The GAM (often pronounced during the hearing as a word, "gam") is a hardware module designed to perform baseband processing of GPS signals. *See* Compl. Br. at 20 (citing CX-358C (GAM Documentation) at 602SiRF292710).

The GAM and associated software are discussed in detail below in the infringement analysis sections of this Initial Determination. Yet in summary, complainants allege that SiRF's

GSCi-5000 products run the same core navigation library software as the SiRFstarIII chips, and that the GSCi-4100/4200 products run the so-called "i4100/4200" firmware but with navigation functionality that is fundamentally similar to that found in the SiRFstarIII navigation software. *Id.*

The Products Made or Sold by the Non-SiRF Respondents

SiRF's GPS chips are incorporated into products such as portable navigation devices ("PNDs"), personal digital assistants ("PDAs") and cell phones that are sold by respondents E-TEN, MiTAC/Mio, and Pharos. The products of E-TEN, MiTAC/Mio and Pharos that contain the SiRFstarIII chips are accused of infringing five of the asserted patents: the '000, '080, '651, '801 and '187 patents.

E-TEN Products

Complainants argue that respondent E-TEN has incorporated SiRFStarIII chips and software into at least 9 PDAs (*i.e.,* personal digital assistant) GPS devices: the G500, M700, X500, X500+, X800, X650, M800, X600 and V900. *See Id.* at 20. It is further argued that the Glofiish X500 and M700 contain a GSC3f SiRF GPS chip that utilizes SiRF's GSW software, and that the Glofiish X500+ contains a GSC3f/LP SiRF GPS chip that utilizes SiRF's GSW software. *Id.* Complainants further argue that the E-TEN X800, X650, M800, X600 and V900 contain a GSC3Lti SiRF GPS chip that utilizes SiRF's GSWLT software, and that the X-500 device features InstantFix. *Id.*

MiTAC and Mio Products

Complainants argue that respondents MiTAC and Mio have incorporated SiRF chips and software into at least 13 GPS devices: the C220, C230, C250, C310, C320, C520, C620, C710, C720, P350, P520, P550, H610, A501, A700, A701 and A702. *See* Compl. Br. at 21. It is further

argued the C220, C230, C250, C320, C520, C710, C720 and P550 contain the GSC3e/LP SiRF GPS chip; that the A501, A700, A701 and C310 contain the GSC3f/LP SiRF GPS chip; and that each of the aforementioned devices uses SiRF's GSW software. *Id.* Complainants allege that at least the C320, C520, C720, A501, A700 and A701 have incorporated SiRF chips and software that also support InstantFix. Compl. Br. at 21.

Pharos Products

Complainants argue that respondent Pharos has incorporated SiRFstarIII chips into 14 GPS devices: the PDR135, PDR140, PDR150, PDR250, PT120, PT250, PTP10, PTL505, PTL525E, PTL525P, PTL535E, PTL535P, PTL600 and PTL600E. *See Id.* at 21. It is further argues that the Pharos Trip and Pics GPS Receiver PTP10, and the Pharos Bluetooth GPS Navigators PT120 and PT250 all contain GSW3.2x software. *Id.*

5. The Domestic Industry Products

The notice of investigation (72 Fed. Reg. 25777 (2007)) provides that a determination must be made as to whether an industry in the United States exists or is in the process of being established, as required by 19 U.S.C. § 1337(a)(2). The domestic industry requirement must be satisfied as to each asserted patent. *See* 19 U.S.C. § 1337(a)(2). The technical and economic factors specific to each of the six asserted patents are detailed in the section of this Initial Determination pertaining to a particular patent. In each case, complainants rely on one or both of two chips sold by Global Locate, *i.e.,* the GL-20000 and the Hammerhead chips. *See* Compl. Br. at 17.

In connection with their domestic industry arguments, complainants describe the operation of the GL-20000 and the Hammerhead chips as combining Global Locate's new Assisted-GPS

("A-GPS") aiding information with "massive parallel correlation and time-free positioning." *Id.* It is argued that both the GL-20000 and Hammerhead chips run GPS software called the Global Locate Library ("GLL"), which resides [ ] Complainants further argue that Global Locate's GL-20000 chip and associated Global Locate software have been incorporated into several commercial products, including Hewlett Packard's HP iPAQ hw6500 series and hw6900 series of PDAs, as well as several additional commercial products, including the TomTom One and TomTom One XL personal navigation devices. It is alleged that the TomTom One XL contains a Hammerhead chip. *See Id.*

II. Importation Or Sale

The Commission instituted this investigation "to determine whether there is a violation of subsection (a)(1)(B) of section 337 [of the Tariff Act of 1930, as amended] in the importation into the United States, the sale for importation, or the sale within the United States after importation of certain GPS devices or products containing same by reason of infringement of one or more" of the aforementioned patent claims. Indeed, subsection (a)(1)(B) of section 337 makes unlawful "the importation into the United States, the sale for importation, or the sale within the United States after importation by the owner, importer, or consignee, of articles" that infringe a valid and enforceable United States registered copyright or patent. *See* 19 U.S.C. § 1337 (a)(1)(B).

Thus, in order to prevail in this investigation, complainants must establish that the devices or products that it accuses of patent infringement are imported into the Untied States, sold for importation to the United States, or sold domestically after importation. Complainants and the Staff argue that the importation or sale requirement has been satisfied, while respondents argue that it has not.

For the reasons stated below, it is found that the importation or sale requirement has been satisfied as to all accused products, except the so-called [ ] chips. Complainants admit that the [ ] *See* Compl. Br. at 17-18 & n.3 [ ] All of the other accused chips for use in a global positioning system have been imported, and all other accused products are imported and contain an imported device (such as a chip) that is accused of infringing one of the GPS-related patents at issue in this investigation.

A. <u>Importation or Sale of Accused Products</u>

Complainants' Motion No. 602-38, referenced above in section I(A), was a wide-ranging request for summary determination concerning the importation requirements of 19 U.S.C. § 1337(a)(1)(B). The motion was denied in Order No. 29. Nevertheless, pursuant to 19 C.F.R. § 210.18(e), Order No. 29 deemed that several facts relating to the importation question had been established. Those facts were demonstrated by the parties' filings related to the summary determination motion, including specific, uncontroverted discovery responses that had been supplied by respondents and which were relied upon by complainants in connection with their motion. In particular, the following importation and sale facts were established:

> 1. From January 1, 2002, to at least November 27, 2007, SiRF has imported or sold for importation into the United States, or sold after importation into the United States, Chips GRF3I-0322, GRF3W-0224, GSP3E-7852, GSP3F-7851, GSC3-7875, GSC3-7877, GSC3F-7879, GSP3F-7855, GSC3LTF-8072, GSC3LTIF-8172, and GSC3LTI-8116.
>
> 2. From January 1, 2002, to at least November 9, 2007, SiRF has imported or sold for importation into the United States, or sold after

> importation into the United States, the SiRF Chips GSCi-4100, GCSi-4200, GSCi-5000, GSCi-5001, GSCi-5050, and GSCi-5101.
>
> 3. From January 1, 2002, to at least January 18, 2008, E-TEN sold for importation into the United States the following products: Glofiish X500, Glofiish X500+, E-TEN G500, E-TEN G500+, E-TEN M700, and E-TEN X800.
>
> 4. From at least January 1, 2002, to January 18, 2008, MITAC has imported, or sold for importation into the United States, the Mio Digiwalker C230, Mio Digiwalker C320, and the Mio Digiwalker C720t.
>
> 5. From January 1, 2002, to at least, January 5, 2008, Pharos imported, exported, sold (or offered for sale) for importation into the United States, or sold (or offered for sale) after importation into the United States the following products: PDR135, PDR140, PDR150, PDR250, PT120, PTP10, PTL505, PTL525E, PTL525P, PTL600, and PTL600E.

Order No. 29 at 1-3.

While the findings of Order No. 29 cover many of the chips and other products accused in this investigation, they were not intended necessarily to cover the totality of complainants' infringement allegations. Nevertheless, complainants argue that all accused SiRF chips are in fact imported, and constitute accused products under the '346 patent. It is further argued that the imported SiRF chips with flash memory contain SiRF embedded software, and thus are accused products under the '801 and '187 patents. *See* Compl. Br. at 23.

Complainants also argue that the imported SiRF chips standing alone are also, at a minimum, components of accused products under the '080, '000, '651, '801 and '187 patents, the importation of which is sufficient to establish the Commission's jurisdiction. *See Id.* (citing *Certain Personal Watercraft and Components Thereof*, Inv. No. 337-TA-452, Order No. 31, 2001 ITC LEXIS 866, at 2-4 (Aug. 13, 2001) (importation of accused components of patented

invention sufficient to establish Commission's jurisdiction)). In addition, complainants argue that imported products of ETEN, MiTAC/Mio, and Pharos contain accused SiRFstarIII chips associated with certain SiRF software (GSW or GSWLT software), and that the imported ETEN X500 and MITAC/Mio C320 and C720 also contain software (known as CLM software) that is used to download extended ephemeris files, and are thus accused of patent infringement. *See Id.* at 23-24.

Respondents do not argue that any of the numerous importation findings made in Order No. 29 were in error. However, respondents argue that complainants failed to present evidence concerning the importation question beyond that offered in connection with their unsuccessful motion for summary determination, and that therefore complainants have once again failed to show that the importation requirement is satisfied. Indeed, respondents argue that the motion for summary determination was properly denied because complainants failed to demonstrate importation of the particular combinations of software, chips, devices and services that are relied upon by complainants to make infringement claims under the asserted patents. *See* Resp. Br. at 28.

Whether respondents' accused chips and other products can be held to infringe all the asserted patent claims, particularly if the accused products must be used in combination with other (possibly non-imported) devices or services, is a question separate from the inquiry as to whether accused chips or other products have been imported. Moreover, respondents do not contest complainants' allegation that each accused chip is imported, and that each accused product is

imported and contains, at a minimum, an accused imported chip.[1] Consequently, the importation or sale requirement of section 337 is deemed to be satisfied as to all accused chips and products containing chips, except the so-called [ ]

B. Jurisdiction

No party contests the Commission's *in personam* jurisdiction, and all have appeared and argued the merits of the investigation. Complainants argue that the Commission has the necessary subject matter and *in rem* jurisdiction as to all issues and products in the investigation. *See* Compl. Br. at 22-24. The Staff similarly argues that the Commission has all jurisdiction necessary for this investigation. *See* Staff Br. at 12-13.

Respondents do not expressly challenge the Commission's *"in rem"* or "subject matter" jurisdiction, but in the jurisdiction section of their brief they raise arguments concerning: (1) an alleged lack of infringement by the accused products, (2) an alleged failure to satisfy the importation requirement of section 337, and (3) an allegation that this investigation must be terminated as to the '346 patent due to a failure to of one of the co-owners of the patent to be joined in the investigation. *See* Resp. Br. at 23-33. Each of these arguments is addressed below.

The infringement questions are fully addressed in the sections containing infringement analyses. Additional issues regarding the alleged lack of effective remedy for some of the accused products (a related issue also raised by respondents) is addressed below, or in the Recommended

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[1] Respondents do not bear the burden on the importation issue. Nevertheless, it is noted that in opposing complainants' request for relief, respondents do not allege that their accused chips or other products are made in the United States, and there is no evidence that any of the accused chips or other products are made domestically. Indeed, complainants seek an exclusion order as to all of the accused products, which is by definition only effective against imported products.

Determination on the remedy issue, which will issue separately. Nevertheless, as stated above, it cannot be found that the so-called [ ] chips have been imported inasmuch as [

] infringe a patent claim.

The importation question was already addressed above, and it was found that the importation requirement of section 337 has been satisfied as to all accused devices or products, except with respect to the [ ] chips.

Finally, the question of ownership of the '346 patent, and related questions having to do with its proper assignment and complainants' standing to bring this investigation, are discussed in detail below in section IV, which pertains exclusively to an analysis to the '346 patent. In summary, it is not found that Global Locate and Broadcom lack standing to bring the complaint and to prosecute this investigation, or that this investigation lacks the participation of any necessary party.

Consequently, it is found that the Commission has all forms of jurisdiction necessary to conduct this investigation, and to issue a remedy in the event that a violation of section 337 is found to exist with respect to any accused device or product.

III. General Principles of Patent Law

A. Claim Construction

Pursuant to the Commission's notice of investigation, this is a patent-based investigation. *See* 71 Fed. Reg. 66193 (2006). Accordingly, all of the unfair acts alleged by complainants are instances of alleged infringement of the asserted patents. Any finding of infringement or non-infringement requires a two-step analytical approach. First, the asserted patent claims must

be construed as a matter of law to determine their proper scope.[2] Second, a factual determination must be made as to whether the properly construed claims read on the accused devices. *See Markman v. Westview Instruments, Inc.*, 52 F.3d 967, 976 (Fed. Cir. 1995)(*en banc*), *aff'd*, 517 U.S. 370 (1996).

Claim construction begins with the language of the claims themselves. Claims should be given their ordinary and customary meaning as understood by a person of ordinary skill in the art, viewing the claim terms in the context of the entire patent. *Phillips v. AWH Corp.*, 415 F.3d 1303, 1312-13 (Fed. Cir. 2005), *cert. denied*, 546 U.S. 1170 (2006).[3] With respect to claim preambles, the Court of Appeals for the Federal Circuit has explained that:

> [A] claim preamble has the import that the claim as a whole suggests for it. In other words, when the claim drafter chooses to use both the preamble and the body to define the subject matter of the claimed invention, the invention so defined, and not some other, is the one the patent protects.

Eaton Corp. v. Rockwell Int'l Corp., 323 F.3d 1332, 1339 (Fed. Cir. 2003) (quoting *Bell Communications Research, Inc. v. Vitalink Communications Corp.*, 55 F.3d 615, 620 (Fed. Cir. 1995)).

In some instances, claim terms do not have particular meaning in a field of art, and claim

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[2] Only those claim terms that are in controversy need to be construed, and only to the extent necessary to resolve the controversy. *Vanderlande Indus. Nederland BV v. Int'l Trade Comm.*, 366 F.3d 1311, 1323 (Fed. Cir. 2004); *Vivid Tech., Inc. v. American Sci. & Eng'g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999).

[3] Factors that may be considered when determining the level of ordinary skill in the art include: "(1) the educational level of the inventor; (2) type of problems encountered in the art; (3) prior art solutions to those problems; (4) rapidity with which innovations are made; (5) sophistication of the technology; and (6) educational level of active workers in the field." *Environmental Designs, Ltd. v. Union Oil Co.*, 713 F.2d 693, 696 (Fed. Cir, 1983), *cert. denied*, 464 U.S. 1043 (1984).

construction involves little more than the application of the widely accepted meaning of commonly understood words. *Phillips*, 415 F.3d at 1314. In such circumstances, general purpose dictionaries may be helpful. In many cases, claim terms have a specialized meaning, and it is necessary to determine what a person of skill in the art would have understood disputed claim language to mean, by analyzing the words of the claims themselves, the remainder of the specification, the prosecution history, and extrinsic evidence concerning relevant scientific principles, as well as the meaning of technical terms, and the state of the art. *Id.* (quoting *Innova/Pure Water, Inc. v. Safari Water Filtration Sys., Inc.*, 381 F.3d 1111, 1116 (Fed. Cir. 2004)).

In cases in which the meaning of a claim term is uncertain, the specification usually is the best guide to the meaning of the term. *Id.* at 1315. As a general rule, the particular examples or embodiments discussed in the specification are not to be read into the claims as limitations. *Markman*, 52 F.3d at 979. However, the specification is always highly relevant to the claim construction analysis. The specification is usually dispositive. It is the single best guide to the meaning of a disputed term. *Phillips*, 415 F.3d at 1315. Moreover, "[t]he construction that stays true to the claim language and most naturally aligns with the patent's description of the invention will be, in the end, the correct construction." *Id.* at 1316.

In any event, claims are not necessarily, and are not usually, limited in scope to the preferred embodiment. *RF Delaware, Inc. v. Pacific Keystone Techs., Inc.*, 326 F.3d 1255, 1263 (Fed. Cir. 2003); *Decisioning.com, Inc, v. Federated Dep't Stores, Inc.*, 527 F.3d 1300, 1314 (Fed. Cir. May 7, 2008) ("[The] description of a preferred embodiment, in the absence of a clear intention to limit claim scope, is an insufficient basis on which to narrow the claims").

Furthermore, claim interpretations that exclude the preferred embodiment, are "rarely, if ever, correct and require highly persuasive evidentiary support." *Vitronics Corp. v. Conceptronic, Inc.*, 90 F.3d 1576, 1583, 39 USPQ2d 1573, 1578 (Fed. Cir. 1996). Such a conclusion can be mandated in rare instances by clear intrinsic evidence, such as unambiguous claim language or a clear disclaimer by the patentees during patent prosecution. *Elekta Instrument v. O.U.R. Sci. Int'l*, 214 F.3d 1302, 1308 (Fed. Cir. 2000); *Rheox, Inc. v. Entact, Inc.*, 276 F.3d 1319 (Fed. Cir. 2002).

If the intrinsic evidence does not establish the meaning of a claim, then extrinsic evidence may be considered. Extrinsic evidence consists of all evidence external to the patent and the prosecution history, including inventor testimony, expert testimony and learned treatises. *Id.* at 1317. Inventor testimony can be useful to shed light on the relevant art. In evaluating expert testimony, a court should discount any expert testimony that is clearly at odds with the claim construction mandated by the claims themselves, the written description, and the prosecution history, in other words, with the written record of the patent. *Id.* at 1318. Extrinsic evidence may be considered if a court deems it helpful in determining the true meaning of language used in the patent claims. *Id.*

B. <u>Patent Infringement</u>

Under 35 U.S.C. §271(a), direct infringement consists of making, using, offering to sell, or selling a patented invention without consent of the patent owner.

Under 35 U.S.C. §271(b), "[w]hoever actively induces infringement of a patent shall be liable as an infringer." To establish liability, a patentee must prove direct infringement for each instance of indirect infringement. *DSU Medical Corp. v. JMS Co.*, 471 F.3d 1293, 1303 (Fed. Cir. 2006). "In order to succeed on a claim of inducement, the patentee must show, first that there has

been direct infringement, and second, that the alleged infringer knowingly induced infringement and possessed specific intent to encourage another's infringement." *Cross Medical Products, Inc. v. Medtronic Sofamor Danek, Inc.*, 424 F.3d 1293, 1312 (Fed. Cir. 2005).

Under 35 U.S.C. §271(c), "[w]hoever offers to sell or sells within the United States or imports into the United States a component of a patented machine, manufacture, combination, or composition, or a material or apparatus for use in practicing a patented process, constituting a material part of the invention, knowing the same to be specially made to or specially adapted for use in the infringement of the patent, and not a staple article or commodity suitable for substantial non-infringing use, shall be liable as a contributory infringer."

A seller of a component of an infringing product can also be held liable for contributory infringement if: (1) there is an act of direct infringement by another person; (2) the accused contributory infringer knows its component is included in a combination that is both patented and infringing; and (3) there are no substantial non-infringing uses for the accused component, *i.e.*, the component is not a staple article of commerce. *Carborundum Co. v. Molten Equip. Innovations, Inc.*, 72 F.3d 872, 876 (Fed. Cir. 1995).

In a section 337 investigation, the complainant bears the burden of proving infringement of the asserted patent claims by a preponderance of the evidence. *Certain Flooring Products*, Inv. No. 337-TA-443, Commission Notice of Final Determination of No Violation of Section 337, 2002 WL 448690 at 59, (March 22, 2002); *Enercon GmbH v. Int'l Trade Comm'n,* 151 F.3d 1376 (Fed. Cir. 1998).

Each patent claim element or limitation is considered material and essential. *London v. Carson Pirie Scott & Co.*, 946 F.2d 1534, 1538 (Fed. Cir. 1991). Literal infringement of a claim

occurs when every limitation recited in the claim appears in the accused device, *i.e.,* when the properly construed claim reads on the accused device exactly. *Amhil Enters., Ltd. v. Wawa, Inc.*, 81 F.3d 1554, 1562 (Fed. Cir. 1996); *Southwall Tech. v. Cardinal IG Co.*, 54 F.3d 1570, 1575 (Fed Cir. 1995).

If the accused product does not literally infringe the patent claim, infringement might be found under the doctrine of equivalents. The Supreme Court has described the essential inquiry of the doctrine of equivalents analysis in terms of whether the accused product or process contains elements identical or equivalent to each claimed element of the patented invention. *Warner-Jenkinson Co., Inc. v. Hilton Davis Chemical Co.*, 520 U.S. 17, 40 (1997).

Under the doctrine of equivalents, infringement may be found if the accused product or process performs substantially the same function in substantially the same way to obtain substantially the same result. *Valmont Indus., Inc. v. Reinke Mfg. Co.,* 983 F.2d 1039, 1043 (Fed. Cir. 1993). The doctrine of equivalents does not allow claim limitations to be ignored. Evidence must be presented on a limitation-by-limitation basis, and not for the invention as a whole. *Warner-Jenkinson*, 520 U.S. at 29; *Hughes Aircraft Co. v. U.S.*, 86 F.3d 1566 (Fed. Cir. 1996). Thus, if an element is missing or not satisfied, infringement cannot be found under the doctrine of equivalents as a matter of law. *See, e.g.*, *Wright Medical*, 122 F.3d 1440, 1444 (Fed. Cir. 1997); *Dolly, Inc. v. Spalding & Evenflo Cos., Inc.*, 16 F.3d 394, 398 (Fed. Cir. 1994); *London v. Carson Pirie Scott & Co.*, 946 F.2d 1534, 1538-39 (Fed. Cir. 1991); *Becton Dickinson and Co. v. C.R. Bard, Inc.*, 922 F.2d 792, 798 (Fed. Cir. 1990).

The concept of equivalency cannot embrace a structure that is specifically excluded from the scope of the claims. *Athletic Alternatives v. Prince Mfg., Inc.*, 73 F.3d 1573, 1581 (Fed. Cir.

1996). In applying the doctrine of equivalents, the Commission must be informed by the fundamental principle that a patent's claims define the limits of its protection. *See Charles Greiner & Co. v. Mari-Med. Mfg., Inc.*, 92 F.2d 1031, 1036 (Fed. Cir. 1992). As the Supreme Court has affirmed:

> Each element contained in a patent claim is deemed material to defining the scope of the patented invention, and thus the doctrine of equivalents must be applied to individual elements of the claim, not to the invention as a whole. It is important to ensure that the application of the doctrine, even as to an individual element, is not allowed such broad play as to effectively eliminate that element in its entirety.

Warner-Jenkinson, 520 U.S. at 29.

Prosecution history estoppel may bar the patentee from asserting equivalents if the scope of the claims has been narrowed by amendment during prosecution. A narrowing amendment may occur when either a preexisting claim limitation is narrowed by amendment, or a new claim limitation is added by amendment. These decisions make no distinction between the narrowing of a preexisting limitation and the addition of a new limitation. Either amendment will give rise to a presumptive estoppel if made for a reason related to patentability. *Honeywell Int'l Inc. v. Hamilton Sundstrand Corp.*, 370 F.3d 1131, 1139-41 (Fed. Cir. 2004), *cert. denied*, 545 U.S. 1127 (2005)(citing *Warner-Jenkinson*, 520 U.S. at 22, 33-34; and *Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co.,* 535 U.S. 722, 733-34, 741 (2002)). The presumption of estoppel may be rebutted if the patentee can demonstrate that: (1) the alleged equivalent would have been unforeseeable at the time the narrowing amendment was made; (2) the rationale underlying the narrowing amendment bore no more than a tangential relation to the equivalent at issue; or (3) there was some other reason suggesting that the patentee could not reasonably have been expected

to have described the alleged equivalent. *Honeywell*, 370 F.3d at 1140 (citing, *inter alia*, *Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co.,* 344 F.3d 1359 (Fed. Cir. 2003)(*en banc*)).

C. Validity

One cannot be held liable for practicing an invalid patent claim. *See Pandrol USA, LP v. AirBoss Railway Prods., Inc.*, 320 F.3d 1354, 1365 (Fed. Cir. 2003). However, the claims of a patent are presumed to be valid. 35 U.S.C. § 282; *DMI Inc. v. Deere & Co.*, 802 F.2d 421 (Fed. Cir. 1986). Although a complainant has the burden of proving a violation of section 337, it can rely on this presumption of validity. A respondent that has raised patent invalidity as an affirmative defense must overcome the presumption by "clear and convincing" evidence of invalidity. *Checkpoint Systems, Inc. v. United States Int'l Trade Comm'n*, 54 F.3d 756, 761 (Fed. Cir. 1995).

1. Anticipation

Pursuant to 35 U.S.C. § 102, prior art anticipates a patent claim when a single piece of art discloses each and every limitation of the claimed invention. *See Schering Corp. v. Geneva Pharms.*, 339 F.3d 1373, 1377 (Fed. Cir. 2003); *C.R. Bard v. M3 Sys.*, 157 F.3d 1340, 1349 (Fed. Cir. 2000).

The disclosure by an invalidating reference need not be express, but may anticipate by inherency where such inherency would be appreciated by one of ordinary skill in the art. *EMI Group North America, Inc. v. Cypress Semiconductor Corp.*, 268 F.3d 1342, 1350 (Fed. Cir. 2001). Anticipation does not require that the reference "teach" the subject matter of the patent. It is necessary only that the claims being challenged "read on" something that is disclosed in the reference. *Celeritas Techs., Ltd. v. Rockwell Int'l*, 150 F.3d 1354, 1361 (Fed. Cir. 1998).

Anticipation, like all forms of patent invalidity, must be established by clear and convincing evidence. *Glaxo Inc. v. Novopharm Ltd.*, 52 F.3d 1043, 1047 (Fed. Cir. 1995). Whether a patent claim is anticipated is a question of fact. *See Smith Kline Beecham Corp. v. Apotex Corp.* 403 F.3d 1331, 1343 (Fed. Cir. 2005).

2. <u>Obviousness</u>

Obviousness is grounded in 35 U.S.C. § 103, which provides, *inter alia*, that:

> A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

35 U.S.C. § 103(a).

An allegation of obviousness is evaluated under the so-called *Graham* factors: (1) the scope and content of the prior art; (2) the differences between the prior art and the claims at issue; (3) the level of ordinary skill in the art; and (4) objective evidence, so-called "secondary considerations," *e.g.*, commercial success, long felt need, and failure of others of nonobviousness. *See Graham v. John Deere Co.*, 383 U.S. 1, 13-17 (1966); *Dystar Textilfarben GmbH v. C.H. Patrick Co.*, 464 F.3d 1356, 1361 (Fed. Cir. 2006).

"Thus evidence arising out of the so-called 'secondary considerations' must always when present be considered en route to a determination of obviousness." *Stratoflex, Inc. v. Aeroquip Corp.*, 713 F.2d 1530, 1536 (Fed. Cir. 1983). Secondary considerations, such as commercial success, will not always dislodge a determination of obviousness based on analysis of the prior art. *See KSR Int'l Co. v. Teleflex Inc.*, No. 04-1350, ___ U.S. ___ , 127 S.Ct. 1727, 1745 (2007)

(commercial success did not alter conclusion of obviousness).

"One of the ways in which a patent's subject matter can be proved obvious is by noting that there existed at the time of invention a known problem for which there was an obvious solution encompassed by the patent's claims." *KSR Int'l,* 127 S.Ct. at 1742. "[A]ny need or problem known in the field of endeavor at the time of invention and addressed by the patent can provide a reason for combining the elements in the manner claimed." *Id.*

Specific teachings, suggestions or motivations to combine prior art may provide helpful insights into the state of the art at the time of alleged invention. *Id.* at 1741. Nevertheless, "an obviousness analysis cannot be confined by a formalistic conception of the words teaching, suggestion, and motivation, or by overemphasis on the importance of published articles and the explicit content of issued patents. The diversity of inventive pursuits and of modern technology counsels against limiting the analysis in this way." *Id.* "Under the correct analysis, any need or problem known in the field of endeavor at the time of invention and addressed by the patent can provide a reason for combining the elements in the manner claimed." *Id.* at 1742. A "person of ordinary skill is also a person of ordinary creativity . . . ." *Id.*

The Federal Circuit has harmonized the *KSR* opinion with many prior circuit court opinions by holding that when a patent challenger contends that a patent is invalid for obviousness based on a combination of prior art references, "the burden falls on the patent challenger to show by clear and convincing evidence that a person of ordinary skill in the art would have had reason to attempt to make the composition or device, or carry out the claimed process, and would have had a reasonable expectation of success in doing so. *PharmaStem Therapeutics, Inc. v. ViaCell, Inc.*, 491 F.3d 1342, 1360 (Fed. Cir. 2007)(citing *Medichem S.A. v. Rolabo S.L.,* 437 F.3d 1175,

1164 (Fed. Cir. 2006)); *Noelle v. Lederman,* 355 F.3d 1343, 1351-52 (Fed. Cir. 2004); *Brown & Williamson Tobacco Corp. v. Philip Morris, Inc.,* 229 F.3d 1120, 1121 (Fed .Cir. 2000) and *KSR,* 127 S.Ct. at 1740 ("a combination of elements 'must do more than yield a predictable result'; combining elements that work together 'in an unexpected and fruitful manner' would not have been obvious").

The ultimate determination of whether an invention would have been obvious is a legal conclusion based on underlying findings of fact. *In re Dembiczak*, 175 F.3d 994, 998 (Fed. Cir. 1999).

3. The Section 112 Enablement Requirement

The enablement requirement of section 112 of the Patent Act ensures that the inventor provides sufficient information about the claimed invention in a patent so that one of ordinary skill in the art at the time could make and use the claimed invention without undue experimentation. Failure to do so leads to patent invalidity. *See* 35 U.S.C. § 112, ¶ 1; *PPG Indus., Inc. v. Guardian Indus. Corp.*, 75 F.3d 1558, 1563 (Fed. Cir. 1996).

4. Indefiniteness Under Section 112

The definiteness requirement of 35 U.S.C. § 112 ensures that the patent claims particularly point out and distinctly claim the subject matter that the patentee regards to be the invention. *See* 35 U.S.C. § 112, ¶ 2; *Metabolite Labs., Inc. v. Laboratory Corp. of America Holdings*, 370 F.3d 1354, 1366 (Fed. Cir. 2004). If a claim's legal scope is not clear enough that a person of ordinary skill in the art could determine whether a particular product infringes or not, it is indefinite and invalid. *Geneva Pharm., Inc. v. GlaxoSmithKline PLC*, 349 F.3d 1373, 1384 (Fed. Cir. 2003). It has been found that:

> When a proposed construction requires that an artisan make a separate infringement determination for every set of circumstances in which the composition may be used, and when such determinations are likely to result in differing outcomes (sometimes infringing and sometimes not), that construction is likely to be indefinite.

Halliburton Energy Servs. v. M-I LLC, 514 F.3d 1244, 1255 (Fed. Cir. 2008).

5. <u>Patentable Subject Matter: 35 U.S.C. § 101</u>

Section 101 of the Patent Act provides: "Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefore, subject to the conditions and requirements of this title." 35 U.S.C. §101. One may allege that a patent claim is invalid because it purports to cover something that is not patentable under the statute. However, the Federal Circuit reiterated last year that patentable subject matter under the current Act is "extremely broad." *See In re Comiskey*, 499 F.3d 1365, 1375 (Fed. Cir. 2007).

Of particular importance to respondents' section 101 arguments in this investigation is the fact that the Supreme Court has held that a mere mathematical formula, even if novel and useful, is not patentable subject matter. *Parker v. Flook*, 437 U.S. 584, 585 (1978). Indeed, a mathematical algorithm is not patentable to the extent that it presents "merely abstract ideas." *State Street Bank & Trust Co. v. Signature Financial Group*, 149 F.3d 1368, 1373 (Fed. Cir. 1998). Nevertheless, a patent claim that transforms data and presents a practical application of the algorithm is patentable if it produces a "useful, concrete and tangible result." *Id.* Moreover, "a process claim reciting an algorithm could state statutory subject matter if it (1) is tied to a machine or (2) creates or involves a composition of matter or manufacture." *Comiskey*, 499 F.3d at 1377. For example, the Federal Circuit has "found processes involving mathematical algorithms used in

computer technology patentable because they claimed practical applications and were tied to specific machines." *Id.*

D. <u>Inequitable Conduct</u>

Applicants for patents have a duty to prosecute patents in the U.S. Patent and Trademark Office ("PTO") with candor and good faith, which includes a duty to disclose information known to the applicants to be material to patentability. *Pharmacia Corp. v. Par Pharm, Inc.*, 417 F.3d 1369, 373 (Fed. Cir. 2005). A breach of this duty may render the patent that issues unenforceable for inequitable conduct. *Cargill, Inc. v. Canbra Foods, Ltd.*, 476 F.3d 1359, 1363 (Fed. Cir. 2007).

Thus, a patent is unenforceable if the patentee withheld material information with an intent to deceive or mislead the PTO. *See Purdue Pharma L.P. v. Endo Pharms., Inc.*, 438 F.3d 1123, 1128 (Fed. Cir. 2006). Intent is a subjective inquiry based on all the evidence, including evidence of good faith. *See Kingsdown Med. Consultants, Ltd. v. Hollister, Inc.*, 863 F.2d 867, 876 (Fed. Cir. 1988) (en banc in relevant part). A finding of deceptive intent requires clear and convincing evidence. *See Northern Telecom, Inc. v. Datapoint Corp.*, 908 F.2d 931, 939 (Fed. Cir. 1990). "[G]eneralized allegations lack the particularity required to meet the threshold level of deceptive intent necessary for a finding of inequitable conduct." *Sanofi-Synthelabo v. Apotex, Inc.* 470 F.3d 1368, 1381 (Fed. Cir. 2006). Indeed, an intent to deceive, "cannot be 'inferred solely from the fact that information was not disclosed; there must be a factual basis for a finding of deceptive intent'." *Purdue Pharma, L.P.*, 438 F.3d at 1134 (quoting *Hebert v. Lisle Corp.*, 99 F.3d 1109, 1116 (Fed. Cir. 1996)).

In determining whether there has been inequitable conduct, a court (1) determines whether the withheld information meets a threshold level of materiality and whether the applicant's conduct at issue meets a threshold level of intent to deceive, and (2) weighs the materiality and intent in light of the circumstances to determine whether the applicant's conduct is so culpable that the patent should be held unenforceable. *Cargill*, 476 F.3d at 1363.

IV. U.S. Patent No. 6,606,346 ("the '346 Patent")

A. Global Locate's Standing

According to the first page of United States Patent No. 6,606,346, entitled "Method and Apparatus for Computing Signal Correlation," it issued to Charles Abraham and Donald L. Fuchs, on August 12, 2003, based on an application filed on May 18, 2001, and was assigned to Global Locate, Inc. *See* JX-2 ('346 patent). Thus, on the face of the evidence, Global Locate owns the '346 patent, and has standing to bring that portion of the complaint and investigation addressing the patent.

Respondents argue that a closer examination of the facts shows that Global Locate is at best only a co-owner of the '346 patent, and that complainants have failed to establish that by themselves they have sufficient standing to bring a complaint with respect to the '346 patent. *See* Resp. Br. at 28-32 (citing *Lujan v. Defenders of Wildlife*, 504 U.S. 555, 561 (1992) (the issue of standing is an indispensable part of a plaintiff's case)); Resp. Reply at 6-7. Thus, respondents argue, this investigation must be terminated as to the '346 patent for lack of jurisdiction. *See* Resp. Br. at 28, 32-33 (citing *Rite-Hite Corp. v. Kelley Co.*, 56 F.3d 1538, 1551 (Fed. Cir. 1995) (*en banc*) (lack of standing raises a question of jurisdiction)).

In particular, respondents argue that when one of the named inventors on the '346 patent,

Charles Abraham, conceived of his invention in 1999, he worked at the Magellan Corporation ("Magellan"), and that his employment was subject to a prior written agreement whereby [

] Although Abraham left Magellan to work for Global Locate, where he subsequently applied for the '346 patent, it is argued that no assignment of Abraham's work that led to the patent was ever made by Magellan to Global Locate. Respondents further argue that to this day, despite a settlement of trade secret litigation between Magellan and Global Locate that pre-dates the application for the '346 patent, Abraham's contribution to the patent has never been assigned to Global Locate. Thus, respondents submit that without the joinder of Magellan to this investigation, the current complainants (Global Locate and Broadcom) lack standing to bring this investigation or otherwise sue under the '346 patent. *See* Resp. Br. at 28-33.

It must be observed that respondents' arguments concerning the conception and ownership of the '346 patent and its claimed invention are not consistent. For example, in certain parts of respondents' briefs, they plainly argue that Abraham conceived of the claimed invention while at Magellan. *See, e.g.,* Resp. Br. at 28 (section heading "Charles Abraham Assigned the '346 Invention to Magellan"), 30 [

] Yet, in other instances, respondents argue in a different manner so as to suggest that Abraham had no role in the development of the claimed invention. *See, e.g., Id.* at 28 ("If, as Global Locate claims, Charles Abraham conceived the invention claimed in the '346 patent in October 1999 . . . ."). Indeed, in other portions of their brief, respondents argue that Abraham did not conceive of the claimed invention at all, but that he stole the invention (which they also argue is not a genuine

invention but is invalid) from yet another Magellan employee, and that Abraham subsequently obtained the '346 patent through the destruction of evidence, intentional deception and fraud. *See Id.* at 254-260. The question of fraud on the Patent Office is discussed in a separate section of the Initial Determination on the question of inequitable conduct. As will be seen in detail below, whether Abraham or another Magellan employee conceived of the '346 patent's invention is immaterial to the outcome of the ownership and jurisdictional question.

Complainants address respondents' allegations concerning ownership of the '346 patent in their reply brief, with the assumption that Charles Abraham is a co-inventor of the patent. They address the alleged fraud issue in other portions of their briefs. Complainants submit that contrary to respondents' arguments, the prior litigation involving Magellan did indeed resolve the question of whether or not Global Locate could apply for the '346 patent. In addition, complainants argue that Magellan never claimed ownership of the '346 patent when the application was filed in 2001; when the patent issued in 2003; when Broadcom acquired Global Locate in 2007; or when Magellan was subpoenaed by both the SiRF respondents and Global Locate in this investigation. *See* Compl. Reply at 26-27.

The Staff anticipated (undoubtedly based on prior events and arguments) that the issue of alleged co-ownership by Magellan would be raised by respondents in connection with their inequitable conduct arguments. Thus, the Staff briefed this issue in connection with, and in a manner appropriate to, the question of inequitable conduct. In any event, it is clear from the Staff's arguments and citations to the record that it does not believe that possible Magellan ownership should be at issue in view of the litigation settlement between Magellan and Global

Locate. The Staff also notes that Magellan has never asserted ownership over any right to the '346 patent. *See* Staff Br. at 28-29.

Complainants do not contest the fact that any conception of the claimed invention by Charles Abraham would have taken place in 1999 while he was employed by Magellan. Indeed, complainants rely on an October 1999 conception and spring 2000 reduction to practice in connection with their arguments relating to the validity of the '346 patent, and set forth evidence to that effect. *See, e.g.,* Compl. Reply at 23-25 ("The Asserted Claims of the '346 Patent Were Conceived by October 1999 and Reduced to Practice by June 2000"). Yet, with respect to the alleged [ ] and Magellan's current ownership (or lack of ownership) of the invention, the parties' arguments cannot be reconciled. Complainants and the Staff do, however, make compelling arguments that are dispositive of the issue. In short, the claimed invention is owned by Global Locate.

In that regard, when determining whether or not Global Locate owns the '346 patent, it is significant that Magellan has never sought to exercise ownership over the patent, even given the public issuance of the patent (in a field doubtlessly monitored by Magellan), or moreover, when Magellan was later subpoenaed in connection with ITC litigation involving the '346 patent.

Additionally, it was shown during the hearing testimony of Mr. Abraham, as a result of questioning by both respondents' and complainants' counsel, that while at Magellan he disseminated information within the company pertaining to the work that he would later use as a basis for the claims of the '346 patent that are asserted in this investigation. *See* Abraham Tr. 3175-3180, 3200-3204; CX-74C (October 14, 1999 email); CX-103C (PowerPoint at Magellan); *see also* Braasch Tr. 3344-3350 (expert testimony concerning Abraham's email and

presentations at Magellan). It is, therefore, reasonable to conclude that Magellan knew of Abraham's relevant ideas during its litigation with Global Locate.

Moreover, to determine whether or not Magellan claimed ownership of the intellectual property that led to the '346 patent all parties rely on the settlement document that was produced as a consequence of the Magellan litigation. All parties focus on the same language of the settlement agreement, but respondents ascribe to it a meaning that is different from that ascribed by complainants and the Staff.

The Magellan settlement provides in pertinent part:

[

]

CX-23C (Magellan Settlement Agreement) at GL-602-97130-31 (cited in Resp. Br. at 31; respondents' emphasis).

The plain settlement language quoted above indicates that in settling the litigation with Magellan, Global Locate and Magellan agreed that [

] As detailed below in connection with claim construction and infringement, this is the technology involved in the asserted claims of the '346 patent. In fact, all parties treat this portion of the agreement as relating to the claimed invention of the '346 patent. *See* Resp. Br. at 31; Compl. Reply at 27;

Staff Br. at 28; *see also,* Abraham Tr. 3210-3211 (concerning the settlement agreement; [

]

Consequently, based on the foregoing evidence, it is found that Global Locate owns the asserted claims of the '346 patent, and has standing to bring before the Commission its dispute with respondents concerning the asserted claims of the '346 patent.

B. <u>Inequitable Conduct</u>

Respondents argue that the '346 patent is unenforceable due to inequitable conduct by Global Locate in its prosecution of the patent before the PTO. In particular, respondents allege that Global Locate "deceived the Patent Office about the true inventor" and that "Global Locate stole the invention from Magellan." Respondents argue that the true inventor (of an invention they otherwise argue is not even patentable) is Yi-Hsiu Wang, an engineer and subordinate of Charles Abraham when he worked at Magellan. Respondents also allege that Abraham instructed Wang to destroy all evidence of Mr. Wang's work on the invention. *See* Resp. Br. at 254-260; Resp. Reply at 7, 62-63.

Complainants contend that respondents' arguments are due little credence because without presenting any live hearing testimony of Mr. Wang, or any expert testimony on the subject, respondents rely primarily on deposition testimony and a supposed re-creation of Wang's work that was prepared for, but never filed in, the prior Magellan litigation. Moreover, complainants argue that the claims of the '346 patent were in fact invented by the named inventors, Charles Abraham and Don Fuchs. *See* Compl. Br. at 77-79; Compl. Reply at 25-26.

The Staff agrees with Global Locate and also argues that respondents have failed to meet their burden of proof to show that Wang is the true inventor of the '346 patent. *See* Staff Br.

at 28.

Indeed, the evidence presented by respondents is meager, unclear and not sufficiently reliable to carry the heavy burden of showing that the '346 patent is unenforceable. The deposition testimony of Mr. Wang is based, as one might anticipate, on a series of leading questions. *See, e.g.,* JX110C-(Wang Tr.) at 54-62. Respondents rely upon, and duplicated in their brief, a series of detailed questions to which Wang merely responded "correct." *See* Resp. Br. at 256-257 (quoting JX-110-3C (Wang Tr.) at 54-55).

Wang's testimony, as presented by respondents, also appears to be inconsistent with an alleged admission to a colleague, Robert Lorenz, that Charles Abraham was in fact the inventor. *See* JX-60C (Lorenz Tr.)(attached to JX-111-3C) at 132. That admission is itself contained within deposition testimony taken specifically to address the question of inequitable conduct, and not subject to scrutiny at the hearing.

The documentary evidence is, as argued by complainants, a sort of re-creation of supposed work that was never filed in the prior Magellan litigation. It also sets the date of Wang's work [ ] relied upon by respondents in connection with their jurisdictional argument that Abraham had actually assigned his invention to Magellan rather than to Global Locate. *See* RX-238C (Wang Decl.); JX-110-3C (Wang Tr.) at 86-89 and 129-131 (testifying to the [ ]date, and later recanting it); *see also,* Braasch Tr. 3344-3350 (expert testimony analyzing the [ ] work of Abraham while at Magellan) (discussed further below in connection with the question of prior art and patent validity).

In general, the evidence relied upon by respondents also lacks corroboration. For example,

as noted, respondents argue that Abraham instructed Wang to destroy all evidence of Wang's work. Yet, that argument comes from [ ] and there is no independent evidence that Magellan destroyed any such documentation. Nor was Abraham questioned about such a vital element of respondents' inequitable conduct case when Abraham took the witness stand during the evidentiary hearing in this investigation. Such a failure to question Abraham, given respondents' accusations, is a significant, if not curious, omission.

In summary, respondents have not established by clear and convincing evidence that the '346 patent is unenforceable due to fraud or any other sort of inequitable conduct.

C. Claim Construction

The '346 patent is entitled "Method and Apparatus for Computing Signal Correlation," and its claimed invention "relates to signal correlators for digital signal receivers and, more particularly, the invention relates to a method and apparatus for performing signal correlation in, for example, a global positioning system (GPS) receiver." JX-2 ('346 Patent) col. 1, ll. 1-11 (title and "Field of Invention").

The specification of the '346 patent provides a "Description of the Background Art" that summarizes many of the GPS concepts and terms discussed above in section I.B.1. (Technological Background). It also contains background information that is more specific to the claimed invention, and a description of perceived problems in the art (as of the time of the patent application) that the inventors sought to resolve. The specification provides:

> The process of measuring a global positioning system (GPS) signal begins with a procedure to search for the GPS signal in the presence of noise by attempting a series of correlations of the incoming signal against a known pseudo-random noise (PRN) code. The search process can be lengthy, as both the exact frequency of the signal and the time-of-arrival delay are unknown. To find the signal,

receivers traditionally conduct a two dimensional search, checking each delay possibility at every possible frequency. To test for the presence of a signal at a particular frequency and delay, the receiver is tuned to the frequency, and the incoming signal is correlated with the known PRN code delayed by an amount corresponding to the time of arrival. If no signal is detected, the search continues to the next delay possibility, and after all delay possibilities are checked, continues to the next frequency possibility. Each individual correlation is performed over one or more milliseconds in order to allow sufficient signal averaging to distinguish the signal from the noise. Because many thousand frequency and delay possibilities are checked, the overall acquisition process can take tens of seconds.

Recently, new applications of GPS technology in wireless devices have emerged, for example, the use of GPS in cellular phones to provide emergency location capability. In these applications, rapid signal acquisition in just a few seconds is required. Furthermore, these applications require a GPS receiver to operate in harsh signal environments and indoors, where GPS signal levels are greatly attenuated. Detecting attenuated signals requires each correlation to be performed over a relatively long period of time. For example integration may be performed over a few seconds, as opposed to the 1-10 millisecond period used in traditional GPS receivers. The two dimensional sequential search process employed by traditional receivers becomes impractical at such long integration times, because the overall search time increases by a factor of 100 or more.

To accelerate the search process, GPS designers add additional correlators to the receiver so that multiple time of arrival possibilities can be checked simultaneously. Typically, each correlator that is added requires a separate code mixer and signal accumulator. For a given sensitivity level, this decreases search times in proportion to the number of correlators. To achieve the sensitivity and acquisition time demanded in cellular phone applications, the design might have to incorporate thousands of correlators. This addition is typically prohibitively complex and expensive for a consumer class device.

For example, U.S. Pat. No. 5,901,171, issued May 4, 1999, describes a triple multiplexing technique that allows a single time shared processing block to be used to perform up to 20 simultaneous correlations on each of 12 channels. This offers an improvement in performance relative to single correlator designs since blocks of 20 delay possibilities are checked simultaneously. A

full signal search over a full range of delay uncertainties requires using the block of 20 correlators approximately 100 times in succession to check 2046 delays. Thus, if an acquisition must be performed in a few seconds, the integration time is limited to tens of milliseconds. This is insufficient to achieve the sensitivity needed for indoor GPS applications.

To further improve the search process, other GPS receiver architectures include processing capable of generating a convolution between the incoming signal and the known PRN code. This is equivalent to providing a complete set of correlators spanning all time delay possibilities over a full C/A code epoch (1023 chips), and U.S. Pat. No. 5,663,734, issued Sep. 2, 1997, describe fast Fourier transform (FFT) based software techniques to efficiently generate the necessary correlation results using software algorithms. This approach is not suitable for all applications, because a programmable digital signal processor (DSP) is needed to run the software FFT, and a large memory is needed to store unprocessed signal samples. Furthermore, this approach can have a large processing delay due to the software computations and the fact that software processing starts only after a complete snapshot of the signal is stored. In many applications, a real time processing solution is preferred, preferably one that does not involve extensive software processing. Lyusin et al., "Fast Acquisition by Matched Filter Technique for GPS/GLONASS Receivers", pp 307-315 describes hardware approaches to performing the convolution in real time using a matched filter with 1023 taps. The matched filter consists of shift registers large enough to hold a full C/A code epoch, as well as a width 1023 vector multiplier and adder unit that generates the inner product between a full epoch of the signal and the C/A code.

This circuit is complex relative to the constraints of low cost consumer devices such as cellular phones. Other matched filter approaches, such as utilized in military class receivers for P-code acquisition, also incorporate large vector multipliers.

Thus, there is a need for an improved, simple and low cost GPS processing block capable of processing an entire epoch of signal and C/A code. Such a device must be built from hardware of relative simplicity, yet be capable of generating a full convolution, or many parallel correlations, preferably without a large vector multiplier.

JX-2 ('346 Patent), col. 1, l. 13 - col. 2, l. 44.

The '346 patent also provides a "Summary of the Invention," as follows:

> The invention provides a method and apparatus for computing a full convolution between an input signal (e.g., a GPS signal) and a pseudorandom noise (PRN) code reference by generating the convolution result in real time without storing unprocessed signal samples, and without extensive software processing. The apparatus comprises a vector multiplier running at high speed to achieve the same result as a vector multiplier sized to process an entire epoch. The invention can be implemented in an integrated circuit that fits the complexity constraints of a consumer class device such as a cellular phone. The design includes the necessary logic to enable long term averaging of convolution results to ensure high sensitivity. This invention is capable of correlating signals for use in deriving a position location from highly attenuated signals, including signals received indoors.
>
> The complete apparatus consists of a conventional GPS tuner, a decimation circuit, a convolution processor, and RAM blocks that accumulate convolution results. The convolution processor runs at a high clock rate on the order of 100 MHz and higher enabling the computation of a full convolution by repeated use of a small block of circuitry. Specifically, each point of the convolution is decomposed into a series of partial correlations, each of which is generated using a vector multiplier that is sized to process only a portion of an epoch. The apparatus organizes the partial correlations by subdividing the C/A code into a non-overlapping set of code segments. Each partial correlation uses only one code segment at a time, allowing the C/A code to be stored and retrieved efficiently, using a simple lookup table.
>
> The processor begins by decimating input IF[4] samples to create a signal stream at a desired sample rate, where the rate is precisely matched to the timing of the incoming signal. If the desired sample rate is Pf_o (P samples per C/A chip) then the sampling rate is set so that exactly 1023×P samples are taken in each signal epoch. The

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[4] IF stands for "intermediate frequency." *See* JX-2 ('346 patent), col. 3, l. 65 - col. 4, l. 3 (In the preferred embodiment: "Signals (such as GPS signals) are received by an antenna **101**. A radio-frequency-to-intermediate-frequency converter (RF/IF converter) **102** filters, amplifies, and frequency shifts the signal for digitization by an analog-to-digital converter (A/D) **103**. The elements **101**, **102** and **103** are substantially similar to those elements used in a conventional GPS receiver.").

> processor correlates the signal clocking signals through shift registers sized to hold P×K input samples, where K is a factor of 1023. At each signal shift, a series of M partial correlation operations are performed with M chosen such that M×K=1023. Each partial correlation consists of taking the inner product of the contents of the signal shift registers with a block of reference samples created by extending a length K segment of the C/A code to P×K samples. Partial correlation results are accumulated in memory. By accumulating partial correlation results, the processor generates complete correlation results for many correlation points, up to the full convolution.

JX-2 ('346 patent), col. 2, l. 48 - col. 3, l. 28.

Thus, when using the system disclosed in the '346 patent, there is no need to wait to receive a full epoch of signal before beginning correlation. Braasch Tr. 1411. Instead, as the first segment of signal is received, it is correlated with all segments of the stored reference code (representing all possible code offsets). This operation necessarily produces only partial correlation results. Braasch Tr. 1409-1410. Yet, in the time that it takes to perform that operation with the first segment of signal, the second segment of signal arrives and it too is correlated with all segments of the reference code (again representing all possible code offsets). That process continues until all segments of a full epoch of signal have been received and each segment of signal has been compared with all segments of stored reference code. As these "partial correlations" are performed, the partial correlations are summed to produce a plurality of full correlations for multiple code offsets. Braasch Tr. 1409-1411. As a result, in approximately one millionth of a second more than the millisecond it takes to receive an epoch of signal, and after passing the received signal through the correlator only once, the system disclosed in the '346

an RF/IF converter for filtering and frequency translating received GPS signals having a repeating code to form an IF signal;

an analog to digital converter for digitizing the IF signal;

a tuner for removing Doppler shift from the digitized signal and producing an in-phase (I) signal and a quadrature (Q) signal;

a decimation circuit for subsampling the I and Q signals;

a convolution processor for producing I and Q partial correlations by multiplying selected segments of a C/A reference code with portions of said repeating code of each of said subsampled I and Q signals;

a first accumulator for accumulating said I partial correlations to form a plurality of correlations between said I signal and the C/A reference code; and

a second accumulator for accumulating said Q partial correlations to form a plurality of correlations between said Q signal and the C/A reference code.

JX-2 ('346 patent), col. 12, ll. 36-49, 57-59; col. 13, ll. 16-34.

Most of the terms used in the asserted claims are not in dispute. However, the parties dispute the following terms or phrases: (1) "code segment" and a term that the parties treat as related, *i.e.,* "segments of a C/A reference code;" (2) "an inner product;" (3) "a tuner for removing Doppler shift from the digitized signal and producing an in-phase (I) signal and a quadrature (Q) signal;" (4) "a decimation circuit for subsampling the I and Q signals;" and (5) "GPS signals having a repeating code." Each is discussed individually.

"Code Segment"/"Segments of a C/A Reference Code"

Complainants argue that "code segment" (which appears in independent claim 1) and "segments of a C/A reference code" (which appears in independent claim 11) "should be

construed consistent with their plain meaning as 'portion(s) of one cycle (i.e., epoch) of a reference code.'" Compl. Br. at 39.

Referring to the plain claim language, complainants argue that claims 1 and 11 require only that the reference code be divided into segments inasmuch as claim 1 describes "dividing a pseudorandom reference code into a plurality of code segments" for the purpose of performing correlation between segments of reference code and portions of received signal, and claim 11 describes "multiplying selected segments of a C/A reference code with portions of" received signal. It is argued that the claims place no restriction on the size of the segments other than the requirement that they be segments of the reference code. *See Id.* at 39-40.

Complainants also rely on the specification's summary of the invention (quoted in full, above). They argue that the reference code referred to in the claims is the C/A code of the GPS system, and the specification describes dividing an epoch of the C/A code into "non-overlapping" segments. *See Id.* at 40 (quoting col. 3, ll. 3-11 ("Specifically, each point of the convolution is decomposed into a series of partial correlations, each of which is generated using a vector multiplier that is sized to process only ***a portion of an epoch***. The apparatus organizes the partial correlations by ***subdividing the C/A code into a non-overlapping set of code segments***.") (complainants' emphasis); col. 11, ll. 30-35 ("each segment is a separate non-overlapping section of the code"); and Braasch Tr. 1421-1422). Thus, complainants argue, a "segment" is "a portion," as that word is understood in ordinary use even outside the GPS art. *See Id.* (citing CX-246 (American Heritage Dictionary) at 1634 (defining "segment" as "[a]ny of the parts into which something can be divided" or "[t]he portion of a line between any two points on the line."); Braasch Tr. 1420-1421).

Finally, complainants also contrast the language of the asserted claims with that of unasserted dependent claim 3, which is presumed to have a narrower scope than independent claim 1, and which specifically refers to the use of sets of reference code that are "an integer times a factor of 1023."[6] Thus, complainants argue, under the doctrine of claim differentiation, the term "code segment" should not be limited to "an integer times a factor of 1023" or "an integer factor . . . of the epoch length." *See* Compl. Br. at 42 (citing claim 3, and the testimony of complainants' and respondents' expert witnesses).

Respondents state that the parties do not dispute that "a C/A reference code" refers to the coarse acquisition code broadcast by the GPS satellites, and correctly point out that the only issue to be decided is the proper construction of a code "segment." In that regard, respondents argue in their post-hearing brief that a segment is "a portion that is an integer factor of the full block length or epoch length (e.g. 1023 in the case of the GPS C/A code)." Resp. Br. at 221.[7]

To support their argument that "each segment must be of equal length (K)," respondents turn primarily to two examples from the "Detailed Description" portion of the specification,[8] and

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[6] Claim 3 of the '346 patent provides: "The method of claim **1** where a size of said set of digital signal samples and a size of said set of pseudorandom reference code is an integer times a factor of 1023." JX-2 ('346 patent), col. 12, ll. 54-56.

[7] Respondents' previous positions taken in this investigation with respect to this claim term are summarized in complainants' brief. *See* Compl. Br. at 39.

[8] The "Detailed Description" portion of the specification sets forth the preferred embodiment or embodiments of the claimed invention. Indeed, the section ends with a proviso found in many "embodiments" portions of patents specifications, which in this case reads: "Although various embodiments which incorporate the teachings of the present invention have been shown and described in detail herein, those skilled in the art can readily devise many other varied embodiments that still incorporate these teachings." *See* JX-2 ('346 patent), col. 12, ll. 31-34.

the related testimony of their expert witness, in which each segment is of equal length. *See* Resp. Br. at 221-222 (quoting JX-2 ('346 patent), col. 10, ll. 54-55 ("As described, the invention requires that the code be factored into M segments of length K."), col. 9, ll. 23-29). Respondents argue with respect to unasserted claim 3 that the dependent claim confirms that each segment must of equal length, and narrows claim 1 "by limiting the size of the set of pseudorandom and reference codes to an integer times a factor of 1023." Thus, respondents argue, the limitation added by claim 3 is not the fact that the segments are of equal length, but rather "that the set of codes be of length 1023." *See Id.* at 222.

The Staff argues that the terms at issue should be given their plain and ordinary meaning, and further that complainants' proposed construction is reasonable. *See* Staff Br. at 22-23.

As indicated above, the portions of the '346 patent specification relied upon by respondents pertain to the preferred embodiment. No party disputes the fact that the plain language of the specification which discloses the preferred embodiment uses code segments of equal length (K). However, an examination of the specification at the portions relied upon by respondents shows no language to indicate that this feature of the preferred embodiment must be used in every embodiment of the claimed invention. Further, respondents have cited no expert testimony or other evidence to indicate why the claimed invention would have to be implemented only with code segments of equal length. Thus, there is need to take the extraordinary step of reading a limitation of the preferred embodiment into the entire claimed invention.

In fact, in portions of general application located in the "Summary of the Invention," the specification describes the code segments in way that allows for code segments of different lengths, and nothing that would require a segment to be a portion that is an integer factor of the

full block length. *See* JX-2 ('346 patent), col. 3, ll. 3-11 ("Specifically, each point of the convolution is decomposed into a series of partial correlations, each of which is generated using a vector multiplier that is sized to process only a portion of an epoch. The apparatus organizes the partial correlations by subdividing the C/A code into a non-overlapping set of code segments. Each partial correlation uses only one code segment at a time, allowing the C/A code to be stored and retrieved efficiently, using a simple lookup table"); col. 11, ll. 30-35 ("each segment is a separate non-overlapping section of the code"). In harmony with the summary of the invention contained in the specification, there is nothing in the language of the asserted claims to support respondents' arguments.

Each party also makes claim differentiation arguments with respect to unasserted claim 3, and complainants extend their arguments also to unasserted claim 4. *See* Compl. Reply at 7. Claim differentiation is "not a hard and fast rule of construction." *Kraft Foods, Inc. v. Int'l Trading Co.,* 203 F.3d 1362, 1368 (Fed. Cir. 2000). However, an independent claim is normally expected to be broader than its dependent claims. The independent claim is not expected to require the limitations added in the dependent claims. *Dow Chem. v. United States,* 226 F.3d 1334, 1341-1342 (Fed. Cir. 2000) (applying the doctrine of claim differentiation and concluding that an independent claim should be given broader scope than a dependent claim to avoid rendering the dependent claim redundant).

All parties agree that claim 3 adds a limitation to claim 1 concerning the length of a code segment. However, respondents' argument to the effect that even without claim 3, a segment would have to be a portion that is an integer factor of the full block length is strained because if that were the case, much of the language of claim 3 would be superfluous, and also because there

is nothing in independent claim 1 (from which claim 3 depends) to limit the length of the code segments in that way.[9]

Accordingly, it is found that a "segment" as used in the asserted claims refers to a portion of one cycle (*i.e.,* epoch) of a reference code.

"An Inner Product"

Claim 1 of the '346 patent (from which asserted claim 4 depends) provides in its third enumerated limitation: "(c) forming an inner product between said selected code segment and a portion of said repeating code of said digital signal to produce a partial correlation." JX-2 ('346 patent), col. 12, ll, 42-44.

Complainants argue that the term "inner product" "should be construed consistent with its ordinary meaning as 'the value obtained by multiplying corresponding elements of sets of values and summing the results.'" Complainants' Br. at 44 (citing Braasch Tr. 1444).

They argue that in a general sense, an inner product between two respective sets of ones and zeroes, for instance, involves multiplying the respective ones and zeroes and then summing the results as shown below:

1	0	1	0	0	1
1	1	1	0	1	1

$= 1 \times 1 + 0 \times 1 + 1 \times 1 + 0 \times 0 + 0 \times 1 + 1 \times 1 = 3$

Complainants further argue that the specification confirms that the claims use the term "inner product" in a manner consistent with its ordinary meaning. They rely on a portion of the

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[9] It is expected that respondents would find portions of the specification that support the limitation of claim 3. *See* Resp. Br. at 221-222. However, the description of a particular embodiment in the specification with code segments limited in accordance with claim 3 should not be read as a limitation into claim 1. As the independent claim, claim 1 should be broad enough to encompass claim 3, but the limitation of claim 3 should not be read into claim 1.

specification illustrating an embodiment of the '346 invention, which states that "[t]he operation consists of ***multiplying*** each of the 66 signal samples … by 66 code samples (formed by extending 33 code samples with the code extender **409**), and ***summing the results*** … ." *Id.* at 44-45 (quoting JX-2 ('346 patent), col. 7, ll. 39-43 (complainants' emphasis); citing Braasch Tr. 1445-1446).

Complainants further argue that in connection with the patent's preferred embodiment, the specification provides a mathematical expression of such an operation. *Id.* at 45 (citing JX-2, col. 7, ll. 44-50).

In their post-hearing brief, respondents do not prose a succinct verbal construction of the term "inner product." *See, e.g.,* Resp. Br. at 220 (chart contrasting the parties' proposed constructions). Yet, they argue that the patentees have acted as their own lexicographer with respect to "an inner product," and defined it mathematically in the specification as:

$$\sum_{i=l}^{PxK} \langle \text{signal}_i \rangle \langle \text{code } c_i \rangle$$

See Resp. Br. at 220 (citing JX-2 ('346 patent); *see also,* col. 7, ll. 27-50 (describing the mathematical operation that yields an the inner product, and illustrating the advance of information through a portion of the preferred embodiment).

Respondents argue that complainants (both at the hearing and in their briefs) treat the mathematical expression in the specification as "just an example," and attempt to broaden the definition of "inner product" unjustifiably. *See Id.* at 220-21; Resp. Reply at 46.

The Staff acknowledges that respondents have set forth more than one proposed claim construction for "an inner product" during the course of this investigation, but agrees with one of

their earlier proposals by which an inner product is the sum of the results of multiplying the digital signal samples with a respective chip of the selected code segment. *See* Staff Br. at 23-24.

There is no disagreement among the parties that although the definition of "inner product," including its mathematical expression, occurs in connection with a description of a preferred embodiment, the definition itself is one of general application. Nor is there any disagreement about the basic operation by which numbers are multiplied and added. Upon examination of the specification, the undersigned concurs that the term is defined in the specification, in particular by the mathematical expression reproduced therein and its surrounding context.

The disagreement among the parties is somewhat vague, at least if one considers only the proposed claim constructions offered in the brief (rather than the infringement arguments). However, it is apparent that a question is raised as to whether or not the inner product can reflect an adjustment for the Doppler effect (detailed above in the technology background section I.B.1.). *See, e.g.,* Compl. Br. at 45-46. As discussed below, the specification shows that the answer must be in the affirmative, although that adjustment does not occur as a result of the mathematical operation expressed in the specification, but rather beforehand.

While the simple mathematical operation that defines "inner product" does not contain any function connected directly to Doppler adjustment, in the preferred embodiment the multiplication is performed after the signal has adjusted for Doppler. In particular, the inner product multiplication takes place in the "convolution processor **109**" as it is labeled in the embodiment illustrated in the specification. *See* Braasch Tr. 1448; JX-2 ('346 patent), col. 7, ll. 7-11 (Fig. 4 depicts convolution processor **109**). The received signal is multiplied with a value for Doppler in

the tuner **105**. JX-2 ('346 patent), col. 4, ll. 10-14. In the embodiment shown in Figure 1, the convolution processor **109** is located after the tuner **105**, and the operations of the convolution processor are performed after those of the tuner. *See* JX-2 ('346 patent), Fig. 1; col. 4, ll. 8-17, ll. 43-62 5265; *see* Heppe Tr. 2787-2788, 2797-2798 (confirming in the Figure 1 embodiment that the signal is Doppler-adjusted). As a result, the inner product equation shown in column 7 of the specification represents the correlation of a Doppler-adjusted signal with a reference code.

In fact, the current proposed construction offered by respondents and their expert, Dr. Heppe, is directly contrary to the positions taken in Dr. Heppe's validity expert report. There, he opined that an alleged prior art patent first multiplies the reference code with a value for Doppler and then multiplies the resulting Doppler-adjusted code with a received signal in the digital correlator. *See* Braasch Tr. 1459-1460; Heppe Tr. 3113-3114; RX-104 (prior art patent), col. 9, ll. 23-24; col. 9, l. 66 - col. 10, l. 3; col. 11, ll. 56-61. Respondents' expert asserted that this correlation between a received signal and a Doppler-adjusted reference code forms the required inner product notwithstanding the fact that the inner product equation contains a value for Doppler, and the Doppler is removed in the digital correlator. Heppe Tr. 3113-3114; Braasch Tr. 1458-1460.

When respondents' expert was confronted during his deposition and at hearing with the inconsistency between respondents' earlier positions and their current proposed claim construction, Dr. Heppe testified that he provided "both sides of the question," rather than "recommend a single course." He indicated that he provided a "nuanced description of the situation" to inform the court's opinion. *See* Heppe Tr. 3115-3116; *see also* Heppe Tr. 3146-3149 (inconsistencies or "multiple alternatives" with respect to another claim term). The court finds

this explanation somewhat puzzling.

Although claim construction is indeed a question of law (and therefore to be determined by a court), it would have been much more useful if respondents' expert had set forth from the beginning a proposed construction that he believed to be accurate, and upon which respondents could have constructed a sound, reliable and consistent set of argument that could be used throughout their case involving the '346 patent. In any event, as illustrated above, the '346 patent specification clearly states the manner in which the inner product is to be derived, and also that it may be the product of values that have already been adjusted for Doppler.

Accordingly, the claim term "inner product" is construed to mean the value obtained by multiplying corresponding elements of sets of values and summing the results. The inner product may reflect a prior Doppler adjustment to values used to obtain the product.

"A Tuner for Removing Doppler Shift From the Digitized Signal and Producing an In-Phase (I) Signal and a Quadrature (Q) Signal"

The term "a tuner for removing Doppler shift from the digitized signal and producing an in-phase (I) and a quadrature (Q) signal" appears in claim 11 of the '346 patent. *See* JX-2 ('346 patent), 13:22-24.[10]

Complainants argue that "[t]his claim term should be given its plain meaning: 'A tuner for removing Doppler shift from the digitized signal and producing an in-phase (I) and a quadrature (Q) signal.'" Compl. Br. at 48 (citing Braasch Tr. 1482-1483).

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[10] The terms "I" and "Q" signals are used in the '346 patent specification. *See, e.g.,* ("The output from the tuner is a baseband signal consisting of an in-phase component (I) and a quadrature component (Q)."). JX-2 ('346 patent), col. 4, ll. 14-16; *see* Heppe Tr. 2794-2795 (discussing I and Q signals in relation to sign and cosign waves).

Respondents argue that "this term does not require construction." Resp. Br. at 223. Notwithstanding this statement, respondents proceed to argue that the claim language requires that the tuner do two things: first, to remove Doppler shift from the digitalized signal generated by the analog to digital converter; and second, to produce I and Q signals from which the Doppler has been removed. *See Id.*

The Staff argues that the disputed term does not require construction in view of clear claim language. *See* Staff Br. at 24-25.

The salient difference between complainants' and respondents' proposed constructions is that respondents require a specific order in which the tuner must perform its operations, and the circuitry used to perform such ordered operations. However, no such order or specific circuit is required.

Claim 11 is an apparatus claim, and nothing in the claim language or the specification suggests that the tuner is required to perform, or is constructed to perform, the tuning operations in a particular order or at a particular point in a single circuit. Nothing in the specification suggests any benefit from performing the tuning operations in a particular order. To the contrary, the specification explains that the tuner has no particular requirements unique to the '346 patent, but rather is a conventional GPS tuner such as that used in the preferred embodiment. *See* JX-2 ('346 patent), col. 4, ll. 16-18 ("The steps of **105** and **106** are substantially similar to those used in conventional GPS receiver designs.").

Respondents' expert acknowledged at the hearing that the I and Q signals are components

of the digitized signal. *See* Heppe Tr. 2795.[11] This fact is confirmed in the patent specification with reference to the preferred embodiment. JX-2 ('346 patent), col. 4, ll. 14-16 ("The output from the tuner is a baseband signal consisting of an in-phase component (I) and a quadrature component (Q)."). Thus, removal of Doppler after the signal is divided into I and Q components (*i.e.*, from the I and Q components of the signal), and it constitutes removal of Doppler from the digitized signal. *See* Braasch Tr. 1494.

Accordingly, a tuner for removing Doppler shift from the digitized signal and producing an in-phase (I) and a quadrature (Q) signal is construed to mean a tuner for removing Doppler shift from the digitized signal and producing an in-phase (I) and a quadrature (Q) signal.

"A Decimation Circuit for Subsampling the I and Q Signals"

The term "a decimation circuit for subsampling the I and Q signals" appears in claim 11. Complainants argue that this claim term "should be given its plain meaning: 'A circuit for decreasing the sampling rate of the I and Q signals.'" Compl. Br. at 52 (citing Braasch Tr. 1491).

Respondents argue that "the decimation circuit claim term does not require construction." Resp. Br. at 224. Yet, they disagree with complainants' proposed construction, and argue that the plain language of claim 11 requires that the decimation circuit operate after the tuner circuit has both performed Doppler wipeoff, and produced I and Q signals. *See Id.*

The Staff argues that this term does not require construction in view of clear claim language. Staff Br. at 25.

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[11] The contention of respondents' expert in his initial report that the claimed tuner is met by a system which first generates I and Q signals in one circuit and then removes Doppler later in the digital correlator – the exact opposite order required by respondents' current construction – suggests that respondents seek to add a requirement to create a noninfringement position. *See* Heppe Tr. 3146-3149.

In its summary of the invention, the patent specification explains that "the complete apparatus consists of a conventional GPS tuner, a decimation circuit, a convolution processor, and RAM blocks that accumulate convolution results." JX-2 ('346 patent), col. 2, ll. 64-66. The specification further describes the operation of the decimator by stating that "[t]he processor begins by ***decimating*** input IF samples to create a signal stream at a desired sample rate, where the rate is precisely matched to the timing of the incoming signal. If the desired sample rate is Pf_o (P samples per C/A chip) then the sampling rate is set so that exactly 1023×P samples are taken in each signal epoch." JX-2 ('346 patent), col. 3, ll. 12-14 (emphasis added).

As in the case of the tuner limitation (construed above), the decimator limitation is part of an apparatus claim (claim 11), which does not mandate a particular order of operations. Nor is there any portion of the specification suggesting that the decimator should be required to operate after Doppler removal for any particular reason. Complainants admit that Figure 1 depicts a circuit in which Doppler is removed prior to decimation. *See* Compl. Reply at 10 n.6. However, there is nothing in the specification to indicate that such must be the case in all embodiments of the claimed invention.

Accordingly, a decimation circuit for subsampling the I and Q signals is construed to mean a circuit for decreasing the sampling rate of the I and Q signals.

"GPS Signals Having a Repeating Code"

Complainants argue that no party has made any substantive argument with respect to the term "GPS signals having a repeating code," which appears in independent claim 11. *See* Compl. Reply at 10 n.7.

Respondents argue that "GPS signals having a repeating code" would be understood by

one of ordinary skill in the art to mean precisely that, and that the term does not require construction. Resp. Br. at 225. They disagree with any attempt to add limitations simply to avoid the prior art, but offer no analysis to accompany their position. *See Id.*

The Staff argues that this term does not require construction, but does not object to the proposed construction contained in complainants' pre-hearing brief to the effect that the term refers to "GPS signals each including a code that is unique to its sender and that repeats with a period equivalent to the length of the code." The Staff argues that such a construction would be consistent with the specification. *See* Staff Br. at 23.

In their reply, respondents argue that during the hearing, complainants' expert admitted that "limitations that Global Locate sought to add to the claim term" are not found in the specification; that complainants appear to have abandoned prior arguments; and thus, no construction is necessary. *See* Reply at 49-50 (citing Braasch Tr. 1534).

There appears no longer to be any controversy with respect to this claim. Indeed, there is no support in the intrinsic evidence for requiring an identifier to be added to the repeating code that is unique to the claimed invention of this patent. However, it is noted as a matter of technical background that during the hearing (in a transcript portion cited by respondents), complainants' expert pointed out that at least in modern satellites it is not uncommon for each GPS satellite to broadcast a PRN code which is unique to the satellite. *See* Braasch Tr. 1533-1536. Such a fact is not, however, included as a claim limitation.

D. <u>Infringement Determination</u>

Complainants accuse the SiRF GSCi-4100/4200 and GSCi5000 series GPS chips, which incorporate the GPS Acquisition Module or GAM, of infringing claims 4 and 11 of the '346

patent. Complainants allege that GSCi-410/4200 chips are incorporated into a number of products sold in the United States, including the [ ] and the [.] It is further alleged that GSCi-5000 chips are also incorporated into a number of products sold in the United States, including the [ ][12] Complainants also allege that SiRF has used each of the accused chips domestically. In particular, they accuse SiRF of testing the GSCi-4100/4200 and GSCi-500 chips in the United States. Compl. Br. at 55.

In their post-hearing brief, respondents argue that none of the respondents is a direct infringer, and that complainants have failed to prove contributory or induced infringement. Resp. Br. at 225-26. However, respondents do not contest the allegation that at least the GSCi5000 chipsets are sold to [ ] for use in devices sold in the United States. *See Id.* at 288 (arguing that sales are limited and do not support a broad remedy). Furthermore, in neither their main brief nor their reply brief do respondents contest complainants' allegations that SiRF has tested the accused products in the United States. *See, e.g.,* Resp. Reply at 44-45, 53-56.

Indeed, the record establishes SiRF's testing in the United States of imported, accused products. *See* Braasch Tr. 1414-1415; Ogren Tr. 1765-1766 (confirming tests in the United States of the GSCi-5000); CX-377C (Overview Slides produced by SiRF concerning testing in the United States) at 602SiRF13145-13150.

In view of respondents' failure to dispute complainants' arguments and evidence, and the

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[12] Complainants also allege that the GSCi-5000 will be incorporated into a [ ] product. Compl. Br. at 55. However, there is no allegation that such a produced has been both (1) manufactured, and (2) sold for importation or imported into the United States. *See* Compl. Br. at 55.

clear evidence showing the domestic testing of imported, accused products by the SiRF respondents, a violation of section 337 may be based on direct infringement by at least the SiRF respondents. To prove a violation of the statute, it is not necessary for complainants to establish the elements of contributory or induced infringement (although such elements might be evident given SiRF's admitted sales of accused chips to [ ] for use in products imported into the United States). Thus, the remaining question is whether or not the accused chips infringe claim 4 and, or, claim 11 by practicing all of the claim elements.

It is admitted that "[t]here is "no dispute concerning the operation or architecture" of the accused chips. Resp. Br. at 225; *see also* Resp. Reply at 44 ("[T]here is no dispute over the operation of the accused products . . . .").

As indicated above, complainants argue that all claim elements are found in the accused devices. They argue that the claims are literally infringed, and set forth arguments and citations to record evidence as to all limitations contained in both asserted claims. *See* Compl. Br. at 55-59.

Respondents argue that if the Commission adopts even one of their proposed claim constructions for a term found in an asserted claim, that claim cannot be infringed. *See* Resp. Br. at 225. Indeed, all claim elements must exist in an infringing device in order for it to infringe. However, the undersigned has not adopted any of the key points of respondents' proposed constructions that might have prevented a finding of infringement. *See* section IV.C. (claim construction). Thus, the infringement analysis cannot focus on a single claim element.

While respondents do not contest complainants' allegations as to most limitations of the asserted claims, they contest complainants' infringement allegations and present evidence and arguments concerning each of the claim limitations that were contested in connection with the

claim construction issue, *i.e.,* limitations addressing the length code segments, the inner product, the required tuner, and the required decimation circuit. *See Id.* at 226-236. Yet, in each case, respondents' arguments are based on their proposed constructions. Thus, respondents argue that the accused products do not correlate segments of "equal length," a requirement that was rejected in connection with claim construction. *See Id.* at 226-29.

Respondents also argue that the accused products do not form the required inner product because, among other things, the GAM found in the accused devices multiplies a portion of a satellite's "PN code" (or pseudorandom code) by a portion of the reference code that compensates for Doppler. *See Id.* at 229-232 (relying in part on product documentation). Respondents reiterate their rejected argument that the tuner must perform its operations in a certain order, an argument that was rejected above. *See Id.* at 232-35. Respondents also argue that the GAM in the accused devices does not include a decimation circuit that subsamples I and Q signals from which Doppler has first been removed. *See Id.* at 235-236. However, no such Doppler removal limitation was found to exist in the decimation element of claim 11.

The Staff argues that the accused products do not infringe claim 4 because they do not meet all the inner product limitation of independent claim 1. The Staff also argues that claim 11 is not infringed because the accused products do not meet the "tuner" and "decimation circuit" limitations. *See* Staff Br. at 25-26. As in the case of respondents' more expansive arguments, the Staff's arguments are based on claim construction interpretations that have been rejected.

As indicated above, there is no dispute as to the vast majority of claim elements. In addition, evidence concerning those undisputed elements is summarized in complainants' main brief. *See* Compl. Br. at 56-61 (citing, *inter alia*, Braasch Tr. 1428-1504). With respect to the

code segments, the inner product, the required tuner and the required decimation circuit, a preponderance of the evidence demonstrates infringement of claims 4 and 11 by the accused devices.

As required by claim 4, the accused devices perform correlation with code segments that are portions of one cycle (*i.e.,* epoch) of a reference code. In particular, the GAM in the accused products divides a pseudorandom reference code used for correlation into sixteen code segments. Braasch Tr. 1428-1430; CX-358C (GAM Documentation) at 602SiRF 292720-721; Heppe Tr. 3104. The segments consist of a series of ones and zeroes. CX-358C (GAM Documentation) at 602SiRF 293139-40 (depicting R1, R2 and R3 values as ones and zeroes). The GAM divides the reference code into fifteen segments with a length of 128 samples and a sixteenth segment with a length of 126 samples with two zeroes added to the end. A location referred to the R3 register holds segments of code. Braasch Tr. 1432; Heppe Tr. 3104-3105; CX-358C (GAM Documentation) at 602SiRF 293132, 293137 (Figure 5-123 shows 128 samples passed to the R3 register for correlation).

The GAM has two copies of the R3 register, each of which loads and holds a segment of reference code. Braasch Tr. 1440-1441; CX-358C (GAM Documentation) at 602SiRF 293118 (Figure 5-110 depicting registers A and B, the two copies of the R3 register). A multiplexer (or MUX) selects a segment of code from either the A or B register for use in correlation. Braasch Tr. 1441-1443; CX-358C (GAM Documentation) at 602SiRF 293118.

As required by claim 4, GAM in the accused devices uses an "inner product" (*i.e.,* the value obtained by multiplying corresponding elements of sets of values and summing the results) to compute correlation. The GAM performs correlation by multiplying a segment of reference

code with a segment of satellite signal and sums the results to form a partial correlation. Braasch Tr. 1450-1452; CX-358C (GAM Documentation) at 602SiRF 293140-141 (Figure 5-130 depicts the inner product operation of the GAM); CX-858C (SiRF Verilog code encoding the GAM Flash Correlator). The GAM holds a portion of satellite signal constant while the portion of signal is correlated against multiple segments of Doppler-adjusted reference code. It repeats this process for each successive portion of satellite signal. Braasch Tr. 1461-1466; CX-358C (GAM Documentation) at 602SiRF 292720. Each correlation of a portion of received signal with a segment of Doppler-adjusted reference code produces a partial correlation. Braasch Tr. 1463-1464; CX-358C (GAM Documentation) at 602SiRF 293108 (The value of R1 incremented for each partial correlation). As each partial correlation is produced in the GAM flash correlator, the partial correlation value is summed with previous partial correlation results to form a plurality of full correlations. Braasch Tr. 1466-1468; CX-358C (GAM Documentation) at 602SiRF 293151-52 (Figure 5-137 depicting the GAM coherent integrators); CX-358C (GAM Documentation) at 602SiRF 292721 ("each integration memory location behaves like an accumulator").

As required by claim 11, each device also includes a tuner for removing Doppler shift from the digitized signal and producing an in-phase (I) signal and a quadrature (Q) signal, according to the proper construction of the claim. *See* Braasch Tr. 1487. The GAM contains a mixer and numerically controlled oscillator (NCO) for the purpose of producing I and Q signals for correlation. Braasch Tr. 1487-1488; Heppe Tr. 2781 (GAM's mixer creates I and Q outputs), 3147 (GAM produces I and Q signals); CX-358C (GAM Documentation) at 602SiRF 293036 (Figure 5-51 depicts the GAM's ISIP block containing the Mixer and NCO). The GAM's Doppler NCO and R2 register remove Doppler from the satellite signal by multiplying a Doppler

value with a segment of reference code, which is then multiplied by a portion of satellite signal. Braasch Tr. 1488. CX-358C (GAM Documentation) at 602SiRF 293135.

As further required by claim 11, each accused device contains a decimation circuit for subsampling the I and Q signals, as that circuit is properly construed. The GAM's decimation circuit subsamples I and Q components of the signal to reduce the sample rate. Braasch Tr. 1495-1498 (GAM decimator decreases the sampling rate); CX-358C (GAM Documentation) at 602SiRF293052-53 (Figure 5-67 indicating the GAM decimator subsamples I and Q signals). The GAM performs correlation for both I and Q components of the received signal to produce the required I and Q partial correlations. Braasch Tr. 1499-1500.

Accordingly, it is found that all limitations of claim 4 (and claim 1 from which it depends) and of claim 11 are present in the SiRF GSCi-4100/4200 and GSCi5000 series GPS chips. The accused devices literally infringe the asserted claims of the '346 patent.

E. Validity

1. Anticipation

Respondents argue that claims 4 and 11 of the '346 patent are invalid due to anticipation, if the claims are construed according to complainants' proposed claim constructions. In particular, they argue that the GAM itself (which is found in the accused SiRF devices) is prior art to the '346 patent, and thus any finding of infringement automatically invalidates the asserted claim. *See* Resp. Br. at 236. In order to make their arguments as to each limitation of the asserted claims (including independent claim 1 from which claim 4 depends), respondents rely not on the GAM itself (with supporting documentation), but rather on two United States patents (*i.e.,* U.S. Patent No. 6,804,290 ("the '290 patent") and U.S. Patent No. 6,775,319 ("the "'319 patent")) that

they argue are prior art to the '346 patent, and describe the relevant GAM correlator architecture. *See Id.* at 236-254; Resp. Reply at 56-62.

Complainants oppose respondents' anticipation defense with detailed arguments and citations to the evidentiary record. Complainants also argue that inasmuch as respondents were barred during the hearing from presenting invalidity evidence concerning the GAM due to their failure to provide adequate notice of their anticipation arguments and to follow the procedural rules of this investigation, they should be not allowed at this juncture to argue that the GAM is invalidating prior art. *See* Compl. Br. at 69-78; Compl. Reply at 17-26.

Although the Staff opposed a finding of infringement due to similarities between some of its proposed claim constructions and those of respondents, they do not join with respondents in arguing that the asserted claims are invalid due to anticipation, even under complainants' proposed constructions. In particular, the Staff argues that with respect to the '290 patent, respondents' expert admitted during his deposition that the '290 patent does not disclose the required "decimation circuit;" and with respect to the '319 patent, the Staff argues that respondents rely on attorney argument without citing to evidentiary testimony in order to explain how the '319 patent would meet every limitation of the asserted claims. *See* Staff Br. at 28; Staff Reply at 4.

At the outset it must be observed that complainants are correct that due to a failure on respondents' part to adhere to the procedural rules, and to avoid prejudice to complainants and the public interest, respondents were precluded at the hearing from offering any testimony from their expert, Dr. Heppe, that the GAM is prior art to the '346 patent. Heppe Tr. 2426-2428. Respondents nevertheless now assert that the GAM is prior art and that, if Global Locate succeeds

in proving infringement, then the GAM anticipates. By basing their arguments on the '290 and '319 patents, respondents attempt to make the same arguments they would have based on the GAM.[13] In any event, the factual record does not support a finding of patent claim invalidity based on either alleged prior art patent.

As detailed above in connection with the claim construction and infringement issues, the specification of the '346 patent makes it clear that a key element of the claimed invention, including asserted claims 4 and 11, is summing a plurality of partial correlations to form a plurality of correlations. Yet, testimony regarding the '290 patent confirmed that the '290 patent discloses forming only one full correlation at a time. *See* Compl. Br. at 72-73. For example, complainants' Dr. Braasch testified that the '290 patent teaches summing segment correlation values to form a single correlation. *See* Braasch Tr. 3340-1334. Both '290 inventors, Jeff Ogren and Michael King, conceded that the '290 patent discloses summing the segment correlation values to form only a single correlation sum at a time. *See* Ogren Tr. 1775-1777; JX-110-1C (King Tr.) at 256-257. The '290 patent itself confirms this fact as well. *See* RX-108 ('290 patent), col. 6, ll. 41-44 ("This process continues until all 16 correlation values for all 16 segments are added together and stored as a single correlation sum in the first address of memory 206.").

Accordingly, the '290 patent does not anticipate the asserted claims of the '346 patent.

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[13] There is a question as to whether or not the patents relied upon by respondents actually describe the GAM, especially the '290 patent. Named inventor Ogren conceded at his deposition and at the hearing that that the '290 patent does not describe the GAM. *See* Ogren Tr. 1783, 1792-1793. Ogren further conceded that the GAM "was not developed" and in fact "didn't even exist" until the middle of 2001 (which is nearly two years after the '346 patent was conceived). *See* Ogren Tr. 1795-1797. Michael King, the other '290 patent inventor, also testified during his deposition that the '290 patent does not describe the GAM. *See* JX-110-1C (King Tr.) at 50:6-12; *see also* Ogren Tr. 1786-1789 (quoting from King deposition).

With respect to the '319 patent, the Staff is correct in its argument that respondents have failed use testimonial evidence from the hearing to compare the '319 patent to each element of the asserted '346 patent claims. That may be due to the fact that during the hearing, in order to quell procedural objections, respondents' counsel represented that he would not elicit such testimony from respondents' expert. *See* Heppe Tr. 28042805. Yet, apparently for the first time, respondents now claim in their post-hearing briefing that the '319 patent is anticipatory prior art.

Even if there were record evidence comparing the '319 patent to the asserted claims, the '319 is not prior art to the '346 patent. The record shows that the earliest date of conception for the '319 patent is three months after the October 1999 conception date for the '346 patent. While respondents argue that the'319 patent was conceived by January 1, 2000, the signatures on the very invention disclosure upon which the patent is based is dated April 5, 2000. *See* RX-192C (Motorola invention disclosure). The named inventor, King (who was unable to travel to the hearing),testified in his deposition that January 2000, as a conception date, was only an "approximation," and that it could have been a month or two "either way." *See* JX-110-1C (King Tr.) at 107. Respondents also argue that by February 8, 2000, King had designed the block diagram that would appear as Figure 4 in the '319 patent. Yet, King's testimony was not clear on as to the precise date. *See* JX-110-1C (King Tr.) at 90-91. Similarly, there is a lack of record evidence concerning the reduction practice of the invention claimed in the '319 patent.

By contrast, complainants presented detailed evidence supporting the October 1999 conception and spring 2000 reduction to practice of the '346 invention. Much of that evidence is discussed above in connection with the questions raised by respondents concerning Global Locate's alleged lack of ownership of the '346 patent, and whether the true identity of the inventor

was purposely concealed from the PTO – with both questions answered in the negative. As a result, even if the '319 patent had been conceived by January 1, 2000, it still would not be prior art to the '346 patent's asserted claims. Respondents have failed to establish by clear and convincing evidence that the asserted claims of the '346 patent are invalid due to anticipation by the '319 patent.

In summary, it has not been established that the asserted claims of the '346 patent are invalid due to anticipation.

2. <u>Obviousness</u>

Respondents reiterate their argument that the asserted claims are anticipated under complainants' proposed claim construction, and also argue that "to the extent that a particular claim is found not to be anticipated, then that claim is obvious in light of the GAM prior art and the understanding of one of ordinary skill in the art." Resp. Br. at 254 (citing *KSR*, 127 S.Ct. at 1731). They state further only that "[t]here is no evidence of secondary considerations of non-obviousness to rebut this invalidity." *See Id.* The obviousness section of respondents' brief (with respect to the '346 patent) consists of only three sentences. *See Id.*

Complainants oppose any finding of obviousness, arguing that such a finding would not be supported by the record. *See* Compl. Reply at 21, n.12. Similarly, the Staff argues that respondents rely only on attorney argument, and that their expert did not testify at the hearing as to any obviousness of the asserted claims. *See* Staff Reply at 4-5.

It has long been recognized that in principle any anticipated claim is necessarily obvious. *See In re Baxter Travenol Labs.*, 952 F.2d 388, 391 (Fed. Cir. 1991)("[S]ince anticipation is the ultimate of obviousness . . . the subject matter of these claims is necessarily obvious and we need

not consider them further."). However, in this instance, respondents allege obviousness as an independent defense as to any claim not already found to be anticipated. Yet, respondents do not support their brief argument with any citation to evidence.

It cannot be found by clear and convincing evidence that any asserted claim of the '346 patent is invalid due to obviousness.

F. Summary

As detailed above, Global Locate owns the asserted claims of the '346 patent, and had standing to this action with respect to the asserted claims. It is found that the accused products literally infringe claims 4 and 11 of the patent. Neither asserted claim is found to be invalid due to anticipation or obviousness. It has not been found that the '346 patent is unenforceable.

V. The "Assisted-GPS" Patents: The '000, '080, And '651 Patents

It is an accepted fact that signal communication from a satellite to a GPS receiver will not always occur under ideal conditions. In those circumstances, "Assisted-GPS," also commonly known as "A-GPS," will enhance the ability to determine global position in a low-signal environment. As explained below, Assisted-GPS "is a means of obtaining the data needed for navigation such as ephemeris or other acquisition assistance through an alternate communication path." Dafesh Tr. 590.[14]

Three of the patents-in-suit are Assisted-GPS patents. They are U.S. Patent No. 6,651,000 ("the '000 patent"), U.S. Patent No. 6,704,651 ("the '651 patent"), and U.S. Patent No. 7,158,080 ("the '080 patent").

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[14] Assisted-GPS was developed decades ago, but became much more popular around 1995. This popularity spike was due to the "E-911" mandate which required GPS in cell phones. Dafesh Tr. 590-591.

A. Introduction

As discussed earlier, global positioning is determined through the process of trilateration. (A short refresher here might be helpful.) Essentially, the GPS receiver uses the difference between the time of transmission of satellite radio frequency ("RF") signals, and the time of reception by the receiver, to determine position. Dafesh Tr. 559-560.

The GPS receiver knows where the satellites are in space through information broadcast to it by the satellites in the form of ephemeris.[15] As explained by complainant's expert, Dr. Philip Dafesh, ephemeris data describes the trajectory of the satellite through space. "Ephemeris tells you, well, at this time, the satellite is here, at this later time, it is going to be here and at this later time, it is going to be here." Dafesh Tr. 561. Accordingly, "the receiver needs to know accurately what time the signal was transmitted." *Id.*[16]

Again, as noted earlier, each GPS satellite transmits two information streams modulated onto a carrier wave.[17] The carrier wave is essentially the frequency at which the GPS satellite sends this information. One of the information streams is the pseudorandom noise code, *i.e.,* the

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[15] Each of the 32 satellites that orbit the earth transmits at 1575.42 megahertz. Dafesh Tr. 565.

[16] While the clock in the satellite is "very accurate," the clock in the GPS receiver is "fairly inaccurate." Dafesh Tr. 562. The receiver, however, gets time transferred to it through the navigation process. As noted, four satellites are used in trilateration. Three of the satellites determine position (*i.e.,* longitude, latitude, and altitude), while the fourth satellite "is used to determine this inaccurate receiver clock." *Id.* In sum, while the transmission times for the signals sent from the four satellites are going to be different, they will be received by the GPS receiver at the same time. This "common clock offset" is solved through the process of trilateration. Dafesh Tr. 562-563.

[17] The term "modulated" means that essentially the information streams are riding on the carrier wave. Dafesh Tr. 566, 577-578.

PRN code. The PRN code has its own "unique fingerprint," thus enabling the GPS receiver to identify the satellite. Dafesh Tr. 564-567; CDX-96.

The other information stream is the Navigation (NAV) Message. After a receiver has identified a satellite through the PRN code, and has acquired its signal, the receiver can read the NAV message.[18] The NAV message contains important time and satellite position information that the GPS receiver uses to compute its position. *Id.* In that regard, the navigation data message contains the time of transmission, as well as the ephemeris data, *i.e.,* the accurate position, velocity, and clock correction (*i.e.,* the offset of the satellite's clock from true GPS time) for each satellite. Dafesh Tr. 579-580; CDX-21.[19] In normal modes of operation, the ephemeris data is valid for 2 to 4 hours. Dafesh Tr. 583.

A GPS receiver acquires a satellite's signal by matching a received PRN code against replica PRN code that the receiver stores for each satellite.[20] As illustrated in CDX-97, the receiver will shift the replica PRN code until it matches the PRN code received from the satellite. This process of trying to establish a match is known as "correlation." Dafesh Tr. 568-571.[21]

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[18] First comes acquisition, then tracking, then the ephemeris data which is used to obtain position. van Diggelen Tr. 160-161.

[19] Almanac data also is sent. This is coarse location and clock information for the satellites. Dafesh Tr. 580.

[20] In commercial GPS receivers, the code is 1023 bits long. It is a repeating code that changes at a rate of about one million bits per second. (It takes a satellite one millisecond to transmit a single set of PRN code.) By contrast, approximately 50 bits of navigation message are received per second. Dafesh Tr. 568-569.

[21] The correlation process can be expedited if the receiver is provided with other information in the form of acquisition assistance. For example, the search could be narrowed if the receiver had some understanding of its own position, as well as the position of the satellite.

(continued...)

"[T]he PRN code is unlocking the door so that you can get the data, so you have this unique PRN code for each satellite and for each satellite, you have a particular key, which is your replica, and you unlock the door associated with each signal to get the data for each satellite." Dafesh Tr. 578 -579.

Just how far you have to move to match the codes is called the "code phase offset, which would essentially be your time uncertainty." Dafesh Tr. 571. During a receiver acquisition process, one of the things that the GPS receiver wants to do is to determine this code phase offset. Dafesh Tr. 571-572.

In attempting to match the PRN code received from the satellite with the replica PRN code generated by the GPS receiver, however, there are "code uncertainty" and "frequency uncertainty" problems that must be solved. Dafesh Tr. 571-572, 575.

Code uncertainty is the receiver's inability to know how far the received PRN code is offset relative to the replica code, and thus how far the receiver must shift the replica code to match the received code. Dafesh Tr. 571-572; CDX-97.

Frequency uncertainty is the GPS receiver's inability to know at what frequency a satellite's signal will arrive at the receiver. For example, the frequency of a satellite's signal will change during transmission due to "Doppler" effect. As a result, the frequency will be affected by whether the satellite is moving towards, over, or away from the GPS receiver. This will require the receiver to search over different frequencies until it gets a match. Dafesh Tr. 573-576; CDX-95.

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[21](...continued)
Dafesh Tr. 572-573.

B. Weak Signal Environments And The Need For Assisted-GPS

As noted, there are circumstances under which GPS receivers will have difficulty locating their position. Those circumstances occur in weak signal environments such as indoors, tunnels, parking garages, buildings, and where obstructed by foliage. In those situations, the satellite signal could be up to one thousand times weaker. In fact, at some point, both the process of acquiring the satellite signal and obtaining the navigation message will fail due to a weak signal. Dafesh Tr. 589-590; CDX-22. Thus, the need developed for obtaining the data required for navigation, such as ephemeris, or other acquisition assistance through an alternate communication. Dafesh Tr. 590; CDX-74. This need was met through Assisted-GPS.

C. Global Locate's Assisted-GPS Patents

Three of the patents-in-suit in this investigation are Assisted-GPS patents. They are the '000 patent that addresses "Compaction," the '080 patent that addresses "Long Term Orbits," and the '651 patent that addresses "Acquisition Sensitivity." These patents, and their alleged infringement, are discussed below.

1. The '080 Patent

Dr. van Diggelen is the sole named inventor in the '080 patent. In this patent, he devised a system in which a server would use algorithms to predict ephemeris for satellites into the future and then send that "long term orbit" data to remote GPS receivers. The system would allow the GPS receivers to have ephemeris data for extended periods of time, for use in satellite acquisition and position, without having to frequently download the data from the satellites or an Assisted-GPS source. van Diggelen Tr. 203-204.

The '080 patent is entitled, "Method And Apparatus For Using Long Term Satellite

Tracking Data In A Remote Receiver." JX-6. It is referred to as the "Long Term Orbit" patent. As its title indicates, the '080 patent claims both a method and an apparatus for using long term satellite tracking data at a remote receiver to acquire satellite transmissions and calculate navigation solutions. This includes using the long term satellite tracking data to compute acquisition assistance data in the remote receiver, which then uses the acquisition assistance data to acquire satellite signals that in turn may be used to locate the position of the remote receiver. JX-6, Summary of the Invention, cl. 3, ll. 16-38.

Dr. Philip Dafesh, complainant's expert, testified that the '080 patent addresses the problem where you have an occasionally connected device. He explained, "[T]here are scenarios where you have a device that may get, say, broadcast ephemeris through assisted GPS and the broadcast ephemeris is only valid, say two to four hours. But you don't have a network connection for a period of time greater than two to four hours." Dafesh Tr. 607. Dr. Dafesh further explained that the '080 patent addresses this problem by providing a method and apparatus "for receiving long-term satellite tracking data at a remote receiver from a server and using this data to compute acquisition assistance at the remote receiver to acquire signals." Dafesh Tr. 607-608; CDX-75.

a. <u>The Asserted Claims</u>

Global Locate asserts claims 1, 2 and 22 of the '080 patent against SiRF. Specifically, these claims are asserted against respondent's SiRFstarIII and [ ] chips and associated hardware, including GSW/SLC and CLM software, that implement InstantFix. Compl. Br. at 100. The asserted claims of the '080 patent are set forth below.

1. A method comprising:

receiving long term satellite tracking data at a remote receiver from a server;

computing acquisition assistance data using said long term satellite tracking data at said remote receiver; and

receiving satellite signals at said remote receiver using said acquisition assistance data.

2. The method of claim **1**, further comprising:

computing position of said remote receiver using said satellite signals and said long term satellite tracking data.

* * * * *

22. A receiver comprising:

a communications transceiver for receiving long term satellite tracking data from a server; and

a microcontroller for computing acquisition assistance data using said long term satellite tracking data; and

a satellite signal receiver for receiving satellite signals using said acquisition assistance data.

JX-6, col. 11, ll. 30-40 & col. 12, ll. 54-60.

b. <u>Claim Construction</u>

"long term satellite tracking data"

There is only one term of the '080 patent that requires construction. The term having this distinction is "long term satellite tracking data," also referred to as "LT-STD." This disputed claim term is included in each of the asserted claims. Long term satellite tracking data is a set of orbital and, or, clock parameters that provides a description of a satellite's trajectory and, or, clock. Dafesh Tr. 778. *See* JX-6 ('080 patent), col. 4, ll. 17-20 ("The server 102 distributes data

representative of satellite trajectory information, satellite clock information, or both to facilitate operation of the remote receivers 104 ('satellite tracking data')").

With respect to the disputed claim, Global Locate and SiRF disagree over whether it is the "set" of data as a whole that must be valid longer than the broadcast ephemeris (as Global Locate contends), or whether "each" orbital and/or clock parameter must be valid longer than broadcast ephemeris (as SiRF contends). The Staff takes a somewhat different approach, focusing on the validity of blocks of ephemeris.[22]

Global Locate construes "long term satellite tracking data" to mean, "A set of orbital and/or clock parameters that provides an accurate description of at least one of a satellite's position, a satellite's velocity or a satellite's clock error, that is valid longer in time than broadcast ephemeris data." Compl. Br. at 100.

SiRF construes "long term satellite tracking data" as, "A set of orbital and/or clock parameters each valid for a long period of time as compared to the ephemeris data broadcast by the satellites which is valid two to four hours." Resp. Br. at 86-87.

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[22] In their Main Briefs, both Global Locate and the Staff address the issue as to whether the LT-STD of the asserted claims must be "accurate" like broadcast ephemeris. *See* Compl. Br. at 101-102, 105-107; Staff Br. at 40-41. Global Locate and the Staff conclude that it must. SiRF does not address this issue. *See* Resp. Br. at 86-88. For the reasons cited by the parties, this court agrees with Global Locate and the Staff. For example, Global Locate correctly points out that the claims and specifications of the '080 patent require long term satellite tracking data to be sufficiently accurate so that it can be used to compute position. Global Locate also correctly points out that during prosecution of the application leading to the '080 patent, the inventors specifically distinguished long term satellite tracking data from "almanac." Compl. Br. at 106. The Staff submits that "LT-STD must provide a description that is as accurate like that provided by broadcast ephemeris, which a person of ordinary skill in the art would have understood to be on the order of meters or tens of meters, and unlike that provided by almanac, which one of ordinary skill would have understood to be on the order of a kilometer." Staff Br. at 40 (citing Dafesh Tr. 586, 924-925; Heppe Tr. 3121).

The Staff does not offer a specific claim construction, but instead generally suggests a construction by way of argument. The Staff submits, "LT-STD is comprised of blocks of data, each valid longer in time than broadcast ephemeris – one of ordinary skill would have understood ephemeris to be valid two to four hours." Staff Br. at 41. Building upon this argument, the Staff further submits, "As to the validity period of LT-STD, in every embodiment disclosed in the specification, LT-STD is valid for at least six hours into the future, which suggests that LT-STD is valid for longer than broadcast ephemeris." *Id.*

It is found that the claim language and specification of the '080 patent support Global Locate's construction of the claim term "long term satellite tracking data." Accordingly, "long term satellite tracking data" is construed as, "A set of orbital and/or clock parameters that provides an accurate description of at least one of a satellite's position, a satellite's velocity or a satellite's clock error, that is valid longer in time than broadcast ephemeris data." Thus, it is the sum total of the data, and not the individual parameters making up the set of data, that must be valid longer than broadcast ephemeris.

First, as argued by Global Locate, a plain reading of the phrase "long term satellite tracking data" demonstrates that it is the "satellite tracking data" as a whole (*i.e.,* the satellite tracking data in its entirety) that must be considered in determining what is "long term." Because the words "long term" modify the term "satellite tracking data" in claims 1 and 22 (claim 2 depends from claim 1), complainants offer the proper construction of the disputed claim term.

This construction is also supported by claim 13 of the '080 patent, which is unasserted. Claim 13 depends from claim 1. It further requires that the long term satellite tracking data comprises at least one of "a plurality of satellite positions with respect to time and a plurality of

satellite clock offsets with respect to time." JX-6, col. 12, ll. 24-27. What this tells us is that the individual satellite parameters making up the long term satellite tracking data in claim 13 are valid

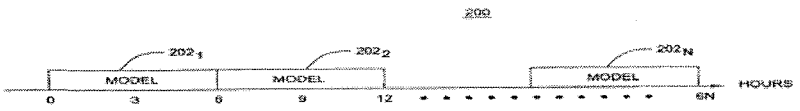

FIG. 2

only for the "positions with respect to time" that they individually describe. Accordingly, the positions by definition cannot be valid longer than broadcast ephemeris. Thus, as argued by Global Locate, "claim 13 unequivocally provides that, as a whole, the positions constitute long term satellite tracking data." Compl. Br. at 102.

Second, the '080 patent specification supports Global Locate's construction. It states, in part, "As described in detail below, the satellite tracking data distributed to the receivers 104 by the server 102 is valid for a long time as compared to standard broadcast ephemeris (e.g., two to four days). As such, the remote receiver 104_3 may continue to operate for a significant duration despite the unavailability of a connection to the server 102." JX-6, col. 4, ll. 47-53.

Furthermore, the specification of the '080 patent also discusses a "plurality of models" and "blocks" of satellite tracking data, specifically with respect to Figure 2, set forth below: Referencing Figure 2,the specification states:

> The satellite tracking data 200 is defined by N sequential blocks of satellite orbit and/or clock data (i.e., the N models 202). For purposes of clarity by example, each of the models 202 is valid for a period of six hours and thus the satellite tracking data is valid for 6N hours. It is to be understood, however, that each of the models 202 may be valid for other durations. For example, satellite tracking data valid for four days may be generated using 16

sequential ones of the models 202.

JX-6, col. 5, ll. 53-61.

Third, U.S. Patent No. 6,542,820 ("the '820 patent") provides further support for complainants' construction. CX-109. (The '820 patent is incorporated by reference into the '080 specification. JX-6, cl. 5, ll. 28-31.) In that regard, Global Locate correctly submits that "[t]he '820 patent specification reinforces that it is the period of validity of the *entirety* of the data that makes long term satellite tracking data, not the period of validity of any model or parameter within the data." Compl. Br. at 103 (complainants' emphasis).[23]

Finally, Global Locate cites to a former construction of the disputed claim term, "long term satellite tracking data," offered by SiRF's expert, Dr. Heppe, as support for the construction offered by complainants and adopted by this court. Global Locate notes that at the hearing, Dr. Heppe agreed with complainants' counsel's representation that previously he had taken the position in his initial expert that, "if long-term is construed to mean something longer than four hours or six, and you have multiple data sets, which in the aggregate span perhaps eight or ten hours, that data set of multiple individual shorter curve fits *would be considered long term.*" Compl. Br. at 105 (complainants' emphasis), citing Heppe Tr. 3067-3068.[24] The court finds that

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[23] *See* CX-109 ('820 patent), col. 4, l. 66 - col. 5, l. 7 ("For use with existing GPS receivers, the preferred embodiment of the model is the GPS ephemris model as described in ICD-GPS-200 and an ephemeris model is generated from the LT-STD for each 4 hour period as illustrated in the timeline 300 of Fig. 3, i.e., a different model 301, 302 and so on is generated for each six hour period. As such, the plurality of models 301, 302 and so on cumulatively span the length of the available LT-STD.")

[24] Dr. Heppe: "Well, actually, I proposed that, I believe in my initial report. But upon further review of the patent and specification, I have come to the conclusion that I would no longer agree with that statement, that I believe the individual blocks need to be longer than four

(continued...)

Dr. Heppe's testimony lends further support to complainants' construction.

In advocating an alternative construction, SiRF contends that the phrase, "the satellite tracking data ... may be referred to herein as 'long term satellite tracking data' in order to distinguish such data from broadcast ephemeris, which is typically only valid between 2 and 4 hours," supports its position that each parameter must be valid for a long period of time as compared to the ephemeris broadcast data. Resp. Br. at 87 (citing JX-6 at col. 5, ll. 23-28). This argument simply is not persuasive and, as set forth above, is not in accord with the claim language and specification of the '080 patent.

Next, SiRF turns to the prosecution history of the '080 patent. It argues that "[i]n order to overcome the indefiniteness rejection of the term," the applicant distinguished long term satellite tracking data from broadcast ephemeris that is typically valid for no longer than 4 hours. Resp. Br. at 87. To support this position, SiRF cites to JX-7 at GL-602 002365-66 & GL-602 002389, without further argument or explanation. This court has reviewed the cited pages and does not share respondents' view that the prosecution history supports their construction of long term satellite tracking data.

Respondents also note that "*every* embodiment in the written description of the '080 patent describes 'long term satellite tracking data' that is valid for a period of at least six hours into the future." Resp. Br. at 87 (respondents' emphasis). SiRF, however, does not explain why this statement is significant. The Staff, however, comments that this "suggests that LT-STD is valid

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[24](...continued)
hours." Heppe Tr. 3068. Dr. Heppe also concedes that under the definition in his initial expert report, SiRF products have long term satellite tracking data. *See* Heppe Tr. 3072-3073 ("If the definition is applied that the blocks of data do not need to be longer than four hours, then that would comprise long-term satellite tracking data.").

for longer than broadcast ephemeris." Staff Br. at 41 (describing LT-STD as "blocks of data, each valid longer in time than broadcast ephemeris"). Staff also appears to cite claim 16 of the '080 patent as support for this proposition. *Id.*

In response, Global Locate submits that it is not true that every embodiment in the '080 specification discloses individual "blocks" of data valid longer than broadcast ephemeris. Compl. Reply at 34-35. Indeed, complainants further submit that the specification does not even require that the long term satellite tracking data be in blocks. Compl. Reply at 35, citing JX-6 ('080 patent), col. 5, ll. 13-31 & CX-109 ('820 patent), at Figure 2, col. 4, ll. 61-65.

For the reasons cited by Global Locate, SiRF's and the Staff's argument on this point is rejected. Also, the Staff's reliance upon claim 16 is found to be misplaced. As Global Locate notes, claim 16 is a dependent claim, ultimately depending from claim 1. Claim 16 further limits the long term satellite tracking data to "blocks" that are each valid at least "six hours into the future." JX-6, claim 16. Citing the doctrine of claim differentiation, Global Locate correctly argues that "the fact that this *dependent* claim further limits the scope of long term satellite tracking data indicates that the broader independent claim 1 is *not* limited to blocks valid six hours into the future." Compl. Reply at 35 (complainants' emphasis), citing *Phillips v. AWH Corp.,* 415 F.3d 1303, 1315 (Fed. Cir. 2005) (*en banc*).

Lastly, SiRF argues that "[i]n view of the ICD-GPS-200's industry standard, a person of ordinary skill in the art would have further understood '*long term* satellite tracking data' to mean 6- to 146-hour curve-fit intervals as specified for *long term* extended operations," (as distinguished from 4-hour curve-fit intervals specified for 'normal operations')." Resp. Br. at 88 (respondents' emphasis).

In response, Global Locate states that '820 patent teaches that long term satellite tracking data can be modeled using the parameters and curve-fits defined in the ICD-GPS-200, and that the '820 patent teaches the use of the ICD-GPS-200 "4-hour fit" to model LT-STD. Compl. Reply at 36, citing CX-109, col. 4, l. 66 - col. 5, l. 7. Furthermore, complainants note that the '820 patent teaches that "the plurality of models ... *cumulatively span the length of the available LT-STD.*" Compl. Reply at 36 (complainants' emphasis), citing CX-109, col. 5, ll. 5-7. Thus, Global Locate concludes that SiRF's reliance upon ICD-GPS-200 is contrary to the express teachings of the '080 and '820 patents "that 4-hour curve fits of the ICD-GPS-200 may be used to model long term satellite tracking data, so long as the 'cumulative' sum of the models is valid longer than broadcast ephemeris." Compl. Reply at 36. This court agrees.

c. Infringement Determination - The '080 Patent

Global Locate charges that SiRFstarIII chips GSC3, GSC3e/LP, GSC3f, GSC3LT, GSC3LTf, GSC3LTi, GSC3LTif, and GSD3t support InstantFix and, or, SiRFLoc and that these chips, along with associated software, infringe claims 1, 2 and 22 of the '080 patent.[25] Compl. Br. at 107. We begin with a review of InstantFix and SiRFLoc.

i. InstantFix

InstantFix, also referred to as SiRFInstantFix, is an end-to-end Assisted-GPS system that provides server-generated extended ephemeris ("EE") files to end-user devices via the Internet using a wireless or wireline connection. This ephemeris data is valid for either three-day or seven-day intervals. *See* Heppe Tr. 3022-3023; Dafesh Tr. 654 (CX-257 "depicts the SiRFInstantFix service whereby extended ephemeris is sent from the SiRFInstantFix server to a

[25] The same chips also are accused of infringing the '000 and '651 patents.

mobile device through a customer distribution server. And it's sent either through web, meaning wired, or wireless means.... Wireless could be wireless Internet, or other wireless means. ")

SiRF represents that the InstantFix "end-to end service greatly improves navigation device start-up times without complex network integration." CX-276. In this document, it also states that "[t]he key to the SiRFIntantFix solution is a sophisticated set of proprietary algorithms that calculate an Extended Ephemeris (EE) file, yielding an accurate fix long after a traditional broadcast ephemeris has timed out – about four hours." *Id.*

Referring to a SiRFInstantFix Service Interface Reference Manual (CX-605C)(Bates stamped MiTAC 2753), complainants' expert, Dr. Dafesh, discussed the features of this system. Dr. Dafesh explained:

> SiRFInstantFix is a complete end-to-end system that offers improved TTFFs [time-to-first-fix[26]] and sensitivity without complex network integration. SiRF maintains the sophisticated server that creates the EE file. The EE file is transferred to the customer, on a daily basis, via easy to use HTTP transfer protocol. The customer then broadcasts this to the end-user via a periodic connection.

Dafesh Tr. 685-686.

Dr. Dafesh also testified that the end-user devices also use the EE for signal acquisition and satellite position computation. *See* Dafesh Tr. 658-660 (discussing SiRF document, CX-278C (System design of ephemeris extension)); *see also,* CX-57 (SiRFInstantFix datasheet) & Dafesh Tr. 654.

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[26] "TTFF" is the total time to first fix. "[I]t's from the time that you start the receiver to the time that you get the first fix, longitude, latitude, altitude." Dafesh Tr. 657.

The Sirf InstantFix system works as follows. SiRF maintains [

] JX-110-8C (Phatak Dep. Tr. at 144-146). [ ] generates extended ephemeris files once per day, and allows authorized users to download the EE files daily, or at a higher frequency. CX-311C [

] at 602SiRF2641.

In order to generate the EE files, the InstantFix [ ] receives and downloads from the [ ] satellite signals, containing proposed orbit data, including ephemeris data. Dafesh Tr. 660-662, 670-671 ("That's the rapid and ultra rapid orbits. That's past orbital data, so historical trajectory information or historical ephemeris."); CX-278C, CX-311C [ ] at 602SiRF2641-44), & CX-825C (System Overview for Server [ ] at SRF88048.

The [ ] takes the ephemeris data that it has received from [ ] and uses it to predict satellite orbits and clock information for 7 days at 15-minute intervals. SiRF's InstantFix server generates 3-day or 7-day extended ephemeris by predicting GPS satellite orbits into the future. Dafesh Tr. 679, 658; CX-276 (InstantFix Brochure) & CX-278C at 602SiRF716. The EE file contains long term orbit data for all of the satellites in the GPS constellation. Dafesh Tr. 671-672; CX-825C at SRF08846-47.

After SiRF has computed 3-day or 7-day predicted orbits for satellites by means of the [ ] it then compacts the extended ephemeris into EE files stored in SiRF's InstantFix server. Dafesh Tr. 663 [

] CX-277C [

] at 602 SiRF138624-40; CX-278C at 602SiRF718; & CX-825C at SRF088047. [

]. Dafesh Tr. 674-676; CX-310C (EE File Definition) at 602SiRF2589-92.[27] [

] Dafesh Tr. 678; CX-310C at 602SiRF2593.

SiRF transmits the EE files to remote GPS receivers, either directly or indirectly via a customer server. Dafesh Tr. 658, 671; CX-278C at 602SiRF716, 718; CX-311C at 602SiRF646; & CX-825C at SRF88048. The remote, or mobile device, downloads the EE data through the Internet, a wireless link, or through a combination. Pratt Tr. 1211; CX-276 (InstantFix data sheet); CDX-87C.

The mobile GPS devices used with SiRF's InstantFix system contain SiRF chips and software. InstantFix is "compatible with all SiRFstarIII and SiRFstarII solutions." CX-276 at 2; CX-257 (SiRFInstantFix data sheet) at GL-602 9736. Accused chips GSC3, GSC3e/LP, GSC3f/LP, GSC3f, GSC3LT, GSC3LTf, GSC3LTi, GSC3LTif, and GSD3t are SiRFstarIII chips that operate with GSW or SLC software and support SiRFInstantFix. Dafesh Tr. 642-644; CDX-78C & CDX-79C.[28]

In order to allow its customers to use this InstantFix service, SiRF provides a software program called a Client Location Manager ("CLM"). Dafesh Tr. 672, 678; CX-276 (SiRF

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[27] [

] *See* Dafesh Tr. 665-666; CX-278C at SiRF720-721.

[28] [

]. JX-111-1C (Kuykendall Tr.) at 129.

InstantFix data sheet); CX-313C [ ] Theory of Operation and SW Requirement Specification) at SRF087978; JX-110-8C (Phatak Tr.) at 204-205, 207-208. Dr. Dafesh explained, "[t]he client location manager is a small program that SiRF supplies to host receiver developers to -- that unpacks the EE file and makes it compatible with the remote receiver." Dafesh Tr. 672.[29]

If the SiRFstarIII chip in the product determines that it needs ephemeris data, a message will be sent to the CLM requesting ephemeris. Dafesh Tr. 673; CX-316C (Ephemeris Extension Software Design Specification) at 602SiRF2532-33; CX 825C (System Overview for [ ] at SRF88049. [ ] Dafesh Tr. 698; CX-313C [ ] CLM Theory of Operation and SW Requirement Specification) at SRF087987-92; CX-341C (CLM/GPS - Sensor Theory of Operation for [ ] at 620SiRF2547-59, 63; JX110C-8C (Phatak Tr.) at 210-211, 213-216.

ii. <u>SiRFLoc</u>

Like InstantFix, SiRFLoc is end-to-end system. Heppe Tr. 3022-3023; CX-307C (E2E Theory of Operation for SiRFLoc EE), at 602SiRF18225. While InstantFix focuses solely on providing extended ephemeris data to GPS receivers, the SiRFLoc end-to-end system provides (for purposes of this investigation) current satellite ephemeris to SiRF-enabled roaming GPS

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[29] "Once in the remote receiver, the client manager location manager runs on the host processor ... or within the microprocessor in a GPS device ... to be more specific, within the microprocessor in a SiRFstarIII chip. And then provides the SiRF software with 4-hour ephemeris segments upon request." Dafesh Tr. 727.

devices. *See* CX-265C (Functional Specifications (Apr. 25, 2007)). Dr. Dafesh described SiRFLoc as "a multimode aiding solution that SiRF provides, that provides aiding data to a remote GPS receiver." Dafesh Tr. 687.

The SiRFLoc also incorporates the InstantFix service so that SiRFInstantFix EE files may now be transmitted to end users via the SiRFLoc system. Dafesh Tr.687-688 (agreeing that there is an implementation of SiRFLoc in which EE files from the InstantFix server are delivered to remote devices), Tr. 726-727; CX-307C (E2E Theory of Operation for SiRFLoc EE) at 602 SiRF18225. As explained by Dr. Dafesh, CX-307C [

]

Dafesh Tr. 689.

With respect to SiRFLoc, for purposes of the present investigation involving the '000, '080, and '651 patents, the [

] Dafesh Tr. 725-729; CDX-94-C.

iii. <u>The SiRFstarIII Chips and Software</u>

<u>Claim 1</u>

The evidence establishes that each of the accused SiRFstarIII chips and associated software implementing SiRFInstantFix practice each of the claim elements of claim 1 of the '080 patent. Each of these claim elements is addressed below.

"receiving long term satellite tracking data at a remote receiver from a server"

The claim term "long term satellite tracking data" has been construed as, "A set of orbital and/or clock parameters that provides an accurate description of at least one of a satellite's

position, a satellite's velocity or a satellite's clock error, that is valid in time longer than broadcast ephemeris data..

The SiRF InstantFix extended ephemeris files previously discussed clearly constitute LT-STD. Indeed, respondents' expert, Dr. Heppe, stated that he was in "complete agreement" with the view of complainant's expert, Dr. Dafesh, that the EE files contain multiple blocks of parameters, each block being valid for 4 hours. Dr. Heppe stated, "[t]he EE files are definitely comprised of blocks of data with validity of 4 hours each." Heppe Tr. 2525, 3046.

Moreover, SiRF's 3-day and 7-day EE files contain data that, as a set, are longer than broadcast ephemeris. In that regard, applying the definition that he had offered in his initial expert report (and the definition advanced by Global Locate and adopted by this court), SiRF's expert, Dr. Heppe, conceded that the SiRF products have long term satellite tracking data. Heppe Tr. 3072-3073.

Lastly, it also has been established the SiRF's 3-day and 7-day EE files are sent from the [ ] to remote receivers. This has been discussed, *supra.*

Accordingly, it is held that respondents literally infringe that claim element "receiving long term satellite tracking data at a remote receiver from a server."

"computing acquisition assistance data using said long term satellite tracking data at said remote receiver"

Only Global Locate addresses this claim element. Global Locate is correct in asserting that "[i]t is undisputed that the SiRFstarIII chips and associated software that implement InstantFix use the EE extended ephemeris files to calculate acquisition assistance data." Compl. Br. at 109.

In that regard, the testimony of Dr. Dafesh regarding CX-272C (SiRFstarIII Aiding Module Software Design Specification) at 602SiRF182481 demonstrates that SiRF practices this claim element. Dr. Dafesh described CX-272C as the software design specification for the aiding module (*i.e.,* "a piece of software that performs a specific function") within the overall software architecture of the SiRFstarIII software. Dafesh Tr. 703. He added that all of the aiding data in the form of assisted-GPS "would be processed by this module before sent on to another place in the software." *Id.* at 704. *See* CDX-94C (InstantFix Flowchart).

Dr. Dafesh further explained that following the entry point, [

] Dafesh Tr. 705. *See* CX-273C (SiRFstarIII SVD Module Software Design Specification) at 602SiRF184466-68; CX-320C (SiRFstarIII Rx Software Design Specification) at SRF62576; JX-111-1C (Syed Tr.) at 41.

Next is the [

] Dafesh Tr. 705, 712-716, 718-719. *See* CX-275C (SSIII BEP software requirements) at 602SiRF397158, 397163; CX-320C (SiRFstarIII Rx Software Design Specification) at SRF62567; *see also,* Dafesh Tr. 717 [

]

After the SiRFstarIII [

].[30]

Accordingly, because SiRF's extended ephemeris files are "long term satellite tracking data," and because SiRF computes acquisition data from the EE files, the respondents literally infringe the claim element "computing acquisition assistance data using said long term satellite tracking data at said remote receiver."

"receiving satellite signals at said remote receiver using said acquisition assistance data"

Again, neither SiRF nor the Staff present any argument with respect to this claim element. As explained previously, SiRF's SiRFstarIII chips and software that implement InstantFix receive satellite signals using the acquisition assistance data in the form of code and frequency data calculated from SiRF extended ephemeris files. *See* Dafesh Tr. 719-720, 722, 750-752; *see also,* CX-285C (Acquisition Module Software Design Specification) at 602SiRF182445; CX-329C (ATX Control Module Software Design Specification) at 602SiRF182920.

Accordingly, respondents literally infringe the claim element "receiving satellite signals at said remote receiver using said acquisition assistance data."

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[30] [

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Claim 2

"computing position of said remote receiver using said satellite signals and said long term satellite tracking data"

Claim 2 depends from claim 1. Claim 2 further requires, "computing position of said remote receiver using said satellite signals and said long term satellite tracking data." It is found that respondents literally infringe claim 2.

As discussed earlier, Dr. Dafesh testified that the '080 patent teaches, and that claim 2 claims, that long term satellite tracking data can be used in lieu of broadcast ephemeris to perform the computations necessary to calculate position. Speaking in terms of a person of ordinary skill in the art, with respect to claim 2 of the '080 patent, Dr. Dafesh testified, "They would understand that once you've used the EE files to help you acquire and receive signals, that you use the same long-term satellite tracking data to compute a position." Dafesh Tr. 793.

Dr. Dafesh further offered the opinion that the SiRFstarIII chips and the software incorporating SiRFIntantFix are covered by claim 2. *Id.* at 794. He based his opinion on the fact that "in addition to computing acquisition assistance data from the EE file, the SiRF chips and software also compute position using the EE file." *Id.* *See* Dafesh Tr. 659-660; CX-278C (System design of ephemeris extension) at 602SiRF716-17; JX-110-8C (Phatak Tr.) at 140-141, (InstantFix reduces the time-to-first-fix by avoiding the need [

.]

In addition, Dr. Dafesh testified that his opinion also was that the SiRFLoc service incorporating SiRFInstantFix, the SiRFInstantFix evaluation kits (*i.e.,* the EVKs), and SiRF's testing of InstantFix are likewise covered by claim 2 of the '080 patent. Dr. Dafesh based his

opinion on the fact that "they use the SiRFInstantFix service to provide -- to receive long-term satellite tracking data at a remote receiver, which is -- which is comprised of the SiRF chips and software, in addition to the elements of claim 1, the -- they compute position." Dafesh Tr. 794-795.

Accordingly, this limitation is literally infringed by the SiRFstarIII chips and software.

Claim 22

Claim 22 is an independent apparatus claim. Claim 22 contains three limitations.

"a communications transreceiver for receiving long term satellite tracking data from a server"

A transreceiver is both a receiver and a transmitter. A cellular telephone, for example, contains a transreceiver. Also, a device that connects to "WI-FI" has both a transmitter and a receiver. Heppe Tr. 3065-3066. With specific significance to this investigation, a "UART" is a receiver and transmitter. In that regard, the InstantFix extended ephemeris is delivered to the SiRFstarIII chips by the UART of the SiRF chip. *Id.* at 3066; Dafesh Tr. 862-863.

The block diagram from SiRF's SiRFstarIII GSC3LT and GSC3LTf data sheet shows a UART for data transfer. Heppe Tr. 3066-3067; CX-394C (SiRFstarIII GSC3LT and GSC3LTf data sheet) at 1. Accordingly, the SiRFstarIII chips literally meet the first limitation of claim 22 of the '080 patent.

"a microcontroller for computing acquisition assistance data using said long term satellite tracking data"

It is undisputed that the SiRFstarIII chips contain a microcontroller in the form of an ARM processor for performing calculations, including the computation of acquisition assistance data.

Heppe Tr. 3066-3067; Chansarkar Tr. 2325-2326; CX-394C. Accordingly, the SiRFstarIII chips meet the second limitation of claim 22.

"a satellite signal receiver for receiving satellite signals using said acquisition assistance data"

It also is undisputed that the acquisition search strategies of the SiRFstarIII chips, including those that rely on [

] of the SiRF chips to receive satellite signals. Heppe Tr. 3066; CX-394C (SiRFstarIII GSC3LT and GSC3LTf data sheet) at 1. Accordingly, SiRF literally meets the third limitation of claim 22 of the '080 patent.

iv. [ ]

As discussed, *supra,* because the [ ] it cannot be found to infringe any of the claims of the '080 patent.

d. <u>Non-SiRF Respondents</u>

i. <u>Direct Infringement</u>

It is found that non-SiRF respondents E-TEN, MiTAC, and Mio directly infringe apparatus claim 22 of the '080 patent through the importation and sales of products containing SiRFstarIII chips and associated software, including CLM (client location manager) software that implements InstantFix. *See* Compl. Br. at 114.

This finding is supported by the deposition testimony of Freddie Fu (JX-111-1C (Fu Tr.) at 84-85; CX-574C (chart listing E-TEN products with SiRF chips and software, including the X-500 product containing GSW and CLM software); the deposition testimony of S. Wang (JX-111-1C (S. Wang Tr.) at 96; and CX-660 (chart listing MiTAC products, including those with Instant

Fix capabilities). *See* Dafesh Tr. 651-653 (discussing SiRF chips and software being used in a MiTAC products).

ii. Indirect Infringement

It has been found that the accused SiRFstarIII chips and associated software, including the Client Location Manager (CLM) program, directly infringe the '080 patent. As explained below, by selling, promoting, and importing the accused chips and software, or devices containing the chips and software, SiRF and the other Respondents also indirectly infringe the claimed invention.

(1) Respondents Actively Induce Infringement of the '080 Patent

SiRF, MiTAC/Mio and E-TEN actively induce infringement of the '080 patent in violation of 35 U.S.C. §271(b). SiRF and the other respondents have had knowledge of the '080 patent at least since Global Locate filed its complaint with the International Trade Commission on March 30, 2007, initiating this Investigation. And since at least that date, SiRF and the Respondents have continued to induce infringement of the '080 patent.

SiRF induces infringement by marketing its chips, software and services to makers of those products, by providing assistance in designing SiRF chips into such products, and by continuing to support the operation of the SiRF chips and software, knowing that when devices containing the SiRF chips are used, they will perform all of the steps of the asserted claims. *See* Pratt Tr. 1089-1093; CDX-202; CX-753C (summary of SiRF revenue, broken down by chip family).

For example, SiRF targets handset manufacturers (such [ ]) and makers of personal navigation devices (such as [ ]) for purchase of the accused SiRF chips and software. *See* JX-111-2C (Huntingford Tr.) at 94-96. SiRF also provides design assistance to OEMs developing

products that use the accused SiRF chips and software. *See* JX-111-2C (Fudurich Tr.) at 70-71 (discussing design reviews of customer schematics and board layout); CX-852C at 602SiRF2425136 (reporting to [ ] that "[t]he benefits of having InstantFix synthetic ephemeris is highlighted by the number of fixes lengthened or lost by interrupted ephemeris due to marginal signal levels or motion that caused signal drop-outs resulting in navigation data stream bit errors"). Finally, once an OEM implements the accused SiRF chips and software into its products, SiRF continues to provide technical support to that OEM regarding its chips and software. JX-111-2C (Fudurich Tr.) at 70-71.

SiRF also encourages OEMs to market the use of SiRF chips and software in their end-user products as a distinguishing product feature. In order to ensure "greater recognition & differentiation in the market place," SiRF offers its "SiRF Powered Program," which encourages the use of SiRF designed artwork on "the face plate or other location on a product, during software application start up, within product literature, upon product packaging, on a website," and through "advertising, direct mail, or catalogs." CX-693C ("SiRF Powered Program Guidelines") at 602SiRF00136855; *see also,* Mayo Tr. 1611-1612; JX-111-4C (Boeryd Tr.) at 136.

MiTAC/Mio and E-TEN induce infringement by actively marketing their GPS devices containing SiRF chips and software. *See* Pratt Tr. 1094-1098 (discussing documentary evidence of marketing, user support, and technical support); CDX-271; *see also,* CX-602 (Where to Buy Mio Products); CX-608C (summary of Mio US sales to customers). MiTAC/Mio and E-TEN also induce infringement by specifically encouraging and supporting the use of the GPS functionality. MITAC/Mio and E-TEN further provide their customers with user manuals for their products

incorporating the accused SiRF chips and software. *See* JX-111-2C (Fu Tr.) at 129-130 (reviewing E-TEN M700 Users Manual). MiTAC/Mio and E-TEN also each provide their customers with technical support for their GPS devices containing the SiRF chips and software. *See* JX-111-2C (Lee Tr.) at 62-63 (discussing providing technical support in the United States); JX-111-2C (Feng Tr.) at 43 (same).

(2) Contributory Infringement

Complainants have failed to show that SiRF, MiTAC/Mio and E-TEN, contributorily infringe the '080 patent by selling in the United States, selling for importation into the United States and, or, importing into the United States devices containing the infringing SiRFstarIII chips and associated software, including the client location manager software used to manage InstantFix EE files. SiRF and respondents MiTAC/Mio and E-TEN further contributorily infringe by making InstantFix EE files available for downloading by remote receivers.

Complainants' citation to CX-278 (System Design of Ephemeris Extension) 602SiRF715, CX-313 [ ] CLM Theory of Operation and Software Requirement Specification) SRF87978, and JX-111-2C (Fudurich Tr.) at 55-55, alone is simply not enough to establish all elements of contributory infringement.

Accordingly, it is found that respondents do not contributorily infringe the '080 patent.

e. Validity

i. The Asserted Claims are not Anticipated by Prior Art

SiRF broadly argues that "[t]he testimony of both van Diggelen and Dr. Dafesh confirm that the asserted claims fail to claim anything inventive over the prior art." Resp. Br. at 88. In that regard, SiRF strings together a series of quotations from Dr. van Diggelen and Dr. Dafesh in

an attempt to support respondents' contention that it was well-known in the prior art (a) how to predict GPS orbits accurately for days into the future, (b) how to send such information to a receiver as assistance data, (c) how to use such information to reduce frequency uncertainty, and (d) how to use the same information to compute position. Resp. Br. at 89. SiRF, however, offers no detailed, patent-specific (or claim-specific) analysis to support this assertion.

In response, Global Locate correctly notes that anticipation requires that a single piece of art disclose each and every limitation of the claimed invention. Compl. Reply at 36 (citing *Schering Corp. v. Geneva Pharms.,* 339 F.3d 1373, 1377 (Fed. Cir. 2003)). SiRF falls considerably short of this standard. Again, it offers no real analysis to support its position; stringed quotations alone won't do.

Accordingly, SiRF's argument that the asserted claims claim nothing inventive over the prior art is rejected.

ii. <u>Dr. Van Diggelen's '080 Invention was not Derived from JPL</u>

SiRF contends that "[t]he evidence at trial further proves that Global Locate derived the subject matter of the '080 patent from technology it learned from JPL." Resp. Br. at 89. Indeed, respondents suggest that "the capability to generate, distribute, and format accurate, long term predicted GPS orbits for use by conventional GPS receivers to compute acquisition assistance data was commercially available from JPL since 1994." Resp. Br. at 91 (citation omitted).

In support of this argument, SiRF asserts that as early as April 6, 2000, [ ] apparently in pursuit of a [ ] SiRF further asserts that, thereafter, Global Locate learned of JPL's predicted GPS orbit products, culminating in [

] more than one year before the filing date for the '080 patent. Resp. Br. at 89-90 (citing, in part, Bar-Sever Tr. 2089; RX-22C; RX-23C) .[31]

Thus, SiRF maintains that Global Locate was not only aware of JPL's capability to generate "long term satellite tracking data" in a standard format compatible with GPS receivers, but [ ]

In response, Global Locate argues that because "SiRF has not demonstrated either a prior conception by JPL, or communication of any purported 'conception' to Global Locate by JPL, its derivation argument fails." Compl. Reply at 37 (citing *Gambro Lundia AB v. Baxter Healthcare Corp.,* 110 F.3d 1573, 1577 (Fed. Cir.) (citations omitted) (derivation requires a showing of (1) prior conception of the invention by another, and (2) communication of the complete claimed invention to the patentee sufficient to allow for the construction and successful operation of the invention)).

To support this argument, Global Locate cites to evidence showing that Dr. van Diggelen's '080 invention was not derived from JPL. In that regard, Dr. van Diggelen testified that he was unaware that JPL purportedly offered future orbits in the 2000 or 2001 time-frame. With specific

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[31] The [ ] states:

[

]

RX-23 at GL-602 149385 (respondents' emphasis); *see* Resp. Br. at 90.

reference to RX-23 [ ] Dr. van Diggelen stated when he had discussions with JPL, JPL did not provide [

] He explained:

[

]

van Diggelen Tr. 468-469 (emphasis added). *See* van Diggelen Tr. 473-474 [

]

On balance, SiRF has failed to show that Dr. van Diggelen's '080 invention was derived from JPL. As noted above, the evidence is not sufficient to show that JPL conceived of the invention prior to Global Locate, or that JPL communicated the complete claimed invention of the '080 patent to Dr. van Diggelen, or to anyone else at Global Locate.

iii. <u>The '080 Patent is not Anticipated by the GPS System</u>

Next, SiRF argues that the '080 patent is anticipated by the GPS system. Resp. Br. at 91-97. For the reasons cited by Global Locate in opposition, SiRF's anticipation argument is

rejected. *See* Compl. Br. at 118-120; Compl. Reply at 38-40.[32]

The NavStar GPS system does not anticipate because: (1) the NavStar GPS system is a conventional GPS system and does not disclose an assisted-GPS system in which data is received from a server and used to compute acquisition assistance data; and (2) the NavStar GPS system discloses only broadcast ephemeris, not long term satellite tracking data which is longer than broadcast ephemeris.[33]

Moreover, the NavStar GPS system was disclosed and discussed in the Background section of the '080 patent. JX-6 ('080 patent), col. 1, l. 19 - col. 2, l. 21. Accordingly, as noted by Global Locate, "SiRF's burden of demonstrating anticipation of the '080 patent by the GPS system is 'especially difficult.'" Compl. Reply at 38 (citing *Sanofi-Synthelabo v.Apotex, Inc.*, 470 F.3d 1368, 1375 (Fed. Cir. 2006); *Abbott Labs. v. Syntron Bioresearch, Inc.*, 334 F.3d 1343, 1357 (Fed. Cir. 2003) (While "the presumption of validity remains the same whether or not art relied upon was before the examiner ... the fact that a skilled examiner passed upon that very reference during prosecution may be a factor in determining whether the challenger has met the clear and convincing burden.) (internal citations omitted)).

In addition, the '820 patent, which is incorporated by reference into the '080 patent, discloses and discusses the ICD-GPS-200 standard, which describes the interface between GPS

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[32] Complainants use the term "NavStar GPS system," which Dr. Dafesh described as "the system of orbiting satellites relating to this investigation, including space, control, and user segments." Dafesh Tr. 3296. He concluded that it is fair to say that the NavStar GPS system is GPS itself. Dafesh Tr. 3297.

[33] Also, the '080 patent teaches that long term satellite tracking data is "generated at the server," JX-6 at col. 5, ll. 13-20. Broadcast ephemeris, however, is not generated at a server in an Assisted-GPS system, but is collected from the GPS satellites by GPS receivers and, or, receiving stations.

satellite signals and GPS receivers. This fact was included by Global Locate's expert, Dr. Dafesh, as one of the reasons why the NavStar GPS system does not anticipate the asserted claims of the '080 patent. Dr. Dafesh explained:

> The '820 patent, which is incorporated by reference into the '080 patent, also discloses ICD GPS 200, which is the space to user interface in the NavStar GPS system, as well as discloses the longer-term fit intervals that may be broadcast, in the case of anomalous operation. This includes the six-hour, eight-hour, et cetera, up to 146-hour curve fit intervals that, again may be broadcast on occasion in anomalous modes of operation.
>
> And next point is that there is no teaching of assisted GPS in ICD GPS 200. It teaches conventional GPS, not assisted GPS, just conventional broadcast data. And lastly, the '080 patent distinguishes long-term satellite tracking data from broadcast ephemeris data and, thus, that includes the broadcast ephemeris, including the longer fit intervals. And since almanac is not long-term satellite tracking data either, *NavStar GPS cannot possibly invalidate the '080 patent.*

Dafesh Tr. 3297-3298 (emphasis added).

Thus, Global Locate correctly argues that because the NavStar GPS system discloses only conventional GPS, it does not disclose using data from a server to compute "acquisition assistance data" as required by claims 1, 2 and 22 of the '080 patent. *See* Compl. Br. at 119. Global Locate also correctly argues that the NavStar GPS system does not disclose receiving or using long term satellite tracking data having a validity period longer than broadcast ephemeris (van Diggelen Tr. 199), as required by each of the asserted claims. *Id.*[34]

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[34] The '080 patent further requires that the long term satellite tracking data must be received at remote receivers "from a server." JX-6, claims 1, 22. The GPS system does not. Accordingly, because the GPS system does not teach the receipt or use of long term satellite tracking data, it does not teach, as claims 1 and 22 require, the use of long term satellite tracking data to compute acquisition assistance data at a remote receiver.

SiRF also claims that its 1999 version of the SiRFLoc system anticipates. *See* Resp. Br. at 93-95. Global Locate counters, however, with the argument that SiRF's own witnesses testified that in 1999 (as opposed to the present day), the SiRFLoc system "did not generate, send, or use extended ephemeris or any other form of long term satellite tracking data." Compl. Reply at 40 (citing Garin Tr. 1875, 1881; Chansarkar Tr. 2330). For the reasons cited by Global Locate, it is found that SiRF's 1999 version of SiRFLoc did not anticipate the claims of the '080 patent.

iv. <u>TOPEX/Poseidon does not Anticipate the Asserted Claims</u>

The TOPEX/Poseidon was a project designed by Jet Propulsion Laboratories to map the topography of the world's oceans. Bar-Sever Tr. 2118. At the hearing, SiRF introduced three TOPEX-related articles, RX-7, RX-8, and RX-9. In addition, Dr. Bar-Sever, a JPL representative, testified regarding this project. SiRF contends that Dr. Bar-Sever's testimony demonstrates that (i) the TOPEX/Poseidon received almanac data that was sufficiently accurate to constitute long term satellite tracking data, and (ii) it used the data to compute acquisition assistance data. Resp. Br. at 98-100.

Both Global Locate and Staff argue that TOPEX/Poseidon does not anticipate the asserted claims. Global Locate and Staff are correct. The evidence offered by SiRF does not rise to the level of "clear and convincing" necessary to invalidate the asserted claims as being anticipated.

In that regard, RX-7, RX-8, and RX-9 do not describe what is claimed in the '080 patent. They do not disclose the use of long term satellite tracking data to calculate acquisition assistance data, as required by claims 1 and 22. These references also do not disclose the use of long term satellite tracking data to calculate position, as required by claim 2. *See* Dafesh Tr. 3288-3292.

Furthermore, the testimony of Dr. Bar-Sever does not add to the disclosures in RX-7,

RX-8, and RX-9. Dr. Bar-Sever testified that initialization data sent to the receiver from a ground station contained parameters that were identical or nearly identical to the parameters of broadcast almanac. He also testified that almanac data is an abbreviated representation of the satellite orbit. Bar-Sever Tr. 2117-2118, 2120. No data that had the 15 parameters of broadcast ephemeris, however, was ever uploaded to the TOPEX/Poseidon. Also, the almanac initialization data that was transferred to the TOPEX was never used to calculate a navigation solution. Bar-Sever Tr. 2121-2122.

In fact, the data uploaded to the TOPEX/Poseidon was called almanac data and was used in the same manner as conventional GPS almanac, *i.e.,* only once, for initialization, and not for navigation. Dafesh Tr. 3288-3289. While Dr. Bar-Sever did testify that the initialization data was used to reduce code and frequency uncertainties, he admitted that the only document that he testified about that discussed uncertainty reductions was RX-9 ("GPS Precise Orbit Determination") which discusses reducing frequency uncertainties only after acquisition. Bar-Sever Tr. 2123-2126. Claims 1, 2 and 22 of the '080 patent, however, require data generated prior to acquisition.

Accordingly, none of the TOPEX/Poseidon publications anticipate the asserted claims of the '080 patent. *See* Dafesh Tr. 3288-3292.

v. <u>Dr. van Diggelen's ION-GPS 2001 Article does not Anticipate</u>

Dr. van Diggelen was not scheduled to speak at the 2001 ION Conference in Salt Lake City, Utah, which was held September 11-14, 2001. Due to the tragic events of "9/11," however, Dr. van Diggelen was asked to"fill in" for a scheduled presenter unable to reach the conference. Van Diggelen Tr. 376-377. Sometime after his presentation at the 2001 ION conference, Dr. van

Diggelen published a paper. It is the timing of this publication that is at the center of the present dispute.

SiRF contends that "[Dr.] van Diggelen's 'Global Locate Indoor GPS Chipset & Service' paper ('ION-GPS 2001 paper') described Global Locate long-term orbit('LTO') service (which Global Locate claims satisfies the domestic industry requirement and, thus, admits meets every element of the claim)." Resp. Br. at 100-101(citing Dafesh Tr. 817-820). SiRF concludes that the ION-GPS 2001 paper is prior art because "it was presented *before* more than one year before the filing date of the '080 patent. 35 U.S.C. § 102(b)." Resp. Br. at 101 (respondents' emphasis).

Global Locate disagrees, arguing that the van Diggelen ION GPS article upon which SiRF relies was not published more than one year prior to the original application of the '080 patent, and thus does not constitute prior art under Section 102(b). Compl. Br. at 123. Global Locate states that the ION GPS article could not have been published until after November 2001, inasmuch as the article cites a reference having a November 2001 publication date. *Id.,* (citing van Diggelen Tr. 378-379; RX-127 (ION GPS Paper) at 602 SiRF908678 (listing "J. LaMance et al 2001, 'Low Infrastructure Assisted GPS' GPS World magazine, November 2001")).[35]

At the hearing, Dr. van Diggelen testified that he wrote the paper *after* the conference, and that due to the circumstances, he believes that the paper describes something different than what was presented at the 2001 ION GPS conference. van Diggelen Tr. 378-379. Dr. van Diggelen, however, "just can't remember the details of the slides" that he presented at the conference. *Id.* Tr. 379. He stated, "I just can't recall exactly how much of what's in the paper was presented."

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[35] The application that issued as the '080 patent was filed on September 29, 2003, and claims priority to an earlier application that was filed October 2, 2002. The critical date, therefore, is October 2, 2001.

Id. Tr. 380.[36]

On balance, while the testimony of Dr. van Diggelen may be sketchy as to what he presented at the 2001 ION GPS conference, it is found that SiRF has not carried its burden of showing by "clear and convincing" evidence that Dr. van Diggelen's ION GPS subsequently published paper constitutes prior art under Section 102(b). It is also found that the ION conference paper was published after the conference.

In arguing to the contrary, SiRF merely offers an alternative view as to what may have happened and when the events may have occurred. Such an alternative view, however, falls far short of "clear and convincing" evidence.

SiRF's explanation of events is suggestive, but not conclusive. For example, SiRF cites to an email sent by Dr. van Diggelen after the ION GPS conference to a group of Global Locate employees. The email states in part, [

] Resp. Br. at 101 (citing RX-234C at GL-602 119414). The email also stated, [

] *Id.* Contrary to SiRF's position, these two references do not prove its case as to the paper being prior art.

SiRF also argues that Dr. van Diggelen's testimony is entitled to no weight inasmuch, in respondents' view, it is self-serving and, in part, is the result of "coaching" by counsel. Resp. Br. at 102. In that regard, SiRF's argument is directed to a reference in the van Diggelen paper to an article dated November 2001(the LaMance article referenced earlier).

SiRF's argument that Dr. van Diggelen's testimony is entitled to no weight is rejected.

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[36] Dr. van Diggelen: "I did present things that I had from the class, which was a class on indoor GPS. And I believe I used a video that I had." van Diggelen Tr. 380.

There has been no showing that the witness did not testify truthfully; nor has there been a showing that the witness was coached during deposition (to which SiRF refers). Finally, the fact that Dr. van Diggelen agrees that the LaMance paper (the one referenced in the 2001 ION GPS paper) was actually published in March 2002 (van Diggelen Tr. 390-391), without further explanation, is not sufficient to establish that the van Diggelen ION conference article is prior art.

f. Unenforceability

SiRF argues that the '080 patent is unenforceable because Global Locate withheld material prior art. *See* Resp. Br. at 80-86. Respondents state that the applicant distinguished his invention over the prior art by claiming that the use of "long term satellite tracking data" was what made the invention novel. Resp. Br. at 80. SiRF asserts that nonetheless, the applicant "withheld from the Examiner Phan, prior art that disclosed long term ephemeris with validity periods ranging from 6 to 146 hours, a teaching inconsistent with the applicant's argument for patentability of the '080 patent." *Id.*[37] According to respondents, the withheld art was "highly material and not cumulative," and the withholding was "clearly intentional." *Id.*

Global Locate argues that Dr. van Diggelen did not withhold any material prior art or other information. Compl. R. Br. at 29-33. The Staff agrees, stating that "Respondents have failed to meet their burden of proving by clear and convincing evidence intent to deceive the PTO." Staff Br. at 45 (citing van Diggelen testimony). For the reasons cited by Global Locate and the Staff, SiRF's unenforceability argument fails.

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[37] "Not only should the withheld prior art references have been disclosed to Examiner Phan during the prosecution of the '080 patent, but Examiner Issing's rejection of overlapping subject matter in the '164 application, and van Diggelen's intentional abandonment of that invention, should also have been disclosed to Examiner Phan." Resp. Br. at 82.

First, there was no concealment of the '164 application. It was disclosed and incorporated by reference into the '080 patent. JX-6 ('080 patent) at col. 5, ll. 8-12. Second, both the ICD-GPS-200 and Russell references were disclosed in the '164 application. The ICD-GPS-200 was also disclosed and discussed in Global Locate's '820 patent and both the '164 application and the '820 patent were incorporated by reference in their entirety into the '080 patent. *See* JX-6 ('080 patent) at col. 2, ll. 27-31; CX-109 ('820 patent) at col. 4, l. 60 - col. 5, l. 12.

Third, SiRF has not shown that the rejection of the claims in the '164 application would be considered important by the examiner of the '080 patent; nor does it explain why the abandonment of the '164 application should be considered material. In that regard, Dr. van Diggelen testified that the '164 application was a "fairly simple idea" -- *i.e.,* a distribution of the satellite orbits computed by the Air Force, but that "we could not actually implement this system." van Diggelen Tr. 223. Dr. van Diggelen continued, "We then had to do something different, and that's what's in the '820 and the '080 patent, which is recreating the future orbits for the satellites ourselves, we would have to do it ourselves. And in particular making them longer than what's available from the broadcast satellites and then distributing that data." *Id.*

Finally, the evidence shows that Dr. van Diggelen did not intentionally withhold anything during prosecution. To prove inequitable conduct because of the omission of a material reference, the record must contain clear and convincing evidence that the applicant made a deliberate decision to withhold a known material reference. *See Eli Lilly & Co. v. Zenith Goldline Pharm. Inc.,* 471 F.3d 1369, 1382 (Fed. Cir. 2006). As the testimony of Dr. van Diggelen at the hearing in this investigation, such is simply not the case here. *See* van Diggelen Tr. 221-224.

g. Indefiniteness

Finally, SiRF argues that the asserted claims of the '080 patent are invalid for indefiniteness pursuant to 35 U.S.C. § 112, ¶2. Resp. Br. at 105-106. SiRF argues that because Dr. Diggelen and Dr. Dafesh testified that the meaning of the term "long term satellite tracking data" depends upon the fit interval or validity period of the broadcast ephemeris, and because the validity of the broadcast ephemeris could vary, then the asserted claims must be indefinite.

This argument is without merit. As explained by Global Locate, "a person of ordinary skill in the art would readily understand that (i) long term satellite tracking data is clearly defined in relation to the period of validity of broadcast ephemeris; (ii) broadcast ephemeris is 'typically" defined by a period of validity of between 2-4 hours; and (iii) the *broadcast ephemeris data message itself* will inform users of the GPS system if the satellites in the GPS constellation are using an atypical fit interval of longer than 2-4 hours." Compl. Reply at 44 (complainants' emphasis) (citing Dafesh Tr. 607, 658-659, 3297-3298; van Diggelen Tr. 360-362).

2. The '000 Patent

U.S. Patent No. 6,651,000 is entitled, "Method and Apparatus for Generating and Distributing Satellite Tracking Information in a Compact Format." JX-3. It describes methods and apparatuses for creating and distributing satellite tracking data to a remote receiver, where the satellite tracking data is provided in a format that is compatible with the remote receiver. Compl. Br. at 126; Resp. Br. at 107.

Dr. van Diggelen, Charles Abraham, and James LaMance are the named inventors in the '000 patent. They devised a method for "compacting" ephemeris or other satellite tracking data, so that the data takes less space during transmission from server to the remote receiver. van

Diggelen Tr. 226. *See* Dafesh Tr. 593 (The '000 patent "is an orbital data specific form of compaction or compression.")

The invention described in the '000 patent addresses the problem that there is often insufficient bandwidth to efficiently transmit satellite tracking data from servers to remote receivers and that, therefore, "there is a need for a method and apparatus for providing satellite trajectory and clock information to a remote receiver in a compact form." JX-3 ('000 patent) at col. 1, l. 64 - col. 2, l. 3. *See* van Diggelen Tr. 225-226; *see also,* Dafesh Tr. 594 ("[T]he scope of this invention is in an assisted GPS context.").

The Summary of the Invention states: "The present invention is a method and apparatus for generating satellite tracking data (STD), then transmitting the data to a remote receiver in a compact form. The STD is derived by receiving at one or more satellite tracking stations the signals from at least one satellite and determining satellite tracking information (STI) through signal processing or by extracting the ephemeris message from the received signals. STI contains present satellite orbit trajectory data and satellite clock information. The STD is reformatted into a compact format and provided to a remote satellite signal receiver via a network or communications system. The receiver converts the compact format into a standard format and uses the STD to compute the position of the receiver." JX-3 ('000 patent), Summary Of The Invention, col. 2, ll. 6-20.

The invention of the '000 patent is illustrated in Fig. 1 of the patent. JX-3. Figure 1 and the accompanying text describe an exemplary system for creating and distributing satellite tracking data to enhance the performance of remote positioning receivers. Figure 1 of the '000 patent is illustrated below.

Figure 1 depicts a block diagram of the system in which a network of GPS tracking stations (102) collects measurement data, called satellite tracking information (*i.e.,* the STI) from GPS satellites (104). The STI is sent to the satellite tracking data (*i.e.,* the STD) and computation server (106). The server (106) produces the STD from the STI. The server then sends the STD to a distribution server (110) where formatting software (111) formats the data into a compact format, such as compact ephemeris model. The distribution server then distributes the compact data to GPS devices (112) which "expand the model to a format that is conventional for the

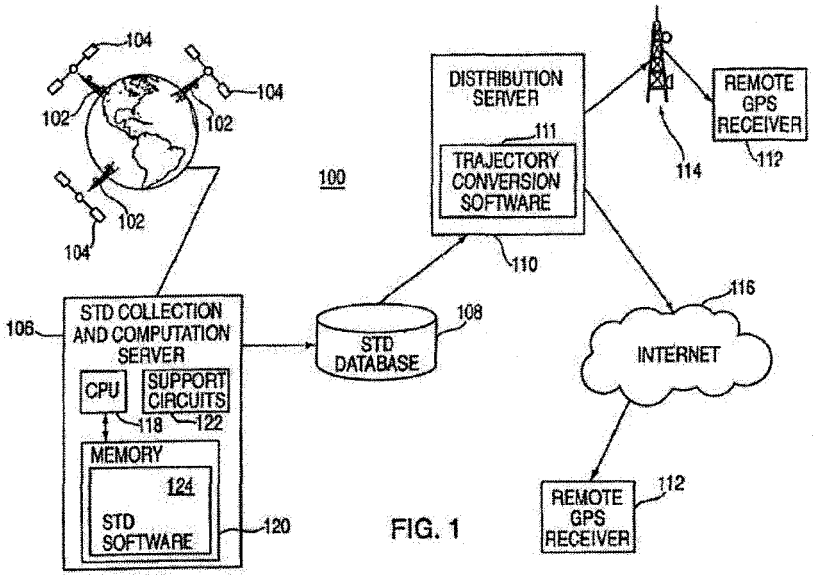

FIG. 1

receiver." JX-3 ('000 patent) at col. 2, l. 37 - col. 4, l. 8 & Fig. 1. Compl. Br. at 126-127; Resp. Br. at 111.[38]

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[38] *See* Dafesh Tr. 595 ("[T]he server collects or receives this satellite tracking information, which the patent describes as one code phase measurement, carrier phase measurements, Doppler measurement, or ephemeris data."); Tr. 596, 598 (after the STI is used to compute the STD, the STD is stored in the server database); (the software in a distribution server represents this STD in a compact format called a "first format"); Tr. 596-597 (satellite sends this compact STD through the Internet, or through a wireless connection to a remote receiver, where (continued...)

There are three methods for compaction identified in the preferred embodiment. One method "is to send a subset of the standard ephemeris parameters and adjust the remaining ones." Dafesh Tr. 599. In that regard, satellite tracking data, or ephemeris, typically consists of 15 separate parameters. In one example of compaction, six of the less critical parameters are eliminated and the remaining parameters are adjusted to account for their elimination. This results in a subset of the standard ephemeris that accurately describes a particular satellite's trajectory. *See* van Diggelen Tr. 232-233; *see also,* JX-3 ('000 patent) at col. 5, ll. 45-55.

A second method "is mathematical curve fit modeling, so fitting this data, for example, position, satellite positions, to a model that will describe where the positions are." Dafesh Tr. 599. Dr. Dafesh stated that rather than sending "many, many" data points that a receiver needed to navigate (*e.g.,* position of the satellite versus time), "you send a fit of this data to a model." Dafesh Tr. 600; CDX-31. In other words, parameters of the model are sent instead of all the points, and that reduces the amount of data that is transmitted. Dafesh Tr. 601.

The third method for compaction "is to send a master value plus delta values that require fewer bits to encode." Dafesh Tr. 599; *see* JX-3 at col. 6, ll. 23-27. "[I]nstead of sending the data from each satellite, you send the data from the first satellite and then you send the differences between the first satellite and the subsequent satellites." *Id.* In that regard, satellite tracking data also contains certain parameters that are "common or close to common among the different satellites." *See* van Diggelen Tr. at 234. Transmitting the master value and delta values instead of the common and close-to-common parameters reduces the amount of data that must be

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[38](...continued)
the remote receiver converts the STD, or first format, "to a standard format or second format that the receiver can understand.")

transmitted to the receiver. *See* JX-3 ('000 patent) at col. 6, ll. 23-27; *see also,* van Diggelen at 234.

a. <u>The Asserted Claims</u>

Global Locate asserts claims 1, 2 and 5 of the '000 patent. These claims read as follows:

> **1**. A method of creating and distributing compact satellite orbit models comprising:
>
> receiving satellite signals from at least one satellite and at least one receiving station;
>
> Extracting at least a portion of the satellite tracking data from said satellite signal, representing said data in a first format;
>
> Transmitting the formatted data to a remote receiver; and
>
> At the remote receiver, representing said formatted data in a second format supported by the remote receiver.
>
> **2**. The method of claim **1** wherein said satellite tracking data comprises at least one of a satellite orbit model or a satellite clock model.
>
> * * * * *
>
> **5**. The method of claim **1** wherein said second format comprises parameters defined in ICD-GPS-200.

JX-3, col. 6, ll. 39-51, 58-59.

b. <u>Claim Construction</u>

"compact satellite orbit models"

This claim term appears in claim 1. Global Locate construes this claim term as "satellite orbit models whose parameters have been adjusted such that the number of bits used to accurately represent the satellite orbit models over a comparable time period has been reduced." Compl. Br.

at 128-129. SiRF submits that no construction is necessary, stating that the "preamble is not limiting." Resp. Br. at 114. The Staff agrees with Global Locate 's proposed construction. The Staff submits that "the compact format of the satellite orbit models is fundamental to the invention." Staff Br. at 30. The Staff also agrees with Global Locate that "this term states a necessary and defining aspect of the invention, and thus is a limitation on the scope of the claims." *Id.*

This court agrees with the proposed construction offered by Global Locate and supported by the Staff. Accordingly, the disputed claim term "compact satellite orbit data" is construed as "satellite orbit models whose parameters have been adjusted such that the number of bits used to accurately represent the satellite orbit models over a comparable time period has been reduced."

The claim language of claim 1 of the '000 patent mandates this construction. It makes clear that the satellite orbital models referred to in claim 1 must be in compact form. For example, the preamble states that the claim is a method for "creating and distributing compact satellite orbit models." JX-3, col. 6, ll. 39-40. *See On Demand Mach. Corp. v. Ingram Indus.,Inc.,* 442 Fed. Cir. 1331, 1343 (Fed. Cir. 2006) ("[i]n considering whether a preamble limits a claim, the preamble is analyzed to ascertain whether it states a necessary and defining aspect of the invention, or is simply an introduction to the general field of the claim.") Claim 1 then continues on to describe the creating and distributing of satellite data in a first format.

The specification confirms that transmitting the data in a compact format is fundamental to the invention. For example, it notes that Assisted-GPS systems typically transmit the entire ephemeris message to the remote receiver and that, in many instances, bandwidth or packet size for the transmission of this message is not readily available. Thus, "there is a need for a method

and apparatus for providing satellite trajectory and clock information to a remote receiver in compact form." JX-3 ('000 patent) at col. 1, l.64 - col. 2, l. 4.

In addition, the Summary Of The Invention states that "[t]he present invention is a method and apparatus for generating satellite tracking data (STD), then transmitting the data to a remote receiver in a compact form." JX-3 at col. 2, ll. 6-8. *See* Background Of The Invention, JX-3 at col. 1, ll. 18-21 ("the invention relates to a method and apparatus for generating and distributing satellite tracking information in a first format (e.g., a compact ephemeris model)).")[39]

Finally, the specification explains that "compaction" is a function of using less data to accurately represent the satellite orbit model over a period of time that is comparable to the non-compacted data. *See, e.g.,* van Diggelen Tr. 230-231 & Dafesh Tr. 678 (the compaction is orbital data specific compaction); *see also,* Heppe Tr. 3038 (no requirement in claim 1 that there be compact satellite orbit models) & Heppe Tr. 3117-3118 (respondents' expert agreeing that the '000 patent addresses the problem presented by bandwidth or packet size relating to the transmission of data in Assisted-GPS by reformatting data into compact form).

Given the preceding discussion, Global Locate correctly states that "[w]here, as here, the specification repeatedly describes the invention as requiring compaction, the preamble's reference to 'creating and distributing compact satellite orbit models' is a logical and necessary limitation to the claims." Compl. Br. at 132 (citing Dafesh Tr. 736 (a person of ordinary skill in the art would understand the preamble to claim 1 to mean "that the orbital models must be compact," "they must ... require fewer bits to represent than the data used to create them.")).

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[39] For other references in the specification to "compact model," "compact ephemeris model," or "compact form," *see* JX-3 at Abstract, Fig. 2; col. 2, ll. 16-18; col. 3, ll. 36-43; col. 3, ll. 47-53; col. 3, ll. 59-63; & col. 4, l. 9 - col. 6, l. 27.

"satellite signals"

This disputed claim term is found in claim 1. Global Locate proposes that this term be construed as "signals for a satellite which can be used to accurately locate the satellite, including the raw signals directly received from the satellites, or processed signals derived from satellite transmissions in the form of satellite tracking information." Compl. Br. at 132. SiRF states that the term "satellite signals" should be construed as "signals that emanate from a satellite." Resp. Br. at 118. The Staff agrees with respondents' construction that the disputed claim term means "a signal generated by a satellite." Staff Br. at 31. All the parties submit that the plain and ordinary meaning of the disputed claim language supports their construction.

Taking into account the language of the disputed term as it appears in claim 1and the specification, it is found that one of ordinary skill in the art would construe "satellite signals" to mean "a raw signal received directly from a satellite or processed signals derived from satellite transmissions in the form of satellite tracking information."

As Global Locate correctly submits, the plain meaning of the disputed claim term makes clear that, as used in claim 1, "satellite signals" includes both the raw signals received directly from satellites and the processed signals obtained from the receiving stations. *See* Compl. Br. at 133. Specifically, claim 1 expressly refers to "receiving satellite signals from at least one satellite *and* at least one receiving station." JX-3, claim 1, at col. 6, ll. 42-43 (emphasis added). This is the reading offered by complainants' expert, Dr. Dafesh. Dafesh Tr. 737. This reading supports complainants' position.

Further support for the construction advanced by Global Locate is found in Figure 1 in the specification. Figure 1 depicts "a block diagram of a system 100 for creating and distributing

satellite tracking data (STD)." JX-3 ('000 patent) at col. 2, ll. 52-53. The system described in Figure 1 includes tracking stations 102 "used to collect measurement data from the GPS satellites." *Id.* at col. 2, ll. 62-63.[40] In addition, the description of Figure 1 notes that the satellite measurements in the form of STI are sent to the "STD collection and computation server" which processes STI to generate the STD (*i.e.,* the satellite tracking data). Figure 1, therefore, supports the construction offered by Global Locate.

The testimony of complainants' expert, Dr. Dafesh, provides additional support for this construction. With respect to Figure 1, Dr. Dafesh testified that the portion of the first limitation of claim 1 referring to receiving satellite signals from at least one receiving station "has to occur at 106 because the signals are coming from receiving stations 102." Dafesh Tr. 757. He further testified that a person of ordinary skill in the art would not understand that raw satellite signals would be sent from the receiving stations 102 to the STD collection and computation server 106. ("Of course not. Because raw RF signals are processed at the receiving stations." *Id.* Dr. Dafesh added, "[t]hat would be very, very impractical, if not impossible." *Id.*)

The construction of "satellite signals" proposed by SiRF and the Staff (essentially, "signals that emanate from a satellite") is rejected as being inconsistent with the plain language of the claim term as it appears in claim 1, as well as being inconsistent with the specification of the '000 patent. In that regard, SiRF cites the following passage in the Summary of the Invention:

> The present invention is a method and apparatus for generating satellite tracking data (STD), then transmitting the data to a remote receiver in a compact form. The STD is derived by

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[40] In the description of Figure 1, the "measurement data" is also "referred to herein as satellite tracking information (STI) that includes at least one of: code phase measurements, carrier phase measurements, or ephemeris data." *Id.* at col. 3, ll. 3-8.

> receiving at one or more satellite tracking stations the signals from at least one satellite and determining satellite tracking information (STI) through signal processing *or* by extracting the ephemeris message from the received signals.

Resp. Br. at 119, citing JX-3 at col. 2, ll. 7-15 (respondents' emphasis).

SiRF's argument that the above passage supports a construction that a "satellite signal" is "simply a signal received from a satellite" is unpersuasive. This argument fails in light of the plain language of the disputed claim term, the patent specification, and the testimony of Dr. Dafesh, particularly as to one of ordinary skill in the art.

Finally, both SiRF's and the Staff's advance arguments based upon U.S. Patent No. 6,542,820 ('820 patent) and both arguments likewise fails. *See* Resp. Br. at 119; Staff Br. at 32-33. The '820 patent (CX-190) is incorporated into the '000 patent in its entirety by reference in the specification. JX-3 at col. 1, ll. 8-11. The '820 patent is entitled, "Method and Apparatus for Generating and Distributing Satellite Tracking Information." The '820 patent is generally directed to a method and apparatus for generating satellite tracking data that is valid for an extended period of time.

First is the Staff's '820 argument. The Staff notes that during the prosecution of the application leading to the '000 patent, the examiner issued an office action rejecting certain claims, including then pending claim 1, as being unpatentable over the claims of the co-pending application leading to the '820 patent based on obviousness-type double patenting. JX-10 at GL-602 001050-53. The Staff further notes that to traverse this rejection, the applicants filed a terminal disclaimer. *Id.* at 001117-18. *See* Staff Br. at 32.[41]

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[41] The '820 issued on April 1, 2003. The '000 patent subsequently issued on November (continued...)

The Staff goes on to note the similarities, in its view, between claim 1 of the '820 patent and claim 1 of the '000 patent. The Staff also notes what it believes are similarities in Figure 1 of the two patents describing the a network of GPS tracking stations 102, GPS satellites 104, and an STD collection and computation server 106. Staff Br. at 33. Thus, the Staff concludes that "one of ordinary skill in the art would recognize that the 'receiving satellite signals from at least one satellite *and* at least one receiving station' limitation of claim 1 of the '000 patent means receiving satellite signals from at least one satellite *at* at least one receiving station." *Id.* (Staff's emphasis).[42]

The Staff's '820 argument fails because it is contrary to the plain wording of claim 1 of the '000 patent. Claim 1 reads, in part, "receiving satellite signals from at least one satellite and at least one receiving station." JX-3 ('000 patent) at col. 6, ll. 42-43. Claim 1 of the '000 patent does not read "receiving satellite signals from at least one satellite *at* at least one receiving station," as the Staff would do. Thus, the Staff's proposed construction is inconsistent with the plain language of the claims and is, therefore, improper. *See Z4 Techs., Inc. v. Microsoft Corp.*, 507 F.3d 1340, 1348 (Fed. Cir. 2007).[43]

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[41](...continued)
18, 2003.

[42] As additional support for this proposition, the Staff cites the testimony of respondents' expert, Dr. Heppe, at transcript pages 3044-3045. *Id.* Given Dr. Heppe's numerous changes of position at the hearing in this investigation from the positions articulated in his initial expert report, Staff's reliance upon his testimony is misplaced. The testimony of Dr. Heppe is given little weight by this court.

[43] The Staff also argues that its rejected proposed construction of the claim term "satellite signals" (*i.e.*, the "*at* at" construction) is further supported by apparatus claim 29 of the '000 patent. Staff Br. at 33. The Staff submits that claim 29 includes limitations corresponding
(continued...)

Next is respondents' '820 argument. SiRF states that "[w]hile the '000 patent claims recite simply a 'satellite signal,' the '820 patent claims recite: '*producing* long term satellite tracking data from information *derived from* said satellite signals.'" Resp. Br. at 119 (respondents' emphasis) (citing RX-109). SiRF argues that the construction proferred by Global Locate for the claim term "satellite signal" parallels the claimed embodiment of the '820 patent, and not the claimed embodiments of the '000 patent. Resp. Br. at 119-120.

This argument is simply beside the point. Here, as already explained, Global Locate's proposed construction of the disputed claim term was adopted on the basis of the plain language of the '000 patent and the '000 patent's specification.

"extracting"

This claim term appears in claim 1. Global Locate's proposed construction is that "extracting" means "computing." Compl. Br. at 135. SiRF does not believe that construction of this claim term is necessary. It does, however, disagree with Global Locate's proposed construction. Resp. Reply at 83. The Staff agrees with complainants' proposed construction. Staff Br. at 34.

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[43](...continued)
to those recited in method claim 1 of the '000 patent. It further submits that complainants' expert, Dr. Dafesh, testified that the claimed "satellite signal receiver" may be the GPS tracking stations 102 of Figure 1 of the '000 patent. This, in the Staff's view, supports its proposed construction of "satellite signals." Staff Br. at 33-34 (citing Dafesh Tr. 919, 922-923).

This court, however, does not find that the Staff's claim 29 argument supports its proposed construction of "satellite signals." Moreover, Dr. Dafesh appears to distinguish claim 1 from claim 29 of the '000 patent in stating that similar claim terms can have different meanings, depending on the context of the term in light of the specifications. Dr. Dafesh testified, "So, in this case, the specification uses signal more broadly to cover both the raw satellite signal and a processed signal in the form of STI. And in that context, then, a broader definition could apply." Dafesh Tr. 918-919.

Both Global Locate and the Staff submit that the '000 patent specification supports construing the claim term "extracting" to mean "computing." The parties are correct. The specification confirms that, as used in claim 1, "extracting" refers not only to reading data from the satellite signal, but also processing the data to form satellite data, as well as compact satellite models. The server at which the extraction takes place is referred to as the "collection and computation" server. *See* JX-3 ('000 patent) at col. 3, ll. 3-5 ("An STD collection and computation server 106 collects and processes the measurement data."); *see also,* JX-3 at col. 4, ll. 12-13 ("At step 204, the satellite trajectory data (STD) is computed or extracted from satellite signals.")

In addition, Figure 2 refers to the extraction step 204 as "compute STD." JX-3, Fig. 2. The specification explains that "[a]t step 204, the satellite trajectory data (STD) is computed or extracted from the satellite signals." JX-3 at col. 4, ll. 12-13 & Fig. 2 (illustrating step 204).

Dr. Dafesh also testified that a person of ordinary skill in the art relative to this patent "would understand that extracting means computing." Dafesh Tr. 765. Dr. Dafesh further testified that the satellite tracking data referred to in col. 3, ll. 15-20 of the specification as being produced by the server 106 are produced by the extraction method as claimed in the second limitation of claim 1 of the '000 patent. ("Yes. Absolutely.") Dafesh Tr. 766.

Accordingly, the claim term "extracting" is construed as "computing."

"representing said data in a first format"

This claim term appears in claim 1. Global Locate proposes that "representing said data in a first format" be construed as "representing the extracted data as one or more compact satellite orbit models." Compl. Br. at 138. SiRF believes that no construction of this term is necessary.

The Staff agrees with Global Locate's proposed construction. Staff Br. at 35.

It is found that the claim term "representing said data in a first format" means "representing the extracted data as one or more compact satellite orbit models." The structure of the claim supports this construction. In that regard, the preamble to claim 1 describes "[a] method of creating and distributing compact satellite orbit models." The first limitation of claim 1 reads "receiving satellite signals from at least one satellite and at least one receiving station." The second limitation reads "extracting at least a portion of the satellite tracking data from said satellite signal, representing said data in a first format." JX-3 ('000 patent), claim 1. Thus, the data in the first format represents the extracted data as one or more satellite orbit models.

The claim construction proposed by Global Locate is also supported by the specification. For example, the specification describes various methods for outputting "the formatted STD ... as [a] compact model." JX-3 at col. 4, ll. 17-18 & Figs. 2, 4. Also, the specification does not disclose methods for creating and transmitting anything other than compact satellite orbit models.

"transmitting the formatted data to a remote receiver"

This claim term appears in claim 1. Global Locate construes "transmitting the formatted data to a remote receiver" as "distributing the compact satellite orbit models to a receiver that is separate from the transmitter of the data in a first format." Compl. Br. at 139. SiRF believes that no construction is required. Resp. Br. at 123. Respondents, however, argue that the claim term requires transmitting to the remote receiver "that represents the formatted data in a second

format." *Id.*[44] The Staff submits that complainants' construction is reasonable. Staff Br. at 35.

The construction proposed by Global Locate and supported by the Staff is adopted. The claim term "transmitting the formatted data to a remote receiver" is construed as "distributing the compact orbital models to a receiver that is separate from the transmitter of the data in a first format." This construction is supported by a plain reading of the language of claim 1.

This construction also is supported by the specification. For example, according to the specification, the claimed distribution system may be implemented by communication systems that do not make direct transmissions. In that regard, both Global Locate and the Staff cite to JX-3 ('000 patent) at col. 3, ll. 44-47 ("The distribution process may be implemented using some form of wireless communications system 114, or over the Internet 116, or a combination of both, or by some other means of communication."); *see* JX-3, Fig. 1 (also cited by complainant).

Moreover, as explained by Dr. Dafesh, when files are transmitted over the Internet, the transmission does not have to be direct. The files may pass "through a number of nodes on the Internet that are, essentially just pass-throughs or, you know, temporary storage locations." Dafesh Tr. 768-796.

"representing said formatted data in a second format supported by the remote receiver"

This claim term appears in claim 1. The parties are in agreement that "representing said formatted data in a second format supported by the remote receiver" is to be construed as "converting the data received in the first format to a second format supported by the remote

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[44] Global Locate states that the position taken by SiRF actually "advocates for an interpretation that would require the transmission of the data in the first format from the transmitter to the remote GPS receivers to be *direct*." Compl. Reply at 53 (complainants' emphasis).

receiver." Resp. Br. at 123-124.

c. Infringement Determination - the '000 Patent

Global Locate asserts that chips GSC3, GSC3e/LP, GSC3f, GSC3LT, GSC3LTf, GSC3LTi, GSC3LTif, and GSD3t, along with associated software, and that support InstantFix and, or, SiRFLoc infringe claims 1, 2 and 5 of the '000 patent.

i. SiRFstarIII Chips and Software Utilizing the Instantfix System

Claim 1

The evidence establishes that each of the accused SiRFstarIII chips and associated software supporting InstantFix and, or, SiRFLoc practice each of the claim elements of claim 1 of the '000 patent. The claim elements are discussed below, beginning with the preamble.

"compact satellite orbit models"

SiRF compacts the extended ephemeris (*i.e.,* the EE) files that its SiRFInstantFix server transmits. *See* CX-278C (System Design of Ephemeris Extension (June 18, 2004)) at 602SiRF716 & 718; JX-111-1C (Kuykendall Tr.) at 118-119, (System Design of Ephemeris Extension describes the generation of EE. Kuykendall has no reason to believe that there are any significant changes to the generation, including the described compaction that occurs at the InstantFix server).

The testimony of several witnesses provides further support for the proposition that the accused SiRF products meet the first limitation of claim 1. Dr. Dafesh, testifying as to CX-278C, stated that SiRF's [

] Dafesh Tr. 663-664. *See* Garin Tr. 1879 (Phatak designed the compaction portion of the InstantFix

system); *see also,* JX-110-8C (Phatak Tr.) at 150-159, 184-185, (explaining the compaction method used by SiRF).

"receiving satellite signals from at least one satellite and at least one receiving station"

The SiRF InstantFix service literally meets the first limitation of claim 1 when the InstantFix server downloads processed satellite signals from [ ]

In that regard, Dr. Dafesh offered the opinion that the accused InstantFix products are covered by this limitation. Dafesh Tr. 736. Dr. Dafesh explained that "claim 1says receiving satellite signals from at least one satellite and at least one receiving station." Dafesh Tr. 737. Because of the word "and," he noted that "the satellite signals are received both from the satellite and the receiving station." *Id.*[45]

Dr. Dafesh then concluded that the "InstantFix server receives satellite tracking information in the form of rapid and ultra-rapid orbits that it gets from [ ] Dafesh Tr. 738. In explaining how the InstantFix server downloads data, Dr. Dafesh explained, "it takes past orbit data from the IGS Web site [called the International GNSS Service and managed by [ ] in the form of - - in the form of [ ] Dafesh Tr. 660. *See* Dafesh Tr. 661 (InstantFix server receives data from JPL "in the form of these

[45] In the claim construction discussion, *supra,* it was noted that Dr. Dafesh discussed that the STD collection and computation server (Fig. 1) must be receiving its satellite tracking information from the receiving stations in the form of processed signals, rather than the raw signals that are coming down from the satellite. Dafesh Tr. 737.

[ ][46]

In offering his opinion, Dr. Dafesh acknowledged that the satellite signals received by the SiRFInstantFix server are "processed satellite signals." Dafesh Tr. 761. The signals are processed at the [ ] location before they are transferred to the InstantFix server. *Id.* Dr. Dafesh testified that this fact does not change his opinion, "[b]ecause, to be consistent with the claims, the specification and the preferred embodiment, the satellite signals must also be processed satellite signals, as well as the raw satellite signals from the satellite." *Id.*

SiRF asserts that Global Locate is wrong as to the first limitation of claim 1, inasmuch as "SiRF's InstantFix server *does not receive satellite signals* – only [ ] receives satellite signals and it does *not* send them to SiRF." Resp. Br. at 126 (respondents' emphasis).

Like SiRF, the Staff submits that the accused products do not meet the first claim limitation. Staff Br. at 36. In so arguing, the Staff places a great deal of reliance upon the testimony of respondents' expert, Dr. Heppe. In that regard, Dr. Heppe testified that the accused products do not meet the first limitation of claim 1 of the '000 patent because "SiRF does not actually receive satellite signals because, instead, they receive information from [ ] Heppe Tr. 2595.

It is the finding of this court that the fact that [ ] processes the satellite signals, and then sends the processed signals to the SiRFInstantFix server, establishes that the accused products meet the first limitation of claim 1. As to this finding, the testimony of

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[46] Discussing the InstantFix server, Dr. Pratt, another of complainants' experts, stated that "the primary input is from the [ ] who have a means of tracking GPS satellites and providing information about their position, the position of those satellites over time." Pratt Tr. 1215.

Dr. Dafesh is credited over the contrary testimony of Dr. Heppe.[47] Dr. Dafesh's testimony is consistent with the plain wording of claim 1.

Accordingly, because the [ ] data that is received by the SiRFInstantFix is derived from at least one satellite and at least one receiving station, the "receiving satellite signals" limitation of claim 1 is met.

"extracting at least a portion of the satellite tracking data from said satellite, representing said data in a first format"

The evidence establishes that this second limitation of claim 1 also is met. First, the SiRFInstantFix server extracts at least a portion of the satellite tracking data from the processed JPL signals by taking accurate 15-minute JPL orbit data and performing the "prediction" function necessary for the ultimate generation of EE files. In that regard, in offering the opinion that the SiRFInstantFix service, including the server, chips, and software, are covered by the second claim element, Dr. Dafesh explained:

> The basis is that the SiRF server receives process signals in the form of satellite tracking information or these [
>
>]
>
> So you see, there's a prediction step, which is the extraction. And there is a compaction step.

Dafesh Tr. 763; *see* CX-278C (System design of ephemeris extension) at 602SiRF716, Fig. 1.

Second, the evidence also establishes that SiRF's extended ephemeris (EE) files are

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[47] As noted previously, in a number of instances, Dr. Heppe has changed his position at the hearing from earlier positions set forth in his initial expert report. Also, as earlier noted, this has adversely affected his credibility.

"satellite tracking data" because they contain a set of orbital and, or, clock parameters that provide an accurate description of the GPS satellites' position, velocity, and clock error. *See* Dafesh Tr. 671-672 (the EE file is basically the long-term orbit data file, containing long-term orbit data for all the satellites in the GPS constellation); Tr. 773 (EE files contains satellite orbit model and clock model for satellites in the GPS system). *See also,* CX-825C (SGEE System Overview) at SRF 88046-47.

Third, the evidence establishes that the SiRFInstantFix server performs the step of "representing said data in a first format." The server uses the [ ] data to predict future orbit data. *See* Dafesh Tr. 763 (quoted above) (opinion that InstantFix service, chips, and software meet the second limitation, in part, because server is "computing satellite tracking data from this satellite signal and representing that data in a first compact format."); *see also,* CX-278C at 602SiRF716-718.

Specifically, the InstantFix server compacts the data using a [ ] The server further uses a [ ] Dafesh Tr. 665-667, 762-763; CX-278C at 602SiRF716 at Fig. 1 & 602SiRF720-721.[48]

Accordingly, it is found that the accused products meet the second element of claim 1.

"transmitting the formatted data to a remote receiver, and at the remote receiver, representing said formatted data in a second format supported by the receiver"

The evidence establishes that the accused products meet the third limitation of claim 1.

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[48] The InstantFix server then uses a [ ] Dafesh Tr. 677.

First, Global Locate is correct in asserting that SiRF directly transmits EE files from the SiRFInstantFix server when testing and through the SiRFLoc server, which acts as the distribution server. Also, SiRF indirectly transmits the EE files from the InstantFix server to remote receivers when it transmits the files to its customers, who then distribute the files to remote receivers. Compl. Br. at 144. *See* Dafesh Tr. 671 [ ] transmits EE file to remote GPS receiver through customer EE server); 768-769; CX-278C at 602SiRF716 (transmit block in Fig. 1) & CX-825C (SGEE System Overview) at SRF 88048.

Second, the SiRF Client Location Manager (*i.e.,* the CLM) embedded in receivers takes the EE files (*i.e.,* the data in the first format) and processes it into a format compatible with the receiver (*i.e.,* the data in the second format). *See* Compl. Br. at 144.[49]

In that regard, the CLM software generates from the EE files [ ] 4-hour block of ephemeris in which all of the delta values for that block have been converted back to full parameters. The SiRF CLM software that is embedded in the accused SiRFstarIII chips located in the other respondents' and third-party downstream GPS receivers processes the EE files to generate [ ] 4-hour block of ephemeris supported by the SiRFstarIII chip and software. Dafesh Tr. 697-698 (Discussing message flows -- *i.e.,* how the information is transmitted from the client location manager to the SiRF chip and software. "[T]he CLM software ... [

]. *See* CX-314C (CLM/GPS-Sensor Theory of Operation for SEA-SGEE) & JX-110-8C (Phatak Tr.) at 210-211, 213-216);

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[49] As noted earlier, the CLM is a software program that SiRF supplies to host receiver developers that unpacks the EE file and makes it compatible with the remote receiver. Dafesh Tr. 672, 727.

CX-825C (System Overview for Server-Generated Extended Ephemeris) at SRF 88048.

Accordingly, it is found that SiRF literally infringes claim 1 of the '000 patent.

Claim 2

Claim 2 depends from claim 1. It provides: "**2**. The method of claim **1** wherein said satellite tracking data comprises at least one of a satellite orbit model or a satellite clock model." JX-3 ('000 patent) at col. 6, ll. 50-52.

It is found that the accused products, SiRFInstantFix service, chips, and software, literally infringe claim 2 of the '000 patent. In that regard, the EE files that are distributed in SiRF's InstantFix service contain satellite orbit clock models and data. Dafesh Tr. 773. Neither SiRF, nor the Staff, specifically address the infringement issues relating to claim 2. *See* Resp. Br. at 124-135; Staff Br. at 37.

Claim 5

Claim 5 depends from claim 1. It provides: "**5**. The method of claim **1** wherein said second format comprises parameters defined in ICD-GPS-200." JX-3 ('000 patent) at col. 6, ll. 59-60.

It is found that the SiRFInstantFix service, chips, and software practice claim 5 of the '000 patent. In that regard, the second format in the client location manager is the broadcast ephemeris format defined in the ICD-GPS-200. Dafesh Tr. 774-775. Neither SiRF, nor the Staff, specifically address the infringement issues relating to claim 5. *See* Resp. Br. at 124-135; Staff Br. at 37.

ii. SiRFLoc System Incorporating InstantFix, SiRF InstantFix Evaluation Kits, and SiRF's Testing of InstantFix

As noted, SiRF's SiRFLoc system can transmit EE files generated at the InstantFix server to remote receivers. Heppe Tr. 3022-3023; Dafesh Tr. 687-688. In addition, SiRF distributes InstantFix evaluation kits and tests InstantFix in the United States. *See* Heppe Tr. 3030-3031; CX-284C (SiRFLoc End-to-End System Integration, Validation and Performance Test Plan) at 602SiRF264191; *see also,* Dafesh Tr. 690-692, 694-695; CX-264C (SiRF InstantFix Evaluation Kit User Guide) at 602SiRF1242.

It is found that SiRF's SirfLoc system, which incorporates InstantFix, the use of SiRF InstantFix Evaluation Kits, and SiRF's testing of InstantFix infringe claim 1, claim 2, and claim 5 of the '000 patent.

As to claim 1, in each of these instances, the SIRFInstantFix server receives satellite signals in the form of satellite tracking data from the [ ] Dafesh Tr. 738-739. This satisfies the first limitation of claim 1.

These accused products also practice the second limitation of claim 1. In that regard, the SiRFInstantFix server extracts satellite tracking data and represents it is a first format, *i.e.,* a compact orbit model. Dafesh Tr. 763-764.

The third limitation of claim 1 is satisfied because the SiRFLoc server transmits the compact orbital models represented by the EE files to a remote receiver. Dafesh Tr. 770. In addition, a SiRFInstantFix server transmits EE files to remote evaluation receivers when SiRF tests InstantFix. Dafesh Tr. 687-688, 692-695, 697; CX-264C (SiRF InstantFix Evaluation Kit User Guide) at 602SiRF124254.

The above accused products meet the final limitation of claim 1 because at the remote receiver the EE format is converted into a format that the receiver understands. Dafesh Tr. 772-773.

The SiRFLoc system incorporating InstantFix, the InstantFix evaluation kits, and SiRF's testing of InstantFix also infringe claims 2 and 5 of the '000 patent. The accused products infringe claim 2 because they use the EE file that contains orbit and clock models. Dafesh Tr. 773-774. The accused products infringe claim 5 because the second format is the broadcast ephemeris format defined in the ICD-GPS-200. Dafesh Tr. 775.

d. Invalidity

i. SiRF Prior Art

SiRF contends that it was practicing the steps of the asserted claims of the '000 patent through tests and demonstrations of SiRFLoc in 1999. *See* Resp. Br. at 137-140. This contention is rejected.

First, SiRF has failed to establish that the tests and demonstrations constitute prior art. While SiRF cites two articles from 1999 and 2000 (RX-100 & RX-111) that describe SiRFLoc, it does not allege that either article is anticipatory. Moreover, as complainants note, "SiRF has also provided no evidence regarding when or where any such tests or demonstrations took place." Compl. Reply at 62.

ii. The TIA/EIA/IS-801 Standard

The TIA/EIA/IS-801 Standard does not anticipate as claimed by SiRF. Resp. Br. at 140-144. The TIA/EIA/IS-801 reference describes a position determination service protocol between mobile stations and base stations operating in a CDMA system. *See* RX-285(TIA/EIA/IS-801) at

602SiRF1753777 ("This standard defines a set of signaling messages between the mobile station and base station to provide a position determination service.").

The TIA/EIA/IS-801 standard does not anticipate the asserted claims because it does not teach a method or apparatus for creating and distributing "compact satellite orbit models," or extracting any satellite tracking data and representing it in a "first format" as each of the asserted claims require. Dr. Dafesh, in disagreeing with Dr. Heppe's opinion that the IS-801 reference anticipates, testified that "[i]t does not teach compaction of satellite tracking data and it does not teach representing satellite tracking data in a second format supported by a remote receiver." Dafesh Tr. 3305.[50]

For the reasons mentioned above, in particular the testimony of Dr. Dafesh, it is found that the TIA/EIA/IS-801 standard does not anticipate.

iii. <u>U.S. Patent No. 6,429,811 ("Zhao")</u>

SiRF submits that U.S. Patent No. 6,429,811 ("Zhao") anticipates all of the asserted claims of the '000 patent. Resp. Br. at 144-150; RX-107. The Zhao patent is entitled, "Method and Apparatus for Compressing GPS Satellite Broadcast Message Information." It has a priority date of February 15, 2001. Global Locate argues that Zhao does not anticipate. Compl. Br. at 151-152; Compl. Reply at 63-64. The Staff agrees with Global Locate. Staff Br. at 38.

Both Global Locate and the Staff rely upon the testimony of Dr. Dafesh to support their position. Their reliance upon Dr. Dafesh's testimony is well-placed. In that regard, Dr. Dafesh explained that the Zhao patent discloses two embodiments. The first embodiment expands, rather

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[50] In addition, Dr. Dafesh disagreed with Dr. Heppe's conclusion that compaction occurs here. Dr. Dafesh stated that what Dr. Heppe calls compaction "consists of ionospheric corrections" and "[i]onospheric corrections are not satellite tracking data." Dafesh Tr. 3306.

than compacts, satellite tracking data because multiple data sets are to be sent over short intervals. Dafesh Tr. 3300-3301; RX-107 (Zhao) at col. 6, ll. 39-45.[51] Thus, the first embodiment of Zhao does not teach a method or apparatus for creating and distributing "compact satellite orbit models" or the representation of extracted satellite tracking data in a "first format."

The second embodiment does not compact data as called for in the '000 patent because the excluded data is not satellite tracking data. Dafesh Tr. 3301-3304; RX-107 at col. 11, ll. 4-19. Thus, the second embodiment also fails to teach a method or apparatus for creating and distributing "compact satellite orbit models," or "extracting at least a portion of the satellite tracking data" from a satellite signal and representing it in a "first format." This embodiment eliminates certain data other than the orbital and, or, clock parameters from the entire satellite broadcast message, but does not extract any satellite tracking data and represent it in a first compacted format. *See* RX-107 (Zhao) at col. 4, ll. 40-48; col. 10, l. 14 - col. 11, l. 2 & Table 2; *see also,* Compl. Br. at 152. The second Zhao embodiment transmits ephemeris and clock offsets – the information that is satellite tracking data – without any compaction. Dafesh Tr. 3301-3304. *See* RX-107 at col. 11, lines 5-19 (Table 2).

iv. <u>JPL Rapid and Ultra-Rapid Orbit Products</u>

SiRF argues that the JPL Rapid and Ultra-Rapid products, stating that they predict GPS orbits into the future, anticipate the claims 2 the '000 patent. Resp. Br. at 150-153. SiRF relies upon the testimony of Dr. Bar-Sever to support its argument.

In response, Global Locate argues that (1) SiRF does not state which statutory provision it

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[51] Zhao teaches sending position coordinates x, y, and z (which define the position of a satellite at a given time) in multiple data sets separated in time by a difference Zhao calls delta T. RX-107 (Zhao) at col. 4, ll. 34-40; col. 6, ll. 39-42; and col. 7, ll. 1-15.

relies on to establish that the JPL Rapid and Ultra-Rapid products are prior art; (2) SiRF has not even alleged, let alone shown, that these JPL orbits were compact; and (3) SiRF has failed to identify the inventor who supposedly was first to invent, as required by 35 U.S.C. § 102(g). Compl. Reply at 64.

Given the arguments advanced by complainants, it is found that SiRF has failed to prove by clear and convincing evidence that the JPL Rapid and Ultra-Rapid products anticipate the claims of the '000 patent.

e. Indefiniteness

SiRF submits that "[i]f the claims of the '000 patent are construed to require an additional limitation of accuracy, they will be indefinite because no standard is provided in the '000 patent." Resp. Br. at 153. In such a case, it concludes that the '000 patent is invalid under 35 U.S.C. § 112 by reason of indefiniteness.

It is found that SiRF has not met its burden of proving indefiniteness by clear and convincing evidence. Insofar as the '000 patent is concerned, one of ordinary skill in the GPS art would readily understand what it means for satellite tracking data to be accurate. *See* JX-3 ('000 patent) at col. 3, ll. 10-20. Moreover, as noted by Global Locate, SiRF's own U.S. Patent No. 7,142,157 ("the '157 patent"), issued to former SiRF engineer Lionel Garin, "demonstrates that those of skill in the art have no trouble understanding what it means for STD to be accurate." Compl. Reply at 65 (citing CX-305 ('157 patent) at col. 10, ll. 45-61).

3. The '651 Patent

United States Patent No. 6,704,651 is entitled, "Method And Apparatus For Locating Mobile Receivers Using A Wide Area Reference Network For Propagating Ephemeris." JX- 4

('651 patent). Frank van Diggelen is the sole named inventor in the '651 patent.

The '651 patent is directed to a method for delivering to GPS receivers, from a source other than the GPS satellites themselves, precise satellite data, *i.e.,* ephemeris, to enable the receivers to acquire and track satellite signals in low signal environments. *See* JX-4 ('651 patent) at col. 1, ll. 11-16; van Diggelen Tr. 157-158 ; Pratt Tr. 1189. *See also,* Summary Of The Invention, col.2, ll. 11-21("The wide area network of GPS receivers collects the ephemeris data that is transmitted by the satellites and communicates the data to the central site. The central site delivers the ephemeris to the mobile receiver. The mobile GPS receiver uses the delivered data to enhance its sensitivity in two ways. First, the data allows the receiver to detect very weak signals that the receiver would not ordinarily be able to detect, and second, the GPS receiver does not have to track the satellite signals for very long before a position can be calculated.")

a. <u>The Asserted Claims</u>

Global Locate asserts claims 1 and 2 of the '651 patent. These claims read as follows:

> **1**. A method of receiving global positioning system (GPS) satellite signals comprising:
>
> receiving satellite ephemeris at a first location;
>
> communication [*sic*] the satellite ephemeris to a mobile GPS receiver at a second location; and
>
> processing satellite signals received at the mobile GPS receiver using the ephemeris to reduce code and frequency uncertainty in the mobile GPS receiver to improve acquisition sensitivity of the mobile GPS receiver.
>
> **2**. The method of claim **1** wherein said communicating step is performed through a wireless path.

JX 4, col. 10, ll. 61 - col. 11, l. 5.

b. Claim Construction

"satellite ephemeris," "the satellite ephemeris," "the ephemeris"

These claim terms appear in claim 1 of the '651 patent. Global Locate construes the terms as "A set of orbital parameters that provides an accurate description of a satellite's position, a satellite's velocity, and a satellite's clock error." Compl. Br. at 157. SiRF believes that no construction is necessary, "except to the extent necessary to clarify that 'the satellite ephemeris' and 'the ephemeris' refer back to the same 'satellite ephemeris." Resp. Br. at 49. The Staff submits that "the term 'satellite ephemeris' refers to the ephemeris transmitted by a satellite, *i.e.*, broadcast ephemeris, which is different from almanac." Staff Br. at 46. Staff also agrees with SiRF, however, "that these terms refer to the same satellite ephemeris, based on the language of the claim." Staff Br. at 48.

The claim terms "satellite ephemeris," "the satellite ephemeris," and "the ephemeris" are construed as "A set of orbital parameters that provides an accurate description of a satellite position, a satellite's velocity, and a satellite's clock error."

As asserted by Global Locate (Compl. Br. at 158), this construction is supported by the patent specification and its prosecution history. *See* (JX-4) ('651 patent) at col. 1, ll. 60-61 ("the ephemeris data contains an accurate description of the satellite position, velocity, and clock errors"); JX-11('651 prosecution history) at GL-602 1753. *See also,* Pratt Tr. 1196-1197, & 1274 ("[T]he ephemeris has to be the same ephemeris. But the form of the ephemeris doesn't necessarily have to be the same.") Moreover, as both Global Locate and the Staff submit, the claims and the specification of the '651 patent clearly distinguish between almanac and ephemeris in a satellite signal. *See* Compl. Br. at 158; Staff Br. at 46-48.

"using the ephemeris to reduce code and frequency uncertainty in the mobile GPS receiver to improve acquisition sensitivity of the mobile GPS receiver"

This claim term appears in claim 1 of the '651 patent. Global Locate construes this claim term as follows: "Using the ephemeris to reduce both the uncertainty of the range of possible satellite signal frequencies and the uncertainty of the range of possible satellite signal delays during signal acquisition to improve acquisition sensitivity of the mobile GPS receiver." Compl. Br. at 159. SiRF submits, "No construction necessary, except to the extent necessary to clarify that 'using ephemeris to reduce code and frequency uncertainty' can happen either at the mobile GPS receiver or at a central site or server." Resp. Br. at 50. The Staff agrees with Global Locate's construction, "in view of the plain and ordinary meaning of the claim language and the prosecution history." Staff Br. at 49.

The claim term "using the ephemeris to reduce code and frequency uncertainty in the mobile GPS receiver to improve acquisition sensitivity of the mobile GPS receiver" is construed as "using the ephemeris to reduce both the uncertainty of the range of possible satellite signal frequencies and the uncertainty of the range of possible satellite signal delays during signal acquisition to improve the acquisition sensitivity of the mobile GPS receiver."

As pointed out by the Staff, this construction is supported by Figure 6 of the '651 patent, as well as by the accompanying text. Staff Br. at 49; *see* Compl. Br. at 155-156.

In that regard, Figure 6 of the '651 patent shows the search space for a GPS receiver, represented in a two-dimensional diagram with the axes being the regions of uncertainty in the code (pseudorange) and frequency (pseudorange rate) signal parameters:

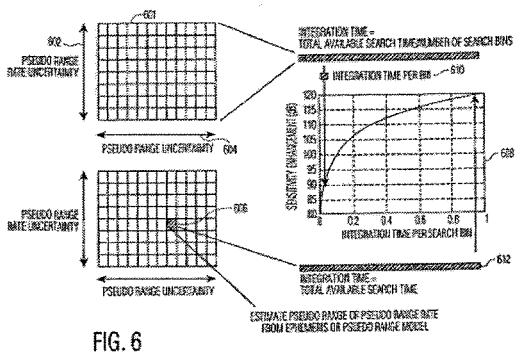

FIG. 6

JX-4 ('651 patent), figure 6.

Figure 6 also illustrates the invention of the '651 patent: the reduction in search space (represented at 606) that occurs when information about code and frequency uncertainty is available. That reduction in search space allows an increase in the time spent integrating (searching for a signal) and an increase in acquisition sensitivity (the ability to acquire weaker signals), as shown in the right-hand chart in Figure 6. It is described in the specification:

> Better sensitivity is achieved as follows: The sensitivity of a GPS receiver is a function of the amount of time that the receiver can integrate the correlator outputs. The relationship between sensitivity and integration time is shown by the graph 608. With many bins to search, the integration time 610 equals the total available search time divided by the number of search bins. With only a single bin to search, the integration time 612 equals the total available search time, increasing the sensitivity as shown 608.

JX-4 ('651 patent) at col. 7, l. 61 - col. 8, l. 2. *See* Pratt Tr. 1200-1201(one of ordinary skill in that art would understand this limitation of claim 1 to require using ephemeris to reduce (a) the

uncertainty of the range of possible satellite signal frequencies, and (b) the uncertainty of the range of possible satellite signal delays during signal acquisition, using both to improve acquisition sensitivity of the mobile GPS receiver.)

The plain language of claim 1 of the '651 patent establishes that the preceding claim limitation occurs at the mobile GPS receiver. JX-4, claim 1. *See* Pratt Tr. 1202-1203.

c. <u>Infringement Determination - The '651 Patent</u>

Global Locate asserts that accused chips GSC3, GSC3e/LP, GSC3f, GSC3LT, GSC3LTf, GSC3LTi, GSC3LTif, and GSD3t, along with associated software, and that support InstantFix and, or, SiRFLoc infringe claims 1 and 2 of the '651 patent.

i. <u>SiRFstarIII Chips and Associated Software Utilizing the InstantFix System</u>

<u>Claim 1</u>

"receiving satellite ephemeris at a first location"

The SiRFInstantFix is a service that includes a SiRF server that receives satellite ephemeris. This InstantFix server receives ephemeris in the form of ephemeris data from [ ] The InstantFix server also receives ephemeris in the form of EE files that are generated by the server using the [ ] and then stored in memory at the server. The EE files will then be transferred to a customer distribution server.

SiRF, therefore, meets the first claim element of claim 1 on three occasions. The first is when the SiRFInstantFix server receives [ ] the second is when the memory store of the SiRFInstantFix server receives the EE files generated by the server; and the third is when a

customer distribution server in SiRF's end-to-end InstantFix service receives the EE files from the SiRF InstantFix server. CX-825C (System Overview for Server-Generated Extended Ephemeris) at SRF 87981, Fig. 2 (depicting path of EE through SiRFInstantFix system). *See* Pratt Tr. 1214-1217.

"communication the satellite ephemeris to a mobile GPS receiver at a second location"

The accused products meet the second limitation of claim 1 of the '651 patent. The testimony of complainants' expert, Dr. Pratt, provides substantial support for this proposition. The testimony of Dr. Pratt shows that SiRF performs the "communication" element of claim 1 through its end-to-end InstantFix service in at least two ways. The first way occurs when the SiRFInstantFix server communicates the ephemeris data to the mobile GPS receivers. This communication is done through a SiRF client's intermediate distribution server. Pratt Tr. 1229-1231; CX-276C (SiRFInstantFix Data Sheet); CX-313C (SEA-SGEE CLM Theory of Operation and Software Requirements Specification) at SRF 87981.

The second way in which the accused products meet this claim element is when the ephemeris is passed from the client's intermediate distribution server to the mobile GPS receiver. Pratt Tr. 1229.

"processing satellite signals received at the mobile GPS receiver using the ephemeris to reduce code and frequency uncertainty in the mobile GPS receiver to improve acquisition sensitivity of the mobile GPS receiver"

As explained by complainants' expert, Dr. Pratt, SiRF has designed its InstantFix service so that the EE files are used by SiRF's accused chips and software at the mobile GPS receiver to reduce code and frequency uncertainty so as to improve acquisition sensitivity. Accordingly,

SiRF infringes the third claim element of claim 1 of the '651 patent. Pratt Tr. 1235-1253.

As further proof that SiRF meets the third limitation of claim 1, Global Locate points to a satellite strategy employed by SiRF that is known as [ ] *See* Compl. Br. at 167. Citing to the testimony of Dr. Pratt (Tr. 1235-1236), Global Locate states , "[t]hat search strategy will not be executed unless the code and frequency uncertainties have been sufficiently reduced and the device has ephemeris available." *Id.* Thus, complainant notes, the "reduction of the uncertainties allows for increased integration time in a smaller code and frequency search space, and the sensitivity of the GPS receiver is increased such that it is able to detect weaker signals." *Id.*

Where the uncertainty level is not a small [ ] uncertainty (indicated by "unc level [ ] the receiver will turn to the "full" type of acquisition. This full search mode does not involve any reduction in code uncertainty. Pratt Tr. 1246-1248. If the uncertainties are smaller, the SiRF receiver can then enter into a [ ] The [ ] search mode will involve a reduction in code and frequency uncertainty in order to improve the receiver's acquisition sensitivity. *See* Pratt Tr. 1248; Dafesh Tr. 752-753.

The frequency uncertainty in the [ ] search (plus or minus 78.12 Hz overlap) is less than the uncertainty in the Full I and II searches (plus or minus 312.5/156.7Hz overlap). Therefore, there is less frequency space to search. The code uncertainty also is smaller than the full range of code uncertainty in the Full I and II searches. Thus, the [ ] search allows SiRF to achieve a longer dwell time and a higher acquisition sensitivity. Pratt Tr. 1248-1249.

As a result, a SiRF receiver performing a [ ] is able to detect satellite signals as weak as 15dB, a lower signal strength than the 23 and 17 dB sensitivity level it is able to achieve through the Full I and II searches. Pratt Tr. 1253.

Accordingly, in the [ ] SiRF practices the third limitation of claim 1 of the '651 patent in using a reduction in code and frequency uncertainty to improve acquisition sensitivity.

Claim 2

Claim 2 of the '651 patent provides, "2. The method of claim 1 wherein said communicating step is performed through a wireless path." JX-4, claim 2. The evidence establishes that SiRFInstantFix, when used in conjunction with the SiRFstarIII chips and associated software, performs the communicating step through a wireless path when it communicates satellite ephemeris to a mobile GPS receiver. Pratt Tr. 1231-1232; CX-313C (SEA-SGEE Theory of Operation and Software Requirement Specification) at SRF 87981; CX-276C (SiRFInstantFix Data Sheet).

Accordingly, the accused products literally infringe claim 2.

ii. SiRFLoc

SiRF's software and chips operating with SiRFLoc also infringe claims 1 and 2 of the '651 patent. In that regard, SiRFLoc receives EE files from the InstantFix server and provides those files to mobile receivers. Pratt Tr. 1218-1220; CX-307C (E2E Theory of Operation for SiRFLoc EE) at 602SiRF188225.

Thus, the SiRFInstantFix server serves as a first location that receives ephemeris files from [ ] (Pratt Tr.1220; CX-307C at 602SiRF188225), and it is a first location that receives EE files generated by the processor of the InstantFix server. The SiRFLoc server also is a first location that receives EE files generated by the InstantFix server. The SiRFLoc server transmits the EE files generated at the SiRFInstantFix server directly to mobile GPS receivers in the same way the

customer distribution server transmits the EE files to mobile GPS receivers. Pratt Tr. 1232-1234; CX-265C (SLS 4.0 Functional Specification) at 602SiRF244602; CX-307C at 602SiRF188225.

iii. [ ]

As discussed, *supra*, because the [ ] it cannot be found to infringe claims 1 and 2 of the '651 patent. Global Locate's argument to the contrary is rejected.

iv. <u>SiRF's Testing and Evaluation</u>

SiRF testing of InstantFix and SiRFLoc with all of its accused chips and software meets the first limitation of claim 1. *See* Pratt Tr. 1222 (SiRF conducts validation and performance test); Tr. 1224 (Discussion of SiRF test plan to demonstrate the performance of their SiRFLoc system); CX-284C (SiRFLoc End-to-End System Integration, Validation and Performance Test Plan). *See also,* Pande Tr. 1991 (SiRF is currently conducting testing of SiRFLoc with InstantFix).

In this testing, SiRF validates the end-to-end implementation and performance of InstantFix. Pratt Tr. 1226-1227; CX-321C (SiRF Enhanced Autonomous Server Generated Extended Ephemeris System Validation Report). As Dr. Pratt explained, this testing provides "the validation results for the testing that's been performed on the [SEA-SGEE system."] Pratt Tr. 1227. Insofar as the first location limitation of claim 1 of the '651 patent is concerned, referring to section 4 of CX-321C, Dr. Pratt noted "the schematic showing the provision of files from the [ ] Pratt Tr. 1228. ("The provision of those upon request of the customer EE server." *Id.*) Thus, Dr. Pratt concluded:

> So a first location remains in the [ ] server where the

> extended ephemeris information is received into its -- into its memory. And, also, a first location is in the customer extended ephemeris server ... when it receives the data on its input communication port, and, also, where it receives the extended ephemeris information into its memory.

Pratt Tr. 1228.

In addition, SiRF's use of its evaluation kits also meets the first limitation of claim 1. *See* Pratt Tr. 1222-1223 (Demonstration users are allowed access to the demo server located in [ ] which is different from the InstantFix server, "[s]o that's another first location.") Dr. Pratt offered the following testimony which supports this first location conclusion:

> SiRF provides evaluation kits to its potential OEM customers. And this allows them to have access to the SiRFInstantFix server through a demo server. So here is a demo server at this point. An evaluation kit is provided, containing a receiver. That is coupled to a pocket PC. It's provided with some software, the SiRFDemoPPC firmware. That is coupled to a PC, which is right here. And that's provided with some code, which is SiRF Get Extended Ephemeris. And that code requests extended ephemeris through an Internet connection from the SiRF demo server. So it has in it a data file which contains the extended ephemeris information.
>
> And then, upon request, it provides that extended ephemeris information back to the PC and then ... it flows back into the Pocket PC, and then from there into the evaluation receiver. Of course, the evaluation receiver is able to receive GPS signals and using the extended ephemeris will be able to, A, search for and find the satellites, and ultimately get a location solution.

Pratt Tr. 1225-1226. *See* CX-264C (SiRF InstantFix Evaluation Kit User Guide) at 602SiRF125254, Fig. 1-1 (Ephemeris Access)).

SiRF also practices the second limitation of claim 1 of the '651 patent ("communication the satellite ephemeris to a mobile GPS receiver at a second location") as to testing and

evaluation. Pratt Tr. 1228-1229. In that regard, beginning with a discussion of the first location, Dr. Pratt explained:

> I think there are several. The communication -- there's a communication connection between the InstantFix server and a customer's distribution server. So there's a communication of satellite ephemeris. But it doesn't go directly to the GPS receiver at that point.
>
> However, the customer distribution server does provide to the mobile GPS server the extended ephemeris files. And that meets the second limitation.

Pratt Tr. 1229. *See* Pratt Tr. 1234-1235 (SiRF performs communication step when conducting test for [

] at 602SiRF254900. *See also,* Pratt Tr. 1233-1234 (SiRF performs communication step of claim 1 through validation and testing of InstantFix service and SiRFLoc system); CX-284C (SiRFLoc End-to-End System Integration, Validation and Performance Test Plan); CX-321C (SiRF Enhanced Autonomous Server Generated Extended Ephemeris Validation Report).

Finally, in each of these instances, SiRF also performs the third limitation of claim 1. When testing its chips and software with InstantFix and SiRFLoc, SiRF will use the satellite ephemeris at the mobile receiver to reduce code and frequency uncertainties and improve acquisition sensitivity, just as it does when it implements InstantFix and SiRFLoc for production customers. *See* Pratt Tr. 1221-1223, 1225; CX-321C (SiRF Enhanced Autonomous Server Generated Extended Ephemeris System Validation Report); CX-264C (SiRF InstantFix Evaluation Kit User Guide) at 602SiRF124254; CX-284C (SiRFLoc End-to-End System Integration, Validation and Performance Test Plan) at 602SiRF264208.

d. Validity

SiRF raises a number of invalidity arguments. These arguments, all of which fail, are addressed below.

i. SiRF's Prior Publications and Products

"The ION GPS Articles"

SiRF submits that "[p]rior art SiRFLoc systems and prior art papers that described its function and operation in 1999 anticipate the asserted claims under 35 U.S.C. § 102(a), § 102(f) and § 102(g)." Resp. Br. at 61 (citing RX-110 & RX-111). As support for this proposition, SiRF states that in 1996, it introduced its first chipset for commercial receivers (Pande Tr. 1926; Heppe Tr. 2411). In 1998, SiRF's SnapStart technology was described in a paper presented by SiRF at the 1998 ION conference. Pande Tr. 1929-1930; RX-320.[52]

Thereafter, in 1999, SiRF states that it was working on expanding hot start and SnapStart to help receivers acquire signals in weaker environments. Resp. Br. at 62 (citing Pande Tr. 1932). In September 1999, SiRF presented test results of its SiRFLoc system at an ION GPS conference in a paper titled, "Wireless Assisted GPS-SIRF Architecture and Field Test Results." RX-111. In January 2000, SiRF described its SiRFLoc technology in another ION paper, titled, "Acquisition of GPS Signals at Very Low Signal to Noise Ratio." RX-110. Resp. Br. at 62. SiRF argues that "[t]hese papers and prior art products were well known to van Diggelen before he 'conceived' of the '651 patent." *Id.* (Transcript citations omitted); *see* Resp. Br. at 62-63.

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[52] "SnapStart is a faster type of hot start that uses ephemeris data previously collected from satellites to provide fast acquisition of satellite signals." Resp. Br. at 61. SiRF asserts that as of 1998, its receivers operating in "hot start or SnapStart mode" performed the "processing" step of the '651 patent. *Id.*

Contrary to SiRF's assertions, the 1999 and 2000 ION GPS articles discussed above do not anticipate the '651 patent. Both Global Locate and the Staff agree on that point. *See* Compl. Br. at 177-179; Staff Br. at 51.

In that regard, the 1999 ION GPS paper ("Wireless Assisted GPS-SiRF Architecture and Field Test Results") does not disclose use of ephemeris to reduce code or frequency uncertainty. *See* RX-111 at 602SiRF730225; *see also,* Pratt Tr. 2889-2890 (paper states that code and frequency uncertainty can be reduced by using "network assistance," but contrasts "network assistance" with "broadcast ephemeris and other data.") It also does not disclose using ephemeris to improve acquisition sensitivity. *See* Pratt Tr. 2892.

Indeed, as argued by Global Locate, the use of ephemeris is simply not a focus of the 1999 ION GPS article. Global Locate explains:

> In a summary of the assistance methods supported by SiRFLoc at the time, ephemeris is never mentioned. The section, titled "SiRFLoc Assistance Concepts," contains a table that compares the different types of assistance modes. *See* RX-111 at 602SiRF730226-227 and Table 1. The table does not disclose the use of ephemeris in any of the modes, and an author of the article acknowledged as much. *See id.*; Garin, Tr. 1906:15-1907:13. The table describes what Lionel Garin called "the poor man's solution" in which computations based on ephemeris were conducted at the server—a solution that Mr. Garin testified was the state of the art at the time. Garin, Tr. 1907:1-13, 1908:7-10. What neither Mr. Garin nor SiRF explains is why this comparison chart—which purports to compare the assistance methods supported by SiRFLoc at the time—fails to mention any use of ephemeris as part of the network assistance data for use *by the receiver*. Instead, Mr. Garin now claims that the table was "for reference" and is not what SiRF was practicing. Garin, Tr. 1908:6-7. Garin acknowledged that the article contained "just hints about what could be our system." Garin, Tr. 1912:24-1913:1.

Compl. Br. at 178-179.

In addition, the 2000 ION GPS paper ("Acquisition of GPS Signals at Very Low Signal to Noise Ratio") does not disclose the use of ephemeris to reduce code and frequency uncertainty or to improve acquisition sensitivity. *See* RX-110. This article concerns "very long coherent integration," and it discusses the limits of the length of time coherent integration can be done. *See* van Diggelen Tr. 190-191. Also, as asserted by the Staff, the 2000 ION GPS paper "focuses on time to acquisition, which may result in poorer, not greater, acquisition sensitivity." Staff Br. at 51; *see* Heppe Tr. 2491; Pratt Tr. 2892-2894.

"SiRFLoc"

At pages 63 through 70 of its brief, SiRF discusses the development of its SiRFLoc system, as well as retracing the path of the 1999 and 2000 ION conference articles (RX-110 & RX-111), discussed above. In brief, SiRF states that by 1999 it had developed, tested, and demonstrated the SiRFLoc platform with broadcast ephemeris. Resp. Br. at 63. Thereafter, separate testing was conducted by SiRF and Diablo Research. *Id.* at 63-64. These tests were presented at the 1999 ION conference. *Id.* at 64. SiRF further states that it continued to develop its server business and in 2001, it used a SiRF chip inside a Motorola phone with Nortel and SignalSoft geolocation. Also, in 2001, Benefon used a SiRF chip to receive ephemeris aid information from a Global Locate receiver. *Id.* at 65. *See* Resp. Br. at 65-70 for discussion of claims 1 and 2.

In its opposition, Global Locate cites to the high burden of proof, *i.e.,* "clear and convincing evidence," that SiRF must satisfy in order to show that the SiRFLoc system anticipates the '651 patent. Compl. Reply at 80. Complainant submits, however, that all that SiRF has presented to satisfy this burden is "uncorroborated testimony." *Id.*

In that regard, Global Locate states that the "only real evidence of SiRF's 1999 'field tests'" of its SiRFLoc technology consist of the two SiRF articles from 1999 (RX-111) and 2000 (RX-110). Those articles do not disclose use of ephemeris to reduce code and frequency uncertainty to improve acquisition sensitivity. Compl. Reply at 80 (citing Resp. Br. at 25, 63-65, 67-68). *See* Garin Tr. 1912-1913.

Furthermore, as complainants argue, the remainder of SiRF's evidence consists of an amalgamation of a 2007 document reflecting 2007 testing (CX-284C); two undated documents that do not disclose the technology of the '651 patent (one of which reflects a demonstration that occurred outside the United States and cannot, therefore, be used to demonstrate anticipation) (RX-64C; RX-342C); an email that does not provide any detail about what was being tested or where it was being tested (RX-272C); and disparate pieces of code (RX-160C; RX-35C; RX-140C; RX-154C). Either individually, or collectively, these documents do not constitute clear and convincing evidence of a prior art system.

For example, SiRF relies on a figure representing the SiRFLoc test set-up. Resp. Br. at 64 (citing CX-284C (SiRFLoc End-to-End System Integration, Validation and Performance Test Plan) at 602SiRF264194). This figure is from a 2007 document and it represents SiRF's infringing testing of the SiRFLoc end-to-end system today. *See* Garin Tr. 1871-1872; Pratt Tr. 1223-1224; Dafesh Tr. 694-696. Also, SiRF's witness conceded that the SiRFLoc end-to-end feature was not tested in 1999. Garin Tr. 1875.

In addition, SiRF relies on a figure from an undated presentation to show that ephemeris was collected at a server. *See* Resp. Br. at 65-66 (citing RX-64C (GPS Based Location Architectures)). SiRF's witness testified that this document reflected a demonstration conducted

in Japan, not the United States. Garin Tr. 1996-1997. The demonstration discussed in this document is not tied to the rest of SiRF's discussion about demonstration and testing in 1999, and there is no argument that this document or the related testimony shows communication of ephemeris to a mobile GPS receiver or use of ephemeris at a mobile GPS receiver to reduce code or frequency uncertainty.

SiRF further argues that, using the results of the field tests reflected in the ION GPS papers, a SiRFLoc technical specification was created and provided to potential customers, but the undated document to which SiRF refers provides no further information beyond that contained in the SiRF ION GPS articles. Resp. Br. at 65 (citing RX-342C (Handset Based Geolocation Service Technical Specification)). Because the document is undated, and because SiRF's witness could not provide testimony regarding the exact date, it is inadequate to establish prior art. *See* Garin Tr. 1870.

This document also does not disclose the use of ephemeris aiding information communicated to a mobile GPS receiver to reduce code and frequency uncertainty or to improve acquisition sensitivity. *See* Garin Tr. 1813-1815. Also, the witness could not confirm whether or when the document was provided to any potential customers (he thought it was provided to one potential customer, but did not know the date). Garin Tr. 1870.

SiRF also refers to testing sponsored and financed by [ ] which it refers to as [ ] testing. Resp. Br. at 63. SiRF's evidence, however, does not show what was tested, let alone whether such testing included any functions resembling the method of the '651 patent. *See, e.g.*, Garin Tr. 1818-1819; RX-272C. While Pande did discuss the kinds of technology involved in the [ ] testing, including the use of coherent and non-coherent integration to increase dwell time,

his testimony was uncorroborated. Moreover, as with the SiRF ION articles discussed earlier, this technology is unrelated to the claims of the '651 patent. *See* Pande Tr. 1932-1933.

Finally, in an effort to tie the '651 patent to SiRF's 1999 activity, SiRF presents some code that it vaguely argues was used in SiRF products with SiRFstarI, SiRFstarII, and SiRFstarIII chips "since the late 1990s." Resp. Br. at 68-69. SiRF, however, offers no reliable evidence that this code was ever used or incorporated in any way. *Id.* SiRF failed to present any documentation concerning the alleged use of this code in 1999.

ii. <u>The '651 Patent is not Derived from the SiRFLoc System</u>

SiRF states that the asserted claims of the '651 patent are invalid under 35 U.S.C. § 102(f) because Dr. van Diggelen derived the invention from SiRF. Resp. Br. at 70. Respondents are wrong; the '651 patent is not derived from SiRF's SiRFLoc system.

A derivation claim requires a showing of both (1) prior conception of the invention by another, and (2) communication of the complete claimed invention to the patentee that is "sufficient to enable [him] to construct and successfully operate the invention." *Gambro Lundia AB v. Baxter Healthcare Corp.*, 110 F.3d 1573, 1577 (Fed. Cir. 1997) (citations omitted). SiRF has not met its burden.

SiRF fails to meet this standard in light of Dr. van Diggelen's testimony that he did not think SiRF had any Assisted-GPS technology in the 1999-2000 timeframe. van Diggelen Tr. 187 (around the time that Dr. van Diggelen was developing the '651 patent idea, he "was aware that [SiRF] had done some research in [the assisted GPS] area, but [he] was unaware of any products available at that time"). Also persuasive is Dr. van Diggelen's testimony that the 2000 ION GPS paper relates to long coherent integration time, a subject unrelated to the technology of the '651

patent. van Diggelen Tr. 191-193 (noting that the paper discussed "using ephemeris data . . . but using it in a different way from what we have discussed, using it to wipe off these data bits . . . so that you can do long coherent integration. So it is an entirely different thing from what we were doing, and from what the '651 patent is about."). With respect to the 1999 ION GPS paper, SiRF ignores Dr. van Diggelen's testimony that he had not seen this article before this investigation began. van Diggelen Tr. 195-196.

Thus, for the foregoing reasons, SiRF's argument that the '651 patent is derived from the SiRFLoc system must fail.

iii. <u>SiRF Receivers Operating in Hot Start Mode</u>

SiRF submits that "[s]ince the claims of the '651 patent do not require receiving ephemeris at a first location on Earth, they are anticipated by traditional GPS systems since the Air Force uploads ephemeris information to the GPS satellites." Resp. Br. at 71 (citing van Diggelen Tr. 467; CX–262C at GL-602051136). Respondents state that this satisfies the step of "receiving satellite ephemeris at a first location." *Id.*[53]

SiRF further submits that the second step of communicating the satellite ephemeris to a mobile GPS receiver at a second location is also satisfied. *Id.,* (citing van Diggelen Tr. 467; Pratt Tr. 1297). Citing to the testimony of Dr. Pratt at 1297, SiRF also states that claim 2 is anticipated. *Id* .

Global Locate characterizes SiRF's arguments as weak and "specious." Compl. Reply at

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[53] In its argument, SiRF also offers the view that, "Prior art GPS receivers – such as receivers with SiRFStarI and SiRFStarII chipsets operating in hot start or SnapStart mode – processed satellite signals using ephemeris to reduce code and frequency uncertainty." Resp. Br. at 71 (citing Garin Tr. 1852). This leads SiRF to conclude that all elements of claim 1 have been satisfied. *Id.*

82. In that regard, complainants correctly note, however, that "the '651 patent is about Assisted GPS, a technology that is indisputably not a part of the conventional GPS system." Compl. Reply at 82. Global Locate also correctly notes that SiRF's hot start and SnapStart technology attempted to improve first fix, and not acquisition sensitivity, and that they did not involve the use of ephemeris received from anything other than a satellite, and occurred only after the satellites have initially been acquired. Compl. Reply at 82-83 (citing Resp. Br. at 61-62).

iv. <u>The Schuchman '450 Patent</u>

U.S. Patent No. 5,365,450 ("Schuchman") does not anticipate the '651 patent. First, the reference does not disclose reduction of code uncertainty prior to acquisition of a satellite signal. It also does not disclose the use of ephemeris to reduce code uncertainty. Pratt Tr. 2885-2888. Instead, code uncertainty is reduced through resolution of time-position ambiguity using prior knowledge of position, which was obtained by acquiring the first satellite. RX-98 (Schuchman) at col. 5, l. 58 - col. 6, l. 24.

Second, Schuchman does not disclose the use of ephemeris to reduce frequency uncertainty prior to acquisition of a satellite signal. *See* Heppe Tr. 2503-2504.

Third, Schuchman does not disclose reducing code and frequency uncertainty using ephemeris from a source other than the satellites, as required by the '651 patent. *See* RX-98 at col. 5, ll. 22-32; Heppe Tr. 2503-2504.

Finally, Schuchman does not disclose using ephemeris to improve acquisition sensitivity. *See* Pratt Tr. 2888-2889, 2893, & 2906.

v. <u>Indefiniteness</u>

SiRF argues that the term "to improve acquisition sensitivity," as used in claim 1 of the

'651 patent, is indefinite. SiRF is wrong.

As discussed earlier, the patent specification describes what is meant by improvement in acquisition sensitivity. It states that "[b]etter sensitivity" is achieved as follows:

> The sensitivity of a GPS receiver is a function of the amount of time that the receiver can integrate the correlator outputs . . . . With many bins to search, the integration time 610 equals the total available search time divided by the number of search bins. With only a single bin to search, the integration time 612 equals the total available search time, increasing the sensitivity as shown 608.

JX-4 ('651 patent) at col. 7, l. 61 - col. 8, l. 2.

Moreover, SiRF notes in its brief that "[i]t was well known that sensitivity could be increased by increasing dwell time." *See* Resp. Br. at 74 (citing RX-110); *see also,* Pratt Tr. 2906-2907; Podshivalov Tr. 521 ("integration time is also known as dwell time").[54]

To the extent that SiRF relies upon the testimony of Dr. Heppe to support its position, its reliance is misplaced. *See* Resp. Br. at 75. Dr. Heppe did not explain what was unclear about this language, despite the fact that he found the term sufficiently clear to offer the opinion that several references anticipate the '651 patent. *See* Heppe Tr. 2415-2416, 2418.

e. <u>Inequitable Conduct</u>

The '651 patent is not unenforceable due to inequitable conduct. In that regard, Dr. Van Diggelen did not withhold any references from the Patent Office during prosecution of the '651 patent.

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[54] Contrary to SiRF's indefiniteness argument, two of its witnesses had an understanding of what improvement in acquisition sensitivity means. *See* Garin Tr. 1818 ("To improve sensitivity, you need to integrate for a longer period of time in order to get a better signal-to-noise ratio at the output of the correlator."); Pande Tr. 1933 (explaining how one can acquire a weaker satellite signal with increased dwell time).

As argued by Global Locate, "[w]ith the exception of one article (the 2000 ION GPS paper ...) , the evidence shows that the 'references' SiRF cites were unknown to Dr. van Diggelen during prosecution of the '651 patent." Compl. Reply at 85 (citing van Diggelen Tr. 187, 195-196). *See* Staff Br. at 51 ("Dr. van Diggelen testified credibly that he did not intentionally withhold information from the PTO during the prosecution of the '651 patent." (Transcript cites omitted.)

This court agrees with the Staff's (and complainants') assessment of Dr. van Diggelen's credibility. Accordingly, it is found that SiRF has failed to prove inequitable conduct with respect to the '651 patent.

VI. U.S. Patent No. 6,417,801 ("the '801 Patent")

A. Claim Construction

United States Patent No. 6,417,801, entitled "Method and Apparatus for Time-Free Processing of GPS Signals," issued on July 9, 2002 to Frank van Diggelen, and was assigned to Global Locate. *See* JX-1 ('801 Patent). The claimed invention "relates to satellite-based position location and, more particularly, the invention relates to a method and apparatus for time-free processing of global positioning system (GPS) signals." JX-1 ('801 Patent), title and col. 1, ll. 5-9 ("Field of Invention").

The '801 patent specification's "Description of the Background Art" describes many terms and concepts that have already been discussed above, and others that will be discussed for the first time. The specification explains that GPS receivers normally determine their position by computing time delays between the transmission and reception of signals transmitted from satellites, and that the satellites transmit ephemeris data, as well as so-called "absolute time"

information associated with the satellite signal. JX-1 ('801 Patent), col. 1, ll.12-23.[55] This absolute time signal allows the receiver to determine unambiguously a so-called "time tag" that indicates when each received signal was transmitted by each satellite. By knowing the exact time of transmission of each of the signals, the receiver uses the ephemeris data to calculate where each satellite was when it transmitted a signal. The receiver combines the knowledge of satellite positions with the computed distances to the satellites to compute the receiver position. JX-1 ('801 Patent), col. 1, ll. 22-31.

As discussed above in numerous portions of this Initial Determination, and as recognized by the specification of the '801 patent, the process of searching for and acquiring GPS signals, as well as reading the ephemeris data, absolute time and other data for a multiplicity of satellites, is time-consuming and introduces unacceptable delays in computing the receiver position. Further, in many situations, the received signal level can be too low to demodulate and derive the satellite data without error. However, in such situations the receiver can rely on an external source of ephemeris and absolute time. Indeed, the '801 patent specification reports that several innovations had been made to provide what it refers to as "GPS Aiding" (*i.e.,* "assisted" GPS) which consists of external sources of ephemeris (or equivalent) data and absolute time information. JX-1 ('801 Patent), col. 1, ll. 32-51.

The specification states that at that time all GPS systems using "GPS Aiding" needed accurate external knowledge of the absolute time for an accurate determination of satellite position, and that the required accuracy was between 1 millisecond and 10 milliseconds.

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[55] The absolute time information is not a conventional time signal that indicates calendar days, hours, minutes and seconds. Rather, "the absolute time signal is sent as a second of the week signal." *See* JX-1 ('801 Patent), col. 1, ll. 22-23.

"Unfortunately," in the words of the specification, there were "desired implementations of GPS Aiding where absolute time [could] not easily be obtained to this accuracy at the GPS receiver," including many situations involving cellular telephone systems that could not, or did not, support precise time information. Thus, according to the specification, "[i]n these situations it is desirable to provide a method for computing GPS receiver position without knowing the absolute time." JX-1 ('801 Patent), col. 1, ll. 52-65.

In this background portion of the '801 patent specification, the patentee then provides instances of specific problems that may occur when the GPS receiver relies on absolute time information to perform GPS, and concludes by stating that there is a need for a system that does require the GPS receiver to receive and use absolute time information. Inasmuch as this portion of the specification frames the discussion for the claimed invention in the patentee's own words (and is related to the '187 patent specification discussed below), it is reproduced herein:

> More specifically, Global Positioning System (GPS) receivers receive GPS signals transmitted from orbiting GPS satellites containing unique pseudo-random noise (PN) codes. The GPS receivers determine the time delays between transmission and reception of the signals by comparing time shifts between the received PN code signal sequence and internally generated PN signal sequences.
>
> Each transmitted GPS signal is a direct sequence spread spectrum signal. The signals available for commercial use are provided by the Standard Positioning Service. These signals utilize a direct sequence spreading signal with a 1.023 MHZ spread rate on a carrier at 1575.42 MHZ (the L1 frequency). Each satellite transmits a unique PN code (known as the C/A code) that identifies the particular satellite, and allows signals transmitted simultaneously from several satellites to be received simultaneously by a receiver with very little interference of any one signal by another. The PN code sequence length is 1023 chips, corresponding to a 1 millisecond time period. One cycle of 1023 chips is called a PN frame. Each received GPS

signal is constructed from the 1.023 MHZ repetitive PN pattern of 1023 chips. At very low signal levels the PN pattern may still be observed, to provide unambiguous time delay measurements, by processing, and essentially averaging, many PN frames. These measured time delays are called "sub-millisecond pseudoranges", since they are known modulo the 1 millisecond PN frame boundaries. Once the absolute time delay can be calculated, by resolving the integer number of milliseconds associated with each delay to each satellite, then one has true, unambiguous, pseudoranges. The process of resolving the unambiguous pseudoranges is known as "integer millisecond ambiguity resolution".

A set of four pseudoranges together with a knowledge of the absolute times of transmissions of the GPS signals and satellite positions at those absolute times is sufficient to solve for the position of the GPS receiver. The absolute times of transmission are broadcast from the satellites in the Navigation Message, which is superimposed on the 1.023 MHZ PN code at a lower, 50 Hz, data rate. This 50 Hz signal is a binary phase shift keyed (BPSK) data stream with bit boundaries aligned with the beginning of the PN frame. There are exactly 20 PN frames per data bit period (20 milliseconds). The 50 Hz signal contains data bits describing the GPS satellite orbits, satellite clock corrections, time of week information, and other system parameters.

The absolute times associated with the satellite transmissions are determined in conventional GPS receivers by reading the Time of Week (TOW) data in the Navigation Message of the GPS signal. In the standard method of time determination, a conventional GPS receiver decodes and synchronizes to the 50 baud data stream. The 50 baud signal is arranged into 30-bit words grouped into subframes of 10 words, with a length of 300 bits and a duration of six seconds. Five subframes comprise a frame of 1500 bits and a duration of 30 seconds, and 25 frames comprise a superframe with a duration of 12.5 minutes. A superframe contains the complete Navigation Message. The data bit subframes that occur every six seconds contain bits that provide the TOW to six second resolution. The 50 baud data stream is aligned with the C/A code transitions so that the arrival time of a data bit edge (on a 20 ms interval) resolves the absolute transmission time to the nearest 20 milliseconds. Precision synchronization to bit boundaries can resolve the absolute transmission time to one millisecond or less.

The absolute times associated with the satellite signals are determined in Wireless Aided-GPS receivers by having an external timing source that is calibrated to GPS time then using this time to provide a precise time tag at the time of reception of the satellite signal. The time of reception minus the pseudorange gives the absolute time of transmission for each satellite (with the pseudorange expressed in time units, reflecting the transmission-reception time delay).

The absolute times of transmission are needed in order to determine the positions of the satellites at the times of transmission and hence to determine the position of the GPS receiver. GPS satellites move at approximately 3.9 km/s, and thus the range of the satellite, observed from the earth, changes at a rate of at most ±800 m/s. Absolute timing errors result in range errors of up to 0.8 m for each millisecond of timing error. These range errors produce a similarly sized error in the GPS receiver position. Hence, absolute time accuracy of 10 ms is sufficient for position accuracy of approximately 10 m. Absolute timing errors of much more than 10 ms will result in large position errors, and so typical GPS receivers have required absolute time to approximately 10 millisecond accuracy or better.

Note that absolute timing errors also introduce errors as a result of the GPS satellite clock drift, but these are so much smaller than the satellite position error that they can be ignored for the purposes of this explanation (GPS clocks drift typically less than 0.1 nanoseconds per second, and the observed range to the satellite is affected by the GPS clock drift multiplied by the speed of light, this error is less than 0.03 m/s, about 25 thousand times smaller than errors caused by changes in satellite position).

There is another time parameter closely associated with GPS positioning, this is the sub-millisecond offset in the time reference used to measure the sub-millisecond pseudorange. This offset affects all the measurements equally, and for this reason it is known as the "common mode error".

The common mode error should not be confused with the absolute time error. As discussed above, an absolute time error of 1 millisecond leads to range errors of up to 0.8 meters while an absolute time error of 1 microsecond would cause an almost

> unobservable range error of less than 1 millimeter. However, a common mode error of 1 microsecond causes a pseudorange error of 1 microsecond multiplied by the speed of light, that is 300 meters.
>
> Because common mode errors have such a large effect on pseudoranges, and because it is practically very difficult to calibrate the common mode error, traditional GPS receivers treat the common mode error as an unknown that must be solved for, along with position, once sufficiently many pseudoranges have been measured at a particular receiver. However, no traditional GPS receivers solve for absolute time error instead relying on the fact that they know absolute time to the required accuracy (of 10 milliseconds or better).
>
> Therefore, a need exists in the art for a method and apparatus that processes GPS signals without using absolute time.

JX-1 ('801 Patent), col. 1, l. 66 - col. 3, l. 52.

In its "Summary of the Invention," the '801 patent specification reports that it discloses both a method and an apparatus by which global position can be computed without the need for the receiver to obtain and use absolute time information. Rather, in the preferred embodiment, the claimed invention relies on a server that fits pseudorange information obtained from the receiver into a mathematical model in which the GPS receiver position and the absolute time are previously unknown parameters. The specification provides a concise description of the claimed invention, as follows:

> The present invention is a method and apparatus for computing GPS receiver position without using absolute time information transmitted by a satellite or by an alternative source of timing available at the GPS receiver. In an embodiment of the invention, the GPS receiver is contained in an integrated receiver that also includes a wireless communication transceiver, but does not have access to an accurate source of absolute time information. The wireless transceiver communicates through a wireless network to a server. The GPS receiver measures satellite pseudoranges and uses

> the wireless communication transceiver to send the pseudoranges to the server. The server fits the pseudoranges to a mathematical model in which the GPS receiver position and the absolute time are unknown parameters. The server then computes a position and absolute time that best fit the model, thus yielding the correct position for the GPS receiver, and the absolute time at which the pseudorange measurements were made.

JX-1 ('801 Patent), col. 3, l. 55 - col. 4, l. 5.

The specification includes drawings and descriptions thereof, a detailed description of the invention (including the preferred embodiment or embodiments), and sets forth the claimed invention in a series of 35 claims. In this investigation, complainants assert claims 1, 2 (which depends from claim 1) and 11 (which depends from claim 4, and ultimately from claim 1). Claims 1, 2, 4 and 11 provide, as follows:

> **1**. A method for calculating an absolute position of a GPS receiver and an absolute time of reception of satellite signals comprising:
>
> > providing pseudoranges that estimate the range of the GPS receiver to a plurality of GPS satellites;
> >
> > providing an estimate of an absolute time of reception of a plurality of satellite signals;
> >
> > providing an estimate of a position of the GPS receiver;
> >
> > providing satellite ephemeris data;
> >
> > computing absolute position and absolute time using said pseudoranges by updating said estimate of an absolute time and the estimate of position of the GPS receiver.
>
> **2**. The method o[f] claim **1** wherein said pseudor[]anges are sub-millisecond pseudoranges.
>
> **4**. The method of claim **1**, wherein said estimate of absolute time is provided by a clock that is not linked to a GPS reference time.

11. The method of claim **4**, wherein one or more of the updates is assumed known, so that the remaining updates may be computed.

JX-1 ('801 Patent), col. 12, ll. 28-41; col. 12, ll. 46-48; col. 13, ll. 13-15.

Many of the terms and phrases used in the asserted claims are not at issue. It appears that in their main post-hearing briefs, the parities had slightly divergent expectations about which claim terms would be at issue. In consideration of the parties' main and reply briefs, it is evident that the following two categories of terms are in dispute: ***Category (1)*** the limitations "providing pseudoranges that estimate the range of the GPS receiver to a plurality of GPS satellites," "providing an estimate of an absolute time of reception of a plurality of satellite signals," and "computing absolute position and absolute time using said pseudoranges by updating said estimate of an absolute time and the estimate of position of the GPS receiver," which are found in claim 1 but only insofar as respondents allege that complainants improperly attempt to read "without having absolute time information" into each of these limitations; and ***Category (2)*** "wherein said pseudoranges are sub-millisecond pseudoranges," which is the limitation added to claim 1 by dependent claim 2. *See, e.g.,* Resp. Br. at 158-69. Each category of disputed claim terms is discussed individually below.

***Category (1)*: "providing pseudoranges that estimate the range of the GPS receiver to a plurality of GPS satellites," "providing an estimate of an absolute time of reception of a plurality of satellite signals," and "computing absolute position and absolute time using said pseudoranges by updating said estimate of an absolute time and the estimate of position of the GPS receiver"**

Complainants argue that the claim limitations relating to (a) "providing pseudoranges that estimate the range of the GPS receiver to a plurality of GPS satellites," (b) "providing an estimate of an absolute time of reception of" the satellite signals, and (c) "computing … absolute time"

using the pseudoranges, are all based on the absence of absolute time information and should be construed accordingly. Thus, for example, they argue that would read "providing pseudoranges that estimate the range of the GPS receiver to a plurality of GPS satellites" to mean "providing pseudoranges, *without having absolute time information*, that estimate the range of the GPS receiver to a plurality of GPS satellites."

As stated quite simply in their reply brief, respondents take the position that "the 801 patent teaches solving for absolute time, but that the claims do not require it. *See* Resp. Reply at 105. They argue, among other things, that complainants' proposed claim constriction would impermissibly import a limitation from the specification into the claims, would read out the primary embodiment of the specification, and would render claim 4 superfluous. *See* Resp. Br. at 158-65.

The Staff argues that while "providing pseudoranges that estimate the range of the GPS receiver to a plurality of GPS satellites" should not require construction, complainants' proposed "clarification of 'without having absolute time information'" is consistent with the intrinsic record. *See* Staff Br. at 54.

Indeed, as the Staff points out, the intrinsic evidence, supports a reading of the asserted claims such that the GPS receiver does not have or require absolute time information. As detailed extensively in the background portion of the specification, quoted above, the numerous and complex problems associated with relying on the GPS receiver to receive and use absolute time information was what made the claimed invention worthwhile. Moreover, as detailed in the specification's summary of the invention (quoted in full, above), the hallmark of the claimed invention is that it obviates the need for a GPS receiver to receive and perform computations

based upon absolute time information. As explicitly stated in the summary of the invention: "The present invention is a method and apparatus for computing GPS receiver position without using absolute time information transmitted by a satellite or by an alternative source of timing available at the GPS receiver." *See also* JX-1 ('801 Patent), col. 4, ll. 34-36 (introduction to detailed embodiment) ("The invention is a method and apparatus for determining position and time in a global positioning system (GPS) without having access, at the GPS receiver, to absolute time information."). Such statements, by their plain language, pertain to all embodiments of the claimed invention, and not just to the particular embodiments summarized or detailed therein.

Indeed, a construction in accordance with this does not "read out" the preferred embodiment, as argued by respondents.[56] Furthermore, if the situation were reversed, it would be impossible in view of the specification for complainants to argue that the asserted claims allowed for, or required, a GPS receiver that received and used absolute time information to conduct computations. Based on the clear language of the specification, such a claim construction could not be allowed. Indeed, the patentee (or his counsel) represented to the patent examiner that unlike the prior art, his application did not teach "providing an estimate of absolute time" or "computing an absolute position and absolute time." Pratt Tr. 1025-1026; JX-8 ('801 file history)

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[56] According to respondents, the "primary embodiment" from the '801 specification involves a server that has absolute time information – which they argue would not be covered by complainants' construction. *See* Resp. Br. 163-164. This argument, which respondents raise for the first time in their brief, and without any supporting testimony, is contrary to the specification and the issues. First, neither the embodiment in Figures 1 and 2, nor the words of the detailed description assumes that the server lacks absolute time. In fact, the contrary is true. *See* JX-1 ('801 patent), col. 4, ll. 54-62; col. 6, ll. 6-9 ("[T]his particular embodiment is assumed to have a server clock that provides a time tag within one minute of the actual absolute time of reception of the GPS signals at the GPS receiver."). Second, the relevant claim construction issue pertains to the GPS receiver, and has nothing to do with absolute time information being unavailable to the server.

at GL-602 443. *See Markman*, 52 F.3d at 980 (prosecution history is "undisputed public record" of PTO proceedings and "is of primary significance in understanding the claims").

It should be noted that respondents' expert focused on a reading of the claims without reference to the prosecution history. *See* Heppe Tr. 2660-2661. His expert reports did not mention the file history. Heppe Tr. 3079-3080. Of course, claim construction requires consideration of the specification and file history. *See Markman*, 52 F.3d at 979-80. For example, without consulting the specification, one could not even know whether the claims should receive their ordinary meaning, or whether the patentee wishes to alert the reader that he intends to act his own lexicographer and impart a special meaning to a claim term.

Consequently, the claim terms at issue are construed to refer only to situations in which the GPS receiver does not have absolute time information.

***Category (2)*: "wherein said pseudoranges are sub-millisecond pseudoranges"**

Complainants argue that claim 1 provides for pseudoranges that "estimate the range of the GPS receiver to a plurality of GPS satellites," and that claim 2 adds "wherein said pseudoranges are sub-millisecond pseudoranges." They argue that a person of ordinary skill in the art would understand claim 2, in the context of the other claims and the specification, to mean "wherein each pseudorange is composed of a measured submillisecond component and a calculated integer millisecond component, and wherein each pseudorange has a consistent common mode error." Compl. Br. at 196-97 (citing Pratt Tr. 1068).

As simply stated in their reply brief, respondents argue that the '801 patent specification teaches (but the claims do not require) calculating pseudoranges using only submillisecond measurements. They argue, among other things, that the term "submillisecond pseudoranges"

does not cover submillisecond plus an integer, and that the "pseudolite embodiment" is captured by claim 2 without rewriting the claim. *See* Resp. Br. at 165-169.[57]

The Staff argues that complainants' proposed construction is appropriate in view of the proper understanding of a pseudorange, and further that the proposed construction is consistent with the specification. *See* Staff Br. at 53.

Claim 1 provides for pseudoranges that "estimate the range of the GPS receiver to a plurality of GPS satellites," and that claim 2 adds "wherein said pseudoranges are sub-millisecond pseudoranges." According to the testimony of complainant's expert witness, a sub-millisecond pseudorange, such as that referred to in claim 2, does not estimate the range between a user and a satellite. Thus, one of ordinary skill would understand that "each the pseudoranges is composed of the measured submillisecond component and a calculated integer millisecond component," also that the added limitation is that each pseudorange has to have "a consistent common mode error, a consistent receiver clock bias." *See* Pratt Tr. 1068.[58] That interpretation of the claim appears reasonable from the perspective of one of ordinary skill.

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[57] Pseudolites are a ground-based transmitters that are known to generate a PN code similar to a GPS signal. *See* JX-1 ('801 patent), col. 12, ll. 1-13 . Respondents' "pseudolite" argument is curious in view of their changing claim constructions. Respondents' expert did not include this "pseudolite" claim construction in his expert reports, and he was precluded from presenting this new pseudolite claim construction at the hearing. *See* Heppe Tr. 2666-2672. Further, respondents' pseudolite construction finds no support in the hearing record. *See, e.g.,* Pratt Tr. 1305, 1367-1368.

[58] The testimony of complainants' expert, also took into account the entire intrinsic record, including the specification and Figure 3, which disclose combining submillisecond measurements with calculated numbers of integer milliseconds to form full pseudoranges that have a consistent common bias. *See* JX-1 ('801 patent) at col. 8, l. 15 - col. 9, l. 19, Fig. 3; Pratt Tr. 990-998 ("This is probably the most complicated part of the '801 patent. But it's also the key to the means by which it operates."). It did not appear that respondents' expert took account of the specification, including Figure 3, or any other portion of the intrinsic record.

By contrast, respondents' positions with respect to the construction of claim 2 are inconsistent at best. In their brief, respondents argue that claim 2 "does not need to be construed" and should be given its "plain and ordinary meaning." *See* Resp. at 165. Yet, at the hearing, their expert testified that claim 2 is "devoid of meaning." *See* Heppe Tr. 2695-2697. By contrast, when SiRF's principal software engineer was testifying at the hearing about alleged prior art, he testified that the phrase "sub-millisecond pseudorange" has a "traditional" meaning (which appears to be consistent with complainants' proposed construction), and even specified that a pseudorange in which the submillisecond part is measured and the remaining part is "artificially constructed." *See* Chansarkar Tr. 2220-2221. That definition of a "sub-millisecond pseudorange" appears to coincide in part with that of complainants' expert. However, the '801 patent is presumed to address an invention.

The '801 patent purports to disclose a novel method of calculating a GPS receiver's position without absolute time, and thus the specification of the '801 patent makes clear that the submillisecond pseudoranges used by the '801 patent must have a consistent common mode error. *See* JX-1 ('801 Patent), col. 8, ll. 53-57 ("the common mode error will absorb any errors made in this integer, *as long as exactly equal errors are made in all the other integers*." (emphasis added)); *id.* at col. 9, ll. 15-19 ("any expression may be used to compute these integers, *provided the relationship to t_c is consistently maintained for all the integers*." (emphasis added)).

Consequently, the limitation "wherein said pseudoranges are sub-millisecond pseudoranges" in claim 2 is construed to mean "wherein each pseudorange is composed of a measured submillisecond component and a calculated integer millisecond component, and wherein each pseudorange has a consistent common mode error."

B. Infringement Determination

Complainants argue that claims 1, 2 and 11 of the '801 patent are infringed by the accused SiRF chips when operating the SiRFstarIII navigation software or the GSCi-4100/4200 firmware. Furthermore, they allege that the chips directly infringe, and that respondents have engaged in induced and contributory infringement. *See* Compl. Br. at 201-210.

It is undisputed that respondents' expert conceded infringement during the hearing that he only provided testimony concerning the validity question. He did not counter complainants' evidence of infringement. *See* Heppe Tr. 3078. Furthermore, contrary to respondents' argument that complainants nonetheless failed to set forth sufficient evidence of infringement (*see* Resp. Br. at 197-200), the record confirms Global Locate's contention that the accused products have infringed the asserted claims. The Staff agrees and supports a finding of infringement. *See* Staff Br. at 56-58; Staff Reply at 10-11.

During the hearing, complainants' expert provided element-by-element analysis of the accused chips to show that they literally practices claims 1, 2 and 11 of the '801 patent. *See* Pratt Tr. 1014-1089. Furthermore, the record shows that SiRF infringes through testing activity n the United States. *See* Pratt Tr. 1087-1089 (relying in evidence provided by SiRF personnel); JX-111-2C (Chen Tr.) at 85-87, 115-117.

In addition, complainants argue induced and contributory infringement. For the reasons stated below, complainants' arguments and citations to the record clearly established induced infringement by SiRF and the other respondents (MiTAC/Mio, E-TEN and Pharos), as proscribed in 35 U.S.C. §271(b).

SiRF and the other respondents have had knowledge of the '801 patent at least since

Global Locate filed its complaint with the International Trade Commission on March 30, 2007, initiating this investigation. And since at least that date, SiRF and the other respondents have continued to actively induce infringement of the '801 patent.

SiRF actively induces infringement by marketing its chips and navigation software to makers of those products, by providing assistance in designing SiRF chips into such products, and by continuing to support the operation of the SiRF chips and software, knowing that when devices containing the SiRF chips are used, they will perform all of the steps of the asserted claims. *See* Pratt Tr. 1089-1093; CX-753C (summary of SiRF revenue, broken down by chip family).

SiRF targets handset manufacturers (such as [ ] and makers of personal navigation devices (such as [ ] for purchase of the accused SiRF chips and navigation software. *See* JX-111-2C (Huntingford Tr.) at 94-96. SiRF also provides design assistance to OEMs developing products that use the accused SiRF chips and software. *See* JX-111-2C (Fudurich Tr.) at 70-71, (discussing design reviews of customer schematics and board layout). Finally, once an OEM implements the accused SiRF chips and software into its products, SiRF continues to provide technical support to such OEMs regarding its chips and software. *See id.* at 71.

In addition, SiRF encourages OEMs to market the use of SiRF chips and software in their end-user products as a distinguishing product feature. In order to ensure "greater recognition & differentiation in the market place," SiRF offers its "SiRF Powered Program," which encourages the use of SiRF designed artwork on "the face plate or other location on a product, during software application start up, within product literature, upon product packaging, on a website," and through "advertising, direct mail, or catalogs." CX-693C ("SiRF Powered Program

Guidelines") at 602SiRF00136855; *see* Mayo Tr. 1611-1612; JX-111-4C (Boeryd Tr.) at 136.

MiTAC/Mio, E-TEN, and Pharos induce infringement by actively marketing their GPS devices containing SiRF chips and software. *See* Pratt Tr. 1094-1098 (discussing documentary evidence of marketing, user support, and technical support). *See* CX-602 (Where to Buy Mio Products); CX-608C (summary of Mio US sales to customers). MiTAC/Mio, E-TEN, and Pharos also induce infringement by specifically encouraging and supporting the use of the GPS functionality. MITAC/Mio, E-TEN and Pharos provide their customers with users manuals for their products incorporating the accused SiRF chips and software. *See, e.g.*, JX-38C [Fu Tr.] (attached to JX-111-2C) at 129-130 (reviewing E-TEN M700 Users Manual). MiTAC/Mio, E-TEN, and Pharos also each provide their customers with technical support for their GPS devices containing the SiRF chips and software. *See, e.g.*, JX-111-2C (Lee Tr.) at 62-63, (discussing providing technical support in the United States); JX-111-2C (Feng Tr.) at 43, (technical support).

Accordingly it is found that claims 1, 2 and 11 of the '801 patent are literally and directly infringed by the accused, imported SiRF devices, and further that all respondents have indirectly infringed through inducing infringement.

C. <u>Validity</u>

Respondents argue that the asserted claims are invalid on three grounds: (1) that the claims "recite non-statutory subject matter," (2) the claims are not enabled under complainants' proposed construction, and (3) that the claims are invalid due to anticipation. *See* Resp. Br. at 169-197; Resp. Reply at 111-117. Respondents' arguments are opposed by complainants and the Staff. *See* Compl. Br. at 209-34; Compl. Reply at 100-25; Staff Br. at 58; Staff Reply at 11-12.

1. Patentable Subject Matter

Respondents argue that the asserted claims of the '801 patent are not directed to patentable subject matter under 35 U.S.C. § 101 and are thus invalid "because all the steps of the asserted claims merely involve providing inputs and carrying out a mathematical calculation." Resp. Br. at 169-170.

As stated above in the section on legal principles of general application (section III), the subject matter that is patentable under the current Act is "extremely broad." *See Comiskey*, 499 F.3d at 1375. A mathematical algorithm is not patentable to the extent it presents "merely abstract ideas." *State Street Bank & Trust Co. v. Signature Financial Group*, 149 F.3d 1368, 1373 (Fed. Cir. 1998). Yet, a claim that transforms data and presents a practical application of the algorithm is patentable if it produces a "useful, concrete and tangible result." *Id.* Moreover, "a process claim reciting an algorithm could state statutory subject matter if it (1) is tied to a machine or (2) creates or involves a composition of matter or manufacture." *Comiskey*, 499 F.3d at 1377. For example, the Federal Circuit has "found processes involving mathematical algorithms used in computer technology patentable because they claimed practical applications and were tied to specific machines." *Id.* Under such applicable legal standard, the asserted claims of the '801 patent recite patentable subject matter.

For example, claim 1 calculates "an absolute position of a GPS receiver and an absolute time of reception of satellite signals." JX-1 ('801 Patent), col. 12, ll. 28-30 (preamble of claim 1); *see also id.* at col. 12, ll. 37-39 (final limitation, which recites "computing absolute position and absolute time ..."). The position and time of a GPS receiver are useful, concrete, and tangible results. *See Comiskey*, 499 F.3d at 1377 & n.14 (noting patentability of claims that "determine the

value of" an indicator, transform data into a final share price, or analyze "electrocardiograph signals for the detection of a specific heart condition"). In addition, claim 1 is tied to a specific machine – a GPS receiver. *See* JX-1 ('801 Patent), col. 12, ll. 28-30 (a method for calculating an absolute position "of a GPS receiver"), col. 12, ll. 31-32 (providing pseudoranges that estimate "the range of the GPS receiver to a plurality of GPS satellites"), col. 12, l. 35 (providing an estimate of a position "of the GPS receiver"), col. 12, ll.37-38 (computing absolute position by updating the estimate of position "of the GPS receiver"). In fact, the only reasonable reading on claim 1 is that it is tied to GPS receiver, especially because pseudoranges (the distances or estimated distances between satellites and a GPS receiver) can exist only with respect to a particular GPS receiver that receives the satellite signals.[59]

Accordingly, it is found that the asserted claims of the '801 patent recite patentable subject matter.

2. <u>Enablement</u>

Respondents argue that the '801 patent contains many mistakes, and that after the patent issued, an ineffective certificate of correction issued to correct four mistakes in the patent's mathematical formulas, and yet two mistakes in the formulas still exist. Therefore, respondents argue, the asserted claims fail to satisfy the enablement requirement of 35 U.S.C. § 112. *See* Resp. Br. at 176-177.

Respondents' argument relies primarily on attorney argument. An examination of the

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[59] As discussed above, claim 1 of the '801 patent is necessarily tied to a particular apparatus, a GPS receiver. Further, the process is tied to the apparatus in a non-conventional way: it improves the operation of a GPS receiver because it solves for an additional unknown (absolute time) and unconventionally allows the receiver to calculate its position when it does not have absolute time.

record evidence concerning the '801 patent shows that a finding of lack of enablement would be disconnected from the realities of one of ordinary skill working in the GPS field. Further, such a finding is not mandated by law.

In *Southwest Software, Inc. v. Harlequin, Inc.*, 226 F.3d 1280 (Fed. Cir. 2000), a case relied upon by respondents, the Federal Circuit explained that in order to determine the enablement issue, it is necessary to analyze a patent with its mistakes and determine whether the patent remains enabled. *Id.* at 1297. The enablement standard requires the disclosure to be sufficient to enable a person of ordinary skill in the art to practice the claimed invention. *Lindemann Maschienfabrik v. American Hoist & Derrick Co.*, 730 F.2d 1452, 1463 (Fed. Cir. 1984).

Here, the only record evidence shows that the clerical mistakes drafting in the equations at issue are "minor" and could be corrected by a person of ordinary skill in the art. *See, e.g.,* Pratt Tr. 2916-2917.[60] Consequently, a person of ordinary skill could make and use the invention.

It has not been established, therefore, by clear and convincing evidence that the claims are invalid due to a lack of enablement.

3. <u>Anticipation</u>

Respondents argue that the asserted claims of the '801 patent are invalid under 35 U.S.C. § 102 due to anticipation. In particular, they argue that the claims are anticipated by U.S. Patent No. 6,618,670 (the '670 patent"), entitled "Resolving Time Ambiguity in GPS Using

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[60] Corrections to the equations were also made via a Certificate of Correction that is attached to the '801 patent. *See* JX-1 ('801 Patent). The legal effectiveness of that certificate with respect to the enablement issue is a matter of dispute among the parties. Nevertheless, inasmuch as the errors are of no practical significance to one of ordinary skill, that issue need not be resolved.

Over-Determined Navigation Solution" (RX-106), and by traditional GPS receivers as shown a 1978 paper by Milliken and Zoller, entitled "Principle of Operation of NAVSTAR and System Characteristics" (RX-117). *See* Resp. Br. at 178-197.

As discussed below, it is not found that the '670 patent discloses the subject matter of the asserted claims of the '801 patent because the key algorithm disclosed in the '670 patent does not work; the SiRF Overdetermination Procedure (allegedly disclosed in the '670 patent) does not have priority over the invention of the '801 patent; and the article by Miller and Zoller does not anticipate any asserted claim of the '801 patent because it is a nearly 30-year old article that is based on the former global positioning system over which the '801 patent is an improvement.

The 670 Patent Does Not Disclose the Subject Matter of the Asserted Claims

The algorithm disclosed in the '670 patent to SiRF's Dr. Chansarkar attempts to solve just one part of the "time-free" problem that Dr. van Diggelen solved completely in April 2000, and disclosed in the asserted claims of the '801 patent. As demonstrated at the hearing, the '670 patent does not meet its more modest goal.

In particular, the '670 patent specification discloses a two-step algorithm to compute a GPS receiver's position. The patent refers to this procedure as an "Overdetermination Procedure." RX-106 ('670 patent), col. 4, l. 62. The disclosure of the entire overdetermination procedure consumes less than a column of the patent (*see* RX-106 ('670 patent),col. 4, l. 63 - col. 5, l. 47), and it is not covered in the claims of the '670 patent (*see id.* col. 6, ll. 28-45).

The overdetermination procedure described in the '670 patent specification involves the calculation of a ΔT variable used to determine absolute time. RX-106 ('670 Patent), col. 5, l. 10.

The specification of the '670 patent recognizes that without accurate absolute time information, an ordinary four-state GPS receiver with only four measurements will fail because the receiver will not be able to place the satellites in their proper locations. *See* RX-106 ('670 patent), col. 2, ll. 46-56.

The overdetermination procedure of the '670 patent appears to begin by using pseudoranges to compute "user position and clock bias" according to an ordinary four-state algorithm. *See* RX-106 ('670 patent) at col. 5, ll. 3-5 ("Let Pr_i be the pseudorange for the ith satellite. Let (X, Y, Z and B) be the computed user position and clock bias, respectively."). The process then appears to involve the use of an extra measurement (presumably a fifth satellite pseudorange measurement) to calculate a residual (Z_i) for each satellite. *See id.* at col. 5, ll. 6-12. The residual is the difference between the measured pseudorange (Pr_i) and an expected pseudorange.

The '670 patent ultimately discloses the following key equation for calculating ΔT:

where

R_i = Geometric Range to the ith satellite from the estimated user location.
SVV_i = Speed of the ith GPS satellite.
$LOSV_i$ = Line of sight speed of the ith GPS satellite based on the estimated user location.

RX-106 ('670 Patent), col. 5, ll. 29-37.

After calculating ΔT, the overdetermination procedure appears to require using that value to increment the estimated time, using the new estimated time as the basis for another ordinary four-state (four-satellite) position computation, and then repeating the entire process iteratively until the residuals are sufficiently small that the process has yielded a converged time and position solution. *See* RX-106 ('670 patent) at col. 5, ll. 44-47 ("[T]his procedure must be recursively

performed to refine the time and position estimate till consecutive solutions are within acceptable errors with respect to one another.").

However, from the beginning SiRF had difficulties with the algorithm in its provisional patent application. Even after the provisional application was filed, Dr. Chansarkar and SiRF had to make multiple revisions to the algorithm. When SiRF finally did get an Over Determination Procedure to work in at least some situations, the equations looked nothing like the equations in the provisional patent and it was long after the '801 patent had been conceived and reduced to practice. *See* Chansarkar Tr. 2302-2316.

Prior art that is inoperable cannot invalidate a later invention. *See United States v. Adams*, 383 U.S. 39, 50 (1966). Such is the case here. Complainants' expert was unequivocal in his hearing testimony that the SiRF algorithm "doesn't work." Pratt Tr. 2852. At the hearing, respondents' expert offered no contradictory opinion. In fact, it appears that respondents' expert understood the "concerns" that one would have with the algorithm, and in fact expressed skepticism about it. *See* Heppe Tr. 2702, 2705 ("it would be difficult to state unequivocally that it would converge [to a solution].").

As complainants' expert explained at the hearing, one of ordinary skill immediately observes a problem with the overdetermination procedure of the '670 patent in that the formula for calculating ΔT does not use any actual measurement data. *See* Pratt Tr. 2852. The ΔT variable is supposed to update and refine the initial estimate of absolute time for use during the next, iterative step of the position computation. However, the inputs for the ΔT equation – the R_i, $LOSV_i$, and SVV_i terms – are each calculated without any reference to the pseudorange measurements or residuals. As explained at the hearing, without any measurement data to

improve the estimation as the algorithm iterates, the algorithm will not work. *See* Pratt Tr. 2853.

Consequently, the '670 patent cannot anticipate any asserted claim of the '801 patent. In addition, even if the algorithm of the '670 patent were operable, the patent could not render claim 11 invalid for the reasons discussed below.

Respondents' expert, Dr. Heppe, argued at the hearing that claim 11 (in addition to claim 1) is anticipated by the overdetermination procedure. *See* Heppe Tr. 2697. Citing a small section of the '670 specification (*see* RX-106 ('670 Patent), col. 6, ll. 1-9), Dr. Heppe argued that claim 11 is anticipated because the '670 patent suggests that one could use a highly accurate clock to allow other variables to be determined. Claim 11, however, depends ultimately from claim 1, and as explained in the claim construction section, claim 1 requires the computation of position *without having absolute time information.* A "highly-accurate clock" would provide precisely that information. Further, claim 11 depends from claim 4, which requires that the "estimate of absolute time is provided by a clock that is *not* linked to a GPS reference time." JX-1 ('801 Patent), col. 12, ll. 46-48 (emphasis added). The '670 patent cannot, therefore, anticipate claim 11.

The '670 Patent Is Not Prior Art

Even assuming that the SiRF Overdetermination Procedure (which was allegedly encompassed by the '670 patent to SiRF's Dr. Chansarkar) did disclose the limitations of one or more of the claims of the '801 patent, it still could not anticipate because it does not have priority over the '801 patent. Under § 102(g), "priority of invention goes to the first party to reduce an invention to practice unless the other party can show that it was the first to conceive the invention and that it exercised reasonable diligence in later reducing that invention to practice." *Monsanto*

Co. v. Mycogen Plant Science, Inc., 261 F.3d 1356, 1362 (Fed. Cir. 2001) (quoting *Mahurkar v. C.R. Bard, Inc.*, 79 F.3d 1572, 1577 (Fed. Cir. 1996)). "Thus, a showing of diligence is necessary for a party who was first to conceive but second to reduce to practice. The time period for which diligence must be shown by the party first to conceive is 'from a date just prior to the other party's conception to ... [the date of] reduction to practice [by the party first to conceive].'" *Monsanto*, 261 F.3d at 1362-63 (quoting *Mahurkar*, 79 F.3d at 1578).

The provisional application for the '670 patent (RX-31) was filed on September 15, 2000, two months before the date of the '801 patent application (November 17, 2000). The '801 patent, however, was conceived in April 2000. There is clear evidence for that date of conception (including dated notes and sworn, corroborated testimony from the inventor) and clear evidence for a reduction to practice by no later than June 2000, as discussed below. By contrast, there is no sufficient, corroborated evidence that Dr. Chansarkar conceived of, reduced to practice, or exercised diligence towards reducing to practice the overdetermination procedure at any time prior to the filing of the provisional patent application in September 2000.

Dr. van Diggelen offered clear, uncontradicted testimony that he conceived the '801 patent in April 2000. *See* van Diggelen Tr. 99-106, 118-125. Dr. van Diggelen explained that the task of figuring out how a GPS receiver could determine its position without knowing absolute time was thrust upon him within days after he joined Global Locate in April 2000. Global Locate had planned to build a simpler GPS receiver that would not decode the Navigation Message. van Diggelen Tr. 66. At an April 6, 2000, meeting with scientists from [

] scientists told Global Locate that it would be "impossible" for a receiver to compute position without reading the Navigation Message. van Diggelen Tr. 99; CX-79C (van

Diggelen notes from April 6, 2000, [ ] meeting) at GL-602 119214.

Dr. van Diggelen spent the next several days trying to develop a solution to the problem, ultimately succeeding and producing a set of so-called "alchemy engine" equations on large "Post-it" notes that he hung on the wall in his office. CX-82C (van Diggelen notes) at GL-602 10066; CX-83C (van Diggelen notes) at GL-602 10068; van Diggelen Tr. 118-124. When van Diggelen completed the notes, he wrote the date on them – April 11, 2000. *See* van Diggelen Tr. 122-123, 403. Those notes were witnessed on Dr. van Diggelen's wall by Charles Abraham in April 2000. *See* Abraham Tr. 3213-3214.

As complainant's expert, Dr. Pratt, and inventor van Diggelen explained, these notes show all of the elements of claim 1 of the '801 invention. *See* van Diggelen Tr. 120; Pratt Tr. 2865-2870. They show the extension of the standard four-state model to include an extra unknown – the absolute time error ("dts") – in a five-state matrix solution. CX-82C at GL-602 10066; CX-83C at GL-602 10068; van Diggelen Tr. 121-122. They reflect the provision of pseudoranges, the use of estimates of position and time, the use of ephemeris data, and the computation of position and time by updating the initial estimates. *See* Pratt Tr. 2865-2870; van Diggelen Tr. 120.

It is also clear that Dr. van Diggelen conceived of claim 2 and reduced to practice claims 1 and 2 no later than June 2000. Dr. van Diggelen and Charles Abraham testified regarding a June 15, 2000 email from Dr. Van Diggelen. CX-108C (June 15, 2000 email from van Diggelen) at GL-602 73188-93; van Diggelen Tr. 134-136; Abraham Tr. 3206. The email shows [

] and the email shows [

] CX-108C at GL-602 73190. The

position was calculated with MATLAB computer code using "actual sub-millisecond measurements from the GPS satellites" collected by a Global Locate GPS receiver referred to as the "recorder-player." van Diggelen Tr. 134-135; *see also id.* at 75-76, 136; Pratt Tr. 2871-2872.

After the June 15, 2000, successful calculation of position, Global Locate worked to implement the "alchemy engine" equations in C++ source code that could be used in an actual product. *See* van Diggelen Tr. 137. Both Dr. van Diggelen and Dr. Pratt testified regarding a piece of Global Locate C++ source code [ ] *See* CX-200C (GL source code dated July 12, 2000).

Dr. van Diggelen testified that the code was written by Phong Van at Global Locate in [ ] van Diggelen Tr. 139-140, 409-413. The source code contains repeated references to being [ ] *See* CX-200C (Source Code) at GL-602 88955, 88959, 88965. Both Dr. van Diggelen and Dr. Pratt testified that the source code showed [ ] *See* Pratt Tr. 2872-2875; van Diggelen Tr. 140; CX-200C (GL source code dated [ ]) at GL-602 88962-63 [ ] The source code also shows [ ] as required by claim 11 of the '801 patent. *See* Pratt Tr. 2875; CX-200C (GL source code dated [ ]) at GL-602 88967-68.

In contrast to the detailed, documentary and corroborated evidence presented by complainants regarding the conception and reduction to practice of the '801 patent, the evidence

presented by respondents is vague and uncorroborated. Respondents' evidence fails to establish the priority of the SiRF overdetermination procedure over the '801 patent.

First, there is insufficient evidence of conception of the '670 patent's overdetermination procedure prior to the April 2000 conception of the '801 patent. Conception requires a "definite and permanent idea of the complete and operative invention," *Cooper v. Goldfarb*, 154 F.3d 1321, 1327 (Fed. Cir. 1998). Conception is complete "only when the idea is so clearly defined in the inventor's mind that only ordinary skill would be necessary to reduce the invention to practice, without extensive research or experimentation." *Burroughs Wellcome Co. v. Barr Lab.*, 40 F.3d 1223, 1228 (Fed. Cir. 1994). While reasonable experimentation does not preclude conception, conception will not be found when "the subsequent course of experimentation, especially experimental failures, reveals uncertainty that so undermines the specificity of the inventor's idea that it is not yet a definite and permanent reflection of the complete invention as it will be used in practice." *Id.* at 1229.

Respondents rely on an April 12, 1999, email (RX-31) that is largely identical to the disclosure of the overdetermination procedure in the '670 patent specification as its proof of conception. Yet, as explained in detail above, the equations in that email (and in the '670 patent specification) do not work. Dr. Pratt's opinion that the algorithm would not work explains the later testing and multiple modifications of the two-step algorithm by SiRF engineers (in December 2000, and January 2001). That testing – and resulting modifications – shows that, in April 1999, Dr. Chansarkar did not have a "definite and permanent idea of the complete and operative invention." *See Cooper*, 154 F.3d at 1327. In the words of the Federal Circuit, "the subsequent course of experimentation, especially [the] experimental failures, reveal[ed] uncertainty that so

undermines the specificity of the inventor's idea that it [was] not yet a definite and permanent reflection of the complete invention as it will be used in practice." *See Burroughs Wellcome Co.* at 1229. Indeed, the two-step algorithm was never "used in practice," because SiRF abandoned the idea and never implemented any form of the two-step algorithm in any SiRF navigation library.

Second, there is no corroborating evidence that SiRF reduced the overdetermination procedure to practice prior to the conception of the '801 patent in April 2000, or that SiRF exercised diligence from before that conception through reduction to practice. SiRF has never presented any document showing any simulation of the equations in the April 1999, email or the '670 patent prior to the testing in December 2000, that showed those equations not to work.

Former SiRF employee Lionel Garin asserted that he saw the results of simulations conducted by Dr. Chansarkar in 1999 and that they were "successful." Garin Tr. 1868. On cross-examination, Garin stated that "I think I might have done it myself." Garin Tr. 1917. Garin provided no documents to corroborate his testimony. Garin also provided no details regarding what formulas were tested, what data were used, or how pseudoranges were constructed.

The only other evidence SiRF presented to attempt to show a reduction to practice was a draft Engineering Requirements Document (ERD) dated August 3, 1999 (RX-343), which, according to Dr. Chansarkar, contained a reference to his overdetermination procedure. *See* Chansarkar Tr. 2153-2158. Dr. Chansarkar testified that the document specified the engineering requirements for a SiRF product then in development, SiRFLoc. Chansarkar Tr. 2154. Dr. Chansarkar testified that "[p]rior to any requirements being written into a formal engineering requirements document, they have to be evaluated, analyzed and simulated," and that "[f]or the

concept of sync-free nav there was a simulation done before writing" the draft ERD. Chansarkar Tr. 2155.

However, Dr. Chansarkar, like Garin, produced no such simulation and provided no details regarding the alleged simulation. He did not specify when the simulation occurred, who was involved, what formulas were tested, or what measurements were used. Dr. Chansarkar also could point to no document or written policy to support his assertion that simulations had to occur before requirements could be written into a formal engineering requirements document. Chansarkar Tr. 2317-231. In any event, the SiRFLoc engineering document was still in draft form more than a year later. *See* CX-847C; Chansarakar Tr. 2318- 2319. Further, Dr. Chansarkar admitted that sync-free navigation was not actually implemented in SiRFLoc software for another three years after that. Chansarkar Tr. 2319-2320.

Finally, the uncorroborated assertion that SiRF conducted a simulation of the Overdetermination Procedure in 1999 is belied by the fact that, when SiRF undisputedly did test the '670 algorithm in 2000, SiRF engineers quickly realized the equations did not work and had to alter the equations not just once, but at least twice. If SiRF engineers had tested the equations in 1999, they would have discovered the same thing, and presumably Dr. Chansarkar would not have included in the September 2000 provisional patent application the same (inoperable) equations that he initially developed 17 months earlier in the April 1999 email (RX-31C).

"While a patentee may have the burden of going forward with rebuttal evidence once a challenger has presented a *prima facie* case of invalidity, the presumption of validity remains intact and the ultimate burden of proving invalidity remains with the challenger throughout the litigation." *Innovative Scuba Concepts, Inc. v. Feder Industries, Inc.*, 26 F.3d 1112, 1115 (Fed.

Cir. 1994). In *Innovative Scuba*, the court held that it was "legal error" for the trial court to require the patentee to prove by clear and convincing evidence that it conceived and reduced to practice before the creation of the prior art. *Id.* Furthermore, oral testimony by an inventor, standing on its own, is insufficient to establish the inventive facts. *See Brown v. Barbacid*, 276 F.3d 1327, 1335 (Fed. Cir. 2002); *Price v. Symsek*, 988 F.2d 1187, 1194 (Fed. Cir. 1993). Corroboration is required, regardless of whether the person testifying is interested in the outcome of the litigation. *See Finnigan Corp. v. International Trade Comm'n*, 180 F.3d 1354, 1367 (Fed. Cir. 1999). Even if there is corroboration for an inventor's testimony, courts apply a "rule of reason" analysis, evaluating all pertinent evidence "so that a sound determination of the credibility of the story may be reached." *See Price*, 988 F.2d at 1195.

In this case, the evidence of any alleged reduction to practice in 1999 is not persuasive. For example, the testimony provided no details about an alleged simulation, as Dr. Chansarkar admitted, "I do not remember the details of the simulation." Chansarkar Tr. 2215. Despite producing many emails from the 1999 time period, SiRF produced no documentary evidence showing any simulation results or even referring to the existence of a simulation in 1999. Such deficient evidence, offered by a current and former SiRF employee as SiRF's only colorable defense to the infringement of the '801 patent, is insufficient to meet SiRF's burden and to overcome the presumption of validity that attaches to the '801 patent. SiRF also presented no evidence whatsoever purporting to show that it exercised diligence towards reduction to practice from before Dr. van Diggelen's conception of the '801 patent (in April 2000) through any later reduction to practice.

Respondents therefore have not met their burden of establishing, by clear and convincing

evidence, priority of its overdetermination procedure (allegedly disclosed in the '670 patent) over invention of the '801 patent.

The Milliken Paper Does Not Anticipate the Asserted Claims of the '801 Patent

Respondents argue that the asserted claims of the '801 patent are anticipated by a 1978 paper by Milliken and Zoller (the "Milliken" paper), entitled "Principle of Operation of NAVSTAR and System Characteristics" ("the Milliken paper")(RX-117). This paper is among the first published on GPS navigation algorithms. *See* Pratt Tr. 2849. The algorithm disclosed in Milliken depends on the receiver having received absolute time information from the GPS satellite Navigation Message. This is, of course, contrary to the claimed invention of the '801 patent. *See generally* Pratt Tr. 2848-2852.

As discussed in detail in the section on claim construction, the invention of the '801 patent is an improvement over the older system method and apparatus, as described in the Milliken paper, in which the GPS receiver received the absolute time information. However, as explained above, respondents would have the claims of the '801 patent read on a receiver that received and used the absolute time information, an argument that was rejected as inconsistent with the plain language and indeed all the intrinsic evidence.

In fact, Dr. Heppe admitted at the hearing that his argument concerning the Milliken paper requires the assumption that the PTO granted – when it issued the '801 patent in 2002 – claims covering GPS receivers that had been on sale for over 20 years, and that a GPS receiver such as that described in the Milliken paper must get time information from the satellite navigation message or some other source. *See* Heppe Tr. 3078-3079.

Accordingly, it has not been established that the Milliken paper anticipates any claim of the '801 patent.

D. Summary

For the reasons detailed above it is found that claims 1, 2 and 11 of the '801 patent are literally infringed directly, and indirectly through induced infringement. Furthermore, it has not been shown by clear and convincing evidence that the asserted claims are invalid due to a failure to claim patentable subject matter, a lack of enablement or anticipation.

VII. U.S. Patent No. 6,937,187 ("the '187 Patent")

A. Claim Construction

United States Patent No. 6,937,187, entitled "Method and Apparatus for Forming a Dynamic Model to Locate Position of a Satellite Receiver," issued to Frank van Diggelen and Charles Abraham on August 30, 2005, and was assigned to Global Locate. The application that led to the '187 patent was a continuation-in-part of an application that issued as United States Patent No. 6,734,821, which in turn was a continuation-in-part of an application that led to the '801 patent (which is asserted in this investigation). The specification of the '187 states that both '821 and '801 patents are incorporated by reference in their entireties. *See* JX-5 ('187 Patent), cover page, col. 1, ll. 7-13.

As in the case of the '801 patent, the claimed invention of the '187 patent "relates to satellite-based position location and, more particularly, the invention relates to a method and apparatus for time-free processing of global positioning system (GPS) signals." JX-5 ('187 Patent), col. 1, ll. 18-21. Due to the relationship of the '187 patent to the '801 patent, many portions of the patents' specifications are identical. For example, for a description of the "related

art" of the '187 patent, one may see the description of the "background art" contained in the '801 specification (and quoted extensively, above), including those portions that address matters relating to the "time tag." The summary of the claimed invention of the '187 patent builds upon that of the '801 patent, by repeating the prior patent's text and adding descriptions of other embodiments of the claimed invention, including one that uses a "dynamic model" to compute the position of the satellite receiver. The "Summary of the Invention" contained in the '187 patent specification is as follows:

> The present invention is a method and apparatus for computing GPS receiver position without using absolute time information transmitted by a satellite or by an alternative source of timing available at the GPS receiver. In an embodiment of the invention, the GPS receiver is contained in an integrated receiver that also includes a wireless communication transceiver, but does not have access to an accurate source of absolute time information. The wireless transceiver communicates through a wireless network to a server. The GPS receiver measures satellite pseudoranges and uses the wireless communication transceiver to send the pseudoranges to the server. The server fits the pseudoranges to a mathematical model in which the GPS receiver position and the absolute time are unknown parameters. The server then computes a position and absolute time that best fit the model, thus yielding the correct position for the GPS receiver, and the absolute time at which the pseudorange measurements were made.
>
> In another embodiment, pseudoranges are obtained that estimate the range of a satellite signal receiver to a plurality of satellites. An absolute time and a position are computed using the pseudoranges at a first time. The absolute time is then used to compute another position at a subsequent time. In yet another embodiment, a plurality of states associated with a satellite signal receiver are estimated, where the plurality of states includes a time-tag error state. A dynamic model is then formed relating the plurality of states, the dynamic model operative to compute position of the satellite signal receiver.

JX-5 ('187 Patent), col. 3, l. 66 - col. 4, l. 26.

The specification of the '187 patent contains drawings with a description of them, a detailed description of the claimed invention that includes the preferred embodiment or embodiments, and also sets forth the claimed invention in a series of 10 claims. Complainants argue that each of the accused SiRF chips and software (and the non-SiRF respondents' products in which the accused SiRF chips are incorporated) infringes claim 1 of the '187 patent. They also argue that the accused products of the non-SiRF respondents, which include the accused SiRF chips, are mobile devices that include each element of claim 9. *See* Compl. Br. at 250.

Claims 1 and 9 are both independent claims, and they provide, as follows:

1. A method, comprising:

> estimating a plurality of states associated with a satellite signal receiver, the plurality of states including a time tag error state, the time tag error state relating a local time associated with said satellite signal receiver and an absolute time associated with signals from a plurality of satellites; and
>
> forming a dynamic model relating the plurality of states, the dynamic model operative to compute position of the satellite signal receiver.

9. A mobile device, comprising:

> a satellite signal receiver for providing pseudoranges that estimate the range of the mobile device to a plurality of satellites; and
>
> a sequential estimator having a plurality of states associated with the satellite signal receiver, the plurality of states including a time tag error state, the time tag error state relating a local time associated with said satellite signal receiver and an absolute time associate with signals from the plurality of satellites.

JX-5 ('187 Patent), col. 20, ll. 44-53,; col. 22, ll. 1-12.

The following terms are disputed, and are discussed individually below: (1) "time tag

error" or "time tag error state" found in claims 1 and 9; (2) "estimating a plurality of states associated with a satellite signal receiver, the plurality of states including a time tag error state" found in claim 1; (3) "forming a dynamic model relating the plurality of states" found in claim 1; and (4) "a sequential estimator having a plurality of states associated with the satellite signal receiver" found in claim 9.

"time tag error" or "time tag error state"

Complainants argue that a "time tag error" is "a value, separate from the common mode error, that represents the difference in time between an absolute time and the local receiver time." Compl. Br. at 240-241.

Respondents argue that "time tag error state" must be construed because it does not have an ordinary meaning to those skilled in the art. They argue that a "time tag error state" is "a state representing the difference between local time and an absolute time of reception generated when the absolute time is not available from either the satellite signals or an external source of information." Resp. Br. at 203-204.

The Staff argues that complainants' proposed construction relating to the time tag error state limitation is reasonable and consistent with the intrinsic record. It is argued that respondents' proposed construction would improperly restrict the time tag error state. *See* Staff Br. at 60.

The term "time tag error" appears in claims 1 and 9. These claims both recite and describe the term: "the time tag error state relating a local time associated with said satellite signal receiver and an absolute time associated with signals from a plurality of satellites." JX-5 ('187 Patent), col. 20, ll. 47-50 (claim 1), col. 22, ll. 8-11 (claim 9). As explained herein, this term is construed

to mean "a value, separate from the common mode error, that represents the difference in time between an absolute time and the local receiver time."

One of ordinary skill would understand that the "common mode error" is distinct from the "time tag error." *See* Pratt Tr. 1113. In fact, the specification of the related '801 patent (quoted above) and the '187 patent is careful to differentiate between the two. *See* JX-5 ('187 Patent), col. 3, ll. 44-51.[61] Thus, complainants' proposed claim construction is consistent with the intrinsic evidence because it merely restates the description contained in the claim language and clarifies it by reiterating the express teachings of the specification that differentiate time tag error from common mode error.

Respondents' proposed construction for a "time tag error state" is problematic. First, it doe not differentiate between time tag error and a common mode error. Second, respondents' construction is simply wrong to suggest that it will be generated only when absolute time is not available. *See* Pratt Tr. 1113-1114. Nothing in the '187 patent imposes such a requirement on the asserted claims. *See* Pratt Tr. 1115-1121.

Accordingly, "time tag error" is construed to mean "a value, separate from the common mode error, that represents the difference in time between an absolute time and the local receiver time."

"estimating a plurality of states associated with a satellite signal receiver, the plurality of states including a time tag error state"

Complainants argue that "estimating a plurality of states associated with a satellite signal receiver, the plurality of states including a time tag error state" means "estimating, without having

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[61] Complainants' expert, Dr. Pratt, elaborated on the time tag error, and also explained that it is different from a common mode error. *See* Pratt Tr. 1107-1109.

absolute time information, a plurality of states associated with a satellite signal receiver, where the plurality of states includes a time tag error state." Compl. Br. at 241-243.

Respondents argue that this phrase does not require construction, particularly once "time tag error state" is defined. Resp. Br. at 204.

The Staff agrees with respondents that this phrase does not require construction, but does not object to complainants' proposed construction, which is consistent with the intrinsic evidence. *See* Staff Br. at 61.

The first part of the first limitation of claim 1 provides, "estimating a plurality of states associated with a satellite signal receiver, the plurality of states including a time tag error state." JX-5 ('187 patent), col. 20, ll. 45-47. This phrase should be construed, consistent with the '801 and '187 patents, to mean "estimating, without having absolute time information, a plurality of states associated with a satellite signal receiver, where the plurality of states includes a time tag error state." *See* Pratt Tr. 1133-1136. As with the '801 patent, from which the '187 patent is a continuation-in-part, the '187 patent itself is clear that the invention involves estimating a time tag error state (and other states) without having absolute time information.

Starting with the "Abstract" and the "Summary of the Invention," the '187 patent explains that: "An absolute time and a position are computed using the pseudoranges at a first time. The absolute time is then used to compute another position at a subsequent time." JX-5 ('187 patent), Abstract, col. 4, ll. 18-20 (Summary of the Invention). As complainants' expert explained, "if we have absolute time in the first instance, then it can't be computed. We already have it." Pratt Tr. 1134. The '187 patent thus involves a receiver that, at least initially, does not have absolute time information.

Consequently, "estimating a plurality of states associated with a satellite signal receiver, the plurality of states including a time tag error state" means "estimating, without having absolute time information, a plurality of states associated with a satellite signal receiver, where the plurality of states includes a time tag error state

"forming a dynamic model relating the plurality of states"

Complainants argue that "forming a dynamic model relating the plurality of states" means "forming a model of a dynamic system represented by a plurality of states, with the model describing the relationship between the states as they change." Compl. Br. 243-245.

Respondents argue that this phrase means "building a mathematical model whose states are updated by a sequential estimator." Resp. Br. at 204-205.

The Staff argues that respondents' proposed construction is too narrow, and that complainants' proposal is reasonable in view of the intrinsic evidence. In particular, it is argued that the specification discloses the use of sequential estimators, such as the Kalman filter, but does not appear to limit the dynamic model to sequential estimators. Staff Br. at 61-62.[62]

The last limitation of claim 1 provides: "forming a dynamic model relating the plurality of states, the dynamic model operative to compute position of the satellite signal receiver." JX-5 ('187 patent) at col. 20, ll. 51-53. Thus, the phrase at issue should be construed in an manner that is consistent with the broad use of "dynamic model" in the patent claim and the disclosure of a dynamic model in the specification. *See* Pratt Tr. 1140-1146.

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[62] A Kalman filter is a form of sequential estimator involving complex mathematics. *See* JX-5 ('187 patent), claim 10, col. 14, ll. 10-11; col. 16, ll. 54-63 ("In one embodiment, the sequential estimator is a Kalman filter ...."); van Diggelen Tr. 153-154; Pratt Tr. 1110-1112. The filter will evaluate the accuracy of measured and actual values, and it will, over time, adjust the weighting of the two values based on their respective accuracy. *See* Pratt Tr. 1111-1112.

SiRF, however, proposes to construe this phrase far more narrowly, as "building a mathematical model whose states are updated by a sequential estimator." Yet, that proposed construction is inconsistent with the claims and specification. SiRF's did not originally propose its current construction. In his invalidity expert report, respondents' Dr. Heppe opined that if a system is solved iteratively – *i.e.*, if it uses repeated, recursive calculations to reach a position solution for a given point in time – it would qualify as a dynamic model and sequential estimator. *See* Heppe Tr. 3087-3093. Dr. Heppe expressly included "least-squares" estimators as such dynamic models. *See* Heppe Tr. 3090. In his non-infringement expert report, however, Dr. Heppe narrowed his definition dramatically to cover only sequential estimators (possibly in an attempt to save SiRF's accused products from infringement). He then contended that "the term[] dynamic model would be clearly understood by one of ordinary skill as excluding static models (point estimators) such as least squares estimators." *See* Heppe Tr. 3090-3091. During the hearing, Dr. Heppe disavowed his original construction and agreed that, at his deposition, he had stated that he had "misconstrued" the claim. *See* Heppe Tr. 3091-3093.

Dr. Heppe's current construction of "dynamic model," however, also misconstrues the claim. Too broad the first time, Dr. Heppe now errs on the narrow side. Dr. Pratt's definition, however, is grounded in the claims and specification of the '187 patent and supported by credible extrinsic evidence, such as the *IEEE 100: The Authoritative Dictionary of IEEE Standards Terms*.

Because the term "dynamic model" has a well-understood meaning in the art, a dictionary definition provides helpful context for construing the term. The IEEE dictionary defines a dynamic model, in contrast to a static model, as a "model of a system in which there is change,

such as the occurrence of events over time or the movement of objects through space." CX-241 at 347; Pratt Tr. 1144.

The '187 patent uses the term "dynamic model" in the same broad manner as the IEEE. The patent generally describes a GPS receiver that uses a dynamic model to incorporate the history of the receiver and to model changes from one point in time to the next. Pratt Tr. 1145-1146; JX-5 ('187 patent), col. 16, ll. 16-29. The patent notes that "*in another embodiment of the invention*, a sequential estimation process is used to determine GPS receiver position and absolute time." JX-5 ('187 patent), col. 16, ll. 30-32 (emphasis added). That makes clear that a sequential estimator is one embodiment of, and not the only way to implement, the '187 patent. *See* Pratt Tr. 1146.

Claim 4 provides further support for complainants' construction. Claim 4 adds to claim 1 the further limitation that "the dynamic model is formed within a sequential estimator." *See* JX-5('187 Patent), col. 20, ll. 66-67.

"a sequential estimator having a plurality of states associated with the satellite signal receiver"

Complainants argue that "a sequential estimator having a plurality of states associated with the satellite signal receiver" means "a process that sequentially produces, at least once without having absolute time information, estimates of a plurality of states associated with the satellite signal receiver." Compl. Br. at 246-249.

Respondents argue that this phrase means "a device that estimates the current values of states associated with the satellite signal receiver by merging current measurements with previously calculated values for the same states." Resp. Br. 205-207.

The Staff argues that complainants' proposed construction is reasonable. The Staff argues, among other things, that complainants' "clarification of 'at least once without having absolute time information' is appropriate" in view of the specification. Staff Br. at 62.

The last limitation of claim 9 requires, "a sequential estimator having a plurality of states associated with the satellite signal receiver, the plurality of states including a time tag error state." JX-5 ('187 patent), col. 22, ll. 6-11. Consistent with the broad use of "sequential estimator" in the patent and the structure of the claims, as well as the ordinary meaning of the term "sequential estimator," the phrase "a sequential estimator having a plurality of states associated with the satellite signal receiver" should be construed to mean "a process that sequentially produces, at least once without having absolute time information, estimates of a plurality of states associated with the satellite signal receiver."

SiRF has proposed various constructions in this investigation, depending on the circumstances. As discussed above, Dr. Heppe's invalidity report initially proposed a broad construction of dynamic model and sequential estimator. *See* Heppe Tr. 3087-3093. Dr. Heppe later disavowed that position and argued, in his noninfringement expert report, that the sequential estimator element is narrowly limited to the use of a Kalman filter. *See* Heppe Tr. 3093-3095. Now, respondents offer another interpretation in their brief.

Complainants' expert, Dr. Pratt, explained at the hearing that a sequential estimator is simply a process. "It could be a dynamic model, but it operates at specific instants in time. So, in other words, at time 1, it produces an estimate of the position. At time 2, it produces an estimate of the position, probably having received some input, [although] that isn't always necessary. At time 3, it will produce another estimate of the position and so on." Pratt Tr. 1143. The essential

feature of a sequential estimator is not any particular relationship between inputs and outputs, but simply the overall process of estimating, in a discrete, sequential manner, the states of a system using some combination of new measurements and prior state information. *See* Pratt Tr. 1163, 1106-1107; *see also,* Pratt Tr. 1161-1166.[63]

In this instance, the "sequential estimator" limitation should be construed to include the language that it "produces, at least once without having absolute time information, estimates of a plurality of states associated with the satellite signal receiver." This is because the invention is based on the use of the '801 time-free technique, as discussed above with respect to claim 1. *See* Pratt Tr. 1162. It also is confirmed by the patent's discussion of Figure 9, in which there is an initialization of the sequential estimator with the time tag error state (when the system does not have absolute time information), and then subsequently the system may obtain absolute time information. Pratt Tr. 1164; JX-5 ('187 patent) at col. 18, ll. 21-43, Fig. 9.

Accordingly, "a sequential estimator having a plurality of states associated with the satellite signal receiver" means "a process that sequentially produces, at least once without having absolute time information, estimates of a plurality of states associated with the satellite signal receiver."

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[63] For example, in sequential estimators that are Kalman filters (as once proposed by respondents' experts for the present claim term), the manner in which previously calculated values and new measurements are combined will vary over time. *See* Pratt Tr. 1111-1112.

B. Infringement Determination

1. The SiRF Devices Infringe the Asserted Claims

Complainants argue that respondents' infringement of the '187 patent is clear under either their, or respondents', proposed claim constructions. Complainants accuse all of respondents' products at issue in this investigation of infringing the asserted claims, *i.e.,* the SiRFstarIII chips and GSCi-5000 chips (operating with the SiRFstarIII navigation software), the [ ] the GSCi4100/4200 InstantGPS chips (operating with the GSCi4100/4200 firmware), and E-TEN, MiTAC/Mio and Pharos products that incorporate the SiRFstarIII chips. Compl. Br. at 249-257.

Respondents argue that although initially complainants accused SiRF's Kalman filter implementation, after complainants realized that the Kalman filter implementation did not have a tag time error state, complainants changed course and accused SiRF's sync-free module (also referred to as "SyncFreeNav"). In any event, respondents argue, the sync-free mode is a static model, and thus complainants' infringement arguments are without merit. They also provide non-infringement arguments and citations to the record concerning the Kalman filter implementation. *See* Resp. Br. at 208-212.

The Staff argues that the accused SiRFstarIII devices and SiRF InstantGPS devices infringe claims 1 and 9 of the '187 as properly construed. The Staff also argues that the terms at the center of the parties' infringement dispute are "time error state" and "dynamic model," and that the weight of the evidence favors complainants. *See* Staff Br. at 63; Staff Reply at 12.

At the outset, it is noted that infringement cannot be found with respect to the so-called [ ] they cannot have been imported, and their design

[ ] *See* Sections I (Background) and III (Importation or Sale).

With respect to other accused products, the record shows that contrary to respondents' argument, SiRF's sync-free module or SyncFreeNav does meet the limitations of the asserted claims.[64] Respondents argue that in sync-free mode their devices possess a static model least squares estimator. However, the record shows that in sync-free navigation mode the devices reuse previously calculated values, and are a dynamic model and a sequential estimator, as required by claims 1 and 9.[65]

For example, as conceded during the hearing, in SiRF's devices "the position from the previous computation would be used to initialize the sync-free least squares calculation in the next epoch." *See* Chansarkar Tr. 2326-2327. As complainants' Dr. Pratt explained, that reuse of position makes SiRF's least squares estimator a dynamic model. *See* Pratt Tr. 2879. Inasmuch as respondents admit that the SiRF devices use at least the prior position state information during subsequent sync-free computations, under complainants' proposed construction, which was adopted herein, respondents infringe.

Furthermore, even if respondents' proposed constructions were adopted, SiRF's products still would infringe because SiRF reuses its time tag error state. Indeed, SiRF's source code demonstrates that SiRF reuses its time tag error. *See* Pratt Tr. 1153-1154, 2882-2883. The only

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[64] Complainants' expert set forth evidence concerning each of the limitations of the asserted claims, including those that are not the focus of respondents' non-infringement arguments. *See* Pratt Tr. 1136-1167.

[65] While respondents also offered evidence that their devices' Kalman filter mode does not have a time tag error and therefore does not infringe (particularly with respect to claim 9), complainants did not accuse SiRF's Kalman filter mode of operation during the hearing or in their post-hearing briefs. *See* Pratt Tr. 2877. No infringement finding is made concerning the Kalman filter mode.

basis to suggest otherwise was the trial testimony of Dr. Chansarkar, which was inconsistent with his deposition testimony, and was not supported by any documents or reference to any documents. *See* Pratt Tr. 1155-1157, 2879-2883; Chansarkar Tr. 2355-2357.

Accordingly, it is found that respondents' accused products infringe claims 1 and, as to mobile devices, also claim 9 of the '187 patent (except the so-called [

] As detailed below, complainants have demonstrated direct infringement by SiRF, and induced infringement by all respondents.

2. <u>SiRF's Direct Infringement</u>

SiRF directly infringes the '187 patent by its extensive testing of the accused SiRF chips in the United States. Inasmuch as the infringement of the '187 patent depends upon the operation of the same software and hardware as the '801 patent, the analysis is the same for both patents. *See* Pratt Tr. 1167-1168.

Furthermore, as quoted above, claim 9 expressly requires a "mobile device." The accused mobile devices of MiTAC/Mio, E-TEN and Pharos infringe claim 9 of the '187 patent. *See* Pratt Tr. 1159-1167 (mobile devices incorporating accused chips and performing all claim elements).

3. <u>All Respondents Have Induced Infringement</u>

SiRF, MiTAC/Mio, E-TEN, and Pharos actively induce infringement of the '187 patent. *See* 35 U.S.C. §271(b). As explained above, SiRF and the other respondents have had knowledge of the '187 patent since Global Locate filed its complaint with the International Trade Commission on March 30, 2007, initiating this Investigation. And since at least that date, the respondents have continued actively to induce infringement of the '187 patent, knowing that when

devices containing the SiRF chips are used, they will perform all of the steps of the asserted claims.[66] Inasmuch as infringement of the '187 patent depends upon the operation of the same software and hardware as for the '801 patent, the inducement analysis above applies equally here. *See also* Pratt Tr. 1168-1169.

C. Validity

Respondents argue that complainants' construction of dynamic model and sequential estimator encompasses a static model, and that static models with a time tag error were known before the invention of the '187 patent, including the '801 patent (asserted in this investigation) and the '670 patent (discussed above in connection with the '801 patent). *See* Resp. Br. at 212.

In particular, respondents argue that if the accused SiRF SyncFreeNav module practices all the limitations of clams 1 and 9, as alleged by complainants, then the module invalidates the asserted claims because it was invented in 1999, over four years before the filing of the '187 patent application. *See Id.* at 213-15.

Furthermore, respondents briefly argue that the '670 patent invalidates the asserted claims under complainants' proposed claim constructions. *See Id.* at 216. Finally, in another brief argument, respondents allege that the asserted '801 patent invalidates the asserted claims of the '187 patent under complainants' proposed claim constructions, and add that like the '187 patent, claim 1 of the '187 patent merely recites a mathematical algorithm that is not patentable under section 101 of the Patent Act. *See Id.* at 216-217.

Respondents' invalidity arguments are opposed by complainants and the Staff. *See* Compl. Br at 257-59; Compl. Reply at 129-32; Staff Br. at 64 (arguing, among other things that

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[66] *See* Pratt Tr. 1169; Mayo Tr. 1580-1583; CX-608C (summary of Mio US sales).

with respect to the SiRF system, the "evidence indicates that the navigation solution had not been implemented in any code"); Staff Reply Br. at 13-15.

It Has Not Been Established That SiRF's SyncFreeNav Module Anticipated the Asserted Claims

Respondents argue that the very document complainants' Dr. Pratt relied upon to show infringement predates the invention of the '187 patent and shows anticipation under complainants' claim construction. *See* Resp. Br. at 212 (compare CX-335C (SiRF documentation concerning the SyncFreeNav) with JX-5 ('187 Patent), 214 (alleging that complainants' relied upon the document to argue literal infringement). Respondents do not contend that any art anticipates under their construction. *See Id.* at 212-217.

The document in question, "Network Centric Location Algorithms," does not appear to have been relied upon at all by respondents' expert during the hearing to make an invalidity argument. Complainants argue that SiRF should be precluded from fashioning an anticipation defense around new arguments. *See* Compl. Reply at 129 (citing Order No. 2, Ground Rule 8.3 ("[E]ach party shall file a pre-hearing brief, which shall set forth with particularity a party's contentions on each of the proposed issues ...."). Yet, in any event, the respondents fail to meet their burden of showing, by clear and convincing evidence, that the '187 is invalid.

Indeed, complainant's expert, Dr. Pratt, relied on the Network Centric Location Algorithms document (CX-335C) only to show that the accused SiRF products conduct sync-free processing (*i.e,* that they calculate position without knowing absolute time). He did not rely on the document to show how the SiRF products reuse information from one sync-free calculation to the next (*i.e.*, to show that SiRF's products contain a dynamic model or sequential estimator). *See*

Pratt Tr. 1075-1077.

It has not been shown that all elements of the '187 patent's claimed invention are present in the SiRF document. Indeed, respondents seem to base their argument on complainants' supposed reliance on the document to prove all elements. Yet, for the elements of the '187 patent requiring the reuse of information from one sync-free calculation to the next, Dr. Pratt did not rely on the document in question. Instead, he relied on a detailed analysis of the SiRF source code showing that the time tag error and position states are reused from one calculation to the next. *See* Pratt Tr. 1153-1154, 2882-2883.

Consequently, it has not been shown by clear and convincing evidence that SiRF's sync-free module (or "SyncFreeNav") anticipates the asserted claims of the '187 patent.

The '670 and '801 Patents Do Not Anticipate the '187 Patent

Respondents' brief arguments concerning anticipation and the '670 and '801 patents are based on the assumption that complainants' proposed claim construction would encompass static models. *See* Resp. Br. at 216. However, complainants' proposed construction does not do so, and moreover, the constructions adopted in this decision do not encompass static models. Indeed, it has not been shown that the '670 or '801 patents disclose repeated calculations of positions, much less calculations involving the use of prior state information.

Consequently, it has not been shown by clear and convincing evidence that the either the '670 patent or the '801 patent anticipates any asserted claim of the '187 patent.

The '187 Patent Is Not Invalid for Lack of Enablement or Lack of Patentable Subject Matter

Respondents's arguments concerning alleged lack of enablement (as to both claims 1 and 9) and failure to recite patentable subject matter (as to claim 1) are expressly based on the

same rationale as similar arguments involving the '801 patent. *See* Resp. Br. at 216-27. Those arguments were rejected in connection with the '801 patent, and thus they are rejected here.

It has not been shown by clear and convincing evidence that the asserted claims of the '187 patent are invalid due to a lack of enablement, or that claim 1 fails to recite patentable subject matter.

D. Summary

For the reasons discussed above, it is found that except for the so-called [,] all of respondents' products at issue in this investigation (the SiRFstarIII chips and GSCi-5000 chips (operating with the SiRFstarIII navigation software), the GSCi4100/4200 InstantGPS chips (operating with the GSCi4100/4200 firmware), and E-TEN, MiTAC/Mio and Pharos products that incorporate the SiRFstarIII chips) infringe claims 1 and 9 of the '187 patent. It has been established that SiRF directly infringes the claims, and that all respondents have engaged in induced infringement.

Further, it has not been established by clear and convincing evidence that either claim is invalid due to anticipation. Nor does the record show that the claims lack enablement, or that claim 1 lacks patentable subject matter.

VIII. Domestic Industry

A. Background

As stated in the notice of investigation, a determination must be made as to whether an industry in the United States exists as required by subsection (a)(2) of section 337. Section 337 declares unlawful the importation, the sale for importation or the sale in the United States after importation of articles that infringe a valid and enforceable U.S. patent only if an industry in the

United States, relating to articles protected by the patent . . . concerned, exists or is in the process of being established. There is no requirement that the domestic industry be based on the same claim or claims alleged to be infringed. 19 U.S.C. § 1337(a)(2).

The domestic industry requirement consists of both an economic prong (*i.e.,* there must be an industry in the United States) and a technical prong (*i.e.,* that industry must relate to articles protected by the patent at issue). *See Certain Ammonium Octamolybdate Isomers,* Inv. No. 337-TA-477, Comm'n Op. at 55, USITC Pub. 3668 (Jan. 2004). The complainant bears the burden of proving the existence of a domestic industry. *Certain Methods of Making Carbonated Candy Products,* Inv. No. 337-TA-292, Comm'n Op. at 34-35, USITC Pub. 2390 (June 1991).

Thus, in this investigation it must be shown by complainants that they satisfy both the technical and economic prongs of the domestic industry requirement with respect to the asserted patents.

B. Analysis

1. Technical Analysis

The '346, '801 and '187 Patents

No party disputes the fact that the technical prong of the domestic industry requirement is satisfied as to the '346, '801 and '187 patents. *See* Resp. Br. at 260-263 (arguments raised only with respect to the '651, '000 and '080 patents); Staff Br. at 27, 58, 64. Consequently, for the purposes of this investigation, the technical prong of the domestic industry requirement is deemed to be satisfied with respect to those patents.

The '000, '080 and '651 Patents

As indicated above, complainants rely on the GL-20000 and Hammerhead products to

satisfy the domestic industry requirement. It is argued that both run GPS software called the Global Locate Library (or "GLL"), which [ ] Complainants argue that the GL-20000 chip and the associated software have been incorporated into several commercial products, including Hewlett Packard's HP iPAQ hw6500 and hx6900 series PDAs; and that the Hammerhead chip (released in 2005), is incorporated into several commercial products, including the TomTom One and TomTomOne XL personal navigation devices. Compl. Br. at 259.

In their main brief, complainants argue (with citations to expert testimony and other record evidence) that as to each asserted patent, at least one claim is practiced with at least one of the aforementioned products. *See* Compl. Br. at 259-275. In their reply, complainants concentrate on the three Assisted-GPS patents, *i.e.,* the three patents as to which technical prong was placed at issue by respondents' main brief. *See* Compl. Reply at 45 ('080 patent), 65-66 ('000 patent), 86-87 ('651 patent).[67]

Respondents argue that complainants were unable to prove that Global Locate's long-term orbit (or "LTO") meets the "long term satellite tracking data" limitation of the asserted claims of the '080 patent "for the same reasons that the accused extended ephemeris does not meet" the limitation. With respect to the '000 patent, respondents argue that "[f]or the same reasons that it failed to meet its burden of proving infringement, Global Locate also failed to prove a domestic industry for the '000 patent." In particular, respondents argue that Global Locate lacks direction or control over the entities alleged to perform the steps of the asserted method claims of the '000

[67] As explained, *supra*, as a general matter of law, it is not necessary for a complainant to prove domestic industry as to an asserted claim, rather only as to one claim of each asserted patent. Nevertheless, in this case, complainants happen to rely on one or more asserted claims of the patents in order to prove domestic industry.

patent. Finally, with respect to the '651 patent, respondents argue that complainants fail to prove that Global Locate practices the steps of "receiving," "communicating," and "processing;" that it uses the same satellite ephemeris for each step (of claim 1); and that any particular product and service combination practices the patent. *See* Resp. Br. at 260-263; Resp. Reply at 131-134.

As discussed above, the Staff argued that complainants had not shown that any accused product infringes any asserted claim of the Assisted-GPS patents. Thus, the Staff's positions on the technical prong of the domestic industry requirement are similar, but not exactly the same as, those of respondents. The Staff presents only brief arguments (sometimes only two sentences long), but takes the position that complainants do not practice claims1 or 2 of the '000 patent; that the GL-20000 chip incorporated into the HP iPAQ and the Hammerhead chip incorporated into the TomTom One do in fact practice claim 1 of the '080 patent; but that complainants do not practice claims 1 or 2 of the '651 patent. *See* Staff Br. at 37-38, 43-44, 50.

As acknowledged in the parties' briefs, in many respects, the arguments relating to the technical prong of the domestic industry requirement mirror those made in connection with the claim construction and infringement issues, except that the claims now must be compared to the alleged domestic industry products. Indeed, in order to show a violation of section 337, the Asserted-GPS patents must be read onto the alleged domestic industry products under the same claim constructions used in the infringement analyses.

Consequently, to the extent it was found above that respondents' proposed constructions impinged upon a proper reading of the patent claims, they remain rejected. A repeat of the prior claim construction analysis is not necessary. Further, the record shows that when the claims of the Assisted-GPS patents are construed correctly, complainants have shown that at least one claim of

each asserted patent is practiced so as to satisfy the domestic industry requirement.

With respect to the '000 patent, Global Locate directs and controls the use of its LTO data, which is generated at its Worldwide Reference Network. Global Locate transmits this data for use at remote receivers containing the GL-20000 and Hammerhead chips and software, which cannot be [ ] *See* Dafesh Tr. 811-814; Podshivalov Tr. 484-485. Under the same rationale that infringement was found with respect to the accused products, it is found that the technical prong is satisfied with respect to the domestic industry products.

With respect to the '080 patent, under the same rationale that SiRF's EE files were found to be a key aspect of infringement, it is found that the Global Locate chips and software that receive and implement Global Locate's multi-day LTO service receive "long term satellite tracking data." *See* Dafesh Tr. 811-813; Podshivalov Tr. 490; Pratt Tr. 1258-1259.

With respect to the '651 patent, contrary to respondents' argument, complainants have identified specific products as the subject of the domestic industry, and there was extensive testimony at the hearing concerning Global Locate's GL-20000 chips and Hammerhead chips as they are incorporated into the TomTom and HP mobile devices identified above, as well as the Global Locate services that those products use. *See, e.g.,* van Diggelen Tr. 240-242; Podshivalov Tr. 482-483; Pratt Tr. 1171.

Further, just as respondents failed to rebut complainants' evidence relating to the direction and control issues with respect to SiRF's Assisted-GPS system, so too they have failed to rebut complainants' evidence regarding Global Locate products and services. The TomTom devices that incorporate Global Locate products cannot use [ ] unless they have Global Locate software operating with a Global Locate chip. *See* van Diggelen Tr. 262-263; Podshivalov

Tr. 537. In a manner similar to that used by SiRF's InstantFix service, LTO files provide the same received ephemeris, and further, the memory store at Global Locate's Assisted-GPS servers provides [ ] communicated to mobile GPS receivers. *See* Pratt Tr. 1257-1261; Podshivalov Tr. 488-489.

In addition, the record contains extensive testimony concerning the use of the ephemeris to reduce code and frequency uncertainty to improve acquisition sensitivity in mobile GPS receivers using Global Locate chips, software and services. In fact, it appears undisputed that Global Locate software operating with a Global Locate GL-20000 or Hammerhead chip enters into [

]

Consequently, based on the evidence pertaining to Global Locate's chips, software, services, and the HP and TomTom products relied upon by complainants, it is found that the technical prong of the domestic industry requirement is satisfied by the practice of at least claim 1 of the '651 patent. *See* Podshivalov Tr. 534-535; Pratt Tr. 1260-1261.

In summary, it has been established that the technical prong of the domestic industry requirement is satisfied as to all asserted patents.

2. <u>Economic Analysis</u>

The economic prong of the domestic industry requirement is defined in subsection 337(a)(3) as follows:

> (3) For purposes of paragraph (2), an industry in the United States shall be considered to exist if there is in the United States, with respect to the articles protected by the patent, copyright, trademark or mask work concerned –

(A) significant investment in plant and equipment;

(B) significant employment of labor or capital; or

(C) substantial investment in its exploitation, including engineering, research and development, or licensing.

19 U.S.C. § 1337(a)(3).

The economic prong of the domestic industry requirement is satisfied by meeting the criteria of any one of the three factors listed above.

In this investigation, complainants and respondents entered into a stipulation that the economic prong of the domestic industry requirement is satisfied by substantial investment in the engineering, as well as research and development, of Global Locate's GL-20000 and Hammerhead products. The Staff did not oppose the stipulation. The stipulation was accepted during the evidentiary hearing. *See* Tr. 1563-1564.

Consequently, the economic prong of the domestic industry question is deemed to be satisfied as to each asserted patent.

C. Conclusion

In view of the parties' technical arguments and economic stipulation, detailed above, there is no dispute that the domestic industry requirement is satisfied as to the '346, '801 and '187 patents. The controverted issues relating to the domestic industry question pertained to the technical prong of the '000, '080 and '651 patents, and they have been resolved in Global Locate's favor.

Consequently, it is found that a domestic industry exists, and the domestic industry is satisfied as to all six patents asserted in this investigation.

IX. Conclusions of Law

1. The Commission has personal jurisdiction over the parties, and subject-matter jurisdiction over the investigation.

2. The importation or sale requirement of section 337 is satisfied as to all accused products, except for one product that is still in development.

3. It is found that the accused products infringe claims 4 and 11 of U.S. Patent No. 6,606,346.

4. It is not found that any asserted claim of the '346 patent is invalid.

5. It is not found that the '346 patent is unenforceable.

6. It is found that a domestic industry exists with respect the '346 patent.

7. It is found that a violation of section 337 has occurred with respect to the '346 patent.

8. It is found that the accused products (except for one product that is still in development) infringe claims 1, 2 and 22 of United States Patent No. 7,158,080.

9. It is not found that any claim of the '080 patent is invalid.

10. It is not found that the '080 patent is unenforceable.

11. It is found that a domestic industry exists for the '080 patent.

12. It is found that a violation of section 337 has occurred with respect to the '080 patent.

13. It is found that the accused products infringe claims 1, 2 and 5 of United States Patent No. 6,651,000.

14. It is not found that any asserted claim of the '000 patent is invalid.

15. It is found that a domestic industry exists for the '000 patent.

16. It is found that a violation of section 337 has occurred with respect to the '000 patent.

17. It is found that the accused products (except for one product that is still in development) infringe claims 1 and 2 of United States Patent No. 6,704,651.

18. It is not found that any asserted claim of the '651 patent is invalid.

19. It is not found that the '651 patent is unenforceable.

20. It is found that a domestic industry exists for the '651 patent.

21. It is found that a violation of section 337 has occurred with respect to the '651 patent.

22. It is found that the accused products infringe claims 1, 2 and 11 of United States Patent No. 6,417,801.

23. It is not found that any asserted claim of the '801 patent is invalid.

24. It is found that there is a domestic industry for the '801 patent.

25. It is found that a violation of section 337 has occurred with respect to the '801 patent.

26. It is found that the accused products (except for one product still in development) infringe claims 1 and 9 of United States Patent No. 6,937,187.

27. It is not found that any claim of the '187 patent is invalid.

28. It is found that domestic industry exists for the '187 patent.

29. It is found that a violation of section 337 has occurred with respect to the '187 patent.

X. Initial Determination and Order

Based on the foregoing, it is the INITIAL DETERMINATION ("ID") of the undersigned that a violation of section 337 of the Tariff Act of 1930, as amended, has occurred in the importation into the United States, the sale for importation, or the sale within the United States after importation of certain global positioning system or GPS devices and, or, products containing same by reason of infringement of claims 1, 2 and 11 of U.S. Patent No. 6,417,801; claims 4 and

11 of U.S. Patent No. 6,606,346; claims 1, 2 and 5 of U.S. Patent No. 6,651,000; claims 1 and 2 of U.S. Patent No. 6,704,651; claim 1 and 9 of U.S. Patent No. 6,937,187; or claims 1, 2 and 22 of U.S. Patent No. 7,158,080.

Further, this Initial Determination, together with the record of the hearing in this investigation consisting of:

(1) the transcript of the hearing, with appropriate corrections as may hereafter be ordered, and

(2) the exhibits received into evidence in this investigation, as listed in the attached exhibit lists, is CERTIFIED to the Commission.

In accordance with 19 C.F.R. § 210.39(c), all material found to be confidential by the undersigned under 19 C.F.R. § 210.5 is to be given *in camera* treatment.

The Secretary shall serve a public version of this ID upon all parties of record and the confidential version upon counsel who are signatories to the Protective Order (Order No. 1) issued in this investigation, and upon the Commission investigative attorney.

To expedite service of the public version, each party is hereby ORDERED to file with the Commission Secretary by no later than August 15, 2008, a copy of this ID with brackets that show any portion considered by the party (or its suppliers of information) to be confidential, accompanied by a list indicating each page on which such a bracket is to be found. At least one copy of such a filing shall be served upon the Administrative Law Judge, and the brackets shall be marked in red. If a party (and its suppliers of information) considers nothing in the ID to be confidential, and thus makes no request that any portion be redacted from the public version of this ID, then a statement to that effect shall be filed in lieu of a document with brackets.

Pursuant to 19 C.F.R. § 210.42(h), this Initial Determination shall become the determination of the Commission unless a party files a petition for review pursuant to § 210.43(a) or the Commission, pursuant to § 210.44, orders on its own motion a review of the ID or certain issues herein.

Carl C. Charneski
Administrative Law Judge

Issued: August 8, 2008

CERTAIN GPS CHIPS DEVICES AND PRODUCTS CONTAINING SAME

Inv. No. 337-TA-602

PUBLIC CERTIFICATE OF SERVICE

I, Marilyn R. Abbott, hereby certify that the attached **INITIAL DETERMINATION** has been served by hand upon the Commission Investigative Attorney, Vu Q. Bui, Esq., and the following parties as indicated, on November 25, 2008.

Marilyn R. Abbott, Secretary
U.S. International Trade Commission
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Washington, D.C. 20436

FOR COMPLAINANT GLOBAL LOCATE, INC.: Michael D. Esch, Esq. **WILMER CUTLER PICKERING HALE AND DORR LLP** 1875 Pennsylvania Ave., N.W. Washington, D.C. 20006	( ) Via Hand Delivery (✓) Via Overnight Mail ( ) Via First Class Mail ( ) Other: _____
FOR RESPONDENT SIRF TECHNOLOGY, INC.: Steven E. Adkins, Esq. **JONES DAY** 51 Louisiana Ave., N.W. Washington, D.C. 20001-2113	( ) Via Hand Delivery (✓) Via Overnight Mail ( ) Via First Class Mail ( ) Other: _____

CERTAIN GPS CHIPS DEVICES AND PRODUCTS CONTAINING SAME

Inv. No. 337-TA-602

FOR RESPONDENTS SIRF TECHNOLOGY, INC., E-TEN CORP., PHAROS SCIENCE & APPLICATIONS, INC., MITAC INTERNATIONAL CORP., AND MIO TECHNOLOGY LIMITED, USA.:	
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