

In the Matter of

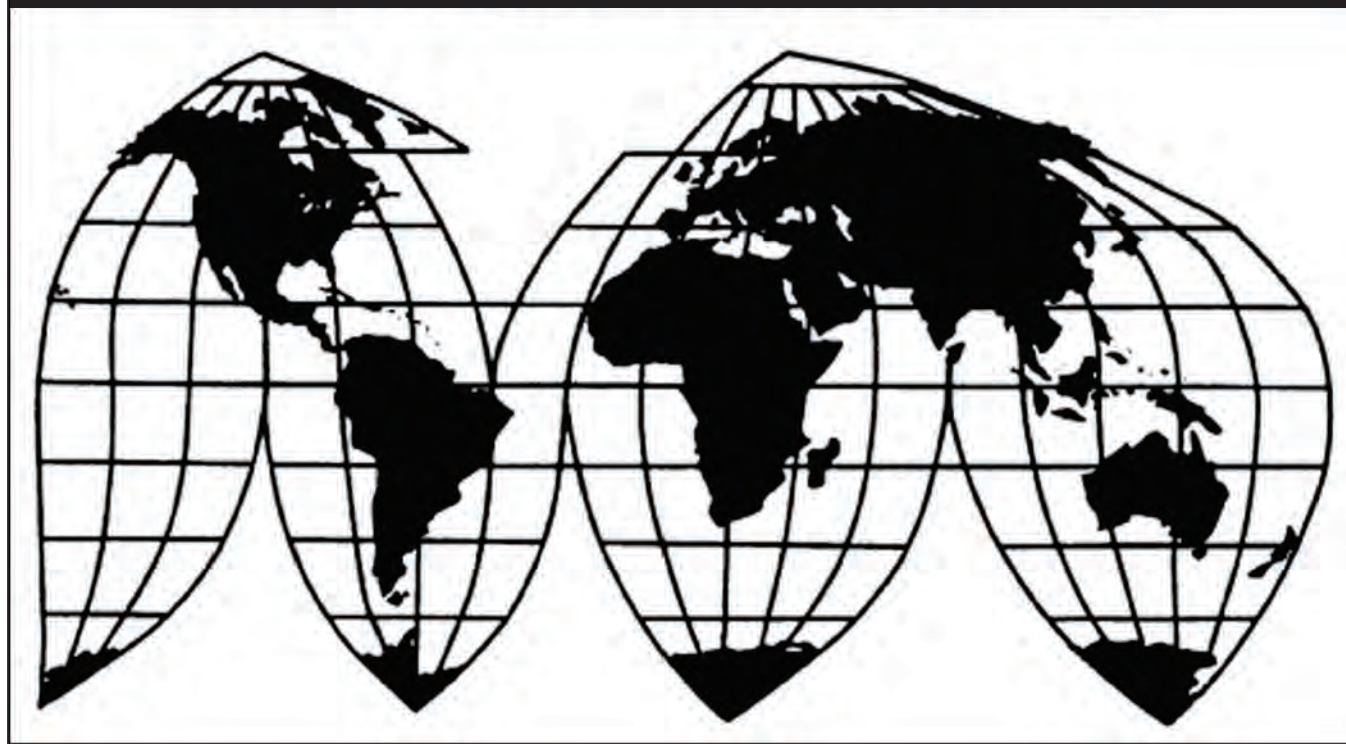
**CERTAIN TELEVISION SETS, TELEVISION
RECEIVERS, TELEVISION TUNERS, AND
COMPONENTS THEREOF**

337-TA-910

Publication 4868

February 2019

U.S. International Trade Commission



Washington, DC 20436

U.S. International Trade Commission

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U.S. International Trade Commission

Washington, DC 20436
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UNITED STATES INTERNATIONAL TRADE COMMISSION
Washington, DC

In the Matter of

**CERTAIN TELEVISION SETS,
TELEVISION RECEIVERS,
TELEVISION TUNERS, AND
COMPONENTS THEREOF**

Inv. No. 337-TA-910

**NOTICE OF COMMISSION DETERMINATION
TERMINATING THE INVESTIGATION
WITH A FINDING OF NO VIOLATION OF SECTION 337**

AGENCY: U.S. International Trade Commission.

ACTION: Notice.

SUMMARY: Notice is hereby given that the U.S. International Trade Commission has determined to terminate the above-captioned investigation with a finding of no violation of section 337 of the Tariff Act of 1930, 19 U.S.C. § 1337.

FOR FURTHER INFORMATION CONTACT: Sidney A. Rosenzweig, Office of the General Counsel, U.S. International Trade Commission, 500 E Street, S.W., Washington, D.C. 20436, telephone 202-708-2532. 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 (<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 March 5, 2014, based on a complaint filed by Cresta Technology Corporation, of Santa Clara, California ("Cresta"). 79 *Fed. Reg.* 12526 (Mar. 5, 2014). The complaint alleged violations of section 337 of the Tariff Act of 1930, as amended 19 U.S.C. § 1337, by reason of the infringement of certain claims from three United States patents. The notice of investigation named ten respondents: Silicon Laboratories, Inc. of Austin, Texas ("Silicon Labs"); MaxLinear, Inc. of Carlsbad, California ("MaxLinear"); Samsung Electronics Co, Ltd. of Suwon, Republic of Korea and Samsung Electronics America, Inc. of Ridgefield Park, New Jersey (collectively, "Samsung"); VIZIO, Inc. of Irvine, California ("Vizio"); LG Electronics, Inc. of Seoul, Republic of Korea and LG Electronics U.S.A., Inc. of Englewood Cliffs, New

Jersey (collectively, “LG”); and Sharp Corporation of Osaka, Japan and Sharp Electronics Corporation of Mahwah, New Jersey (collectively, “Sharp”). The Office of Unfair Import Investigations was also named as a party.

On May 16, 2014, the ALJ issued an initial determination granting Cresta’s motion to amend the complaint and notice of investigation to add six additional respondents: SIO International Inc. of Brea, California and Hon Hai Precision Industry Co., Ltd. of New Taipei City, Taiwan (collectively, “SIO/Hon Hai”); Top Victory Investments, Ltd. of Hong Kong and TPV International (USA), Inc. of Austin, Texas (collectively, “TPV”); and Wistron Corporation of New Taipei City, Taiwan and Wistron Infocomm Technology (America) Corporation of Flower Mound, Texas (collectively, “Wistron”). Order No. 12 (May 16, 2014), *not reviewed*, Notice (June 9, 2014).

On November 3, 2014, the ALJ granted-in-part Samsung and Vizio’s motion for summary determination of noninfringement as to certain televisions containing tuners made by a third party, NXP Semiconductors N.V. Order No. 46 at 27-30 (Nov. 3, 2014), *not reviewed*, Notice (Dec. 3, 2014). On November 21, 2014, the ALJ issued granted Samsung’s and Vizio’s motion for summary determination that Cresta had not shown that certain Samsung televisions with NXP tuners had been imported. Order No. 58 at 4-5 (Nov. 21, 2014), *not reviewed*, Notice (Dec. 8, 2014).

On November 12, 2014, the ALJ granted Cresta’s motion to partially terminate the investigation as to one asserted patent and certain asserted claims of the two other asserted patents. Order No. 50 (Nov. 12, 2014), *not reviewed*, Notice (Dec. 3, 2014). The two asserted patents still at issue in the investigation are U.S. Patent No. 7,075,585 (“the ’585 patent”) and U.S. Patent No. 7,265,792 (“the ’792 patent”). Claims 1-3, 10, and 12-13 of the ’585 patent, and claims 1-4, 7-8, and 25-27 of the ’792 patent, remain at issue in the investigation.

The presiding ALJ conducted a hearing from December 1-5, 2014. On February 27, 2015, the ALJ issued the final ID. The final ID finds that Cresta failed to satisfy the economic prong of the domestic industry requirement, 19 U.S.C. § 1337(a)(2), (a)(3), for both asserted patents. To satisfy the economic prong of the domestic industry requirement, Cresta relied upon claims 1-3, 5-6, 10, 13-14, 16-19, and 21 of the ’585 patent; and claims 1-4, 7, 10-12, 18-19, and 26-27 of the ’792 patent. The ID finds that certain Cresta products—on their own, or combined with certain televisions into which Cresta’s tuners are incorporated—practice claims 1-3, 5-6, 10, 13, 16-19, and 21 of the ’585 patent, as well as claims 1-4, 7, 10-12, 18-19, and 26 of the ’792 patent.

The ID finds some Silicon Labs tuners (as well as certain televisions containing them) to infringe claims 1-3 of the ’585 patent, and no other asserted patent claims. The ID further finds some MaxLinear tuners (as well as certain televisions containing them) to infringe claims 1-3, 10, 12, and 13 of the ’585 patent and claims 1-3, 7-8, and 25-26 of the ’792 patent.

The ID finds claims 1 and 2 of the ’585 patent to be invalid pursuant to 35 U.S.C. § 102 (anticipation), and claim 3 of the ’585 patent to be invalid pursuant to 35 U.S.C. § 103 (obviousness). The ID finds all of the asserted claims of the ’792 patent to be invalid pursuant to

35 U.S.C. §§ 102 or 103.

The ALJ recommended that if a violation of section 337 is found, that a limited exclusion order and cease and desist orders issue. The ALJ recommended, however, that the implementation of such orders be delayed by twelve months in view of public interest considerations. The ALJ also recommended that there be zero bond during the period of Presidential review.

On March 16, 2015, petitions for Commission review were filed by the following parties: the Commission investigative attorney (“IA”); Cresta; the Silicon Labs respondents; and the MaxLinear respondents. On March 24, 2015, OUII and Cresta each filed a reply to the other parties’ petitions. That same day, the respondents filed a reply to Cresta’s petition.

On April 30, 2015, the Commission determined to review the ID in part. The scope of Commission review is set forth in the Commission notice that issued on that date. 80 *Fed. Reg.* 26091 (May 6, 2015). The Commission solicited briefing on the issues under review, and on remedy, bonding and the public interest.

On May 14, 2015, the IA, Cresta, and the respondents filed briefs in response to the Commission notice of review, and on May 26, 2015, they filed replies to each other’s briefs.

Having examined the record of this investigation, including the ALJ’s final ID, the petitions for review, and the responses thereto, and the briefing in response to the notice of review, the Commission has determined to terminate the investigation with a finding of no violation of section 337.

The Commission has determined to affirm the ID’s findings of invalidity of claims 1-4, 7-8, and 26-27 of the ’792 patent because of an on-sale bar. Further, the Commission finds claim 3 of the ’585 patent obvious in view of Boie combined with Kerth. The Commission finds claim 10 of the ’585 patent and claims 1-4 of the ’792 patent obvious in view of Boie as well as in view of Boie combined with VDP. The Commission finds that the respondents did not demonstrate obviousness clearly and convincingly as to claims 12-13 of the ’585 patent and claims 25-26 of the ’792 patent.

As to infringement, the Commission affirms the ID’s finding that the accused MaxLinear tuners infringe claims 1, 2, 3, 10, 12, and 13 of the ’585 patent and claims 1-3, 7-8, and 25-26 of the ’792 patent. The Commission has determined to affirm in part and reverse in part the ID’s findings concerning Silicon Labs’ infringement of the claims of the ’585 patent. In particular, the Commission finds that certain accused Silicon Labs tuners infringe claims 1-3, and 7-8 of the ’585 patent and that Cresta failed to demonstrate infringement by Silicon Labs of claims 10, 12, and 13 of the ’585 patent. The Commission also finds that Cresta failed to demonstrate that Silicon Labs infringes any of the asserted claims of the ’792 patent.

The Commission finds that, for the specific models of televisions for which Cresta demonstrated direct infringement that Cresta adequately demonstrated contributory infringement by MaxLinear or Silicon Labs.

The Commission finds that Cresta satisfies the technical prong of the domestic industry requirement for the '792 patent, but not for the '585 patent. The Commission further finds that Cresta failed to satisfy the economic prong of the domestic industry requirement for the '585 patent and the '792 patent.

The reasons for the Commission's determinations will be set forth more fully in the Commission's forthcoming opinion. Commissioner Schmidlein will write separately with her views as to the basis for the Commission's determination that Cresta failed to meet the economic prong of the domestic industry requirement.

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 Part 210 of the Commission's Rules of Practice and Procedure (19 C.F.R. Part 210).

By order of the Commission.

A handwritten signature in black ink, appearing to read 'Lisa R. Barton', with a stylized flourish at the end.

Lisa R. Barton
Secretary to the Commission

Issued: September 29, 2015

**CERTAIN TELEVISION SETS, TELEVISION RECEIVERS,
TELEVISION COMPONENTS THEREOF**

Inv. No. 337-TA-910

CERTIFICATE OF SERVICE

I, Lisa R. Barton, hereby certify that the attached **NOTICE** has been served by hand upon the Commission Investigative Attorney, Peter J. Sawert, Esq., and the following parties as indicated, on **September 29, 2015**.



Lisa R. Barton, Secretary
U.S. International Trade Commission
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**CERTAIN TELEVISION SETS, TELEVISION RECEIVERS,
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Inv. No. 337-TA-910

Certificate of Service – Page 2

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PUBLIC VERSION

UNITED STATES INTERNATIONAL TRADE COMMISSION
Washington, DC

In the Matter of

CERTAIN TELEVISION SETS,
TELEVISION RECEIVERS,
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I. BACKGROUND

The Commission instituted this investigation on March 5, 2014, based on a complaint filed by Cresta Technology Corporation of Santa Clara, California (“Cresta”). 79 *Fed. Reg.* 12526 (Mar. 5, 2014). The complaint alleged violations of section 337 of the Tariff Act of 1930, as amended, 19 U.S.C. § 1337, by reason of the infringement of certain claims from three United States Patents. The notice of investigation named ten respondents: Silicon Laboratories, Inc. of Austin, Texas (“Silicon Labs”); MaxLinear, Inc. of Carlsbad, California (“MaxLinear”); Samsung Electronics Co., Ltd. of Suwon, Republic of Korea and Samsung Electronics America, Inc. of Ridgefield Park, New Jersey (collectively, “Samsung”); VIZIO, Inc. of Irvine, California (“Vizio”); LG Electronics, Inc. of Seoul, Republic of Korea and LG Electronics U.S.A., Inc. of Englewood Cliffs, New Jersey (collectively, “LG”); and Sharp Corporation of Osaka, Japan and Sharp Electronics Corporation of Mahwah, New Jersey (collectively, “Sharp”). *Id.* at 12526-27. The Office of Unfair Import Investigations (“OUII”) was also named as a party to the investigation. *Id.* at 12527.

On May 16, 2014, the presiding Administrative Law Judge (“ALJ”) issued an initial determination granting Cresta’s motion to amend the complaint and notice of investigation to

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add six additional respondents: SIO International Inc. of Brea, California and Hon Hai Precision Industry Co., Ltd. of New Taipei City, Taiwan (collectively, “SIO/Hon Hai”); Top Victory Investments, Ltd. of Hong Kong and TPV International (USA), Inc. of Austin, Texas (collectively, “TPV”); and Wistron Corporation of New Taipei City, Taiwan and Wistron Infocomm Technology (America) Corporation of Flower Mound, Texas (collectively, “Wistron”). Order No. 12 (May 16, 2014), *not reviewed*, Notice (June 9, 2014).

On November 3, 2014, the ALJ granted-in-part Samsung and Vizio’s motion for summary determination of noninfringement as to Samsung televisions containing tuners made by third party NXP Semiconductors N.V. Order No. 46 at 27-30 (Nov. 3, 2014), *not reviewed*, Notice (Dec. 3, 2014). On November 21, 2014, the ALJ granted Samsung’s and Vizio’s motion for summary determination that Cresta had not shown that certain Samsung televisions with NXP tuners had been imported. Order No. 58 at 4-5 (Nov. 21, 2014), *not reviewed*, Notice (Dec. 8, 2014).

On November 12, 2014, the ALJ granted Cresta’s motion for partial termination of the investigation as to one asserted patent and certain asserted claims of the two other asserted patents. Order No. 50 (Nov. 12, 2014), *not reviewed*, Notice (Dec. 3, 2014). The two asserted patents still at issue in the investigation are U.S. Patent No. 7,075,585 (“the ’585 patent”) (JX-1) and U.S. Patent No. 7,265,792 (“the ’792 patent”) (JX-2). Claims 1-3, 10, and 12-13 of the ’585 patent and claims 1-4, 7-8, and 25-26 of the ’792 patent remain asserted in the investigation.¹

¹ In addition to the asserted claims recited in the text, claims 5-6, 14, 16-19 and 21 of the ’585 patent and claims 10-12, 18-19 and 27 of the ’792 patent were relied upon by Cresta to satisfy the technical prong of the domestic industry requirement.

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The subject articles are certain television sets, television receivers, television tuners, and components thereof. Respondents Silicon Labs and MaxLinear make accused television tuners. The Silicon Labs tuners are incorporated into certain Samsung, LG, and Vizio televisions. The MaxLinear tuners are incorporated into certain Sharp and Vizio televisions. SIO/Hon Hai, TPV, and Wistron make televisions for Vizio.

The presiding ALJ conducted a hearing from December 1-5, 2014.² On February 27, 2015, she issued the final initial determination (“ID” or “final ID”) presently before the Commission.³ The final ID found no violation of section 337. In particular, Cresta failed to satisfy the economic prong of the domestic industry requirement, 19 U.S.C. § 1337(a)(2), (a)(3), for both asserted patents. ID at 167, 187-91. The ID found some Silicon Labs tuners (as well as the Samsung, LG and Vizio televisions containing them) to infringe claims 1-3 of the ’585 patent, and no other asserted patent claims. *Id.* at 66-67. The ID found some MaxLinear tuners (as well as certain Samsung and Vizio televisions containing them) to infringe claims 1-3, 10, 12, and 13 of the ’585 patent and claims 1-3, 7-8, and 25-26 of the ’792 patent. *Id.* at 77-81, 93-97. Claims 1 and 2 of the ’585 patent were determined to be

² Following the hearing, the parties filed opening and reply post-hearing briefs with the ALJ. *See* Compl’t Cresta Tech. Corp.’s Initial Post-Trial Br. (Dec. 12, 2014) (“Cresta Post-Hearing Br.”); Resp’ts Initial Post-Hearing Br. (Dec. 12, 2014) (“Resp’ts Post-Hearing Br.”); Initial Post-Trial Br. of the Office of Unfair Import Investigations (Dec. 12, 2014) (“OUII Post-Hearing Br.”); Compl’t Cresta Tech. Corp.’s Reply Post-Trial Br. (Dec. 19, 2014) (“Cresta Post-Hearing Reply Br.”); Resp’ts Reply Post-Hearing Br. (Dec. 19, 2014) (“Resp’ts Post-Hearing Reply Br.”); Reply Post-Trial Br. of the Office of Unfair Import Investigations (Dec. 19, 2014) (“OUII Post-Hearing Reply Br.”). *See generally* Order No. 2 (Ground Rules) § 11 (Mar. 5, 2014).

³ Initial Determination on Violation of Section 337 and Recommended Determination on Public Interest, Remedy, and Bonding (Feb. 27, 2015). Because we find no violation of section 337, we do not reach the ALJ’s recommendations concerning public interest, remedy, and bonding.

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invalid pursuant to 35 U.S.C. § 102 (anticipation), and claim 3 of the '585 patent was determined to be invalid pursuant to 35 U.S.C. § 103 (obviousness). *Id.* at 105-15. All of the asserted claims of the '792 patent were found invalid pursuant to 35 U.S.C. § 102.⁴ *Id.* at 137-47.

On March 16, 2015, petitions for Commission review were filed by the following parties: OUII; Cresta; the Silicon Labs respondents; and the MaxLinear respondents.⁵ On March 24, 2015, OUII and Cresta each filed a reply to the other parties' petitions.⁶ That same day, the respondents filed a reply to Cresta's petition.⁷

⁴ The ALJ's notice that issued concurrently with the ID inadvertently states that the ID found claims 10-12 and 27 of the '792 patent to be invalid under 35 U.S.C. § 102. Notice Regarding Initial Determination on Violation of Section 337 and Recommended Determination on Remedy and Bond ¶ 15 (Apr. 27, 2015). The ID does not contain invalidity findings as to those claims. The Notice also inadvertently omits, at ¶ 14, the finding that claim 13 of the '585 patent is not invalid in view of the prior art.

⁵ Office of Unfair Import Investigations' Pet. for Rev. of the Initial Determination (Mar. 16, 2015) ("OUII Pet."); Compl't Cresta Tech. Corp.'s Pet. for Rev. (Mar. 16, 2015) ("Cresta Pet."); The Silicon Labs Resp'ts Contingent Pet. for Rev. of the Initial Determination on Violation of Section 337 and Recommended Determination on Public Interest, Remedy, and Bonding (Mar. 16, 2015) ("Silicon Labs Pet."); The MaxLinear Resp'ts Contingent Pet. for Rev. of Initial Determination (Mar. 16, 2015) ("MaxLinear Pet.").

By "the Silicon Labs Respondents," that petition refers to Silicon Labs and the other respondents who use Silicon Labs tuners in their televisions, *i.e.*, Samsung, LG and Vizio. Similarly, by "the MaxLinear Respondents," that petition refers to MaxLinear and the other respondents who use MaxLinear tuners in their televisions, *i.e.*, Sharp, Vizio, SIO/Hon Hai, TPV, and Wistron.

⁶ Combined Resp. of the Office of Unfair Import Investigations to Cresta Tech. Corp.'s Pet. for Rev. of Initial Determination, the Silicon Labs Resp'ts Contingent Pet. for Rev. of the Initial Determination, & the MaxLinear Resp'ts Contingent Pet. for Rev. of the Initial Determination (Mar. 24, 2015) ("OUII Pet. Reply"); Compl't Cresta Tech. Corp.'s Combined Resp. to Resp'ts and Staff's Pets. for Rev. of Initial Determination (Mar. 24, 2015) ("Cresta Pet. Reply").

⁷ Resp'ts Resp. to Cresta Tech. Corp.'s Pet. for Rev. of Initial Determination (Mar. 24, 2015) ("Resp'ts Pet. Reply").

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On April 30, 2015, the Commission determined to review the ID in part. 80 *Fed. Reg.* 26091 (May 6, 2015). The scope of Commission review, as set forth in that notice, is as follows:

1. Infringement

The Commission has determined not to review the ID's claim constructions. ID at 16-49. The Commission has determined to review the ID's infringement analysis concerning the "signal processor" for "processing . . . in accordance with" the "format of" the "input RF signal" limitation of all asserted patent claims. '585 patent col. 6 line 65 – col. 7 line 2 (claim 1); '792 patent col. 10 lines 60-65 (claim 1); ID at 57-60, 72-75, 84-85 & 94. The Commission has also determined to review the ID's infringement analysis concerning the "applies one of a plurality of finite impulse response filters . . . corresponding to a format of" the "input RF signal" limitation of asserted claims 10, 12 and 13 of the '585 patent and all asserted claims of the '792 patent. '585 patent col. 7 lines 36-40; '792 patent col. 10 line 65 – col. 11 line 2 (claim 1); ID at 67-68, 79-80, 85 & 93.

The Commission has also determined to review the ID's determinations concerning contributory infringement of the asserted patent claims.

Notwithstanding the foregoing review, the Commission has determined not to review the ID's exclusion of certain testimony by Alan Hendrickson. *Cresta Pet.* at 37. The Commission has also determined not to review the ID's findings as to Cresta's lack of evidence regarding allegedly representative products. *See* ID at 65-66, 78-79.

2. Invalidity

The Commission has determined not to review the ID's finding that claims 1-4 and 25-26 of the '792 patent are anticipated by the '585 patent; and not to review the ID's finding that claims 1 and 2 of the '585 patent are anticipated by Boie.

The Commission has determined to review the ID's determinations that that the asserted claims are not obvious in view of the combination of Boie and VDP. The Commission has also determined to review whether claim 3 of the '585 patent is obvious in view of Boie and Kerth; whether claim 25 of the '792 patent is obvious in view of VDP alone; and whether claim 26 of the '792 patent is obvious in view of Boie and Micronas.

The Commission has determined to review the ID's findings concerning an on-sale bar that invalidates claims 1-4, 7-8, and 26-27 of the '792 patent. ID at 142-47.

The Commission has determined to review the ID's finding that claim 1 of the '585

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patent is not indefinite under 35 U.S.C. § 112 in view of the plural and singular use of the term “signals.” On review, the Commission finds that claim 1 of the ’585 patent is not indefinite. The respondents have failed to demonstrate clear and convincing evidence of invalidity. The use of the plural and singular for “signal” does not create ambiguity in the claim, and neither side’s experts had difficulty ascertaining the scope of the claim.

The Commission has also determined to review the issue of whether the claims of the ’792 patent are invalid under the written description requirement of 35 U.S.C. § 112. On review, the Commission finds that the claims are not invalid under the written description requirement for the same reasons provided in the ID as to the ’585 patent.

3. Domestic Industry

The Commission has determined to review whether Cresta proved the existence of articles protected by the patents that incorporate the XC5000A series tuner. *See* ID at 195-96. The Commission has determined not to review the ID’s remaining findings concerning the technical prong of the domestic industry requirement, including the ID’s findings as to tuners other than the XC5000A series.

The Commission has also determined to review the ID’s findings on the economic prong of the domestic industry requirement.

Id. at 26092-93.

The Commission solicited briefing on the following issues under review:

- a. Cresta alleges that certain accused products practice the claim limitations under review because they can operate to receive signals according to U.S. standards (6 MHz) as well as foreign standards that operate at a bandwidth other than 6 MHz. Please explain whether Cresta demonstrated that the accused products are capable of processing signals conforming to such foreign standards without modification to the accused televisions or tuners (whether by software, firmware or hardware). *See, e.g., Finjan, Inc. v. Secure Computing Corp.*, 626 F.3d 1197, 1204-05 (Fed. Cir. 2010); *Silicon Graphics, Inc. v. ATI Technologies, Inc.*, 607 F.3d 784, 794 (Fed. Cir. 2010).
- b. Please explain whether Cresta demonstrated that Silicon Labs’ non-U and non-V tuners (*i.e.*, those models without a “U” or a “V”) process analog and digital signals differently so as to infringe claims 1-3 of the ’585 patent.
- c. In connection with the Commission’s consideration of the infringement analysis of the two claim limitations on review (“signal processor” and “applies one of a plurality of finite impulse response filters”), please provide a chart that presents the following: the accused product, including its model

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number(s); and for each of the two claim limitations on review whether and why the accused product does or does not practice that claim limitation under the ID's claim constructions, including citations to the evidence of record.

- d. Cresta alleges the contributory infringement of certain asserted patent claims by respondents MaxLinear and Silicon Labs. Please explain whether the original and/or amended complaint filed by Cresta provided the requisite knowledge of the patents asserted in this investigation. Parties are to discuss Commission determinations (including those in Commission Inv. Nos. 337-TA-723, -744, and -770) as well as federal caselaw including, for example, *Rembrandt Social Media, LP v. Facebook, Inc.*, 950 F. Supp. 2d 876, 881-82 (E.D. Va. 2013) and cases discussed therein. If one or both complaints provide legally adequate knowledge, please explain whether a finding of contributory infringement requires a showing of the respondents' continued sale of infringing products after being served with the complaint, *see, e.g.*, Cresta Post-Trial Br. 53, and whether Cresta made that showing. Please also discuss on what basis, if any, other than the original or amended complaint, the respondents were provided with knowledge of the asserted patents for purposes of contributory infringement.
- e. Please explain whether the accused tuners are capable of substantial noninfringing uses, including whether such accused tuners are embedded in systems on a chip, and whether that embedment prevents substantial noninfringing uses as to those embedded tuners. Please also explain whether and why, legally and factually, the following statement is pertinent to the Commission's analysis of contributory infringement in this investigation: - "Cresta is not accusing any cable or satellite TV set-top boxes in this Investigation, and my infringement findings are limited to the SoCs where Cresta has identified [an infringing] 'plurality of demodulators'" ID at 82.
- f. In connection with the Commission's analysis of invalidity of claims 10, 12, and 13 of the '585 patent, and the asserted claims of the '792 patent in view of Boie and VDP, please explain whether a programmable filter meets the limitation of "appl[ying] one of a plurality of finite impulse response filters"
- g. Should the Commission find a violation of section 337, please explain, in view of the facts of this investigation as well as Commission precedent concerning remedies, whether public-interest considerations, 19 U.S.C. § 1337(d)(1), (f)(1), warrant tailoring of any remedial orders, and if so, what that tailoring should be. The parties' discussion of the public interest considerations implicated by this investigation should account for the ID's unreviewed determination that Cresta failed to provide adequate evidence as to allegedly representative products. *See* ID at 65-66, 78-79.

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Id. at 26093. On May 14, 2015, OUII, Cresta, and the respondents filed briefs in response to the Commission notice of review,⁸ and on May 26, 2015, they filed replies to each other's briefs.⁹ Cresta's and the respondents' briefs also include discussion of issues under review other than those for which briefing was requested.

II. THE ASSERTED PATENTS

The two asserted patents were developed by, and assigned to, a predecessor of Cresta called Xceive Corp. *See* ID at 3-4. There are four named inventors of the '585 patent. Those same four inventors, along with four additional inventors, are the eight named inventors of the '792 patent.

A. The '585 Patent

As noted earlier, Cresta asserts independent claim 1 and dependent claims 2-3, 10, 12 and 13. The language of the claims tracks closely to the description of the preferred embodiments. Claims 1 and 10, in their entirety, read as follows:

1. A receiver comprising:

a tuner for receiving input RF signals and for converting said input RF signals to intermediate signals having an intermediate frequency (IF), said input RF signals encoding information in one of a plurality of formats; and

⁸ Office of Unfair Import Investigations' Resps. to the Commission's Apr. 30, 2015 Questions and Submission on Remedy, Public Interest, and Bonding (May 14, 2015) ("OUII Comm'n Br."); Cresta Tech. Corp.'s Submission Regarding the Commission's Determination to Rev. in Part a Final Initial Determination Finding No Violation of Section 337 (May 14, 2015) ("Cresta Comm'n Br."); Resp'ts Opening Br. to Commission on Issues Under Rev. (May 14, 2015) ("Resp'ts Comm'n Br.>").

⁹ Office of Unfair Import Investigations' Resps. to the Opening Brs. of the Private Parties (May 26, 2015) ("OUII Comm'n Reply Br."); Cresta Tech. Corp.'s Reply Br. Regarding Resp'ts and Staff's Resps. to the Commission's Apr. 30, 2015 Questions and Submission on Remedy, Public Interest, & Bonding (Mar. 24, 2015) ("Cresta Comm'n Reply Br."); Resp'ts Reply Br. to Commission on Issues Under Rev. (Mar. 24, 2015) ("Resp'ts Comm'n Reply Br.>").

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a channel filter for receiving the intermediate signals, said channel filter comprising:

an anti-aliasing filter for filtering said intermediate signals;

an analog-to-digital converter for sampling said filtered intermediate signals and generating a digital representation thereof;

a signal processor for processing said digital representation of said intermediate signals in accordance with said format of said input RF signal, said signal processor generating digital output signals indicative of information encoded in said input RF signal; and

a plurality of demodulators, each coupled to receive output signals from said signal processor, each of said demodulators for demodulating said digital output signals according to one of said formats of said input RF signal, each of said demodulators generating video and audio baseband signals corresponding to said format of said input RF signal.

10. The receiver of claim 1, wherein said signal processor applies one of a plurality of finite impulse response filters to said digital representation of said intermediate signal, each of said plurality of finite impulse response corresponding to a format of said input RF signal.

'585 patent, claims 1, 10.

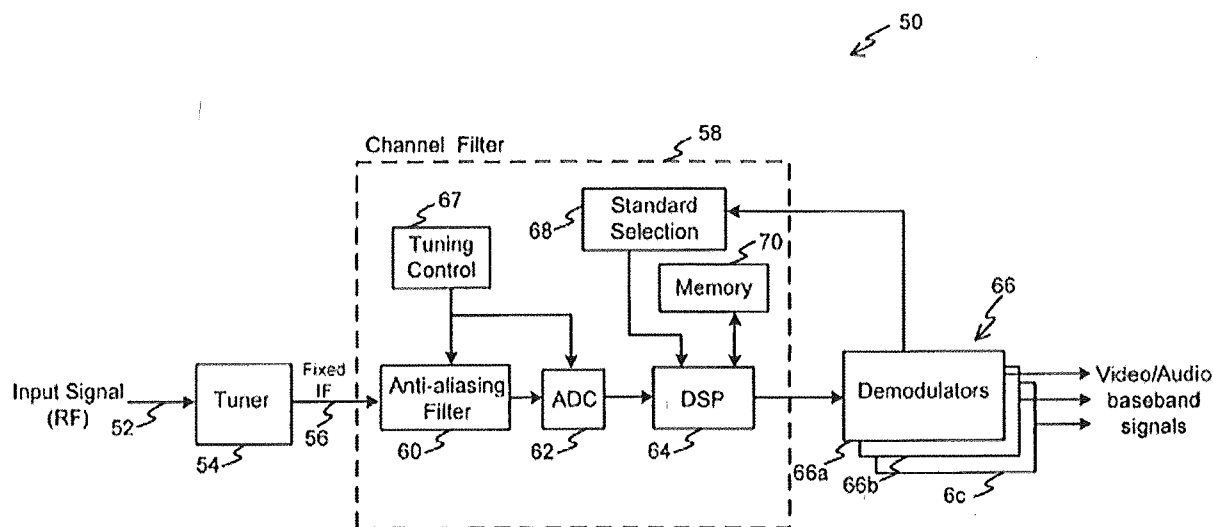
The application that issued as the '585 patent was filed on September 6, 2002, and claims priority to an earlier-filed provisional application. The '585 patent discloses a television receiver that can receive television signals from incompatible sources. '585 patent col. 1 lines 23-43, col. 2 lines 27-40. Thus, the receiver disclosed by the '585 patent can be used to receive both analog and digital broadcasts. In addition, it can receive broadcasts using a variety of standards. Because of this capability, a global receiver can be made that does not specialize in the standards used in a particular geographic region (such as the United States or Europe). *See id.* col. 1 lines 39-42.

The '585 patent explains that while multi-standard receivers have existed in the past, they have been large, expensive, and have required duplicative components. *Id.* col. 2 lines 27-

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35. In particular, prior art systems required multiple channel filters, one such filter for each television standard. Fig. 1 (channel filters **18a-18c**); *see* col. 2 lines 13-15. In addition, in the prior art, each filter required its own demodulator. Fig. 1 (demodulators **20a-20c**); col. 2 lines 15-17.

Figure 2 of the '585 patent discloses the structure of the preferred embodiments of the invention:



This figure shows television receiver 50.¹⁰ Working from left to right, radio frequency (RF) signals, such as broadcast or cable signals are received on input terminal 52. “The input RF signals are coupled to a tuner 54 which operates to convert the RF signal to an intermediate signal [56] using one or more frequency conversions.” Col. 3 lines 48-50. In one embodiment, the tuner is a discrete component, and “outputs intermediate signals having an intermediate frequency (IF) that is determined by the geographic region of interest.” *Id.* col. 3 lines 52-56. In another embodiment, the tuner is integrated into the receiver. *Id.* col. 3 lines 59-60.

¹⁰ In the '585 patent, the tuner **54** is a component that outputs an intermediate frequency signal. '585 patent col. 3 lines 48-62.

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In Figure 2, continuing to the right of the intermediate signal **56**, is the multi-standard channel filter **58**. That filter includes “an anti-aliasing filter **60**, an analog-to-digital converter (ADC) **62** and a digital signal processor (DSP) **64**.”¹¹ *Id.* col. 4 lines 5-7. The filter also “includes a standard selection circuit **68** for selecting between the several analog television standards and the several digital standards.” *Id.* col. 4 lines 55-58; *see also id.* col. 5 lines 7-22. The patent explains the overall operation of the channel filter:

As described above, channel filter **58** is capable of receiving intermediate signals from tuner **54** having any intermediate frequency. Furthermore, channel filter **58** digitizes the incoming televisions signals and performs subsequent processing in the digital domain entirely. Thus, by applying the appropriate sampling frequency at the ADC circuit and the appropriate signal processing functions at the DSP circuit, channel filter **58** can handle television signals in any format (analog or digital) and in any standard (NTSC, PAL or ATSC).

Id. col. 4 lines 7-16.

In Figure 2, continuing from the right of the filter, the patent explains:

The output signals from channel filter **58** are coupled to a bank of demodulators **66** for generating into the appropriate video and audio baseband signals. The video and audio baseband signals are usually coupled to video and audio decoders before being displayed or playback [*sic*] on a view screen.

Id. col. 5 lines 43-48. Figure 2 shows three demodulators, **66a-c**, one for analog television signals (**66a**), one for digital television signals (**66b**), and one for “digital data channels” (**66c**). Because the output of the digital signal processor is digital, the demodulators operate in the digital domain, even for the analog television demodulator **66a** (also called the analog demodulator). *See* col. 5 lines 42-54; *see also* col. 6 lines 6-11. However, a digital-to-analog

¹¹ The operation of those components of the filter are described in detail in the '585 patent. *Id.* col. 4 lines 17-54; *id.* col. 4 line 58-col. 5 line 6; *id.* col. 5 lines 23-41.

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converter (that is not shown in Figure 2) “can be included between the output terminal of DSP 64 and the input terminal of analog demodulator 66a.” *Id.* col. 5 lines 56-58.

The asserted claims 1, 2, 3, 10, 12, and 13 correspond to application claims 1, 2, 4, 11, 13, and 14. In a first office action (JX-3.124-.130), the examiner rejected most of the originally-presented claims (JX-3.0017-.0021) as anticipated by, or obvious in view of U.S. Patent No. 6,643,502 to van de Plassche (“the VDP patent” as it will be called in the invalidity discussion, *infra*) (RX-30). Certain dependent claims reciting a “plurality of demodulators” were found to be allowable over the prior art. JX-3.0129. Consequently, the applicant amended the claims so that all of them included this limitation. JX-3.0134. For claim 1, this amendment added the entirety of the “plurality of demodulators” limitation. *Id.* After another office action regarding claims not asserted here (JX-3.0143-.0148), the patent issued.

B. The '792 Patent

As noted earlier, claims 1-4, 7-8, and 25-26 are asserted. Claim 1 is independent and all of the other claims in the patent are dependent upon it. The language of the asserted claims of the '792 patent is substantially similar to the claim language in the '585 patent. Claim 1 of the '792 patent, for example, tracks claim 10 of the '585 patent. Claim 1 of the '792 patent reads in its entirety as follows:

1. A television receiver comprising:

a frequency conversion circuit for receiving an input RF signal and for converting the input RF signal to an intermediate frequency signal having an intermediate frequency (IF), the input RF signal encoding information in one of a plurality of television signal formats;

an analog-to-digital converter for sampling the intermediate frequency signal and generating a digital representation thereof;

a signal processor for processing the digital representation of the intermediate frequency signal in accordance with the television signal

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format of the input RF signal, the signal processor generating digital output signals indicative of information encoded in the input RF signal, wherein the signal processor applies one of a plurality of finite impulse response filters to the digital representation of the intermediate frequency signal, each of the plurality of finite impulse response corresponding to a format of the input RF signal; and

a signal output circuit for receiving the digital output signals from the signal processor and for providing one or more output signals corresponding to the digital output signals.

'792 patent claim 1.

The application that issued as the '792 patent was filed on July 1, 2004. The patent discloses a "dual-format television (TV) receiver for receiving analog and digital TV signals." '792 patent col. 3 lines 11-12. Numerous passages of the '792 specification are similar to the '585 patent, though no priority is claimed to the '585 patent, or to the earlier-filed provisional application.

Asserted claims 1-4, 7-8, and 25-26 of the '792 patent correspond to application claims 1-4, 7-8, and 26-27. In a first office action, the examiner rejected most of the originally-presented claims (JX-4.0026-.0035) as anticipated by or obvious in view of the published patent application that issued as the '585 patent (called "Favrat" in this file history). JX-4.00900-.0092. Certain dependent claims (application claims 6-9, 15, and 18-29) were found to be allowable over the prior art. *Id.* at .0092. In response to the office action, the applicant amended independent claim 1 to include the limitation of (allowable) dependent claim 24. JX-4.0095-.0096. That additional limitation is the "wherein" clause that forms the second half of

the “signal processor” limitation of claim 1 as issued. That “wherein” clause closely tracks dependent claim 10 of the ’585 patent.¹² The ’792 patent then issued.

III. ANALYSIS

A. Claim Construction

The ID construed fourteen claim terms. ID at 21-49. The petitions for review challenged certain of the constructions.¹³ We determined not to review these constructions. 80 *Fed. Reg.* at 26092.

In its petition to the Commission, MaxLinear styled certain of its other arguments as concerning claim construction. *See, e.g.*, MaxLinear Pet. 6-11 (“channel filter comprising” a “plurality of demodulators”); *id.* at 12-15 (“plurality of demodulators, each coupled to receive output signals”); *id.* at 30-33. (“signal output circuit”). The construction of the first two of these terms listed above (“channel filter comprising” a “plurality of demodulators,” and “a plurality of demodulators, each coupled to receive output signals”) were not contested at all before the ALJ, and for the third (“signal output circuit”), MaxLinear offers different arguments to the Commission than it presented to the ALJ. *Compare* MaxLinear Pet. 30-33 with Resp’ts Post-Hearing Br. 58-62. Accordingly, MaxLinear’s arguments have been waived. Order No. 2 ¶ 11.1 (Ground Rules).

¹² The examiner never discussed why claims of the ’792 patent were allowable in view of the prior art limitations of claim 10 of the ’585 patent.

¹³ Specifically, Silicon Labs’ and MaxLinear’s petitions for review challenged the ID’s construction of “intermediate frequency,” a term that appears in all of the asserted patent claims. Silicon Labs Pet. 28-35; MaxLinear Pet. 33-38; *see* ID at 25-34. MaxLinear also petitioned for review of the ID’s construction of “signal processor,” *see* ID at 34-38, which also appears in all asserted patent claims, and the “real part” and “imaginary part” limitation in claim 12 of the ’585 patent and claim 25 of the ’792 patent, *see id.* at 44-45.

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Moreover, MaxLinear's arguments, which purport to take issue with the plain and ordinary meaning of these terms, are properly viewed instead as infringement-related. *See, e.g., Tessera, Inc. v. ITC*, 646 F.3d 1357, 1364 (Fed. Cir. 2011) ("Tessera's contention at best is a disagreement over the Commission's *application* of Tessera's construction to the accused wBGA devices.") (emphasis in original); *Versata Software, Inc. v. SAP Am., Inc.*, 717 F.3d 1255, 1262 (Fed. Cir. 2013) ("Whether 'computer instructions' can include source code thus becomes a pure factual question."). We determined not to review the ALJ's infringement determinations concerning the claim limitations identified by MaxLinear above. 80 *Fed. Reg.* at 26092.

B. Infringement

1. The ID's Findings

There were more than 100 different Silicon Labs tuners, based upon the part numbers (so-called "Order Part Numbers" or "OPNs") of those tuners, which at one point were identified as accused of infringement in this investigation. JX-56C; *see* Resp'ts Post-Hearing Br. 63-64. Depending on how they are grouped together, there are up to seven classes of Silicon Labs tuners at issue in this investigation. ID at 51. Some of these tuners are no longer at issue in this investigation.¹⁴ We will group them into seven categories for purposes of our infringement analysis on review:¹⁵

¹⁴ Cresta effectively withdrew its infringement contentions as to certain Silicon Labs analog-only and digital-only tuners, and the ID thereby found that such tuners do not infringe the asserted patents. ID at 52. Those tuners are no longer at issue in the investigation.

¹⁵ Our classification is consistent with that of the respondents in their briefing to the Commission, *see* Resp'ts Comm'n Br. 10-11, and to the ALJ, Resp'ts Post-Hearing Reply Br. 49-50, except that we have placed the Si2185 tuner in its own category.

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1. [REDACTED] series tuners (*i.e.*, those tuners in the [REDACTED] series in which the “x” can be any digit and in which there is a [REDACTED] suffix).¹⁶
2. [REDACTED] series tuners (*i.e.*, those tuners in the [REDACTED] series in which the “x” can be any digit and in which there is a [REDACTED] suffix).¹⁷
3. [REDACTED] series tuners (*i.e.*, those tuners in the [REDACTED] series in which the “x” can be any digit and in which there is a [REDACTED] suffix).¹⁸
4. [REDACTED] series tuners (*i.e.*, those tuners in the [REDACTED] series in which the “x” can be any digit and in which there is a [REDACTED] suffix).¹⁹
5. [REDACTED] tuners (*i.e.*, those tuners in the [REDACTED] series in which the “x” can be any digit and in which there is [REDACTED] suffix).²⁰
6. The [REDACTED] tuner.²¹
7. [REDACTED] tuners (*i.e.*, those tuners in the [REDACTED] series, in which the “x” can be any digit and in which there is [REDACTED] suffix).²²

¹⁶ The OPN for such tuners is [REDACTED]. JX-56C.0001.

¹⁷ The OPNs for such tuners are [REDACTED]. JX-56C.0002.

¹⁸ The OPN for such tuners is [REDACTED]. JX-56C.0001.

¹⁹ The OPNs for such tuners are [REDACTED]. JX-56C.0002.

²⁰ There are 17 such OPNs for these tuners, including, for example, [REDACTED]. JX-56C.0001.

²¹ This tuner has an OPN of [REDACTED]. JX-56C.0001; *see also* RX-1991C Q/A 135.

²² There are 56 such OPNs for these tuners, including, for example, [REDACTED]. JX-56C.0001-.002. These OPNs are also identified in the Respondents’ Commission Brief at 17, except that we have removed the [REDACTED] tuner from this category and placed it into its own.

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Cresta also accused of infringement certain Samsung, LG and Vizio televisions containing these Silicon Labs tuners. CX-2024C Q/A 261 (Samsung televisions); *id.* Q/A 273 (LG televisions); *id.* Q/A 293 (Vizio televisions).

Cresta accused two MaxLinear tuners, the MxL601 and the MxL661. ID at 53. It was agreed that the two MaxLinear tuners are substantially identical for purposes of infringement. *Id.* Cresta also accused of infringement certain Samsung, Vizio and Sharp televisions containing these MaxLinear tuners. CX-2024C Q/A 261 (Samsung televisions); CX-2024C Q/A 293 (Vizio televisions); *id.* Q/A 278 (citing CX-101C, response to Interrogatory No. 17) (Sharp televisions).

The ID found that the Silicon Labs Si2185 tuner (which contains [REDACTED]), as well as televisions incorporating that tuner, directly infringes claims 1-3 of the '585 patent. ID at 66-67. The ID found that a certain subset of accused televisions incorporating other Silicon Labs tuners (but not the tuners themselves) also directly infringe claims 1-3 of the '585 patent.²³ For such televisions that directly infringe, the ID found that the Silicon Labs tuners so incorporated into the televisions contribute to that infringement. *Id.* at 69. The ID found no other infringement by Silicon Labs or the televisions containing Silicon Labs tuners. *Id.* at 67-68, 85-90.

The ID further found that a certain subset of accused televisions incorporating the accused MaxLinear tuners directly infringe claims 1-3, 10, 12, and 13 of the '585 patent and

²³ More specifically, the ID finds that televisions incorporating the [REDACTED] systems on chip (with accused Silicon Labs tuners other than the Si215xV) directly infringe. ID at 66 & n.7. Systems on chip are discussed, *infra*, Part III.B.3.

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claim 8 of the '792 patent.²⁴ For such televisions that infringe, the ID found that the MaxLinear tuners so incorporated into the televisions contribute to that infringement. ID at 82, 97. The ID further found that the accused MaxLinear tuners directly infringe claims 1-3, 7, and 25-26 of the '792 patent. *Id.* at 91-97.

2. The Commission's Notice of Review

We determined to review the ID's infringement findings regarding the following limitation in claim 1 of the '585 patent: "a signal processor for processing said digital representation of said intermediate signals in accordance with said format of said input RF signal." 80 *Fed. Reg.* at 26092. We also determined to review the ID's infringement findings for the corresponding or similar limitation in claim 1 of the '792 patent: "a signal processor for processing the digital representation of the intermediate frequency signal in accordance with the television signal format of the input RF signal." 80 *Fed. Reg.* at 26092. The ID found all Silicon Labs tuners except for the Si2158V to infringe these limitations. ID at 60 ('585 patent); *id.* at 85 ('792 patent). The ID found that both accused MaxLinear tuners infringe these limitations. *Id.* at 75 ('585 patent); *id.* at 92 ('792 patent).

In addition, we determined to review the ID's infringement findings regarding the following limitation of claim 10 of the '585 patent: "said signal processor applies one of a plurality of finite impulse response filters to said digital representation of said intermediate signal, each of said plurality of finite impulse response filters corresponding to a format of said input RF signal." 80 *Fed. Reg.* at 26092. We also determined to review the ID's infringement findings for the corresponding or similar limitation in claim 1 of the '792 patent: "wherein the

²⁴ More specifically, the ID finds that televisions incorporating the [REDACTED] systems on chip (with either of the accused MaxLinear tuners) directly infringe. ID at 78-81, 95-96.

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signal processor applies one of a plurality of finite impulse response filters to the digital representation of the intermediate frequency signal, each of the plurality of finite impulse response corresponding to a format of the input RF signal.” 80 *Fed. Reg.* at 26092. The ID found that Cresta failed “to meet its burden to prove infringement of” this limitation “by any accused Silicon Labs tuner or any television incorporating a Silicon Labs tuner.” ID at 68 (’585 patent); *accord id.* at 85 (’792 patent). The ID found, however, that both accused MaxLinear tuners practice this limitation. *Id.* at 80 (’585 patent); *id.* at 93 (’792 patent).

For the ’585 patent, the ID’s infringement findings turned substantially on the “plurality of demodulators” limitation in asserted claim 1.²⁵ The ID found that the Silicon Labs Si2185 tuner was the only accused tuner to practice that claim limitation. *Id.* at 66, 75. The other accused tuners do not have a plurality of demodulators, but Cresta asserted that the accused televisions into which those tuners are incorporated contain the claimed “plurality of demodulators.” *Id.* at 64-66 (Silicon Labs); *id.* at 77-79 (MaxLinear). The ID found that Cresta failed to demonstrate that all of the accused televisions practice this limitation, and that Cresta bore its burden only as to “televisions incorporating other Silicon Labs tuners [*i.e.*, other than the Si2185] with the [REDACTED]” systems on chip (“SoCs”), *id.* at 66 & n.7, and as to “televisions incorporating MaxLinear tuners and [REDACTED] SoCs,” *id.* at 79 & n.9. Thus, the ID found that certain accused televisions directly infringe claim 1 of the ’585 patent, and the tuners in those televisions contribute to the infringement. *Id.* at 82. We determined not to

²⁵ Similarly, claim 8 of the ’792 patent calls, *inter alia*, for a “demodulator circuit” and a “decoder circuit.” ’792 patent claim 8. Cresta relied upon the same evidence for practicing this limitation that it relied upon for practicing the “plurality of demodulators” limitation. ID at 88-89, 95-96.

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review the findings of direct infringement concerning the “plurality of demodulators” limitation, but determined to review the ID’s findings regarding contributory infringement. 80 *Fed. Reg.* at 26092.

3. Representative Systems on Chip

The ID determined that for the asserted claims of the ’585 patent and claim 8 of the ’792 patent (each of which calls for demodulators), Cresta satisfied its burden of demonstrating infringement only as to specific systems on chip.²⁶ *See* ID at 65-66 & n.7 (televisions with the [REDACTED] SoCs with Silicon Labs tuners), 78-79 & n.86 (televisions with [REDACTED] SoCs with MaxLinear tuners). The ID found that for other televisions, Cresta failed to demonstrate “how demodulation actually occurs in the accused televisions, which Cresta only provides for specific SoCs.” ID at 65. The ID rejected Cresta’s argument that because infringement was established as to televisions containing specific models of SoCs, the ID should infer that every SoC meets the limitation. ID at 65-66, 77-78. The ID properly reasoned that Cresta failed to meet its burden to demonstrate that the analyzed televisions containing specific SoCs are representative of other accused SoCs and televisions. *Id.* The ID noted that complainant’s expert, Dr. Snelgrove, provided no explanation for selecting certain televisions incorporating the SoCs he analyzed, nor did he otherwise provide evidence that the non-selected televisions perform demodulation as required by the limitations of the asserted claims. *See* ID at 65-66, 77-78. Cresta’s petition for review challenged these findings. Cresta Pet. 38-50. The Commission determined not to review these findings. 80 *Fed. Reg.* at 26092.

²⁶ The “system on chip” or “SoC” is an integrated circuit board that typically includes a television’s demodulators and decoders. *See, e.g.*, CX-2024C Q/A 255.

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Cresta's petition argued in the alternative that, even if its infringement showing failed as to certain accused televisions, its showing sufficed as to Sharp televisions that use MaxLinear's [REDACTED] tuner and the [REDACTED] SoC. Cresta Pet. 53-60. Cresta's petition points to an alleged error in a footnote in the ID, which explained that Sharp televisions did not use the specific SoCs upon which Cresta presented evidence, specifically the "[REDACTED]." ID at 78-79. Cresta argued in its petition that the SoC used by Sharp televisions (the [REDACTED]) "is identical in all aspects relevant to infringement" to the [REDACTED] SoC found to infringe in the pertinent portion of the ID, as well the [REDACTED] SoC found to infringe elsewhere the ID. Cresta Pet. 54-55; *see* ID at 64, 66, 89. In order to make this demonstration, Cresta's petition compares data sheets for the [REDACTED] with datasheets for these other [REDACTED] SoCs. Cresta Pet. 55-60.

In response to the Commission notice of review, Cresta reiterated its argument as to Sharp televisions. Cresta Comm'n Br. 49-50. In so arguing, Cresta seeks clarification about the scope of Commission non-review of the ALJ's findings concerning other SoCs.

Our determination not to review the ID's holdings concerning representative products encompassed the Sharp televisions identified by Cresta. As to the Sharp televisions, Cresta's argument boils down to its position that the ALJ should have appreciated the similarity between the [REDACTED] SoCs used in [REDACTED] televisions and should have, *on her own*, concluded that these two SoCs are substantially identical to another [REDACTED] SoC (the [REDACTED]) used in Sharp televisions by conducting an independent comparison of the SoCs. By Cresta's rationale, an infringement case is adequately made through the introduction of technical documents without any explanation in the post-hearing

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brief as to their contents or the relationships between and among various SoCs and television makes and models. Cresta's failure as to the Sharp televisions is the same as for its broader reliance upon representative products—it failed to explain adequately the universe of SoCs and why its selection of the analyzed SoCs are representative. The ID correctly rejected Cresta's representative models argument for failure to explain and prove that the SoCs Dr. Snelgrove selected for analysis were, in fact, representative of the universe of accused SoCs and that this failure of proof extended to the SoCs used in the Sharp televisions. The ALJ did not err in concluding that Cresta failed to carry its burden of demonstrating infringement as to the Sharp televisions, for which reason we determined not to review the issue.

4. The Claim Limitations Under Review

As noted above, the Commission determined to review whether the accused products practice two particular limitations of both of the asserted patents. The two claim limitations at issue on review are similar, both involving the claimed “signal processor.”

The first disputed limitation is a “signal processor” for “processing in accordance with” the “format of” the “input RF signal.” ’585 patent, claim 1; *accord* ’792 patent claim 1 (a “signal processor” for “processing” in “accordance with the television signal format of the input RF signal”). At issue on review is whether the accused signal processors process *in accordance with the format* of the input RF signal. The claim limitation requires that the signal processor must process the digital representation of the intermediate signals based upon the format of the input RF signal. Doing so requires that different formats be processed differently.

The second claim limitation at issue on review requires that the signal processor “applies one of a plurality of finite impulse response filters . . . corresponding to a format of”

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the “input RF signal” in asserted claims 10, 12, and 13 of the ’585 patent and all asserted claims of the ’792 patent. This is a more specific limitation than the first limitation at issue, involving a particular type of processing applying a particular finite impulse response filter based upon the format of the input RF signal.

- a) A “signal processor” for “processing in accordance with” the “format of” the “input RF signal”

As quoted earlier, all of the asserted patent claims include a limitation, *inter alia*, that the “signal processor” processes “the digital representation of [the] intermediate signals in accordance with [the] format of said input RF signal.” ’585 patent claim 1, col. 6 lines 65-67 ; *accord* ’792 patent claim 1, col. 10 lines 60-62. We granted review as to the ID’s infringement findings for this claim limitation. 80 *Fed. Reg.* at 26092.

Before the ALJ, Cresta argued alternative infringement theories concerning format-specific processing in the accused products. In particular, Cresta argued that certain accused tuners contain signal processors for: (1) processing input RF signals of different bandwidths differently; and/or (2) processing analog and digital input RF signals differently. Cresta Post-Hearing Br. 65-70, 97-100; Cresta Post-Hearing Reply Br. 37-39, 57-60.

- (i) Infringement by the Silicon Labs tuners and televisions containing them

- (A) Different bandwidths

With respect to Cresta’s bandwidth argument, Cresta argued that the [REDACTED] of the Silicon Labs [REDACTED] tuners is capable of format-specific processing of different bandwidths (6, 7, or 8 MHz) of input RF signals. Cresta Post-Hearing Br. 66 (explaining that the [REDACTED]); *see also* Resp’ts Comm’n Reply Br. 6 n.3. The ID rejects Cresta’s infringement

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argument based on the absence of any evidence that the processing of signals differs based on bandwidth. ID at 59. In addition, the ID notes that Respondents' expert, Professor McNair, testified that the FCC's transmission standard mandates a 6 MHz bandwidth in the United States. *Id.* at 59 ("Pf. McNair states that the FCC mandates a 6MHz bandwidth for all transmission standards."). Cresta challenges these findings in its petition for review arguing that the evidence of record demonstrates that [REDACTED]

[REDACTED]²⁷ Cresta Pet. 32-35. The Commission determined to review these findings. 80 *Fed. Reg.* at 26092-93.

Before the ALJ, Cresta argued that the [REDACTED] of the Silicon Labs [REDACTED] [REDACTED] tuners is capable of format-specific processing of different bandwidths (6, 7, or 8 MHz) of input RF signals. Specifically, Cresta argued as follows:

[REDACTED]

²⁷ The respondents contended in their reply to Cresta's petition for review that bandwidth was a mere "characteristic" of a format as opposed to a format itself. Resp'ts Pet. Reply 30; *see* ID at 43 (finding that Cresta's proposed construction of "format" that referred to "one or more characteristics" of the input RF signal corresponding to the transmission standard" as making "a distinction without a difference"). However, the bandwidth characteristic here is representative of an input format because "the ATSC and NTSC standards . . . mandate channel bandwidth of 6 MHz, whereas supported PAL and SECAM standards require channel bandwidth of 8 MHz." Cresta Pet. 34. Even OUII—whose proposed construction of "format" was adopted in the ID—recognized that standards could be determined based upon "relevant" characteristics. OUII Post-Hearing Br. 30; *see* Cresta Post-Hearing Reply Br. 25 ("the only relevant characteristics identified in the patent are those identified by CrestaTech: bandwidth, analog v. digital, and cable v. terrestrial"). Accordingly, we find that format-specific processing can be based upon the bandwidth of the television signal.

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Cresta Post-Hearing Br. 66. To support its argument, Cresta relied upon a single page of a Silicon Labs internal design review document (JX-35C.0013) and the testimony of the respondents' expert, Professor McNair, purportedly admitting such capability. *Id.* Cresta presented no testimony interpreting or explaining the internal design review document, and we find Professor McNair's equivocal testimony inadequate to demonstrate that the [REDACTED] Silicon Labs tuners engage in format-specific processing of television signals based upon the operation of the channel filter in the accused Silicon Labs products. Moreover, Silicon Labs disputed that these tuners were so capable due to the absence of any evidence that [REDACTED]

[REDACTED]. Resp'ts Post-Hearing Reply Br. 47. Silicon Labs pointed out that Cresta's expert never testified about Cresta's new infringement theory, *see* CX-2024C Q/A 338 & 350, which was raised for the first time in its post-hearing brief. Resp'ts Post-Hearing Reply Br. 47. Moreover, Silicon Labs noted that Professor McNair's testimony shows that there is no reason to make this combination because of the FCC's 6 MHz mandate. *Id.*

In its submissions to the Commission, Cresta cites new evidence from the record, not presented to the ALJ, in support of its argument that, in operation, [REDACTED] [REDACTED] in the accused televisions containing the identified Silicon Labs tuners. Specifically Cresta relies on a host of new design documents and product specification sheets. Cresta Pet. 33-34. Cresta's submission in response to the Commission's request for briefing introduces an additional new technical document relating to the [REDACTED] tuner. Cresta Comm'n Br. 3 (discussing JX-10). None of this evidence was presented to the ALJ in Cresta's post-hearing briefing in connection with Cresta's bandwidth-related arguments, in violation of the Ground Rules of this investigation, and we decline to consider it. Cresta's evidence, picked in

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hindsight from the record, without explanation or support from its expert, and without providing the respondents with an adequate opportunity to respond or rebut, falls far short of demonstrating the format-specific processing of the accused Silicon Labs televisions.

Notwithstanding Cresta's failure to demonstrate the actual operation of the accused Silicon Labs tuners or televisions containing them, an apparatus claim can be infringed by devices with capabilities that may be unused so long as exercise of the capability does not require modification of the apparatus. *See, e.g., Finjan, Inc. v. Secure Computing Corp.*, 626 F.3d 1197, 1204-05 (Fed. Cir. 2010); *Silicon Graphics, Inc. v. ATI Techs., Inc.*, 607 F.3d 784, 794 (Fed. Cir. 2010). Commission briefing topic "a" asked the parties "whether Cresta demonstrated that the accused products are capable of processing signals conforming to such foreign standards without modification to the accused televisions or tuners (whether by software, firmware or hardware)." ²⁸ 80 *Fed. Reg.* at 26093.

Cresta overreaches in its interpretation of the guiding Federal Circuit caselaw regarding capabilities of apparatuses. Cresta relies upon *Fantasy Sports Properties, Inc. v. SportsLine.com, Inc.*, 287 F.3d 1108 (Fed. Cir. 2002) to support its proposition that accused tuners infringe "[r]egardless of whether" the "capability" of receiving 7 or 8 MHz signals "is

²⁸ In applying the guiding Federal Circuit case law recited above, we must distinguish between the two different categories of accused products: tuners (or chips containing them) and assembled televisions. Once a tuner is embedded into assembled televisions, capabilities of a tuner might no longer be available, as, for example, if a television is programmed to utilize only some of the functions of the tuner. *See, e.g., Resp'ts Comm'n Reply Br. 10* (alleging that a specific accused Sharp television supports only the "American TV Standard ATSC/NTSC system"); *see also* RX-1991C Q/A 125. Thus, even if certain accused tuners support multiple input RF standards, there may still be an issue whether accused televisions that are imported into the United States with such a tuner actually support multiple input RF standards and process signals of such standards differently.

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activated or utilized in any way in the televisions.” Cresta Comm’n Br. 5. In *Fantasy Sports*, the accused product, Commissioner.com, was a website that users visited in order to organize fantasy sports leagues; it was not downloadable software. 287 F.3d at 1119. The asserted patent called for a “computer for playing football” and the defendant argued that the Commissioner.com product was not a computer. *Id.* at 1118. The court rejected that argument because Commissioner.com, of course, ran on a computer. *Id.* The defendant also argued that Commissioner.com did not infringe because to practice the patent claims users creating sports leagues would need to make selections to enable claimed features for a fantasy league. *Id.* at 1119 (discussing “bonus points”). The court found infringement because the software tool enabled the creation of fantasy leagues without having to reconfigure any software. *Id.*

The difference between *Fantasy Sports* and the present case is that Cresta needs to, but has not, demonstrated that the processing of 7 and 8 MHz signals is operable—*i.e.*, capable of operation—in the accused tuners or accused televisions containing them. If that functionality is inoperable, then there cannot be infringement. None of the cases relied upon by Cresta is to the contrary.

The respondents in their briefing to the Commission rely heavily on *Nazomi Communications, Inc. v. Nokia Corp.*, 739 F.3d 1339 (Fed. Cir. 2014). In that case, the asserted patent claims called for a “central processing unit (CPU) capable of executing a plurality of instruction sets.” *Id.* at 1343-44. The Federal Circuit found that “specific claim functionalities . . . cannot be practiced in hardware alone,” *id.* at 1343, and thereby that the plaintiff had “claimed a *combination* of hardware and software capable of performing [the claimed] function,” *id.* at 1344. To the extent that the respondents argue here that all hardware cannot operate without implementing software, the respondents extend *Nazomi* too far, and do

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so in a way that risks being irreconcilable with *Silicon Graphics, Inc. v. ATI Technologies, Inc.*, 607 F.3d 784, 794 (Fed. Cir. 2010). In *Silicon Graphics*, the patent claims called for “a rasterization circuit . . . that rasterizes the primitive according to a rasterization process,” and the Federal Circuit found that the claim language merely required circuitry with the ability to rasterize. *Silicon Graphics*, 607 F.3d at 795. *Silicon Graphics*, however, does not support Cresta for the same reason as *Fantasy Sports*: the capabilities of the systems there were not at issue, whereas here Cresta failed to offer evidence as to capabilities of the accused televisions, the accused tuners, and the relationship between the two.

Accordingly, we find that Cresta’s arguments based on bandwidth-specific processing by Silicon Labs fail for three reasons. First, in order meet its burden to demonstrate infringement, Cresta has relied upon evidence and arguments that are waived by failure to raise them to the ALJ. Second, Cresta did not demonstrate that accused televisions incorporating accused Silicon Labs [REDACTED] tuners are capable of processing 7 or 8 MHz signals without modification. Third, even if Cresta could have so demonstrated, it failed to show format-specific processing by virtue of the accused [REDACTED], *i.e.*, Cresta failed to explain how the accused [REDACTED] operate in connection with its infringement theory.

(B) Analog versus digital television signals

Cresta also offered several different infringement theories for format-specific processing, each of which relies upon differences in how the accused Silicon Labs tuners process analog versus digital television input RF signals. Cresta Post-Hearing Br. 66-68.

Cresta’s contentions regarding the manner in which Silicon Labs’ tuners process analog and digital input RF signals was set forth in a chart on pages 49-50 of the respondents’ post-hearing reply brief:

[CHART REDACTED FROM PUBLIC VERSION]

Resp'ts Post-Hearing Reply Br. 49-50; *see also* Resp'ts Comm'n Br. 10-11.²⁹ The ID relied, in part, upon this chart. ID at 59-60. The chart illustrates four different infringement theories:

²⁹ As noted earlier, these six categories of Silicon Labs tuners correspond to the seven categories laid out earlier in this Opinion with one exception: we have separately addressed the [REDACTED] tuner from the [REDACTED] tuners because it alone contains a [REDACTED], pertinent to other infringement issues. For purposes of the infringement analysis in this section, the [REDACTED] operates in the same manner as the [REDACTED] tuners. *See* Resp'ts Comm'n Br. 17; CX-2024C Q/A 230.

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First, the second and third columns address the [REDACTED]
[REDACTED]
[REDACTED].³⁰ Second, the fourth column addresses the accused [REDACTED]; this column represents the foreign formats and 6 MHz bandwidth that we have already addressed, and does not deal with analog versus digital TV signals. Third, the fifth column addresses [REDACTED]. Fourth, the sixth (last) column addresses the ordering of certain processing in the accused Silicon Labs tuners for analog versus digital TV signals. We will address these arguments in the following order: [REDACTED]
[REDACTED]. We will not revisit the [REDACTED], which we have already discussed.

1. Ordering of processing

Cresta accused the [REDACTED]
[REDACTED] of meeting the “in accordance with” claim limitation as a result of the different order in which analog and digital TV signals are processed.³¹ More specifically, for analog signals, the [REDACTED]
[REDACTED], whereas for digital signals, the [REDACTED]
[REDACTED]. The ID finds that Cresta demonstrated that the [REDACTED] tuners satisfy the claim limitation in view of such different processing. ID at 60. We affirm that determination.

³⁰ The second and third columns are effectively linked because the [REDACTED]
[REDACTED]. See, e.g., Cresta Comm’n Br. 15. [REDACTED]
[REDACTED]. See, e.g., id.

³¹ No other tuners (i.e., the [REDACTED]) were accused of infringing based upon this theory.

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2. [REDACTED]

Cresta also alleged that the accused Silicon Labs tuners ([REDACTED])

[REDACTED]) make use of [REDACTED]

[REDACTED]³²

These differences are reflected in the second and third columns of the chart reprinted above.

The ID agreed with Cresta that for the [REDACTED]

[REDACTED] satisfies the “in accordance with” claim limitation.³³ ID at 59. We affirm the ID’s

finding concerning the [REDACTED] tuners; the respondents have failed to

demonstrate error in the ID’s infringement determination. *See* Resp’ts Comm’n Br. 14-15;

Silicon Labs Pet. 9; *see also* Resp’ts Post-Hearing Br. 78-79; Resp’ts Post-Hearing Reply Br.

49-50.

As to the [REDACTED] tuners, the respondents’ briefing took the position that

[REDACTED]
[REDACTED]
[REDACTED] Resp’ts Post-Hearing Reply Br. 49 (emphasis added); *see*

also Resp’ts Post-Hearing Br. 80. Should the accused [REDACTED] tuners operate in the

³² More specifically, the [REDACTED] were not accused of infringing under this theory because they [REDACTED]

[REDACTED]. This is reflected in the second and third columns in the chart in the rows for the [REDACTED]

[REDACTED]. Resp’ts Post-Hearing Reply Br. 49-50.

³³ The ID appears to treat as interchangeable the [REDACTED] tuners, and the [REDACTED] tuners. ID at 51. We find that they are not interchangeable for purposes of our discussion of this limitation.

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italicized manner, they would operate just as they do for analog TV signals. *Id.* The parties dispute the operation of the [REDACTED] tuners.

In its post-hearing brief, Cresta's only support for this theory of infringement was Professor McNair's witness statement. Cresta Post-Hearing Br. 66 (citing RX-1911C [sic RX-1991C] at Q/A 128, 164). Professor McNair testified in the cited passages, however, only as to [REDACTED] tuners (Q/A 128) and [REDACTED] tuners (Q/A 164). For the [REDACTED] tuners, Silicon Labs asserted that it was unable to ascertain whether its tuners were capable of [REDACTED]

[REDACTED], which was beyond Silicon Labs' control. Resp'ts Post-Hearing Br. 66 (citing RX-1991C Q/A 130 and RX-1994C Q/A 38-56). In particular, [REDACTED]

Id. Cresta did not analyze [REDACTED] to ascertain whether television manufacturers take advantage of the [REDACTED]. Cresta Post-Hearing Br. 65-70; *see also* Resp'ts Post-Hearing Br. 66. Cresta's post-hearing reply brief did not address these arguments, but instead assumed certain operation of the [REDACTED] tuners. Cresta Post-Hearing Reply Br. 38.

In its petition for review, Silicon Labs argued that the format-specific processing concerning the [REDACTED] tuners was error. Silicon Labs Pet. 5 (“[T]he record is clear that there is no evidence that [REDACTED] in any Silicon Labs tuner (other than the [REDACTED] Tuners) performs format-specific processing.”). In response, Cresta argued (notwithstanding its burdens of proof and persuasion for infringement) that to the extent that Silicon Lab tuners were configured to [REDACTED], Silicon Labs should have offered “rebuttal evidence that any of its accused tuners do that.” Cresta Pet. Reply 20.

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Cresta's opening brief in response to the Commission's notice of review likewise assumed the operation of [REDACTED] without acknowledging or responding to the previous arguments made by Silicon Labs regarding [REDACTED]. Cresta Comm'n Br. 10-12, 14-15, 18. In its opening brief, Silicon Labs reiterated its arguments that Cresta failed to demonstrate infringement by the [REDACTED] tuners because of Cresta's failure to examine [REDACTED]. Resp'ts Comm'n Br. 7. In its reply brief, Cresta argues, including based on the guiding Federal Circuit caselaw, that capability of the tuners is enough to demonstrate infringement. Cresta Comm'n Reply Br. 12-13. While Cresta contends that Silicon Labs' arguments are "unsupported hypothetical theory," Cresta Comm'n Reply Br. 12, Cresta's failure of proof makes its own arguments both unsupported and hypothetical.

Cresta's arguments fail here for substantially the same reasons as they did earlier in connection with different bandwidths. First, Cresta's evidence that purports to substantiate what it offered in its post-hearing brief came too late, in violation of the ground rules of the investigation. Order No. 2 ¶ 11.1 (Ground Rules). Second, Cresta failed to demonstrate that accused televisions incorporating the accused Silicon Labs [REDACTED] tuners are capable of processing analog and digital TV signals differently without modification.

[REDACTED]

As shown in the chart reprinted earlier, Cresta alleged that the [REDACTED] in the [REDACTED] practices the "in accordance with" limitation. Cresta's arguments regarding the [REDACTED] are based upon the use of [REDACTED] [REDACTED]. *Id.* at 15-17. That infringement contention is the same as for the application of "one of a plurality of finite impulse response filters . . . corresponding to a format of" the "input RF signal." *Id.* at 17. As we discuss below, we find that Cresta failed

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to demonstrate that the accused Silicon Labs [REDACTED] practices this claim limitation.

3. Summary

As a result of the foregoing discussion, we have found that the [REDACTED] tuners practice the “in accordance with” claim limitation because of the [REDACTED]. We have found that the [REDACTED] practice the “in accordance with” claim limitation because of the [REDACTED].³⁴ We affirm the ID’s finding that the [REDACTED] tuner does not practice this claim limitation. ID at 60. We reverse the ID’s finding that the [REDACTED] tuner does practice this limitation. *Id.* at 59.

(ii) Infringement by the accused MaxLinear tuners

For MaxLinear’s products, the ID finds that all of the accused MaxLinear tuners practice this claim limitation, based upon format-specific processing of different bandwidths of input RF signals, *id.* at 73-74, and also based upon format-specific processing of digital versus analog input RF signals, *id.* at 73-75. MaxLinear did not petition for review of these determinations. On review, we have determined to affirm the ID’s findings at pages 73-75 as to the accused MaxLinear tuners. With respect to the accused televisions incorporating MaxLinear’s tuners, we affirm the ID’s finding that the accused televisions containing MaxLinear tuners practice this limitation, and clarify the basis of that affirmance. Specifically, as described below we find that the televisions practice the “in accordance with” limitation on

³⁴ Thus, there are two independent bases for the [REDACTED]’s practice of the “in accordance with” limitation.

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the basis of how they process analog and digital RF signals, and not on an alleged configuration for foreign transmission standards.

We find that Cresta has failed to demonstrate that any accused television incorporating the MaxLinear tuners are configured for foreign transmission standards. Before the ALJ, Cresta never provided evidence regarding the capabilities of accused televisions containing MaxLinear products based upon the operation of the accused “signal processor” in connection with those televisions’ processing of foreign-formatted signals. As a result, Cresta, in hindsight, presents to the Commission cobbled-together evidence that it could have and should have presented to the ALJ. Cresta Comm’n Br. 8. By way of example, Cresta points to its expert’s, Dr. Snelgrove’s, testimony at CX-2024C at Q/A 385-88. This testimony, however, concerns the “plurality of demodulators” limitation of claim 1 of the ’585 patent, and not the “signal processor” limitation. Dr. Snelgrove was silent as to the operation of any televisions with respect to the “signal processor” limitations of claim 1 of the ’585 patent. *Id.* at Q/A 384. Cresta presented no testimony interpreting or explaining the litany of documents that it now purports to present to the Commission concerning the operation of the accused televisions for foreign-formatted signals. *Compare* Cresta Comm’n Br. 8 *with* Cresta Post-Hearing Br. 85. These arguments, having not been timely presented to the ALJ, have been waived. Order No. 2 ¶ 11.1 (Ground Rules) (“All other issues” not presented in the opening post-hearing briefs “shall be deemed waived.”).

In its post-hearing brief, Cresta argued that the accused televisions containing the accused MaxLinear tuners practice the “signal processor” claim limitation by virtue of

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processing analog and digital RF signals.³⁵ Cresta Post-Hearing Br. 85. The respondents, while advancing other non-infringement arguments concerning the “signal processor” claim limitation, did not dispute that to the extent that MaxLinear’s tuners meet this claim limitation based upon the processing of analog and digital signals, that the accused televisions containing those MaxLinear tuners practice this claim limitation as well. Accordingly, we find that the accused televisions containing the accused MaxLinear tuners practice this claim limitation.

b) Applying “one of a plurality of finite impulse response filters . . . corresponding to a format of” the “input RF signal”

(i) Silicon Labs

For the second of the two limitations at issue on Commission review, the ID finds that Cresta failed to prove infringement of this limitation by Silicon Labs’ products. ID at. at 67-68. As for the earlier “in accordance with” limitation, Cresta alleged that the filter application in the Silicon Labs products was based upon input RF signal bandwidth and, separately, based upon whether the input RF signal was analog or digital. Cresta Post-Hearing Br. 79-81. Cresta’s expert offered no testimony to support Cresta’s allegations based upon bandwidth differences. CX-2024C at Q/A 350. Cresta’s briefing to the Commission offers no support in the evidentiary record for allegations concerning [REDACTED] in the accused Silicon Labs products. Cresta Comm’n Br. 17-18. As to analog versus digital signals, Cresta relied in part upon certain testimony of Silicon Labs employee Alan Hendrickson. *Id.* We determined not to review the ID’s exclusion of that testimony. 80 *Fed. Reg.* at 26092. Cresta also relied upon a programming guide for Silicon Labs tuners. CX-2024C at Q/A 350 (citing JX-54C.112). We

³⁵ It is not genuinely disputed that the Federal Communications Commission requires televisions to support both analog and digital input RF signals. *See* Cresta Post-Hearing Br. 57 n.54 (citing FCC Pub. No. 218634 (Dec. 19, 2009)).

find that the fact that the tuners may be capable of “ [REDACTED] [REDACTED],” *id.*, is insufficient to demonstrate that the tuners are capable of applying a filter based upon a format without modification; indeed the “custom” nature presumes modification. Cresta’s argument here, which assumes the contribution of custom-designed filters, is indistinguishable from *Nazomi Communications, Inc. v. Nokia Corp.*, 739 F.3d 1339, 1346 (Fed. Cir. 2014). We therefore affirm the ID’s finding that Cresta failed to demonstrate that Silicon Labs tuners practice this claim limitation.³⁶ ID at 67-68.

(ii) MaxLinear

The ID finds that MaxLinear’s application of one of several finite impulse response filters practices the disputed limitation of claims 10, 12 and 13 of the ’585 patent. ID at 79-80. On review, we affirm the ID. We reject MaxLinear’s contentions that MaxLinear’s tuners do not apply filters based upon a format of an incoming signal. Resp’ts Comm’n Br. 25-27 (arguing that its tuners do not process “in accordance with” format, but instead based on “bandwidth, source, and clock rate”); *see supra* note 27 (discussing formats and characteristics). The respondents did not dispute that, should the MaxLinear tuners be found to infringe, that the accused televisions containing MaxLinear tuners infringe based upon the filters used to process analog and digital signals. *See* ID at 80 (NTSC and ATSC); Resp’ts Post-Hearing Reply Br. 72-73; MaxLinear Pet. 19-24. As noted earlier, however, Cresta failed

³⁶ As noted above, *see supra* note 35, it is not genuinely disputed that the Federal Communications Commission requires televisions to support both analog and digital input RF signals. But even if Cresta demonstrated that televisions must support analog and digital input RF signals, Cresta has failed to show that any accused televisions containing Silicon Labs tuners do so in the manner required by the claims, specifically with regard to the application of “one of a plurality of finite impulse response filters . . . corresponding to a format of” the “input RF signal.”

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to demonstrate that the accused televisions containing MaxLinear tuners are capable of processing foreign-formatted signals.

5. Contributory Infringement

All of the asserted claims of the '585 patent call for a "plurality of demodulators." Claim 8 of the '792 patent calls for "a demodulator circuit for demodulating the first output signal and second output signal according to the television signal format of the input RF signal." Except for the Silicon Labs [REDACTED] tuner (which contains [REDACTED]), the accused tuners do not contain these claimed demodulators; accordingly Cresta's allegations of infringement by Silicon Labs' and MaxLinear's tuners as to these claims was based upon contributory infringement under 35 U.S.C. § 271(c). Section 271(c) provides:

Whoever 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 especially made or especially adapted for use in an infringement of such patent, and not a staple article or commodity of commerce suitable for substantial noninfringing use, shall be liable as a contributory infringer.

Id.

In its complaint, Cresta pleaded that the respondents contributorily infringe the asserted patents in part because the respondents "know such devices to be especially made or especially adapted for uses that infringe the" asserted patents.³⁷ First Amended Compl. of Cresta Tech. Corp. Under Section 337 of the Tariff Act of 1930, as Amended ¶ 90 (Apr. 21, 2014); *accord* Verified Compl. of Cresta Tech. Corp. Under Section 337 of the Tariff Act of 1930, as

³⁷ We find, as did the ID, that the accused tuners are a material part of the invention, as required for contributory infringement, 35 U.S.C. § 271(c). *See* ID at 69, 82, 90, 97.

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Amended ¶ 84 (Jan. 28, 2014); *see also id.* Exs. 44-45 & 47-48 (infringement claim charts for claim 1 of the '585 patent and claim 1 of the '792 patent). In proceedings before the ALJ, Cresta argued that the “knowledge requirement” for contributory infringement was “satisfied, at a minimum, by service of the complaint on all Respondents.” Cresta Post-Hearing Br. 54, 57. The respondents’ only rebuttal to Cresta’s allegations of contributory infringement before the ALJ concerned certain allegedly substantial noninfringing uses of the accused products.³⁸ *See, e.g.,* Resp’ts Post-Hearing Br. 73 n.22, 96-97, 145-46 (hypothetical uses of accused products); Resp’ts Post-Hearing Reply Br. 57-59, 93 (same). OUII did not raise any issues regarding contributory infringement, including substantial noninfringing uses. OUII Post-Hearing Br. 39-43, 52; OUII Reply Post-Hearing Br. 3-5, 7-8. We find that Silicon Labs, MaxLinear, and OUII waived all arguments concerning the respondents’ knowledge for purposes of contributory infringement.

A finding of contributory infringement requires, *inter alia*, the accused infringer’s “knowledge of the existence of the patent that is infringed.” *Global-Tech Appliances, Inc. v. SEB SA*, 131 S. Ct. 2060, 2068 (2011). In the ID, the ALJ stated that this knowledge was provided “at least as of the filing of the Complaint.” ID at 69, 82, 90, 97. The ID relies upon the Commission opinion in *Certain Inkjet Ink Cartridges with Printheads & Components Thereof*, Inv. No. 337-TA-723, Comm’n Op. at 8, 18-19 (Dec. 1, 2011). OUII petitioned for review of this determination, based on an alleged inconsistency in Commission opinions regarding whether such knowledge may be proven by service of the complaint or whether pre-complaint knowledge of the patent is required. OUII Pet. 9-10. The respondents did not

³⁸ As will be discussed, *infra*, for the Si2185 tuner, Silicon Labs also argued that no acts of direct infringement had been demonstrated. *See* Resp’ts Post-Hearing Br. 97.

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petition for review on this point, nor did they respond to, much less support, OUII's position in their reply to the other petitions. Resp'ts Pet. Reply 27-28 (discussion of the OUII petition limited to support of OUII's arguments regarding the technical prong of the domestic industry requirement).

While the respondents and OUII have waived any challenge to contributory infringement other than alleging substantial non-infringing uses, Order No. 2 ¶ 11.1 (Ground Rules), we granted review solely to clarify any inconsistency in our precedent with regard to knowledge of the patent and to address respondents' challenge to the ID's determination as to whether the accused products had substantial non-infringing uses.

On review, the Commission notes that there is no guiding Federal Circuit case on point,³⁹ and there is a lack of uniformity in the district courts as to what is sufficient to provide knowledge of the asserted patents.⁴⁰ In the context of section 337, we conclude that service of a section 337 complaint can be adequate to provide knowledge of the asserted patents. The Commission's Rules of Practice and Procedure dictate that complaints provide highly detailed information concerning the asserted patents and complainant's infringement allegations.⁴¹

³⁹ We do not agree with Cresta that the Federal Circuit endorsed any position in *In re Bill of Lading Transmission & Processing System Patent Litig.*, 681 F.3d 1323 (Fed. Cir. 2012). See Cresta Comm'n Br. 29. *Bill of Lading* instead turned on pleading requirements concerning substantial noninfringing uses (contributory infringement) and knowledge that induced acts cause patent infringement (inducement). *Bill of Lading*, 681 F.3d at 1339-40.

⁴⁰ According to one district court decision, "a majority of district courts considering this issue" have held that a complaint can provide the requisite knowledge of the asserted patents. *Rembrandt Social Media, LP v. Facebook, Inc.*, 950 F. Supp. 2d 876, 881 (E.D. Va. 2013). Other district courts, taking what *Rembrandt* characterizes as the "minority view," *id.* at 881, find that knowledge of the patents cannot come from the complaint, *id.* at 881 & n.4.

⁴¹ Beyond providing knowledge of the patent, section 337 complaints are required by the Commission's Rules of Practice and Procedure to provide the complainant's

[Footnote continued on next page]

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Moreover, remedies available under Section 337 are wholly prospective. 19 U.S.C. § 1337(d),

(f). Consequently, policies supporting a requirement that a pleading aver pre-complaint knowledge differ in important respects at the Commission than in the district courts.⁴²

[Footnote continued from previous page]

infringement contentions. See 19 C.F.R. § 210.12(a)(9)(vii) (identification in the complaint of the specific claims alleged to be infringed); *id.* § 210.12(a)(9)(viii) (patent infringement contention charts to be included in the complaint); *id.* § 210.12(a)(9)(x) (requiring in the complaint drawings, photographs, or other visual representations of the accused articles). Commission rules also require complaints to include certified copies of the prosecution history for each asserted patent as well as copies of all patents and technical references cited in the prosecution history. *Id.* § 210.12(c). Nonetheless, respondents sometimes argue that they lack the *mens rea* to be liable for indirect infringement despite the allegations of the complaint. See, e.g., *Certain Electronic Digital Media Devices and Components Thereof*, Inv. No. 337-TA-796, Comm'n Op. 51-52 (Sept. 6, 2013) (the belief of the existence of substantial noninfringing uses may preclude knowledge of infringement); *Certain Mobile Devices, Associated Software, and Components Thereof*, Inv. No. 337-TA-744, Comm'n Op. at 18-19 (June 5, 2012) (respondents' reasonable belief of noninfringement or invalidity after service of the complaint). See generally *Commil USA, LLC v. Cisco Sys., Inc.*, 135 S. Ct. 1920, 1926-27 (2015). Neither the respondents nor OUII raised such timely arguments in this investigation in response to Cresta's argument before the ALJ that the "knowledge requirement" for contributory infringement was "satisfied, at a minimum, by service of the complaint on all Respondents," Cresta Post-Hearing Br. 54.

⁴² *Rembrandt*, among other district court decisions, has held that pre-complaint knowledge need not be pleaded in a civil action. *Rembrandt*, 950 F. Supp. 2d at 881. Respondents note that some district courts have interpreted the operation of the Federal Rules of Civil Procedure differently with regard to the pleading requirements for a civil action. See Resp'ts Comm'n Br. 28 n.7. Neither the respondents nor OUII presented such arguments or case law to the ALJ, in violation of the Ground Rules. Order No. 2 ¶ 11.1 (Ground Rules). While we are bound by our own pleading requirements, as opposed to the Federal Rules of Civil Procedure, we do not, in any event, find such cases persuasive. Nor do we find that our decision "would 'vitiate the Supreme Court's holding in *Global-Tech* that an allegation of knowledge of a patent is required to state a claim for induced infringement.'" Resp'ts Comm'n Br. 28 n.7 (quoting *Brandywine Comm'n Techs. v. T-Mobile USA, Inc.*, 904 F. Supp. 2d 1260, 1268-69 (M.D. Fla. 2012)). In *Global-Tech*, which involved inducement, infringement was alleged to occur before the filing of the complaint, and damages were assessed for that infringement. See *SEB S.A. v. Montgomery Ward & Co.*, 594 F.3d 1360, 1365 (Fed. Cir. 2010), *aff'd sub nom.*, *Global-Tech Appliances, Inc. v. SEB S.A.*, 563 U.S. 754 (2011).

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OUII's petition for review suggests that *Certain Video Game Systems and Wireless Controllers and Components Thereof*, Inv. No. 337-TA-770, Comm'n Op. at 31-32 (Oct. 28, 2013), runs contrary to the Commission's precedent regarding when the complaint can serve as knowledge of the patent. To the extent that *Video Games* is read in a way that is inconsistent with this Opinion, the Commission, on review, clarifies that this Opinion governs.

The only arguments against contributory infringement that have been preserved by the respondents involve substantial non-infringing uses.⁴³ For the '585 patent, the ID found that there are no substantial noninfringing uses for MaxLinear's tuners because only the tuners put to specific uses fall within the scope of the investigation. ID at 82 ("Cresta is not accusing any cable or satellite TV set-top boxes in this Investigation, however, and my infringement findings are limited to the SoCs where Cresta has identified a 'plurality of demodulators' infringing claim 1 of the '585 patent."). The Commission solicited further briefing on this issue. 80 *Fed. Reg.* at 26093 (briefing topic "e"). We find the ID erred in concluding that *accused uses* of a component preclude consideration of substantial non-infringing uses of the component that are not accused.⁴⁴

⁴³ Respondents, for the first time in this investigation, contend that Cresta should have, but did not, "present evidence of post-complaint acts of alleged contributory infringement (where the complaint serves as the purported evidence of knowledge) in order to prove a contributory infringement claim." Resp'ts Comm'n Br. 28-29. Respondents never made this argument before the ALJ and it is now clearly waived. The ALJ reasonably relied upon Cresta's evidence and arguments in the post-hearing brief with regard to the knowledge requirement of contributory infringement under *Inkjet Ink Cartridges*, Comm'n Op. at 8, 18-19 (Dec. 1, 2011), inasmuch as neither the respondents nor OUII offered any argument or evidence to the contrary on this point. In any event, the record reflects that respondents have admitted the continuing importation of the accused articles. See Resp'ts Post-Hearing Br. 231; see also Resp'ts Comm'n Br. 53.

⁴⁴ Cresta does not defend the ID's statement on page 82, but deems it "superfluous." Cresta Comm'n Br. 35.

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The proper test for substantial noninfringing uses for contributory infringement is set forth in *Ricoh Co. v. Quanta Computer Inc.*, 550 F.3d 1325 (Fed. Cir. 2008). In that case, the Federal Circuit held that if a subcomponent (in that case, a microcontroller) contributes to infringement, the fact that the subcomponent is part of a larger component (an optical disc drive) does not negate contributory liability solely on the ground that the larger component is capable of substantial noninfringing uses. *Id.* at 1337-38. Thus, in considering substantial noninfringing uses in this case, we focus on the components accused of contributory infringement, the tuners. That a television (which directly infringes) might have noninfringing uses—*e.g.*, using a video input in the television for which the tuner is not utilized, *see, e.g.* Resp'ts Comm'n Br. 32 (connection of the television to a set-top box)—is immaterial.

As to the component at issue for substantial noninfringing uses in this investigation—the tuner—we find that Cresta met its burden to demonstrate that there are no substantial noninfringing uses of Silicon Labs' or MaxLinear's tuners.⁴⁵ This is not because only certain uses are accused in this investigation, but because Cresta met its burden to demonstrate the lack of substantial noninfringing uses. For the accused Silicon Labs tuners, our noninfringement determinations above concerning foreign-formatted signals (*i.e.*, the [REDACTED]); intermediate frequencies of digital and analog TV signals (*i.e.*, [REDACTED]) and the [REDACTED] moot some of the alleged substantial noninfringing uses argued by Silicon Labs here. We thereby do not reach whether, had we found direct infringement by the [REDACTED] tuners, there would have been substantial

⁴⁵ See generally *Golden Blount, Inc. v. Robert H. Peterson Co.*, 438 F.3d 1354, 1363-64 (Fed. Cir. 2006) (explaining that the patentee bears the burden of persuasion to show no substantial noninfringing uses, but the burden of production can shift to the accused infringer).

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noninfringing uses.⁴⁶ We also do not consider whether the [REDACTED] tuner contributes to infringement because Cresta has failed to identify any act of direct infringement by a television containing it. Resp'ts Post-Hearing Br. 97.

The respondents argued in their briefing to the ALJ that, hypothetically, Silicon Labs tuners could be programmed by certain host software so as not to infringe the asserted patent claims. Resp'ts Post-Hearing Br. 145-46; Resp'ts Post-Hearing Reply Br. 58-59, 93. This is not enough. *See Toshiba Corp. v. Imation Corp.*, 681 F.3d 1358, 1362 (Fed. Cir. 2012) (noninfringing uses are substantial “when they are not unusual, far-fetched, illusory, impractical, occasional, aberrant, or experimental”). We have reviewed Professor McNair’s testimony, RX-1991C Q/A 435-38 (’585 patent) and Q/A 531-546 (’792 patent). We reject his assertions that his hypothetical uses for Silicon Labs products refute Cresta’s demonstration of no substantial noninfringing uses.

The ALJ, reviewing all of the testimony presented to her, nonetheless identified a different possible noninfringing use as combination of a MaxLinear tuner with cable or satellite television set-top boxes that contain one demodulator, and not the “plurality of demodulators” required by the ’585 patent claims. ID at 82 (citing Hashemi, RX-1996C at Q/A 181 & 182). This argument was not raised by MaxLinear in the post-hearing briefs. We find MaxLinear’s arguments to have been waived for failure to have raised them in a timely fashion, and in violation of the Ground Rules of the investigation. In addition, Dr. Hashemi offered nothing

⁴⁶ For example, the respondents argue that [REDACTED]. Resp'ts Post-Hearing Br. 72-73 n.22. We found that Cresta failed to demonstrate direct infringement as to these products under that infringement theory. Accordingly, the respondents’ argument that “it would be a substantial noninfringing use” to use these tuners with certain host software, *id.*, is moot.

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cognizable as to substantial noninfringing uses, such as actual uses of MaxLinear's accused tuners in cable boxes. Nor did either of Dr. Vander Veen's witness statements, RX-1676C and RX-1999C, to which Dr. Hashemi points in his witness statement. In contrast to Dr. Hashemi's conclusory and unsupported statement, Cresta's expert Dr. Snelgrove explained in detail why there are no substantial noninfringing uses for the accused Silicon Labs and MaxLinear tuners. CX-2024C Q/A 415-427.

MaxLinear purports to offer more in its brief to the Commission, but it is a hindsight cobbling together of evidence that it could have and should have presented to the ALJ. Resp'ts Comm'n Br. 31-34. Silicon Labs, which did not petition for review as to the ID's finding of no substantial noninfringing uses of its tuners, also presents newfound arguments in its briefing to the Commission, and they too have been waived. *See* Cresta Comm'n Br. 33-34; Cresta Comm'n Reply Br. 28-30; *cf.* OUII Comm'n Br. 10. In any event, these arguments, based upon the Silicon Labs [REDACTED], are moot because there was no finding of direct infringement based upon them. Accordingly, we find that Cresta has demonstrated that there are no substantial noninfringing uses for the accused Silicon Labs and MaxLinear tuners for which direct infringement has been demonstrated. We thus further affirm the ID's finding of contributory infringement with respect to these same tuners.⁴⁷

⁴⁷ While we have found that the ALJ did not err in determining that the knowledge requirement for contributory infringement is satisfied in this investigation for the reasons set forth earlier, the respondents' knowledge of the asserted patents combined with the lack of substantial noninfringing uses provides an alternative basis for finding the knowledge requirement to have been met. *Spansion, Inc. v. ITC*, 629 F.3d 1331, 1355 (Fed. Cir. 2010).

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C. Invalidity

In our notice of review, we determined not to review the ID's finding that claims 1-4 and 25-26 of the '792 patent are anticipated by the '585 patent; and not to review the ID's finding that claims 1 and 2 of the '585 patent are anticipated by the Boie patent application (RX-10). 80 *Fed. Reg.* at 26092. We determined to review and affirm certain findings in the ID concerning invalidity under 35 U.S.C. § 112. 80 *Fed. Reg.* at 26092. We also determined to review the ID's findings concerning an on-sale bar that invalidates claims 1-4, 7-8, and 26-27 of the '792 patent. On review, we affirm the ID's findings concerning the on-sale bar and adopt its reasoning. ID at 142-47.

We also determined to review certain findings regarding obviousness that involved one or both of Boie and the Van de Plassche patent (RX-30) ("VDP").⁴⁸ 80 *Fed. Reg.* at 26092. On review, we affirm the ID's finding that claim 3 of the '585 patent is obvious in view of Boie combined with the Kerth patent (RX-33). The ALJ found that "it would have been obvious to one of ordinary skill in the art to modify Boie to use a well-known digital-to-analog converter coupled to a well-known demodulator receiving analog inputs." ID at 115. We agree. Professor McNair explained that because industry standard demodulators had analog inputs, it would have been obvious to a person of ordinary skill in the art to include a digital-to-analog converter in between the output of Boie's channel filter and a demodulator, in order to

⁴⁸ We have determined to affirm the ID's findings concerning secondary considerations of obviousness as to the '585 patent, ID at 122-25, and we find that those same findings regarding secondary considerations apply to the '792 patent.

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use those standard demodulators. RX-1677C Q/A 285. Kerth provides one such example.⁴⁹ *Id.* at Q/A 286. Accordingly, we affirm the ID's finding of obviousness of claim 3 of the '585 patent.

Our review also encompasses the combination of Boie and the VDP patent (RX-30) for claims 10, 12, and 13 of the '585 patent. The ID finds these claims not obvious. ID at 117 (Boie alone), 132-34 (VDP). We sought further briefing on this issue. 80 *Fed. Reg.* at 26093 (briefing topic "f"). Cresta has admitted that the validity of claims 1-4 and 26 of the '792 patent rise and fall with claims 10, 12, and 13 of the '585 patent. Cresta Pet. Reply 41, 43.

As discussed below, we find that the ID erred in finding claim 10 of the '585 patent (and thereby claims 1-4 of the '792 patent)⁵⁰ not invalid.

Claim 10 discloses and claims:

The receiver of claim 1, wherein said signal processor applies one of a plurality of finite impulse response filters to said digital representation of said intermediate signal, each of said plurality of finite impulse response corresponding to a format of said input RF signal.

The ID found that the "only limitation of claim 10 not disclosed in Boie is the implementation of the band-pass filter 8 as a plurality of FIR filters wherein 'each of said plurality of finite impulse response [filters] corresponding to a format of said input RF signal." ID at 117 (modification in the ID). The ID found that the testimony of Professor McNair concerning the

⁴⁹ In their briefing, the respondents have improperly gone beyond the scope of Commission review by arguing invalidity of claim 3 of the '585 patent based upon Boie in view of prior art other than Kerth. Resp'ts Comm'n Br. 54.

⁵⁰ As noted earlier, claim 1 of the '792 patent is substantially similar to claim 10 of the '585 patent. While claims 2-4 of the '792 patent include limitations not found in claim 10 of the '585 patent, Cresta has not argued that any of those additional limitations are absent in the prior art. *See* Cresta Pet. Reply 41. Respondents have established that these additional limitations are disclosed in the prior art. ID at 135-36, 150-152.

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knowledge of one skilled in the art only cited examples of “single filters with multiple coefficients stored in memory” and that this was insufficient to render claim 10 with the plurality of FIR filters obvious. ID at 118.

In the prior art, as taught by the '585 patent, a bank of filters (*i.e.*, multiple filters) was used, because the filters were preprogrammed for each format of a television signal. '585 patent col. 2 lines 3-8, 12-14. The multiple filters are shown in Figure 1 of the '585 patent (channel filters **18a-18c**). In contrast, the invention in the '585 patent is for a programmable device that can process any television format. '585 patent col. 3 lines 25-35. The digital signal processor performs the filtering, as opposed to the discrete filters of the prior art. '585 patent col. 4 line 53 – col. 5 line 1. In particular, the DSP obtains the “coefficients” of filters’ functions “stored in a look-up table” in memory, and then applies a filter with those coefficients “to the incoming digital signals.” '585 patent col. 4 lines 61-64.

We agree with the respondents that the patent teaches that the filters can be programmable.⁵¹ See Resp’ts Comm’n Br. 35; RX-1677C Q/A 184. In so finding, we reverse the ID’s finding that “single filters with multiple coefficients stored in memory,” ID at 118, cannot satisfy the claim, *id.* at 117, which requires application of “one of a plurality of finite

⁵¹ MaxLinear now suggests that the filters must be programmable because its products use the filter bank shown in the '585 patent’s illustration of the prior art. Resp’ts Comm’n Br. 36-37. MaxLinear’s argument, however, goes beyond the scope of Commission review. In any event, the claim constructions properly impose no such requirement. The claims can be practiced by programmable filters, but nothing in the intrinsic record imposes such a requirement that they must be practiced by programmable filters.

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impulse response filters,” each of which corresponds “to a format of said input RF signal,” ’585 patent claim 10.⁵²

Furthermore, although Boie did not explicitly disclose the use of a FIR filter, the experts agreed that the FIR filter was the most natural choice for a filter.⁵³ RX-1677C at Q/A 296; Hr’g Tr. 1232:5-24 (Cresta’s expert) (“a person of ordinary skill at the time of the patent would be inclined to use a FIR filter”). *See generally KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 417 (2007). Accordingly, claim 10 of the ’585 patent is invalid in view of Boie and the knowledge of a person of ordinary skill.

We have also reviewed whether Boie in combination with VDP renders claim 10 obvious. In their petitions for review, the respondents argued in favor of this combination. MaxLinear Pet. 22-24; Silicon Labs Pet. 38-39. The motivation to combine the two references is strong: VDP is expressly an improvement upon Boie. VDP col. 1 line 15 – col. 2 line 3. VDP teaches a programmable filter that we find falls within the scope of claim 10 of the ’585 patent. VDP col. 8 lines 38-49. RX-1677C Q/A 297, 466, 511-13. Claim 10 is obvious in view of Boie and VDP combined. In VDP, there are a number of filters DF4-DF10, which

⁵² Cresta argues that the coefficients used in Boie’s filter are “*adaptive*, meaning that its coefficients must change on-the-fly in order to adapt to the reception conditions,” which “stands in contrast with the ‘cast-in-stone’ flavor of coefficients stored in memory,” and thus that Boie’s filters are “not programmable.” Cresta Comm’n Br. 37. Cresta asserts that “programmable filters are programmed by some external entity to a programmed (fixed) set of coefficients.” *Id.* Thus, Cresta now attempts to construe the patent claim as requiring a “‘cast-in-stone’ flavor of coefficients stored in memory,” challenging the now-accepted claim constructions. The respondents properly attack Cresta’s arguments as being both waived and incorrect. Resp’ts Comm’n Br. 30-32. The respondents are correct that the patent claims do not (and should not) be construed to be limited to Cresta’s “‘cast-in-stone’ flavor” of filters.

⁵³ We find that use of an FIR filter, a well-known filter with well-understood benefits, would have predictable results when used with the Boie patent. *See* RX-1677C at Q/A 296; Hr’g Tr. 1232:5-24.

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ordinarily process demodulated signals, VDP col. 6 lines 52-56, but which can be placed before the demodulator if the filters are digital, *id.* col. 9 lines 3-9. The effect of these seven filters (DF4-DF10) is to “provide various frequency responses IIfil1, IIfil2 associated with different transmission standards.” VDP col. 3 lines 5-8; *id.* col. 8 lines 59-61; Abstract. The use of DF4-DF10 is illustrated in Figure 5. DF4 is used for terrestrial TV transmissions. *Id.* col. 6 line 60. DF5-DF6 are used in connection with certain satellite transmission standards. *Id.* col. 7 lines 6-8. For another satellite standard, an additional filter DF7 is used too. *Id.* col. 7 lines 15-16. DF8 does not appear to be standard-based. *Id.* col. 7 lines 21-23. “Digital filters DF9 and DF10 filter the stream of symbols in accordance with standards for European and American digital cable TV transmissions, respectively.” *Id.* col. 7 lines 36-38. Figures 6A-15A recite preferred coefficients for each filtering operation. Col. 7 lines 63-65.

There is no dispute that the effect of the VDP filtering is to enable reception of television signals of different standards, through the application of different combinations of DF4-DF10. In its analysis of VDP standing alone, however, the ID finds that VDP’s cascade of filters does not correspond to the plurality of filters of claim 10 of the ’585 patent. In particular, the ID finds that “signal processor FIL, rather than applying one of a plurality of filters, applies multiple filters in sequence.” ID at 1133 (citing RX-0030 at Fig. 5). But some of the filters correspond to different formats, for example, DF9 and DF10, which filter the closed-caption information in U.S. and European signals, respectively. *See* RX-1677C Q/A 446, 511; *see also* RX-1663C Q/A 200. The respondents so demonstrated clearly and convincingly.

As further support for the conclusion that Boie in combination with VDP renders claim 10 obvious, we observe that VDP refers to a patent application that issued as U.S. Patent

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5,784,414 (RX-25) to Bruekers. VDP col. 5 lines 58-60 (“WO-A 96/8078 . . . describes a suitable manner of achieving anti-aliasing by means of a digital filter which carries out a scalar-vectorial conversion.”). That patent, in turn, explains: “Filters may be in the form of a general purpose digital signal processor with filter coefficients stored in a memory inside or outside this processor.” RX-25 col. 13 lines 2-7. This is precisely what claim 10 purports to claim.

Claim 12 of the ’585 patent calls for the signal processor of claim 1 to comprise “a first computing unit and a second computing unit, said first computing unit processing a real part of said finite impulse response filter operation while said second computing unit processing an imaginary part of said finite impulse response filter operation.” ’585 patent claim 12; *accord* ’792 patent claim 25. We find that the respondents did not provide clear and convincing evidence of obviousness in view of VDP alone or Boie and VDP combined.⁵⁴ We affirm and adopt the ALJ’s findings concerning the additional limitation of claim 12 (but not the ID’s reliance upon the nonobviousness of claim 10). ID at 119-120. We further find that the respondents’ arguments were too scant and conclusory to demonstrate invalidity clearly and convincingly. RX-1677C Q/A 305-06; Resp’ts Post-Hearing Br. 134-35; Cresta Post-Hearing Reply Br. 79-80.

⁵⁴ We determined to review the obviousness of claim 25 of the ’792 patent in view of VDP alone. For purposes of invalidity, that claim is admitted to be identical to claim 12 of the ’585 patent. *See* Cresta Pet. Reply 42-43. Accordingly, our obviousness findings apply to both claims.

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The respondents now argue that several filters in VDP contain the two computing units required by claim 12 of the '585 patent and claim 25 of the '792 patent.⁵⁵ Resp'ts Comm'n Br. 41; *see* VDP Fig. 5 (DF1, DF4 and DF8). Only the first filter (DF1), however, has been shown to have a real and imaginary part, ID at 120; *see* MaxLinear Pet. 29-30, and we find that the respondents failed to demonstrate that DF1's filtering operation is format-specific. *See* VDP col. 5 lines 33-60 (DF1 corrects transmission problems in the satellite signal prior to the processing of DF4-10). The respondents argue that the ID errs in finding that VDP lacks two separate computing units. Resp'ts Comm'n Br. 42. Such bare attorney argument cannot overcome the respondents' failure to explain the operation of VDP with respect to the additional limitation of claim 12. Accordingly, we find that the respondents failed to carry their burden to demonstrate the invalidity of claim 12 of the '585 patent and claim 25 of the '792 patent.⁵⁶

Claim 13 of the '585 patent adds to claim 10, *inter alia*, a limitation that the channel filter include a "standard selection circuit" that generates a "signal indicative of the format of" the input signal." We affirm and adopt the ID's findings concerning the additional limitation

⁵⁵ Cresta and OUII do not address the limitations of claims 12 and 13 of the '585 patent. While those claims fall within the scope of Commission review, *see* 80 *Fed. Reg.* at 26092 (review of Boie and VDP for all claims; review of Boie and Micronas for claim 26 of the '792 patent), the limitations in claims 12 and 13 of the '585 patent did not fall within the scope of requested briefing. For that reason, instead of responding to the arguments raised by the respondents, Cresta purports to rely upon its arguments to the ALJ and in its petition-stage submissions to the Commission regarding those claims. *See* Cresta Comm'n Reply Br. 31 n.12. To the extent Cresta argues that the issues are not under review by virtue of the scope of requested briefing, *id.*, Cresta errs. As noted earlier, parties were not limited to the issues recited in the requested briefing questions. Indeed, Cresta itself has gone beyond the requested questions in its own briefing. Cresta Comm'n Br. 49-50.

⁵⁶ In so concluding, we find that Dr. Caloyannides did not admit that VDP discloses the limitation of claim 12. Resp'ts Post-Hearing Br. 134-35; Hr'g Tr. 1246-48.

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of claim 13 (but not the ID's reliance upon the nonobviousness of claim 10). ID at 122. In its petition for review, Silicon Labs argued that claim 13 is obvious in view of Boie or in view of Boie combined with Micronas, Silicon Labs Pet. 39-41, while MaxLinear argued that the claim is obvious in view of Boie combined with VDP, MaxLinear Pet. 24-25. The Commission granted review as to Boie and VDP generally, and as to Boie and Micronas (RX-38) for claim 26 of the '792 patent.⁵⁷ Claim 26 of the '792 patent and claim 13 of the '585 patent, necessarily rise and fall together. Cresta Pet. Reply 43.

The respondents' arguments for the invalidity of claim 13 of the '585 patent and claim 26 of the '792 patent are conclusory and insufficient to demonstrate obviousness clearly and convincingly. For Boie, they argue that a person of ordinary skill "would understand that there must be a TV selection circuit coupled to the band-pass filter 8 to generate a signal that enables selection of the proper coefficients for the band-pass filter 8 in response to the format of the input RF signal." Resp'ts Comm'n Br. 44; *see* RX-1677C Q/A 308-09. Respondents' mere recitation that a person of ordinary skill would include the feature of claim 13 is not enough to demonstrate invalidity clearly and convincingly. *See, e.g., ActiveVideo Networks, Inc. v. Verizon Commc'ns, Inc.*, 694 F.3d 1312, 1327 (Fed. Cir. 2012). The respondents also presented the combination of Boie and Micronas. Micronas (RX-38) is relied upon to fill in a gap by providing an example of a standard selection circuit. *See* RX-1677C Q/A 309-10. The respondents' testimony, however, is too conclusory to demonstrate obviousness clearly and convincingly.

⁵⁷ Because claim 26 of the '792 patent is admitted to be identical to claim 13 of the '585 patent for purposes of invalidity, Cresta Pet. Reply 43, our obviousness findings apply to both claims.

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For the foregoing reasons, we find the following patent claims obvious: claim 3 of the '585 patent (Boie and Kerth); claim 10 of the '585 patent (Boie as well as Boie and VDP); and claims 1-4 of the '792 patent (Boie, as well as Boie and VDP, for the same reasons as claim 10 of the '585 patent). We find that the respondents failed to meet their burden to show invalidity clearly and convincingly as to claim 12 of the '585 patent and corresponding claim 25 of the '792 patent (VDP alone, or VDP and Boie) and as to claim 13 of the '585 patent and corresponding claim 26 of the '792 patent (Boie alone, or Boie and Micronas).

D. The Domestic Industry Requirement

A complainant must establish that an industry “relating to the articles protected by the patent . . . exists or is in the process of being established” in the United States. 19 U.S.C. § 1337(a)(2). Under Commission precedent, the domestic industry requirement of section 337 consists of an “economic prong” and a “technical prong.” *See, e.g., Alloc, Inc. v. ITC*, 342 F.3d 1361, 1375 (Fed. Cir. 2003).

To meet the technical prong, the complainant must establish that it practices at least one claim of the asserted patent. *See Certain Microsphere Adhesives, Process for Making Same, and Products Containing Same, Including Self-Stick Repositionable Notes*, Inv. No. 337-TA-366, Comm’n Op., 1996 WL 1056095, at *7-8 (Jan. 16, 1996). “The test for satisfying the ‘technical prong’ of the industry requirement is essentially the same as that for infringement, *i.e.*, a comparison of domestic products to the asserted claims.” *Alloc*, 342 F.3d at 1375.

The “economic prong” of the domestic industry requirement is satisfied when it is determined that sufficient economic activities and investments set forth in subsections (A), (B), and/or (C) of subsection 337(a)(3) demonstrate that a domestic industry exists or is in the process of being established. *Certain Variable Speed Wind Turbines & Components Thereof*,

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Inv. No. 337-TA-376, USITC Pub. No. 3003, Comm'n Op. 21 (Nov. 1996). With respect to the "economic prong," 19 U.S.C. § 1337(a)(2) and (3) provide, in full:

(2) Subparagraphs (B), (C), (D), and (E) of paragraph (1) apply only if an industry in the United States, relating to the articles protected by the patent, copyright, trademark, mask work, or design concerned, exists or is in the process of being established.

(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, mask work, or design 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.

Given that these criteria are listed in the disjunctive, satisfaction of any one of them is sufficient to meet the economic prong of the domestic industry requirement. *Wind Turbines*, Comm'n Op. at 21.

In general, a domestic industry must exist or be in the process of being established at the time of the filing of the complaint. *Motiva, LLC v. ITC*, 716 F.3d 596, 601 n.6 (Fed. Cir. 2013). The Commission has considered evidence subsequent to the filing of the complaint only in very specific circumstances, *i.e.*, "when a significant and unusual development has occurred after the complaint has been filed." *Certain Video Game Systems and Controllers*, Inv. No. 337-TA-743, Comm'n Op. at 5 (Jan. 20, 2012). Extraordinary developments prompting a post-complaint analysis have included bankruptcy, a change in patent ownership, manufacturing, or licensing activity. *Id.* at 5-6; *see Electronic Imaging Devices*, Inv. No. 337-TA-726, Order No. 18 at 8-11 (Feb. 7, 2011) (unreviewed) (licensing activity); *Certain*

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Semiconductor Integrated Circuits and Products Containing Same, Inv. No. 337-TA-665, Final Initial Determination at 229-30 (Oct. 19, 2009) (unreviewed in relevant part) (bankruptcy); *Certain Video Graphics Display Controllers, and Products Containing Same*, Inv. No. 337-TA-412, Final Initial Determination at 12-13 (May 17, 1999) (unreviewed in relevant part) (manufacturing and licensing); *Wind Turbines*, Inv. No. 337-TA-376 (Remand), Comm'n Op. 4, 10-13 (Aug. 21, 1997) (manufacturing and licensing activity); *Wind Turbines*, Inv. No. 337-TA-376, Comm'n Op. 22-26 (Sept. 23, 1996) (licensing).

1. The Technical Prong of the Domestic Industry Requirement

The ALJ found that Cresta had demonstrated the existence of articles practicing the '792 patent. ID at 201-07. We determined not to review those findings. 80 *Fed. Reg.* at 26092-93. The ALJ also found that the Cresta XC5000A series tuner, incorporated into certain ■■■ televisions, practices claims 1-3, 5-6, 10, 13, 16-19, and 21 of the '585 patent. *Id.* at 193-201. OUII's petition for review questioned whether Cresta had demonstrated the existence of any televisions in the United States that practiced the asserted '585 patent claims. OUII Pet. 11. We determined to review the ID's finding that the technical prong had been met as to the XC5000A product for the '585 patent.⁵⁸ *Id.*

In proceedings before the ALJ, the respondents argued that Cresta had not demonstrated the existence of any specific ■■■ televisions in the United States with a plurality of demodulators that included Cresta's tuner. Resp'ts Post-Hearing Br. 121. They note that

⁵⁸ To the extent that our grant of review is read to encompass the technical prong for the '792 patent as it concerns the XC5000A tuner, we affirm the ID's findings as to the technical prong for the '792 patent. ID at 201-07 (finding that Cresta practices all of the domestic-industry patent claims of the '792 patent except claim 27). The '792 patent claims upon which Cresta relied for domestic industry do not call for the demodulators recited in the claims of the '585 patent.

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Cresta's evidence is from 2009 and that Cresta offered no evidence as to any televisions more recent, and that [REDACTED] had not been a Cresta customer since approximately [REDACTED]. *Id.* In the alternative, the respondents observed that to the extent that Cresta demonstrated any protected articles, those articles would have incorporated the XC5000A, as opposed to Cresta's other tuners. The ID relied upon that alternative argument. ID at 194-95.

Section 337 requires that a domestic industry exist "with respect to articles protected by the patent." 19 U.S.C. § 1337(a)(3). The question here is whether Cresta adequately identified any articles protected by the '585 patent, in this case televisions with Cresta tuners and with a plurality of demodulators.

On review, we find that the ALJ erred in crediting Cresta's showing as to the [REDACTED] televisions that incorporate the XC5000A tuner. Before the ALJ, Cresta offered schematics of two [REDACTED] televisions that omit model numbers. CX-1167C; CX-1398C. Cresta asserted that these schematics are those of domestic industry products, without demonstrating the existence of [REDACTED] televisions made in accordance with those schematics. *See, e.g.*, Cresta Post-Hearing Br. 112-14; Cresta Post-Hearing Reply Br. 69-70; CX-2024C Q/A 169 (citing CX-1167C and CX-1398C). We conclude that Cresta failed to meet its burden to establish the existence of protected articles as to the '585 patent, in which each claim calls for a "plurality of demodulators." That conclusion is consistent with the ID's infringement-related determinations, which we determined not to review, that Cresta's showing about representative products fails.⁵⁹

⁵⁹ Had Cresta demonstrated the existence of protected articles with respect to the '585 patent, we agree with the ID that Cresta's demonstration would have concerned only the XC5000A tuner. *See* ID at 194-95.

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2. The Economic Prong of the Domestic Industry Requirement

Cresta alleged the existence of a domestic industry under subparagraphs (A), (B), and (C) of section 337(a)(3). See ID at 168 n.22. Under subparagraphs (A) and (B), Cresta relied upon the development and support of its television tuners. Cresta Post-Hearing Br. 192-94. Cresta's showing under subparagraph (C) was based upon engineering and research and development, as opposed to licensing. *Id.* at 209-12. The ID held that the evidence relied upon by Cresta to establish its investments in a domestic industry was unreliable. ID at 168-78, 188-90. As a result, Cresta failed to carry its burden of proof as to the economic prong of the domestic industry requirement. *Id.* Further, the ID found that Cresta's claimed domestic industry ceased to exist at least six months prior to the filing of the complaint; and, therefore, Cresta did not prove that a domestic industry existed at the time the complaint was filed. *Id.* at 179-87. Cresta petitioned for review, and we determined to review the ID's findings regarding the economic prong of the domestic industry requirement. On review, as discussed below, we affirm the ID's determination that the economic prong was not met,⁶⁰ both because of the unreliability of Cresta's evidence, and independently, because Cresta's claimed domestic industry did not exist at the time the complaint was filed.⁶¹

⁶⁰ We find it unnecessary to rely upon the ID's statements in footnotes 30 and 41 of the ID in order to affirm the ID's determination that the economic prong was not satisfied, and we therefore vacate the findings in those footnotes.

⁶¹ Commissioner Schmidlein agrees that Cresta failed to demonstrate the existence of a domestic industry based upon the unreliability of Cresta's evidence and therefore joins the Commission in affirming the ALJ on this basis. Commissioner Schmidlein, however, does not join the Commission in its alternative basis for affirming the ALJ and writes separately to explain her views.

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a) Overview of Cresta's Business Activities

On January 28, 2014, Cresta filed a complaint alleging a domestic industry based upon its TV-tuner business under subparagraphs (A), (B), or (C). Cresta's alleged investment and activities spanned from October 2011-September 2012 ("Year 1") to October 2012-September 2013 ("Year 2").⁶² These activities consisted primarily of the design, engineering and support of the XC5000 and CTC70X series tuners.⁶³ ID at 169. Cresta's involvement with the tuners at issue began in September 2011 when Cresta purchased the assets of Xceive Corp, including the two patents asserted in this investigation. *Id.* at 171-72. Cresta acknowledges that the XC5000 series products were actually designed by Xceive. ID at 169, n.24. Cresta's activities related to the XC5000 series consisted of "product support activities on those products." *Id.* With respect to the CTC70X tuners, Cresta furthered development work on those products after their acquisition from Xceive in addition to providing product support. *Id.*

Beginning in early 2012, Cresta's business model began to shift away from its tuner business. [REDACTED]

[REDACTED]

[REDACTED]

⁶² Cresta filed an amended complaint on June 12, 2014.

⁶³ In the witness statement of Cresta's Chief Financial Officer (Mr. Lewis), Cresta belatedly attempted to expand its domestic industry to cover its investments related to the CTC71X series tuners. Aside from Cresta's failure to rely on those investments in a timely manner, the Commission agrees with the ALJ that evidence set forth by Cresta does not demonstrate cognizable investment in the domestic industry. ID at 172-73. Cresta's investment in those tuners, therefore, do not form part of its domestic industry relevant to this investigation.

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[REDACTED].⁶⁴ ID at 180-82. [REDACTED], in late 2012, Cresta hired a new CEO and added a new board member [REDACTED]

[REDACTED].⁶⁵ *Id.* at 182-83. In February 2013, Cresta's managing board [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]⁶⁶ [REDACTED]

[REDACTED]

[REDACTED] RX-1097C, at 147045. Cresta and the respondents dispute whether the Cresta board [REDACTED]. Cresta Pet. 22; Resp'ts Pet. Reply 10. The ID finds that although Cresta may have [REDACTED]

[REDACTED]

[REDACTED] and it subsequently shifted— [REDACTED].⁶⁷

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[REDACTED]
RX-1689C at 107:20-24.

[REDACTED] Hr'g Tr. 717:15-20; *see also id.* at 715:11-717:25; RX-1259C; RX-1123C; RX-1158C; RX-1306C.

⁶⁵ *See also* RX-1695C (Bose) at 46:9-47:12, 111:14-112:5, 134:1-135:7; RX-1688C (Folkebrant) at 39:5-12, 181:2-23, 267:13-271:21; RX-1155C; RX-1691C (Hughes) at 37:1-4; RX-1683 (Hoffman) at 44:18-23.

⁶⁶ RX-1097C at CRESTA00147044-45 ([REDACTED]); Hr'g Tr. at 733:4-16.

[REDACTED] RX-0780C.

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[REDACTED], Cresta offered no evidence of any licenses, or the investment in obtaining licenses. Nor did Cresta argue that it was in the process of establishing a licensing-based domestic industry. 19 U.S.C. § 1337(a)(2), (a)(3)(C). Rather, as will be discussed, *infra*, [REDACTED]

[Footnote continued on next page]

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ID at 183.⁶⁸ [REDACTED]

[REDACTED] RX-1307C at 316578 [REDACTED]

id. at 316579. *See* ID at 183. [REDACTED]

[REDACTED]⁶⁹ ID at 181. [REDACTED]

[REDACTED]⁷⁰ [REDACTED]

[REDACTED]⁷¹

[REDACTED]⁷² Cresta ceased next generation development of the [REDACTED] by [REDACTED]⁷³

[Footnote continued from previous page]

rather than to support the establishment of a licensing-based domestic industry. *See generally John Mezzalingua Assocs. v. ITC*, 660 F.3d 1322, 1328 (Fed. Cir. 2011).

⁶⁸ *See also id.* at 184 n.36 [REDACTED]

⁶⁹ *See also* Hr'g Tr. 719:7-16; RX-1683C at 80:6-14.

⁷⁰ *See also* RX-1689C (Zien) at 91:1-23.

⁷¹ *See also* RX-1684C (Murgulescu) at 44:8-23, 154:3-155:8; RX-1685C (Lewis) at 94:7-10, 288:6-25; RX-1342C.

⁷² RX-1216C; RX1683C (Hoffman) at 81:23-82:7; Hr'g Tr. 715:11-716:5, 718:1-24.

⁷³ RX-1683C (Hoffman) at 200:14-201:4; RX-1684C (Murgulescu) at 57:4-12; RX-1685C (Lewis) at 94:20-95:15; RX-1688C (Folkebrant) at 142:10-25; RX-1694C (Lewis) at 469:13-473:14; RX-0780C; CX-1706C (Lewis) Q/A 16; Hr'g Tr. at 565:19-22, 566:7-567:3.

[REDACTED] ⁷⁴
ID at 186. [REDACTED], Cresta filed the complaint in this investigation on January 28, 2014.⁷⁵

b) Cresta Failed to Present Credible Evidence of Its Investments

In its petition for review, Cresta argued the evidence shows that, in the 24 months between October 2011 and September 2013, Cresta expended [REDACTED] in salaries and benefits for its employees, [REDACTED] in plant and equipment, and [REDACTED] in payments to domestic suppliers regarding its domestic industry products.⁷⁶ Cresta Pet. 11.

Cresta's evidence of payments to domestic suppliers is insufficient to meet the requirements set out by the Federal Circuit in *Lelo Inc. v. ITC*, 786 F.3d 879 (Fed. Cir. 2015). In *Lelo*, the Federal Circuit found that it was necessary for the complainant to demonstrate the

⁷⁴ At the same time Cresta pursued this investigation, it was named as a respondent in *Certain Silicon Tuners and Products Containing Same, Including Television Tuners*, 337-TA-917 ("the 917 investigation"). In July 2014, just one month after the case was instituted, Cresta accepted a Consent Order in the 917 investigation (RX-1535) that prohibits it from importing into the United States, selling for importation into the United States, or selling after importation Cresta's domestic industry products. [REDACTED]
[REDACTED] See ID at 87.

⁷⁵ RX-0954C; RX-0955C; RX-1377C; RX-1378C; RX-1381C; RX-1382C; RX-1384C; RX-1683C (Hoffman) at 79:21-80:1; RX-1685C (Lewis) at 86:7-87:2; RX-1694C (Lewis) at 410:4-420:19; RX-1699C (Folkebrant) at 49:23-58:20; Hr'g Tr. at 722:1-3, 729:2-18.

⁷⁶ Of the labor and capital and plant and equipment expenditures, Cresta allocated [REDACTED] to its XC5000 domestic industry product. *Id.* [REDACTED] payments to domestic suppliers are allocated to the XC5000 product. *Id.* at 12. Cresta contends that these figures are undisputed. The respondents disagree with that contention. Resp'ts Pet. Reply 18-19.

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“share of labor or capital cost attributable solely to purchases made by” the complainant. *Id.* at 884-85. Moreover, the Court required that the complainant “account for the value expended on *relevant* domestic activities, as opposed to total profit or total general administrative costs.” *Id.* at 884 n.4 (emphasis in original). In this investigation, Cresta offered no evidence concerning its suppliers’ relevant investments in Cresta’s products.

As to Cresta’s own investments—as opposed to the alleged investment by its suppliers—Cresta’s originally submitted figures were challenged extensively by the respondents. Ultimately, the ID determined that the evidence submitted by Cresta was unreliable and, therefore, was insufficient to meet its burden of establishing the economic prong requirement. The ID recognized that the calculations performed by Matthew Lewis, Cresta’s Chief Financial Officer, were inconsistent. The ALJ determined that “given Mr. Lewis’s mistakes, conflicting evidence, and questionable allocation of time and resources, his testimony cannot be relied upon.”⁷⁷ ID at 177.

These inconsistencies pervaded not only Cresta’s evidence concerning its investments in Year 1 and Year 2 but also its evidence regarding ongoing activities that Cresta engaged in until the filing of the complaint and beyond. ID at 162, 169, 171, 173. For example, Cresta asserted [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

⁷⁷ Respondents’ extensively cross-examined Mr. Lewis at pages 740-63 of the confidential trial transcript.

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[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED] To the extent that these statements may be reconcilable, Cresta has failed to reconcile them in its submissions to the ALJ and the Commission.

Nor was Cresta able to demonstrate investment in product support at the time of the complaint. Weighing the evidence of the record, the ID fairly found that [REDACTED]

[REDACTED]

[REDACTED] ID at 181 (citing Hr'g Tr. 716:7-717:20). As discussed above, the [REDACTED] prior to the filing of the complaint here. Meanwhile, also as discussed above, [REDACTED]

[REDACTED] prior to the filing of the complaint. Mr. Lewis, testifying as to Cresta's domestic industry, did "not specify the nature or extent of the [alleged] testing and product support" performed by Cresta thus to demonstrate ongoing product support. ID at 169. Similarly, Mihai Murgulescu, Cresta's Chief Technology Officer, failed to explain the product support for the domestic industry products, other than through vague statements about responding to customer inquiries. *See* Hr'g Tr. 555-56. Lacking any reliable evidence of record, the ID properly concluded that Cresta did not demonstrate an ongoing investment in product support at the time of the filing of the complaint. ID at 180-82.

Inconsistencies, contradictions and unsupported assertions, such as those discussed by the ALJ, militate against reliance on Cresta's testimony in regard to the alleged investments

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and allocations. Indeed, upon review of the evidentiary record, the Commission determines that the record warrants the ALJ's finding that there is a lack of credible evidence to assess the domestic industry requirement.⁷⁸ The Commission has therefore determined to affirm and adopt the ALJ's finding that the figures Cresta has provided for its domestic industry investments in its tuner-based business, which changed each time the figures were challenged, are unreliable.⁷⁹ Cresta has, thereby failed to satisfy its burden to demonstrate the existence of a domestic industry.⁸⁰ *Cf. Certain Soft-Edged Trampolines and Components Thereof*, Inv. No. 337-TA-908, Comm'n Op. 56-57 (May 1, 2015) ("The Commission supports the ALJ's determination that there was a lack of credible evidence presented by" the complainant and that the complainant "failed to meet its burden of proof in establishing the significance of its investments in terms of this industry or in general.").

⁷⁸ These inconsistencies are discussed extensively at pages 174-178 of the ID, at pages 15-18 of the respondents' response to Cresta's petition for review, and at pages 125-128 of the respondents' post-hearing reply brief.

⁷⁹ In making this determination, the Commission does not opine on whether the investments would have been significant or substantial if the evidence had been reliable.

⁸⁰ Our finding that Cresta's evidence is unreliable applies to subparagraphs (A), (B), and (C) of section 337(a)(3). We discussed the requirements for subparagraph (a)(3)(C) in *Certain Computers and Computer Peripheral Devices, and Components Thereof, and Products Containing Same*, Inv. No. 337-TA-841, Comm'n Op. at 40 (Jan. 9, 2014); see also *LSI Corp. v. USITC*, 604 Fed. App'x 924, 928 (Fed. Cir. Mar. 20, 2015) (agreeing with the Commission's analysis in *Peripheral Devices*) (nonprecedential); *Certain Integrated Circuit Chips and Products Containing the Same*, Inv. No. 337-TA-859, Comm'n Op. 36-44 (Aug. 22, 2014) (explaining that research and development under subparagraph (C) must relate to the patented features of the protected articles). While qualifying investments under subparagraph (C) are in the exploitation of the patent, Cresta did not rely upon Xceive's expenditures, and its own showing under subparagraph (C) was only product-related, see Cresta Post-Hearing Br. 209-12, as opposed to patent- or technology-focused. Accordingly, Cresta's showing fails under subparagraph (C) at least for the same reasons as under (A) and (B).

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- c) Cresta's Investments and Activities Related to Protected Articles Failed to Establish That a Domestic Industry Existed at the Time of the Complaint

Before the ALJ, Cresta relied upon its investments in plant, equipment, and labor as well as research and development related to its TV-tuners to support its allegations of a domestic industry. Cresta alleged that its domestic industry was based on the fabless design, engineering, and support of silicon tuners using the patented technology. ID at 168.

As discussed above, we affirm the ID's conclusion that Cresta's evidence regarding its TV-tuner-based investments in Years 1 and 2 was unreliable. In addition, the ID found that any such industry predicated on those investments did not exist at the time of the complaint. The ID found that Cresta was operating under a new business model (monetization of the patents at issue), ID at 182-87, but Cresta did not claim any investments in this new business to establish a domestic industry in this investigation. Cresta Post-Hearing Br. 192-95. *See generally* 19 U.S.C. § 1337(a)(3)(C) (licensing). The Commission finds that Cresta failed to demonstrate the existence of a domestic industry based upon investments in Cresta's protected articles at the time the complaint was filed.

In its petition for review, Cresta contends the ID erred in finding that Cresta's business no longer existed. Specifically, Cresta argues that its domestic industry as a domestic fabless producer of tuners continued until the time of the original complaint. Cresta Pet. 15-24; *see* Compl. ¶¶ 15, 57-61. As discussed below, the Commission finds that the record does not support Cresta's position. To the contrary, the record contains no reliable evidence that Cresta's activities and investments at the time of the Complaint involved ongoing, qualifying domestic activities stemming from investments in the protected articles.

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Section 337 requires that “an industry in the United States, relating to the articles protected by the patent, copyright, trademark, mask work, or design concerned, *exists*. . .”⁸¹ The Federal Circuit has affirmed the Commission’s practice of using the complaint filing date as “the relevant date at which to determine if the domestic industry requirement of Section 337 was satisfied.” *Motiva*, 716 F.3d at 601 n.6. Past expenditures may be considered to support a domestic industry claim so long as those investments pertain to the complainant’s industry with respect to the articles protected by the asserted IP rights and the complainant is continuing to make qualifying investments at the time the complaint is filed. For subsection 337(a)(3)(C), the claimed R&D and engineering investments must be in exploitation of the patent. 19 U.S.C. § 1337(a)(3)(C).

As detailed above, Cresta was, and still purports to be, a fabless semiconductor manufacturer engaged in design and engineering of silicon tuners that are protected by the asserted patents. ID at 169; Cresta Pet. 7-8. Cresta contends that its domestic industry activities and investments in its TV-tuner development and software/firmware support continued until the time of the original complaint. Cresta Pet. 15-24. The evidence, however, does not support Cresta’s contention. As articulated by the extensive factfinding in the ID, Cresta’s tuner business was in rapid decline [REDACTED] and Cresta undertook to end operations and investments in the protected articles. ID at 179-87. By the time of the complaint, Cresta had decided to fund this investigation, and all that remained of the tuner-based business was at best a modicum of sales for products [REDACTED]. *Id.* at 188-90.

⁸¹ 19 U.S.C. § 1337(a)(2) (emphasis added). Cresta did not rely upon evidence that its domestic industry was in the process of being established.

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The present facts—involving Cresta’s pre-complaint repudiation of its tuner business, without any ongoing activities cognizable under section 337(a)(3)—are distinguishable from those of our previous investigations. Commission precedent indicates that where production, development or sales of protected articles have declined or even ceased entirely, a domestic industry may nevertheless be established based on past significant or substantial investments relating to the protected articles provided that complainant continues to maintain ongoing qualifying activities under section 337(a)(3) at the time the complaint is filed. In *Toy Vehicles*, the Commission held that when a complainant continues its operations and improves its products, past expenditures linked to these products are considered for purposes of a domestic industry. *Certain Battery-Powered Ride-On Toy Vehicles and Components Thereof*, Inv. No. 337-TA-314, Order No. 6 at 18-21 (Dec. 5, 1990) (unreviewed in relevant part) (domestic industry found to exist, where manufacturing of protected articles had ceased in favor of an improved model before the complaint was filed, based on substantial past investments in equipment, labor and capital in development and exploitation of the patent combined with continued activities supplying patented replacement units, which are a safety feature of the vehicles);⁸² see also *Certain Electronic Digital Media Devices and Components Thereof*, Inv. No. 337-TA-796, Comm’n Op. at 99-102 (Sept. 6, 2013) (finding domestic industry exists where complainant had substantial past investments in engineering and R&D related to discontinued protected articles and continued to exploit the patent through further development of existing products at the time of the complaint); *Certain Electronic Devices, Including Mobile Phones, Portable Music Players, and Computers*, Inv. No. 337-TA-701, Order No. 58

⁸² Unlike *Toy Vehicles*, Cresta here did not move on to newer or improved products. Rather, its newer product, [REDACTED], was abandoned in [REDACTED] ID at 166; see also *id.* at 180 n.35, 184, 187.

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at 16-17 (Nov. 18, 2010) (unreviewed) (domestic industry satisfied based on past substantial investments in R&D for protected articles and undisputed facts showing ongoing activities with respect to protected articles including development, warranty repairs, sales, and/or maintenance of inventories in the United States at the time the complaint was filed).

Similarly, when post-complaint developments have prompted an examination of the facts concerning the viability of complainant's domestic industry, the Commission has likewise credited past significant or substantial investments where complainant had ongoing qualifying activities, albeit more limited, pertaining to protected articles. For example, in *Wind Turbines*, the Commission held that the complainant's own post-bankruptcy operations were still substantial, as were those activities resumed by a U.S. licensee, and thus sufficient to preserve the existence of the domestic industry. *Wind Turbines*, Comm'n Op. at 22-26 (Sept. 23, 1996); see also *Video Graphics*, Final Initial Determination at 11-13 (finding domestic industry exists where complainant ceased manufacturing after the complaint was filed, based on past significant investments in plant and equipment for the development and manufacture of protected articles, coupled with credible evidence of continued sales, payments for R&D activities for protected articles, and licensing of the patent to a third party); *Semiconductor Integrated Circuits*, Final Initial Determination at 232-36 (finding a domestic industry based on continued operation of one semiconductor-fabrication plant notwithstanding the abandonment of most of complainant's U.S. operations).⁸³ The facts of the present investigation are unusual

⁸³ A complainant may also be able to rely upon past expenditures if its industry was destroyed by the unfair competition at issue in the investigation. See *Bally/Midway Mfg. v. USITC*, 714 F.3d 1117, 1121 (Fed. Cir. 1983). While *Bally/Midway* involves post-complaint destruction of a domestic industry (thereby relying upon the date of the complaint, as opposed to the industry that remained at the time of issuance of remedial orders), the ID here considered *Bally/Midway* possibly to apply to pre-complaint destruction

[Footnote continued on next page]

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and involve more than a mere decline in investments or transition to newer products as in such past Commission investigations.

In its petition for review, Cresta Pet. 17-18, Cresta points to [REDACTED] to support its post-Year-2 pre-complaint domestic industry. CX-635C [REDACTED]; CX-636C [REDACTED]; CX-637 [REDACTED]; CX-638C [REDACTED]. These [REDACTED] are unexplained in the record.⁸⁴ Indeed, while they are offered for [REDACTED]. Cresta's petition also points to certain "additional evidence showing the continuation" of engineering activity. Cresta Pet. 18 (citing CX-1710C at Q/A 112-16). What Cresta cites is Dr. Murgulescu's testimony, which in turn refers to [REDACTED]. CX-1137C. In any event, Dr. Murgulescu specifically, and Cresta generally,

[Footnote continued from previous page]

of a domestic industry. Whether *Bally/Midway* applies to pre-complaint events is immaterial, because the ALJ properly concluded that Cresta did not demonstrate that its business was destroyed by the unfair competition alleged in this investigation. ID at 167-68 n.21; *id.* at 190-91.

⁸⁴ Elsewhere in its petition for Commission review, Cresta purports to cite [REDACTED]. Cresta Pet. 22 (citing CX-1176C). Cresta has failed to explain [REDACTED], *see* Hr'g Tr. 813-15, Cresta failed to explain [REDACTED] investments in [REDACTED]. It is even unclear to which product these *de minimis* activities pertain. Compare CX-1252C [REDACTED] with Hr'g Tr. 822 [REDACTED].

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failed to explain the nature of the engineering or support work purportedly carried out in the context of these emails and the scope of the investment other than the time spent typing those emails. Moreover, as the ALJ properly found, Cresta failed to demonstrate its investment in firmware updates after August 2013.⁸⁵ ID at 185. As such, Cresta provided no reliable evidence sufficient to show that at the time of the complaint, it was engaged in qualified activities under Section 337(a)(3) involving continued investments in its claimed domestic industry.

As noted above, Cresta raised funds from investors before the complaint was filed here, but it was not to reinvigorate Cresta's tuner design business, [REDACTED] ID at 185-87. The ID found, based on the record evidence, that Cresta's claimed domestic industry based on the fabless design of silicon tuners was no longer in existence when the complaint was filed on January 28, 2014.

Cresta now contends that its expenditures in its tuner business continued after the complaint was filed, particularly as to "support" activities for its products, such as software/firmware updates. Cresta Pet. 2, 16-17 (citing *Certain Airtight Cast-Iron Stoves*, Inv. No. 337-TA-69, Comm'n Op. 10 (Jan. 1981)). As noted earlier, the Commission will consider post-complaint evidence regarding domestic industry only in very specific circumstances, *i.e.*, "when a significant and unusual development has occurred after the complaint has been filed." *Video Game Sys.*, Inv. No. 337-TA-743, Comm'n Op. at 5. We find that there has been no significant and unusual development here after the complaint was filed. Instead, as discussed

⁸⁵ In its petition for Commission review, Cresta cites Dr. Murgulescu's testimony in support of Cresta's ongoing firmware updates for Cresta's customers. Cresta Pet. 16 (citing CX-1710C at Q/A 32-33, 80-83). Cresta failed to demonstrate the existence of any such firmware updates much less Cresta's investment in those updates for purposes of section 337(a)(3).

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extensively above and in the ID, the significant and unusual development here occurred prior to the complaint, when Cresta phased out its tuners, shifted its business focus to patent monetization, laid off most of its staff, and discontinued investments in developing and supporting protected articles.

Beyond demonstrating no substantial change post-complaint, the post-complaint activities to which Cresta points are *de minimis* and the evidence supporting them is unreliable, for the reasons already set forth. *See also, e.g.*, ID at 188-90; Hr'g Tr. 813-821, Resp'ts Pet. Reply 11-12; OUII Pet. Reply 5-7, 10. With respect to any allegedly ongoing activity related to a very small number of products Cresta purportedly continues to sell⁸⁶—[REDACTED] *see* ID at 189—such sales alone are insufficient to establish a domestic industry. Hr'g Tr. at 820; *see, e.g.*, H.R. Rep. No. 100-40, Pt. 1, at 157 (1988) (“Marketing and sales in the United States alone would not, however, be enough to meet this test.”); S. Rep. 100-71, at 29 (1988) (same); *Certain Stringed Musical Instruments and Components Thereof*, Inv. No. 337-TA-586, Comm'n Op. 14-16 (May 16, 2008) (discussing the 1988 legislative history); *Certain Integrated Circuits, Processes for Making Same, and Products Containing Same*, Inv. No. 337-TA-450, Final ID at 150 (May 6, 2002), (“[T]he mere marketing and sale of products in the

⁸⁶ Cresta maintained inventory of wafers for its tuners, RX-1689C at 92-98, 103-04, 107-09, as well as overseas inventory of certain finished tuners, *id.* at 104. Cresta argues that there was a post-complaint sale [REDACTED]. Cresta Post-Hearing Br. 214; Hr'g Tr. 797; CX-1250C. The record is far from clear as to the nature of that transaction, which came six months after the filing of the complaint here. Cresta did not argue that it itself maintained investment in its protected articles as a result of its sale. Rather, it relied upon the cost it paid to its U.S.-based supplier [REDACTED] for that transaction. CX-1250C. As discussed earlier, that showing of cost, absent more, is insufficient under *Lelo*, 786 F.3d at 884, to be creditable toward a domestic industry. Moreover, even if the investment were creditable in some manner, it is *de minimis*. CX-1250C [REDACTED].

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United States is insufficient to constitute a domestic industry.”), *not reviewed* Notice (June 21, 2002).

Indeed, Cresta cites no Commission precedent supporting the proposition that past investments in protected articles suffice to satisfy the requirement that “an industry in the United States, relating to the articles protected by the patent ...*exists*” at the time of the complaint based upon *de minimis* ongoing sales. 19 U.S.C. § 1337(a)(2) (emphasis added). To the contrary, where the complainant relies upon past investments relating to protected articles but its ongoing activities at the time of the complaint are not cognizable under Section 337(a)(3), such as patent litigation that does not relate to exploitation of the patent, the Commission has found that a domestic industry does not exist. *See Certain Video Game Systems and Controllers*, Inv. No. 337-TA-743, ID at 167 (Nov. 2, 2011) (unreviewed in relevant part). Accordingly, Cresta’s reliance on post-complaint sales or profit and loss statements, Cresta Pet. 18 (relying upon JX-152C), is insufficient to demonstrate cognizable investments under section 337. Moreover, as discussed earlier, Cresta’s sales, whatever they may be, are substantially unexplained in the record; Cresta further fails to explain how those sales constitute relevant investments in protected articles or exploitation of the asserted patents under the language of section 337(a)(3).

What is at issue in this investigation is not merely a decline in an ailing business or discontinued products, but the lack of evidence that a cognizable domestic industry exists at the time the complaint was filed. Cresta’s claimed domestic industry predicated on design and support of protected articles ceased to exist. Its U.S. business shifted toward patent monetization and away from any research and development, or engineering related to its tuner products. In so changing its business, Cresta ceased making investments in plant and

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equipment, as well as labor and capital, related to protected articles it may have previously made, *i.e.*, investments in the activities upon which it attempted to rely before the ALJ to prove a domestic industry exists. Nor did Cresta continue to invest in development and engineering in exploitation of the asserted patents.⁸⁷ Cresta's business now hinges on the results of this investigation, [REDACTED]

[REDACTED]—not reinvestment in TV-tuners or support thereof. ID at 185; *see also* RX-1271C; Hr'g Tr. 489-90. Such investments and activities, as described in this record, are not cognizable as domestic industry investments. Accordingly, we conclude that due to the lack of credible evidence of any ongoing activities and investments at time of the filing of the complaint related to the protected tuners, other than a handful of sales that are inadequately explained in the record, Cresta has failed to prove that a domestic industry exists with respect to articles protected by the asserted patents.⁸⁸

⁸⁷ As noted above, *see supra* note 74, Cresta has agreed, by consent order at the Commission, not to import its tuners into the United States. *Certain Silicon Tuners and Products Containing the Same, Including Television Tuners*, Inv. No. 337-TA-917, Consent Order (July 1, 2014). While the consent order permits Cresta to manufacture tuners in the United States, the effect of the consent order was to shutdown Cresta's overseas production. Hr'g Tr. 739, 813-14; RX-1999C Q/A 116-123 (Rebuttal Witness Statement of Dr. Vander Veen). [REDACTED]

[REDACTED] Hr'g Tr. 815, 822. Cresta has failed adequately to explain those activities. Indeed, it is unclear to which product these activities pertain. *Compare* CX-1252C ([REDACTED]) with Hr'g Tr. 822 ([REDACTED]).

⁸⁸ Patent licensing activities and investments are cognizable under section 337. *See InterDigital Commc'ns, LLC v. ITC*, 707 F.3d 1295, 1303-04 (Fed. Cir. 2013); *Certain*

[Footnote continued on next page]

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IV. CONCLUSION

For the foregoing reasons, we terminate the investigation with a finding of no violation of section 337.

By order of the Commission.

A handwritten signature in black ink, appearing to read 'Lisa R. Barton'.

Lisa R. Barton
Secretary to the Commission

Issued: October 30, 2015

[Footnote continued from previous page]

Computers and Computer Peripheral Devices, and Components Thereof, and Products Containing Same, Inv. No. 337-TA-841, Comm'n Op. at 37 (Jan. 9, 2014) ("We reject the respondents' invitation to impose a production-driven requirement on licensing-based domestic industries."); *id.* at 37-40. But Cresta offered no licensing expenditures nor did argue or demonstrate that it was in the process of establishing a licensing-oriented domestic industry.

**Separate Views of Commissioner Rhonda K. Schmidlein
on the Economic Prong of the Domestic Industry Requirement**

I agree with the Commission's decision to affirm the ALJ on the economic prong of the domestic industry requirement based on the ALJ's credibility findings. I see no basis in the record to disturb the ALJ's findings that certain testimony regarding the amount and allocation of Cresta's domestic industry investments was unreliable. I do not, however, join the Commission's decision to affirm the ALJ on the separate and independent basis that Cresta's sales of domestic industry products at the time of the complaint are not "qualifying activities," which would allow consideration of Cresta's pre-complaint domestic industry investments. In my view, Cresta's activities at the time of the complaint, including Cresta's sales of domestic industry products, are sufficient activities to allow the Commission to consider the domestic industry investments made prior to the filing of the complaint.

Section 337(a)(3), in defining the domestic industry requirement, states that "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 . . . (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 Commission assesses this statutory domestic industry requirement from the perspective of the time of the filing of the complaint. *See Certain Video Game Systems and Controllers*, Inv. No. 337-TA-743, Comm'n Op. at 5 (Jan. 20, 2012), *aff'd*, *Motiva, LLC v. U.S. International Trade Comm'n*, 716 F.3d 596, 601 n.6 (Fed. Cir. 2013). This does not mean, however, that section 337 requires that investments that makeup a domestic industry must be incurred or ongoing at the exact moment the complaint is filed. Indeed, the Commission has expressly rejected such a view. *See, e.g., Certain Electronic Digital Media Devices and Components Thereof*, Inv. No. 337-TA-796, Comm'n Op. at 99 (Sept. 6, 2013) ("Commission precedent also establishes that a domestic industry can be found based on complainant's past activities in exploiting the [asserted] patent.") (emphasis in original); *Certain Kinesiotherapy Devices and Components Thereof*, Inv. No. 337-TA-823, Comm'n Op. at 30 (July 12, 2013), *rev'd on other grounds*, *Lelo Inc. v. U.S. International Trade Comm'n*, 786 F.3d 879 (Fed. Cir. 2015); *Certain Variable Speed Wind Turbines and Components Thereof*, Inv. No. 337-TA-376, Comm'n Op. at 25-26 (Sept. 23, 1996); *Certain Integrated Circuit Devices and Products Containing the Same*, Inv. No. 337-TA-873, Order No. 32 at 6 (Oct. 21, 2013) (unreviewed). Instead, when investments that are no longer taking place are asserted, the Commission has determined that "a domestic industry [may be] found to exist based on a combination of prior activities and some type of current activity related to the domestic industry." *Certain Video Game Systems and Controllers*, Inv. No. 337-TA-743, Final ID at 167 (Dec. 8, 2011) (*aff'd* by Commission).

In this investigation, Cresta filed its complaint in January 2014. Cresta alleges that from October 2011 to September 2013 it invested [REDACTED] in design, engineering and manufacturing related activities in the United States, which yielded technology incorporated into existing domestic industry products. Specifically, Cresta alleges during that time frame it invested [REDACTED] in salaries and benefits for engineering labor, [REDACTED] in plant and equipment, and more than [REDACTED] in payments to domestic manufacturers related to its

domestic industry products.¹ With regard to activity at the time of the complaint, Cresta asserts continued domestic production and sales of Cresta's tuners based on [REDACTED].² Although the sales may have been declining, OUII acknowledges that during the period from June 2013 to December 2013, Cresta [REDACTED].³ Moreover, Cresta asserts that at the time of the complaint Cresta continued to employ engineers in the United States for technical support and maintenance of domestic industry products.⁴

While I join, as noted above, the Commission in its determination to affirm the ALJ's findings that the evidence put forward by Cresta was not reliable, the Commission today also offers a separate and independent basis for affirming the ALJ. Specifically, the Commission finds that it cannot properly consider the [REDACTED] Cresta invested in design, engineering, and manufacturing related activities when assessing the economic prong of the domestic industry requirement because those investments pre-date the filing of the complaint and Cresta's sales of domestic industry products at the time of the complaint are not "qualifying activities," which would allow consideration of past investments.⁵ With regard to this basis, I respectfully disagree. In my view, the continued sales of the domestic industry products are sufficient activities to permit the Commission to consider Cresta's past, cognizable investments under section 337. Moreover, as described above, the activities asserted to be taking place at the time of the complaint include more than sales of domestic industry products. They also include the continued employment of engineers engaged in technical support of domestic industry products. The employment of these engineers (even if not precisely quantified or allocated) are additional current activities permitting the Commission to consider Cresta's past investments. Furthermore, the activities asserted to be taking place at the time of the complaint include domestic production related to the domestic industry products.

¹ Cresta Post-Hearing Br. at 206-208; Cresta Pet. at 11 (citing CX-1706C (Lewis WS) at Q/A 54-75).

² Cresta Pre-Hearing Br. at 444; Cresta Post-Hearing Br. at 185, 213-214; see CX-1706C (Lewis WS) at Q/A 77, 81; CX-1710C (Murgulescu WS) at Q/A 55-56; Hr. Tr. 766:25-769:20; CX-0635C ([REDACTED]); RX-1689C at 86-92, 98:10-20, 106:7-106:13; 106:18-108:5; see also ID at 189 (citing RX-1683C at 70:18-21, 71:3-74:14; 75:20-76:12).

³ OUII Resp. to Pet. at 6 (citing Cresta Pre-Hearing Br. at 444); see CX-1706C (Lewis WS) at Q/A 86; CX-1171C.

⁴ Cresta's Pre-Hearing Br. at 420, 452, 454-455; Cresta Post-Hearing Br. at 213; see CX-1710C (Murgulescu WS) at Q/A 25, 80-84, 112-113, 123-126; Hr. Tr. 553:7-25, 555:16-556:7, 766:25-769:20; CX-560C; CX-1107C and CX-1111C (emails from October 2013 involving Cresta engineers); CX-1137C (email from February 2013 involving Cresta engineer).

⁵ The Commission describes Cresta's ongoing sales as *de minimis*. As noted above, OUII acknowledges that during the period from June 2013 to December 2013, Cresta averaged sales [REDACTED]. As such, I cannot agree that sales of this volume are *de minimis* for purposes of considering past investments. Moreover, I cannot ignore these sales simply because the XC5000 series products [REDACTED] or because CTC70X series products [REDACTED].

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To be clear, I am not finding or advocating that ongoing sales by themselves are sufficient to establish a domestic industry. Rather, it is that these sales constitute current activities with respect to domestic industry articles that allow the Commission to consider past, cognizable domestic industry investments when assessing the domestic industry requirement. *See Video Game Systems*, Final ID at 167 (“In each of these cases, there is a common theme: while the primary domestic industry activities are no longer taking place, a domestic industry was found to exist based on a combination of prior activities and some type of current activity related to the domestic industry.”). Indeed, Cresta alleges that its products for sale are the result of its earlier design, engineering, and manufacturing related investments. And, in this investigation, as noted earlier, more activities than sales were asserted to be occurring at the time of the complaint.

My view is supported by Commission precedent. For example, in *Toy Vehicles*, the Commission was presented with the issue of whether “current sales” of patented toys out of existing inventory permitted the Commission to consider the past costs relating to the development and exploitation of the patent. *Certain Battery-Powered Ride-On Toy Vehicles*, Inv. No. 337-TA-314, Order No. 6, at 18-21 (Dec. 5, 1990) (unreviewed in relevant part). In that investigation, despite complainant Kransco “not us[ing] [the] patent in any” toy for over a year before the complaint was filed and “admit[ting] that it has no plans to manufacture any more” of the patented toys, the Commission concluded that ongoing but limited sales of the toys from inventory still allowed “all of the prior costs relating to the development and exploitation of the patent” to be considered. *Id.* The Commission explained its reasoning in *Toy Vehicles* as follows:

Kansco still has an inventory of the dual control power pedal unit that is the subject of the patent, and some of these units are still sold as replacement parts to stores or individual purchasers when the warranties on their toys have expired. The dual control unit is a safety feature on the toy. Furnishing replacement parts would be significant to the complainant even if it did not bring in substantial income. Making replacement parts available generates good will for the company. The toys are expensive, and parents who spend this much for a toy would expect a U.S. company to make replacement parts available for repairs. Section 337 should protect small industries as well as large ones. The current sales of the unit may be few, and the costs of replacing these parts free may not be large, but they meet the criteria of the statute.

As long as Kransco is still replacing any of these units, all of the prior costs relating to the development and exploitation of the patent should be considered along with the current expenditures relating to replacement parts when determining whether there is a domestic industry.

Id. at 20-21.

Similarly, in *Video Graphics Display Controllers*, the Commission concluded that offering for sale domestic industry products from existing inventory in addition to payments made to a third party for continuing research and development activities allowed the

Commission to credit prior investments in developing and manufacturing the product. *Certain Video Graphics Display Controllers and Products Containing Same*, Inv. No. 337-TA-412, Final ID, at 13 (May 14, 1999) (unreviewed); *see also Certain Electronic Devices, Including Mobile Phones, Portable Music Players, and Computers*, Inv. No. 337-TA-701, Order No. 58 at 16-17 (Nov. 18, 2010) (unreviewed) (finding the domestic industry satisfied based on past substantial investments in R&D for protected articles and undisputed facts showing ongoing activities with respect to protected articles including sales and/or maintenance of inventories in the United States at the time the complaint was filed).⁶

The Commission also dismisses Cresta's current sales and other ongoing activities on the basis that Cresta undertook affirmative actions to shift its business to patent monetization and away from any research and development. Even if Cresta shifted its business model going forward, a changed business model should not void or undercut what is taking place at the time of the complaint. To hold otherwise would effectively inject into the domestic industry requirement an inquiry into the motivations or intent of a business as it evolves over time. As the Commission explained in *Computer and Computer Peripheral Devices*, an inquiry into the complainant's motivations when assessing the domestic industry requirement is "needlessly burdensome and costly to the complainant, its licensees, and the Commission; unreasonably subjective; and unwarranted in view of the statutory language and legislative history." *Certain Computer and Computer Peripheral Devices*, Inv. No. 337-TA-841, Comm'n Op. at 39 (Jan. 9, 2014). If there is current activity with regard to articles protected by the patent at the time the complaint is filed and there are significant/substantial past investments, the intention of the management to take the business in a different direction in the future is irrelevant. In other words, I do not find that a shift in business model breaks the link between the current activity related to the domestic industry and the past investments. *See Toy Vehicles*, Order No. 6, at 18-21 (finding the domestic industry requirement satisfied even though the complainant had effectively taken its business in a new direction and "stopped practicing the patent").

In my view, a complainant should not be denied relief simply because the importation of infringing articles happens to take place after a domestic industry product is developed but when that product is produced, sold to customers, and/or supported by the complainant. Development and engineering costs are frequently incurred at an early stage of a product's development. Were complainants to be denied relief in such circumstances, it would enable evasion of the protection intended by Congress under section 337.

⁶ The Commission's decision in *Certain Video Game Systems and Controllers*, Investigation 743, does not compel a different result. In that investigation, the asserted engineering and R&D activities had ceased over three and a half years before the complaint was filed. *See* Final ID at 167 (Dec. 8, 2011) (aff'd by Commission). And "[t]he invention was never produced and was never close to being 'production-ready'" as a result of those activities. *Id.* The Commission therefore determined that complainant's ongoing litigation, which was not directed toward establishment of a licensing program, did not constitute "a continuing domestic industry activity." *Id.* In contrast, in the current investigation the asserted primary design, engineering, and manufacturing activities ceased a few months before the complaint was filed and those activities yielded domestic industry products, which were still being produced and sold at the time of the filing of the complaint.

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In short, I would affirm the ALJ on the economic prong of the domestic industry requirement based on the ALJ's credibility findings. I cannot otherwise join the Commission's opinion on the economic prong for the reasons explained above.

CERTIFICATE OF SERVICE

I, Lisa R. Barton, hereby certify that the attached **OPINION** has been served by hand upon the Commission Investigative Attorney, Peter J. Sawert, Esq., and the following parties as indicated, on **October 30, 2015**.



Lisa R. Barton, Secretary
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**CERTAIN TELEVISION SETS, TELEVISION RECEIVERS,
TELEVISION COMPONENTS THEREOF**

Inv. No. 337-TA-910

Certificate of Service – Page 2

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UNITED STATES INTERNATIONAL TRADE COMMISSION
Washington, DC

In the Matter of

**CERTAIN TELEVISION SETS,
TELEVISION RECEIVERS,
TELEVISION TUNERS, AND
COMPONENTS THEREOF**

Inv. No. 337-TA-910

**NOTICE OF COMMISSION DETERMINATION TO REVIEW IN PART
A FINAL INITIAL DETERMINATION FINDING NO VIOLATION OF SECTION 337;
SCHEDULE FOR FILING WRITTEN SUBMISSIONS ON THE ISSUES UNDER
REVIEW AND ON REMEDY, THE PUBLIC INTEREST, AND BONDING; AND
DENIAL OF A MOTION TO REOPEN THE RECORD**

AGENCY: U.S. International Trade Commission.

ACTION: Notice.

SUMMARY: Notice is hereby given that the U.S. International Trade Commission has determined to review in part the final initial determination ("final ID") issued by the presiding administrative law judge ("ALJ") on February 27, 2015, finding no violation of section 337 of the Tariff Act of 1930, in the above-captioned investigation. The Commission has also determined to deny the motion filed on March 16, 2015, by certain respondents to reopen the record of the investigation. The Commission requests certain briefing from the parties on the issues under review, as indicated in this notice. The Commission also requests briefing from the parties and interested persons on the issues of remedy, the public interest, and bonding.

FOR FURTHER INFORMATION CONTACT: Sidney A. Rosenzweig, Office of the General Counsel, U.S. International Trade Commission, 500 E Street, S.W., Washington, D.C. 20436, telephone 202-708-2532. 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 (<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 March 5, 2014, based on a complaint filed by Cresta Technology Corporation, of Santa Clara, California ("Cresta"). 79 *Fed. Reg.* 12526 (Mar. 5, 2014). The complaint alleged violations of

section 337 of the Tariff Act of 1930, as amended 19 U.S.C. § 1337, by reason of the infringement of certain claims from three United States patents. The notice of institution named ten respondents: Silicon Laboratories, Inc. of Austin, Texas (“Silicon Labs”); MaxLinear, Inc. of Carlsbad, California (“MaxLinear”); Samsung Electronics Co, Ltd. of Suwon, Republic of Korea and Samsung Electronics America, Inc. of Ridgefield Park, New Jersey (collectively, “Samsung”); VIZIO, Inc. of Irvine, California (“Vizio”); LG Electronics, Inc. of Seoul, Republic of Korea and LG Electronics U.S.A., Inc. of Englewood Cliffs, New Jersey (collectively, “LG”); and Sharp Corporation of Osaka, Japan and Sharp Electronics Corporation of Mahwah, New Jersey (collectively, “Sharp”). The Office of Unfair Import Investigations was also named as a party.

On May 16, 2014, the ALJ issued an initial determination granting Cresta’s motion to amend the complaint and notice of investigation to add six additional respondents: SIO International Inc. of Brea, California and Hon Hai Precision Industry Co., Ltd. of New Taipei City, Taiwan (collectively, “SIO/Hon Hai”); Top Victory Investments, Ltd. of Hong Kong and TPV International (USA), Inc. of Austin, Texas (collectively, “TPV”); and Wistron Corporation of New Taipei City, Taiwan and Wistron Infocomm Technology (America) Corporation of Flower Mound, Texas (collectively, “Wistron”). Order No. 12 (May 16, 2014), *not reviewed*, Notice (June 9, 2014).

On November 3, 2014, the ALJ granted-in-part Samsung and Vizio’s motion for summary determination of noninfringement as to certain televisions containing tuners made by a third party, NXP Semiconductors N.V. Order No. 46 at 27-30 (Nov. 3, 2014), *not reviewed*, Notice (Dec. 3, 2014). On November 21, 2014, the ALJ issued granted Samsung’s and Vizio’s motion for summary determination that Cresta had not shown that certain Samsung televisions with NXP tuners had been imported. Order No. 58 at 4-5 (Nov. 21, 2014), *not reviewed*, Notice (Dec. 8, 2014).

On November 12, 2014, the ALJ granted Cresta’s motion to partially terminate the investigation as to one asserted patent and certain asserted claims of the two other asserted patents. Order No. 50 (Nov. 12, 2014), *not reviewed*, Notice (Dec. 3, 2014). The two asserted patents still at issue in the investigation are U.S. Patent No. 7,075,585 (“the ’585 patent”) and U.S. Patent No. 7,265,792 (“the ’792 patent”). Claims 1-3, 10, and 12-13 of the ’585 patent, and claims 1-4, 7-8, and 25-27 of the ’792 patent, remain at issue in the investigation.

The presiding ALJ conducted a hearing from December 1-5, 2014. On February 27, 2015, the ALJ issued the final ID. The final ID finds that Cresta failed to satisfy the economic prong of the domestic industry requirement, 19 U.S.C. § 1337(a)(2), (a)(3), for both asserted patents. To satisfy the economic prong of the domestic industry requirement, Cresta relied upon claims 1-3, 5-6, 10, 13-14, 16-19, and 21 of the ’585 patent; and claims 1-4, 7, 10-12, 18-19, and 26-27 of the ’792 patent. The ID finds that certain Cresta products—on their own, or combined with certain televisions into which Cresta’s tuners are incorporated—practice all of the domestic-industry claims of the ’585 patent, except for claim 14; as well as all of the domestic-industry claims of the ’792 patent except for claim 27.

The ID finds some Silicon Labs tuners (as well as certain televisions containing them) to infringe

claims 1-3 of the '585 patent, and no other asserted patent claims. The ID further finds some MaxLinear tuners (as well as certain televisions containing them) to infringe claims 1-3, 10, 12, and 13 of the '585 patent and claims 1-3, 7-8, and 25-26 of the '792 patent.

The ID finds claims 1 and 2 of the '585 patent to be invalid pursuant to 35 U.S.C. § 102 (anticipation), and claim 3 of the '585 patent to be invalid pursuant to 35 U.S.C. § 103 (obviousness). The ID finds all of the asserted claims of the '792 patent to be invalid pursuant to 35 U.S.C. §§ 102 or 103.

The ALJ recommended that if a violation of section 337 is found, that a limited exclusion order and cease and desist orders issue. The ALJ recommended, however, that the implementation of such orders be delayed by twelve months in view of public interest considerations. The ALJ also recommended that there be zero bond during the period of Presidential review.

On March 16, 2015, petitions for Commission review were filed by the following parties: the Commission investigative attorney ("IA"); Cresta; the Silicon Labs respondents; and the MaxLinear respondents. On March 24, 2015, OUII and Cresta each filed a reply to the other parties' petitions. That same day, the respondents filed a reply to Cresta's petition.

The Commission's determinations to review are as follows:

1. Infringement

The Commission has determined not to review the ID's claim constructions. ID at 16-49. The Commission has determined to review the ID's infringement analysis concerning the "signal processor" for "processing . . . in accordance with" the "format of" the "input RF signal" limitation of all asserted patent claims. '585 patent col. 6 line 65 – col. 7 line 2 (claim 1); '792 patent col. 10 lines 60-65 (claim 1); ID at 57-60, 72-75, 84-85 & 94. The Commission has also determined to review the ID's infringement analysis concerning the "applies one of a plurality of finite impulse response filters . . . corresponding to a format of" the "input RF signal" limitation of asserted claims 10, 12 and 13 of the '585 patent and all asserted claims of the '792 patent. '585 patent col. 7 lines 36-40; '792 patent col. 10 line 65 – col. 11 line 2 (claim 1); ID at 67-68, 79-80, 85 & 93.

The Commission has also determined to review the ID's determinations concerning contributory infringement of the asserted patent claims.

Notwithstanding the foregoing review, the Commission has determined not to review the ID's exclusion of certain testimony by Alan Hendrickson. Cresta Pet. at 37. The Commission has also determined not to review the ID's findings as to Cresta's lack of evidence regarding allegedly representative products. *See* ID at 65-66, 78-79.

2. Invalidity

The Commission has determined not to review the ID's finding that claims 1-4 and 25-26 of the '792 patent are anticipated by the '585 patent; and not to review the ID's

finding that claims 1 and 2 of the '585 patent are anticipated by Boie.

The Commission has determined to review the ID's determinations that the asserted claims are not obvious in view of the combination of Boie and VDP. The Commission has also determined to review whether claim 3 of the '585 patent is obvious in view of Boie and Kerth; whether claim 25 of the '792 patent is obvious in view of VDP alone; and whether claim 26 of the '792 patent is obvious in view of Boie and Micronas.

The Commission has determined to review the ID's findings concerning an on-sale bar that invalidates claims 1-4, 7-8, and 26-27 of the '792 patent. ID at 142-47.

The Commission has determined to review the ID's finding that claim 1 of the '585 patent is not indefinite under 35 U.S.C. § 112 in view of the plural and singular use of the term "signals." On review, the Commission finds that claim 1 of the '585 patent is not indefinite. The respondents have failed to demonstrate clear and convincing evidence of invalidity. The use of the plural and singular for "signal" does not create ambiguity in the claim, and neither side's experts had difficulty ascertaining the scope of the claim.

The Commission has also determined to review the issue of whether the claims of the '792 patent are invalid under the written description requirement of 35 U.S.C. § 112. On review, the Commission finds that the claims are not invalid under the written description requirement for the same reasons provided in the ID as to the '585 patent.

3. Domestic Industry

The Commission has determined to review whether Cresta proved the existence of articles protected by the patents that incorporate the XC5000A series tuner. *See* ID at 195-96. The Commission has determined not to review the ID's remaining findings concerning the technical prong of the domestic industry requirement, including the ID's findings as to tuners other than the XC5000A series.

The Commission has also determined to review the ID's findings on the economic prong of the domestic industry requirement.

4. Other Matters

The ID recommends certain action concerning a breach of the administrative protective order in this investigation. ID at 3 n.1; *see* 19 C.F.R. § 210.34(c)(2). That recommendation is not part of the Commission review of violation of section 337, *see* 19 C.F.R. § 210.42. Accordingly, any action by the Commission will be conducted separately from review of the ID, in accordance with Commission practice concerning possible breaches of administrative protective orders. *See generally* Notice, 80 *Fed. Reg.* 1664 (Jan. 13, 2015).

On March 16, 2015, Silicon Labs moved the Commission to reopen the record to admit as evidence a January 9, 2015, response by Cresta in an *inter partes* review of the '585

patent being conducted by the U.S. Patent & Trademark Office (“PTO”). The IA and MaxLinear responded in support of the motion; Cresta responded in opposition. Silicon Labs, a party to the PTO review proceeding, waited more than two months to present the document to the Commission. Silicon Labs could have timely moved the ALJ to reopen the record. Accordingly, the Commission has determined to deny the motion.

All other issues upon which the parties petitioned for review that are not expressly recited above are not reviewed.

The parties are asked to brief the following issues with reference to the applicable law and the existing evidentiary record. For each argument presented, the parties’ submissions should set forth whether and/or how that argument was presented in the proceedings before the ALJ, with citations to the record. *See* Order No. 2 ¶ 11.1 (Mar. 4, 2014) (Ground Rules).

- a. Cresta alleges that certain accused products practice the claim limitations under review because they can operate to receive signals according to U.S. standards (6 MHz) as well as foreign standards that operate at a bandwidth other than 6 MHz. Please explain whether Cresta demonstrated that the accused products are capable of processing signals conforming to such foreign standards without modification to the accused televisions or tuners (whether by software, firmware or hardware). *See, e.g., Finjan, Inc. v. Secure Computing Corp.*, 626 F.3d 1197, 1204-05 (Fed. Cir. 2010); *Silicon Graphics, Inc. v. ATI Technologies, Inc.*, 607 F.3d 784, 794 (Fed. Cir. 2010).
- b. Please explain whether Cresta demonstrated that Silicon Labs’ non-U and non-V tuners (*i.e.*, those models without a “U” or a “V”) process analog and digital signals differently so as to infringe claims 1-3 of the ’585 patent.
- c. In connection with the Commission’s consideration of the infringement analysis of the two claim limitations on review (“signal processor” and “applies one of a plurality of finite impulse response filters”), please provide a chart that presents the following: the accused product, including its model number(s); and for each of the two claim limitations on review whether and why the accused product does or does not practice that claim limitation under the ID’s claim constructions, including citations to the evidence of record.
- d. Cresta alleges the contributory infringement of certain asserted patent claims by respondents MaxLinear and Silicon Labs. Please explain whether the original and/or amended complaint filed by Cresta provided the requisite knowledge of the patents asserted in this investigation. Parties are to discuss Commission determinations (including those in Commission Inv. Nos. 337-TA-723, -744, and -770) as well as federal caselaw including, for example, *Rembrandt Social Media, LP v. Facebook, Inc.*, 950 F. Supp. 2d 876, 881-82 (E.D. Va. 2013) and cases discussed therein. If one or both complaints provide legally adequate knowledge, please explain whether a finding of contributory infringement requires a showing of the respondents’ continued sale of infringing products after being served with

the complaint, *see, e.g.*, Cresta Post-Trial Br. 53, and whether Cresta made that showing. Please also discuss on what basis, if any, other than the original or amended complaint, the respondents were provided with knowledge of the asserted patents for purposes of contributory infringement.

- e. Please explain whether the accused tuners are capable of substantial noninfringing uses, including whether such accused tuners are embedded in systems on a chip, and whether that embedment prevents substantial noninfringing uses as to those embedded tuners. Please also explain whether and why, legally and factually, the following statement is pertinent to the Commission's analysis of contributory infringement in this investigation: "Cresta is not accusing any cable or satellite TV set-top boxes in this Investigation, and my infringement findings are limited to the SoCs where Cresta has identified [an infringing] 'plurality of demodulators'" ID at 82.
- f. In connection with the Commission's analysis of invalidity of claims 10, 12, and 13 of the '585 patent, and the asserted claims of the '792 patent in view of Boie and VDP, please explain whether a programmable filter meets the limitation of "appl[ying] one of a plurality of finite impulse response filters"
- g. Should the Commission find a violation of section 337, please explain, in view of the facts of this investigation as well as Commission precedent concerning remedies, whether public-interest considerations, 19 U.S.C. § 1337(d)(1), (f)(1), warrant tailoring of any remedial orders, and if so, what that tailoring should be. The parties' discussion of the public interest considerations implicated by this investigation should account for the ID's unreviewed determination that Cresta failed to provide adequate evidence as to allegedly representative products. *See* ID at 65-66, 78-79.

In connection with the final disposition of this investigation, the Commission may (1) issue an order that could result in the exclusion of the subject articles from entry into the United States, and/or (2) issue one or more cease and desist orders that could result in the respondent(s) being required to cease and desist from engaging in unfair acts in the importation and sale of such articles. Accordingly, the Commission is interested in receiving written submissions that address the form of remedy, if any, that should be ordered. If a party seeks exclusion of an article from entry into the United States for purposes other than entry for consumption, the party should so indicate and provide information establishing that activities involving other types of entry either are adversely affecting it or likely to do so. For background, see *Certain Devices for Connecting Computers via Telephone Lines*, Inv. No. 337-TA-360, USITC Pub. No. 2843, Comm'n Op. (December 1994).

If the Commission contemplates some form of remedy, it must consider the effects of that remedy upon the public interest. The factors the Commission will consider include the effect that an exclusion order and/or cease and desist orders would have on (1) the public health and welfare, (2) competitive conditions in the U.S. economy, (3) U.S. production of articles that are like or directly competitive with those that are subject to investigation, and (4) U.S. consumers.

The Commission is therefore interested in receiving written submissions that address the aforementioned public interest factors in the context of this investigation.

If the Commission orders some form of remedy, the U.S. Trade Representative, as delegated by the President, has 60 days to approve or disapprove the Commission's action. *See* Presidential Memorandum of July 21, 2005, 70 *Fed. Reg.* 43251 (July 26, 2005). During this period, the subject articles would be entitled to enter the United States under bond, in an amount determined by the Commission. The Commission is therefore interested in receiving submissions concerning the amount of the bond that should be imposed if a remedy is ordered.

WRITTEN SUBMISSIONS: The parties to the investigation are requested to file written submissions on the issues under review. Parties to the investigation, interested government agencies, and any other interested parties are encouraged to file written submissions on the issues of remedy, the public interest, and bonding. Such submissions should address the recommended determination by the ALJ on remedy and bonding. The complainants and the IA are also requested to submit proposed remedial orders for the Commission's consideration. The complainants are also requested to state the date that the asserted patents expire and the HTSUS numbers under which the accused products are imported. The written submissions and proposed remedial orders must be filed no later than close of business on May 14, 2015, and should not exceed 60 pages. Reply submissions must be filed no later than the close of business on May 23, 2015, and such replies should not exceed 40 pages. The respondents may allocate the page limits amongst themselves as they see fit. No further submissions on these issues will be permitted unless otherwise ordered by the Commission.

Persons filing written submissions must file the original document electronically on or before the deadlines stated above and submit 8 true paper copies to the Office of the Secretary by noon the next day pursuant to section 210.4(f) of the Commission's Rules of Practice and Procedure (19 C.F.R. 210.4(f)). Submissions should refer to the investigation number ("Inv. No. 337-TA-910") in a prominent place on the cover page and/or the first page. (*See* Handbook for Electronic Filing Procedures, http://www.usitc.gov/secretary/fed_reg_notices/rules/handbook_on_electronic_filing.pdf). Persons with questions regarding filing should contact the Secretary (202-205-2000).

Any person desiring to submit a document to the Commission in confidence must request confidential treatment. All such requests should be directed to the Secretary to the Commission and must include a full statement of the reasons why the Commission should grant such treatment. *See* 19 C.F.R. § 201.6. Documents for which confidential treatment by the Commission is properly sought will be treated accordingly. A redacted non-confidential version of the document must also be filed simultaneously with the any confidential filing. All non-confidential written submissions will be available for public inspection at the Office of the Secretary and on EDIS.

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 Part 210 of the Commission's Rules of Practice and Procedure (19 C.F.R. Part 210).

By order of the Commission.

A handwritten signature in black ink, appearing to read 'Lisa R. Barton', with a stylized flourish at the end.

Lisa R. Barton
Secretary to the Commission

Issued: April 30, 2015

CERTIFICATE OF SERVICE

I, Lisa R. Barton, hereby certify that the attached **NOTICE** has been served by hand upon the Commission Investigative Attorney, Peter J. Sawert, Esq., and the following parties as indicated, on **April 30, 2015**.



Lisa R. Barton, Secretary
U.S. International Trade Commission
500 E Street SW, Room 112
Washington, DC 20436

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**CERTAIN TELEVISION SETS, TELEVISION RECEIVERS,
TELEVISION COMPONENTS THEREOF**

Inv. No. 337-TA-910

Certificate of Service – Page 2

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**On Behalf of Respondents Wistron Corporation and Wistron
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PUBLIC VERSION

UNITED STATES INTERNATIONAL TRADE COMMISSION

Washington, D.C.

In the Matter of

**CERTAIN TELEVISION SETS,
TELEVISION RECEIVERS,
TELEVISION TUNERS, AND
COMPONENTS THEREOF**

Inv. No. 337-TA-910

**INITIAL DETERMINATION ON VIOLATION OF SECTION 337 AND
RECOMMENDED DETERMINATION ON PUBLIC INTEREST, REMEDY, AND
BONDING**

Administrative Law Judge Dee Lord

(February 27, 2015)

Appearances:

For Complainant Cresta Technology Corporation:

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Louis S. Mastriani, Esq. and Daniel F. Smith, Esq. of Adduci Mastriani & Schaumberg LLP (Washington, DC)

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Marc Collier, Esq. of Norton Rose Fulbright (Austin, TX)

For Respondents MaxLinear, Inc.:

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PUBLIC VERSION

For Respondents Samsung Electronics Co., Ltd. and Samsung Electronics America, Inc.:

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For Respondents VIZIO, Inc., SIO International, Inc., Top Victory Investments, Ltd., TPV International (USA) Inc., and Hon Hai Precision Industry Co., Ltd.:

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For Respondents LG Electronics, Inc. and LG Electronics U.S.A.:

Richard Sterba, Esq. and Daniel Tishman, Esq. of Fish & Richardson P.C. (Washington, DC)

For Respondents Wistron Corporation and Wistron Infocomm Technology (America) Corporation:

Eric C. Rusnak, Esq. of K&L Gates LLP (Washington, DC) and Harold H. Davis, Esq. of K&L Gates LLP (San Francisco, CA)

For International Trade Commission:

Anne Goalwin, Esq. and Peter Sawert, Esq. (Washington, DC)

PUBLIC VERSION

Pursuant to the Notice of Investigation and Rule 210.42 of the Rules of Practice and Procedure of the United States International Trade Commission, this is the Administrative Law Judge's Final Initial Determination in the matter of Certain Television Sets, Television Receivers, Television Tuners, and Components Thereof, Investigation No. 337-TA-910.

The Administrative Law Judge hereby determines that there is no violation of Section 337 of the Tariff Act of 1930, as amended, 19 U.S.C. § 1337, in the importation into the United States, the sale for importation, or the sale within the United States after importation of certain television sets, television receivers, television tuners, and components thereof in connection with U.S. Patent No. 7,075,585 or U.S. Patent No. 7,265,792.

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The following abbreviations may be used in this Initial Determination:

Tr.	Transcript
WS	Witness Statement
DWS	Direct Witness Statement
RWS	Rebuttal Witness Statement
JX	Joint Exhibit
CX	Complainant's exhibit
CPX	Complainant's physical exhibit
CDX	Complainant's demonstrative exhibit
CIB	Complainant's initial post-hearing brief
CRB	Complainant's corrected reply post-hearing brief
RX	Respondents' exhibit
RPX	Respondents' physical exhibit
RDX	Respondents' demonstrative exhibit
RIB	Respondents' initial post-hearing brief
RRB	Respondents' reply post-hearing brief
SIB	Staff's initial post-hearing brief
SRB	Staff's reply post-hearing brief
CPHB	Complainant's pre-hearing brief
RPHB	Respondents' pre-hearing brief
SPHB	Staff's pre-hearing brief

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I. BACKGROUND

A. Procedural History

A complaint was filed with the Commission on January 28, 2014, alleging violations of section 337 of the Tariff Act of 1930, as amended (“Section 337”), by reason of infringement of certain claims of U.S. Patent No. 7,075,585 (“the ’585 patent”), U.S. Patent No. 7,265,792 (“the ’792 patent”), and U.S. Patent No. 7,251,466 (“the ’466 patent”). On February 27, 2014, the Commission issued a Notice of Investigation in this matter to determine:

whether 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 television sets, television receivers, television tuners, and components thereof by reason of infringement of one or more of claims 1-3, 5, 10, 12-14, and 16-19 of the ’585 patent; claims 1-17 and 25-27 of the ’792 patent; claims 1, 2, 5, 8, 9, 11-13, 16, 20-22, 24-26, 29, 31, 32, 35-37, and 39 of the ’466 patent; and whether an industry in the United States exists as required by subsection (a)(2) of section 337.

See Notice of Investigation (February 27, 2014). The Commission further instructed:

Pursuant to Commission Rule 210.50(b)(1), 19 CFR 210.50(b)(1), the presiding administrative law judge shall take evidence or other information and hear arguments from the parties and other interested persons with respect to the public interest in this investigation, as appropriate, and provide the Commission with findings of fact and a recommended determination on this issue, which shall be limited to the statutory public interest factors, 19 U.S.C. 1337(d)(1), (f)(1), (g)(1).

Id. The Investigation was instituted upon publication of the Notice of Investigation in the *Federal Register* on March 5, 2014. *See* 79 Fed. Reg. 12526-27 (2014); 19 CFR § 210.10(b).

The complaint was filed by Cresta Technology Corporation of Santa Clara, CA (“Cresta” or “Complainant”). *Id.* The named respondents are Silicon Laboratories, Inc. of Austin, TX (“Silicon Labs”), MaxLinear, Inc. of Carlsbad, CA (“MaxLinear”), Samsung Electronics Co., Ltd. of Suwon, Republic of Korea and Samsung Electronics America of Ridgefield Park, NJ (collectively, “Samsung”), VIZIO, Inc. of Irvine, CA (“VIZIO”), LG Electronics, Inc. of Seoul,

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Republic of Korea and LG Electronics U.S.A. of Englewood Cliffs, NJ (collectively, “LG”), and Sharp Corporation of Osaka, Japan and Sharp Electronics Corporation of Mahwah, NJ (collectively, “Sharp”). The Office of Unfair Import Investigations is also a party in this Investigation.

On March 25, 2014, I issued Order No. 4, setting the target date for June 29, 2015.

On May 16, 2014, I issued Order No. 12, an initial determination granting Cresta’s motion for leave to amend the complaint to add respondents SIO International Inc. of Brea, CA (“SIO”) and Hon Hai Precision Industry Co., Ltd. of New Taipei City, Taiwan (“Hon Hai”) (collectively, “SIO/Hon Hai”), Top Victory Investments, Ltd. of Hong Kong and TPV International (USA), Inc. of Austin, TX (collectively, “TPV”) Wistron Corporation of New Taipei City, Taiwan and Wistron Infocomm Technology (America) of Flower Mound, TX (collectively, “Wistron”), to the Investigation. The Commission determined not to review this initial determination on June 9, 2014.

On November 3, 2014, I issued Order No. 46, an initial determination granting-in-part Samsung and Vizio’s motion for summary determination of non-infringement as to certain accused products using NXP tuners. The Commission determined not to review this initial determination on December 3, 2014.

On November 12, 2014, I issued Order No. 50, an initial determination granting Cresta’s motion to partially terminate the Investigation as to all asserted claims of the ’466 patent and claims 5, 14, and 16-19 of the ’585 patent and claims 5, 6, 9-17, and 27 of the ’792 patent. The Commission determined not to review this initial determination on December 1, 2014.

On November 21, 2014, I issued Order No. 58, an initial determination granting Samsung and Vizio’s motion for summary determination as to the importation of Samsung products using

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NXP tuners. The Commission determined not to review this initial determination on December 8, 2014.

On November 25, 2014, the parties presented tutorials on technology, and I held a hearing regarding a breach of the Protective Order in this Investigation. On November 26, 2014, I issued Order No. 61 ordering remedies for the breach of the Protective Order and requesting additional briefing regarding sanctions.¹

An evidentiary hearing in this Investigation was held over five days from Monday, December 1, 2014, through Friday, December 5, 2014.

B. The Private Parties

1. Complainant

Complainant Cresta is a Delaware corporation having its headquarters at 3900 Freedom Circle, Suite 201, Santa Clara, California 95054. Cresta was founded in 2005 in Silicon Valley and in 2011, it acquired the TV tuner business and assets of another Silicon Valley company,

¹ In response to Order No. 61, Respondent Silicon Labs filed a memorandum on December 29, 2014, deferring to the ALJ and Commission to take any appropriate action regarding the Protective Order breach. Staff filed a response on January 8, 2015, supporting the issuance of a private reprimand to the breaching attorney. Cresta also filed a response on January 8, 2015, arguing that the appropriate action would be a private warning letter. The facts surrounding the Protective Order breach are recited in Staff's memorandum as well as the parties' briefs in response to Order No. 54, which were filed on November 24, 2014.

After considering the relevant facts and the parties' briefs, I find that the severity of the breach falls between reported cases where the Commission has issued private warning letters and cases where the Commission has issued private reprimands. Aggravating factors include the fact that the confidential material was reviewed by several individuals at Cresta who were not authorized to receive CBI and that the information was particularly sensitive to Silicon Labs. Mitigating factors include the fact that: (1) the disclosure was inadvertent; (2) Cresta's counsel self-reported the breach and took prompt action to destroy all copies of the disclosed document and prevent further dissemination; (3) Silicon Labs is not seeking any further sanction; and (4) I am not aware of any previous violations of Commission protective orders by Cresta's counsel. Accordingly, it is my recommended determination pursuant to Commission Rule 210.34(c)(2) that the Commission issue a private warning letter to the breaching attorney.

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Xceive Corporation (“Xceive”), including the ’585 and ’792 patents. Amended Complaint at ¶¶ 10-16, Exhibit 1, Exhibit 25, Exhibit 26.

2. Respondents

Respondent Silicon Labs is a Delaware corporation having its headquarters at 400 W. Cesar Chavez St., Austin, Texas 78701. Silicon Labs manufactures proprietary, analog-intensive, mixed signal integrated circuits (ICs) for a broad range of applications, including TV tuners. Amended Complaint at ¶¶ 17-21; Silicon Labs Answer to Amended Complaint at ¶¶ 17-21; RIB at 3-4.

Respondent MaxLinear is a Delaware corporation with its headquarters at 5966 La Place Court, Carlsbad, California 92008. MaxLinear is a fabless semiconductor company founded in 2003 that has developed a wide array of semiconductor solutions, including TV tuners. Amended Complaint at ¶¶ 26-27; MaxLinear Answer to Amended Complaint at ¶¶ 26-27; RIB at 4.

Respondent Samsung is an electronics company that manufactures and sells a variety of products, including televisions. Samsung Electronics Co., Ltd. is a South Korean corporation with its address at 129, Samsung-ro, Yeongton-gu, Suwon-si, Gyeonggi-do, 443-742, Republic of Korea. Samsung Electronics America, Inc. is a wholly-owned subsidiary of Samsung Electronics Co. incorporated in New York with its principal place of business located at 85 Challenger Road, Ridgefield Park, New Jersey 07660. Amended Complaint at ¶¶ 22-23; Samsung Answer to Amended Complaint at ¶¶ 22-23; RIB at 4-5.

Respondent LG is an electronics company that manufactures and sells a variety of products, including televisions. LG Electronics, Inc. is a South Korean corporation with its principal executive offices at LG Twin Towers, 20 Yeouido-dong, Yeongdeungpo-gu, Seoul

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150-7-21, South Korea. LG Electronics U.S.A., Inc. is a wholly-owned subsidiary of LG Electronics, Inc. incorporated in Delaware with its principal place of business located 1000 Sylvan Avenue, Englewood Cliffs, New Jersey 07632. Amended Complaint at ¶¶ 23-24; LG Answer to Amended Complaint at ¶¶ 23-24; RIB at 5.

Respondent Sharp is an electronics company that manufactures and sells a variety of products, including televisions. Sharp Corp. is a Japanese corporation with its principal place of business at 22-22 Nagaike-cho, Abeno-ku, Osaka 545-8522, Japan. Sharp Electronics Corporation is a wholly-owned subsidiary of Sharp Corporation, is incorporated in the state of New York, and has its principal place of business at 1 Sharp Plaza, Mahwah, New Jersey, 07495-1163. Amended Complaint at ¶¶ 28-29; Sharp Answer to Amended Complaint at ¶¶ 28-29; RIB at 5.

Respondent VIZIO is a California corporation with its principal place of business located at 39 Tesla, Irvine, California 92618. VIZIO is a marketing company that sells televisions. Amended Complaint at ¶¶ 28-29; Sharp Answer to Amended Complaint at ¶¶ 30-31; RIB at 5-6.

Respondents SIO and Hon Hai are original design manufacturers (“ODM”) for certain VIZIO televisions. Hon Hai is a manufacturing company with its principal place of business at No. 2, Tze Yu Street, Tu-Cheng District, New Taipei City, Taiwan, Republic of China. SIO is a holding company for Hon Hai, and it is a California corporation with a place of business located at 105 S. Puente Street, Brea, California, 92821. Amended Complaint at ¶¶ 32-33; SIO/Hon Hai Answer to Amended Complaint at ¶¶ 32-33; RIB at 6.

Respondent TPV is an ODM for certain VIZIO televisions. TPV International (USA), Inc. is a California corporation with its principal place of business at 3737 Executive Center Drive, Austin, Texas, 78731. Top Victory Investments, Ltd. is a Hong Kong company with its

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principal place of business at Room 2108, 21st Floor, Harcourt House, 39 Gloucester Road, Wanchai, Hong Kong. Amended Complaint at ¶¶ 36-37; TPV Answer to Amended Complaint at ¶¶ 36-37; RIB at 6.

Respondent Wistron is an ODM for certain VIZIO televisions. Wistron Infocomm Technology (America) Corporation is a Texas corporation with its principal place of business at 800 Parker Square, Suite 285A, Flower Mound, Texas 75028. Wistron Infocomm Technology (America) Corporation is a wholly-owned subsidiary of Wistron Corp., which is a Taiwanese corporation with a principal place of business at 21F, 88, Sec. 1, Hsintai 5th Road, Hsichih, New Taipei City 22181, Taiwan, Republic of China. Amended Complaint at ¶¶ 34-35; Wistron Answer to Amended Complaint at ¶¶ 34-35; RIB at 6-7.

C. Witness Testimony

I received testimonial evidence in this Investigation in the form of witness statements, live testimony, and deposition designations from both fact and expert witnesses.

1. Fact Witnesses

At the evidentiary hearing, Cresta presented the testimony of several of its executives and engineers. The first of these witnesses was Dominique Python, one of the named inventors on both the '585 and '792 patents. Tr. at 359:4-400:17; CX-1688C; CX-1980C. Cresta subsequently called Mihai Murgulescu, the chief technical officer of Cresta. Tr. at 482:3-496:23, 545:2-575:21; CX-1710C. Cresta also presented the testimony of Matthew Lewis, Cresta's chief financial officer. Tr. at 704:7-798:10; CX-1706C. Torbjorn Folkebrant, the chief executive officer, was the last fact witness to testify for Cresta. Tr. at 799:7-826:2, 838:18-851:7; CX-1724C.

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Silicon Labs also called several of its engineers and executives to testify, starting with George Tyson Tuttle, Silicon Labs's Chief Executive Officer. Tr. at 409:8-454:7; RX-1989C. Silicon Labs also presented the testimony of Alan Hendrickson, its Director of Engineering. Tr. at 940:18-949:13; RX-1719C. This was followed by testimony from Ramin Poorfard, the Director of Engineering for Silicon Labs's Home Products Group. Tr. at 949:22-961:5; RX-1739C; RX-1994C. Silicon Labs later called Alessandro Piovaccari, its Vice President of Engineering. Tr. at 972:6-991:25; RX-1720C. He was followed by Eric Garlepp, Silicon Labs's Senior Director of IoT Home Products. Tr. at 992:23-1035:19; RX-1730C. Silicon Labs also called one adverse witness, Anik Bose, a former Cresta board member. Tr. at 456:1-480:21.

The other Respondents also presented several witnesses. Sharp presented the testimony of John Mitchell Revie and Tsuyoshi Itaya. Tr. at 962:11-967:18; RX-1550C; RX-1551C. Vizio presented the testimony of Kenneth R. Lowe. Tr. at 968:1-970:17; RX-1970C. MaxLinear presented the testimony of Dr. Curtis Ling. Tr. at 1039:2-1089:19; RX-1659C; RX-1995C. Samsung presented the testimony of Daniel Schinasi. Tr. at 1091:6-1096:23; RX-1707C.

2. Expert Witnesses

The private parties relied on outside experts to render opinions on infringement, invalidity, and domestic industry. Cresta presented testimony from Dr. Martin Snelgrove, and I received his testimony as an expert in the field of RF receivers.² Tr. at 142:23-143:4. Dr. Snelgrove testified regarding infringement, technical domestic industry, and invalidity. Tr. at 133:9-337:9, 1285:13-1305:21; CX-2024C; CX-1968C. Cresta also presented the testimony

² Cresta initially tendered Dr. Snelgrove as an expert in the field of "RF receivers, including television receivers," and Silicon Labs objected to the qualification including television receivers. Tr. at 136:5-142:22. Cresta withdrew the "television receivers" portion of its tender in its post-trial brief. CIB at 14 n.12.

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of Dr. Michael Caloyannides on the issue of invalidity, and his testimony was received as an expert in RF receiver design. Tr. at 1195:11-1266:3; CX-1981C. Silicon Labs presented the testimony of Bruce McNair regarding invalidity, infringement, and technical domestic industry, and he was received as an expert in the field of RF receivers. Tr. at 577:7-703:16; RX-1677C; RX-1991C. MaxLinear's technical expert on invalidity and infringement was Dr. Hossein Hashemi, who was received as an expert in the field of multistandard RF receivers. Tr. at 864:2-940:4; RX-1663C; RX-1996C.

Cresta presented the testimony of Dr. Kenneth Button on the issues of public interest and remedy, and he was received as an expert in the field of economics. Tr. at 1266:14-1283:18; CX-1896C. The Respondents presented the testimony of Dr. Thomas Vander Veen on the issues of public interest, domestic industry, and remedy; Dr. Vander Veen was also received as an expert in the field of economics. Tr. at 1097:9-1193:19; RX-1676C; RX-1999C.

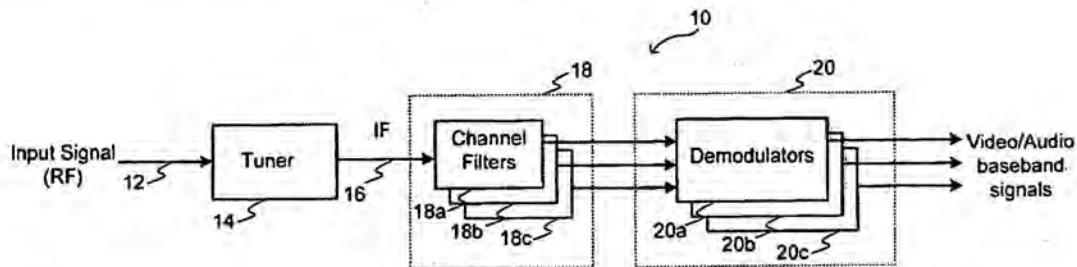
3. Deposition Designations

The private parties submitted additional testimony through deposition designations pursuant to Commission Rule 210.28(g). Complainant submitted designated transcripts for Akio Kitaya (CX-1982C), Alan Hendrickson (CX-1983C), Ann Liu (CX-1985C), Bill Bock (CX-1986C), Curtis Ling (CX-1988C, CX-1989C, CX-1990C), Daniel Schinasi (CX-1991C), Dolly Low (CX-1992C), Jae-Min Ha (CX-1994C), James Stansberry (CX-1995C), John Revie (CX-1997C), Ken Lowe (CX-1998C), Kyoung-Shin Jin (CX-1999C), Mac Chuang (CX-2000C), Mustafa Koroglu (CX-2001C), P. Britton Gregory (CX-2002C), Peng Zhuchun (CX-2003C), Richard Lee (CX-2005C), Tony Chen (CX-2007C), Tsuyoshi Itaya (CX-2008C, CX-2009C), Tyson Tuttle (CX-2010C), and Wender Wang (CX-2011C). Respondents submitted designated transcripts for Didier Margairaz (RX-1682C), Rainer Hoffman (RX-1683C; RX-1686C), Mihai

Murgulescu (RX-1684C; RX-1696C), Matthew Lewis (RX-1685C; RX-1694C), Dominique Python (RX-1687C; RX-1698C), Torbjorn Folkebrant (RX-1688C; RX-1699C), Jimmy Zien (RX-1689C), Friederich Mombers (RX-1690C), Harold Hughes (RX-1691C), Ramon Cazares (RX-1692C), Hans Fiesel (RX-1693C), and Anik Bose (RX-1695C).

D. Overview Of The Technology

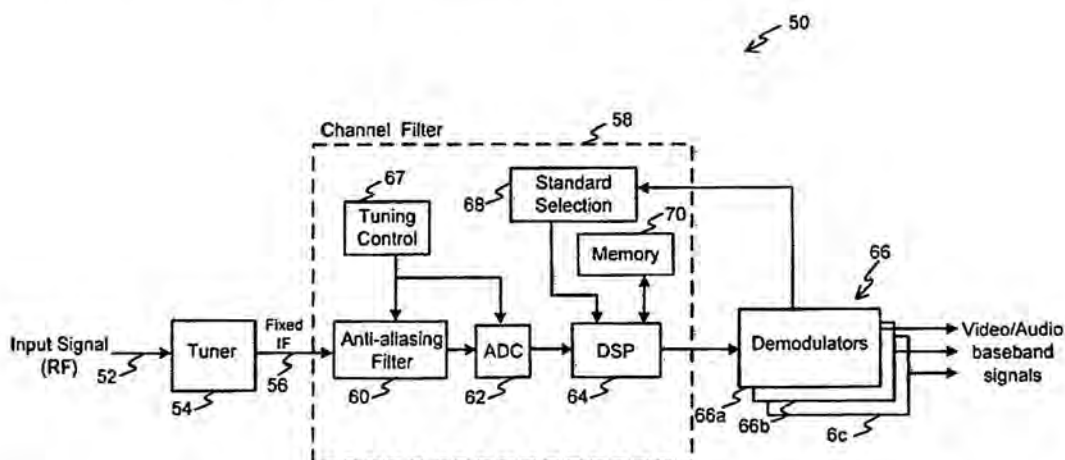
This Investigation relates to television tuners for receiving and processing television radio frequency (RF) signals. CPHB at 13-15; RPHB at 8-11. Television signals are formatted according to certain standards, such as the NTSC (“National Television Standards Committee”) analog transmission standard and the ATSC (“Advanced Television System Committee”) digital transmission standard. CPHB at 14; RPHB at 9. Historically, television tuners were implemented using a collection of discrete components to receive and process signals encoded to one particular standard. CPHB at 14-15; RPHB at 8-9. An example of this conventional architecture is depicted in Figure 1 of the ‘585 patent:



JX-0001 at Fig. 1. In this architecture, the tuner receives the incoming signal and converts the incoming radio frequency (RF) signal to an intermediate frequency (IF) signal. *Id.* at 1:49-57. A channel filter and demodulator converts the IF signal to video and audio baseband signals that can be used to generate images and sound. *Id.* at 2:1-11. To process signals for different television standards, multiple channel filters and demodulators can be used for each type of signal, such as digital demodulators for digital television signals. *Id.* at 2:12-26.

E. Overview Of The Asserted Patents

The '585 patent, entitled "Broadband receiver having a multistandard channel filter," issued on July 11, 2006. JX-0001. The application for the '585 patent was filed on September 6, 2002 and claims priority to U.S. Provisional Application No. 60/322,548 ("the '548 provisional"), filed September 17, 2001. *Id.* The '585 patent discloses a television receiver architecture with channel processing and filtering in the digital domain. CPHB at 126-17; RPHB at 9. This architecture is depicted in Figure 2 of the '585 patent:



JX-0001 at Fig. 2. The digital processing in the channel filter allows for compatibility with multiple different television standards without using the multiple channel filters required in the prior art. *Id.* at 4:12-16. A bank of demodulators generates video and audio baseband signals, which can be decoded for playback on a view screen. *Id.* at 5:43-52. Claim 1 of the '585 patent reads:

1. A receiver comprising:

a tuner for receiving input RF signals and for converting said input RF signals to intermediate signals having an intermediate frequency (IF), said input RF signals encoding information in one of a plurality of formats; and

a channel filter for receiving the intermediate signals, said channel filter comprising:

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an anti-aliasing filter for filtering said intermediate signals;

an analog-to-digital converter for sampling said filtered intermediate signals and generating a digital representation thereof;

a signal processor for processing said digital representation of said intermediate signals in accordance with said format of said input RF signal, said signal processor generating digital output signals indicative of information encoded in said input RF signal; and

a plurality of demodulators, each coupled to receive output signals from said signal processor, each of said demodulators for demodulating said digital output signals according to one of said formats of said input RF signal, each of said demodulators generating video and audio baseband signals corresponding to said format of said input RF signal.

(*Id.* at 6:52-7:9.)

The '792 patent, entitled "Television receiver for digital and analog television signals," issued on September 4, 2007. JX-0002. The application for the '792 patent was filed on July 1, 2004. *Id.* On September 30, 2014, Cresta filed a terminal disclaimer for the '792 patent, agreeing to shorten its term to expire at the same time as the '585 patent. CX-1376C. The '792 patent builds on the architecture of the '585 patent and discloses signal output circuits that provide specific video and/or audio outputs following the digital processing of the IF signal. CPHB at 17-18; JX-0002 at Abstract. Claim 1 of the '792 patent reads:

1. A television receiver comprising:

a frequency conversion circuit for receiving an input RF signal and for converting the input RF signal to an intermediate frequency signal having an intermediate frequency (IF), the input RF signal encoding information in one of a plurality of television signal formats;

an analog-to-digital converter for sampling the intermediate frequency signal and generating a digital representation thereof;

a signal processor for processing the digital representation of the intermediate frequency signal in accordance with the television signal format of the input RF signal, the signal processor generating digital output signals indicative of information encoded in the input RF signal, wherein the signal processor applies one of a plurality of finite impulse response filters to the digital representation of

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the intermediate frequency signal, each of the plurality of finite impulse response corresponding to a format of the input RF signal; and

a signal output circuit for receiving the digital output signals from the signal processor and for providing one or more output signals corresponding to the digital output signals.

Id. at 6:52-7:9.

F. Products At Issue

Cresta asserts that Silicon Labs tuners, and televisions incorporating such tuners, infringe claims 1, 2, 3, 10, and 13 of the '585 patent and claims 1-4, 7, 8, and 26 of the '792 patent. CIB at 57, 152. Cresta also asserts that MaxLinear tuners, and televisions incorporating such tuners, infringe claims 1, 2, 3, 10, 12 and 13 of the '585 patent and claims 1-3, 7, 8, 25 and 26 of the '792 patent. CIB at 83, 161-67. In addition, Cresta asserts that certain Cresta tuners, and televisions incorporating such tuners, practice claims 1-3, 5-6, 10, 13-14, 16, 17-19, 21 of the '585 patent and claims 1-4, 7, 10-12, 18-19, and 26-27 of the '792 patent. CIB at 111-14, 167-68.

The accused Silicon Labs tuners are a line of hybrid (analog and digital) television tuners, which are identified by Order Part Numbers ("OPNs") in a chart that Silicon Labs produced in this Investigation. CIB at 54-56; RIB at 63-65; JX-0056C. Certain televisions sold by Samsung, LG, and VIZIO (manufactured by [REDACTED]) incorporate the accused Silicon Labs tuners. CIB at 56-57. The accused MaxLinear tuners are identified as the MxL601 and MxL661 tuners. CIB at 83-87. Certain televisions sold by Sharp, Samsung, and VIZIO (manufactured by [REDACTED]) incorporate the accused MaxLinear tuners. CIB at 87-93. Cresta's alleged domestic industry products are the XC5000A series, XC5000C series, CTC70X series, CTC71X series tuners. CIB at 111-14.

II. JURISDICTION

In order to have the power to decide a case, a court or agency must have both subject matter jurisdiction and jurisdiction over either the parties or the property involved. 19 U.S.C. § 1337; *Certain Steel Rod Treating Apparatus and Components Thereof*, Inv. No. 337-TA-97, Commission Memorandum Opinion, 215 U.S.P.Q. 229, 231 (1981).

A. Subject Matter Jurisdiction

Section 337 confers subject matter jurisdiction on the International Trade Commission to investigate, and if appropriate, to provide a remedy for, unfair acts and unfair methods of competition in the importation, the sale for importation, or the sale after importation of articles into the United States. *See* 19 U.S.C. §§ 1337(a)(1)(B) and (a)(2). The complaint alleges that Respondents have violated subsection 337(a)(1)(B) by the importation and sale of products that infringe the asserted patents. All the Respondents have entered into stipulations regarding importation and have conceded that the importation requirement of Section 337 is satisfied with respect to the accused products. CX-1697C (SIO/Hon Hai); CX-1698C (TPV); CX-1699C (Samsung); CX-1700C (Wistron); CX-1701C (LG); CX-1702C (MaxLinear); CX-1721C (Silicon Labs); CX-1730C (Sharp); CX-1831C (VIZIO). Thus, I find that the Commission has subject matter jurisdiction over this Investigation under Section 337 of the Tariff Act of 1930. *See Amgen, Inc. v. U.S. Int'l Trade Comm'n*, 902 F.2d 1532, 1536 (Fed. Cir. 1990).

B. Personal Jurisdiction

Respondents each responded to the Complaint and Notice of Investigation, participated in the Investigation, made an appearance at the hearing, and submitted joint post-hearing briefs. Thus, I find that Respondents have submitted to the personal jurisdiction of the Commission.

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See Certain Miniature Hacksaws, Inv. No. 337-TA-237, Initial Determination, 1986 WL 379287 (October 15, 1986) (unreviewed by Commission in relevant part).

C. In Rem Jurisdiction

The Commission has *in rem* jurisdiction over the products at issue by virtue of the above finding that the accused products have been imported into the United States. *See Sealed Air Corp. v. U.S. Int'l Trade Comm'n*, 645 F.2d 976, 985 (C.C.P.A. 1981).

D. Standing

Respondents assert that Cresta lacks prudential standing with respect to the asserted patents because of restrictions imposed by certain security agreements with Cresta's investors. Respondents argue that, under these agreements, Cresta "forfeited its rights to freely dispose of the asserted patents." RIB at 8 (*citing* RX-0954C; RX-0955C; RX-1383C; RX-1999C at Q/A 147-54). Respondents note that the security agreements identify as collateral in which the investors have a security interest "all intellectual property," "patents and patent applications," and "all licenses relating to any of the foregoing." RIB at 9 (*citing* RX-0955C at 249; RX-1383C at 810; Tr. at 723:21-724:1,727:13-15). Respondents state further that each security agreement prohibits Cresta from surrendering or otherwise disposing of "any right or interest in the collateral, except in the ordinary course of business." RIB at 9.

Respondents argue that under Federal Circuit precedent, limitations on the right to transfer a patent and consent to the settlement of litigation "are often fatal to a party's prudential standing." RIB at 10. They state that because Cresta gave away these rights before the Complaint was filed Cresta lacks prudential standing, and that the defect is incurable at this late stage of the Investigation. *Id.* at 11. Respondents assert that although the security agreements carve out transfers that occur in the ordinary course of business, the litigation context in which

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the investors issued the loans to Cresta casts doubt on whether Cresta possesses the rights to license, assign or transfer patents rights in connection with this Investigation or district court litigation. RRB at 2-3.

Cresta says that it retains all significant rights in the patents except in the event of default or bankruptcy. In that event, the investors have a secured interest in all of Cresta's assets, including patents. CIB at 10. Cresta states that this is a "standard and ubiquitous term in commercial business lending." *Id.*

Staff argues that Cresta lacks standing because the security agreements implicitly grant Cresta's investors the right to accept or veto any licensing agreements or settlements. SIB at 10-11.

The question of standing focuses on whether a complainant has all substantial rights in the patent and is thus considered the patent owner. *Certain Optical Disc Drives, Components Thereof, and Products Containing Same ("Optical Disc Drives")*, Inv. No. 337-TA-897 at 11 (Comm'n Op. Jan. 7, 2015). In this case, the pertinent provision of the Security Agreements between Cresta and its investors states in Section 6 (e):

[REDACTED]

RX-0955C; RX-1383C.

In the context of the security agreement of which it is a part, this provision [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED] Respondents simply read the provision incorrectly, as [REDACTED]

RRB at 2. In fact, as quoted above, the language at issue prohibits Cresta from

Respondents' erroneous reading makes all the difference.

The quoted language in Section 6 impinges on none of the substantial rights inherent in patent ownership. I agree with Cresta that the restriction on transfer of patent rights other than in the ordinary course of business is consistent with ownership of the patent rights by Cresta, not with alienation of those rights by Cresta to the investors. The provisions pertaining to default reflect commercial practice and do not confer more than reversionary rights, if that, on the investors here.

In determining whether a party has sufficient rights to be considered the owner of a patent, the Federal Circuit has determined that the right to sue "is the most important consideration." *Optical Disc Drives* at 17 (quoting *Alfred E. Mann Found. For Scientific Research v. Cochlear Corp.*, 604 F.3d 1354, 1360-61 (Fed. Cir. 2010)). Examining both the content and the context of the security agreements, I find no limitation on the right to sue in Section 6(e) of the Security Agreement. In addition, I find no limitation, express or implied, on Cresta's right to license its patents or enter into settlements resolving patent claims. Based on the evidence of record, and in the absence of any evidence to the contrary, Cresta has standing.

III. CLAIM CONSTRUCTION

A. Applicable Law

"An infringement analysis entails two steps. The first step is determining the meaning and scope of the patent claims asserted to be infringed. The second step is comparing the properly construed claims to the device accused of infringing." *Markman v. Westview*

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Instruments, Inc., 52 F.3d 967, 976 (Fed. Cir. 1995) (*en banc*), *aff'd*, 517 U.S. 370 (1996) (citation omitted). Claim construction “is a matter of law exclusively for the court.” *Id.* at 977. See also *Lighting Ballast Control LLC v. Philips Electronics North America Corp.*, 744 F.3d 1272 (Fed. Cir. 2014), *vacated and remanded*, 2015 WL 303220, *in view of Teva Pharmaceuticals USA, Inc. v. Sandoz, Inc.*, 135 S.Ct. 830, 574 U.S. ____ (January 20, 2015). “[T]he construction of claims is simply a way of elaborating the normally terse claim language[] in order to understand and explain, but not to change, the scope of the claims.” *Embrex, Inc. v. Serv. Eng’g Corp.*, 216 F.3d 1343, 1347 (Fed. Cir. 2000) (alterations in original). “[O]nly those [claim] terms need be construed that are in controversy, and only to the extent necessary to resolve the controversy.” *Vivid Techs., Inc. v. Am. Sci. & Eng’g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999).

Claim construction focuses on the intrinsic evidence, which consists of the claims themselves, the specification, and the prosecution history. See generally *Phillips v. AWH Corp.*, 415 F.3d 1303 (Fed. Cir. 2005) (*en banc*). The Federal Circuit in *Phillips* explained that, in construing terms, courts must analyze each of these components to determine the “ordinary and customary meaning of a claim term,” which is “the meaning that the term would have to a person of ordinary skill in the art in question at the time of the invention.” *Id.* at 1313.

“It is a ‘bedrock principle’ of patent law that ‘the claims of a patent define the invention to which the patentee is entitled the right to exclude.’” *Id.* at 1312. “Quite apart from the written description and the prosecution history, the claims themselves provide substantial guidance as to the meaning of particular claim terms.” *Id.* at 1314. For example, “the context in which a term is used in the asserted claim can be highly instructive,” and “[o]ther claims of the patent in question, both asserted and unasserted, can also be valuable sources of enlightenment as to the

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meaning of a claim term.” *Id.*

“[T]he specification ‘is always highly relevant to the claim construction analysis. Usually, it is dispositive; it is the single best guide to the meaning of a disputed term.’” *Id.* “The longstanding difficulty is the contrasting nature of the axioms that (a) a claim must be read in view of the specification and (b) a court may not read a limitation into a claim from the specification.” *Innova/Pure Water, Inc. v. Safari Water Filtration Sys., Inc.*, 381 F.3d 1111, 1117 (Fed. Cir. 2004). The Federal Circuit has explained that there are certain instances when the specification may limit the meaning of the claim language. For example, “the specification may reveal a special definition given to a claim term by the patentee that differs from the meaning it would otherwise possess. In such cases, the inventor’s lexicography governs.” *Phillips*, 415 F.3d at 1316. The specification also “may reveal an intentional disclaimer, or disavowal, of claim scope by the inventor.” *Id.* In such cases, “the inventor has dictated the correct claim scope, and the inventor’s intention, as expressed in the specification, is regarded as dispositive.” *Id.*

In addition to the claims and the specification, the prosecution history should be examined if in evidence. “The prosecution history . . . consists of the complete record of the proceedings before the PTO and includes the prior art cited during the examination of the patent. Like the specification, the prosecution history provides evidence of how the PTO and the inventor understood the patent.” *Id.* at 1317. “[T]he prosecution history can often inform the meaning of the claim language by demonstrating how the inventor understood the invention and whether the inventor limited the invention in the course of prosecution, making the claim scope narrower than it would otherwise be.” *Id.*

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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 dictionaries, inventor testimony, expert testimony and learned treatises. *Id.* at 1317. Extrinsic evidence is generally viewed “as less reliable than the patent and its prosecution history in determining how to read claim terms” *Id.* at 1318. “The court may receive extrinsic evidence to educate itself about the invention and the relevant technology, but the court may not use extrinsic evidence to arrive at a claim construction that is clearly at odds with the construction mandated by the intrinsic evidence.” *Elkay Mfg. Co. v. Ebco Mfg. Co.*, 192 F.3d 973, 977 (Fed. Cir. 1999).

B. Field of the Invention and Level of Ordinary Skill in the Art

Cresta argues that the relevant field of art is television tuners and receivers. CIB at 12-13; CX-2024C at Q/A 147 (Snelgrove DWS). Respondents’ experts describe a broader field of art of “integrated circuits and radio frequency communication receivers” and “RF receivers and signal processing design.” RX-1663C at Q/A 41 (Hashemi DWS); RX-1677C, at Q/A 70 (McNair DWS). The asserted patents both describe the field of the invention as “relate[d] to a television signal receiver.” JX-0001 at 1:15-19; JX-0002 at 1:6-10. I therefore agree with Cresta that the relevant field of the invention is television tuners and receivers.

The parties also disagree regarding the level of ordinary skill in the art for the asserted patents. CIB at 12-14; SIB at 14-15. Cresta argues that a person of ordinary skill in the art would have a Bachelor of Science degree in Electrical Engineering (BSEE) or a closely related field and at least two years of professional experience in implementing radio frequency circuits for television applications. CIB at 13-14; CX-2024C at Q/A 148 (Snelgrove DWS). Silicon Labs’s expert Pf. McNair proposes a higher education requirement of a Master of Science degree

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in Electrical Engineering (MSEE), or equivalent, but allowed for a more general two years of experience in RF receiver and signal processing design. RX-1677C at Q/A 70. MaxLinear's expert Dr. Hashemi proposes an MSEE with four years of substantial experience designing or doing research in the area of wireless communication receivers and integrated circuit realization of RF receivers. RX-1663C at Q/A 41. Dr. Hashemi further testifies that "[a]dditional education may compensate for less experience and vice-versa." *Id.* Dr. Snelgrove also proposes alternative qualifications, testifying that a person of ordinary skill in the art could have a BSEE with four years of experience in RF integrated circuit design that is not specific to the field of televisions or a MSEE with two years of experience in RF integrated circuit design that is not specific to televisions. CX-2024C at Q/A 149. Pf. McNair proposes alternative qualifications of an MSEE with a concentration in RF receiver and signal processing design (without work experience) or a BSEE with two to four years of industry experience in RF receiver and signal processing design. RX-1677C at Q/A 70.

With the multiple alternatives proposed by the experts, there are only minor differences between the parties' positions, and I agree with the general requirements of both Dr. Snelgrove's and Pf. McNair's proposals. I therefore find that a person of ordinary skill in the art for the asserted patents would have a BSEE (or equivalent) and four years of industry experience in RF integrated circuit and signal processing design or a MSEE with two years of similar industry experience. More specialized experience or education with television tuners could substitute for additional years of experience, *e.g.*, a BSEE with two years of experience implementing RF integrated circuits for television applications or a MSEE with one year of experience implementing or studying RF integrated circuits for television applications.

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C. Disputed Claim Terms

1. “receiver”

Cresta’s Proposed Construction	Respondents’ Proposed Construction	Staff’s Proposed Construction
television receiver	<i>preamble not limiting</i>	<i>preamble not limiting</i>

The term “receiver” appears in the preamble of claim 1 of the ’585 patent. A preamble generally does not limit the claims unless “it recites essential structure or steps” or it is “necessary to give life, meaning and vitality” to the claim. *American Medical Systems, Inc. v. Biolitec, Inc.*, 618 F.3d 1354, 1358 (Fed. Cir. 2010) (citing *Catalina Mktg. Int’l, Inc. v. Coolsavings.com, Inc.*, 289 F.3d 801, 808 (Fed. Cir. 2002); *Pitney Bowes, Inc. v. Hewlett-Packard Co.*, 182 F.3d 1298, 1305 (Fed. Cir. 1999)). In addition, the Federal Circuit has held that a preamble is not construed as a separate limitation where it “is reasonably susceptible to being construed to be merely duplicative of the limitations in the body of the claim (and was not clearly added to overcome a rejection).” *Symantec Corp. v. Computer Associates Intern., Inc.*, 522 F.3d 1279, 1288-89 (Fed. Cir. 2008). I find that the preamble here, “[a] receiver comprising,” neither recites essential structure nor gives life to the claim. Moreover, the first limitation of the claim recites “a tuner for receiving input RF signals,” which is duplicative of the preamble term “receiver.”

Cresta’s briefs do not address any of the Federal Circuit law regarding the construction of preamble limitations and instead argues that the specification clearly limits the overall invention to television signal receivers. CIB 17-18. I do not reach that question, however, because I find that the Federal Circuit case law regarding preambles is controlling, and I therefore conclude that the preamble term “receiver” is not limiting.

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2. “tuner”

Cresta’s Proposed Construction	Respondents’ Proposed Construction	Staff’s Proposed Construction
circuit that converts television radio frequency input signals to signals at an intermediate frequency	circuitry that selects a bandwidth of radio frequency input signals and converts that band to a band of output signals at an intermediate frequency	circuit that selects a bandwidth of radio frequency input signals and converts that band to output signals at an intermediate frequency

The term “tuner” appears in claim 1 of the ’585 patent. Cresta seeks to limit this term to “television” signals, arguing that the overall invention is limited to television signal receivers. CRB at 11. Respondents and Staff oppose this “television” limitation and argue for a different construction specifying that tuning requires selection of a bandwidth of radio frequency, *e.g.*, a band corresponding to a particular television channel, citing a dictionary definition. RIB at 15-16; SIB at 17-19; RX-0621 at 808. Cresta argues that tuners can be implemented to cover the entire received spectrum rather than a selected bandwidth but submits that there is no substantive issue that turns on this distinction. CIB at 18-19; CX-2024C at Q/A 58 (Snelgrove DWS).

I decline to read Cresta’s proposed “television” limitation into this claim term. The Federal Circuit has consistently held that claim terms are presumed to have their ordinary and customary meaning unless “the patentee has acted as his own lexicographer or disavowed claim scope in the specification or during the prosecution history.” *Azure Networks, LLC v. CSR PLC*, 771 F.3d 1336, 1348 (Fed. Cir. 2014). Although Cresta points to evidence that the overall invention of the ’585 patent is directed to television tuners, there are no statements in the specification specifically limiting the term “tuner” to television or disavowing tuners that receive other radio frequency input signals. I also find no explicit support in the specification for the selection limitation proposed by Respondents and Staff, and I decline to import this into the claim language. Respondents and Staff cite a dictionary definition supporting the limitation,

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RX-0621 at 808, but there was no testimony at the hearing explaining why this definition is relevant to the '585 patent; the only expert testimony on this issue was Dr. Snelgrove's opinion that a tuner could convert the entire received spectrum rather than a selected bandwidth. CX-2024 at Q/A 58.

The parties' proposed additional limitations are not supported by the patent's consistent description of tuners as circuitry for converting radio frequency input signals to intermediate frequency signals. JX-0001 at 1:58-61 ("a tuner 14 for receiving the input RF signal on input terminal 12 and converting the RF signal to an IF signal by one or more frequency conversions"), 3:48-50 ("a tuner 54 which operates to convert the input RF signal to an intermediate signal using one or more frequency conversions"). These functions for the tuner are recited directly in the claim language, and the parties do not dispute these limitations, including them in each of their proposed constructions.

Accordingly, I construe the term "tuner" to mean circuitry that converts radio frequency input signals to signals at an intermediate frequency.

3. "frequency conversion circuit"

Cresta's Proposed Construction	Respondents' Proposed Construction	Staff's Proposed Construction
circuit that converts television radio frequency input signals to signals at an intermediate frequency	circuitry that converts a selected bandwidth of radio frequency input signals and converts that band to a band of output signals at an intermediate frequency	circuit that converts a selected bandwidth of radio frequency input signals and converts that band to output signals at an intermediate frequency

The term "frequency conversion circuit" appears in claim 1 of the '792 patent, and the parties' proposed constructions are nearly identical to those that they proposed for the term "tuner" in the '585 patent, discussed above. Cresta again seeks to limit this term to "television" signals, while Respondents and Staff argue that tuning implies selection of a bandwidth of radio

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frequency. CRB at 11; RIB at 16-18; SIB at 19-20. For the same reasons as discussed above for the term “tuner,” I decline to import either of these limitations into the construction for “frequency conversion circuit.” The ’792 patent describes the “frequency conversion circuit” using the same language that the ’585 patent uses to describe its “tuner.” *See* JX-0002 at 4:55-58 (“Frequency conversion circuit 110 operates to convert the input RF signal to an intermediate frequency (IF) signal using one or more frequency conversions.”)

Accordingly, I construe the term “frequency conversion circuit” to mean circuitry that converts radio frequency input signals to signals at an intermediate frequency.

4. “input RF signal(s)”

Cresta’s Proposed Construction	Respondents’ Proposed Construction	Staff’s Proposed Construction
input RF television signal(s)	radio frequency input signal(s)	radio frequency input signal(s)

The term “input RF signal(s)” appears in claims 1, 10, and 13 of the ’585 patent and claims 1, 8, and 26 of the ’792 patent. Cresta seeks to limit this term to “television” signals, arguing that the overall invention is limited to television signal receivers. CIB at 17-18. Respondents’ and Staff’s constructions merely explain that “RF” stands for radio frequency, which is undisputed. RIB at 18-19; SIB at 20-21. Respondents argue that the ordinary meaning of “RF signal” is not limited to television and there is no reference to television in claims 1, 10, or 13 of the ’585 patent. RIB at 18. In addition, dependent claims 2, 4, 5, and 18 explicitly reference “television,” and Respondents argue that this invokes the doctrine of claim differentiation. *See Phillips*, 415 F.3d at 1315 (“the presence of a dependent claim that adds a particular limitation gives rise to a presumption that the limitation in question is not present in the independent claim.”). RIB at 14. Similarly, the ’792 patent explicitly references “television” in its claims while the ’585 patent does not. RIB at 18-19; *compare* JX-0002, ’792 patent at

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10:52-56 (“one of a plurality of television signal formats”) *with* JX-0001, ’585 patent at 6:53-56 (“one of a plurality of formats”). Cresta argues that because there are other differences between these claims, the doctrine of claim differentiation does not apply. CRB at 10-11.

While I agree with Cresta that claim differentiation does not strictly apply here, I do not find any compelling reason to read a “television” limitation into the “input RF signal(s)” term. Although the overall invention may be directed to television signals, Cresta fails to identify any evidence that the ’585 patent defines the term “input RF signal(s)” to be specifically limited to television. I thus find that this term should have its plain and ordinary meaning in accordance with Respondents’ and Staff’s proposed construction: radio frequency input signal(s).

5. “intermediate signal” / “intermediate frequency (IF)”

Cresta’s Proposed Construction	Silicon Labs’s Proposed Construction	MaxLinear’s and Staff’s Proposed Construction
“intermediate [frequency] signal” – a signal that has been converted from RF but has not yet been demodulated	“intermediate signals having an intermediate frequency (IF)” (’585 patent) – the signals output by the tuner have a frequency band above low-IF	“intermediate [frequency] signal” – signals having an intermediate frequency
“intermediate frequency (IF)” – a frequency of any value other than the RF signal frequency	“intermediate frequency signal having an intermediate frequency (IF)” (’792 patent) – the signals output by the frequency conversion circuit have a frequency band above low-IF	“intermediate frequency (IF)” – a carrier frequency that is different from (1) the transmission frequency of the selected input RF signal band and (2) the frequencies of the baseband signals

The term “intermediate signal having an intermediate frequency” appears in claim 1 of the ’585 patent, and the term “intermediate frequency signal having an intermediate frequency” appears in claim 1 of the ’792 patent. Cresta proposes a construction for “intermediate [frequency] signal” that recognizes the place of this term in the context of the claims, appearing after the input RF signal has been converted but before demodulation. *See* JX-0001, ’585 patent

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at 6:53-57; JX-0002, '792 patent at 10:52-56. Cresta's proposed construction for "intermediate frequency" distinguishes the value of this frequency from the RF signal frequency but places no other limitations on this term. CIB at 19-33. The Respondents and Staff propose constructions that exclude low-IF and zero-IF (baseband) frequencies from the scope of an "intermediate frequency." RIB at 19-33; SIB at 21-23.

There is no meaningful dispute regarding the construction of the first part of this term: "intermediate [frequency] signal." Cresta, Respondents, and the Staff propose constructions that recognize limitations that are apparent from the claim language. There is no dispute that the "intermediate signal" refers to the signal that has been converted from RF but not yet demodulated (as proposed by Cresta), that it is the signal output by the tuner or frequency conversion circuit (as proposed by Silicon Labs), and that it refers to a signal having an intermediate frequency (as proposed by MaxLinear and Staff). The parties' dispute focuses on the construction of the second part of this term, "intermediate frequency (IF)," and specifically, whether it excludes zero-IF and low-IF.

The term "intermediate frequency (IF)" first appears in the asserted patents when describing a conventional television receiver:

The operation of a conventional television receiver includes two main components. First, the receiver receives the incoming television signal in radio frequency (RF) and converts the incoming RF signal to an intermediate frequency (IF) signal. Then, the receiver converts the IF signal to a video baseband signal and an audio baseband signal.

JX-0002 at 1:34-39; JX-0001 at 1:49-54. The asserted patents further explain that "[c]urrently, there are five intermediate frequencies being used in the world. For example, in the United States, the IF is 41 to 47 MHz." JX-0001 at 1:65-67; JX-0002 at 1:49-51. The asserted claims refer to an IF in the context of a frequency conversion from the input RF signals, with the '585

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patent claiming a tuner “for converting said input RF signals to intermediate signals having an intermediate frequency (IF).” JX-0001 at 6:52-55. Similarly, the ’792 patent claims “a frequency conversion circuit for receiving an input RF signal and for converting the input RF signal to an intermediate frequency signal having an intermediate frequency (IF).” JX-0002 at 10:51-55.

The use of the term intermediate frequency (IF) in the asserted patents is consistent with technical dictionary definitions cited by Cresta and Respondents, which describe IF as the result of a shift in frequency of a signal that occurs before demodulation. *See* CX-1832 at 578 (IEEE dictionary defining IF as “frequency to which a signal wave is shifted locally as an intermediate step in transmission or reception” and “[t]he difference frequency resulting from a frequency conversion before demodulation”); RX-0547 at 578 (same dictionary); CX-1834 at 671 (earlier IEEE dictionary with the same definitions); RX-0546 at 269 (Hargrave’s Communications Dictionary defining IF as “[a] frequency to which a carrier frequency is shifted as an intermediate step in transmission or reception”. Articles and textbooks from the time of the asserted patents also use IF in the same way to refer to an intermediate signal that is the result of a frequency conversion from an input RF signal prior to demodulation. *See* RX-0007 at 13 (Crols and Steyaert, CMOS Wireless Transceiver Design: “The wanted signal is downconverted from its carrier frequency to the intermediate frequency by multiplying it with a single sinusoidal signal. It can then be demodulated on this frequency or it can be further downconverted.”); RX-0454 at 27 (Laskar, Modern Receiver Front-Ends: “the input RF signal is down-converted to an intermediate frequency (IF) where it is amplified and filtered before the final demodulation by a low-frequency demodulator.”).

The intrinsic and extrinsic evidence thus consistently refers to an intermediate frequency that is the result of a frequency conversion from an input frequency, and there is no dispute

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between the parties that the claimed intermediate frequency in the asserted patents is different from the input RF frequency. Respondents propose additional limitations on the intermediate frequency, however, with MaxLinear and the Staff arguing that the intermediate frequency must be different from the frequencies of the baseband signals and Silicon Labs arguing that the intermediate frequency must be above low-IF. I find that these additional limitations are not supported by the intrinsic evidence, however. In particular, the '585 patent discloses one embodiment where

tuner 54 can be designed to generate intermediate signals having an intermediate frequency of *any values*. The IF used by [the] tuner can be the same as or different than the IF specified by the worldwide standards ... The value of the IF in an integrated tuner is a matter of design choice. In one embodiment, the IF is selected to be 20 MHz or higher.

JX-0001 at 3:60-4:2 (emphasis added). Respondents and Staff argue that “any value” does not include low-IF or zero-IF, but as discussed below, I find that the intrinsic and extrinsic evidence does not support these additional limitations.

Staff argues that the claims and specification of the asserted patents distinguish the intermediate signal from the baseband signals. SIB at 22-23; SRB at 3. The distinction between IF and baseband is not made on the basis of frequency, however. The asserted patents describe the conversion from RF to IF as a frequency conversion, but the conversion from IF to baseband is described as demodulation without any explicit reference to frequency. *Compare* JX-0001 at 1:58-61 (“converting the RF signal to an IF signal by one or more frequency conversions”) *to id.* at 2:1-3 (“a demodulator 20 for converting the IF signal to video and audio baseband signals.”) *See also* JX-0002 at 1:42-45, 1:52-54. While the asserted patents distinguish between intermediate *signals* and baseband *signals*, they do not distinguish the intermediate *frequency* from a baseband *frequency*. Moreover, MaxLinear’s expert admits that the term baseband has a

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different meaning in the context of demodulator output than in the context of an intermediate frequency. Tr. at 888:1-16 (Hashemi); *see also* CX-2024C, at Q/A 62-63 (Snelgrove DWS). I therefore decline to read the statements in the asserted patents regarding baseband signals to impose any additional limitation on the intermediate frequency.

Silicon Labs contends that intrinsic evidence distinguishes low-IF from IF, citing the '792 patent's explicit disclosure of "low-IF" signals. RIB at 19-22; RRB at 7-10. Specifically, claim 1 refers to an "intermediate frequency (IF)" while dependent claim 15 describes "DTV low-IF signals." JX-0002 at 10:52-56, 12:27-33. Figure 1 separately labels "IF," "Digital IF," "Processed IF," "Sound IF," and "DTV low-IF." JX-0002 at Fig. 1. The specification of the '792 patent also describes a DSP 131 that "performs a down-conversion function for converting the IF signal into a low IF signal." JX-0002 at 6:46-48. While it is clear from these statements that low-IF has a different meaning than IF, this does not preclude an interpretation of low-IF as a subset of IF, as explained by Dr. Snelgrove. CX-2024 at Q/A 70-71. In addition, the DTV low-IF signals in the '792 patent occur only at the signal output, which is a different context from the intermediate frequency generated by the tuner, as discussed above in the context of baseband signals. *See id.* at Q/A 70. I therefore find that the references to low-IF in the '792 patent do not preclude IF from overlapping with low-IF.

MaxLinear argues that the use of the term "intermediate frequency (IF)" in the claims of the asserted patents necessarily excludes a receiver architecture called "zero-IF." RIB at 25-32. Although the term "zero-IF" does not appear in the asserted patents, all of the parties' experts agree that a person of ordinary skill at the time of the asserted patents would have an understanding of zero-IF receivers. CX-2024C at Q/A 76 (Snelgrove DWS); RX-1677C at Q/A 96 (McNair DWS); RX-1996C at Q/A 49 (Hashemi RWS). The experts agree that zero-IF is

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associated with the “direct-conversion” receiver architecture where the input RF signal is shifted directly to a frequency of zero. CX-2024C at Q/A 79 (Snelgrove DWS); RX-1677C at Q/A 96 (McNair DWS); RX-1996C at Q/A 60 (Hashemi RWS). MaxLinear argues that the direct-conversion architecture requires different filter architecture and complex processing that is not disclosed in the asserted patents. RIB at 30-32. Dr. McNair and Dr. Hashemi explain that low-IF and zero-IF architectures use low-pass filters rather than the disclosed band pass filters to eliminate unwanted signals. RX-1677C at Q/A 95 (McNair DWS); RX-1996C at Q/A 53-54 (Hashemi DWS). In addition, direct-conversion architectures require separate in-phase (I) and quadrature-phase (Q) processing, which is not explicitly discussed in the asserted patents. RX-1996C at Q/A 50 (Hashemi DWS). Dr. Snelgrove does not agree that the failure to disclose these features of direct-conversion architecture precludes zero-IF or low-IF, testifying that a person of ordinary skill in the art at the time of the asserted patents would be able to make the necessary modifications. CX-2024C at Q/A 86, 91. Dr. Snelgrove also points to a disclosure of separate I and Q processing disclosed in claim 12 of the ’585 patent. *Id.* at Q/A 91. I find that the evidence is mixed on this issue, but even if Respondents’ experts are correct that certain aspects of the direct-conversion architecture are outside the scope of the asserted patents, this does not necessarily limit the construction of “intermediate frequency.” These aspects of the invention are more properly addressed in the context of the channel filter limitations, where filtering and signal processing are explicitly claimed.³

Respondents also rely on extrinsic evidence to support their proposed constructions, but I find this evidence to be inconclusive and insufficient to overcome the statement in the

³ As discussed below in the context of the “signal processor” and “anti-aliasing filter” limitations, I do not agree with Respondents that the patents are limited to the embodiments disclosed in the specification.

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specification that an intermediate frequency can have “any values.” Dr. Hashemi interprets the term “zero-IF” to reflect a lack of IF. RX-1996 at Q/A 60. Dictionary definitions cited by Respondents support this opinion, including a definition of a “direct-conversion receiver” as “a type of heterodyne receiver, but there is no intermediate frequency.” RX-0621 at 196 (Wiley EE dictionary). *See also* RX-1491 at 194-195 (Illustrated Dictionary of Electronics: “Although the direct-conversion receiver somewhat resembles the superheterodyne type, it has no intermediate-frequency (IF) chain”). An article cited by Dr. Hashemi and Dr. McNair states that “[h]eterodyne and homodyne receivers are often called IF and zero-IF receivers, respectively,” and “[t]he difference between them is in whether or not an IF is used.” RX-0040 at ITC0009447 (Crols and Steyaert, *Low-IF Topologies*); RX-1677C at Q/A 100 (McNair DWS); RX-1996 at Q/A 100 (Hashemi RWS). Silicon Labs further cites this paper as evidence that “[t]he low-IF receiver has a topology which is closely related to the zero-IF receiver.” *Id.*; RX-1677C at Q/A 97 (McNair DWS).

Dr. Snelgrove disagrees with this distinction between IF, zero-IF, and low-IF, explaining that “zero-IF” and “low-IF” are just particular cases of the architecture disclosed in the ’585 patent. CX-2024 at Q/A 79 (Snelgrove DWS). He also cites an article describing the conception of zero-IF as an architecture where “the IF in a superheterodyne is reduced to zero.” RX-0046 at Abstract (Abidi, *Direct-Conversion Radio Transceivers for Digital Communications*). Dr. Snelgrove also cites a Silicon Labs patent that used the term IF to refer to zero-IF, low-IF, and high-IF. CX-2024 at Q/A 77. One of the textbooks cited by Respondents describes the operation of a low-IF receiver referring explicitly to IF frequencies: “Using two down-conversion paths in the receiver, the image would still be available at two IF frequencies.” RX-0454 at 34 (Laskar, *Modern Receiver Front-Ends*). The extrinsic evidence is thus ambiguous as

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to whether low-IF and zero-IF are distinct from IF or whether low-IF and zero-IF are particular species of IF. I find nothing in the extrinsic evidence to conclusively overcome the statement in the specification that the IF can have a frequency of “any values.”

I thus decline to construe “intermediate frequency” to exclude zero-IF or low-IF. This finding is supported by the Federal Circuit’s opinion in *American Radio LLC v. Qualcomm Inc.*, where the court affirmed a construction of “IF” to mean any “frequency to which the input signal is shifted, including shifting the signal to zero Hertz.” 578 Fed. Appx. 975, 979-80 (Fed Cir. Aug. 22, 2014). Although none of the parties cite this opinion in their post-hearing briefs, the issue considered by the Federal Circuit is identical to the dispute here. The patent at issue in *American Radio* related to a radio frequency receiver that converted input signals to an intermediate frequency (IF), and the parties disputed whether the term “IF” included a frequency of zero Hertz. *Id.* The Federal Circuit’s construction supports Cresta’s position, holding that “the meaning of the claim term IF, as understood by those skilled in the art, includes shifting the signal to the baseband frequency or zero Hertz.” *Id.* at 980. In reaching this conclusion, the Federal Circuit approved of the District Court’s reliance on other patents using the term “intermediate frequency” to include zero Hertz. *Id.* (citing U.S. Pat. No. 4,733,403 (“any receiver with an intermediate frequency of zero Hertz is referred to as a direct conversion receiver”), U.S. Pat. No. 4,709,402 (“where the receiver is of the homodyne type, *i.e.*, its intermediate frequency is zero”))). The District Court’s Markman Order concluded that the ordinary meaning of “intermediate frequency” includes zero Hertz and found no special lexicography or disavowal in the patent specification to change that meaning. *American Radio LLC v. Qualcomm Inc.*, Case Nos. CV-12-5908-MRP, CV-12-5909-MRP, CV-12-5910-MRP, CV-12-1123-MRP, Markman Order, 2013 WL 3270404, *11-13 (C.D.Cal. May 23, 2013). The

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Federal Circuit’s construction of IF thus supports a finding that the ordinary meaning of “intermediate frequency” in this field broadly includes zero-IF and low-IF. The *American Radio* court rejected the very limitations that Respondents and Staff seek to impose based on extrinsic evidence, and the intrinsic evidence in the ’585 and ’792 patents is consistent with this construction because the specification states that the IF can have a frequency of “any values.”

Accordingly, I adopt Cresta’s construction and find that an intermediate frequency is a frequency of any value other than the RF signal frequency.

6. “analog-to-digital converter”

Cresta’s Proposed Construction	Respondents’ Proposed Construction	Staff’s Proposed Construction
no construction – plain and ordinary meaning	a component that produces periodic, discrete sample values for an analog input signal	a component that produces periodic, discrete sample values for an analog input signal

The term “analog-to-digital converter” appears in claim 1 of the ’585 patent and claim 1 of the ’792 patent. Cresta did not propose a construction for this term, arguing that it is used in accordance with its plain and ordinary meaning. CIB at 36-37. Respondents and Staff agree that this term is used in accordance with its plain and ordinary meaning but propose an explicit construction: “a component that produces periodic, discrete sample values for an analog input signal.” RIB at 33-34; SIB at 24-25.

Respondents’ and Staff’s proposed construction repeats and rephrases language that is already embodied in the relevant limitation of the asserted claims: “an analog-to-digital converter for sampling said filtered intermediate signals and generating a digital representation thereof” JX-0001 at 6:62-64; *see also* JX-0002 at 10:57-59. The only additional limitation that Respondents and Staff add to the claim language is the word “periodic,” purportedly to account for the sampling rate described in one embodiment of the invention. JX-0001 at 4:28-30 (“ADC

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62 is a 10-bit converter and has a sampling rate of up to 40 megasamples per second.”); *see also* JX-0002 at 5:30-32. Respondents and Staff derive the term “periodic” from the definition for “analog-to-digital converter” in *Hargrave’s Communications Dictionary*, which states: “A device that translates an arbitrary waveform (analog) signal into an equivalent digital form. The converter periodically measures (samples) the analog wave and converts the measured value to a digital word.” RX-0546 at 21. The Staff also cites additional dictionaries with similar definitions, but these do not reference periodic sampling: the *Wiley Electrical and Electronics Engineering Dictionary*, RX-0621 at 25 (“A circuit or device which transforms an analog input into a digital output.”), the *Authoritative Dictionary of IEEE Standards Terms*, RX-0547 at 35 (“A circuit whose input is information in analog form and whose output is the same information in digital form.”), and the *Communications Standard Dictionary*, RX-0623 at 38 (“A device that converts an input analog signal to an output digital signal with the same information content.”). I find the text of the asserted patents and the dictionaries cited by the Staff show a consistent and straightforward meaning for this term without a “periodic” limitation.

Accordingly, I construe “analog-to-digital converter” to have its plain and ordinary meaning, which is a component that converts an analog input into a digital output.

7. “signal processor”

Cresta’s Proposed Construction	MaxLinear’s Proposed Construction	Silicon Labs and Staff’s Proposed Construction
circuitry that processes a television signal in the digital domain	<i>Subject to § 112(f) with corresponding structure:</i> programmable digital signal processor (DSP) <i>If § 112(f) does not apply:</i> a programmable digital signal processor (DSP)	circuitry that processes a signal

The term “signal processor” appears in claim 1 of the ’585 patent and claim 1 of the ’792

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patent. Cresta proposes to limit the signal processor to circuitry that processes a television signal in the digital domain. CIB at 37-40. Cresta identifies no evidence in the asserted patents specifically limiting the term “signal processor” to television signals in the digital domain, however. Although the asserted patents are directed to television signals and the signal processors disclosed in the specification are digital signal processors, there is no definition or disclaimer for “signal processor” limiting this term to processing television signals in the digital domain. For the same reasons as discussed above for the terms “tuner,” “frequency conversion circuit,” and “input RF signal(s),” I therefore decline to adopt Cresta’s proposed limitations.

MaxLinear proposes to construe “signal processor” as a means-plus-function terms under 35 U.S.C. § 112(f) (formerly 35 U.S.C. § 112, ¶ 6). RIB at 40-44. Where claim language does not recite the term “means,” there is a strong presumption that § 112(f) does not apply. *Inventio AG v. ThussenKrupp Elevator Americas Corp.*, 649 F.3d 1350, 1356 (Fed. Cir. 2011).

MaxLinear argues that the term “signal processor” does not connote definite structure and must be subject to § 112(f) because the term improperly claims any possible structure for performing the claimed function of processing the digital representation of the intermediate frequency signal. RIB at 41-42. In similar cases, the Federal Circuit has looked to the claim language and specification to find sufficient structure. *See Apple v. Motorola*, 757 F.3d 1286, 1301 (Fed. Cir. 2014) (finding that “the claim language and specification disclose the heuristics’ operation within the context of the invention.”); *see also Certain Electronic Digital Media Devices and Components Thereof*, Inv. No. 337-TA-796, Order No. 16 at 9-13 (March 6, 2012), *aff’d*, ID at 161-62 (October 24, 2012), *aff’d*, Comm’n Op. at 55 (August 9, 2013) (construing the same term “heuristic” as not subject to § 112(f)). The specifications of the ’585 and ’792 patents describe a digital signal processor (“DSP”) that is “a programmable and reconfigurable processor.” JX-

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0001 at 4:65; JX-0002 at 5:64. This DSP “implements a finite impulse response (FIR) filter which is reconfigured based on the TV standard selected.” JX-0001 at 4:66-7:1; JX-0002 at 5:65-67. Claim 1 of the ’585 patent describes “a signal processor for processing said digital representation of said intermediate signals in accordance with said format of said input RF signal.” JX-0001 at 6:65-67. Claim 1 of the ’792 patent describes “a signal processor for processing the digital representation of the intermediate frequency signal in accordance with the television signal format of the input RF signal, the signal processor generating digital output signals indicative of information encoded in the input RF signal, wherein the signal processor applies one of a plurality of finite impulse response filters to the digital representation of the intermediate frequency signal.” JX-0002 at 10:60-67. Pf. McNair explains that the claim language recites known and definite structure for the signal processor, and I agree with his opinion. McNair DWS, RX-1677C at Q/A 106.

Although a broad construction for “signal processor” may encompass many possible structures, the Federal Circuit has held that patentees are not required to denote a specific structure to avoid application of § 112(f): “it is sufficient if the claim term is used in common parlance or by persons of skill in the pertinent art to designate structure, even if the term covers a broad class of structures and even if the term identifies the structures by their function.”

Lighting World, Inc. v. Birchwood Lighting, Inc., 382 F.3d 1354, 1359-60 (Fed. Cir. 2004).

Silicon Labs identifies two dictionaries defining “signal processor” and “signal processing.” The *Wiley Electrical and Electronics Engineering Dictionary*, RX-0621 at 709 (“a component, circuit, device, piece of equipment, system or process which performs signal processing”), and *Hargrave’s Communications Dictionary*, RX-0546 at 470 (“signal processing: The manipulation of signals that results in their transformation into other forms, such as other waveshapes, power

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levels, frequency distribution, and coding arrangements. Such processing includes detection, filtering, shaping, converting, coding, and time positioning.”) The Federal Circuit has relied on such technical dictionaries to find that terms are common parlance and connote structure to one of ordinary skill in the art. *Williamson v. Citrix Online, LLC*, 770 F.3d 1371, 1378 (Fed. Cir. 2014); *see also Linear Tech. Corp. v. Impala Linear Corp.*, 379 F.3d 1311, 1320 (Fed. Cir. 2004) (“Technical dictionaries, which are evidence of the understandings of persons of skill in the technical arts, plainly indicate that the term ‘circuit’ connotes structure.”). Pf. McNair and Dr. Snelgrove both state that one of ordinary skill in the art would have understood the plain and ordinary meaning of the term “signal processor.” McNair DWS, RX-1677C at Q/A 102. I thus decline to construe “signal processor” as a term subject to § 112(f).

I also reject MaxLinear’s proposed alternative construction, which unduly restricts the “signal processor” to one disclosed embodiment of a programmable digital signal processor (DSP). Although a programmable DSP is the primary embodiment disclosed in the specifications of the asserted patents, MaxLinear fails to identify any statement in the asserted patents where the term “signal processor” is explicitly defined or limited to the disclosed DSP. Moreover, both the ’585 and ’792 patents disclose variations on the DSP with one or multiple computing units, or one or multiple integrated circuits. JX-0001 at 5: 1-6 (disclosing multiple computing units), 6:12-16 (disclosing one or multiple integrated circuits); JX-0002 at 6:1-5 (disclosing multiple computing units); RX-1677 at Q/A 109-10 (McNair DWS). I thus find that MaxLinear’s proposed construction is not consistent with the intrinsic evidence.

Silicon Labs and Staff contend that this term has its ordinary meaning, which is circuitry that processes a signal. RIB at 34-36; SIB at 25-27. I find that this is consistent with the usage of “signal processor” in the asserted patents and the dictionary definitions discussed above. *See*

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RX-1677C at Q/A 102 (McNair DWS). Cresta concedes that there is no material difference between its construction and the one proposed by Silicon Labs and the Staff. CIB at 37; CRB at 20-21. Accordingly, I construe “signal processor” to have its plain and ordinary meaning, which is circuitry that processes a signal.

8. “digital representation of said intermediate signal(s)” / “said digitized signals” / “the digital representation of the intermediate frequency signal”

Cresta’s Proposed Construction	Respondents’ Proposed Construction	Staff’s Proposed Construction
no construction – plain and ordinary meaning	the digital samples as output by the analog-to-digital converter	the digital samples as output by the analog-to-digital converter

The term “digital representation of said intermediate signal(s)” appears in the “signal processor” limitation of claim 1 and claim 10 of the ’585 patent. The term “said digitized signals” appears in “processing” limitation of claim 17 of the ’585 patent. The term “the digital representation of the intermediate frequency signal” appears in the “signal processor” limitation of claim 1 of the ’792 patent. The parties agree that this term has its plain and ordinary meaning, but Respondents and Staff propose an explicit construction to clarify that the “digital representation” in claim 10 of the ’585 patent and claim 1 of the ’792 patent refer to the same “digital representation thereof” referenced in the “analog-to-digital converter” limitation. RIB at 45; SIB at 27-28. There is no dispute that the claim language refers to the same “digital representation” processed by the digital processor and “digital representation thereof” generated by the analog-to-digital converter. I find no other reasonable way to read this claim language, and I therefore see no compelling reason to construe this term, particularly since the parties do not appear to dispute any substantive issue based on this claim construction. CIB at 40. Accordingly, I decline to make an explicit construction for this term.

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9. “baseband signal(s)”

Cresta’s Proposed Construction	Respondents’ Proposed Construction	Staff’s Proposed Construction
television signal that has had its transmission modulation removed but has not been decoded (<i>e.g.</i> CVBS, SIF, MPEG data stream)	encoded but unmodulated video or audio data signals	encoded but unmodulated video or audio data signals

The term “baseband signal(s)” appears in claim 1 of the ’585 patent and claim 8 of the ’792 patent. The parties agree that a baseband signal has been demodulated and is encoded but not yet decoded. CIB at 45-46; RIB at 47-49; SIB at 31-32. Cresta proposes to limit this term to television signals and to specify that the demodulation relates to the transmission modulation of the signal. CIB at 45-47; CRB at 25-26. Respondents admit that there is no substantive difference between the parties’ constructions. RRB at 31. Staff argues that the language “transmission modulation” in Cresta’s proposed construction is unexplained and is inappropriately restricted to a receiver-side view. SIB at 31-32.

I reject Cresta’s “television” limitation for the same reasons discussed above for several other disputed terms. Staff argues that Cresta’s construction may incorrectly cover signals that have some form of modulation, but Respondents agree with Cresta that even after demodulation, baseband signals may have some secondary modulation, which is present in the CVBS and sound IF signals disclosed in the specification. RIB at 48. Baseband signals are consistently described in the specifications of the asserted patents as the output of demodulators, and the baseband signals are coupled to appropriate video and audio decoders. JX-0001 at 1:45-57 (“The baseband signals are coupled to appropriate video and audio decoders” to generate the display signals (*e.g.* RGB) or sound.”); 2:1-3 (“Television receiver 10 includes a channel filter 18 and a demodulator 20 for converting the IF signal to video and audio baseband signals”);

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5:43-45 (“The output signals from channel filter 58 are coupled to a bank of demodulators 66 for generating into the appropriate video and audio baseband signals.”); 5:44-47 (“The video and audio baseband signals are usually coupled to video and audio decoders before being displayed or playback [*sic*] on a view screen.”). *See also* JX-0002 at 1:40-42 (same as above regarding “decoders”); 1:52-53 (same as above regarding “demodulator”). Staff criticizes Cresta’s construction for being limited to the receiver context, but the patents only claim receivers, and the purpose of claim construction is to explain the claim language, not to provide universal definitions for terminology. On the receiver side, and as described in the specifications of the asserted patents, baseband signals are signals that have been demodulated but not yet decoded, and I will adopt these two limitations as the proper construction of this term.

Accordingly, I construe “baseband signal(s)” to mean signals that have been demodulated but not yet decoded.

10. “format”

Cresta’s Proposed Construction	Respondents’ Proposed Construction	Staff’s Proposed Construction
one or more characteristics of the transmission standard that applies to the input RF signal	The analog or digital encoding of a signal	transmission standard corresponding to the input RF signal

The term “format” appears in claims 1, 10, and 13 of the ’585 patent and in claims 1, 8, and 26 of the ’792 patent.⁴ The first paragraph of the description of related art in the asserted patents refers to television standards and formats:

⁴ In the ’585 patent, claim 1 refers to a “plurality of formats” and “said format of said input RF signal,” claim 10 refers to “a format of said input RF signal,” and claim 13 refers to “a format of said input RF signal.” JX-0001 at 6:52-7:9, 7:41-44, 8:1-6. In the ’792 patent, claim 2 refers to “a plurality of television signal formats” and “the television signal format of the input RF signal,” claim 8 refers to “the television signal format of the input RF signal” and “the format of the input RF signal,” and claim 26 refers to “a format of the input RF signal.” Claim 3 of the ’585 patent also refers to an “analog format,” but this term is construed separately, *infra*.

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Television signals are transmitted in analog or digital formats and in accordance with a variety of standards. For analog television transmission, the NTSC (National Television Standards Committee) standard, the PAL (Phase Alternate Lines) standard, and the SECAM (Sequential Couleur Avec Memoire) standard are widely adopted. On the other hand, for digital television transmission, the DVB (Digital Video Broadcast) format and the ATSC (Advanced Television Standards Committee) format are available. Because the different television formats and different television standards are incompatible, television receivers are traditionally made specifically for the analog or digital format and for a specific standard.

JX-0001 at 1:27-39; JX-0002 at 1:18-30. In this passage, there are separate references to “analog or digital format” and “television standards,” and Respondents thus argue that the asserted patents use the term “standard” to refer to television standards and “format” to refer to analog or digital formats. RIB at 46-47, 49-50.

The specifications of the asserted patents are not consistent in their use of these words, however, as the passage above describes NTSC, PAL, and SECAM “standard[s]” and DVB and ATSC “format[s].” Both “standard” and “format” refer to television standards in that context, and in the claims of the ’585 patent, the claim language “format” often refers to passages in the specification discussing television standards. For example, claim 1 of the ’585 patent refers to “a signal processor for processing said digital representation of said intermediate signals in accordance with said **format** of said input RF signal,” JX-0001 at 6:65-7:2 (emphasis added), while the specification describes a “DSP 64” that “implements a finite impulse response (FIR) filter which is reconfigured based on the TV **standard** selected.” *Id.* at 4:66-5:1 (emphasis added). Claim 10 of the ’585 patent refers explicitly to these finite impulse response filters and uses the term “format.” *Id.* at 7:36-40 (“each of said plurality of finite impulse response corresponding to a format of said input RF signal”). Similarly, the “standard selection circuit generating a select signal indicative of a **format** of said input RF signal” in claim 13, *id.* at 8:1-6 (emphasis added), alludes to a passage in the specification describing “a signal which is fed back

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to standard selection circuit 68 indicating which television **standard** the input signal is encoded.” *Id.* at 5:18-20 (emphasis added). The term “format” is clearly used in these claims of the ’585 patent to refer to television standards.

The specification of the ’792 patent uses “format” more consistently to refer to analog and digital formats, explicitly describing a “dual-format television (TV) receiver for receiving analog and digital TV signals.” JX-0002 at 3:9-11; *see also id.* at 5:27-29 (“receiver 100 can handle television signals in any format (analog or digital) and in any standard (e.g. NTSC, PAL, SECAM, DVB or ATSC).”). Claim 1 of the ’792 patent, however, refers to “a plurality of formats” rather than “dual-format,” which suggests that “format” encompasses more than the two options of analog and digital. JX-0002 at 10:52-56. There is further evidence for this in claim 2, a dependent claim that adds the limitation: “wherein the plurality of television signal formats comprises an analog television format and a digital television format.” *Id.* at 11:7-9. By the doctrine of claim differentiation, this dependent claim language “gives rise to a presumption that the limitation in question is not present in the independent claim,” *Phillips*, 415 F.3d at 1315, which would imply that “format” in claim 1 means something more than distinguishing between analog and digital. In addition, claim 4 refers to “an analog television format,” JX-0002 at 11:12-16, suggesting that there is more than one type of analog television format, and claim 6 identifies PAL, SECAM, and NTSC decoder circuits corresponding to different analog television standards. *Id.* at 11:24-26. Similarly, claim 7 refers to “a digital television format.” *Id.* at 11:27-32. Like the ’585 patent, the construction that is most consistent with the use of “format” in the claims of the ’792 patent is one that refers to the transmission standard of the input RF signal.

I thus find that while “format” is used in the specification of the asserted patents to refer

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to analog and digital formats, the claim language referring to the “format of the input RF signal” is properly construed to mean the transmission standard corresponding to the input RF signal, which is the construction proposed by the Staff. SIB at 29-31. While Cresta agrees that “format” should refer to a transmission standard, Cresta argues that “format” should nevertheless have a different meaning than “standard” and thus proposes a construction that refers to “one or more characteristics” of the input RF signal corresponding to the transmission standard rather than the standard itself. CIB at 41-42. Cresta admits that this distinction is relatively minor, CIB at 42, and I find that Cresta’s proposed construction makes a distinction without a difference, and it adds unnecessary complexity to this construction.

Accordingly, I construe “format” in claims 1, 10, and 13 of the ’585 patent and in claims 1, 8, and 26 of the ’792 patent to be the transmission standard corresponding to the input RF signal.

11. “analog format”

Cresta’s Proposed Construction	Respondents’ Proposed Construction	Staff’s Proposed Construction
no construction – plain and ordinary meaning	signal output from said digital-to-analog converter is an analog signal	signal output from said digital-to-analog converter is an analog signal

The term “analog format” appears in claim 3 of the ’585 patent. Respondents and Staff proposed constructions for this term to clarify that the term “format” as used in this claim does not have the same meaning as “format” in other claims, as construed above. RIB at 50; SIB at 33. Cresta argues that this term requires no construction. CIB at 47. Both Cresta and Respondents recognize that there is no substantive dispute regarding this term. CRB at 26-27; RRB at 32. I find that Respondents’ and Staff’s proposed construction does nothing more than restate the limitations of claim 3, and given that there is no substantive dispute regarding this

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claim term, I find that this term has its plain and ordinary meaning and decline to adopt any formal construction.

12. “real part of said/the finite impulse response filter operation” / “imaginary part of said/the finite impulse response filter operation”

Cresta’s Proposed Construction	Respondents’ Proposed Construction	Staff’s Proposed Construction
the real/imaginary part of the weighted sum output, calculated using complex numbers for the weights or signal samples or both	the real/imaginary part of the weighted sum output, calculated using complex numbers for the weights	the real/imaginary part of the weighted sum output, calculated using complex numbers for the weights

Claim 12 of the ’585 patent describes “said first computing unit processing a real part of said finite impulse response filter operation while said second computing unit processing an imaginary part of said finite impulse response filter operation.” JX-0001 at 7:45-50. Claim 25 of the ’792 patent similarly describes “the first computing unit processing a real part of the finite impulse response filter operation while the second computing unit processing an imaginary part of the finite impulse response filter operation.” JX-0002 at 14:29-34. The parties agree that the “finite impulse response filter operation” is a calculation using a weighted sum and that the terms “real” and “imaginary” refer to the parts of a complex number. CIB at 49-50; RIB at 51-52; SIB at 33-35. The dispute between the parties is whether these limitations require that the weights used in the weighted sum must be complex numbers or whether the limitations can also be met by the use of complex signal samples without complex weights.

Outside of the claim language, real and imaginary parts are only discussed in one sentence of the specification: “the filtering operations of the real and imaginary parts in the frequency domain are carried out in parallel.” JX-0002 at 5:1-5; JX-0002 at 5:67-6:4. While the claim language refers to “the real/imaginary parts of ... the filter operation, the specification flips the subject and direct object of this phrase, referring to “the filtering operations of the real and

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imaginary parts.” Thus while the claim language implies that the filtering operations have real and imaginary parts, the specification implies that the signals being filtered have real and imaginary parts. This intrinsic evidence is ambiguous, and I find that one of ordinary skill in the art could read the claim language to mean either a filter operation that uses complex weights or a filter operation that is applied to complex signals. *See* Tr. at 322:6-11 (Snelgrove: “Complex filters are filters that use complex numbers one way or another. So one case is a filter that has complex coefficients in its transfer function, and another case is a filter that uses complex signals.”). Respondents’ and Staff’s proposed construction precludes one of these possibilities, while Cresta’s proposed construction captures the two options disclosed in the claims and specification.

Accordingly, I construe “real/imaginary part of said/the finite impulse response filter operation” to mean the real/imaginary part of the weighted sum output, calculated using complex numbers for the weights or signal samples or both.

13. “anti-aliasing filter”

Cresta’s Proposed Construction	Respondents’ Proposed Construction	Staff’s Proposed Construction
a circuit that filters the intermediate signals to prevent aliasing from occurring during sampling	band-pass filter	band-pass filter

Claim 1 of the ’585 patent describes “an anti-aliasing filter for filtering said intermediate signals.” JX-0001 at 6:60-61. Respondents and Staff propose to restrict the term “anti-aliasing filter” to a band-pass filter, because this is the only embodiment of an anti-aliasing filter disclosed in the specification. RIB at 52-55; SIB at 35-37. Cresta disagrees with this restriction and proposes a construction that is based on the description of the anti-aliasing filter in the specification: a circuit that filters the intermediate signals to prevent aliasing from occurring

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during sampling. CIB at 33-36; CRB at 18-20; JX-0001 at 4:17-20.

Two other claims of the '585 patent also reference the “anti-aliasing filter.” Claim 6 states: “The receiver of claim 1, wherein a center frequency of said anti-aliasing filter and a sampling frequency of said analog-to-digital converter are functions of said intermediate frequency.” JX-0001 at 7:24-47. Claim 17 describes “said filter function being an anti-aliasing filter and having a center frequency.” *Id.* at 8:23-25. Respondents argue that this language is consistent with disclosures in the specification referring to “[t]he center frequency of anti-aliasing filter 60,” *id.* at 4:31-33, and they argue that band-pass filters have center frequencies while low-pass filters (another type of anti-aliasing filter) do not. RIB at 53-54; RRB at 33-34. Cresta interprets this claim language differently, arguing that the reference to a center frequency in dependent claim 6 implies that this limitation does not restrict the scope of claim 1. CRB at 19. While there is no clear claim differentiation here (because claim 6 includes other additional limitations), I am not persuaded that the “center frequency” limitation of claims 6 and 17 must be read into claim 1.

Respondents and Staff argue that the '585 patent consistently discloses band-pass filters as the patent's preferred anti-aliasing filters, *see, e.g.*, JX-0001 at Fig. 3, Fig. 4, but a consistently disclosed embodiment is not sufficient to read a limitation into a claim. The Federal Circuit has held that “it is improper to read limitations from a preferred embodiment described in the specification—even if it is the only embodiment—into the claims absent a clear indication in the intrinsic record that the patentee intended the claims to be so limited.” *Dealertrack, Inc. v. Huber*, 674 F.3d 1315, 1327 (Fed. Cir. 2012) (citing *Enzo Biochem, Inc. v. Applera Corp.*, 599 F.3d 1325, 1342 (Fed.Cir.2010)). Respondents and Staff fail to point to any explicit definition or restriction of an anti-aliasing filter to a band-pass filter. While the specification describes

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numerous embodiments of anti-aliasing filters, there is no explicit reference to a band-pass or low-pass filter. *See* JX-0001 at 4:20-30 (“In one embodiment, anti-aliasing filter 60 can be realized with a SAW filter. In another embodiment, anti-aliasing filter 60 is implemented as shown in FIG. 3 using capacitors and inductors. In yet another embodiment, anti-aliasing filter 60 is realized with transducers (gmC) 99 as shown in FIG. 4”). Instead, the specification describes an anti-aliasing filter in accordance with its plain and ordinary meaning: “Anti-aliasing filter 60 performs pre-processing of the intermediate signals from tuner 54 to prevent aliasing from occurring when the intermediate signals are subsequently sampled and digitized by ADC 62.” JX-0001 at 4:17-20. This description in the specification is consistent with extrinsic definitions for anti-aliasing filters in the record. *See, e.g.* RX-0621 at 30 (“anti-aliasing filter: A filter which blocks all frequencies above a given cutoff frequency, before an analog-to-digital conversion. The filter insures that no input signals have a higher frequency than half the digital sampling rate. This avoids aliasing.”). *See also* CX-2024C at Q/A 118-19 (Snelgrove DWS).

Accordingly, I construe “anti-aliasing filter” to mean a circuit that filters the intermediate signals to prevent aliasing from occurring during sampling.

14. “a signal output circuit for receiving the digital output signals from the signal processor and for providing one or more output signals corresponding to the digital output signals”

Cresta’s and Silicon Labs’s Proposed Construction	MaxLinear’s Proposed Construction	Staff’s Proposed Construction
a circuit that receives the digital output signals from the signal processor and provides one or more output signals corresponding to those digital output signals	<i>Subject to § 112(f) with corresponding structure:</i> the circuits shown in Figure 2 <i>If § 112(f) does not apply:</i> a circuit that receives multiple digital inputs and provides baseband outputs corresponding to the inputs	a circuit that receives the digital output signals from the signal processor and reformats them for output from the receiver

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Claim 1 of the '792 patent describes “a signal output circuit for receiving the digital output signals from the signal processor and for providing one or more output signals corresponding to the digital output signals.” JX-0002 at 11:3-6. MaxLinear argues that this limitation must be construed under 35 U.S.C. § 112(f), RIB at 58-62, but for the same reasons as discussed above for the “signal processor” limitation, I do not agree.

The parties' experts offer conflicting testimony on whether the term “signal output circuit” recites definite structure to avoid the application of 35 U.S.C. § 112(f). Dr. Caloyannides is alone in testifying that the meaning of the term “circuit” is “nebulous” because “[v]irtually anything could be a circuit, from a straight wire connection to a complex microprocessor.” RX-1996 at Q/A 152. Dr. Snelgrove testifies that one of ordinary skill in the art would understand that “signal output circuit” describes “the structure of an electrical circuit that can receive the digital output signals produced by the signal processor and then provide one or more output signals.” CX-2024C at Q/A 146. Pf. McNair explains that a “circuit” is a “definite structure of an electrical circuit, either simple or complex.” RX-1677C at Q/A 122. The specification provides numerous examples of signal output circuits, including circuits with digital-to-analog converters, serializers, low-pass filters, single-ended outputs, differential outputs, and output drivers. JX-0002 at 6:49-9:23, Figs. 1, 2. I find that Dr. Caloyannides's testimony fails to overcome the strong presumption against applying § 112(f) to this term. *Inventio AG*, 649 F.3d at 1356. This is consistent with the Federal Circuit's holding in *Linear Technology Corp. v. Impala Linear Corp.* that the terms “circuit” and “circuitry” were not subject to § 112(f) where there was “a recitation of the respective circuit's operation in sufficient detail to suggest structure to persons of ordinary skill in the art.” 379 F.3d at 1320-21.

In the alternative, MaxLinear proposes to construe this term as a circuit that receives

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multiple digital inputs and provides baseband outputs corresponding to the inputs, RRB at 35-36, but I find that this proposed construction improperly reads limitations from the specification into the claims. Moreover, it is not consistent with the claim language. In particular, the signal output circuit limitation explicitly recites “one or more output signals” but does not claim multiple digital inputs. JX-0002 at 11:3-6. In addition, dependent claims 4 and 8 explicitly claim baseband signals, *id.* at 11:12-16, 33-42, which “gives rise to a presumption that the limitation in question is not present in the independent claim,” *Phillips*, 415 F.3d at 1315.

Staff proposes a construction that substitute the word “reformats” for the claim term “provides.” SIB at 37-38. Since the term “reformat” is not used in the specification and the parties dispute the meaning of the term “format,” I find that the Staff’s construction would only introduce confusion regarding this term. Moreover, the distinction between the Staff’s construction and that proposed by Cresta and Silicon Labs does not appear to affect any substantive issue. Cresta and Silicon Labs propose a construction that merely restates the claim language but changes the conjugation of the verbs from the present progressive tense to the present tense. This does not add anything to the scope or meaning of the claims, and I therefore find it unnecessary to construe this term.

Accordingly, I find that “a signal output circuit for receiving the digital output signals from the signal processor and for providing one or more output signals corresponding to the digital output signals” has its plain and ordinary meaning, and I decline to adopt any formal construction.

IV. INFRINGEMENT

A. Applicable Law

A complainant must prove either literal infringement or infringement under the doctrine

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of equivalents. Infringement must be proven by a preponderance of the evidence. *SmithKline Diagnostics, Inc. v. Helena Labs. Corp.*, 859 F.2d 878, 889 (Fed. Cir. 1988). A preponderance of the evidence standard “requires proving that infringement was more likely than not to have occurred.” *Warner-Lambert Co. v. Teva Pharm. USA, Inc.*, 418 F.3d 1326, 1341 n.15 (Fed. Cir. 2005).

Literal infringement is a question of fact. *Finisar Corp. v. DirecTV Group, Inc.*, 523 F.3d 1323, 1332 (Fed. Cir. 2008). Literal infringement requires the patentee to prove that the accused device contains each and every limitation of the asserted claim(s). *Frank’s Casing Crew & Rental Tools, Inc. v. Weatherford Int’l, Inc.*, 389 F.3d 1370, 1378 (Fed. Cir. 2004).

Contributory infringement requires the patentee to prove that: (1) there is an act of direct infringement in violation of section 337; (2) the accused device has no substantial non-infringing uses; (3) the component is a material part of the invention; and (4) the accused infringer imported, sold for importation, or sold after importation within the United States, the accused components that contributed to another’s direct infringement. *Certain Electronic Devices With Image Processing Systems, Components Thereof, and Associated Software*, Inv. No. 337-TA-724; Comm’n Op. (Dec. 21, 2011) at n.9 (citing *Spansion, Inc. v. U.S. Int’l Trade Comm’n*, 629 F.3d 1331, 1353 (Fed. Cir. 2010)). In addition to the foregoing factors, the Federal Circuit has explained that the patentee must also demonstrate that the alleged infringer “knew that the combination for which its components were especially made was both patented and infringing.” *Golden Blount, Inc. v. Robert H. Peterson Co.*, 365 F.3d 1054, 1061 (Fed. Cir. 2004) (quoting *Preemption Devices, Inc. v. Minn. Mining & Mfg. Co.*, 803 F.2d 1170, 1174 (Fed. Cir. 1986)).

B. Accused Products

1. Silicon Labs Accused Products

Cresta accuses certain Silicon Labs hybrid TV tuners and televisions containing those tuners of infringing claims 1-3, 10, and 13 of the '585 patent and claims 1-4, 7, 8, and 26 of the '792 patent. CIB at 57, 152.

a. Silicon Labs tuners

Dr. Snelgrove identifies four categories of Silicon Labs products in distinct generations defined by their die and firmware and designated by Order Part Numbers ("OPNs"): the 2nd generation Si2170 series, the 3rd generation Si2176 series, the 4th generation Si2178 series, and the 5th generation Si2157 series. CX-2024C at Q/A 214-28. *See also* JX-0056C (OPN Table listing Silicon Labs products by part number, die, and firmware); CX-1721C (Silicon Labs stipulation on importation and inventory). Pf. McNair identifies seven separate classes of Silicon Labs products: (1) Silicon Labs V Tuners, which are identified with a "V" suffix; (2) Silicon Labs LIF Tuners, which includes the V Tuners, analog-only tuners that Cresta is not accusing, and certain additional tuners modified with host software; (3) Si215x tuners; (4) Si217x tuners; (5) the Si2185 tuner; (6) analog-only tuners; and (7) digital-only tuners. RX-1991C at Q/A 126-39. The experts thus agree that tuners identified with OPNs of Si215x operate similarly in the context of the asserted patents and that tuners with OPNs of Si217x also operate similarly. I will refer to these groupings of tuners as the Si2150 series and Si2170 series tuners, respectively. As discussed below, I also consider the analog-only tuners and digital-only tuners separately, and for specific limitations, I address the "V" tuners and the Si2185 tuner separately.

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b. Televisions containing Silicon Labs tuners

Samsung, LG, and VIZIO televisions incorporate accused Silicon Labs tuners.

CX-2024C at Q/A 250 (Snelgrove DWS). Dr. Snelgrove identifies a list of accused Samsung televisions incorporating Silicon Labs tuners in his direct testimony, relying on Samsung's answer to an interrogatory. *Id.* at Q/A 261; *see also* CX-1699C (Samsung Stipulation on Importation and Inventory). Dr. Snelgrove also identifies a list of accused LG televisions, *id.* at Q/A 273, and VIZIO televisions. *Id.* at Q/A 293. *See also* CX-1701C (LG Stipulation on Importation and Inventory); CX-1831C (Vizio Stipulation on Importation and Inventory).

c. Products No Longer Accused

Silicon Labs identifies certain analog-only and digital-only tuners that are no longer accused of infringement by Cresta. RRB at 37. Because these tuners were identified in the parties' stipulation on importation, CX-1721C, and they are listed on the OPN table relied upon by Cresta and Dr. Snelgrove to identify Silicon Labs part numbers, JX-0057C, I find that these products are within the scope of the Investigation. *See* Order No. 46, Initial Determination Granting-in-Part Samsung and Vizio's Motion for Summary Determination of Non-Infringement (November 3, 2014), *aff'd by* Commission Notice (December 3, 2014). Cresta states in its post-hearing brief that these non-hybrid tuners are not accused products, and Cresta did not offer any evidence of infringement for these products at the hearing. CIB at 56 n.53. Accordingly, I find that these analog-only and digital-only tuners do not infringe any asserted claims of the '585 patent or the '792 patent. The non-infringing analog-only and digital-only Silicon Labs tuners are identified in Respondents' Reply Post-Hearing Brief. RRB at 37 n.7.

2. MaxLinear Accused Products

Cresta accuses MaxLinear TV tuners, and televisions incorporating such tuners, of infringing claims 1, 2, 3, 10, 12, and 13 of the '585 patent and claims 1, 2, 3, 7, 8, 25, and 26 of the '792 patent. CIB at 83, 161-167.

a. MaxLinear tuners

Cresta accuses two MaxLinear tuners, the MxL601 and MxL661. CIB at 84. Cresta and MaxLinear agree that these two tuners are substantially identical for the purpose of infringement of the asserted patents. *Id.*; RIB at 4; CX-2024C at Q/A 243 (Snelgrove DWS).

b. Televisions Containing MaxLinear tuners

The MaxLinear tuners are typically housed in a tuner module, and the module is incorporated into a television. CIB at 85-87. Cresta identifies Samsung, Sharp, and VIZIO televisions incorporating accused MaxLinear tuners. CIB at 87-93; CX-2024C at Q/A 250 (Snelgrove DWS). Only one Samsung television model [REDACTED] incorporates a MaxLinear tuner (MxL661). CIB at 90-91; CX-2024C at Q/A 261 (Snelgrove DWS). The accused Sharp televisions include a specific tuner module (RTUDAA083QJQZ) that incorporates a MxL601 tuner and a [REDACTED] System on Chip ("SoC"). CIB at 87-90; CX-2024C at Q/A 280-82 (Snelgrove DWS); CX-101C at 10-12. Dr. Snelgrove also identifies a list of VIZIO televisions incorporating MaxLinear tuners with various SoCs and tuner modules. CX-2024C at Q/A 293; CIB at 91-93.

C. Infringement of the '585 patent

1. Silicon Labs Accused Products

Cresta accuses certain Silicon Labs tuners, and televisions containing those tuners, of infringing claims 1-3, 10, and 13 of the '585 patent. CIB at 57. The tuners are generally accused

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of contributory infringement, while televisions containing the tuners are accused of direct infringement. *Id.* For the reasons discussed below, I find that certain Silicon Labs tuners and certain televisions infringe claims 1-3 of the '585 patent.

a. Claim 1

Cresta asserts that televisions incorporating Silicon Labs tuners directly infringe claim 1 of the '585 patent, relying on the opinions of Dr. Snelgrove. CIB at 57-77; CRB at 30-47; CX-2024C at Q/A 333-47. Silicon Labs disputes the infringement of several limitations, relying on the opinions of Pf. McNair. RIB at 69-93; RRB at 36-54; RX-1991C at Q/A 141-249.

i. "A receiver comprising:"

As discussed above in the context of claim construction, I find that the preamble of claim 1 of the '585 patent is not limiting, and it is therefore not necessary to meet this limitation for infringement. Nevertheless, even if Cresta's construction for this limitation were adopted, I find that the accused Silicon Labs tuners are television receivers. Silicon Labs does not raise any substantive dispute on this limitation. *See* RX-1991C at Q/A 141-44 (McNair RWS).

ii. "a tuner for receiving input RF signals and for converting said input RF signals to intermediate signals having an intermediate frequency (IF), said input RF signals encoding information in one of a plurality of formats"

Dr. Snelgrove identifies input pins labeled [REDACTED] identified in specifications for the Silicon Labs tuners that are designed for receiving input RF signals. CX-2024C at Q/A 334. Silicon Labs argues that Dr. Snelgrove fails to prove that there was no frequency conversion of the signal prior to reaching the Silicon Labs tuner, which was part of the analysis of this limitation by Dr. Caloyannides on invalidity. RIB at 69-71; RRB at 37-38. As discussed below in the context of invalidity, I do not read this claim language to require an "input RF signal" directly from an antenna. Even if this were a requirement of the claim, I find

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that Silicon Labs fails to identify any evidence that a frequency conversion or any other change in the signal occurs prior to being received in the tuner, pointing only to a hypothetical during the cross-examination of Dr. Caloyannides. Tr. at 1212:21-1213:9. Accordingly, I find that Cresta has shown by a preponderance of evidence that the Silicon Labs tuners are designed for receiving input RF signals.

In addition, I find that the Silicon Labs tuners convert RF input signals to an intermediate frequency (IF). Dr. Snelgrove identifies multiple mixers in the Silicon Labs tuners in the [REDACTED] that perform frequency conversions on the input RF signal. CX-2024C at Q/A 334. Silicon Labs and Staff argue that the frequency conversion in the Silicon Labs tuners is to “low-IF” or “zero-IF,” which are not an “intermediate frequency” under Respondents’ and Staff’s proposed constructions. RIB at 71-74; SIB at 40-41. Pf. McNair provided examples of Silicon Labs tuners converting input RF signals from a 6MHz NTSC signal to an intermediate signal “with a picture carrier at approximately 2.25 MHz.” RX-1991C at Q/A 156. Pf. McNair also described conversion of a 6MHz ATSC signal to 1.3MHz in low-IF mode and to 2.7MHz in zero-IF mode. *Id.* at Q/A 156-57. Because I have adopted Cresta’s proposed construction, as discussed above, these frequencies all meet the “intermediate frequency (IF)” limitation as they are different from the frequency of the input RF signal.

Finally, I find that the Silicon Labs tuners support “input RF signals encoding information in one of a plurality of formats.” Dr. Snelgrove identifies a list of supported digital and analog format television signal standards provided on the specification sheets for Silicon Labs tuners, including NTSC and ATSC. CX-2024C at Q/A 334; *see, e.g.* JX-0009C (Si2158-A10 Specifications). Silicon Labs engineer Mustafa Koroglu confirmed that all of the accused

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Silicon Labs tuners were capable of receiving TV signals in analog and digital formats. CX-2001C at 122:2-13.

iii. “a channel filter for receiving the intermediate signals, said channel filter comprising...”

I find that the “channel filter” limitation is met by the majority of the Silicon Labs accused products because of the presence of the “anti-aliasing filter,” “analog-to-digital converter,” and “signal processor” limitations below. Dr. Snelgrove predicates his opinion on his analysis of each of these elements, CX-2024C at Q/A 335, and Silicon Labs does not raise any specific non-infringement argument based on the “channel filter” claim language.

iv. “an anti-aliasing filter for filtering said intermediate signals”

As discussed above, I construe an “anti-aliasing filter” to be a circuit that filters the intermediate signals to prevent aliasing from occurring during sampling. Dr. Snelgrove identifies a pair of anti-aliasing filters preceding the analog-to-digital converter in each of the Silicon Labs tuners located in the [REDACTED] of the 4th and 5th generation tuners, and in the [REDACTED] of the 2nd and 3rd generation tuners. CX-2024C at Q/A 336. When asked whether the Silicon Labs tuners have anti-aliasing filters, Mr. Koroglu testifies: [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED] CX-2001C at 142:9-25. Pf. McNair admits that the low-pass filter in the Silicon Labs tuners attenuates aliases. Tr. at 661:17-20.

Silicon Labs argues that Dr. Caloyannides takes a narrow interpretation of this limitation in the context of invalidity, RIB at 74-75, RRB at 39-41, but I do not read this limitation to require that the primary purpose of the filter must be anti-aliasing. Silicon Labs further argues

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that the low-pass filters in the Silicon Labs tuners do not “prevent” aliasing because other components contribute to anti-aliasing. RIB at 75; RX-1991C at Q/A 170 (McNair DWS). The claim language does not require the “anti-aliasing filter” to be the exclusive source of anti-aliasing, however. Although other components may also perform an anti-aliasing function, the evidence presented by Cresta shows that the identified low-pass filters filter out higher frequency signals, which prevents aliasing in the subsequent analog-to-digital converter. I therefore find that this meets the “anti-aliasing filter” element of the “channel filter” limitation by a preponderance of the evidence.

v. “an analog-to-digital converter for sampling said filtered intermediate signals and generating a digital representation thereof”

Cresta identifies a pair of analog-to-digital converters (“ADCs”) in each Silicon Labs tuner [REDACTED] CIB at 64-65. Dr. Snelgrove describes these as [REDACTED] [REDACTED] CX-2024C at Q/A 337. Pf. McNair agrees that the Silicon Labs tuners had two ADCs but offers his opinion that the claim requires one ADC to sample the filtered intermediate signals. RX-1991C at Q/A 173. I find nothing in the claim language or specification that would preclude the use of two ADCs to convert two parts of the signal, and I therefore find that the Silicon Labs tuners meet this limitation.

vi. “a signal processor for processing said digital representation of said intermediate signals in accordance with said format of said input RF signal, said signal processor generating digital output signals indicative of information encoded in said input RF signal”

Cresta points to a DSP (digital signal processor) block in the Silicon Labs tuners as a “signal processor” according to the ’585 patent. CIB at 65-70. Dr. Snelgrove identifies a [REDACTED] containing processing sub-blocks that [REDACTED]

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CX-2024C at Q/A 338. Dr. Snelgrove cites a Silicon Labs design review document that shows [REDACTED] as evidence that the processing is “in accordance with said format of said input RF signal.” JX-0049C at 3-5.

Silicon Labs argues that the DSP in its tuners does not meet this limitation because the [REDACTED]
[REDACTED] RIB at 77-79, 83-85; RRB at 42-46. Pf. McNair identifies processing by a series of [REDACTED]
[REDACTED] and Silicon Labs argues that these components should not be part of the claimed “signal processor.” RX-1991C at Q/A 174-75; *see also* RX-1719C at Q/A 17 (Hendrickson RWS); RDX-1719.1C; RIB at 77-79. These FIR filters [REDACTED]
[REDACTED]
[REDACTED] RX-1991C at Q/A 306-35, 370 (McNair RWS); RX-1719C at Q/A 26 (Hendrickson RWS). [REDACTED]
[REDACTED] RX-1991C at Q/A 336-44 (McNair RWS); RX-1719C at Q/A 33 (Hendrickson RWS). Silicon Labs thus argues that these conversions [REDACTED]
[REDACTED]

[REDACTED] RIB at 77-79; RRB at 42. I agree with Cresta that Silicon Labs’s reading of this limitation is too narrow. There is nothing in the claims or specification that limits the “signal processor” to only performing format-specific processing. The specification explicitly discloses that “DSP 64 can also implement other filter functions such as ghost cancellation for reducing the interference of the input signal.” JX-0001 at 5:28-30. Under a proper interpretation of this limitation, the “signal processor” thus includes the FIR

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filters and mixers, which perform processing on “said digital representation of said intermediate signals.”

Silicon Labs further disputes whether the processing performed by the DSP is format-specific, arguing that Cresta fails to identify any difference between the processing of signals based on the format of the RF input signal. RIB at 79-81; RRB at 46-50. Cresta asserts several examples of format-specific processing, citing [REDACTED]

[REDACTED] CIB at 66-68; CRB at 37-39. Cresta asserts that the [REDACTED]

[REDACTED] As discussed above, I construe “format” to refer to the transmission standard, and Pf. McNair states that the FCC mandates a 6 MHz bandwidth for all transmission standards. Tr. at 663:14-25. Citing a Silicon Labs design review document, Cresta argues that [REDACTED]

[REDACTED] CIB at 66; JX-0035 at 13. Silicon Labs does not dispute this operation [REDACTED]

[REDACTED] RRB at 49-50; RIB at 80. Cresta further alleges that the [REDACTED]

[REDACTED] but Cresta points to no evidence in the record regarding the [REDACTED] Finally, Cresta points to evidence that the Si2170 series tuners use [REDACTED]

[REDACTED] citing [REDACTED]

⁵ Cresta’s brief cites to deposition testimony from Alan Hendrickson that was excluded on an objection by Respondents. Tr. at 1164:4-7. See Respondents’ Response to Cresta’s Submission on Objections to Corporate Representative Testimony at 4-5 (June 30, 2014).

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[REDACTED]. CIB at 67-68; JX-0049C at 5. Silicon Labs does not contest this assertion but notes that the [REDACTED]

[REDACTED] Tr. at 317:3-10. Based on the foregoing, I find that Cresta has shown by a preponderance of the evidence that all Silicon Labs tuners other than the “V” tuners perform format-specific processing [REDACTED], and all Si2170 series tuners perform format-specific processing by [REDACTED]. This leaves one accused Silicon Labs tuner, however, for which Cresta fails to identify evidence of infringing this limitation: the Si2158V.

Silicon Labs further argues that Cresta fails to identify the claimed “digital output signals” generated by the signal processor in the Silicon Labs tuners. RIB at 85-86. Although Dr. Snelgrove’s testimony on this issue is somewhat vague, CX-2024C at Q/A 338, Tr. at 172:8-17, I find that Cresta has shown by a preponderance of the evidence that the [REDACTED]

[REDACTED] as discussed in more detail below for the next claim limitation. There are several different configurations for the accused Silicon Labs tuners at the interface between the signal processors and demodulators, but in any configuration, I find that digital output signals are generated prior to demodulation.

For the reasons discussed above, I therefore find that all accused Silicon Labs tuners except for the Si2158V meet the “signal processor” limitation.

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- vii. “a plurality of demodulators, each coupled to receive output signals from said signal processor, each of said demodulators for demodulating said digital output signals according to one of said formats of said input RF signal, each of said demodulators generating video and audio baseband signals corresponding to said format of said input RF signal”

Demodulation is implemented several different ways in the televisions containing Silicon Labs tuners, as explained by Dr. Snelgrove. CX-2024C at Q/A 339. For the Si2150 series tuners, Dr. Snelgrove alleges that the demodulators are in the television but outside the tuner. *Id.*; see also JX-0009 at 17; CIB at 71. For the Si2170 series tuners, [REDACTED], but Dr. Snelgrove alleges that digital demodulation occurs outside the tuner. CX-2024C at Q/A 339 (Snelgrove DWS). See JX-0019C at 25; CIB at 72. In the Si2185 series tuners, [REDACTED]. CX-2024C at Q/A 339 (Snelgrove DWS). See JX-0023C at 25; CIB at 71. There is no dispute that televisions containing the Silicon Labs tuners have a plurality of demodulators, as Pf. McNair admits that [REDACTED] Tr. at 673:17-20. Silicon Labs makes several non-infringement arguments based on this claim language, however, as discussed below.

First, Silicon Labs argues that its tuners do not meet this limitation because the demodulators are not “each coupled to receive output signals.” RIB at 86-91.⁶ I do not agree with Silicon Labs’s interpretation of this limitation. Silicon Labs insists that the “each coupled” claim language requires that every demodulator be simultaneously coupled to and receiving

⁶ Silicon Labs separately argues that the demodulators are not “coupled” at the time of importation because the televisions are powered off, but Silicon Labs does not cite any evidence to support this assertion. RIB at 86. The cited testimony of Pf. McNair only states that the demodulators are not demodulating at the time of importation, which is not required by this limitation. RX-1991C at Q/A 437.

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output signals, but this is not consistent with the specification and other intrinsic evidence in the '585 patent. Silicon Labs points to the “auto-detection” embodiment described in the specification, where “[e]ach demodulator in bank 66 generates a signal which is fed back to standard selection circuit 68 indicating which television standard the input signal is encoded.” JX-0001 at 5:17-20. In this embodiment, every demodulator is simultaneously generating signals from the digital output, but the very next sentence in the specification states that “[i]n other embodiments, other means for selecting between different standards can be used.” *Id.* at 5:20-22. The specification also provides that “[t]he selection of the correct standard can be made manually by the user of the television system, such as by activating a switch.” *Id.* at 5:8-10. In addition, the “auto-detection” embodiment is claimed in dependent claims 14 and 15, and this weighs against limiting claim 1 to this embodiment. *Id.* at 8:7-13. Silicon Labs also points to the language in claim 10 describing “one of a plurality of finite impulse response filters,” arguing that claim 1 could have been written to refer to “one of said demodulators” rather than “each of said demodulators.” RIB at 89-90; RX-1991C at Q/A 223-24 (McNair RWS). But this only shows that claim 1 is not restricted to demodulators that only operate one at a time; it does not preclude claim 1 from covering multiple embodiments, such as the auto-detection and manual-switching embodiments described in the specification. In the Silicon Labs tuners, the digital output [REDACTED]

[REDACTED] RX-1991C at Q/A 211-20. I do not read this limitation to require multiple simultaneous demodulation, and I therefore find that the switched connections to at least two demodulators in the Silicon Labs tuners satisfies the “each coupled” limitation.

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Silicon Labs also argues non-infringement for the Si2170 series tuners and the Si2185 series tuners because the demodulators in those tuners [REDACTED] [REDACTED] identified by Dr. Snelgrove. RIB at 91-92. Silicon Labs argues that Dr. Snelgrove takes inconsistent positions on what he accuses as the “signal processor” in the Si2170 and Si2185 products. *Id.* Although Dr. Snelgrove’s witness statement is not clear on this issue, CX-2024C at Q/A 338-39, he explained on cross-examination and re-direct that the [REDACTED] [REDACTED] Tr. at 171:4-172:17, 311:8-316:21. Under this infringement theory, there are no components in the “signal processor” that process the signal after the demodulators, and I do not find any basis for non-infringement based on this argument.

Silicon Labs further argues that the demodulators are not “for demodulating said digital output signals” because [REDACTED] [REDACTED]. RIB at 92-93. Cresta points to claim 3, a dependent claim that explicitly claims “a digital-to analog converter coupled between said signal processor and a first one of said plurality of demodulators.” JX-0001 at 7:13-17. Since independent claim 1 is necessarily broader than dependent claim 3, I find that the demodulator limitation of claim 1 must encompass analog conversion of the digital output signals prior to demodulation.

The television manufacturers further argue that Dr. Snelgrove fails to identify the “plurality of demodulators” in every accused television and did not analyze every SoC, where the demodulators are allegedly located. RIB at 115-20; RRB at 75-76. I agree that evidence of the structure and operation of the accused demodulators is necessary to prove infringement of the “plurality of demodulators,” “demodulating ... according to one of said formats of said input RF

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signal” and “generating video and audio baseband signals corresponding to said format of said input RF signal” limitations of claim 1 of the ‘585 patent. JX-0001 at 7:3-9. The Federal Circuit has held that “[i]n order to prove direct infringement, a patentee must either point to specific instances of direct infringement or show that the accused device necessarily infringes the patent in suit.” *ACCO Brands v. ABA Locks Mfrs. Co., Ltd.*, 501 F.3d 1307, 1313 (Fed. Cir. 2007).

For the Si2185 tuner, Dr. Snelgrove identifies internal analog and digital demodulators inside the tuner and does not rely on any evidence outside of the tuner. For other accused Silicon Labs tuners, Dr. Snelgrove provides evidence of infringement for particular SoCs, such as the [REDACTED] SoC in one [REDACTED] television that incorporates a Silicon Labs Si2178 tuner. CX-2024C at Q/A 340. In this [REDACTED] SoC, Dr. Snelgrove identifies an analog demodulator in the tuner supporting analog formats such as NTSC and a digital demodulator in the SoC supporting digital formats such as ATSC, which meets the “plurality of demodulators” claim limitation. *Id.* (citing CX-1378; CX-1384C; CX-1387C). Dr. Snelgrove also identifies an [REDACTED] SoC in another [REDACTED] television that incorporates a Silicon Labs Si2158 tuner, where analog and digital demodulators are both located in the SoC. *Id.* at Q/A 341 (citing CX-1388C; CX-1383C; CX-1379). Dr. Snelgrove further analyzes the [REDACTED] which is incorporated in [REDACTED] televisions with a Silicon Labs Si2178 tuner, finding that demodulation for analog formats occurs in the tuner while demodulation for digital formats occurs in the SoC. *Id.* at Q/A 342 (citing CX-0229C; CX-0239C). In addition, Dr. Snelgrove analyzes the [REDACTED], which is also incorporated in [REDACTED] televisions with a Si2178 tuner, supporting analog demodulation in the tuner and digital demodulation in the SoC. *Id.* at Q/A 343 (citing CX-0238C; CX-0230C). Finally, Dr. Snelgrove analyzes the [REDACTED] SoC used in a [REDACTED] television with a Silicon Labs Si2157 tuner. *Id.* at Q/A 344. In this television, the SoC

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includes both analog and digital demodulators, supporting multiple different television formats.

Id. (citing CX-1623C; CX-1631C; CX-1636C; JX-0169C).

Respondents argue that any findings of infringement should be limited to the specific television models analyzed by Dr. Snelgrove and further challenge that analysis because Cresta failed to obtain direct evidence from the SoC manufacturers. RIB at 115-20. Cresta argues that since every SoC analyzed by Dr. Snelgrove met the claim limitations, it is reasonable to infer that every SoC meets the limitations. CRB at 65-66. It is Cresta's burden to show that the analyzed products are representative of other accused products, however, and I find that it fails to do so here. *See Certain Bulk Welding Wire Containers and Components Thereof, Inc. No. 337-TA-686*, Initial Determination at 272, 2011 WL 7464368, at *155 (July 29, 2010) ("if Lincoln chooses to analyze a single representative product and claim that a number of other products have identical characteristics, it must point to evidence that supports the proposition that Respondents' accused products are identical for purposes of the [] patent."). Dr. Snelgrove provides no explanation for why he only analyzes certain specific SoCs. While I find that Dr. Snelgrove's testimony is sufficient to prove infringement of this limitation by televisions incorporating the specific SoCs he identifies, I find no reliable basis to apply his analysis to other SoCs. Infringement of this limitation requires not only evidence of more than one demodulator but also that the demodulation performed is "according to one of said formats of said input RF signal" and that the demodulators generate "video and audio baseband signals corresponding to said format of said input RF signal." This requires analysis of how demodulation actually occurs in the accused televisions, which Cresta only provides for specific SoCs.

Accordingly, while I find that Dr. Snelgrove has shown that demodulators in several SoCs infringe the "plurality of demodulators" limitation, I restrict my findings to the specific

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SoCs analyzed by Dr. Snelgrove. In particular, in addition to the direct infringement by the Si2185 tuner, I find that televisions incorporating the [REDACTED] SoCs with Silicon Labs tuners infringe the “plurality of demodulators” limitation.

Based on the foregoing analysis, I therefore find direct infringement of claim 1 of the ’585 patent by the Silicon Labs Si2185 tuner and televisions incorporating this tuner, and I also find direct infringement by televisions incorporating other Silicon Labs tuners with the [REDACTED] SoCs.⁷ I find that Cresta fails to prove direct infringement by any other Silicon Labs tuner or by any television incorporating other SoCs or the Si2158V tuner.

b. Claim 2

Claim 2 of the ’585 patent requires that the “plurality of formats” comprise “an analog television format and a digital television format.” JX-0001 at 7:10-12. As discussed above, there is no dispute that the accused Silicon Labs tuners are capable of receiving TV signals in analog and digital formats. CX-2024C at Q/A 334 (Snelgrove DWS); CX-2001C at 122:2-13 (Koroglu Dep.); *see, e.g.*, JX-0009C (Si2158-A10 Specifications). Accordingly, I find that every Silicon Labs tuner and television containing a Silicon Lab tuner that infringes claim 1 also infringes claim 2.

⁷ Dr. Snelgrove’s testimony identifies TV model numbers corresponding to these identified SoCs for LG televisions and VIZIO televisions. CX-2024C at Q/A 273, 293. For Samsung televisions, he identifies [REDACTED]

Id. at Q/A 265.

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c. Claim 3

Claim 3 of the '585 patent adds a limitation for "a digital-to analog converter coupled between said signal processor and a first one of said plurality of demodulators, said digital-to-analog converter converting said digital output signals to an analog format." JX-0001 at 7:13-17.

As discussed above, Silicon Labs admits that its Si2150 and Si2170 series tuners [REDACTED] [REDACTED] RIB at 92-93; RX-1991C at Q/A 234, 237 (McNair RWS). Accordingly, I find that every tuner and television that infringes claim 1 also infringes claim 3.

d. Claim 10

Claim 10 of the '585 patent adds a limitation "wherein said signal processor applies one of a plurality of finite impulse response filters to said digital representation of said intermediate signal, each of said plurality of finite impulse response corresponding to a format of said input RF signal." JX-0001 at 7:36-40. Cresta identifies the Channel Filter and Video FIR filters in the accused Silicon Labs tuners to meet this limitation. CIB at 79-81; CRB at 47-50. As discussed above in the context of the "signal processor" limitation, however, I find that Cresta fails to identify any evidence that the Channel Filter or Video FIR filters apply any format-specific processing.

While Cresta asserts that the [REDACTED]

[REDACTED]

[REDACTED] Cresta also points to no evidence in the record to support its allegation that the [REDACTED]

[REDACTED] Dr. Snelgrove cites a design document for Si2170 series tuners [REDACTED]

[REDACTED]

Tr. at 171:4-172:17, 311:8-316:21 (Snelgrove). Dr. Snelgrove also relies on hearsay testimony from [REDACTED] for evidence regarding the Video FIR filters, but the excerpt quoted by Dr. Snelgrove demonstrates the unreliability of this testimony, with [REDACTED] equivocating that “[s]ince I’m not an expert in how that firmware actually applies to the coefficients, I can’t speak authoritatively to that.”⁸ CX-2024C at Q/A 350.

Accordingly, I find that Cresta fails to meet its burden to prove infringement of claim 10 of the ’585 patent by any Silicon Labs tuner or any television incorporating a Silicon Labs tuner.

e. Claim 13

Claim 13 of the ’585 patent is dependent upon claim 10 and adds a limitation “wherein said channel filter further comprises a standard selection circuit coupled to said signal processor.” JX-0001 at 8:1-6. Dr. Snelgrove identifies registers [REDACTED] [REDACTED] as examples of select signals indicative of a format. CX-2024C at Q/A 351. Pf. McNair does not specifically address this evidence or this limitation. RX-1991C at Q/A 394. Silicon Labs also does not make any specific non-infringement arguments based on this limitation. RIB at 96; RRB at 57; CRB at 50. In view of this evidence, I find that the “standard selection circuit” limitation is infringed by the accused Silicon Labs tuners, but because I find that Cresta fails to meet its burden on claim 10, I find no infringement of claim 13 by Silicon Labs’s tuners or televisions containing those tuners.

⁸ This testimony was excluded from the record pursuant to Respondents’ objection. *See supra*, n.5.

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f. Contributory Infringement

I find that Silicon Labs meets the knowledge requirement for contributory infringement at least as of the filing of the Complaint. *Certain Inkjet Ink Cartridges with Printheads & Components Thereof*, Inv. No. 337-TA-723, Comm'n Op. at 8, 18-19 (Dec. 1, 2011).

Dr. Snelgrove states that the accused Silicon Labs tuners are a material part of the claimed invention and do not have any substantial non-infringing uses. CX-2024C at Q/A 414.

Pf. McNair states that a substantial non-infringing use for the accused Silicon Labs tuners would be to configure them ("manufacture the Die") for use in non-hybrid televisions. RX-1991C at Q/A 438. The Silicon Labs tuners are identified by different product numbers when intended for use with non-hybrid televisions, however, and as discussed above, I find that these analog-only and digital-only products do not infringe the asserted patents. These are separate non-infringing products, not non-infringing uses for accused products. I therefore find no evidence of substantial non-infringing uses for the accused Silicon Labs tuners. In addition, I find that the Silicon Labs tuners are a material part of the invention because they include elements that meet all the claim limitations other than the "plurality of demodulators." Because I find that certain televisions incorporating the accused Silicon Labs tuners directly infringe claims 1, 2, and 3 of the '585 patent, as discussed above, I therefore also find contributory infringement by the Silicon Labs tuners when incorporated in those televisions.

2. MaxLinear Accused Products

Cresta accuses the MaxLinear MxL601 and MxL661 tuners, and televisions incorporating such tuners, of infringing claims 1, 2, 3, 10, 12, and 13 of the '585 patent. CIB at 83. Cresta accuses the televisions of direct infringement and the MaxLinear tuners of contributory infringement. *Id.* For the reasons discussed below, I find that the MaxLinear

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tuners, when incorporated into certain televisions, infringe claims 1, 2, 3, 10, 12, and 13 of the '585 patent.

a. Claim 1

Cresta asserts that televisions incorporating the MaxLinear tuners directly infringe claim 1 of the '585 patent, relying on the opinions of Dr. Snelgrove. CIB at 93-104; CRB at 56-62; CX-2024C at Q/A 379-88. MaxLinear disputes the infringement of several limitations, relying on the opinions of Dr. Hashemi. RIB at 97-113; RRB at 61-70; RX-1996C at Q/A 141-64.

i. "A receiver comprising"

As discussed above in the context of claim construction, I find that the preamble of claim 1 of the '585 patent is not limiting, and it is therefore not necessary to meet this limitation for infringement. Nevertheless, even if Cresta's construction for this limitation were adopted, I find that the accused MaxLinear televisions include television receivers. *See* CIB at 94.

ii. "a tuner for receiving input RF signals and for converting said input RF signals to intermediate signals having an intermediate frequency (IF), said input RF signals encoding information in one of a plurality of formats"

In his direct witness statement, Dr. Snelgrove identifies [REDACTED] [REDACTED] from datasheets for the MaxLinear tuners that are designed for receiving input RF signals. CX-2024C at Q/A 380; CX-1423C; CX-1416C; JX-0175C. A MaxLinear datasheet provides that: [REDACTED] [REDACTED] JX-0029C. This datasheet identifies [REDACTED] among the supported standards. *Id.*; *see also* CX-2024C at Q/A 380 (Snelgrove DWS); CX-1438; CX-1439C. MaxLinear and Dr. Hashemi do not contest the "receiving input RF signals" or "plurality of formats" limitations, but they contend that the zero-IF architecture of the MaxLinear tuners does

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not convert the input RF signals to an “intermediate frequency (IF).” RIB at 103-05; RRB at 61-64; RX-1996C at Q/A 147-53.

MaxLinear’s and Staff’s non-infringement arguments rely upon their construction of “intermediate frequency (IF), but as discussed above, I adopt Cresta’s construction for this term, which allows the IF to be any frequency other than the frequency of the input RF signal.

MaxLinear’s tuners infringe under this construction because there is a frequency conversion from the RF signal. As stated on MaxLinear’s datasheet: [REDACTED]

[REDACTED] JX-0029C. The [REDACTED] is zero, RX-1996C at Q/A 143 (Hashemi RWS), but a zero-IF is an IF under the proper construction of this term. Accordingly, I find that the MaxLinear tuners infringe the “tuner” limitation of the ’585 patent.

iii. “a channel filter for receiving the intermediate signals, said channel filter comprising...”

I find that the “channel filter” limitation is met by the accused MaxLinear tuners because of the presence of the “anti-aliasing filter,” “analog-to-digital converter,” and “signal processor” limitations below. Dr. Snelgrove predicates his opinion on his analysis of each of these elements, CX-2024C at Q/A 381, and MaxLinear does not raise any specific non-infringement argument based on the “channel filter” claim language.

iv. “an anti-aliasing filter for filtering said intermediate signals”

Dr. Snelgrove identifies [REDACTED] in the MxL661 that act as anti-aliasing filters for the intermediate signals. CX-2024C at Q/A 382. MaxLinear’s only non-infringement argument on this element relies upon a claim construction restricting the limitation to band-pass filters. RIB at 105-06; RX-1996C at Q/A 159 (Hashemi RWS). As discussed above, I do not read “anti-aliasing filter” to be limited to a band-pass filter. At hearing, Dr. Hashemi admitted

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that low-pass filters can be used for anti-aliasing, that the MaxLinear tuners have filters to remove aliasing prior to analog-to-digital conversion, and that the MaxLinear tuners [REDACTED]

[REDACTED] Tr. at 907:11-908:3. Dr. Curtis Ling, MaxLinear's Chief Technical Officer, admits that [REDACTED]

[REDACTED] CX-1990C at 592:10-21, 593:8-13; *see also* RX-1995C at Q/A 21 (Ling RWS).

Accordingly, I find that the MaxLinear tuners infringe the "anti-aliasing filter" limitation of the '585 patent.

v. "an analog-to-digital converter for sampling said filtered intermediate signals and generating a digital representation thereof"

Dr. Snelgrove identifies [REDACTED] in the MaxLinear tuners, citing several MaxLinear architecture documents. CX-2024C at Q/A 383; *see* JX-0158C, CX-1431C, CX-1432C. MaxLinear did not contest the presence of these analog-to-digital converters, and I therefore find that the MaxLinear tuners infringe this limitation.

vi. "a signal processor for processing said digital representation of said intermediate signals in accordance with said format of said input RF signal, said signal processor generating digital output signals indicative of information encoded in said input RF signal"

Dr. Snelgrove identifies several components in the MaxLinear tuners that comprise a "signal processor" meeting the limitations of the '585 patent. CX-2024C at Q/A 384.

Specifically, Dr. Snelgrove identifies a [REDACTED]

[REDACTED] *Id.* (citing CX-1431C; JX-0177C; CX-1414C). Cresta also cites additional evidence that [REDACTED]

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[REDACTED] CIB at 97-98; Tr. at 922:11-923:7, 924:19-926:1 (Hashemi); CX-1424C; CX-1414C; CX-1412C; CX-1424C.

MaxLinear argues that this limitation is not met because the MaxLinear tuners do not contain a programmable digital signal processor, RIB at 106-07, RRB at 65-67, but as discussed above, I decline to read a “programmable” limitation into the construction of “signal processor.” I therefore find that the components identified by Dr. Snelgrove qualify as a “signal processor” in the context of the ’585 patent.

MaxLinear further argues that its tuners do not process the intermediate signals “in accordance with said format of said input RF signals.” RIB at 107-09; RRB at 67. Dr. Hashemi asserts that the channel filtering in the MaxLinear tuners is dependent upon [REDACTED]

[REDACTED] RX-1996C at Q/A 168. Dr. Ling explains that the MaxLinear tuners [REDACTED]

[REDACTED] RX-1995C at Q/A 64-67. Cresta identifies evidence that the MaxLinear tuners are configured differently for certain television standards, however, including [REDACTED]

[REDACTED] CX-1424C at 18-27. When questioned regarding [REDACTED] during cross-examination, Dr. Hashemi admits that [REDACTED]

[REDACTED] Tr. at 922:8-19. He further testifies that “filters are not the only things that change when you go from one medium to another medium, from one standard to another standard. Many other things change. The gains may change. The phase noise of the synthesizers may change. A whole range of parameters will

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change.” *Id.* at 923:2-7. I find this to be compelling evidence of processing in accordance with the format of the input RF signal.

In his rebuttal witness statement, Dr. Hashemi admits that [REDACTED] [REDACTED] but he attempts to make a distinction between configuration by format and configuration by parameters related to the format. RX-1996C at Q/A 169. Dr. Hashemi also equivocates on whether processing is different for analog and digital formats, testifying that [REDACTED]

[REDACTED] *Id.* I do not find the distinction made by Dr. Hashemi to be meaningful, however. [REDACTED]

[REDACTED] I thus find that the MaxLinear tuners infringe this limitation by a preponderance of the evidence.

As further evidence of format-specific processing, Cresta identifies an [REDACTED] [REDACTED] and Dr. Ling testifies that this component [REDACTED] [REDACTED] CX-1989C at 370:4-13. This information is used to perform different processing [REDACTED] *Id.* at 373:23-374:7.

In addition, Dr. Ling states that [REDACTED] [REDACTED] *Id.* at 376:12-377:9. He explains that “there are many analog standards, at least six around the world ... [REDACTED]

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██████████ *Id.* at 377:10-21. This testimony is further evidence of processing in the MaxLinear tuners that is dependent on the format of the input RF signal.

To rebut Cresta's allegations, MaxLinear cites certain evidence ██████████

██████████ Dr. Hashemi cites evidence that ██████████

██████████ RX-1996C at Q/A 169.

MaxLinear also cites a September 2014 demonstration where a MaxLinear tuner provided ██████████

██████████. RX-1996 at Q/A 169-71

(Hashemi RWS); RX-1995C at Q/A 69-70 (Ling RWS). While this is evidence that some

processing in the MaxLinear tuners ██████████ I do not read the claim language to require different processing in every circumstance. The limitation merely requires processing "in accordance with said format of said input RF signal," and I find that Cresta has shown that the MaxLinear tuners meet this limitation by a preponderance of the evidence.

Accordingly, I find that the MaxLinear tuners infringe the "signal processor" limitation of the '585 patent.

- vii. "a plurality of demodulators, each coupled to receive output signals from said signal processor, each of said demodulators for demodulating said digital output signals according to one of said formats of said input RF signal, each of said demodulators generating video and audio baseband signals corresponding to said format of said input RF signal"**

The MaxLinear tuners do not contain demodulators, but Cresta alleges that the televisions containing the MaxLinear tuners contain demodulators that directly infringe this limitation. CIB at 100-104. Dr. Snelgrove identifies several MaxLinear design documents that reference demodulators and instruct television makers how to use the MaxLinear tuners in combination with demodulators. RX-2024C at Q/A 385 (citing CX-1415C, JX-0158C). Dr. Snelgrove also

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analyzes several specific SoCs in accused televisions incorporating MaxLinear tuners from Samsung and VIZIO. *Id.* at Q/A 386-88.

MaxLinear argues that its tuners do not infringe this limitation because their output is analog and the demodulators in the televisions thus process analog signals rather than the claimed “digital output signals.” RIB at 109-10, 112; RRB at 69-70; RX-1996C at Q/A 158 (Hashemi RWS). In view of dependent claim 3, however, the “demodulating said digital output signals” limitation must be read broadly enough to encompass analog conversion of the digital output signals prior to demodulation. I therefore interpret the “coupled to receive output signals” and “demodulating said digital output signals” limitations to allow for the demodulation of digital output signals that have been converted to analog. MaxLinear’s non-infringement argument does not apply under this construction of the claim language.

MaxLinear further argues that the “channel filter” limitation requires that the anti-aliasing filter, analog-to-digital converter, signal processor, and plurality of demodulators to be on the same chip. RIB at 111-12. The indentation of the “plurality of demodulators” limitation in the ’585 patent suggests that it is part of the claimed “channel filter.” JX-0001 at 6:58-7:9. Cresta points out that the specification and prosecution history are inconsistent with this interpretation, however. CRB at 61-62. In the prosecution history, the “plurality of demodulators” limitation was a separate dependent claim before being incorporated into claim 1. JX-0003 at 22. In the specification, the demodulators 66 are consistently depicted and described as outside of the channel filter 58. JX-0001 at 4:5-7 (“Multi-standard channel filter 58 includes an anti-aliasing filter 60, an analog-to-digital converter (ADC) 62 and a digital signal processor (DSP) 64.”), 5:43-45 (“The output signals from channel filter 58 are coupled to a bank of demodulators 66 for generating into the appropriate video and audio baseband signals.”), Fig. 2 (showing

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“Demodulators” labeled 66 outside of the box 58 labeled “Channel Filter”). I therefore read the “plurality of demodulators” limitation to be separate from the “channel filter” limitation and reject MaxLinear’s non-infringement argument.

Finally, MaxLinear and the television manufacturers argue that Dr. Snelgrove fails to identify the “plurality of demodulators” in every accused television and does not analyze every SoC, where the demodulators are allegedly located. RIB at 112-13, 115-20; RRB at 75-76. I agree that evidence of the structure and operation of the accused demodulators is necessary to prove infringement of the “plurality of demodulators,” “demodulating ... according to one of said formats of said input RF signal” and “generating video and audio baseband signals corresponding to said format of said input RF signal” limitations of claim 1 of the ‘585 patent. JX-0001 at 7:3-9. The Federal Circuit has held that “[i]n order to prove direct infringement, a patentee must either point to specific instances of direct infringement or show that the accused device necessarily infringes the patent in suit.” *ACCO Brands v. ABA Locks Mfrs. Co., Ltd.*, 501 F.3d 1307, 1313 (Fed. Cir. 2007).

Dr. Snelgrove provides such analysis for certain specific SoCs, such as the [REDACTED] [REDACTED] television that incorporates a MaxLinear MxL661 tuner. CX-2024C at Q/A 386. Dr. Snelgrove identifies demodulators and decoders in this SoC that support analog and digital television standards, including NTSC and ATSC, which meets the claim limitations. *Id.* (citing CX-0231C, CX-0237). Dr. Snelgrove also identifies a [REDACTED] [REDACTED] *Id.* at Q/A 387 (citing CX-1525C, CX-1455C, CX-2014C, JX-0171C). Dr. Snelgrove further analyzes another VIZIO television containing an [REDACTED]

(citing CX-1665C, CX-1666C, CX-1671C, CX-1455C, CX-0046C, JX-0171C).

Respondents argue that any findings of infringement should be limited to the specific television models analyzed by Dr. Snelgrove and further challenge that analysis because Cresta failed to obtain direct evidence from the SoC manufacturers. RIB at 115-20. Cresta argues that since every SoC analyzed by Dr. Snelgrove met the claim limitations, it is reasonable to infer that every SoC meets the limitations. CRB at 65-66. It is Cresta's burden to show that the analyzed products are representative of other accused products, however, and I find that it fails to do so here. *See Certain Bulk Welding Wire Containers and Components Thereof, Inc. No. 337-TA-686*, Initial Determination at 272, 2011 WL 7464368, at *155 (July 29, 2010) ("if Lincoln chooses to analyze a single representative product and claim that a number of other products have identical characteristics, it must point to evidence that supports the proposition that Respondents' accused products are identical for purposes of the [] patent."). Dr. Snelgrove provides no explanation for why he analyzed the specific SoCs in his testimony. I find that his testimony is sufficient to prove infringement of the "plurality of demodulators" limitation by televisions incorporating those specific SoCs, but I have no basis to apply his analysis to other SoCs.

Accordingly, while I find that Dr. Snelgrove has shown that demodulators in several SoCs infringe the "plurality of demodulators" limitation, I restrict my findings to the specific SoCs analyzed by Dr. Snelgrove. In particular, I find that accused televisions incorporating the [REDACTED] and [REDACTED] SoCs infringe this limitation.

Based on the foregoing analysis, I therefore find direct infringement of claim 1 of the '585 patent by the televisions incorporating MaxLinear tuners and [REDACTED] or [REDACTED]

██████████⁹ I find that Cresta fails to prove direct infringement by any other televisions incorporating MaxLinear tuners.

b. Claim 2

Claim 2 of the '585 patent requires that the “plurality of formats” comprise “an analog television format and a digital television format.” JX-0001 at 7:10-12. As discussed above, there is no dispute that the MaxLinear tuners can receive RF signals in a plurality of formats, including at least NTSC and ATSC. CX-2024C at Q/A 389 (Snelgrove DWS); CX-1439C. Accordingly, I find that all televisions incorporating MaxLinear tuners that infringe claim 1 also infringe claim 2.

c. Claim 3

Claim 3 of the '585 patent adds a limitation for “a digital-to-analog converter coupled between said signal processor and a first one of said plurality of demodulators, said digital-to-analog converter converting said digital output signals to an analog format.” JX-0001 at 7:13-17. As discussed above, MaxLinear explicitly argues that all of its tuners contain a digital-to-analog converter prior to the output to demodulators. *See* RIB at 109-10; RRB at 69-70; *see also* CX-2024C at Q/A 390 (Snelgrove DWS). Accordingly, I find that all televisions incorporating MaxLinear tuners that infringe claim 1 also infringe claim 2.

d. Claim 10

Claim 10 of the '585 patent adds a limitation “wherein said signal processor applies one of a plurality of finite impulse response filters to said digital representation of said intermediate

⁹ Dr. Snelgrove only identified one Samsung television, ██████████ CX-2024C at Q/A 386. He identified several specific VIZIO televisions incorporating the ██████████. *Id.* at Q/A 293. The accused Sharp televisions do not appear to use any of the identified SoCs. *Id.* at Q/A 282.

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signal, each of said plurality of finite impulse response corresponding to a format of said input RF signal.” JX-0001 at 7:36-40. As discussed above in the context of the “signal processor” limitation of claim 1, MaxLinear’s witnesses testify explicitly that [REDACTED] [REDACTED]. RX-1995C at Q/A 64-67 (Ling); RX-1996C at Q/A 170 (Hashemi). In addition, [REDACTED] [REDACTED] CX-1424C at 18-27. Dr. Hashemi was questioned regarding this [REDACTED] [REDACTED] [REDACTED] Tr. at 922:8-19. Dr. Snelgrove also cites [REDACTED] [REDACTED] CX-2024C at Q/A 391. [REDACTED] [REDACTED] but as discussed above, I find that the evidence [REDACTED] correspond to the format of the input RF signal. Accordingly, I find that all televisions incorporating MaxLinear tuners that infringe claim 1 also infringe claim 10.

e. Claim 12

Claim 12 of the ’585 patent is dependent upon claim 10 and adds a limitation “wherein said signal processor comprises a first computing unit and a second computing unit, said first computing unit processing a real part of said finite impulse response filter operation while said second computing unit processing an imaginary part of said finite impulse response filter operation.” JX-0001 at 8:1-6. Dr. Snelgrove identifies [REDACTED] [REDACTED] corresponding to processing for the real and imaginary parts of the signal. CX-2024C at Q/A 392. Specifically, Dr. Snelgrove identifies [REDACTED]

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corresponding to the real and imaginary parts of the finite impulse response filter. *Id.* MaxLinear argues

but as discussed above in the context of claim construction, I construe “real/imaginary part of said/the finite impulse response filter operation” to mean the real/imaginary part of the weighted sum output, calculated using complex numbers for the weights or signal samples or both. There is no dispute that

RX-1996C at Q/A 174 (Hashemi RWS). Accordingly, I find that meet this limitation and all televisions incorporating MaxLinear tuners that infringe claim 1 also infringe claim 12.

f. Claim 13

Claim 13 of the '585 patent is dependent upon claim 10 and adds a limitation “wherein said channel filter further comprises a standard selection circuit coupled to said signal processor, said standard selection circuit generating a select signal indicative of a format of said input RF signal and said signal processor selecting a finite impulse response filter in response to said signal.” JX-0001 at 8:1-6. Dr. Snelgrove identifies a circuit in the MaxLinear tuners that

as discussed above in the context of claim 1. CX-2024C at Q/A 393. MaxLinear does not present any non-infringement arguments specific to this limitation, RIB at 115, RRB at 75, and accordingly, I find that all televisions incorporating MaxLinear tuners that infringe claim 1 also infringe claim 13.

g. Contributory Infringement

I find that MaxLinear meets the knowledge requirement for contributory infringement at least as of the filing of the Complaint. *Certain Inkjet Ink Cartridges with Printheads & Components Thereof*, Inv. No. 337-TA-723, Comm’n Op. at 8, 18-19 (Dec. 1, 2011). Because I find that certain televisions incorporating the accused MaxLinear tuners directly infringe claims 1-3, 10, 12, and 13 of the ’585 patent, as discussed above, I therefore find contributory infringement based on those MaxLinear tuners. Dr. Snelgrove explains that the accused MaxLinear tuners are a material part of the claimed invention and do not have any substantial non-infringing uses. CX-2024C at Q/A 414. Dr. Hashemi opines that a non-infringing use for the MaxLinear tuners would be to use the tuner with a single downstream demodulator, such as in cable and satellite TV set-top boxes. RX-1996C at Q/A 181. Dr. Hashemi further testifies that MaxLinear tuners can be used for applications other than receiving television signals. *Id.* at Q/A 182. Cresta is not accusing any cable or satellite TV set-top boxes in this Investigation, however, and my infringement findings are limited to the SoCs where Cresta has identified a “plurality of demodulators” infringing claim 1 of the ’585 patent. I therefore find no non-infringing uses that are relevant to the MaxLinear tuners at issue. In addition, I find that the MaxLinear tuners are a material part of the invention because they include elements that meet all the claim limitations other than the “plurality of demodulators.” Because I find that certain televisions incorporating the accused MaxLinears tuners directly infringe claims 1, 2, 3, 10, 12, and 13 of the ’585 patent, as discussed above, I therefore also find contributory infringement by the MaxLinear tuners when incorporated in those televisions.

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D. Infringement of the '792 patent

1. Silicon Labs Accused Products

Cresta accuses certain Silicon Labs tuners of infringing claims 1-4, 7-8, and 26 of the '792 patent. CIB at 152. The tuners are accused of direct infringement of all claims except for claim 8, where Cresta accuses the tuners of contributory infringement. *Id.* Cresta also accuses televisions containing the tuners of direct infringement of all the asserted claims. *Id.*

a. Claim 1

Cresta asserts that Silicon Labs tuners directly infringe claim 1 of the '792 patent, relying on the opinions of Dr. Snelgrove. CIB at 152-54; CRB at 90-91; CX-2024C at Q/A 353-58. Silicon Labs disputes the infringement of several limitations, relying on the opinions of Pf. McNair. RIB at 146-48; RRB at 93-95; RX-1991C at Q/A 465-478. The arguments and evidence relied upon by the parties for claim 1 of the '792 patent is similar to that discussed above for claims 1 and 10 of the '585 patent.

i. "A television receiver comprising:"

As discussed above in the context of claim 1 of the '585 patent, I find that the accused Silicon Labs tuners are television receivers. Dr. Snelgrove asserts that the Silicon Labs tuners are television receivers, CX-2024C at Q/A 353, and Pf. McNair does not offer any substantive rebuttal to this opinion. RX-1991C at Q/A 466, 141-144.

ii. "a frequency conversion circuit for receiving an input RF signal and for converting the input RF signal to an intermediate frequency signal having an intermediate frequency (IF), the input RF signal encoding information in one of a plurality of television signal formats"

Dr. Snelgrove identifies the same evidence from Silicon Labs documents and testimony for the "frequency conversion circuit" limitation of the '792 patent as he identifies for the

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“tuner” limitation of the ’585 patent. CX-2024C at Q/A 334, 354. In rebuttal, Pf. McNair also relies on his opinions from the ’585 patent. RX-1991C at Q/A 468. Cresta, Silicon Labs, and Staff also refer back to their ’585 patent arguments. CIB at 153; RIB at 146; SIB at 50-52. I therefore apply the same analysis for the “frequency conversion circuit” limitation of the ’792 patent as I did for the “tuner” limitation of the ’585 patent, and for the reasons discussed above, I find that the Silicon Labs tuners infringe the “frequency conversion circuit” limitation.

iii. “an analog-to-digital converter for sampling the intermediate frequency signal and generating a digital representation thereof”

Dr. Snelgrove identifies the same evidence from Silicon Labs documents and testimony for the “analog-to-digital converter” limitations of the ’585 and ’792 patents. CX-2024C at Q/A 336, 355. In rebuttal, Pf. McNair also relies on his opinions from the ’585 patent. RX-1991C at Q/A 469-70. Cresta also refers back to its ’585 patent arguments, CIB at 153, and Silicon Labs does not contest this element in its post-hearing briefs. I therefore apply the same analysis for the “analog-to-digital converter” limitation of the ’792 patent as I did for the same limitation in the ’585 patent, and for the reasons discussed above, I find that the Silicon Labs tuners infringe the “analog-to-digital converter” limitation.

iv. “a signal processor for processing the digital representation of the intermediate frequency signal in accordance with the television signal format of the input RF signal, the signal processor generating digital output signals indicative of information encoded in the input RF signal”

Dr. Snelgrove identifies the same evidence from Silicon Labs documents and testimony for the “in accordance with the television signal format” limitations of the “signal processor” element in ’585 and ’792 patents. CX-2024C at Q/A 338, 356. In rebuttal, Pf. McNair also relies on his opinions from the ’585 patent. RX-1991C at Q/A 471-72. Cresta and Silicon Labs also refer back to their ’585 patent arguments. CIB at 153-54; RIB at 146-47. I therefore apply

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the same analysis for the “in accordance with the television signal format” limitation of the ’792 patent as I did for the same limitation in the ’585 patent, and for the reasons discussed above, I find that all accused Silicon Labs tuners except for the Si2158V infringe the “in accordance with the television signal format” limitation.

- v. **“wherein the signal processor applies one of a plurality of finite impulse response filters to the digital representation of the intermediate frequency signal, each of the plurality of finite impulse response corresponding to a format of the input RF signal”**

Dr. Snelgrove identifies the same evidence from Silicon Labs documents and testimony for the “plurality of finite impulse response filters” limitations of the claim 1 of the ’792 patent as he did for the nearly identical limitation in claim 10 of the ’585 patent. CX-2024C at Q/A 350, 357. In rebuttal, Pf. McNair also relies on his opinions regarding claim 10 of the ’585 patent. RX-1991C at Q/A 473-74. Cresta and Silicon Labs also refer back to their ’585 patent claim 10 arguments. CIB at 153-54; RIB at 147; RRB at 94-95. I therefore apply the same analysis for the “plurality of finite impulse response filters” limitation of claim 1 of the ’792 patent as I did for the same limitation in claim 10 of the ’585 patent, and for the reasons discussed above, I find that Cresta fails to meet its burden to prove infringement of this limitation by the Silicon Labs tuners.

- vi. **“a signal output circuit for receiving the digital output signals from the signal processor and for providing one or more output signals corresponding to the digital output signals”**

Dr. Snelgrove identifies a signal output circuit in the accused Silicon Labs tuners in the [REDACTED] that provides several different configurations for digital output signals. CX-2024C at Q/A 358. Pf. McNair only contests the presence of this element under MaxLinear’s proposed construction, which I do not adopt, as discussed above. RX-1991C at Q/A 477-78. Silicon Labs does not contest this limitation under any other proposed construction. RIB at 147-48, RRB at

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95. Accordingly, under the proper construction for “signal output circuit,” I find that the accused Silicon Labs tuners infringe this limitation.

Because I find that Cresta fails to prove infringement of the “plurality of finite impulse response filters” limitation, I find that none of the accused Silicon Labs tuners infringe claim 1 of the ’792 patent.

b. Claim 2

Claim 2 of the ’792 patent is dependent on claim 1 and requires that the “plurality of formats” comprise “an analog television format and a digital television format.” JX-0002 at 11:7-9. Dr. Snelgrove identifies the same evidence from Silicon Labs documents and testimony for claim 2 of the ’792 patent as he did for claim 2 of the ’585 patent. CX-2024C at Q/A 334, 359. In rebuttal, Pf. McNair also relies on his opinions regarding claim 2 of the ’585 patent. RX-1991C at Q/A 479-81. Cresta also refers back to its ’585 patent claim 2 arguments. CIB at 154-55. Silicon Labs makes no independent non-infringement argument for this claim. RIB at 148; RRB at 95; CRB at 91. I find that the Silicon Labs tuners meet the limitation specified in claim 2 of the ’792 patent for the same reasons as discussed above for claim 2 of the ’585 patent, but because I find that Cresta fails to prove infringement of claim 1 of the ’792 patent, I find that none of the Silicon Labs tuners infringe claim 2 of the ’792 patent.

c. Claim 3

Claim 3 of the ’792 patent requires that the television receiver of claim 1 to be “formed as a monolithic integrated circuit.” JX-0002 at 11:10-11. Dr. Snelgrove explains that the accused Silicon Labs tuners are integrated on a single die and therefore infringe this limitation. CX-2024C at Q/A 360. Pf. McNair offers no substantive rebuttal regarding this limitation. RX-1991C at Q/A 482-83. Silicon Labs also makes no independent non-infringement argument

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for this claim. RIB at 148; RRB at 95; CRB at 91. I therefore find that the Silicon Labs tuners infringe the “monolithic integrated circuit” claim limitation, but because I find that Cresta fails to prove infringement of claim 1 of the ’792 patent, I find that none of the Silicon Labs tuners infringe claim 3 of the ’792 patent.

d. Claim 4

Claim 4 of the ’792 patent is dependent on claim 1 and further requires that “the signal output circuit provides a first output signal being a video baseband signal corresponding to an analog television format and a second output signal being an audio baseband signal corresponding to the analog television format.” JX-0002 at 11:13-16. Cresta only asserts this claim against the Si2170 series tuners and the Si2185 tuner, which contain analog demodulators. CIB at 155-56; CRB at 91-92. Dr. Snelgrove identifies the [REDACTED] series tuner, accusing these signals of meeting the “first output signal” and “second output signal” limitations. CX-2024C at Q/A 361 (citing JX-0019C at 25). He also identifies [REDACTED] *Id.* (citing JX-0023C). Silicon Labs makes no independent non-infringement arguments for this claim. RIB at 148; RRB at 95; CRB at 91-92. I therefore find that the Si2170 series and Si2185 tuners infringe the “first output signal” and “second output signal” limitations of claim 4, but because I find that Cresta fails to prove infringement of claim 1 of the ’792 patent, I find that none of the Silicon Labs tuners infringe claim 4 of the ’792 patent.

e. Claim 7

Claim 7 of the ’792 patent is dependent on claim 1 and further requires that “the signal output circuit provides a first output signal and a second output signal corresponding to the

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digital output signals, the first output signal and the second output signal being differential output signals corresponding to a digital television format.” JX-0002 at 11:27-32. The parties agreed to a construction of the term “differential output signals” to mean “signals that are output as the voltage difference between a pair of wires, each signal being output on a different pair of wires.” RIB at 149; CRB at 92. Dr. Snelgrove identifies [REDACTED] in the Silicon Labs tuners corresponding to [REDACTED] [REDACTED] CX-2024C at Q/A 362. Pf. McNair interprets the construction for “differential output signals” to require more than one pair of wires and thus opines on rebuttal that the accused Silicon Labs tuners do not infringe because there is only one pair of output signals. RX-1991C at Q/A 496-99. I do not agree with Pf. McNair’s interpretation of the parties’ claim construction. Reading this claim language to require multiple pairs of signals would be inconsistent with the claim language and specification. The claim plainly requires only “a first output signal and a second output signal.” JX-0002 at 11:27-32. Moreover, the specification describes only one pair of output signals for DTV Low-IF, explicitly stating: “Third output terminal 106 therefore includes two signal ports providing differential signals.” JX-0002 at 4:11-12, Fig. 1 (item 106 labeled “DTV low-IF”). I therefore find that the accused Silicon Labs tuners infringe the “differential output signals” limitation of claim 7, but because I find that Cresta fails to prove infringement of claim 1 of the ’792 patent, I find that none of the Silicon Labs tuners infringe claim 7 of the ’792 patent.

f. Claim 8

Claim 8 of the ’792 patent is dependent on claim 7 and further requires a “demodulator circuit generating video and audio baseband signals corresponding to the format of the input RF signal” and “a decoder circuit coupled to decode the video and audio baseband signals for

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providing video and audio display signals corresponding to the digital television format.”

JX-0002 at 11:33-42. The Si2150 series and Si2170 series tuners do not contain digital demodulators, and for the “demodulator circuit” claim limitation, Dr. Snelgrove cites the same evidence of demodulators in the accused televisions as he did for the “plurality of demodulators” limitation of claim 1 of the ’585 patent. CX-2024C at Q/A 339, 363. He again only analyzes a few SoCs in the accused televisions: the [REDACTED]

[REDACTED] *Id.* at Q/A 364-68. For the “decoder circuit” limitation, Dr. Snelgrove admits that none of the Silicon Labs tuners contained a decoder circuit and similarly analyzes the same limited list of SoCs. *Id.* at Q/A 369-74. Respondents make the same arguments regarding Cresta’s failure of proof on this element. RIB at 149, 154-55. For the same reasons discussed above in the context of the “plurality of demodulators” limitation of claim 1 of the ’585 patent, I find that Cresta has shown by a preponderance of the evidence that televisions incorporating Silicon Labs tuners with those specific SoCs infringe the “demodulator circuit” limitation and the “decoder circuit” limitation. Nevertheless, because I find that Cresta fails to prove infringement of claim 1 and 7 of the ’792 patent, I find that none of the televisions containing Silicon Labs tuners infringe claim 8 of the ’792 patent.

g. Claim 26

Claim 26 of the ’792 patent is dependent on claim 1 and further requires a “format/standard selection circuit coupled to the signal processor” and “generating a select signal indicative of a format of the input RF signal and the signal processor selecting a finite impulse response filter in response to the select signal.” JX-0002 at 14:35-41. For this claim limitation, Dr. Snelgrove explicitly references his analysis for claim 13 of the ’585 patent, which contains a very similar limitation. CX-2024C at Q/A 351, 375. Cresta also refers back to its arguments

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regarding claim 13 of the '585 patent, CIB at 161, and Silicon Labs makes no explicit non-infringement arguments regarding this limitation. RIB at 149. Accordingly, I find that the accused Silicon Labs tuners infringe the "format/selection circuit" limitation of claim 26 for the same reasons as discussed above for claim 13 of the '585 patent, but because I find that Cresta fails to prove infringement of claim 1 of the '792 patent, I find that none of the Silicon Labs tuners infringe claim 26 of the '792 patent.

h. Contributory Infringement

I find that Silicon Labs meets the knowledge requirement for contributory infringement at least as of the filing of the Complaint. *Certain Inkjet Ink Cartridges with Printheads & Components Thereof*, Inv. No. 337-TA-723, Comm'n Op. at 8, 18-19 (Dec. 1, 2011). For the same reasons as discussed above for the '585 patent, I also find that there are no substantial non-infringing uses for the accused Silicon Labs tuners, and I find that the Silicon Labs tuners are a material part of the invention. Nevertheless, because I find that none of the Silicon Labs tuners or televisions containing Silicon Labs tuners directly infringe any asserted claims of the '792 patent, I also do not find contributory infringement by the Silicon Labs tuners.

2. MaxLinear Accused Products

Cresta accuses MaxLinear TV tuners, and televisions incorporating such tuners, of infringing claims 1, 2, 3, 7, 8, 25 and 26 of the '792 patent. CIB at 161-67. For the reasons discussed below, I find that the MaxLinear tuners infringe claims 1, 2, 3, 7, 25, and 26 of the '792 patent. I also find that the MaxLinear tuners infringe claim 8 of the '792 patent when incorporated into certain televisions.

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a. Claim 1

Cresta asserts that MaxLinear tuners directly infringe claim 1 of the '792 patent, relying on the opinions of Dr. Snelgrove. CIB at 161-64; CRB at 94-96; CX-2024C at Q/A 394-99.

MaxLinear disputes the infringement of several limitations, relying on the opinions of Dr. Hashemi. RIB at 150-52; RRB at 97-99; RX-1996C at Q/A 141-71. The arguments and evidence relied upon by the parties for claim 1 of the '792 patent are similar to that discussed above for claims 1 and 10 of the '585 patent.

i. “A television receiver comprising:”

As discussed above in the context of claim 1 of the '585 patent, I find that the accused MaxLinear tuners are television receivers. Dr. Snelgrove opines that the MaxLinear tuners are television receivers, CX-2024C at Q/A 400, and MaxLinear does not dispute this limitation. RIB at 150-52

ii. “a frequency conversion circuit for receiving an input RF signal and for converting the input RF signal to an intermediate frequency signal having an intermediate frequency (IF), the input RF signal encoding information in one of a plurality of television signal formats”

Dr. Snelgrove identifies the same evidence from MaxLinear documents and testimony for the “frequency conversion circuit” limitation of the '792 patent as he identified for the “tuner” limitation of the '585 patent. CX-2024C at Q/A 380, 395. In rebuttal, Dr. Hashemi addresses the limitations of the '585 patent and '792 patent together. RX-1996C at Q/A 147-53. Cresta, MaxLinear, and Staff also refer back to their '585 patent arguments. CIB at 162; RIB at 150-51; SIB at 50-52. I therefore apply the same analysis for the “frequency conversion circuit” limitation of the '792 patent as I did for the “tuner” limitation of the '585 patent, and for the

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reasons discussed above, I find that the MaxLinear tuners infringe the “frequency conversion circuit” limitation.

iii. “an analog-to-digital converter for sampling the intermediate frequency signal and generating a digital representation thereof”

Dr. Snelgrove identifies the same evidence from MaxLinear documents and testimony for the “analog-to-digital converter” limitations of the ’585 and ’792 patents. CX-2024C at Q/A 383, 396. Cresta also refers back to its ’585 patent arguments, CIB at 162, and MaxLinear does not contest this element in its post-hearing briefs. I therefore apply the same analysis for the “analog-to-digital converter” limitation of the ’792 patent as I did for the same limitation in the ’585 patent, and for the reasons discussed above, I find that the MaxLinear tuners infringe the “analog-to-digital converter” limitation.

iv. “a signal processor for processing the digital representation of the intermediate frequency signal in accordance with the television signal format of the input RF signal, the signal processor generating digital output signals indicative of information encoded in the input RF signal”

Dr. Snelgrove identifies the same evidence from Silicon Labs documents and testimony for the “signal processor for processing” and “in accordance with the television signal format” limitations of the ’585 and ’792 patents. CX-2024C at Q/A 384, 397. In rebuttal, Dr. Hashemi addresses the limitations of the ’585 patent and ’792 patent together. RX-1996C at Q/A 154-58. Cresta and Silicon Labs also refer back to their ’585 patent arguments. CIB at 162; RIB at 151. I therefore apply the same analysis for the “signal processor for processing” and “in accordance with the television signal format” limitations of the ’792 patent as I did for the same limitation in the ’585 patent, and for the reasons discussed above, I find that the MaxLinear tuners infringe the “signal processor for processing” and “in accordance with the television signal format” limitations.

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- v. **“wherein the signal processor applies one of a plurality of finite impulse response filters to the digital representation of the intermediate frequency signal, each of the plurality of finite impulse response corresponding to a format of the input RF signal”**

Dr. Snelgrove identifies the same evidence from Silicon Labs documents and testimony for the “plurality of finite impulse response filters” limitation of the claim 1 of the ’792 patent as he did for the nearly identical limitation in claim 10 of the ’585 patent. CX-2024C at Q/A 391, 398. In rebuttal, Dr. Hashemi specifically addresses this limitation, RX-1996C at Q/A 168-71, but MaxLinear did not make any specific arguments in post-hearing briefing, referring back to its arguments regarding the ’585 patent. RIB at 151; RRB at 98. Cresta also refers back to its ’585 patent arguments. CIB at 162. I find that the analysis for this “plurality of finite impulse response filters” limitation is the same as the “plurality of finite impulse response filters” limitation in claim 10 of the ’585 patent, and for the reasons discussed above, I find that the MaxLinear tuners infringe this limitation.

- vi. **“a signal output circuit for receiving the digital output signals from the signal processor and for providing one or more output signals corresponding to the digital output signals”**

Dr. Snelgrove identifies a signal output circuit in the MaxLinear tuners that interpolates between samples from the signal processor, frequency converts the interpolated signal with a digital mixer, and converts the signals to analog form. CX-2024C at Q/A 399. Dr. Hashemi’s testimony on this limitation relies on MaxLinear’s construction of “signal output circuit” under § 112(f). RX-1996C at Q/A 165-67. MaxLinear’s non-infringement argument also relies on this proposed claim construction. RIB at 151-52, RRB at 98-99. As discussed above, I adopt a plain meaning construction for “signal output circuit,” and I therefore find that the MaxLinear tuners infringe this limitation.

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Because I find that the MaxLinear tuners infringe each limitation of claim 1 of the '792 patent, as discussed above, I therefore find that the MaxLinear tuners directly infringe claim 1 of the '792 patent.

b. Claim 2

Claim 2 of the '792 patent is dependent on claim 1 and requires that the “plurality of formats” comprise “an analog television format and a digital television format.” JX-0002 at 11:7-9. Dr. Snelgrove identifies the same evidence from MaxLinear documents and testimony for claim 2 of the '792 patent as he did for claim 2 of the '585 patent. CX-2024C at Q/A 389, 400. Cresta also refers back to its '585 patent claim 2 arguments. CIB at 164, CRB at 96, and makes no independent non-infringement argument based on this claim. RIB at 152; RRB at 99. I find that the MaxLinear tuners meet the limitation specified in claim 2 of the '792 patent for the same reasons as discussed above for claim 2 of the '585 patent, and because I find that the MaxLinear tuners infringe claim 1 of the '792 patent, I also find that the MaxLinear tuners infringe claim 2 of the '792 patent.

c. Claim 3

Claim 3 of the '792 patent requires that the television receiver of claim 1 to be “formed as a monolithic integrated circuit.” JX-0002 at 11:10-11. Dr. Snelgrove explains that the accused MaxLinear tuners [REDACTED] and are therefore infringe this limitation. CX-2024C at Q/A 401. MaxLinear makes no independent non-infringement argument based on this claim. RIB at 152-53; RRB at 100; CRB at 96-97. I therefore find that the MaxLinear tuners infringe the “monolithic integrated circuit” claim limitation, and because I find that the MaxLinear tuners infringe claim 1 of the '792 patent, I also find that the MaxLinear tuners infringe claim 3 of the '792 patent.

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d. Claim 7

Claim 7 of the '792 patent is dependent on claim 1 and further requires that “the signal output circuit provides a first output signal and a second output signal corresponding to the digital output signals, the first output signal and the second output signal being differential output signals corresponding to a digital television format.” JX-0002 at 11:27-32.

Dr. Snelgrove identifies [REDACTED] in the MaxLinear tuners corresponding to digital output signals that are differential output signals. CX-2024C at Q/A 402. MaxLinear makes no independent non-infringement argument based on this claim. RIB at 153; RRB at 100; CRB at 97. I therefore find that the MaxLinear tuners infringe the “differential output signals” claim limitation, and because I find that the MaxLinear tuners infringe claim 1 of the '792 patent, I also find that the MaxLinear tuners infringe claim 7 of the '792 patent.

e. Claim 8

Claim 8 of the '792 patent is dependent on claim 7 and further requires a “demodulator circuit generating video and audio baseband signals corresponding to the format of the input RF signal” and “a decoder circuit coupled to decode the video and audio baseband signals for providing video and audio display signals corresponding to the digital television format.” JX-0002 at 11:33-42. The MaxLinear tuners do not contain demodulators, and Dr. Snelgrove cites the same evidence of demodulators in the accused televisions as he did for the “plurality of demodulators” limitation of claim 1 of the '585 patent. CX-2024C at Q/A 385, 403. He again only analyzed a few television models and two different SoCs, the [REDACTED]. *Id.* at Q/A 404-06. For the “decoder circuit” limitation, Dr. Snelgrove admits that none of the Silicon Labs tuners contain a decoder circuit and similarly analyzes the same two SoCs. *Id.* at Q/A 407-10. Respondents make the same arguments regarding Cresta's

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failure of proof on this element. RIB at 153-55. For the same reasons discussed above in the context of the “plurality of demodulators” limitation of claim 1 of the ’585 patent, I find that Cresta has shown by a preponderance of the evidence that televisions incorporating MaxLinear tuners with an [REDACTED] or [REDACTED] SoC infringe the “demodulator circuit” and “decoder circuit” limitations.

Accordingly, because I find that the MaxLinear tuners infringe claim 1 and claim 7 of the ’792 patent, I also find that televisions incorporating MaxLinear tuners with an [REDACTED] or [REDACTED] SoC infringe claim 8 of the ’792 patent.¹⁰

f. Claim 25

Claim 25 of the ’792 patent is dependent on claim 1 and adds a limitation “wherein the signal processor comprises a first computing unit and a second computing unit, the first computing unit processing a real part of the finite impulse response filter operation while the second computing unit processing an imaginary part of the finite impulse response filter operation.” JX-0002 at 14:29-34. For this claim limitation, Dr. Snelgrove explicitly references his analysis for claim 12 of the ’585 patent, which contains a very similar limitation. CX-2024C at Q/A 392, 411. Cresta and MaxLinear also refer back to their arguments regarding claim 12 of the ’585 patent. CIB at 166; RIB at 154; CRB at 97; RRB at 101. Accordingly, for the same reasons as discussed above for claim 12 of the ’585 patent, I find that the MaxLinear tuners infringe the limitations of claim 25 of the ’792 patent, and because I find that the MaxLinear tuners infringe claim 1 of the ’792 patent, I also find that the MaxLinear tuners infringe claim 25 of the ’792 patent.

¹⁰ Dr. Snelgrove identifies certain accused televisions incorporating these SoCs. *See supra* n.9.

g. Claim 26

Claim 26 of the '792 patent is dependent on claim 1 and further requires a “format/standard selection circuit coupled to the signal processor” and “generating a select signal indicative of a format of the input RF signal and the signal processor selecting a finite impulse response filter in response to the select signal.” JX-0002 at 14:35-41. For this claim limitation, Dr. Snelgrove explicitly references his analysis for claim 12 of the '585 patent, which contains a very similar limitation. CX-2024C at Q/A 393, 412. Cresta and MaxLinear also refer back to their arguments regarding claim 13 of the '585 patent. CIB at 167; RIB at 154; CRB at 97; RRB at 102. Accordingly, for the same reasons as discussed above for claim 13 of the '585 patent, I find that the MaxLinear tuners infringe the limitations of claim 26 of the '792 patent, and because I find that the MaxLinear tuners infringe claim 1 of the '792 patent, I also find that the MaxLinear tuners infringe claim 26 of the '792 patent.

h. Contributory Infringement

I find that MaxLinear meets the knowledge requirement for contributory infringement at least as of the filing of the Complaint. *Certain Inkjet Ink Cartridges with Printheads & Components Thereof*, Inv. No. 337-TA-723, Comm'n Op. at 8, 18-19 (Dec. 1, 2011). For the same reasons as discussed above for the '585 patent, I also find that there are no substantial non-infringing uses for the accused MaxLinear tuners, and I find that the MaxLinear tuners are a material part of the invention. Because I find that certain televisions incorporating the accused MaxLinear tuners directly infringe claim 8 of the '792 patent, as discussed above, I therefore also find contributory infringement of claim 8 by the MaxLinear tuners when incorporated in those televisions.

V. INVALIDITY

A. Applicable Law

It is the respondent's burden to prove invalidity, and the burden of proof never shifts to the patentee to prove validity. *Scanner Techs. Corp. v. ICOS Vision Sys. Corp. N.V.*, 528 F.3d 1365, 1380 (Fed. Cir. 2008). "Under the patent statutes, a patent enjoys a presumption of validity, *see* 35 U.S.C. § 282, which can be overcome only through facts supported by clear and convincing evidence" *SRAM Corp. v. AD-II Eng'g, Inc.*, 465 F.3d 1351, 1357 (Fed. Cir. 2006). *See also Microsoft Corp. v. i4i Ltd. P'ship*, 131 S. Ct. 2238, 2242-2253 (2011) (upholding the "clear and convincing" standard for invalidity).

The clear and convincing evidence standard placed on the party asserting an invalidity defense requires a level of proof beyond the preponderance of the evidence. Although not susceptible to precise definition, "clear and convincing" evidence has been described as evidence that produces in the mind of the trier of fact "an abiding conviction that the truth of a factual contention is 'highly probable.'" *Price v. Symsek*, 988 F.2d 1187, 1191 (Fed. Cir. 1993) (citing *Buildex, Inc. v. Kason Indus., Inc.*, 849 F.2d 1461, 1463 (Fed.Cir.1988)).

1. Anticipation

Pursuant to 35 U.S.C. § 102,¹¹ a patent claim is invalid as anticipated if:

- "(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant;"
- "(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of the application for patent in the United States;"

¹¹ As explained in the revision notes and legislative reports in 35 U.S.C.A. § 100, the language of 35 U.S.C. § 102 that was effective prior to the America Invents Act controls in this Investigation.

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- “(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent;”
- “(g)(2) before such person’s invention thereof, the invention was made in this country by another inventor who had not abandoned, suppressed, or concealed it.”

35 U.S.C. § 102 (2008). “A patent is invalid for anticipation if a single prior art reference discloses each and every limitation of the claimed invention. Moreover, a prior art reference may anticipate without disclosing a feature of the claimed invention if that missing characteristic is necessarily present, or inherent, in the single anticipating reference.” *Schering Corp. v. Geneva Pharm., Inc.*, 339 F.3d 1373, 1377 (Fed. Cir. 2003) (citations omitted).

2. Obviousness

Section 103 of the Patent Act states:

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 negated by the manner in which the invention was made.

35 U.S.C. § 103(a) (2008).

“Obviousness is a question of law based on underlying questions of fact.” *Scanner Techs.*, 528 F.3d at 1379. The underlying factual determinations include: “(1) the scope and content of the prior art, (2) the level of ordinary skill in the art, (3) the differences between the claimed invention and the prior art, and (4) objective indicia of non-obviousness.” *Id.* (citing *Graham v. John Deere Co.*, 383 U.S. 1, 17 (1966)). These factual determinations are often referred to as the “*Graham* factors.”

The critical inquiry in determining the differences between the claimed invention and the

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prior art is whether there is a reason to combine the prior art references. *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 399-400 (2007). In *KSR*, the Supreme Court rejected the Federal Circuit's rigid application of the teaching-suggestion-motivation test. The Court stated that "it can be important to identify a reason that would have prompted a person of ordinary skill in the relevant field to combine the elements in the way the claimed new invention does." *Id.* at 402. The Court described a more flexible analysis:

Often, it will be necessary for a court to look to interrelated teachings of multiple patents; the effects of demands known to the design community or present in the marketplace; and the background knowledge possessed by a person having ordinary skill in the art, all in order to determine whether there was an apparent reason to combine the known elements in the fashion claimed by the patent at issue...As our precedents make clear, however, the analysis need not seek out precise teachings directed to the specific subject matter of the challenged claim, for a court can take account of the inferences and creative steps that a person of ordinary skill in the art would employ.

Id. at 418.

Since *KSR* was decided the Federal Circuit has announced that, where 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 . . . 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).

In addition to demonstrating that a reason exists to combine prior art references, the challenger must demonstrate that the combination of prior art references discloses all of the limitations of the claims. *Hearing Components, Inc. v. Shure Inc.*, 600 F.3d 1357, 1373-1374 (Fed. Cir. 2010) (upholding finding of non-obviousness based on the fact that there was substantial evidence that the asserted combination of references failed to disclose a claim

limitation); *Velander v. Garner*, 348 F.3d 1359, 1363 (Fed. Cir. 2003) (explaining that a requirement for a finding of obviousness is that “all the elements of an invention are found in a combination of prior art references”).

3. Written Description

Section 112 of the Patent Act requires that “[t]he specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art . . . to make and use the same.” 35 U.S.C. § 112, ¶ 1. The Federal Circuit has stated the written description requirement is met where “the disclosure of the application relied upon reasonably conveys to those skilled in the art that the inventor had possession of the claimed subject matter as of the filing date.” *Ariad Pharmaceuticals, Inc. v. Eli Lilly and Co.*, 598 F.3d 1336, 1351 (Fed. Cir. 2010). Whether the specification conveys “possession” of the claimed subject matter to those of ordinary skill in the art is a question of fact. *Id.* (citing *Ralston Purina Co. v. Far-Mar-Co, Inc.*, 772 F.2d 1570, 1575 (Fed. Cir. 1985)). The level of “detail required to satisfy the written description requirement varies depending on the nature and scope of the claims and on the complexity and predictability of the relevant technology.” *Id.* (citing *Capon v. Eshhar*, 418 F.3d 1349, 1359 (Fed. Cir. 2005)).

4. Indefiniteness

Patents must “conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.” 35 USC § 112, ¶ 2.¹² The question of whether a claim term satisfies this requirement no longer turns on whether the term is insolubly ambiguous. *See Nautilus, Inc. v. Biosig Instruments*, 134 S. Ct. 2120, 2124

¹² As explained in the revision notes and legislative reports in 35 U.S.C.A. §§ 111 and 112, the language of 35 U.S.C. § 112 that was effective prior to the 2011 amendments to Section 112 and the America Invents Act amendments to Section 112, controls in this Investigation.

(2014). The Supreme Court explained that this standard does not satisfy the statute's definiteness requirement because it tolerates some ambiguous claims but not others. The Supreme Court held that the proper standard for whether "a patent is invalid for indefiniteness" is whether "its claims, read in light of the specification delineating the patent, and the prosecution history, fail to inform, with reasonable certainty, those skilled in the art about the scope of the invention." *Id.* The Supreme Court cautioned that "[i]t cannot be sufficient that a court can ascribe *some* meaning to a patent's claims; the definiteness inquiry trains on the understanding of a skilled artisan at the time of the patent application, not that of a court viewing matters *post hoc*." *Id.* at 2130.

5. On-Sale Bar

35 U.S.C. § 102(b) provides that no person is entitled to patent an invention that has been on sale more than one year before filing a patent application. The on-sale bar applies when two conditions are satisfied before the critical date: (1) the claimed invention must be the subject of a commercial offer for sale, and (2) the invention must be ready for patenting. *Pfaff v. Wells Elec., Inc.*, 525 U.S. 55, 67 (1998). An invention is ready for patenting when prior to the critical date: (1) the invention is reduced to practice; or (2) the invention is depicted in drawings or described in writings of sufficient nature to enable a person of ordinary skill in the art to practice the invention. *Id.*

To qualify as a commercial sale or offer for sale, "the offer must be sufficiently definite that another party could make a binding contract by simple acceptance." *Atlanta Attachment Co. v. Leggett & Platt, Inc.*, 516 F.3d 1361, 1365 (Fed. Cir. 2008). "Neither profit, revenue, nor even an actual sale is required for the use to be a commercial offer under section 102(b) – an attempt to sell is sufficient if it rises to an offer upon which a contract can be made merely by accepting

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it.” *Id.* There is no “supplier exception” to the on-sale bar. *Hamilton Beach Brands, Inc. v. Sunbeam Prods., Inc.*, 726 F.3d 1370, 1375 (Fed. Cir. 2013) (relying on *Special Devices Inc. v. OEA, Inc.*, 270 F.3d 1353, 1355 (Fed. Cir. 2001)). However, a sale for non-commercial purposes such as experimental or validation purposes does not qualify as a commercial sale or offer for sale. *See, e.g., Trading Techs. Int’l, Inc. v. eSpeed, Inc.*, 595 F.3d 1340, 1361-62 (Fed. Cir. 2010). “The on-sale bar is a question of law based on underlying factual findings.” *Hamilton Beach*, 726 F.3d at 1375.

B. Invalidity of the ‘585 patent

1. Priority Date

“A non-provisional utility patent may be afforded the priority date of a related provisional application if the two applications share at least one common inventor and the written description of the provisional application adequately supports the claims of the non-provisional application.” *Apple Inc. v. U.S. Int’l Trade Comm’n*, 725 F.3d 1356, 1371 (Fed. Cir. 2013). “To backdate the later application with the earlier priority date, the specification of the provisional application must ‘contain a written description of the invention’ as defined in § 112 ¶ 1.” *Id.* (quoting *New Railhead Mfg., LLC v. Vermeer Mfg. Co.*, 298 F.3d 1290, 1295 (Fed. Cir. 2002)).

Cresta contends that although the application for the ‘585 patent was filed on September 6, 2002, it is entitled to a priority date of September 17, 2001, when the provisional application No. 60/322,548 (“‘548 Provisional”) was filed. CIB at 115-16. Cresta states that the subject matters claimed in the ‘585 patent were adequately disclosed in the ‘548 Provisional and cites to the testimony of Dr. Snelgrove in support of its contention. CIB at 116 (citing CX-1968C at Q/A 63-79).

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Respondents argue that the subject matter disclosed in the '585 patent was not disclosed in the '548 Provisional and that therefore the claims of the '585 patent are not entitled to an earlier priority date. RIB at 141. First, Respondents state that the use of a non-standard IF recited in all claims of the '585 patent is not disclosed in the '548 Provisional. *Id.* Respondents argue that one of ordinary skill in the art would not have understood the '548 Provisional to disclose the use of non-standard IF. *Id.* (citing RX-1677C at Q/A 127). Respondents argue that Dr. Snelgrove's opinions concerning '548 Provisional's disclosure of a non-standard IF is based on the wrong legal standard. *Id.* at 142.

Second, Respondents state that "a digital to analog converter coupled between said signal processor and a first one of said plurality of demodulators" as recited in claim 3 of the '585 patent is not disclosed in the '548 Provisional. *Id.* at 143. Respondents state that the '548 Provisional only discloses a demodulator that receives digital signals and does not disclose a digital to analog converter. *Id.* at 143-144 (citing RX-1677C at Q/A 128).

Third, Respondents state that the complex signal processing recited in claim 12 of the '585 patent is not disclosed in the '548 Provisional. *Id.* at 144.

I find that the claims of the '585 patent are not entitled to the priority date of the '548 Provisional. One of ordinary skill in the art would not have understood the '548 Provisional to disclose the use of a non-standard IF. The '548 Provisional discloses that in the prior art, IF was fixed, depending on the country of reception. *See* RX-1602 at 3-4; RX-1677 at Q/A 127. Although the '548 Provisional does not specify that the IF used in the invention is a standard IF, it does state that an object of the invention is to offer a "worldwide compatible receiver, due to reconfigurable – *depending on the standard* – integrated filter." RX-1602 at 3 (emphasis added). Thus, the '548 Provisional indicates to one of ordinary skill in the art that while prior art

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systems could only use one standard IF, the invention could be reconfigured to use one of many standard IFs. The '548 Provisional does not explicitly disclose the use of a non-standard IF. *See* RX-1602; RX-1677 at Q/A 127. Contrary to Dr. Snelgrove's opinion, given the stated objective of the '548 Provisional, one of ordinary skill in the art would not have understood the '548 Provisional to implicitly disclose the use of a non-standard IF. Accordingly, the claims of the '585 patent are not entitled to the priority date of the '548 Provisional.

Cresta does not appear to dispute that claims 3 and 12 of the '585 patent are not supported by the written description of the '548 Provisional. Dr. Snelgrove provides no testimony to contradict Pf. McNair's opinions concerning claims 3 and 12. Accordingly, I find that claims 3 and 12 of the '585 patent are not entitled to the priority date of the '548 Provisional.

2. Anticipation

Respondents assert that claims 1 and 2 of the '585 patent are anticipated by EP Patent Application No. 0 966 854 A1 to Boie (RX-0010; "Boie"). RIB at 124-30. Boie is prior art to the '585 patent under 35 U.S.C. §§ 102(a) and (b). The priority date for the claims of the '585 patent is September 6, 2002 under § 102(a) and September 6, 2001 under § 102(b). Boie was published on February 4, 1996 and is therefore prior art to the '585 patent under both sections. RX-0010. For the reasons discussed below, I find that claims 1 and 2 of the '585 patent are anticipated by Boie.

a. Claim 1

Respondents assert that claim 1 of the '585 patent is anticipated by Boie, relying on the testimony of Pf. McNair and Dr. Hashemi. RIB at 125-30; RX-1677C at Q/A 233-81 (McNair DWS); RX-1663C at Q/A 177-96. Cresta disagrees with Respondents and disputes whether Boie anticipates four of the limitations of claim 1. First, the parties disagree as to whether Boie

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discloses “a tuner for receiving input RF signals and for converting said input RF signals to intermediate signals having an intermediate frequency (IF), said input RF signals encoding information in one of a plurality of formats.” CRB at 72. Second, the parties disagree as to whether Boie discloses “an anti-aliasing filter for filtering said intermediate signals.” CRB at 74. Third, the parties disagree as to whether Boie discloses “a signal processor for processing said digital representation of said intermediate signals in accordance with said format of said input RF signal, said signal processor generating digital output signals indicative of information encoded in said input RF signal.” CRB at 75. Fourth, the parties disagree as to whether Boie discloses “a plurality of demodulators, each coupled to receive output signals from said signal processor, each of said demodulators for demodulating said digital output signals according to one of said formats of said input RF signal, each of said demodulators generating video and audio baseband signals corresponding to said format of said input RF signal.” *Id.*

i. “A receiver comprising:”

As discussed above in the context of claim construction, I find that the preamble of claim 1 of the '585 patent is not limiting, and it is therefore not necessary to meet this limitation for invalidity. Nevertheless, even if Cresta's construction for this limitation were adopted, I find that Boie discloses a television receiver. *See* RX-0010 at Fig. 1; RX-1677C at Q/A 240-41 (McNair DWS); RX-1663C at Q/A 186 (Hashemi DWS).

ii. “a tuner for receiving input RF signals and for converting said input RF signals to intermediate signals having an intermediate frequency (IF), said input RF signals encoding information in one of a plurality of formats”

Boie discloses a mixer stage 2 that receives 140 MHz input signals and converts those signals to intermediate signals having an intermediate frequency of 75 MHz. JX-0010 at 2:17-19, 47-57. Respondents' experts, Pf. McNair and Dr. Hashemi, testify that the 140MHz input

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signals are TV signals encoded in either digital or analog formats. RX-1677C at Q/A 244); RX-1663C at Q/A 187. Pf. McNair and Dr. Hashemi also explain that a 140 MHz television signal is an RF TV signal and one of ordinary skill in the art would have understood “input RF signal” to include the 140 MHz input signal disclosed in Boie. RX-1677C at Q/A 244, 250; RX-1663C at Q/A 188.

Cresta argues that Boie does not disclose a tuner for receiving input RF signals because the 140 MHz input signal disclosed in Boie is not an input RF signal. CRB at 73 (citing Tr. 1211:11-21). Cresta states that the 140 MHz signal is an IF signal that has already been down-converted from a 950 MHz-1750 MHz satellite signal. *Id.* (citing RX-0010 at 1:56-2:1). Cresta argues that an RF is distinct from an IF because RF denotes a mode of signal propagation rather than a down-converted signal. *Id.* (citing Tr. at 1211:11-21, 1261:14-21). Cresta further argues that the mixer stage 2 cannot be a “tuner” because (1) it receives down-converted IF signals rather than RF signals and (2) it only shifts the bandwidth of the input signal from 140 MHz to 75 Mhz rather than performing “bandwidth selection” as required by Staff’s and Respondents’ proposed construction of the term “tuner.” *Id.* at 74.

I reject Cresta’s arguments and find that this limitation is disclosed by Boie for two reasons. First, under the proper claim construction of “input RF signal(s),” I find that the 140 MHz input signal disclosed in Boie is an “input RF signal.” Pf. McNair and Dr. Hashemi both state that a 140 MHz signal is a radio frequency (RF) signal. RX-1677C at Q/A 244, 250; RX-1663C at Q/A 188. Even Cresta’s expert Dr. Caloyannides admitted that a 140 MHz signal is generally considered an RF signal. Tr. at 1217:6-19. Although Dr. Caloyannides testifies that an RF signal ceases to be an RF signal once it is down-converted at any point during the transmission, the ‘585 patent places no such limitations on the element identified as “input RF

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signal.” Indeed, I find convincing Pf. McNair and Dr. Hashemi’s testimony that TV signals undergo many frequency conversions before they reach the tuner in a TV and that one of ordinary skill in the art would understand that the signal that is input into the tuner is an input RF signal despite the prior frequency conversions. RX-1677C at Q/A 250; RX-1663C at 188.

Second, under the proper claim construction of “tuner,” I find that the mixer stage 2 disclosed in Boie is a “tuner.” The mixer stage 2 receives a 140 MHz RF input signal and converts it to a 75 MHz intermediate frequency signal. RX-0010 at 2:17-19, 47-57; RX-1677C at Q/A 245; RX-1663C at Q/A 188.

iii. “a channel filter for receiving the intermediate signals, said channel filter comprising...”

I find that the “channel filter” limitation is anticipated by Boie because of the presence of the “anti-aliasing filter,” “analog-to-digital converter,” and “signal processor” limitations below. See RX-1677C at Q/A 259-60 (McNair DWS); RX-1663C at Q/A 190-91 (Hashemi DWS).

iv. “an anti-aliasing filter for filtering said intermediate signals”

Boie discloses an AGC amplifier 5 with an internal band-pass filter. RX-0010 at 2:57-3:1; RX-1677C at Q/A 264; RX-1663C at Q/A 192. Boie discloses that the AGC amplifier 5 amplifies and band-pass filters the IF signal. *Id.* Boie further discloses that the sub-sampling that occurs in the A/D-converter 7 does not cause aliasing problems “because of the bandlimited input signal.” RX-0010 at 3:9-11; RX-1677C at Q/A 264; RX-1633C at Q/A 188. In other words, because the AGC amplifier 5 band-pass filters the IF signal, the signal, aliasing is prevented during sampling by the A/D-converter 7.

Cresta argues that Boie does not disclose an anti-aliasing filter because it does not state that the purpose of the AGC amplifier 5 is related to anti-aliasing and because the function of the band-pass filter is unspecified. CRB at 74 (citing Tr. 1227:3-8, 1226:10-13, 1262:24-1263:19;

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CX-1981C at Q/A 224-25). Cresta argues that the stated purpose of the AGC amplifier 5 in Boie is automatic gain control—not anti-aliasing. CIB at 121-22 (citing Tr. 1262:24-1263:15). Cresta argues that Boie is silent as to the function of the band-pass filter in the AGC amplifier 5. CRB at 74 (citing Tr. 1227:3-8, 1226:10-13, 1262:24-1263:19; CX-1981C at Q/A 224-25). Although Dr. Caloyannides testifies that a band-pass filter can perform an anti-aliasing function when “properly designed,” Cresta states there is no evidence that the band-pass filter in Boie is “properly designed” to perform this function. *Id.* at n.56 (citing Tr. 1220:10-1221:1).

I find that Boie discloses an anti-aliasing filter as recited in claim of the ‘585 patent. Boie discloses that AGC amplifier 5 has a band-pass filter, and one of ordinary skill in the art would have understood that the output signal of the AGC amplifier 5 would be a band-limited signal. RX-0010 at 2:57-3:1; RX-1677C at Q/A 264 (McNair DWS); RX-1663C at Q/A 192 (Hashemi DWS). Boie explicitly discloses that aliasing is not a problem in the sampling process of the A/D-converter 7 *because* the input signal into the A/D-converter 7 is band-limited. RX-0010 at 3:9-11 (“The A/D-convert 7 is operated in the sub-sampling mode, but this does not cause any aliasing problems because of the bandlimited input signal); RX-1677C at Q/A 264; RX-1663C at Q/A 192. I agree with Respondents that one of ordinary skill in the art would have understood the band-pass filter in the AGC amplifier 5 to be a circuit that filters the intermediate signals to prevent aliasing from occurring during sampling. Dr. Caloyannides confirmed this understanding by admitting that even though Boie did not expressly disclose that the band-pass filter in the AGC amplifier 5 performed an anti-aliasing function, it is the only structure disclosed that *could* perform an anti-aliasing function. Tr. at 1225:22-1228:25. I therefore find that there is clear and convincing evidence that Boie anticipates the “anti-aliasing filter” limitation of the ‘585 patent.

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- v. **“an analog-to-digital converter for sampling said filtered intermediate signals and generating a digital representation thereof”**

Boie explicitly discloses an “A/D-converter 7” that receives the IF signal. RX-0010 at 2:57-3:1; RX-1677C at Q/A 269-71 (McNair DWS); RX-1663C at Q/A 194. Cresta does not contest this disclosure, and I therefore find that Boie anticipates the “analog-to-digital converter” limitation.

- vi. **“a signal processor for processing said digital representation of said intermediate signals in accordance with said format of said input RF signal, said signal processor generating digital output signals indicative of information encoded in said input RF signal”**

Boie discloses a band-pass filter 8. RX-0010 at 3:16-19. The band-pass filter 8 processes the digital output of the A/D-converter 7. RX-0010 at 3:16-19; RX-1677C at Q/A 273; RDX-1663C at Q/A 195. The band-pass filter 8 filter is an adaptive filter that filters the digital output of the A/D-converter 7 in accordance with the TV standard of the signal. RX-0010 at 3:16-19, Fig. 1; RX-1677C at Q/A 273; RX-1663C at Q/A 195. The signal generated from the band-pass filter 8 is a desired channel signal indicative of information encoded in the input RF signal with minimal remainder of the adjacent channel signals. RX-0010 at 3:16-19; RX-1677C at Q/A 273.

Cresta argues that Boie does not disclose this limitation. CRB at 75 (citing CX-1981C at Q/A 240-41). Cresta contends that the band-pass filter 8 does not perform the entirety of the “processing” or “generating” functions recited in claim 1 of the ‘585 patent, and that Boie instead relies on the SAW filter 1 to perform some of those functions. CX-1981C at Q/A 241. Cresta also states that Respondents misstate Dr. Caloyannides’ testimony concerning the band-pass filter 8. Cresta contends that only the bandwidth parameter of the band-pass filter 8 is TV standard-dependent and that one of ordinary skill in the art would understand Boie to teach only

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that band-pass filter 8 maximizes signal-to-noise ratio rather than processing signals in accordance with the format of the input RF signal. CRB at 75 (citing Tr. at 1229:19-21, 1230:5-7).

I find that Boie discloses this claim limitation. Pf. McNair and Dr. Hashemi provide detailed opinions that the band-pass filter 8 disclosed in Boie meets this limitation by providing digital processing in accordance with the format of the input RF signal. RX-1677C at Q/A 273; RDX-1663C at Q/A 195. Dr. Caloyannides admitted during his deposition that “the variability in the specification of filter number 8 is TV standard-dependent.” Tr. at 1230:8-1232:3. Under the plain and ordinary meaning of the terms “signal processor” and “digital representation of said intermediate signal,” I find that band-pass filter 8 meets this limitation because it processes the digital output of the A/D-converter 7, which is a digital representation of the down-converted input RF signal, and because its parameters are variable depending on the TV-standard of the input RF signal. The band-pass filter 8 also outputs digital signals that correspond to a desired channel of the input RF signal. Accordingly, I find that Boie anticipates the “signal processor” limitation of the ’585 patent.

- vii. **“a plurality of demodulators, each coupled to receive output signals from said signal processor, each of said demodulators for demodulating said digital output signals according to one of said formats of said input RF signal, each of said demodulators generating video and audio baseband signals corresponding to said format of said input RF signal”**

Boie discloses a QPSK demodulator and an FM-demodulator. RX-0010 at 3:14-25, 40-48; RX-1677C at Q/A 278; RX-1663C at Q/A 196. The QPSK demodulator and FM-demodulator each receive output signals from the band-pass filter 8. RX-0010 at 3:14-25, 40-48; RX-1677C at Q/A 278; RX-1663C at Q/A 196. The elements 11-13, which are part of the QPSK demodulator, generate Q and I video and audio baseband signals and the FM-demodulator

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generates CVBS video and SIF audio baseband signals. RX-0010 at Fig. 1; RX-1677C at Q/A 278.

Cresta contends that Boie does not teach this limitation for three reasons: First, Cresta contends that digital demodulators do not generate Q and I signals and therefore the QPSK demodulator which generates the Q and I signals cannot be a digital demodulator. CRB at 75-76 (citing Tr. at 1235:15-18). Second, Cresta argues that Boie only depicts a partial demodulator. CRB at 76 (citing Tr. 1234:18-21, 1236:8-13). Third, Cresta argues that the Q and I signals generated by elements 11-13 are not baseband signals. CIB at 123; CRB at 75-76 (citing CX-1981C at Q/A 248-49).

I find that Boie discloses this claim limitation. First, although Dr. Caloyannides opines that Q and I signals cannot be outputs of a digital demodulator, he offers no further explanation or evidence to support his opinion. CX-1981C at Q/A 249; Tr. at 1235:1-18. In contrast, both Pf. McNair and Dr. Hashemi explain that elements 11-13, which are components of the QPSK demodulator, generate demodulated Q and I signals. RX-1677C at Q/A 281; RX-1663C at Q/A 198.

Second, Dr. Caloyannides is correct that Boie depicts only part of the QPSK demodulator in Fig. 1. RX-0010 at Fig. 1. However, the specification discloses the use of a QPSK demodulator to demodulate digital output signals from the signal processor. RX-0010 at 3:40-55; RX-1677C at Q/A 278-81; RX-1663C at Q/A 198. Further, Dr. Caloyannides confirmed that elements 11-14 are components of the QPSK demodulator which perform the function of digital TV demodulation. Tr. at 1235:1-1236:13. Thus, one of ordinary skill in the art would have understood Boie to disclose the use of a QPSK demodulator to demodulate digital output signals from the signal processor.

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Third, under the proper claim construction of the term “baseband signal”—signals that have been demodulated but not yet decoded—the Q and I outputs depicted in Fig. 1 of Boie are “baseband signals.” Dr. Caloyannides concedes that elements 11-13 perform a digital TV demodulation function. Tr. at 1235:1-12. Both Pf. McNair and Dr. Hashemi testify that the Q and I signals are demodulated signals. RX-1677C at Q/A 281; RX-1663C at Q/A 198. Pf. McNair also cited testimony from Dr. Caloyannides’s deposition testimony admitting that if a “baseband signal” was one that was demodulated but still encoded, the Q and I signals would be considered “baseband signals.” RX-1677C at 281.

For the reasons discussed above, I find that all the limitations of claim 1 of the ‘585 patent are disclosed in Boie. Accordingly, I find that claim 1 of the ‘585 patent is invalid as anticipated by Boie.

b. Claim 2

Boie discloses receiving analog television format signals for demodulation with the FM demodulator and digital television format signals for demodulation with the QPSK demodulator. RX-0010 at 1, Fig. 1; RX-1677C at Q/A 283 (McNair DWS); RX-1663C at Q/A 197 (Hashemi DWS). Cresta does not appear to dispute that Boie discloses the additional limitation of claim 2 “wherein said plurality of formats comprise an analog television format and a digital television format.” JX-0001 at 7:10-12. Cresta only argues that the dependent claims of claim 1 are not anticipated for the same reasons claim 1 is not anticipated. CIB at 123; CRB at 76. Accordingly, I find that all limitations of claim 2 of the ‘585 patent are disclosed in Boie and that claim 2 of the ‘585 patent is invalid as anticipated by Boie.

3. Obviousness

I find that claim 3 is obvious in view of Boie, but I find that claims 10, 12, and 13 are not obvious over Boie alone or in combination with the identified prior art, as explained below.

a. Claim 3

Respondents contend that modifying Boie to include a digital-to-analog converter between the signal processor and an analog input demodulator would have been obvious to one of ordinary skill in the art. RIB at 131-32. Respondents contend that one of ordinary skill in the art would have known demodulators to require analog inputs and would have included a digital-to-analog converter in the signal chain to support industry standard demodulators. *Id.* at 132. Specifically, Respondents argue that it would have been obvious to combine the disclosures in U.S. Patent No. 6,804,497 to Kerth et al. (“Kerth”)—which discloses the use of a digital-to-analog converter between a channel filter’s digital outputs and other integrated circuits—with Boie. RIB at 132; RX-2015 at 22. Respondents point to Kerth as one of many examples of how the use of a digital-to-analog converter would have been obvious to one of ordinary skill in the art. *Id.* Respondents’ arguments are supported by the testimony of Pf. McNair, who explains that “[i]t was well known in the industry to use DACs [digital-to-analog converters] to interface to industry standard ICs [integrated circuits].” RX-1677C at Q/A 285. In addition to Kerth, Pf. McNair also cites several contemporaneous examples of digital-to-analog converters, including the Aero DS datasheet (RX-0017), Tuttle (RX-0077), and the Micronas DRX 3960A Advance Information publication (RX-0038). RX-1677C at Q/A 286. Dr. Hashemi also cites Malkemes (RX-0034) and Scarpa (RX-0024) as additional references disclosing digital-to-analog converters. RX-1663C at Q/A 198. Respondents also cite Dr. Snelgrove’s testimony regarding enablement of claim 3 that “[t]he person of ordinary skill in the art would know that there are

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dedicated components to do demodulation, would understand that they typically require analog inputs, and would know where in the signal chain to convert back to analog format so as to use them and what component to use to do that.” CX-1968C at Q/A 104.

Cresta argues that Respondents fail to demonstrate why one of ordinary skill in the art would have been motivated to combine Boie with a digital-to-analog converter as taught in Kerth because Kerth relates to cellular technology rather than television and because Boie and Kerth use different bandwidths. CRB at 77-78.

Although Cresta correctly identifies several incompatibilities between Boie and Kerth, I find that the expert testimony and identified references show that modifying a receiver with a digital-to-analog converter would have been obvious to one of ordinary skill in the art.

Pf. McNair, Dr. Hashemi, and Dr. Snelgrove all agree that dedicated components for demodulation existed at the time of the '585 patent that required analog inputs. RX-1677C at Q/A 285 (McNair); RX-1663C at Q/A 198 (Hashemi); CX-1968C at Q/A 104 (Snelgrove). This provides a motivation for one of ordinary skill in the art to convert the digital output of Boie to analog, and as Dr. Snelgrove admits, a digital-to-analog converter was a well-known component for converting signals from digital to analog. CX-1968C at Q/A 104 (“A digital to analog converter is a functional element in electronics which would have been well known to a person of average skill in the art at or even before the time of this invention.”). Kerth and the other identified references are further evidence that digital-to-analog converters were common in the prior art. Accordingly, I find that it would have been obvious to one of ordinary skill in the art to modify Boie to use a well-known digital-to-analog converter coupled to a well-known demodulator receiving analog inputs.

I therefore find that claim 3 is invalid as obvious in view of Boie.

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b. Claim 10

Claim 10 discloses:

The receiver of claim 1, wherein said signal processor applies one of a plurality of finite impulse response filters to said digital representation of said intermediate signal, each of said plurality of finite impulse response corresponding to a format of said input RF signal.

JX-0001 at 7:36-40.

Respondents state that the band-pass filter 8 in Boie is a signal processor that is configurable and responsive to the TV standard of the input RF signal, but that Boie does not disclose how the band-pass filter 8 is implemented. RIB at 132 (citing RX-1677C at Q/A 296). Respondents argue that it would have been obvious to one of ordinary skill in the art to implement the band-pass filter 8 disclosed in Boie as a plurality of finite impulse response (FIR) filters. *Id.* Respondents state that adaptive band-pass channel filters can be implemented either as FIR filters or infinite impulse response (IIR) filters. *Id.* at 133. Respondents state that because FIR filters are cheaper and easier to implement, one of ordinary skill in the art would have found it obvious to implement the band-pass filter 8 as a FIR filter. *Id.* Respondents also argue that claim 10 would have been rendered obvious by Boie in view of U.S. Patent No. 6,643,502 to Van De Plassche et al. ("VDP"). *Id.* (citing RX-1677C at Q/A 297). Respondents state that VDP teaches the implementation of the band-pass filter 8 as a plurality of FIR filters. *Id.* Respondents argue that one of ordinary skill in the art would have been motivated to combine VDP with Boie because VDP expressly states that it is an improvement on Boie. *Id.* (citing RX-0030 at 1:15-15-29, 5:45-60; RX-1677C at Q/A 297, 304).

Cresta argues that Boie does not expressly disclose the use of FIR filters. CRB at 78-79. Cresta states that Boie expressly teaches the use of SAW filters, which are typically IIR filters. *Id.* at 79 (citing CX-1981C at Q/A 263). Cresta further argues that the combination of VDP and

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Boie does not render claim 10 obvious because VDP only suggests generally that it is an improvement on Boie. *Id.* Cresta also states that one of ordinary skill in the art would not have an expectation of success in combining Boie's satellite TV architecture with VDP's terrestrial TV receiver. *Id.* (citing CX-1981C at Q/A 263-65).

As discussed above, Boie discloses all the limitations of claim 1. The only limitation of claim 10 not disclosed in Boie is the implementation of the band-pass filter 8 as a plurality of FIR filters wherein "each of said plurality of finite impulse response [filters] corresponding to a format of said input RF signal."

I find that Respondents do not demonstrate by clear and convincing evidence that one of ordinary skill in the art would have found it obvious to implement the band-pass filter 8 in Boie as a plurality of FIR filters with filter "corresponding to a format of said input RF signal." Pf. McNair testifies that an adaptive band-pass channel filter such as the band-pass filter 8 in Boie can only practically be implemented as an IIR filter or a FIR filter. CX-1677C at Q/A 296. Pf. McNair also details the advantages of FIR filters (1) that they are inherently stable, (2) that they are generally simpler to implement, and (3) that they can be designed to have a linear phase. *Id.* These advantages are corroborated with contemporaneous literature concerning FIR filters. *Id.* (referring to RX-0043 at 364; RX-0018 at 76-78; RX-0029; RX-0028). However, Respondents do not demonstrate by clear and convincing evidence that it would have been obvious to one of ordinary skill in the art to implement the band-pass filter 8 as a plurality of FIR filters wherein each of the FIR filters corresponds to a format of the input RF signal. Pf. McNair only testifies in a conclusory manner that such an implementation would have been obvious, citing back to his testimony in the context of claim 1. CX-1677C at Q/A 296. However, Pf. McNair's testimony in the context of claim 1 does not at all discuss a plurality of FIR filters, each of which

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corresponds to an input RF format. *See id.* at Q/A 273-76. The examples he cites in this portion of his testimony only concern single filters with multiple coefficients stored in memory. *Id.* at Q/A 276. Accordingly, I find that Respondents do not demonstrate by clear and convincing evidence that Boie renders this limitation obvious.

Further, Cresta does not appear to dispute that VDP teaches that the band-pass filter 8 of Boie can be implemented as a plurality of FIR filters. CRB at 79. However, as discussed below in the context of anticipated for claim 1 of the '792 patent, VDP does not disclose a signal processor "wherein the signal processor applies one of a plurality of finite impulse response filters to the digital representation of the intermediate frequency signal, each of the plurality of finite impulse response corresponding to a format of the input RF signal." *See infra.* at 131-134. Accordingly, to the extent Boie does not render claim 10 obvious, the addition of VDP does not render claim 10 obvious either.

Accordingly, I find that claim 10 is not invalid as obvious over Boie or Boie in view of VDP.

c. Claim 12

Claim 12 discloses:

The receiver of claim 10, wherein said signal processor comprises a first computing unit and a second computing unit, said first computing unit processing a real part of said finite impulse response filter operation while said second computing unit processing an imaginary part of said finite impulse response filter operation.

JX-0001 at 7:45-50.

Respondents argue that Boie alone, in combination with U.S. Patent No. 5,388,062 to Knutson ("Knutson"), or in combination with VDP render claim 12 obvious. RIB at 134-35. Respondents argue that one of ordinary skill in the art would have found it obvious to modify Boie with a complex FIR filter with separate computing units for the real and imaginary parts of

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the signal. *Id.* at 134 (citing RX-1677C at Q/A 295, 305). Respondents also argue that Knutson teaches the use of complex signal processing using complex FIR filters with separate computing units for the real and imaginary parts of the signal and describes the benefits of using such filters in multi-standard TV receivers like Boie. *Id.* (citing RX-0076 at 2:28-50; RX-1677C at Q/A 306). Respondents also argue that VDP teaches the use of a complex FIR filter with separate computing units for the real and imaginary parts of the signal and that it would have been obvious to combine VDP with Boie because VDP teaches that it is an improvement over Boie. *Id.* at 134-135 (citing Tr. 1246:11-1248:15; JX-0030 at 12).

Cresta argues that the combinations of Boie and Knutson and Boie and VDP do not teach all the limitations of claim 12. Cresta states that Knutson only discloses generic complex-valued digital filters and does not teach signal processors with two computing units as claimed. CRB at 79-80 (citing RX-0076 at 2:29-50; CX-1981C at Q/A 269). Cresta also states that Knutson only applies to complex functions associated with demodulators rather than signal processors. *Id.* Cresta states that the complex filter disclosed in VDP does not use two separate computing units for the real and imaginary parts of the signal. *Id.* at 80 (citing CX-1981C at Q/A 825).

As discussed above, I find that claim 10 is not obvious in view of Boie alone or in combination with VDP and accordingly, I find that claim 12 (which depends on claim 10) is not invalid as obvious. Even if claim 10 were obvious, however, I find that Respondents do not show clear and convincing evidence that Boie alone, in combination with Knutson, or in combination with VDP renders the additional limitation of claim 12 to be obvious.

First, Respondents' only evidence to support its claim that one of ordinary skill in the art would have found it obvious to modify Boie to include a complex FIR filter with separate computing units for the real and imaginary parts of the signal is Pf. McNair's conclusory opinion

that such a modification would have been obvious. RX-1677C at Q/A 306. Such expert opinions without corroborating evidence or further explanation are insufficient.

Second, Respondents do not demonstrate that the combination of Boie and Knutson discloses all the limitations of claim 12. Knutson describes the use of complex FIR filters, but it does not teach that such complex FIR filters contain separate computing units for the real and imaginary parts of the signal. *See* RX-0076; CX-1981C at Q/A 269. Pf. McNair's conclusory opinion that Knutson describes such a limitation does not meet the clear and convincing standard.

Third, Respondents do not demonstrate that the combination of Boie and VDP discloses all the limitations of claim 12. VDP discloses a digital filter DF1 that receives a real signal as an input and outputs a real signal and an imaginary signal. RX-0030 at 5:45-56, Fig. 5; Tr. at 1247:1-1248:15. However, VDP does not disclose that the $A_x(z)$ and $A_y(z)$ components within DF1 are separate computing units. *See id.* Dr. Snelgrove asserts that $A_x(z)$ and $A_y(z)$ represented different functions, but he does not testify as to how those functions were implemented. Tr. at 1247:7-14. Respondents also do not cite to any testimony from their own expert to support their arguments.

Accordingly, I find that Respondents do not demonstrate by clear and convincing evidence that Boie renders claim 12 obvious alone or in combination with any other reference.

d. Claim 13

Claim 13 discloses:

The receiver of claim 10, wherein said channel filter further comprises a standard selection circuit coupled to said signal processor, said standard selection circuit generating a select signal indicative of a format of said input RF signal and said signal processor selecting a finite impulse response filter in response to said select signal.

JX-0001 at 8:1-6.

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Respondents argue that Boie alone, in combination with Micronas DRX3960A Digital Receiver Front-End Advance Information (“Micronas”), or in combination with U.S. Patent No. 6,147,713 to Robbins et al. (“Robbins”) render claim 13 obvious. RIB at 135-36. First, Respondents argue that one of ordinary skill would have found it obvious to couple a TV standard selection circuit to band-pass filter 8. RIB at 135 (citing RX-1677C at Q/A 308, 309, 315; RX-0010 at Fig. 1). Respondents argue that because Boie discloses that band-pass filter 8 is responsive to the TV standard of the input RF signal, one of ordinary skill in the art would have known that Boie must also include a TV standard selection circuit which generates a TV standard selection signal which causes band-pass filter 8 to select a filter. *Id.*

Second, Respondents argue that the combination of Boie and Micronas renders claim 13 obvious. Respondents state that Micronas discloses a multi-standard tuner that accepts the industry standard I2C interface for a standard selection circuit. *Id.* (citing RX-1677C at Q/A 310; RX-0038 at 16). Respondents also state that it would have been obvious to combine Boie with the I2C interface taught in Micronas to adjust the filter response corresponding to the TV standard of the input RF signal. *Id.* at 136 (citing RX-1677C at Q/A 310).

Third, Respondents argue that the combination of Boie and Robbins renders claim 13 obvious. Respondents state that Robbins teaches a standard selection circuit for selecting a FIR filter corresponding to the TV standard of the input RF signal in the form of a channel map. *Id.* (citing RX-0028 at 3:16-21, 4:22, Figs. 1, 3; RX-1677C at Q/A 313). Respondents argue that it would have been obvious to implement the channel map taught in Robbins to the band-pass filter 8 in Boie. *Id.*

Cresta does not appear to dispute that Boie in combination with Micronas or Boie in combination with Robbins discloses the “standard selection circuit” limitation of claim 13. CRB

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at 80-81. Cresta argues instead that Boie does not render this limitation obvious because Boie does not provide any motivation to combine Boie with a TV standard selection circuit as claimed. CRB at 81. Cresta also argues that Boie does not disclose the selection of different FIR filters in response a select signal indicative of a format of the input RF signal or format-specific processing. *Id.*

As discussed above, I find that claim 10 is not obvious in view of Boie alone or in combination with VDP and accordingly, I find that claim 13 (which depends on claim 10) is not invalid as obvious. In addition, because claim 13 includes a limitation requiring the selection of a finite impulse response filter in response to a select signal indicative of a format, I find that this limitation is not met for the same reasons discussed above for claim 10. Respondents do not identify any evidence of a selection of FIR filters in Boie, VDP, Micronas, or Robbins. I thus find that this FIR filter selection limitation of claim 13 is not rendered obvious for the same reasons discussed above for the FIR filter selection limitation of claim 10.

Accordingly, I find that Respondents do not demonstrate by clear and convincing evidence that Boie renders claim 13 obvious alone or in combination with any other reference.

e. Secondary Considerations of Nonobviousness

Cresta argues that there are several secondary considerations of non-obviousness. First, Cresta argues that until 2008 the vast majority of tuners were CAN tuners and that there was skepticism that silicon tuners could meet or exceed the performance of CAN tuners. CIB at 138-39 (citing CX-1981C at Q/A 1008-10; Tr. at 976:16-977:19, 979:2-8). Second, Cresta argues that Xceive's silicon tuners met a long-felt need to replace CAN tuners because CAN tuners were expensive to manufacture and had to be designed for specific geographic areas. *Id.* at 139-40 (citing CX-1981C at Q/A 1015). Third, Cresta argues that Xceive received "numerous

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industry accolades and acclaim for its products that implemented the ‘585 and ‘792 patents.” *Id.* at 140 (citing CX-1981 C at Q/A 1016). Fourth, Cresta argues that Xceive’s tuners and Silicon Labs’ allegedly infringing tuners were a commercial success and directly linked to the asserted claims of the patents in suit. *Id.* (citing CX-1981C at Q/A 1017). Cresta asserts that these four factors are directly related to the patents-in-suit. *Id.* at 140-141 (citing CX-1981C at Q/A 1019-21).

Cresta further argues that Silicon Labs copied Xceive’s chips, [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED] Cresta states that Xceive’s products [REDACTED]

[REDACTED] *Id.* at 143 (citing CX-0401C at 111; JX0058C at 188-190). Cresta also states that [REDACTED]

[REDACTED]

[REDACTED]

Respondents argue that Cresta fails to establish a nexus between evidence of secondary considerations of non-obviousness and the claimed inventions. RIB at 187 (citing RX-1677C at Q/A 637). Respondents argue that Dr. Snelgrove’s and Dr. Caloyannides’s testimonies concerning secondary considerations of non-obviousness are conclusory and do not show that the evidence of copying or skepticism, long-felt need, commercial success, or industry accolades are attributable to any of the claims of the ‘585 or ‘792 patents. *Id.* at 188-192 (citing CX-1981C at

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Q/A 1015-21; RX-1677C at Q/A 636-42; CX-1968C at Q/A 146, 156; Tr. at 1298:8-14, 1301:6-21, 1302:13-1303:6). Respondents also argue that the overwhelming evidence establishes that Silicon Labs did not copy the claimed inventions or Xceive technology [REDACTED] [REDACTED] *Id.* at 193-196.

Secondary considerations must be considered in evaluating the obviousness of a claimed invention, but they do not overcome a strong *prima facie* case of obviousness. *See, e.g., Wyers v. Master Lock Co.*, 616 F.3d 1231, 1246 (Fed. Cir. 2010); *Leapfrog Enterprises, Inc. v. Fisher-Price, Inc.*, 485 F.3d 1157, 1162 (Fed. Cir. 2007). Moreover, Federal Circuit case law makes clear that for secondary considerations of nonobviousness to be afforded substantial weight, the patentee must establish a nexus between the secondary considerations and the merits of the *claimed invention*. *Wm. Wrigley Jr. Co. v. Cadbury Adams USA LLC*, 683 F.3d 1356, 1365 (Fed. Cir. 2012); *Pregis Corp. v. Kappos*, 700 F.3d 1348, 1355-56 (Fed. Cir. 2012); *Wyers*, 616 F.3d at 1246 (Fed. Cir. 2010); *In re GPAC Inc.*, 57 F.3d 1573, 1580 (Fed. Cir. 1995).

Here, I find that Cresta's evidence of secondary considerations of nonobviousness should not be accorded substantial weight for two reasons: First, with respect to claim 3 of the '585 patent, Respondents demonstrate a strong *prima facie* case of obviousness. Therefore, even if Cresta had been able to present substantial evidence of secondary considerations, such evidence would not control the obviousness determination.

Second, I find that Cresta fails to establish a nexus between the evidence of secondary considerations and the *claimed invention*. Dr. Caloyannides's testimony concerning initial skepticism, long-felt need, praise and industry acceptance, and commercial success is couched in conclusory generalities. Dr. Caloyannides testifies generally that Xceive's products were "silicon television tuners," "monolithic tuners," or "architecture claimed in the patents in suit."

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CX-1981C at Q/A 1007-22. He also testifies generally that the secondary considerations were related to these attributes of Xceive's products, but he does not provide any evidence that the secondary considerations are attributable to the novel aspect of any specific limitation of any specific claim. *Id.*; *see also* CX-1677C at Q/A 636-42. Moreover, the documents Dr. Caloyannides cites in support of his opinions were not admitted into evidence at the hearing and are not part of the record.

With respect to copying, even assuming the evidence established that Silicon Labs copied Xceive's products or designs, Dr. Snelgrove's testimony firmly establishes that no nexus exists between the copying and the asserted claims of the '585 and '792 patents. Dr. Snelgrove is unable to specify what it was that Silicon Labs copied from Xceive. Tr. at 1298:8-14. He further testifies that the similarities between Silicon Labs' products and Xceive's products are features that were not claimed in the '585 or '792 patents. CX-1968C at Q/A 156; Tr. at 1302:13-13030:6. Thus, I find that Cresta fails to establish a nexus between the secondary considerations of nonobviousness and the claimed inventions.

Accordingly, I find that secondary considerations of nonobviousness are not substantial factors in the obviousness analysis.

4. Section 112

MaxLinear argues that the '585 patent is invalid for several different reasons under 35 U.S.C. § 112, but I do not agree, as discussed below.

a. Lack of Written Description of "Having an Intermediate Frequency"

MaxLinear argues that if "intermediate signal having an intermediate frequency" is construed to encompass zero-IF or low-IF, the term "having an intermediate frequency" is not supported by the written description of the '585 patent. RIB at 137. MaxLinear argues that the

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'585 patent only discloses a heterodyne receiver architecture that is different from MaxLinear's zero-IF/direct conversion architecture. *Id.* (citing JX-1 at 1:61-63; Tr. 201:8-202:20, 203:12-205:4). MaxLinear argues that because the written description of the '585 patent does not disclose a zero-IF/direct conversion architecture, "having an intermediate frequency" is not supported by the written description if it encompasses zero-IF. MaxLinear also repeats most of its claim construction arguments. RRB at 87.

Cresta argues that the specification is sufficient to disclose to one of ordinary skill in the art that the inventors of the '585 patent possessed a receiver with an IF that can be programmed to any value. CRB at 85 (citing JX-0001 at 2:43-44, 3:26-28, 3:60-62). Cresta also argues that the specification distinguishes the invention from prior art heterodyne systems and therefore does not limit the invention to heterodyne architectures. *Id.* at 86 (citing JX-0001 at 1:49-67).

I find that Respondents fail to demonstrate by clear and convincing evidence that the term "having an intermediate frequency" lacks a written description. MaxLinear's repeated attempts at drawing a distinction between heterodyne and non-heterodyne systems are misguided. MaxLinear argues that because the construction of the term "intermediate frequency" encompasses a value of zero, all claims of the '585 patent are invalid unless the entirety of a zero-IF/direct conversion architecture, including the different filter architectures and complex processing, is also described in the specification. This is not the correct way to frame the legal issue. The correct question is whether there is sufficient written description in the specification for one of ordinary skill in the art to understand the inventors of the '585 patent to have been in possession of a receiver with an "intermediate signal having an intermediate frequency." *See Ariad Pharmaceuticals, Inc. v. Eli Lilly and Co.*, 598 F.3d 1336, 1351-52 (Fed. Cir. 2010) (en banc). As discussed above in the claim construction of "intermediate frequency," one of

ordinary skill in the art would have understood the claim term to encompass an intermediate frequency of any value other than the RF signal value. MaxLinear does not present any evidence that one of ordinary skill in the art would not have understood the inventors to be in possession of a receiver that uses an intermediate frequency of any value other than the RF signal value. In contrast, Dr. Snelgrove testifies that the patent does not limit itself to non-zero intermediate frequencies. Tr. at 201:16-202:6. Accordingly, I find that MaxLinear does not demonstrate by clear and convincing evidence that the term “having an intermediate frequency” lacks written description support.

b. Indefiniteness of “processor for processing” and “input RF signal”

As discussed above in the discussion on claim construction, the terms “processor” and “input RF signal” have readily apparent meanings and are not indefinite. Importantly, Respondents do not cite the prosecution history or any evidence that these claim terms would not provide reasonable certainty as to the scope of the invention to one of ordinary skill in the art. *See Nautilus, Inc. v. Biosig Instruments, Inc.*, 134 S. Ct. 2120, 2129 (2014). Accordingly, I find that Respondents do not demonstrate by clear and convincing evidence that these two terms are indefinite.

c. Dependent Claim 3

Respondents argue that claim 3 is not a proper dependent claim under Section 112, paragraphs c and d. Respondents state that claim 1 recites: “said signal processor generating digital output signals . . . and a plurality of demodulators, each coupled to receive output signals from said signal processor . . . each of said demodulators for demodulating said digital output signals.” RIB at 140. Respondents state that claim 3 inserts “a digital-to-analog converter coupled between said signal processor and a first one of said plurality of demodulators.” *Id.*

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Respondents argue that the insertion of a digital-to-analog converter between the signal processor and a demodulator creates two problems. *Id.* First, Respondents contend that the demodulator would no longer be coupled to the signal processor as recited in claim 1, but instead be coupled to the digital-to-analog converter. *Id.* Second, Respondents contend that the demodulator would no longer be demodulating digital output signals as recited in claim 1, but instead be demodulating analog output signals from the digital-to-analog converter. *Id.*

I agree with Cresta that Respondents' contentions are attorney argument unsupported by any evidence. CRB at 89-90. Respondents do not demonstrate by clear and convincing evidence that claim 3 is invalid as an improper dependent claim. Importantly, Respondents do not cite to any expert testimony or other evidence that one of ordinary skill in the art would have understood that the insertion of a digital-to-analog converter between the signal processor and demodulator would render the demodulator no longer "coupled" to the signal processor. Nor do Respondents provide any evidence that one of ordinary skill in the art would have understood that a demodulator does not demodulate the digital output signal of the signal processor if the digital output signal is converted to an analog signal prior to demodulation. Accordingly, I find that claim 3 is valid as a proper dependent claim.

C. Invalidity of the '792 patent

1. Priority Date

Cresta states that although it is entitled to an earlier priority date for the '792 patent based on earlier conception, the earlier date does not pre-date any of the asserted prior art references and therefore the issue of prior conception and diligent reduction to practice need not be decided. CRB at 118. Accordingly, I find that for the purpose of this analysis, the prior date of the '792 patent is July 1, 2004, the filing date of the application for the '792 patent.

2. Anticipation

Respondents assert that claims 1, 2, 4, and 25 of the '792 patent are anticipated U.S. Patent No. 6,643,502 to Van de Plassche (RX-0030, "VDP"). RIB at 155-62. Respondents also assert that claims 1, 2, 3, 4, 25, and 26 of the '792 patent are anticipated by the '585 patent. RIB at 162-69. Respondents finally assert that all asserted claims of the '792 patent are anticipated by the Xceive tuner prototype Morton2. RIB at 169-75.

a. VDP

VDP is a U.S. Patent that was filed on July 23, 1998, RX-0030, and it is therefore prior art to the '792 patent under 35 U.S.C. §§ 102(a) and (b). For the reasons stated below, I find that VDP does not anticipate claims 1, 2, or 4 of the '792 patent.

i. Claim 1

Respondents assert that claims 1, 2, 4, and 25 of the '792 patent are anticipated by VDP, relying on the testimony of Pf. McNair. RIB at 155-62; RX-1677C at Q/A 422-51. Cresta disagrees with Respondents and disputes whether VDP discloses three of the limitations of claim 1. First, the parties disagree as to whether VDP discloses "a frequency conversion circuit for receiving an input RF signal and for converting the input RF signal to an intermediate frequency signal having an intermediate frequency (IF), the input RF signal encoding information in one of a plurality of television signal formats." CRB at 98-99. Second, the parties disagree as to whether VDP discloses "a signal processor for processing the digital representation of the intermediate frequency signal in accordance with the television signal format of the input RF signal, the signal processor generating digital output signals indicative of information encoded in the input RF signal, wherein the signal processor applies one of a plurality of finite impulse response filters to the digital representation of the intermediate frequency signal, each of the

plurality of finite impulse response corresponding to a format of the input RF signal.” CRB at 99-100. Third, the parties disagree as to whether VDP discloses “a signal output circuit for receiving the digital output signals from the signal processor and for providing one or more output signals corresponding to the digital output signals.” CRB at 100-101.

a. “A television receiver comprising:”

The first words of the specification of VDP are: “The invention relates to the reception of signals which are transmitted in accordance with different standards. For example, television (TV) signals ...” RX-0030 at 1:6-8; *see* RX-1677C at Q/A 432 (McNair DWS). Cresta does not contest the disclosure of this limitation, and I therefore find that VDP anticipates the preamble of claim 1 of the ’792 patent.

b. “a frequency conversion circuit for receiving an input RF signal and for converting the input RF signal to an intermediate frequency signal having an intermediate frequency (IF), the input RF signal encoding information in one of a plurality of television signal formats”

VDP discloses an embodiment in which TUN is a tuner that receives Srf and convert Srf to Sif. JX-0030 at 9:10-16, Fig. 5; CX-1677C at Q/A 503 (McNair DWS). VDP also discloses that in another embodiment an AFRC receives the Sif and converts it to Sin, which is then sent to an analog-to-digital converter. *Id.* VDP also teaches that the Sin can be at IF, low-IF, or zero-IF and that the frequency conversion performed by the AFRC has “great freedom of choice. RX-0030 at 4:32-35; CX-1677C at Q/A 503. VDP also teaches that Srf encodes information in one of a plurality of television signal formats. RX-0030 at 1:5-11; RX-1677C at Q/A 503.

Respondents argue that the combination of TUN and AFRC comprise a frequency conversion circuit that converts an input RF signal to an intermediate signal having an intermediate frequency. RIB at 156 (citing RX-1677C at Q/A 503).

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Cresta argues that VDP does not disclose this limitation because VDP requires the use of multiple tuners to process multiple standards instead of one multi-standard tuner. CRB at 98-99 (citing RX-0030 at 2:17-26; CX-1981C at Q/A 869-70).

I find that Respondents demonstrate by clear and convincing evidence that VDP discloses this limitation. As discussed above, the combination of the TUN and AFRC converts an input RF signal to an intermediate signal having an intermediate frequency. CX-1677C at Q/A 503; JX-0030 at 4:32-35, 9:10-16. The input RF signal is encoded in one of a plurality of television signal formats. CX-1677C at Q/A 503; JX-0030 at 1:5-11. Thus, this limitation is literally disclosed in VDP. Cresta's argument that VDP does not disclose a single multi-standard tuner is irrelevant. The limitation only requires that the frequency conversion circuit convert an input RF signal to an intermediate signal and that the input RF signal be encoded in *one* of a plurality of television signal formats. The limitation does not require that the frequency conversion circuit be capable of converting input RF signals encoded in *all* of the plurality of television signal formats.

c. "an analog-to-digital converter for sampling the intermediate frequency signal and generating a digital representation thereof"

VDP depicts an analog-to-digital converter in Figure 5 and discloses: "The intermediate-frequency signal S_{if} is subjected to an analog-to-digital conversion ... carried out by the analog-to-digital converter ADC." RX-0030 at 5:33-37. Pf. McNair explains that in one embodiment, the ADC samples S_{if} and in a second embodiment the ADC samples S_{in}. RX-1677C at Q/A 504-05. Cresta does not dispute this limitation, and I therefore find that it is disclosed by VDP.

d. "a signal processor for processing the digital representation of the intermediate frequency signal ... wherein the signal processor applies one of a plurality of finite impulse response filters to the digital representation of the intermediate"

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frequency signal, each of the plurality of finite impulse response corresponding to a format of the input RF signal”

Respondents allege that FIL in Fig. 5 of VDP is the claimed signal processor. RIB at 157-58 (citing RX-0030 at 8:47-49; RX-1677C at Q/A 510-13). VDP discloses an embodiment in which the AFRC converts the Sif to Sin before the signal is digitized by the analog-to-digital converter. RX-0030 at 9:13-16; CX-1677C at Q/A 510. As discussed in the previous section, in this embodiment, Sin is the intermediate frequency signal and the FIL is applied to the output of the analog-to-digital converter which is the digital representation of the intermediate frequency signal. RX-0030 at 9:13-16; CX-1677C at Q/A 510-11. Respondents argue that VDP discloses various types of signal processing performed by FIL and its corresponding FIR filters DF3-DF10. RIB at 158-59 (citing RX-0030 5:33-7:47; RX-1677C at Q/A 511-13). Respondents argue that although DF4-DF10 as depicted in Fig. 5 do not satisfy this claim limitation because they are located behind demodulator SDEM, VDP teaches that DF4-DF10 may be replaced by a digital filter located in front of the demodulator SDEM. *Id.* at 159 (citing RX-0030 at 9:3-9). Respondents argue that DF2 and DF3 filter the signals in accordance with the format of the RF signal because they are low pass filters that have a different responses for different bandwidth channels. *Id.* at 158 (citing RX-0030 at 6:22-27; RX-1677C at Q/A 512). Respondents state that VDP teaches that DF9 and DF10 correspond to different digital TV standards. *Id.* (RX-0030 at 7:36-47; RX-1677C at Q/A 511). Respondents also state that VDP teaches that FIR filters DF4-DF8 are applied if the input RF signal is analog and FIR filters DF9-DF10 are applied if the input RF signal is digital. *Id.* at 159 (citing RX-0030 at 6:52-7:20, 7:36-47; RX-1677C at Q/A 513).

Cresta argues that to the extent Respondents contend AFRC is the signal processor, AFRC does not meet this limitation because it does not perform any processing of the digital

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representation of the intermediate frequency signal. CRB at 99 (citing CX-1981C at Q/A 876-77). Cresta also argues that DF4-DF10 do not correspond to a format of the input RF, but are instead filters that each perform a different specific task. *Id.* at 100 (citing RX-0030 at 6:22-7:47; CX-1981C at Q/A 877). Cresta also argues that DF4-DF10 are applied to a signal that has been demodulated and are therefore not applied to a digital representation of the intermediate frequency signal. *Id.* (citing RX-0030 at 6:32-37, 52-57). Cresta further argues that although VDP discloses embodiments in which DF4-DF10 are located behind the demodulator, that in those embodiments, the demodulator is no longer present and therefore does not satisfy the demodulator element of claim 1. *Id.* (citing CX-1981C at Q/A 877). Cresta also argues that filters DF2-DF10 are not disclosed as being FIR filters. *Id.* (citing CX-1981C at Q/A 877).

I find that Respondents do not demonstrate by clear and convincing evidence that VDP discloses this limitation of claim 1. The parties agree that in the first embodiment at issue taught by VDP, filters DF4-DF10 are not applied to a digital representation of the intermediate frequency signal because they are applied to a demodulated signal. The second embodiment at issue is also problematic for two reasons: First, it is clear from both Pf. McNair's and Dr. Caloyannides's testimony that filters DF2-DF10 are not filters each of which correspond to a format of the input RF signal. CX-1981C at Q/A 877; RX-1677C at Q/A 511-13. Indeed, it is clear that filters DF2-DF10 are filters which perform different particular tasks. *Id.*; *see also* RX-0030 at 6:52-55. It is also clear that the signal processor FIL, rather than applying one of a plurality of filters, applies multiple filters in sequence. RX-0030 at Fig. 5.

Second, VDP discloses that DF4-DF10 may be located in front of the demodulator SDEM, but as a single digital filter. RX-0030 at 9:3-9. Thus, even if DF4-DF10 were located as a single digital filter in front of demodulator SDEM, there would not be a plurality of filters from

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which the signal processor could choose. Rather, there would be three filters DF2, DF3, and a digital filter which are applied in sequence.

Accordingly, I find that VDP does not disclose this limitation.

e. “a signal output circuit for receiving the digital output signals from the signal processor and for providing one or more output signals corresponding to the digital output signals”

Respondents argue that VDP inherently teaches a signal output circuit as claimed.

Respondents state that VDP shows signal lines which receive digital output signals from FIL and provide signals corresponding to those digital output signals to elements SPRC, VPRC, and XPRC. RIB at 160 (citing RX-0030 at Fig. 5; RX-1677C at Q/A 516). Respondents state that SPRC, VPRC, and XPRC are not integrated onto the same circuit as FIL and are instead separate chips. *Id.* Respondents argue that where signal lines connect two different chips, there must inherently be signal output circuits such as driver circuits, latches, or clock signals for receiving and outputting those signals. *Id.* Respondents also argue that in the embodiment where the filters DF4-DF10 are placed before the demodulator SDEM, the demodulator is a signal output circuit as claimed. *Id.* (citing RX-1677C at Q/A 517). Respondents also argue that SPRC, VPRC, and XPRC are signal output circuits because they receive digital output signals from FIL and perform additional reformatting to the signals. *Id.* at 161 (citing RX-0030 at 7:48-52). In yet another alternative, Respondents argue that any filter in FIL that is not merged into a combined filter would be a signal output circuit. *Id.* (citing RX-1677C at Q/A 520).

Cresta argues that because VDP does not disclose the claimed signal processor, it also cannot disclose a signal output circuit that receives digital output signals from the signal processor. CRB at 100 (citing CX-1981C at Q/A 886). Cresta also argues that there is no indication in VDP that SPRC, VPRC, and XPRC are not integrated on the same chip as FIL so

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Respondents' arguments that there are inherent signal output circuits are hypothetical. *Id.* at 100-101 (citing CX-1981C at Q/A 886).

I find that VDP cannot disclose a signal output circuit as claimed because it does not disclose a signal processor that generates a digital output signal as explained in the previous limitation. For the same reason, the demodulator SDEM is not a signal output circuit. Furthermore, I agree with Cresta that VDP does not disclose that SPRC, VPRC, and XPRC are not integrated on the same chip as the FIL. CX-1981C at Q/A 886. Therefore, Respondents do not show by clear and convincing evidence that VDP inherently discloses a signal output circuit as claimed.

Respondents' arguments that the SPRC, VPRC, XPRC, or discrete filters that are not merged into a combined filter can be signal output circuits are supported only by limited, conclusory opinions from Pf. McNair. *See* RX-1677C at Q/A 519-20. Accordingly, I find that Respondents do not demonstrate by clear and convincing evidence that these elements are the claimed signal output circuits.

For the reasons discussed above, I find that claim 1 of the '792 patent is not anticipated by VDP because VDP does not disclose each and every limitation of claim 1.

ii. Claim 2

Claim 2 discloses "[t]he television receiver of claim 1, wherein the plurality of television signal formats comprises an analog television format and a digital television format." JX-0002 at 11:7-9. Cresta does not appear to dispute that VDP discloses the additional limitation of claim 2 "wherein the plurality of television signal formats comprises an analog television format and a digital television format." However, because I find that claim 1 is not anticipated by VDP, claim 2 is also not anticipated by VDP.

iii. Claim 4

Claim 4 discloses “[t]he television receiver of claim 1, wherein the signal output circuit provides a first output signal being a video baseband signal corresponding to an analog television format and a second output signal being an audio baseband signal corresponding to the analog television format.” JX-0002 at 11:12-16.

Respondents argue that VDP discloses that SDEM generates a CVBS and an SIF signal. RIB at 162 (citing RX-0030 at 6:32-67, 7:1-35; RX-1677C at Q/A 535-36). Respondents state the CVBS signal is a video baseband signal corresponding to an analog television format and that SIF is an audio baseband signal corresponding to an analog television format. *Id.*

Respondents also argue that SPRC converts SIF to AF, which is also an audio baseband signal corresponding to an analog television format. *Id.* (citing RX-0030 at 7:48-62; RX-1677C at Q/A 536). Respondents also state in the alternative that VPRC and SPRC demodulate chrominance and aural carriers of its input signals and therefore satisfy the limitation. *Id.*

Cresta argues that VDP does not disclose that SDEM generates baseband signals. CRB at 102 (citing CX-1981C at Q/A 897-98). Cresta also argues that SPRC and VPRC do not satisfy the limitations because Respondents’ characterization of these elements as signal output circuits is inconsistent with their alternative arguments that they are demodulators or decoder circuits. *Id.*

As previously explained, SDEM is not a signal output circuit, accordingly, SDEM cannot satisfy this limitation. VDP discloses that SPRC and VPRC can be used to demodulate signals. However, VDP does not disclose whether the outputs of SPRC and VPRC are baseband signals as properly construed. RX-0030 at 7:48-62. There is also no testimony, expert or otherwise, indicating that the outputs of SPRC and VPRC are demodulated but not yet decoded.

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Accordingly, Respondents fail to demonstrate by clear and convincing evidence that VDP discloses the additional limitation of claim 4.

b. '585 patent as Prior Art to the '792 patent

The '585 patent was filed on September 6, 2002, with a provisional application filed on September 17, 2001. JX-0001. The parties do not dispute the '585 patent is prior art to the '792 patent under 35 U.S.C. § 102(e). CIB at 169. For the reasons discussed below, I find that claims 1, 2, 3, 4, 25, and 26 of the '792 patent are anticipated by the '585 patent.

i. Claim 1

Respondents assert that claim 1 of the '792 patent is anticipated by the '585 patent, relying on the testimony of Pf. McNair. RIB at 164-67; RX-1677C at Q/A 160-94. Cresta does not appear to dispute that the '585 patent discloses all the limitations of claims 1 of the '792 patent except for “a signal output circuit for receiving the digital output signals from the signal processor and for providing one or more output signals corresponding to the digital output signals” recited in independent claim 1. CIB at 169-71; CRB at 103-05.

a. “A television receiver comprising:”

The Abstract of the '585 patent describes “[a] television (TV) receiver.” JX-0001; *see* RX-1677C at Q/A 171 (McNair DWS). Cresta does not contest the disclosure of this limitation, and I therefore find that the '585 patent anticipates the preamble of claim 1 of the '792 patent.

b. “a frequency conversion circuit for receiving an input RF signal and for converting the input RF signal to an intermediate frequency signal having an intermediate frequency (IF), the input RF signal encoding information in one of a plurality of television signal formats”

The '585 patent discloses a tuner 54 that receives input RF signal 52 and converts it into an intermediate frequency signal 56. JX-0001 at 3:44-58, Fig. 2; *see* RX-1677C at Q/A 175

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(McNair DWS). Cresta does not contest the disclosure of this limitation, and I therefore find that the '585 patent anticipates the "frequency conversion circuit" limitation of the '792 patent.

c. "an analog-to-digital converter for sampling the intermediate frequency signal and generating a digital representation thereof"

The '585 patent discloses an analog-to-digital converter (ADC 62), and states that "ADC 62 operates to sample the filtered intermediate signals to generate digital representation thereof." JX-0001 at 4:26-28, Fig. 2; *see* RX-1677C at Q/A 180 (McNair DWS). Cresta does not contest the disclosure of this limitation, and I therefore find that the '585 patent anticipates the "analog-to-digital converter" limitation of the '792 patent.

d. "a signal processor for processing the digital representation of the intermediate frequency signal ... wherein the signal processor applies one of a plurality of finite impulse response filters to the digital representation of the intermediate frequency signal, each of the plurality of finite impulse response corresponding to a format of the input RF signal"

The '585 patent discloses DSP 64, which in one embodiment "implements a finite response (FIR) filter which is reconfigured based on the TV standard selected." JX-0001 at 4:66-5:1; *see* RX-1677C at Q/A 184 (McNair DWS). Cresta does not contest the disclosure of this limitation, and I therefore find that the '585 patent anticipates the "signal processor" limitation of the '792 patent.

e. "a signal output circuit for receiving the digital output signals from the signal processor and for providing one or more output signals corresponding to the digital output signals"

Respondents argue that the plurality of demodulators 66a-66c in the '585 patent are signal output circuits as claimed in the '792 patent because they receive digital output signals from DSP 64 and output video and audio baseband signals corresponding to digital output signals from DSP 64. RIB at 165-66 (citing RX-1677C at Q/A 188, 192; JX-0001 at 5:42-57,

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5:59-6:11, Fig. 2). Respondents also contend that the digital-to-analog converter disclosed in the '585 patent is a signal output circuit because it receives digital output signals from DSP, reformats the signals to analog signals, and provides output signals to demodulators that require analog inputs. *Id.* at 166 (citing RX-1677C at Q/A 188; JX-0001 at 5:59-6:11).

Cresta argues that a demodulator cannot be a signal output circuit because the '792 patent distinguishes between demodulators and signal output circuits. CIB at 170 (citing JX-0002 at claim 8). Cresta also argues that a digital-to-analog converter cannot comprise a signal output circuit because the '792 patent defines a digital-to-analog converter as merely an optional component of a signal output circuit. *Id.* (citing JX-0002 at Fig. 2). Cresta further argues that even if a plurality of demodulators or a digital-to-analog converter are examples of signal output circuits, the '585 patent does not anticipate because it does not disclose the entire scope of the term "signal output circuit" as claimed in the '792 patent.

I find that under the proper claim construction of the term "signal output circuit," Respondents demonstrate by clear and convincing evidence that the '585 patent discloses a signal output circuit as claimed in the '792 patent. The '585 patent discloses that demodulators 66a-66c receive digital output signals from the signal processor DSP 64. JX-0001 at 5:42-68; Fig. 2; RX-1677C at Q/A 188. The '585 patent also discloses that demodulator 66a provides three output signals that correspond to the digital output signals: CVBS, audio 1, and audio 2. JX-0001 at 5:59-61; RX-1677C at Q/A 188. Thus, the '585 patent discloses a signal output circuit as claimed in claim 1.

Cresta's argument that a demodulator cannot be an output circuit is unsupported by credible evidence. Dr. Caloyannides' testimony that a demodulator is not a signal output circuit contains nothing but conclusory opinions on what one of ordinary skill in the art would have

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understood. CX-1981C at Q/A 536. Further, his testimony is contradicted by his admission at trial that demodulator 66a is a circuit that receives digital output signals from the signal processor and provides video and audio baseband output signals. Tr. at 1238:20-1239:22.

Cresta is also mistaken in its assertion that disclosure of one example of a signal output circuit in '585 patent does not anticipate the limitation in the '792 patent. "[I]t is axiomatic that disclosure of a species in a reference is sufficient to prevent a later applicant from obtaining generic claims" *In re Ruscetta*, 255 F.2d 687, 289 (C.C.P.A. 1958); *see also In re Lukach*, 442 F.2d 967, 970 (C.C.P.A. 1971). Unsurprisingly, Cresta does not cite any case law to support its assertion to the contrary. Disclosure of the demodulator in the '585 patent anticipates the entire genus of "signal output circuits" as claimed in the '792 patent.

For the reasons discussed above, I therefore find that claim 1 of the '792 patent is anticipated by the '585 patent.

ii. Claim 2

The '585 patent discloses that "tuner 54 can use the same IF for receiving analog or digital television signals in any standards." JX-0001 at 3:64-67; *see* RX-1677C at Q/A 196 (McNair DWS). Cresta does not contest the disclosure of this limitation, and because the '585 patent anticipates claim 1 of the '792 patent, I also find that the '585 patent anticipates claim 2 of the '792 patent.

iii. Claim 3

The '585 patent discloses that "[i]n one embodiment of the present invention, TV receiver 50 is an integrated circuit where tuner 54, channel filter 58 and demodulators 66 are all integrated onto the same piece of integrated circuit." JX-0001 at 6:12-15; *see* RX-1677C at Q/A 200 (McNair DWS). Cresta does not contest the disclosure of this limitation, and because the

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'585 patent anticipates claim 1 of the '792 patent, I also find that the '585 patent anticipates claim 3 of the '792 patent.

iv. Claim 4

The '585 patent discloses an embodiment where “[a]nalog demodulator 66 a provides three output signals: a Composite Video Baseband Signal (CVBS) containing the video information, and audio 1 and audio 2 containing the audio information.” JX-0001 at 5:59-62; *see* RX-1677C at Q/A 202 (McNair DWS). Cresta does not contest the disclosure of this limitation, and because the '585 patent anticipates claim 1 of the '792 patent, I also find that the '585 patent anticipates claim 4 of the '792 patent.

v. Claim 25

The '585 patent discloses that “DSP 64 includes two computing units to speed up the computation time. Specifically, the filtering operations of the real and imaginary parts in the frequency domain are carried out in parallel.” JX-0001 at 5:2-5; *see* RX-1677C at Q/A 212 (McNair DWS). Cresta does not contest the disclosure of this limitation, and because the '585 patent anticipates claim 1 of the '792 patent, I also find that the '585 patent anticipates claim 25 of the '792 patent.

vi. Claim 26

The '585 patent discloses that “standard selection circuit 68 for selecting between the several analog television standards and the several digital television standards.” JX-0001 at 4:56-58; *see* RX-1677C at Q/A 216 (McNair DWS). Cresta does not contest the disclosure of this limitation, and because the '585 patent anticipates claim 1 of the '792 patent, I also find that the '585 patent anticipates claim 26 of the '792 patent.

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Accordingly, I find that claims 1, 2, 3, 4, 25, and 26 of the '792 patent are anticipated by the '585 patent.

c. Morton2 On-Sale Bar

Respondents argue that by Cresta's own admission, all asserted claims of the '792 patent except for claim 25 were reduced to practice in May 2003 and that Morton2 was a tuner integrated chip that reduced to practice those claims. RIB at 170 (citing RX-1533C at 6, 9-10 (Cresta Interrogatory Responses); RX-1677C at Q/A 631 (McNair DWS); CX-1968C at Q/A 88-90 (Snelgrove RWS)). Respondents argue that on May 16, 2003, Xceive uploaded the Morton2 design to Jazz Semiconductor ("Jazz"), a semiconductor foundry.¹³ *Id.* (citing RX-0811C-RX-0815C; RX-0817C-RX-0826C; RX-1677C at Q/A 631 (McNair DWS); RX-1533C at 9-10). Respondents argue that Xceive paid Jazz for the Morton2 tape-out and that the transaction was a commercial sale. *Id.* at 170-71 (citing RX-1687C at 83:1-16; RX-1677C at Q/A 632).

Cresta argues that the sale of silicon wafers from Jazz to Xceive was not a commercial sale for two reasons: First, Cresta argues that Jazz sold Xceive the service of fabricating a silicon wafer rather than selling Xceive a product embodying the invention. CIB at 180-81 (citing CX-1968C at Q/A 96). Cresta argues that the silicon wafer Jazz sold to Xceive needed further cutting, packaging, and bonding before it would operate as the prototype invention. *Id.* (citing CX-1980C at Q/A 24-25; CX-1968C at Q/A 96; RX-1677C at Q/A 632). Second, Cresta argues that the Morton2 prototype was not a product for commercial exploitation, but a test chip for experimentation, evaluation, and testing because it was not a commercially viable product. *Id.* at 181 (citing CX-1980C at Q/A 24, 26; RX-1677C at Q/A 634; RX-850C). Cresta states that there is no evidence that product samples were provided to customers prior to the critical date.

¹³ This uploading is referred to as a "tape-out" in the industry.

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Id. at 182. Cresta also states that Xceive paid sales tax on its order of wafers to Jazz, indicating that Xceive did not intend to resell the silicon wafer received from Jazz. *Id.*

Respondents discount Cresta's arguments that the product Jazz sold to Xceive required further processing to become the Morton2, citing the testimony of Dr. Snelgrove that the Morton2 was a reduction to practice. RIB at 171 (citing CX-1968C at Q/A 88, 96-98). Respondents argue that any steps Xceive took in cutting, packaging, and bonding the product Jazz sold to Xceive are immaterial to the on-sale bar analysis. *Id.* Respondents also argue that whether the product Jazz sold to Xceive was commercially viable as sold is irrelevant to whether the products embodied the claimed invention. *Id.* at 171-172 (citing CX-1968C at Q/A 98).

Respondents further argue that Jazz's sale to Xceive was not experimental because the Morton2 chips purchased from Jazz were intended to be used as evaluation boards sent to customers to garner interest in the Morton2. *Id.* at 172-74 (citing Tr. at 384:6-387:7, 388:7-394:23; RX-1356C; RX-0931C; RX-0932C; RX-2034C at 527; RX-1902C at 597T; RX-1901C; RX-1547C; RX-1274C). Respondents also cite Federal Circuit law that an experimental use or sale cannot occur after a reduction to practice. *Id.* at 174-75.

Cresta argues in rebuttal that the fact that evaluation boards containing the Morton2 chip were subsequently loaned to customers after the critical date does not transform the initial transaction from an experimental purpose to a commercial purpose. CRB at 116-17. Cresta also argues that experimental use can occur after a reduction to practice for sales by suppliers and contract manufacturers. *Id.* at 117.

The on-sale bar applies when two conditions are satisfied before the critical date: (1) the claimed invention must be the "subject of a commercial offer for sale," and (2) "the invention must be ready for patenting." *Pfaff v. Wells Elec., Inc.*, 525 U.S. 55, 67 (1998). An invention is

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ready for patenting when prior to the critical date: (1) the invention is reduced to practice; or (2) the invention is depicted in drawings or described in writings of sufficient nature to enable a person of ordinary skill in the art to practice the invention. *Id.*; *Hamilton Beach*, 726 F.3d at 1375.

There appears to be no dispute that the invention was reduced to practice in May 2003 and therefore, that the invention was ready for patenting prior to the critical date. Cresta identified May 2003 as its date for reduction to practice in its interrogatory responses, RX-1533C at 6, and Dr. Snelgrove cites the May 2003 tape out as the reduction to practice for all asserted claims of the '792 patent (except claim 25), reviewing several Xceive documents to corroborate this date. CX-1968C at Q/A 88-90. *See also* CIB at 180-84; CRB at 115-18; RX-1677C at Q/A 631 (McNair DWS). Thus, the only question is whether the tape-out of the Morton2 designs constituted a commercial sale under 35 U.S.C. § 102(b). I find that Respondents demonstrate by clear and convincing evidence that the Morton2 designs was a commercial sale under § 102(b). Accordingly, all asserted claims of the '792 patent, except for claim 25, are invalid.

By Cresta's own admissions, the Morton2 design embodied all asserted claims of the '792 patent except for claim 25 and was taped-out to Jazz on May 16, 2003. RX-1533C at 6, 9-10 (Cresta Interrogatory Responses); RX-1677C at Q/A 631 (McNair DWS); CX-1968C at Q/A 88-90 (Snelgrove RWS). Regardless of whether the transaction between Xceive and Jazz is characterized a sale of services or a sale of products, Xceive paid Jazz to manufacture Morton2 silicon which embodied the asserted claims of the '792 patent except for claim 25. RX-1687C at 142:6-143:15 (Python Dep. Tr.); RX-1677C at Q/A 632-33 (McNair DWS). The Morton2 silicon was undoubtedly intended for use in evaluation boards that were eventually provided to Xceive's customers. Tr. at 384:6-387:7, 388:7-392:7 (Python); RX-1677C at Q/A 634 (McNair

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DWS); RX-0932C (Marketing document for the “Xceive XC3028 evaluation board”); RX-1356C (agreements to loan evaluation boards to potential customers). It is clear that the purpose of the evaluation boards was to demonstrate the capabilities of Xceive’s products to at least one of Xceive’s customers as early as May 23, 2003. RX-2034C at CRESTA0094527 [REDACTED] meeting minutes); Tr. 392:8-394:23; RX-1902C at [REDACTED] RX-1901C. Indeed, just two months after Xceive and its customer [REDACTED] met to discuss the evaluation boards and 30 days after the critical date, Xceive and [REDACTED] signed a memorandum of understanding wherein Xceive agreed to provide [REDACTED] evaluation boards and [REDACTED] agreed that it intended to purchase Xceive’s products if the evaluation boards were satisfactory. RX-1274C; RX-1677C at Q/A 634. Thus, I find that Respondents demonstrate by clear and convincing evidence that the transaction between Xceive and Jazz was a commercial sale.

I find Cresta’s arguments that the sale of silicon wafers from Jazz to Xceive was not a commercial sale because Jazz did not sell Xceive a commercially viable product are without merit. “What is important to an assessment of the commercial versus experimental significance of a sale is not necessarily the posture of the invention’s overall development, but the nature or purpose of the particular use to which the invention that is the subject of that sale is to be put.” *Allen Engineering Corp. v. Bartell Industries, Inc.*, 299 F.3d 1336, 1354 (Fed. Cir. 2002) (quoting *EZ Dock v. Schafer Systems, Inc.*, 276 F.3d 1347, 1356 (Fed. Cir. 2002) (Linn, J., concurring)). As discussed above, the Morton2 reduced to practice the asserted claims of the ‘792 patent except for claim 25 and the purpose of purchasing Morton2 silicon from Jazz was commercial in nature. The fact that additional processing of the silicon and experimentation was necessary to render a commercially viable product is irrelevant to whether the claimed invention,

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as embodied in the Morton2 design, was the subject of a sale that was primarily commercial in nature.

Further, I reject Cresta's experimental use defense. The Federal Circuit has made abundantly clear that an experimental use or sale cannot occur after a reduction to practice. *E.g.*, *In re Cygnus Telecommunications Tech., LLC*, 536 F.3d 1343, 1356 (Fed. Cir. 2008); *Zacharin v. U.S.*, 213 F.3d 1366, 1369 (Fed. Cir. 2000); *see also EZ Dock*, 276 F.3d at 1356-57 (Linn, J., concurring); *Certain Ammonium Octamolybdate Isomers*, Inv. No. 337-TA-477, Comm'n Op., 2004 WL 238488, at *23 (Jan. 5, 2004). The cases Cresta cites to the contrary are not persuasive. In *Certain Semiconductor Chips with Minimized Chip Package Size and Products Containing The Same (III)*, Inv. No. 337-TA-630, Comm'n Op., USITC Pub. No. 4209, 2010 WL 5276922 (Dec. 29, 2010), whether the invention had been reduced to practice prior to the offer for sale was not at issue. In fact, in that case, the alleged offer for sale occurred prior to conception of the invention. *Semiconductor Chips (III)*, 2010 WL 5276922, at *95, *102. Cresta's argument relies heavily on *Medicines Co. v. Hospira, Inc.*, 2014 WL 1292802 (D. Del. 2014), an unreported case from a district court. *Medicines* is not binding in this forum and is especially unpersuasive given that it directly contradicts relevant Federal Circuit precedent. Importantly, *Medicines* does not explicitly address the rule against claiming experimental use after a reduction to practice and fails to cite to *In re Cygnus*, *Zacharin*, *EZ Dock*, or any other Federal Circuit case stating this rule.

Cresta seeks to distinguish the Federal Circuit precedent barring experimental use after reduction to practice by arguing that those cases involved sales to third parties, which are presumed to be commercial. CRB at 117. Cresta characterizes Jazz's sale to Xceive as a supplier sale rather than a third-party sale, arguing that this type of sale cannot be presumed to be

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commercial and should thus still qualify for the experimental use exception. *Id.* The rule against experimental use after reduction to practice is not based on a presumption of commerciality, however: “The policy behind experimental use negation is to give the inventor an opportunity to reduce the invention to practice.” *Cont’l Plastic Containers v. Owens Brockway Plastic Prods., Inc.*, 141 F.3d 1073, 1079 (Fed.Cir.1998). Once an inventor has reduced the invention to practice, there is no reason to encourage further experimentation, and this applies equally to supplier sales and customer sales. Moreover, the Federal Circuit has held that “there is no ‘supplier exception’ to the on-sale bar.” *Hamilton Beach Brands, Inc. v. Sunbeam Products, Inc.*, 726 F.3d 1370, 1375 (Fed. Cir. 2013). Cresta admits that the asserted claims of the ‘792 patent except claim 25 were reduced to practice in May 2003 prior to the tape-out to Jazz, and I therefore find that Cresta is precluded from asserting an experimental use defense.

I therefore find that Jazz’s May 2003 sale of Morton2 silicon to Xceive was a commercial sale and that Morton2 was ready for patenting at that time. Accordingly, I find that asserted claims 1-4, 7-8, 10-12 and 26-27¹⁴ of the ‘792 patent are invalid as anticipated pursuant to the on-sale bar of 35 U.S.C. § 102(b).

¹⁴ The parties’ briefs and witness statements refer to all asserted claims (other than claim 25) of the ‘792 Patent, but this phrase is ambiguous. While Cresta asserts claims 1-4, 7-8, and 25-26 on infringement, CIB at 152, 161-67, Cresta asserts claims 1-4, 7, 10-12, 18-19, and 26-27 on domestic industry. CIB at 167-68. Cresta’s interrogatory response identifies the claims reduced to practice by May 2003 as claims 1-17, 26, and 27, RX-1533C at 6, and I therefore limit my findings to asserted claims (on both infringement and domestic industry) that are identified as reduced to practice in Cresta’s interrogatory response.

3. Obviousness

a. Boie

For the reasons stated below, I find that Respondents do not demonstrate by clear and convincing evidence that claims 1, 2, 3, 4, 7, 8, 25, or 26 are obvious over Boie alone or in combination with other prior art references.

i. Claim 1

Respondents argue that Boie discloses all limitations of claim 1 of the '792 patent except for the limitation "wherein the signal processor applies one of a plurality of finite impulse response filters to the digital representation of the intermediate frequency signal, each of the plurality of finite impulse response filters corresponding to a format of the input RF signal." *See* RIB at 176-78. Respondents argue that this limitation is rendered obvious by Boie in combination of the knowledge of one of ordinary skill in the art for the same reasons claim 10 of the '585 patent is rendered obvious by Boie. *Id.* at 177 (citing RX-1677C at Q/A 363).

Cresta argues that Boie does not render claim 1 obvious for three reasons. First, Cresta states that Boie does not disclose a "frequency conversion circuit" as claimed for the same reasons that it does not disclose "a tuner for receiving input RF signals" recited in the '585 patent. CRB at 105. Second, Cresta argues that Boie does not render the "wherein the signal processor applies one of a plurality of finite impulse response filters to the digital representation of the intermediate frequency signal, each of the plurality of finite impulse response filters corresponding to a format of the input RF signal" limitation obvious for the same reasons that Boie does not render obvious claim 10 of the '585 patent. CRB at 106. Third, Cresta argues that the demodulators taught in Boie do not disclose "a signal output circuit" as claimed for the same reasons that the demodulators taught in the '585 patent do not disclose the limitation. *Id.*

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I agree with the parties that the obviousness inquiry for claim 1 of the '792 patent is identical to that discussed above for claim 10 of the '585 patent. There is no dispute that Boie discloses a television receiver meeting the preamble of claim 1 of the '792 patent. *See* RX-0010 at Fig. 1; RX-1677C at Q/A 341-42 (McNair DWS); RX-1663C at Q/A 358 (Hashemi DWS). The "tuner" limitation of the '585 patent comprises the same limitations as the "frequency conversion circuit" limitation of the '792 patent, and I find this limitation disclosed in Boie for the reasons discussed above for claim 1 of the '585 patent. *Compare* JX-0001 at 6:53-57 and JX-0002 at 10:52-56. *See* RX-1677C at Q/A 244, 344; RX-1663C at Q/A 187, 359. The "analog-to-digital converter" limitation of the '585 patent is nearly identical to the "analog-to-digital converter" limitation of the '792 patent, and I find this limitation disclosed in Boie for the reasons discussed above for claim 1 of the '585 patent. *Compare* JX-0001 at 6:62-64 and JX-0002 at 10:57-59. *See* RX-1677C at Q/A 269, 360; RX-1663C at Q/A 194, 360. The first part of the "signal processor" limitation (prior to the "wherein" clause) in claim 1 of the '792 patent is nearly identical to the "signal processor" limitation in the '585 patent, and I find this limitation disclosed in Boie for the reasons discussed above for claim 1 of the '585 patent. *Compare* JX-0001 at 6:65-7:2 and JX-0002 at 10:60-65. *See* RX-1677C at Q/A 273, 364; RX-1663C at Q/A 195, 361. I also find that the final "signal output circuit" limitation of claim 1 of the '792 patent is disclosed by the demodulators in Boie for the same reasons discussed above for the "plurality of demodulators" limitation of claim 1 of the '585 patent. *See* RX-0010 at 3:14-25, 40-48; RX-1677C at Q/A 378; RX-1663C at Q/A 362.

I find that the "each of the plurality of finite impulse response [filters] corresponding to a format of the input RF signal" limitation is not disclosed by Boie, however. The "plurality of finite impulse response filters" claim language after the "wherein" clause in the "signal

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processor” limitation claim 1 of the ‘792 patent is nearly identical to claim 10 of the ‘585 patent. *Compare* JX-0001 at 7:36-40 and JX-0002 at 10:65-11:2. As discussed above in the context of claim 10 of the ‘585 patent, I find that Boie does not render this limitation obvious because Respondents do not demonstrate by clear and convincing evidence that it would have been obvious to one of ordinary skill in the art to implement Boie’s band-pass filter 8 as a plurality of FIR filters wherein each of the FIR filters corresponds to a format of the input RF signal. In addition, as discussed above in the context of anticipation of the ‘792 patent by VDP, I find that VDP also does not disclose this limitation. For those reasons, I therefore find that Boie does not render this “plurality of finite impulse response filters” limitation obvious alone or in combination with VDP.

Accordingly, I find that claim 1 of the ‘792 patent is not invalid as obvious over Boie or Boie in view of VDP.

ii. Claim 2

Respondents argue that Boie anticipates the additional limitation of claim 2. RIB at 178 (citing RX-1677C at Q/A 381). Cresta does not appear to dispute that Boie anticipates the additional limitation of claim 2. *Id.*; CRB at 105-06. Nevertheless, because I find that Boie does not render claim 1 obvious, I find that Boie also does not render claim 2 obvious.

iii. Claim 3

Claim 3 discloses “[t]he television receiver of claim 1, wherein the television receiver is formed as a monolithic integrated circuit.” JX-0002 at 11:10-11. Respondents argue that Boie in combination with VDP, Mirconas, Robbins, Tuttle, or the knowledge of one of ordinary skill in the art would render the additional limitation of claim 3 obvious. Respondents state that VDP teaches that a television receiver that may be implemented as an integrated circuit and that VDP

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is an improvement on Boie. RIB at 178 (citing RX-0030 at 1:6-2:26, 2:27-28; RX-1677C at Q/A 383). Respondents also state that multi-standard tuners implemented as integrated circuits was known to one of ordinary skill in the art and cites Micronas, Tuttle, and Robbins as examples. *Id.* at 178-79 (citing RX-1677C at Q/A 384; RX-0038 at 4, 22, Fig. 5-2; RX-0077 at 6:25-27; RX-0028 at 2:37-41, 13:4-6).

Cresta argues that Robbins only teaches partial integration and does not teach forming Boie's entire TV receiver as an integrated circuit. CRB at 107 (citing RX-0028 at 2:37-41, 4:29-31, 4:51-55, 13:4-6). Cresta argues that Micronas teaches only demodulators, not multi-standard tuners implemented on an integrated circuit. *Id.* Cresta argues that Tuttle should be disregarded because it is not prior art. *Id.* (citing RX-0077; CX-1981C at Q/A 889). Cresta does not appear to dispute that VDP teaches a television receiver that may be implemented as an integrated circuit and that VDP is an improvement on Boie. *Id.*

VDP teaches that it is an improvement on the television receiver disclosed in Boie. RX-0030 at 1:15-29; RX-1677C at Q/A 383. VDP teaches that the invention in VDP may be implemented as an integrated circuit. RX-0030 at 2:27-28; RX-1677C at Q/A 383. As discussed above, one of ordinary skill in the art would have been motivated to combine VDP and Boie. Nevertheless, because I find that Boie does not render claim 1 obvious, I find that Boie also does not render claim 3 obvious.

iv. Claim 4

Respondents argue that Boie teaches that FM demodulator 9 generates a baseband video signal CVBS and baseband sound signals Smod1 and Smod2. RIB at 179 (citing RX-1677C at Q/A 386; RX-0010 at Fig. 1). Respondents argue that CVBS, Smod1, and Smod2 are demodulated, but not yet decoded and are therefore baseband signals under the proper claim

construction. *Id.* Cresta argues, without explanation or citation to evidence, that CVBS, Smo1, and Smo2 are not baseband signals.

Under the proper claim construction, Boie teaches that FM demodulator 9 generates baseband video and audio signals that correspond to an analog television format. RX-1677C at 386; RX-0010 at Fig. 1. Nevertheless, because I find that Boie does not render claim 1 obvious, I find that Boie also does not render claim 4 obvious.

v. Claim 7

Claim 7 discloses:

The television receiver of claim 1, wherein the signal output circuit provides a first output signal and a second output signal corresponding to the digital output signals, the first output signal and the second output signal being differential output signals corresponding to a digital television format.

JX-0002 at 11:27-32.

Respondents argue that the additional limitation of claim 7 is rendered obvious by the combination of Boie and the knowledge of one of ordinary skill in the art or Boie and the Aero datasheet. Respondents state that differential output drivers were well known at the time of the invention and that one of ordinary skill in the art would have found it obvious to use differential output signals to support industry standard interfaces. RIB at 179-80 (citing RX-0017 at 17; JX-95 at 7; RX-1677C at Q/A 392-93). Respondents also argue that the Aero datasheet discloses a signal output circuit providing two differential output signals to support industry standard interfaces. *Id.* at 180 (citing RX-0017 at 17; RX-1677 at Q/A 392). Respondents state it would have been obvious to combine the differential outputs taught in the Aero datasheet with Boie. *Id.*

Cresta argues that Boie teaches digital output signals that interface with a digital QPSK demodulator and that one of ordinary skill in the art would have had no reason to output these signals as analog differential signals. CRB at 108 (citing CX-1981C at Q/A 346). Cresta also

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argues that one of ordinary skill in the art would not have combined the Aero datasheet with Boie because the Aero datasheet relates to cellular telephony architecture while Boie relates to TV receivers. *Id.*

I find that Respondents do not demonstrate by clear and convincing evidence that Boie in combination with the knowledge of one of ordinary skill in the art or in combination with the Aero datasheet renders claim 7 obvious. Aside from the conclusory testimony from Pf. McNair, Respondents do not provide any evidence that one of ordinary skill in the art would have found it obvious to use differential output drivers with the digital signal outputs disclosed in Boie. *See* RX-1677C at Q/A 392. Further, Boie is directed to TV receivers while the Aero datasheet is directed to cellular telephone receivers. CX-1981C at Q/A 346. Respondents and Pf. McNair do not identify any reason one of ordinary skill in the art would have been motivated to combine references from these disparate technologies.

Accordingly, because I find that Boie does not render claim 1 obvious, I find that Boie also does not render claim 7 obvious. In addition, I find that Respondents do not demonstrate by clear and convincing evidence that Boie in combination with the knowledge of one of ordinary skill in the art or in combination with the Aero datasheet renders the additional limitation of claim 7 obvious.

vi. Claim 8

Claim 8 discloses:

The television receiver of claim 7, further comprising:

- a demodulator circuit for demodulating the first output signal and the second output signal according to the television signal format of the input RF signal, the demodulator circuit generating video and audio baseband signals corresponding to the format of the input RF signal; and
- a decoder circuit coupled to decode the video and audio baseband signals for providing video and audio display signals corresponding to the digital television format.

JX-0002 at 11:33-42.

As discussed above, Respondents do not demonstrate by clear and convincing evidence that claim 1 or claim 7 are rendered obvious by Boie in combination with the knowledge of one of ordinary skill in the art or in combination with the Aero datasheet. Accordingly, claim 8 is not rendered obvious by Boie in combination with the knowledge of one of ordinary skill in the art or in combination with other prior art references.

vii. Claim 25

Claim 25 discloses:

The television receiver of claim 1, wherein the signal processor comprises a first computing unit and a second computing unit, the first computing unit processing a real part of the finite impulse response filter operation while the second computing unit processing an imaginary part of the finite impulse response filter operation.

JX-0002 at 14:29-34.

Respondents argue that Boie in combination with the knowledge of one of ordinary skill in the art and in combination with Knutson renders claim 25 obvious. RIB at 181 (citing RX-1677C at Q/A 408-09; RX-0076 at 2:28-50). Respondents state that Knutson describes two computing paths for complex signal processing and that it would have been obvious to combine the complex signal processing described in Knutson with the Boie's filter 8. *Id.* Respondents state that one of ordinary skill in the art would have been motivated to combine the references because Knutson describes the benefits of complex signal processing using FIR filters. *Id.*

Cresta states that it would not have been obvious to combine Knutson with Boie because Knutson describes complex functions associated with demodulators, not tuners and does not teach a signal processor with two computing units. CRB at 110 (citing RX-1981C at Q/A 388; RX-0076 at 2:29-50).

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Because I find that Boie does not render claim 1 obvious, I find that Boie also does not render claim 25 obvious. In addition, the shortcomings of Boie in combination with the knowledge of one of ordinary skill in the art and in combination with Knutson have been described in detail with respect to claim 12 of the '585 patent.

viii. Claim 26

Claim 26 discloses:

The television receiver of claim 1, further comprising a format/standard selection circuit coupled to the signal processor, the format/standard selection circuit generating a select signal indicative of a format of the input RF signal and the signal processor selecting a finite impulse response filter in response to the select signal.

JX-0002 at 14:35-41.

Respondents argue that Boie in combination with the knowledge of one of ordinary skill in the art and in combination with Micronas or Robbins renders claim 26 obvious. Respondents state that filter 8 is a digital filter whose response varies based on the received TV standard. RIB at 182 (citing RX-1677C at Q/A 410-12, 418; RX-0010 at Fig. 1; Tr. at 1230:17-20).

Respondents state that because filter 8 can be adjusted in response to the received TV standard, one of ordinary skill in the art would have understood that there must be a TV standard selection circuit as claimed. *Id.* Respondents further argue that Micronas teaches the use of the I2C interface to program a tuner with the received TV standard and that it would have been obvious to implement the I2C standard to the receiver described in Boie. *Id.* (citing RX-1677C at Q/A 413; RX-0038 at 16). Respondents also argue that it would have been obvious to combine the channel map disclosed in Robbins with the receiver described in Boie. *Id.* at 183 (citing RX-1677C at 416; RX-0038 at 3:16-21, Figs. 1, 3).

Cresta states that filter 8 in Boie as a whole is not TV standard dependent and that bandwidth is the only parameter in filter 8 that is TV standard dependent. CRB at 110-11 (citing

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Tr. 1229:19-21, 1240:5-7). Cresta also argues, without explanation, that it would not have been obvious to combine Micronas with Boie. CRB at 111 (citing CX-1981C at Q/A 961). Cresta states that Robbins is not in the same field of invention as the '792 patent and one of ordinary skill in the art would not have combined it with Boie. *Id.* (citing Cx-1981C at Q/A 619; RX-0028).

As discussed above, I find that claim 1 is not obvious in view of Boie and accordingly, I find that claim 26 is not invalid as obvious. In addition, because claim 26 includes a limitation requiring the selection of a finite impulse response filter in response to a select signal indicative of a format, I find that this limitation is not met for the same reasons discussed above for claim 1. Respondents do not identify any evidence of a selection of FIR filters in Boie, VDP, Micronas, or Robbins. I thus find that this FIR filter selection limitation of claim 26 is not rendered obvious for the same reasons discussed above for the FIR filter selection limitation of claim 1.

b. VDP

For the reasons stated below, I find that that claims 3, 7, 8, 25, and 26 of the '792 patent are not rendered obvious by VDP alone or in combination with the various identified prior art references.

i. Claim 3

Respondents argue that it would have been obvious to implement the television receiver taught in VDP on a monolithic integrated circuit. Respondents state that VDP expressly discloses that "the invention may wholly or partially be implemented as an integrated circuit." RIB at 183 (citing RX-1677C at Q/A 533-34; RX-0030 at 2:27-28). Respondents state that based on this disclosure, one of ordinary skill in the art would have found it obvious to implement the receiver disclosed in VDP as a monolithic integrated circuit. *Id.*

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Cresta argues that VDP does not disclose integrating an entire receiver onto a single die. CRB at 111-12 (citing CX-1981C at Q/A 895; RX-0030 at 2:27-28). Cresta states that VDP only teaches integrating AFRC and FILT onto a single die, rather than an integrating an entire receiver. *Id.*

As discussed above in relation to the obviousness of claim 3 over Boie in combination with VDP, VDP teaches that various components of a television receiver may be implemented as an integrated circuit. However, for the same reasons that VDP does not anticipate claim 1, I find that VDP does not render claim 3 obvious.

ii. Claim 7

Respondents argue that VDP in combination with the knowledge of one of ordinary skill in the art and in combination with the Aero datasheet renders claim 7 obvious. Respondents state that differential output drivers were well known at the time of the purported invention of the '792 patent and it would have been obvious to use differential output signals to support industry standard interfaces. RIB at 184 (citing RX-1677C at Q/A 540-42; JX-0095 at 7). Respondents also argue that the Aero datasheet discloses a signal output circuit providing two differential output signals to support industry standard interfaces. *Id.* at 180 (citing RX-0017 at 17; RX-1677 at Q/A 541).

Cresta argues that VDP does not disclose the claimed signal output circuit or any specific I and Q output signals. CRB at 112 (citing CX-1981C at Q/A 911). Cresta also argues that Respondents do not show why one of ordinary skill in the art would transform the digital output signals in VDP to analog differential signals. *Id.* Cresta also argues that one of ordinary skill in the art would not have combined the Aero datasheet with VDP because the Aero datasheet relates to cellular telephony architecture while VDP relates to TV receivers. *Id.*

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I find that Respondents do not demonstrate by clear and convincing evidence that VDP in combination with the knowledge of one of ordinary skill in the art or in combination with the Aero datasheet renders claim 7 obvious. Aside from the conclusory testimony from Pf. McNair, Respondents do not provide any evidence that one of ordinary skill in the art would have found it obvious to use differential output drivers with the digital signal outputs disclosed in VDP. *See* RX-1677C at Q/A 541. Further, VDP is directed to TV receivers while the Aero datasheet is directed to cellular telephone receivers. CX-1981C at Q/A 911. Respondents and Pf. McNair do not identify any reason one of ordinary skill in the art would have been motivated to combine references from these disparate technologies. Accordingly, I find that Respondents do not demonstrate by clear and convincing evidence that VDP in combination with the knowledge of one of ordinary skill in the art or in combination with the Aero datasheet renders claim 7 obvious. Furthermore, for the same reasons that VDP does not anticipate claim 1, I find that VDP does not render claim 7 obvious.

iii. Claim 8

As discussed above, Respondents do not demonstrate by clear and convincing evidence that claim 7 is rendered obvious by VDP in combination with the knowledge of one of ordinary skill in the art or in combination with the Aero datasheet. For those same reasons, claim 8, which depends from claim 7, is not rendered obvious by VDP in combination with the knowledge of one of ordinary skill in the art or in combination with other prior art references. Furthermore, for the same reasons that VDP does not anticipate claim 1, I find that VDP does not render claim 8 obvious.

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iv. Claim 25

Respondents argue that VDP in combination with the knowledge of one of ordinary skill in the art and in combination with Knutson renders claim 25 obvious. RIB at 185 (citing RX-1677C at Q/A 556-57; RX-0076 at 2:28-50). Respondents state that Knutson describes two computing paths for complex signal processing and that it would have been obvious to combine the complex signal processing described in Knutson with the VDP's FIL. *Id.* Respondents state that one of ordinary skill in the art would have been motivated to combine the references because Knutson describes the benefits of complex signal processing using FIR filters. *Id.* Respondents also state that it would have been obvious to implement two computing units because VDP discloses two separate components for processing real and imaginary parts of a signal. *Id.* (citing Tr. at 1246:11-1248:15; RX-1677C at Q/A 557).

Cresta states that VDP does not teach a plurality of FIR filters. CRB at 113 (citing CX-1981C at Q/A 961). Cresta also states, without explanation or citation to evidence, that VDP does not disclose a select signal indicative of a format of the input RF signal that causes the signal processor to select a FIR filter. *Id.* at 113-14.

The shortcomings of Boie in combination with the knowledge of one of ordinary skill in the art and in combination with Knutson have been described in detail with respect to claim 12 of the '585 patent. For those same reasons, I find that VDP in combination with Knutson does not render claim 25 of the '792 patent obvious. Further, I find that for the same reasons that VDP does not anticipate claim 1, VDP does not render claim 25 obvious.

v. Claim 26

Respondents argue that VDP in combination with the knowledge of one of ordinary skill in the art and in combination with Micronas or Robbins renders claim 26 obvious. Respondents

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state that VDP discloses a standard select signal IFsel generated by a controller. RIB at 186 (citing RX-0030 at 3:20-24, Fig. 5; RX-1677C at Q/A 559). Respondents state that it would have been obvious to use IFsel to select the appropriate FIR filter response for the standard of the input RF signal being received. *Id.* Respondents also state that one of ordinary skill in the art would have known how to implement a standard selection circuit in multi-standard tuners like VDP. *Id.*

Respondents further argue that Micronas teaches the use of the I2C interface to program a tuner with the received TV standard and that it would have been obvious to implement the I2C standard to the receiver described in VDP. *Id.* (citing RX-1677C at Q/A 560; RX-0038 at 16). Respondents also argue that it would have been obvious to combine the channel map disclosed in Robbins with the receiver described in VDP. *Id.* at 183 (citing RX-1677C at 562; RX-0038 at 3:16-21, Figs. 1, 3).

Cresta argues that VDP only discloses a signal but not the controller that generates the signal. CRB at 114 (citing CX-1981C at Q/A 961). Cresta also argues that the disclosure of an I2C interface in the Micronas demodulator does not indicate that a person of ordinary skill in the art would have been motivated to combine Micronas with VDP. *Id.* Cresta also states that one of ordinary skill in the art would not have found it obvious to combine the channel map of Robbins with the receiver in VDP. *Id.* at 115 (citing CX-1981C at 619).

The shortcomings of Boie in combination with the knowledge of one of ordinary skill in the art and in combination with Robbins and Micronas have been described in detail with respect to claim 13 of the '585 patent. For those same reasons, I find that VDP alone or in combination with Boie, Robbins or Micronas does not render claim 26 of the '792 patent obvious. Moreover,

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I find that for the same reasons that VDP does not anticipate claim 1, VDP does not render claim 26 obvious.

c. Secondary Considerations of Nonobviousness

Because I find that Respondents have not made a *prima facie* case of obviousness for the '792 patent, I do not consider Cresta's arguments regarding secondary considerations. The analysis for secondary considerations of nonobviousness for the '792 patent would be the same as the analysis above for the '585 patent.

VI. DOMESTIC INDUSTRY

In patent-based proceedings under Section 337, a complainant must establish that an industry "relating to the articles protected by the patent ... exists or is in the process of being established" in the United States. 19 U.S.C. § 1337(a)(2). Under Commission precedent, the domestic industry requirement of Section 337 consists of an "economic prong" and a "technical prong." *Certain Stringed Musical Instruments and Components Thereof*, Inv. No. 337-TA-586, Comm'n Op. at 12-14, 2009 WL 5134139, at *10 (April 24, 2008) ("*Stringed Musical Instruments*").

A. Economic Prong

1. Introduction and Overview

In late 2012 Cresta was a fabless television tuner design company facing failure due to the lack of any significant market for its domestic industry products. By early 2013 Cresta had

[REDACTED]

[REDACTED]

A year later Cresta filed this action asserting a domestic industry based on "Year 1," which ran from October 2011 through September 2012, and "Year 2," which ran from October

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2012 through September 2013. CX-1685C at ¶ 4. Cresta's Complaint contains [REDACTED] [REDACTED] no indication that it seeks to establish a domestic industry on any basis other than the activities set forth in Year 1 and Year 2. Nor is there any indication that Cresta seeks to establish a domestic industry at any time other than January 28, 2014, the date the Complaint was filed.¹⁵

Respondents and Staff filed a motion for summary determination on October 16, 2014, arguing that Cresta [REDACTED] [REDACTED] and that it no longer satisfied the domestic industry requirement. Motion Docket No. 910-037. Respondents and Staff claimed that using the date a complaint is filed to decide domestic industry is subject to an exception for cases in which there has been a substantial change in the complainant's status, and they relied on events that occurred after January 28, 2014, which they said showed Cresta's [REDACTED]

In response to these allegations, Cresta's approach to establishing a domestic industry shifted. At hearing, while continuing to insist that only events pre-dating the filing of its Complaint should be considered, [REDACTED] [REDACTED] Cresta sought to prove instead that it engaged in substantial, post-filing domestic industry activity.

Cresta's conflicting strategies result in a confused and unpersuasive record regarding the existence of a domestic industry. As discussed below, Cresta fails to prove that a domestic

¹⁵ On June 12, 2014, Cresta filed an Amended Complaint but did not alter its domestic industry allegations. *Compare* Complaint at 20 (Jan. 28, 2014), *with* First Amended Complaint at 23 (June 12, 2014).

¹⁶ The motion for summary determination was denied on the ground that it required the resolution of factual disputes. Order No. 41.

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industry existed as of the date its Complaint was filed, for multiple reasons. As a result, I need not decide the legal issue raised by Respondents and Staff: whether post-filing events indicating a dwindling market should be considered. I do, however, address the facts related to post-filing events to the extent they may be deemed relevant. I find that Cresta's evidence of alleged domestic industry activities after January 2014 is unreliable and cannot support a finding that such activities are significant or substantial.

2. Legal Standards

Subsection (2) of Section 337(a) states that the protection against unfair practices in import trade applies "only if an industry in the United States, relating to the articles protected by the patent . . . concerned, exists or is in the process of being established." 19 U.S.C. § 1337(a)(2). To prevail on the theory that a domestic industry is "in the process of being established" under subsection (a)(2), the patent owner must:

demonstrate that he is taking the necessary tangible steps to establish such an industry [and] must be actively engaged in steps leading to the exploitation of the intellectual property, including application engineering, design work, or other such activities.

Stringed Musical Instruments, 2009 WL 5134139, at *12 (April 24, 2008) (citations omitted).

With respect to the "economic prong," subsection (3) of Section 337(a) provides:

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, mask work, or design 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).

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3. Date for Determining Existence of a Domestic Industry

In *Motiva, LLC v. U.S. Int'l Trade Comm'n*, the Federal Circuit stated that to establish a domestic industry based on licensing, a complainant must produce evidence of production-related activity at the time it chooses to file its complaint. 716 F.3d 596, 601 n.6 (Fed. Cir. 2013). A complainant seeking to establish a domestic industry through *past* investments and activities must show “that its old development activities contributed to a market that existed or was in the process of being created at the time of its complaint.” *Id.* *Motiva* establishes a requirement that a domestic industry, or at least a market for domestic industry products, must exist or be in the process of being created as of the time a complaint is filed under section 337.¹⁷

Motiva affirmed “the Commission’s use of the date of filing of *Motiva*’s complaint” as the date for determining if the domestic industry requirement was satisfied. 716 F.3d at 601, note 6. The Commission decision in the same case, *Certain Video Game Systems and Controllers*, Inv. No. 337-TA-743, Comm’n Op. at 4-5 (Jan. 20, 2012), stated the general rule affirmed in *Motiva* but also noted that sometimes post-filing events are relevant, when “new, relevant and timely disclosed evidence” is developed “or because there is evidence that a complainant’s domestic industry is dwindling.” *Id.* at 5-6.¹⁸

¹⁷ Staff asserts that the Commission may look to the date that an amended complaint was filed to assess the existence of a domestic industry. *Certain Electronic Imaging Devices, Inc.*, No. 337-TA-726, ID/Order No. 18 at 8-16 (Feb. 7, 2011) (Commission Notice Not to Review, Mar. 8, 2011). The cited decision antedates the most recent precedent concerning the general rule for determining the date of a domestic industry. If the operative date in this case were moved to the date that Cresta’s Amended Complaint was filed, June 12, 2014, it would not significantly alter my analysis or conclusions.

¹⁸ Decisions since *Motiva* indicate some flexibility in the rule regarding date of filing. In *Certain Kinesiotherapy Devices and Components Thereof (“Kinesiotherapy”)*, Inv. No. 337-TA-823, Comm’n Op. at 30 (June 17, 2013), the Commission counted toward a domestic industry expenses relating to the complainant’s original domestic industry product, notwithstanding that the product had been discontinued before the complaint was filed. The Commission held that

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Respondents and Staff argue that the “exception” for post-filing events described in the Commission’s decision in *Certain Video Game Systems* applies in this case. Respondents and Staff assert that Cresta’s Complaint describes a business that [REDACTED]

[REDACTED] Respondents and Staff contend that by the time the Complaint was filed the [REDACTED]

[REDACTED] Respondents assert that although Cresta continued to engage in some activities involving the alleged domestic industry products, in particular sales to customers abroad, [REDACTED]

[REDACTED] Instead, according to Staff and Respondents, Cresta had [REDACTED]

Cresta responds by arguing both ways: it says that the operative date for decision is the date the Complaint was filed but also relies heavily on post-Complaint events. Cresta first maintains that the post-Complaint events noted by Respondents and Staff should not be considered. CIB at 188-89. Indeed, at hearing, counsel for Cresta lodges a running objection to questioning about Cresta’s litigation expenses [REDACTED] see Tr. at

expenditures on the original product should be counted toward establishing a domestic industry because the original product “continued to be developed and refined” in subsequent products. *Id.* In *Certain Elec. Digital Media Devices & Components Thereof* (“*Digital Media Devices*”), Inv. No. 337-TA-796, Comm’n Op. at 98-102 (Sept. 6, 2013), the Commission cited precedent that “‘a domestic industry can be found based on complainant’s past activities in exploiting the [asserted] patent.’” *Id.* (quoting *Certain Variable Speed Wind Turbines and Components Thereof* (*Wind Turbines*), Inv. No. 337-TA-376, Comm’n Op. at 25 (Sept. 23, 1996)). In *Wind Turbines*, the Commission noted, the economic prong was satisfied “where complainant continued to operate and service wind turbines after discontinuing manufacturing.” *Digital Media Devices* at 100.

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728:9-729:11), on the ground that the filing of the complaint is “the date of the determination of domestic industry, and after that it’s not relevant.” Tr. at 735:8-13.

Cresta also relies, however, on events that occurred after filing, including events that occurred after the close of discovery. *See* CIB at 195 (“CrestaTech continues to invest in domestic engineering, R&D, and production support activities directed toward the domestic industry products today.”); CX-1710C at Q/A 33. In its post-hearing reply brief, Cresta asserts the theory that “a complainant may rely on investments directed to discontinued products to establish a domestic industry when there are subsequent investments in next-generation products that practice the same patents.” CRB at 124 (citing *Digital Media Services*, Inv. No. 337-TA-796, Comm’n Op. at 98-102). The problem with this theory is that Cresta [REDACTED]

[REDACTED] It is undisputed that Cresta [REDACTED]

[REDACTED] *See* Tr. at 549:10-553:3, 762:5-7 [REDACTED]

[REDACTED] CX-1710C at Q/A 26.¹⁹

Cresta also points to pre-*Motiva* cases, arguing that an entity that has ceased to engage in a domestic industry can satisfy the statute by relying on past domestic industry activities, provided that it continues to engage in activity that exploits the patent. *See Wind Turbines*, 337-TA-376 Comm’n Op. at 25 (citing *Battery-Powered Ride-On Toy Vehicles*, Inv. No. 337-TA-314, Initial Determination (Dec. 5, 1990) (unreviewed in pertinent part)). *Wind Turbines* and *Battery-Powered Ride-On Toy Vehicles* broadly share the following fact pattern: the patent owner has a domestic industry when the invention is developed and patented but manufacturing

¹⁹ For the reasons stated herein, Section 337(a)(2) does not help Cresta to satisfy the statutory requirement. There is no reliable evidence that would support a finding that Cresta is “in the process” of establishing a domestic industry.

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stops due to economic constraints. Depending on other circumstances, such as the amount of time that has passed since the patent owner stopped manufacturing, there may be a domestic industry based on continuing “substantial investment in plant and equipment, significant employment of labor and capital, and substantial investment in engineering, research and development related to the patented technology, as well as evidence that [the patent owner] continues to exploit the patent (albeit in a more limited fashion). . . .” *Wind Turbines*, Comm’n Op. at 26 (modifications in original).

Under *Motiva* and the recent decisions of the Commission, which generally hold that a domestic industry must exist at the time the complaint is filed, this theory may no longer be available.²⁰ Assuming the *Wind Turbines* approach applies, however, Cresta’s effort to establish a domestic industry still fails. Cresta’s domestic industry witness, Matthew Lewis, quantifies activities that took place in 2011 and 2012. Those activities were based on the fables design of television tuners. Several months before the Complaint was filed those activities [REDACTED]

[REDACTED]

[REDACTED]

The evidence Cresta does present is unreliable and conflicting.

As explained below, I find that Cresta’s pre-Complaint domestic industry ceased some six months or more before the Complaint was filed and that its post-Complaint domestic industry activities, to the extent they are relevant, are insignificant.²¹

²⁰ *Certain Video Games* contemplates an exception to the general rule regarding date of filing in the context of a diminishing domestic industry, not the revival of a domestic industry that was moribund as of the date of filing.

²¹ Under *Bally/Midway Mfg. v. U.S. Int’l Trade Comm’n*, 714 F.2d 1117, 1120 (Fed. Cir. 1983), a complainant that no longer can satisfy the economic prong may prevail nevertheless if its domestic industry was destroyed as the result of unfair competition. The *Bally/Midway* doctrine

4. Nature of the Domestic Industry²²

Matthew Lewis, Cresta's chief financial officer, describes a domestic industry that is based on the fabless design of silicon tuners using the patented technology. He states that Cresta is a "fabless semiconductor manufacturer" that "designs and engineers its products, including full integrated circuit (IC) design" CX-1685C (Decl. of Matthew Lewis) at 3; *see* CX-1706C (WS of Matthew Lewis) at 8.²³ He states that Cresta specializes in "silicon tuners for televisions and television viewing products." CX-1706C at Q/A 8. "We design and engineer all of our products," Mr. Lewis testifies, "including fully integrated circuit (IC) design, in house and contract with third parties for the actual production, packaging, and testing of our IC's." He adds, "We also do some testing of our products in house." *Id.* In addition to design engineering, Mr. Lewis testifies, "CrestaTech's U.S. personnel perform continued testing and product support after its products are produced." *Id.*

According to Mr. Lewis, "on a high level" Cresta's technical employees perform engineering, research and development (R&D) and "production support related to the company's tuner products." *Id.* at Q/A 15. Cresta offers two series of products, "The XC5000 series and CTC70X series." *Id.* at Q/A 14. Cresta's non-technical employees perform administrative functions, provide information technology support, "as well as engage in sales and marketing for

is inapplicable because Cresta (1) did not have a domestic industry on the date the Complaint was filed, and (2) has not shown that its alleged domestic industry was destroyed by unfair competition. *See infra*. subsection 9.

²² Cresta alleges a domestic industry under subsections (A), (B) and (C) of Section 337(a)(3). For the reasons discussed herein, I find that Cresta has not established the existence of a domestic industry as of the date its Complaint was filed, or thereafter, under any of these subsections.

²³ A "fabless" producer of IC "means a company that has the design of a product does not have the facility to actually turn it into a physical implementation. You need a fab, a foundry to actually do, then, the manufacturing of the silicon devices." RX-1683C at 73:5-11.

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our XC5000 series and CTC70X series products.” *Id.* at Q/A 15. Those products are Cresta’s domestic industry products. *Id.* at Q/A 16-17; *see also* Tr. at 491:7-15.

To summarize, Cresta’s domestic industry, according to Mr. Lewis, consists primarily of design and engineering of the XC5000 and CTC70X series tuners. Mr. Lewis says that production, packaging and testing are contracted to third parties. He adds, however, that Cresta technical employees perform “continued testing” and product support. He does not specify the nature or extent of the testing and product support. Sales and marketing activities with regard to the XC5000 series and CTC70X series products also contribute to Cresta’s domestic industry, according to Mr. Lewis.

Mihai Murgulescu is Cresta’s chief technical officer and one of the founders of the company. CX-1710C at Q/A 6-7, 19. Mr. Murgulescu also testifies about the XC5000 and CTC70X series products. *Id.* at Q/A. 9-12. Mr. Murgulescu provides a more expansive description of Cresta’s domestic industry. Mr. Murgulescu characterizes Cresta’s business as providing cradle-to-grave television tuner services.²⁴ “Once CrestaTech’s products are mass produced, its domestic engineers continue to support those products throughout their lifecycles.” CIB at 194.

Mr. Murgulescu describes product development activities, maintenance and support activities and customer-driven engineering projects, which are performed by Cresta’s [REDACTED]

²⁴ Cresta acknowledges that the XC5000 series products were designed by Xceive before Cresta purchased Xceive’s assets in 2011. CIB at 192. Cresta states that, with respect to the XC5000 products, its engineers conduct “product support activities on those products, including updating firmware, solving problems with customers using existing firmware, and investigating the products’ abilities to work with new demodulators in the market.” *Id.* With respect to the CTC70X, Cresta took over development from Xceive and Cresta’s “activities related to those products involves the entire product life cycle, including product development and product support.” *Id.* at 194.

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remaining engineers in the U.S. *Id.* at Q/A 25-33. Specifically, he identifies product development activities to include “determining market requirements, specifying product requirements, designing chip architecture, block design, layout, and tape-out,” as well as “wafer fabrication, chip packaging, testing chip evaluation, evaluation kit design and manufacturing, industry-specified test, characterization, and debugging.” *Id.* at Q/A 31, 32. Mr. Murgulescu testifies that Cresta’s engineers perform additional activities: “customer-driven engineering projects, such as firmware upgrades and modifications to ensure continued optimal performance of our products in our customers’ applications. Also, we are looking forward for new products and markets for our company.” *Id.* at Q/A 33.

Mr. Murgulescu describes in detail the development of the CTC70X, part of which took place at Xceive between [REDACTED] CX-1710C Q/A 41-55. Cresta did not become involved until the block design phase of the project, [REDACTED] *Id.* at Q/A 46-49. Mr. Murgulescu describes the other steps in the CTC70X development process and the role played in it by Cresta’s engineers. *Id.* at Q/A 50-69.

Mr. Murgulescu reviews documents as evidence of various activities ascribed to Cresta engineers. *Id.* at Q/A 85-119. He also describes development of testing protocols by Cresta’s engineers for use by third-party testing companies. *Id.* at Q/A 78. Mr. Murgulescu states that Cresta’s engineers provide updates to firmware once product designs are finalized. *Id.* at Q/A 80-84.

Mr. Murgulescu describes Cresta’s current engineering activities, stating that the company [REDACTED]
[REDACTED]

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[REDACTED] *Id.* He mentions [REDACTED]
[REDACTED] *id.* at Q/A 123,
124, and describes specific activities of Cresta's engineers [REDACTED] *Id.*
Q/A 126.²⁵

Mr. Murgulescu's description of Cresta's domestic industry is not limited to Year 1 and Year 2. He places more emphasis on sales, product maintenance (software/firmware) and customer service. In contrast, Mr. Lewis's description of the domestic industry in Year 1 and Year 2 is weighted toward engineering, R&D and development of the domestic industry products. As Cresta describes it in its post-hearing submissions, [REDACTED]
[REDACTED]

Cresta states that it was founded in 2005 "and started designing and developing products related to the software/firmware aspect of TV reception design." CRB at 119; CX-1710C at Q/A 15. Cresta asserts that this was its business "at its founding, when it filed the Complaint, and [] today." *Id.* See also CRB at 212-14. Cresta states that in September 2011, "after acquiring the assets of Xceive," including the patents-in-suit, Cresta "shifted its focus to engineering, research and development and production support for the XC5000, CTC70X, and CTC71X series silicon tuner products." CRB at 119; CX-1710C at Q/A 15. Cresta thus identifies two distinct business

²⁵ Marketing and sales activity alone is not sufficient to establish a domestic industry under subsection (C). *Stringed Musical Instruments*, 2009 WL 5134139 at *11; *Certain Computers and Computer Peripheral Devices and Components Thereof*, Inv. No. 337-TA-841, Comm'n Op., 2014 WL 5380098 at *32 (Jan. 9, 2014) (noting that "marketing and sales" alone are insufficient to establish a domestic industry); *Certain Integrated Circuits, Processes for Making Same, and Products Containing Same*, Inv. No. 337-TA-450, Initial Determination at 150 (May 6, 2002) ("Furthermore, the mere marketing and sale of products in the United States is insufficient to constitute a domestic industry.") (citing, *inter alia*, S. Rep. No. 71, 100th Cong. 1st Sess., at 129 (1987); H.R. Rep. No. 40, 100th Cong., 1st Sess., pt. 1, at 157 (1987)) (unreviewed in pertinent part).

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models. According to Cresta, a software/firmware model existed as of Cresta's founding, on the day the Complaint was filed, and continues today. Cresta's business model in 2011 and 2012 (Year 1 and Year 2), which was focused on research and development relating to the patented products, XC5000 and CTC70X tuners, constituted a "shift" in its operations, Cresta says.²⁶

In addition to the change in emphasis from software/firmware design to engineering and R&D on the domestic industry products, Cresta also expands its domestic industry activities beyond the allegations in the Complaint and in Mr. Lewis's witness statement to include the CTC71X series tuner. Cresta asserts that it has established a domestic industry based on "its XC5000 series and next generation CTC70X and CTC71X series products." CIB at 185. In its reply post-hearing brief, Cresta states that it "conducted all development activities for the CTC71X products, which are in the same category as the CTC70X products, [REDACTED] CRB at 126. As discussed herein, these assertions regarding the CTC71X series are inconsistent with the other evidence presented by Cresta. Notably, the documents Cresta cites in support of

²⁶ Mr. Murgulescu states "CrestaTech's involvement with the XC5000 series and CTC70X series products began in September 2011 when CrestaTech acquired the assets of Xceive Corporation, which included the patents we are asserting. Before that, our main business was the software/firmware aspect of television reception design." CX-1710C at Q/A 15. Mr. Murgulescu's statement confirms that Cresta's activities before it acquired the patents-in-suit were different from the domestic industry activities described in the Complaint. Cresta's description of its software/firmware activities, moreover, is not linked to the patented technology, which was acquired in September 2011 and, apparently, abandoned in 2013. See RX-1307C at 316580 [REDACTED]

[REDACTED] Only to the extent that Cresta can tie its activities to the patented technology can it establish a domestic industry. See 19 U.S.C. §1337(a)(2) (requiring an industry relating to the articles protected by the patent); 19 U.S.C. §1337(a)(3)(C) (requiring exploitation of the patent). On this record, Cresta fails to establish the necessary tie, apart from the activities that are alleged to have occurred in Year 1 and Year 2.

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these assertions [REDACTED]

[REDACTED] See CRB at 126 (citing CX-1123C; CX-1137C).²⁷

The inconsistency of Cresta's allegations makes the exact nature of its alleged domestic industry unclear. Is it the industry that is alleged to exist in Year 1 and Year 2, as described by Mr. Lewis and by Cresta in its initial post-hearing brief? CIB at 156 (citing CX-1706C at Q/A 31-32). That industry was predicated on design and development of the XC5000 and CTC70X tuners. CIB at 198.²⁸ Or is Cresta's domestic industry the expansive "software/firmware aspects of tv design" that Cresta says existed from 2005 until 2011, was ostensibly revived in 2014 (on the date the Complaint was filed) and continues "today," according to Cresta's reply brief and Mr. Murgulescu? See CRB at 119, 126; CX-1710C at Q/A 17. Does the CTC70X domestic industry product include the CTC71X or not? (The answer appears to be not, *see infra* at 192 nn. 44, 45.) Cresta has muddled its allegations, making it difficult to discern the true nature, scope and duration of its domestic industry, if any. The result is that Cresta fails to carry its burden of proof. See *Certain Methods of Making Carbonated Candy Products*, Inv. No. 337-TA-292,

²⁷ The purport of CX-1123C is unclear but the topic seems to be this litigation, not Cresta's domestic industry activities. The author of the document, Cresta's Vice President of Sales, Ramon Cazares, states [REDACTED]

[REDACTED] CX-1123C at 00113746; Tr. at 564:25-565:2. I note in addition that Mr. Cazares includes in the [REDACTED]

[REDACTED] I note further Mr. Cazares's request to have [REDACTED]

[REDACTED] CX-1123C at 00113747. [REDACTED]

²⁸ CX-1685C is Mr. Lewis's declaration submitted at the time the Complaint was filed. In his declaration, Mr. Lewis states that Cresta's "entire business is the development, production, sales, and support of the Domestic Industry Products." CX-1685C at 2 ¶ 6.

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Comm'n Op. at 34-35, 1991 WL 790063 at *17 (June 1991) (complainants have the burden of proving domestic industry).

5. Cresta's Alleged Expenditures

Mr. Lewis states that as Cresta's CFO he was responsible "for providing information regarding the amount of the company's domestic investments over a two year period for the products covered by the patents being asserted in the ITC complaint." CX-1706C at Q/A 29. He states that he consulted with Mr. Murgulescu "to determine the amount of time spent by each engineer on the XC5000 series, CTC70X series and X9 series products." *Id.* at Q/A 30. In the declaration submitted with Cresta's Complaint, he states that he routinely attended meetings at Cresta "concerning planning and personnel utilization." CX-1685C at ¶ 5. He says that through attendance at those meetings "as well as my HR responsibilities, I am knowledgeable about the investment in and allocation of personnel relative to the Domestic Industry Products," and that he also is "generally familiar with the work required to research, develop, design, manufacture, maintain, and support the Domestic Industry Products." *Id.*

Mr. Lewis calculates Cresta's domestic industry "over two distinct one year periods." CX-1706C at Q/A 31. He refers to the period from October 2011 through September 2012 as Year 1, and the period from October 2012 through September 2013 as Year 2. *Id.*

Mr. Lewis purports to adopt the calculations set forth in CX-1685C to quantify Cresta's domestic industry expenditures in Year 1 and Year 2. CX-1706C at Q/A 33.²⁹

²⁹ Mr. Lewis's declaration states that Cresta's "domestic costs associated with the Domestic Industry Products" were [REDACTED] for Year 1 and [REDACTED] for Year 2. CX-1685C at 2 ¶ 6. As discussed herein, the amounts in Mr. Lewis's declaration are inaccurate, as he was compelled to acknowledge. *See* Tr. at 742:4-757:18.

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Mr. Lewis states that Cresta's domestic investment in labor for individuals who spent time working on the domestic industry products was approximately [REDACTED] in Year 1 and [REDACTED] in Year 2. CX-1706C at Q/A 34-35.

Regarding plant and equipment, Mr. Lewis states that Cresta's domestic industry investment in "rent and other expenses directed to its facilities" was [REDACTED] in Year 1 and [REDACTED] in Year 2. CX-1706C at Q/A 45. He states that Cresta's investments in domestic equipment were [REDACTED] in Year 1 and [REDACTED] in Year 2. *Id.* For domestic manufacturing, Mr. Lewis estimates that Cresta invested approximately [REDACTED] with domestic suppliers in Year 1 and approximately [REDACTED] in Year 2. *Id.* at Q/A 48.

Mr. Lewis separately calculates Cresta's domestic investments directed to engineering, R&D and "production support" for the domestic industry products. CX-1706C at Q/A 51. He allocates Cresta's "overall investments in labor related to the domestic industry products" to determine what amounts were directed to engineering, research and development, and production support for the domestic industry products "over selected months in Year 1 and Year 2." *Id.* at Q/A 53.³⁰ This calculation "showed that approximately [REDACTED] of Cresta's employees "who spent time working on the domestic industry products were engaged in engineering, R&D, and production support in Year 1 and [REDACTED] were engaged in engineering, R&D, and production support in Year 2." *Id.* at Q/A 53. Based on those percentages, Mr. Lewis "initially calculated" that Cresta's domestic investment in labor directed to engineering, R&D and production support dedicated to the domestic industry products was approximately [REDACTED] in Year 1 and [REDACTED] in Year 2. *Id.*

³⁰ Mr. Lewis's witness statement does not explain why he selected particular months to perform this calculation.

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After his Declaration was filed, Mr. Lewis states that he conducted another calculation for engineering expenditures, estimating the amount of Cresta's domestic expenditures that were "directed to the XC5000 series and CTC70X series products individually." CX-1706C at Q/A 54; *see also* JX-0153C. This new calculation is based on a compilation of individuals who were employed by Cresta during Year 1 and Year 2. *Id.* at Q/A 55. Mr. Lewis and Mr. Murgulescu, "based on our personal knowledge of what projects CrestaTech's employees were working on," estimated the percentage of time spent on the XC5000 and the CTC70X products. *Id.* at Q/A 55. Mr. Lewis determines that his previous estimates "inadvertently" included [REDACTED]

[REDACTED]
Id. at Q/A 59. Mr. Lewis corrects his original calculation, resulting in an estimate of [REDACTED] directed to engineering, R&D, and production support in Year 1 and [REDACTED] in Year 2. *Id.* at Q/A 60-61. He adds benefits to his salary calculation for engineering, R&D, and production support. *Id.* at Q/A 62.

Mr. Lewis corrects his calculation of "plant and equipment" costs under subsection (C), as well. CX-1706C at Q/A 63-64. The result is [REDACTED] related to "Domestic Facilities Costs Related to XC5000 and CTC70X Engineering" in Year 1, and [REDACTED] in Year 2. *Id.*

Mr. Lewis calculates equipment costs under subsection (C). Those costs amount to about [REDACTED] in Year 1 and [REDACTED] in Year 2. *Id.* at Q/A 67.

Mr. Lewis turns to expenditures incurred with domestic suppliers. By adding up purchase orders between Cresta and [REDACTED] which manufactures analog dies in [REDACTED] Mr. Lewis calculates that Cresta made payments to [REDACTED] of

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██████████ in Year 1 and ██████████ in Year 2. *Id.* at Q/A 68-75.³¹ ██████████
██
██

██ *Id.* at Q/A 76. Mr. Lewis then describes “Allocations Between XC5000 and CTC70X Series Products” by “Time Estimate,” “Sales Quantity,” and “Domestic Manufacturing.” CX-1706C at Q/A 82-88.

Mr. Lewis’s presentations do not provide a clear picture of the amounts invested in Cresta’s alleged domestic industry in Year 1 and Year 2. Mr. Lewis is impeached at hearing in several respects and his testimony is marred by inconsistencies and errors. *See* Tr. at 742-57, *infra.* n.42. I agree with Respondents’ expert that, given Mr. Lewis’s mistakes, conflicting evidence, and questionable allocation of time and resources, his testimony cannot be relied upon. *See* Tr. at 1125:3-1128:8 (“these percents are not very reliable. And I don’t believe that this document [JX-0153C] is reliable.”).

Cresta’s post-hearing submissions rely on Mr. Lewis’s underlying calculations. *See* CIB at 197-212. Cresta represents that “total investment in salary and benefits for domestic employees who spent time working on the domestic industry products was approximately ██████████ in Year 1 and ██████████ in Year 2.” *Id.* at 197-98. Cresta states that its “total investment in labor and capital dedicated to engineering, R&D, and production support of the domestic industry products was ██████████ in Year 1 and ██████████ in Year 2,” for a total of

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██████████ *Id.* at 201. Cresta further states that its “total expenditures in plant and equipment dedicated to engineering, R&D, and production support of the domestic industry products was ██████████ in Year 1 and ██████████ in Year 2,” for a total of ██████████. *Id.* at 203. Cresta separately calculates “qualifying” investments in the XC5000 series and CTC70X series and maintains that either product’s expenditures are sufficient to establish a domestic industry. *Id.* at 205-07. Cresta estimates its “investments in payments to ██████████ for a total of ██████████. *Id.* at 208.

Arguing that its “qualifying domestic industry investments are significant and substantial in an absolute sense when viewed in total,” Cresta presents a summary of its investment in plant and equipment ██████████ labor ██████████; and domestic suppliers ██████████. *Id.* at 208-10.

The absence of a correct, consistent methodology undermines Cresta’s claim to a domestic industry. *See* Tr. at 1125:24-1126:2 (“[C]ertainly, over the course of this case and the various interrogatory responses and deposition testimony that’s come in, we’ve seen a lot of changes in the estimates of the investments and what people [at Cresta] are doing.”).³² Based on the evidence, it appears that a domestic industry of some significance may have existed at some point during the 2011-2012 timeframe, ██████████. I find, however, that Mr. Lewis’s calculations concerning the amount of Cresta’s domestic industry investments are unreliable.³³

³² To establish the existence of a domestic industry, Cresta needed to present coherent, reliable evidence of domestic industry expenditures. I note that Cresta did not employ an expert witness for this portion of its case. A qualified, reasonably objective economic expert on the subject of domestic industry could have enhanced Cresta’s presentation.

³³ Respondents contend that Cresta has failed to establish a nexus between its activities and the claims of the asserted patents. RIB at 228 (citing *Certain Computers & Computer Peripheral*

6. Cresta's Domestic Industry Products Failed

Cresta's witnesses concede that the market for its XC5000 and CTC70X tuners was insufficient to sustain its business at the time the Complaint was filed and still is. Cresta's CEO, Torbjorn Folkebrant, admits that [REDACTED]

[REDACTED]

[REDACTED] Tr. at 812:13-813:7, 819:11-22. Mr.

Folkebrant concedes that [REDACTED] Tr. 813:9-14.³⁴ [REDACTED]

[REDACTED] Tr. at

813:9-14. The evidence, as set forth in detail below, confirms Mr. Folkebrant's testimony.

There is no reliable evidence of significant domestic industry activity at the time the Complaint was filed. To the extent legally relevant, there is no reliable evidence of ongoing development of future domestic industry products, either at the time the Complaint was filed or thereafter.

Devices, Inv. No. 337-TA-841, Comm'n Op. at 32, 34-36). Respondents point to evidence of activities such as "Graphical User Interface development, tape out, and reliability testing, 'latch up' testing and electrostatic discharge testing," citing examples from Cresta's document production of some alleged domestic industry activities. *Id.* Cresta answers that "a nexus may be inferred [by] showing the qualifying investments are in . . . the domestic industry article, 'which is itself the physical embodiment of the asserted patent,'" CIB at 211 (citing *Certain Integrated Circuit Chips and Prods. Containing Same*, Inv. No. 337-TA-859, Comm'n Op. at 40 (Aug. 22, 2014), and asserts that its domestic industry products are the physical embodiment of the patents-in-issue. *Id.* If a nexus between Cresta's activities related to the XC5000 and CTC07X products and the actual claims of the patent were required, Cresta's case might fail in this respect. I do not read the Commission's nexus requirement so stringently. *But see* *Integrated Circuit Chips*, Inv. No. 337-TA-859, Comm'n Op. at 40 (the more closely related the domestic industry activities are to the patented technology, the greater the weight of the activities in determining whether they constitute a domestic industry). *See also* n. 26, *supra* (explaining that Cresta proposes two distinct business models, only one of which clearly relates to exploitation of the patents-in-suit).

³⁴ In *Certain Silicon Tuners and Products Containing the Same, Including Television Tuners*, Inv. No. 337-TA-917, Consent Order (July 1, 2014) (unreviewed), Cresta voluntarily agreed not to import or sell for importation any television tuners in the United States. *See* Tr. at 739:2-20.

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Again, to the extent relevant, there is no reliable evidence of ongoing activities that follow on past domestic industry.

The evidence shows that Cresta as of the time its Complaint was filed and thereafter was

[REDACTED]

[REDACTED] See RX-1695C at 46:9-47:12; Tr. at 174 ([REDACTED])

[REDACTED]

[REDACTED]

[REDACTED]

a. The XC5000 Series

In early 2012, [REDACTED]

[REDACTED] RX-1259C at 209421; RX-1123C at

174342 ([REDACTED])

[REDACTED]; RX-1158C at 186477 [REDACTED]; RX-1306C at 313773

[REDACTED]

[REDACTED]; RX-1098C at 147863 [REDACTED]

[REDACTED]; RX-1123C at 174343 [REDACTED]

[REDACTED]; Tr. 715:11-716:5; 717:23-25. Cresta's [REDACTED]

[REDACTED]

[REDACTED] RX-1689C at 107:20-24; RX-1685C

at 90:17-23; Tr. 715:11-716:5.

[REDACTED]

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On June 18, 2012, [REDACTED]

[REDACTED] RX-1302C at 309537; RX-1695C at 116:9-

17. By May 2013, [REDACTED]

[REDACTED] RX-1216C; Tr. 715:23-25.

Cresta asserts that it “continues to manufacture, sell, and support [the XC5000].” CRB at 125.

This claim is echoed by the statements of Mr. Murgulescu, who alleges that the bulk of Cresta’s work with the XC5000 involves production support. CX-1710C at Q/A 17. Mr. Murgulescu, however, is contradicted by his colleague Mr. Lewis, who states that [REDACTED]

[REDACTED] Tr. 716:7-717:20. Jimmy Zien (Cresta’s vice president of

operations) refers to the XC5000 as [REDACTED]

[REDACTED] RX-1689C at 107:20-24.

b. The CTC70X Series

Design and development of the CTC70X series, Cresta’s second domestic industry product, began at Xceive in [REDACTED] and was completed at Cresta by [REDACTED]. Tr. 492:19-22; 546:15-547:19; 548:20-25. Sales of this product, [REDACTED]

[REDACTED] See Tr.

719:7-16; *see also* RX-1683C at 80:6-14 [REDACTED]

[REDACTED] RX-1689C at 91:1-92:10; Tr. at 554:17-555:20.

Cresta admits that it is [REDACTED]

[REDACTED] RX-1689C at 91:8-16.

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Undisputed evidence establishes [REDACTED] as the date when production of the CTC70X was complete and “firmware updates” for the product began. *E.g.*, Tr. 548:20-25, 554:10-16 (maintenance activities principally entail preparing and releasing firmware). Cresta has not indicated any firmware updates associated with the CTC70X product [REDACTED]. Tr. at 554:10-16; 557:10-558:10. According to the record, as of [REDACTED] Cresta engineer was assigned to firmware updates. Tr. at 556:9-17; RX-1342C. On May 28, 2013, Mr. Murgulescu wrote that a possible [REDACTED] [REDACTED] (the CTC70x ICs).” RX-1342C. Mr. Murgulescu was concerned because [REDACTED] [REDACTED] *Id.* He notes that Cresta employed [REDACTED] for FW [firmware].” *Id.* In sum, the CTC70X design was completed in [REDACTED], the ongoing activity consisted of firmware updates involving [REDACTED], and there is no evidence of firmware updates after [REDACTED]. These facts indicate that on the date the Complaint was filed, January 28, 2014, there was no significant domestic industry activity related to the CTC70X tuner series and there had been none for several months.

7. Cresta’s Business Changed in 2013

[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]

[illegible]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

³⁷ As noted above, the evidence that there were no next-generation products under development at Cresta as of January 2014, when the Complaint was filed, negates Cresta's reliance on *Digital Media Devices*, see CRB at 124. In that Investigation, the Commission allowed Apple to rely on investments in discontinued products because Apple established investments in next-generation products that practiced the asserted patents.

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Over the period from 2012 to 2014 Cresta [REDACTED]
RX-1530C ¶¶ 7, 8; RX-1685C at 50:15-51:23; RX-1695C at 77:13-21. [REDACTED]
[REDACTED] RX-1685C at 50:15-24. Although Cresta maintains that it continued
to conduct maintenance engineering activity (“firmware” updates), the records show no evidence
of such activities after [REDACTED] See Tr. at
554:10-16, 557:10-558:10. At hearing, Cresta made no credible effort to quantify such activities.

[illegible]

On the date the complaint was filed Cresta [REDACTED]
[REDACTED] RX-1694C at 453:4-8; Tr. at 721:22-25. Investors were [REDACTED]

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[REDACTED]

[REDACTED]

[REDACTED]

RX-0780C at 1542.

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

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[REDACTED]

[REDACTED]

In sum, the alleged domestic industry products, XC5000 and CTC70X tuners, [REDACTED]

[REDACTED] when the Complaint was filed.

[REDACTED]

[REDACTED] Cresta's witnesses admit that Cresta [REDACTED]

[REDACTED] Under these circumstances, Cresta fails to satisfy the economic prong. *See Motiva*, 716 F.3d at 601 n.6 (stating that a complainant seeking to establish a domestic industry through past investments and activities must show "that its old development activities *contributed to a market that existed or was in the process of being created at the time of its complaint.*") (emphasis added).⁴¹

[REDACTED]

⁴⁰ Cresta asserts that the [REDACTED] should not result in a finding of no domestic industry, but should instead result in modification of the remedy imposed for unfair importation. CIB at 190. In *Wind Turbines*, however, the complainant's bankruptcy occurred after the Commission had determined that there was a domestic industry. As a result, the effect of the bankruptcy was considered only as to remedy. Inv. No. 337-TA-376, Comm'n Op. at 25-26 (Sept. 23, 1996). *See Certain Elec. Devices, Including Mobile Phones, Portable Music Players, & Computers*, Inv. No. 337-TA-701, Order No. 58 at 6 (Nov. 18, 2010) (not reviewed) (citation omitted) (recognizing distinction between jurisdiction and remedy).

⁴¹ Cresta states that "There is no reason for a company to continue to incur product related manufacturing costs in excess of product revenues if its intention is to [REDACTED] CRB at 128. [REDACTED]

8. Reliable Evidence Does Not Support the Allegation of Substantial Activity Concerning the Alleged Domestic Industry Products After May 2013

Cresta relies heavily on Commission precedent to the effect that it is unnecessary to keep precise records of domestic industry activities. *See Stringed Musical Instruments*, 2009 WL 5134139, at *17. “Nevertheless,” the Commission states in *Stringed Musical Instruments*, “evidence or testimony would have to demonstrate a sufficiently focused and concentrated effort to lend support to a finding of a ‘substantial investment.’” *Id.*

As specified above with respect to several glaring inconsistencies and errors, Cresta’s evidence does not satisfy the Commission’s requirement. The two individuals on whose testimony Cresta’s domestic industry case rises or falls are not credible. Their testimony is evasive and ambiguous. *E.g.*, Tr. at 563:1-569:7. Mr. Lewis and Mr. Murgulescu are impeached several times. *E.g.*, Tr. at 486:18-487:24, 714, 715:11-717:20, 759:1-18. Mr. Lewis’s testimony is riddled with errors and inconsistencies. *See* Tr. at 704-760.⁴² Mr. Murgulescu, Cresta’s key witness on the domestic industry activities conducted by Cresta’s engineers, repeatedly gives vague and contradictory testimony. *See e.g.*, Tr. 551:25-553:3, 554:5-556:6, 558:13-562:22. The reliability of the evidence these key witnesses provide concerning the nature and amount of effort devoted at Cresta to domestic industry products is severely undermined by such lapses.

As stated above, Cresta may have engaged in some domestic industry activity in 2011 and 2012 – the exact nature and significance of the domestic industry is difficult to determine on

⁴² There are other problems with Mr. Lewis’s testimony. For example, in one of his calculations, he rounded the number 11.6 to 13. Tr. 749:24-751:24. Mr. Lewis’s explanation casts further doubt on the reliability of his calculations, as he testifies that rounding is “subjective.” Tr. at 750-51. *Compare* Tr. at 747-48 (rounding 15.2 to 16), *with* Tr. at 785 (where Mr. Lewis testifies that “in accounting, we like to be very, very accurate.”).

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the confused and conflicting record created by Cresta. Toward the end of 2012 and the beginning of 2013, however, it became clear that [REDACTED]

[REDACTED]

[REDACTED] By

mid-2013, [REDACTED] Even if

Mr. Lewis and Mr. Murgulescu had presented credible testimony regarding Cresta's domestic industry, any methodology for allocating Cresta's expenditures in Year 1 and Year 2 could not be reliably applied to Cresta's operations at the time of the Complaint, [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

The great preponderance of the evidence compels the conclusion that Cresta [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED] See RX-1999C at Q/A 123-34.

9. The Record Will Not Sustain a Finding that Cresta's Failure Is Attributable to Alleged Infringement by Respondents.

Cresta argues that "[e]ven if post-complaint facts about CrestaTech's struggling business were relevant, they do not undermine CrestaTech's domestic industry showing, because they are a result of the infringing activity." CIB at 191 (citing *Semiconductor Integrated Circuits*, Inv. No. 337-TA-665, ID at 229). The evidence falls far short of proving that Respondents' alleged infringement caused Cresta's problems. The opposite is true. Cresta's business suffered from a host of problems. Cresta does not demonstrate by any means that these problems were caused by Respondents' alleged infringement.

[REDACTED] See
RX-1999C Q/A 169-86. [REDACTED]
[REDACTED] Tr. 842:20-843:25. [REDACTED] Tr.
461:5-475:16. [REDACTED] RX-0894C; RX-0904C
at 86743; RX-1683C at 209:10-210-1. [REDACTED]
[REDACTED] RX-0908C; RX-1683C at 156:6-11; RX-
1694C at 440:2-25. [REDACTED] Tr.
843:18-20.

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These facts preclude a finding that Cresta would have had a domestic industry for its products, absent allegedly unfair competition from Respondents. The *Bally-Midway* case, where it was found that importation of infringing products caused the complainant's domestic industry to decline, has no application here.⁴³

B. Technical Prong

1. Legal Standards

To meet the technical prong, the complainant must establish that it practices at least one claim of the asserted patent. *Certain Point of Sale Terminals and Components Thereof*, Inv. No. 337-TA-524, Order No. 40 (April 11, 2005). "The test for satisfying the 'technical prong' of the industry requirement is essentially [the] same as that for infringement, *i.e.*, a comparison of domestic products to the asserted claims." *Alloc v. U.S. Int'l Trade Comm'n*, 342 F.3d 1361, 1375 (Fed. Cir. 2003). The technical prong of the domestic industry can be satisfied either literally or under the doctrine of equivalents. *Certain Excimer Laser Systems for Vision Correction Surgery and Components Thereof and Methods for Performing Such Surgery*, Inv. No. 337-TA-419, Order No. 43 (July 30, 1999). A showing that the complainant practices an invalid claim of the asserted patent is not sufficient to meet this requirement, however. *Certain Audiovisual Components and Products Containing the Same*, Inv. No. 337-TA-837, Comm'n Op. at 33 (March 10, 2014).

⁴³ Cresta adduced evidence at hearing concerning certain business practices of the Respondents, in particular, Silicon Labs. See Tr. at 975:4-991:16, 994:25-103:5; CIB at 191-92. Allegations related to unfair competition, other than patent infringement, fall outside the scope of Cresta's Complaint and have not been raised by Cresta as an independent basis for relief. See CPHB at 404; Ground Rule 8.2.

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2. Domestic Industry Products

Cresta asserts that several of its products practice the asserted patents. Specifically, Cresta's alleged domestic industry products are the XC5000A series, XC5000C series, CTC70X series, and CTC71X series tuners. CIB at 111-14. As noted with respect to the economic prong, Cresta's allegations concerning its domestic industry products are unclear. The XC5000A appears to be part of the XC5000 series. *See* CX-1710C at Q/A 13; CIB at 192. The CTC71X, however, contrary to Cresta's litigation position, is not part of the CTC70X series. *See* CX-1710C at Q/A 10-12, 14-14.1.⁴⁴ As Mr. Murgulescu's witness statement makes plain, these series are distinct. *Id.* at Q/A 14-14.1.⁴⁵ Because Dr. Snelgrove opines that [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]. CX-2024C at Q/A 159.

3. Technical Domestic Industry for the '585 patent

Cresta asserts that its alleged domestic industry products practice claims 1-3, 5-6, 10, 13-14, 16, 17-19, and 21 of the '585 patent when installed in televisions. CIB at 111-14. In his direct witness statement, Dr. Snelgrove provides claim-by-claim analysis of Cresta's alleged domestic industry products. CX-2024C at Q/A 154-87. Respondents make three arguments

⁴⁴ The CTC71X series is not identified in the Complaint or in Mr. Lewis's witness statement. From the paragraph numbering of Mr. Murgulescu's statement, *see* CX-1710C at Q/A 14.1, it is evident that inclusion of the CTC71X series as a domestic industry product was an afterthought, part of the attempt to expand Cresta's domestic industry beyond Year 1 and Year 2. *See* CIB at 185, CRB at 119, 126. *See also* CX-1710C at Q/A 16 ("Now it encompasses the entire product cycle of the XC5000 series products and the CTC70X and CTC71X series products.")

⁴⁵ "The CTC70X series products include: CTC701, CTC703, CTC707, and CTC709." CX-1710C at Q/A 14. "The CTC71X series products include: CTC711, CTC713, and CTC717." *Id.* at Q/A 14.1.

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challenging the technical prong of domestic industry: (1) Dr. Snelgrove fails to apply the Respondents' proposed claim constructions; (2) Cresta's alleged domestic industry products do not practice the "intermediate frequency" limitation under Respondents' constructions; and (3) Cresta fails to prove that the televisions containing Cresta's alleged domestic industry products satisfy the "plurality of demodulators" limitation of claim 1. RIB at 120-22; RRB at 76-77. Staff joins Respondents' argument regarding "intermediate frequency" and the "plurality of demodulators" limitation. SIB at 44-46; SRB at 5-7. Because I do not adopt Respondents' proposed constructions for "intermediate frequency," "anti-aliasing filter," and several other limitations, I find that Dr. Snelgrove's failure to apply those constructions does not affect my analysis. As discussed below, however, I find that Cresta only proved that one series of its products satisfies the "plurality of demodulators" when incorporated into a specific television platform. Accordingly, I find that certain of Cresta's alleged domestic industry products incorporated into certain televisions practice claims 1-3, 5-6, 10, 13, 16, 17-19, and 21 of the '585 patent.

a. Claim 1

Dr. Snelgrove cites schematics for Cresta's alleged domestic industry products showing that the products are tuners for receiving input RF signals. RX-2024C at Q/A 163-64. Dr. Snelgrove identifies [REDACTED] [REDACTED] RX-2024C at Q/A 164. At the hearing, Pf. McNair characterized Cresta's alleged domestic industry products as [REDACTED] [REDACTED] Tr. at 640:25-641:2. As discussed above in the context of infringement, a frequency conversion to low-IF satisfies the "tuner" limitation under the proper construction of "intermediate frequency." Dr. Snelgrove also cites datasheets for Cresta's alleged domestic

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industry products showing that they are [REDACTED]

[REDACTED] RX-2024C at Q/A 164 (citing JX-0079C; JX-0069C; JX-0070C; JX-0071C).

Relying on those same datasheets, Dr. Snelgrove further identifies a [REDACTED]

[REDACTED]. *Id.* at Q/A 165-68. Dr. Snelgrove also relies on source code to [REDACTED]
[REDACTED] *Id.* at Q/A 168.

For the “plurality of demodulators” limitation, Dr. Snelgrove identifies an [REDACTED]
[REDACTED] in certain of Cresta’s alleged domestic industry products (the XC5000A, XC5000C, CTC703, CTC709, CTC713, and CTC719) [REDACTED] on all of Cresta’s alleged domestic industry products [REDACTED]
Id. at Q/A 169. Dr. Snelgrove explains that televisions incorporating Cresta’s alleged domestic industry products [REDACTED]

[REDACTED] *Id.* (citing CX-1176C; CX-1398C). Dr. Snelgrove’s analysis of these schematics is un rebutted, but Respondents and Staff argue that the evidence cited only shows a [REDACTED]

[REDACTED] RIB at 121-22; SIB at 44-46; RRB at 77; SRB at 5-7.⁴⁶ [REDACTED]

⁴⁶ Cresta argues that Respondents waived this argument by not asserting it in their pre-hearing brief, but Cresta admits that Staff raised this issue in its pre-hearing brief, which indisputably places it at issue for this Initial Determination. CIB at 68-69; SPHB at 37-40.

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[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

It is Cresta's burden to prove that there are actual televisions that practice the asserted claims, and I find that Cresta largely fails to do so here. *See Microsoft Corp. v. International Trade Commission*, 731 F.3d 1354, 1362 (Fed. Cir. 2013) ("A company seeking section 337 protection must therefore provide evidence that its substantial domestic investment—e.g., in research and development—relates to an actual article that practices the patent."), *affirming in relevant part Certain Mobile Devices, Associated Software, and Components Thereof*, Inv. No. 337-TA-744, ID at 203-208, 2011 WL 6916539 at *125-127 (December 10, 2011) (finding a failure of proof on domestic industry based on complainant's failure to identify specific third-party phones that practice the claims). [REDACTED]

[REDACTED]

CX-1176C; CX-1398C; *see also* CX-2024C at Q/A 169 (Snelgrove DWS). [REDACTED]

[REDACTED]

[REDACTED] CX-1398C; CX-1167C; JX-0069C. Moreover, the

[REDACTED]

(CX-1398C) [REDACTED] (CX-1167C). Accordingly, I find that the XC5000A series tuners meet the "plurality of demodulators" limitation when incorporated with an [REDACTED]

⁴⁷ Cresta's reliance on the requirement that all televisions imported into the United States be hybrid televisions is unpersuasive because Cresta has admitted that its products are no longer contained in televisions being imported into the United States. *See* Tr. 813:9-14 (Mr. Folkebrant conceding that Cresta is no longer "in the U.S. playing field."); *see also supra*, note 34 regarding the consent order in Inv. No. 337-TA-917.

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[REDACTED] I do not find sufficient evidence that this limitation is met by any other Cresta DI Product or any other television.

For the reasons discussed above, I therefore find that claim 1 of the '585 patent is practiced by Cresta's XC5000A series tuners when incorporated with an [REDACTED]

[REDACTED]⁴⁸

b. Claim 2

Dr. Snelgrove cites evidence from Cresta datasheets describing support for "all broadcast television standards and formats" and "compatibility with all ATV and DTV demodulators." RX-2024C at Q/A 170. Respondents and Staff do not specifically contest this limitation. Accordingly, I find that Cresta's alleged domestic industry products that practice claim 1 also practice claim 2.

c. Claim 3

Dr. Snelgrove identifies a [REDACTED] [REDACTED] RX-2024C at Q/A 171. Respondents and Staff do not specifically contest this limitation. Accordingly, I find that Cresta's alleged domestic industry products that practice claim 1 also practice claim 3.

d. Claim 5

Claim 5 of the '585 patent discloses "[t]he receiver of claim 1, wherein said intermediate frequency comprises a frequency value other than those specified by one or more television

⁴⁸ Cresta's economic prong expenses are not separately allocated between the XC5000A and XC5000C, and Cresta's evidence regarding the XC5000A and [REDACTED] televisions appears to pre-date the 2011-2013 timeframe that Cresta relies on to show domestic industry investments. Accordingly, even if I had found that Cresta's investments met the economic prong of domestic industry, Cresta fails to prove a nexus between those investments and the only alleged domestic industry product (XC5000A) it has shown to practice the '585 Patent.

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standards.” JX-0001 at 7:21-23. As discussed above, Dr. Snelgrove and Pf. McNair agree that Cresta’s alleged domestic industry products [REDACTED] RX-2024C at Q/A 164; Tr. at 640:25-641:2 (McNair). Dr. Snelgrove cites a [REDACTED]

[REDACTED] RX-2024C at Q/A 172. Respondents and Staff do not specifically contest this limitation. Accordingly, I find that Cresta’s alleged domestic industry products that practice claim 1 also practice claim 5.

e. Claim 6

Claim 6 of the ’585 patent discloses “[t]he receiver of claim 1, wherein a center frequency of said anti-aliasing filter and a sampling frequency of said analog-to-digital converter are functions of said intermediate frequency.” JX-0001 at 7:24-27. Dr. Snelgrove references his analysis on claim 1 and [REDACTED]

[REDACTED] RX-2024C at Q/A 173. Dr. Snelgrove testifies that the sampling frequency of the ADC is [REDACTED]

[REDACTED] *Id.* Respondents and Staff do not specifically contest this limitation. Accordingly, I find that Cresta’s alleged domestic industry products that practice claim 1 also practice claim 6.

f. Claim 10

For the “plurality of finite impulse response filters” limitation of claim 10, Dr. Snelgrove references his analysis on claim 1 and [REDACTED]

[REDACTED] RX-2024C at Q/A

174. Dr. Snelgrove further identifies [REDACTED]

[REDACTED] *Id.* Respondents and Staff do not specifically contest this limitation.

Accordingly, I find that Cresta's alleged domestic industry products that practice claim 1 also practice claim 10.

g. Claim 13

For the "standard selection circuit" limitation of claim 13, Dr. Snelgrove references his analysis on claims 1 and 10, and he identifies a [REDACTED] [REDACTED], RX-2024C at Q/A 175. He references the datasheets to identify [REDACTED] *Id.*

Respondents and Staff do not specifically contest this limitation. Accordingly, I find that Cresta's alleged domestic industry products that practice claims 1 and 10 also practice claim 13.

h. Claim 14

Claim 14 of the '585 patent discloses "[t]he receiver of claim 13, wherein said standard selection circuit generates said select signal in response to an input signal from a user." JX-0001 at 8:7-9. Dr. Snelgrove references his analysis on claims 1, 10, and 13, and further testified that

[REDACTED] CX-2024C at Q/A 176. While he cites an [REDACTED] on Cresta's alleged domestic industry products [REDACTED]

[REDACTED] Accordingly, I find that Cresta fails to demonstrate that its alleged domestic industry products practice claim 14.

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i. Claim 16

Claim 16 of the '585 patent discloses "[t]he receiver of claim 1, wherein said input RF signals comprise RF signals received from one of terrestrial broadcast, from satellite broadcast, and from cable transmission." JX-0001 at 8:14-16. Dr. Snelgrove references his analysis on claim 1 and cites to the product datasheets for evidence that Cresta's alleged domestic industry products receive signals from terrestrial broadcast and cable transmission. CX-2024C at Q/A 177. Respondents and Staff do not specifically contest this limitation. Accordingly, I find that Cresta's alleged domestic industry products that practice claim 1 also practice claim 16.

j. Claim 17

Claim 17 is a method claim reciting many of the same elements claimed in claim 1 of the '585 patent. JX-0001 at 8:17-34. Dr. Snelgrove identifies evidence for each limitation of claim 17, relying on similar documents and source code from his opinion regarding claim 1. CX-2024C at Q/A 178-84. For the "demodulating using a plurality of demodulators" limitation, Dr. Snelgrove again only cites [REDACTED] *Id.* at Q/A 184 (citing CX-1176C; CX-1398C). For the same reasons discussed above for claim 1, I therefore find that Cresta has only shown that the [REDACTED] meet this "plurality of demodulators" limitation when incorporated with an [REDACTED]. [REDACTED] I do not find sufficient evidence that this limitation is met for any other Cresta DI Product or any other television. Accordingly, I find that claim 17 of the '585 patent is practiced by Cresta's [REDACTED] series tuners when incorporated with an [REDACTED].

⁴⁹ As discussed above, I find that none of Cresta's cited investments can be tied to these alleged domestic industry products. *See supra*, note 48.

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k. Claim 18

Claim 18 of the '585 patent discloses "[t]he method of claim 17, wherein said plurality of formats comprise an analog television format and a digital television format." JX-0001 at 8:35-37. Dr. Snelgrove cites evidence from Cresta datasheets describing support for "all broadcast television standards and formats" and "compatibility with all ATV and DTV demodulators." RX-2024C at Q/A 185. Respondents and Staff do not specifically contest this limitation. Accordingly, I find that Cresta's alleged domestic industry products that practice claim 17 also practice claim 18.

l. Claim 19

Claim 19 of the '585 patent discloses "[t]he method of claim 17, wherein said processing said digital signals is performed in response to a select signal indicative of said format of said input RF signal." JX-0001 at 8:38-41. Dr. Snelgrove references his analysis on claim 17, and he identifies a [REDACTED] in Cresta's alleged domestic industry products. RX-2024C at Q/A 186. He references the datasheets to identify [REDACTED] [REDACTED] *Id.* Respondents and Staff do not specifically contest this limitation. Accordingly, I find that Cresta's alleged domestic industry products that practice claim 17 also practice claim 19.

m. Claim 21

Claim 21 of the '585 patent discloses "[t]he method of claim 17, wherein said center frequency and said sampling frequency are functions of said intermediate frequency." JX-0001 at 8:46-48. Dr. Snelgrove references his analysis on claim 17 and identifies the [REDACTED] [REDACTED] RX-2024C at Q/A 187. Dr. Snelgrove explains that the [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED] *Id.* Respondents and Staff do not specifically contest this limitation. Accordingly, I find that Cresta's alleged domestic industry products that practice claim 17 also practice claim 21.

4. Technical Domestic Industry for the '792 patent

Cresta asserts that its alleged domestic industry products practice claims 1-4, 7, 10-12, 18-19, and 26-27 of the '792 patent. CIB at 167-68. Dr. Snelgrove provides claim-by-claim analysis of Cresta's alleged domestic industry products. CX-2024C at Q/A 188-212. Respondents and Staff challenge Cresta's technical domestic industry for the '792 patent with the same arguments referenced above for the '585 patent. RIB at 155; SIB at 52-53; RRB at 102; SRB at 8. I find that Respondents' and Staff's arguments are not applicable in view of the claim constructions I have adopted for the '792 patent. Accordingly, as discussed below, I find that all of Cresta's alleged domestic industry products practice claims 1, 2, 7, 10-12, 18-19, and 26 of the '792 patent, and I find that certain of Cresta's alleged domestic industry products practice claims 3 and 4 of the '792 patent.

a. Claim 1

Dr. Snelgrove cites schematics for Cresta's alleged domestic industry products showing that the products are television receivers including frequency conversion circuits for receiving input RF signals. RX-2024C at Q/A 188-89. Dr. Snelgrove identifies a [REDACTED]

[REDACTED]

[REDACTED] RX-2024C at Q/A 189. At hearing, Pf. McNair characterized Cresta's alleged domestic industry products as having a [REDACTED]. Tr. at 640:25-641:2. As discussed

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above in the context of infringement, a frequency conversion to low-IF satisfies the “frequency conversion circuit” limitation under the proper construction of “intermediate frequency.” Dr. Snelgrove also cites datasheets for Cresta’s alleged domestic industry products showing that they

[REDACTED] RX-2024C at Q/A 189 (citing JX-0079C; JX-0069C; JX-0070C; JX-0071C). Relying on those same datasheets, Dr. Snelgrove also identifies a [REDACTED]

[REDACTED] *Id.* at Q/A 190. Dr. Snelgrove further identifies a [REDACTED]

[REDACTED] *Id.* at Q/A 191. Dr. Snelgrove also identifies [REDACTED]

[REDACTED] *Id.* at Q/A 192. Dr. Snelgrove identifies [REDACTED]

[REDACTED] *Id.* Finally, Dr. Snelgrove identifies [REDACTED]

[REDACTED] *Id.* at Q/A 193.

Respondents and Staff only contest these limitations under their proposed constructions for terms such as “intermediate frequency,” but these arguments do not apply in light of the claim constructions I have adopted. Accordingly, I find that Cresta’s alleged domestic industry products practice claim 1 of the ’792 patent.

b. Claim 2

Dr. Snelgrove cites evidence from Cresta datasheets describing support for “all broadcast television standards and formats” and “compatibility with all ATV and DTV demodulators.” RX-2024C at Q/A 194. Respondents and Staff do not specifically contest this limitation.

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Accordingly, I find that Cresta's alleged domestic industry products practice claim 2 of the '792 patent.

c. Claim 3

Dr. Snelgrove cites schematics for the XC5000A showing that it is [REDACTED] RX-2024C at Q/A 195. Respondents and Staff do not specifically contest this limitation. Accordingly, I find that the XC5000A practices claim 3 of the '792 patent.

d. Claim 4

Dr. Snelgrove cites evidence from the datasheets for the XC5000A, XC5000C, CTC703, CTC709, CTC713, and CTC719 showing that the [REDACTED] RX-2024C at Q/A 196. Respondents and Staff do not specifically contest this limitation. Accordingly, I find that the XC5000A, XC5000C, CTC703, CTC709, CTC713, and CTC719 practice claim 4 of the '792 patent.

e. Claim 7

Dr. Snelgrove cites evidence from the datasheets and schematics for Cresta's alleged domestic industry products showing that the [REDACTED] RX-2024C at Q/A 196. Respondents and Staff do not specifically contest this limitation. Accordingly, I find that Cresta's alleged domestic industry products practice claim 7 of the '792 patent.

f. Claim 10

Claim 10 of the '792 patent discloses:

The television receiver of claim 1, further comprising:

a bandpass filter coupled to receive the intermediate frequency signal from the frequency conversion circuit and generate a filtered intermediate frequency signal; and

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a variable gain amplifier coupled to receive the filtered intermediate frequency signal and provide the amplified, filtered intermediate frequency signal to the analog-to-digital converter.

JX-0002 at 11:46-54. Dr. Snelgrove references his analysis for claim 1 and identifies evidence

in the schematics for Cresta's alleged domestic industry products of a [REDACTED]

[REDACTED]. CX-2024C at Q/A 198-99. Dr. Snelgrove further identifies

a [REDACTED]

[REDACTED]. *Id.* at Q/A 200. Respondents and Staff do not specifically contest these limitations.

Accordingly, I find that Cresta's alleged domestic industry products practice claim 10 of the '792 patent.

g. Claim 11

Claim 11 of the '792 patent discloses "[t]he television receiver of claim 1, wherein the signal output circuit provides output signals in an analog or a digital signal format." JX-0002 at 11:55-57. Dr. Snelgrove references his analysis for claim 1 and further cites evidence from the schematics for Cresta's alleged domestic industry products showing that the [REDACTED]

[REDACTED] RX-2024C at Q/A 201.

Respondents and Staff do not specifically contest this limitation. Accordingly, I find that Cresta's alleged domestic industry products practice claim 11 of the '792 patent.

h. Claim 12

Claim 12 of the '792 patent discloses "[t]he television receiver of claim 1, wherein the signal output circuit comprises one or more output terminals, each of the one or more output terminals of the signal output circuit comprises a single-ended output terminal or a differential output terminal." JX-0002 at 11:58-62. Dr. Snelgrove references his analysis for claim 1 and further cites evidence from the datasheets and schematics for the XC5000A, XC5000C, CTC703, CTC709, CTC713, and CTC719 showing that [REDACTED]

[REDACTED]
[REDACTED]
[REDACTED] RX-2024C at Q/A 202. [REDACTED]

[REDACTED] *Id.* Respondents and Staff do not specifically contest this limitation. Accordingly, I find that Cresta's alleged domestic industry products practice claim 12 of the '792 patent.

i. Claim 18

Claim 18 of the '792 patent discloses:

The television receiver of claim 1, wherein the signal output circuit comprises:

- a first digital-to-analog converter coupled to receive digital output signals from the signal processor and convert the digital output signals to analog output signals;
- a first driver circuit for driving the analog output signals from the first digital-to-analog converter onto a first output terminal;
- a second driver circuit for driving the analog output signals from the first digital-to-analog converter, the second driver circuit comprising a differential output driver circuit having a first differential output terminal and a second differential output terminal, the first differential output terminal being coupled to the first output terminal and the second differential output terminal being coupled to a second output terminal;
- a second digital-to-analog converter coupled to receive digital output signals from the signal processor encoding audio information and convert the digital output signals to analog output signals; and
- a third driver circuit for driving the analog output signals from the second digital-to-analog converter onto the second output terminal,

wherein the first and second output terminals provide differential output signals indicative of video and audio information encoded in the input RF signal when the input RF signal has a digital television signal format; and the first output terminal provides video information encoded in the input RF signal and the second output terminal provides signals indicative of audio information encoded in the input RF signal when the input RF signal has an analog television signal format.

JX-0002 at 12:45-13:9. Dr. Snelgrove references his analysis for claim 1 and identifies evidence in the schematics for the signal output circuit of Cresta's alleged domestic industry products

[REDACTED] meeting the limitations of this claim. CX-2024C at Q/A 203-08. He further identifies [REDACTED] described in the datasheets for Cresta's alleged domestic industry products. *Id.* at Q/A 209. Respondents and Staff do not specifically contest the limitations in this claim. Accordingly, I find that Cresta's alleged domestic industry products practice claim 18 of the '792 patent.

j. Claim 19

Claim 19 of the '792 patent discloses "[t]he television receiver of claim 18, wherein the signal output circuit further comprises: a low pass filter coupled between the first digital-to-analog converter and the first and second driver circuits, the low pass filter providing low pass filtering function." JX-0002 at 13:10-15. Dr. Snelgrove references his analysis for claims 1 and 18, and he further cites evidence from the schematics for the signal output circuit of Cresta's alleged domestic industry products [REDACTED]. RX-2024C at Q/A 210. Respondents and Staff do not specifically contest this limitation. Accordingly, I find that Cresta's alleged domestic industry products practice claim 19 of the '792 patent.

k. Claim 26

Dr. Snelgrove references his analysis for claim 1, and he identifies a [REDACTED] in Cresta's alleged domestic industry products. RX-2024C at Q/A 211. He references datasheets to identify [REDACTED]. *Id.* Respondents and Staff do not specifically contest this limitation. Accordingly, I find that Cresta's alleged domestic industry products practice claim 26 of the '792 patent.

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I. Claim 27

Claim 27 of the '792 patent discloses "[t]he television receiver of claim 26, wherein the format/standard selection circuit generates the select signal in response to an input signal from a user." JX-0002 at 14:42-44. Dr. Snelgrove references his analysis on claims 1 and 26, and further explains that a user could [REDACTED]

[REDACTED] CX-2024C at Q/A 212. While he cites an [REDACTED]

[REDACTED] Accordingly, I find that Cresta fails to demonstrate that its alleged domestic industry products practice claim 27.

VII. REMEDY & BONDING

A. Limited Exclusion Order / Cease & Desist Order

Cresta seeks a limited exclusion order (LEO) and a cease and desist order (CDO) for each Respondent. CIB at 224-25.

1. Parties' Positions

a. Cresta's Position

Cresta seeks a LEO for each Respondent covering any product that infringes the asserted claims and that applies as well to Respondents affiliates, parents, subsidiaries, licensees, other related business entities, or their successors or assigns. CIB at 224. Cresta also seeks a CDO for each Respondent, alleging that every Respondent maintains a commercially significant inventory of infringing products in the United States. *Id.* at 225.

Cresta cites stipulations with Respondents concerning inventory levels indicating that Samsung as of June 14, 2014 had inventory worth [REDACTED] LG had inventory on July 1, 2014 of approximately [REDACTED] Sharp had inventory worth approximately [REDACTED] as

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of August 31, 2014; VIZIO had inventory worth approximately [REDACTED] in December 2013. *Id.* at 225-26. Cresta alleges that VIZIO's ODMs also stipulated to [REDACTED] *Id.*⁵⁰ Cresta asserts that CDOs should encompass the Internet activities of Respondents Samsung, LG, VIZIO and Sharp. *Id.*

Cresta states that the remedial orders should include infringing televisions sets, not only infringing television tuners. *Id.* at 226. Cresta says that the EPROMS factors do not apply because the television sets are accused in this Investigation and are not downstream products. *Id.* at 227. *See Certain Erasable Programmable Read Only Memories ("EPROMS")*, Inv. No. 337-TA-276, USITC Pub. No. 2196, 1989 WL 1716252, Comm'n Op. (May 1989), *aff'd sub nom. Hyundai Elec. Indus. Co. v. U.S. Int'l Trade Comm'n*, 899 F.2d 1204 (Fed. Cir. 1990).

If the EPROMs factors do apply, Cresta says they do not support excepting Respondents' television sets from remedial orders. Cresta argues that (1) the value of the infringing tuners compared to the value of the infringing television sets weighs in favor of excluding the televisions due to the tuners' qualitative significance; (2) there is no danger that non-Respondents' televisions will be excluded because Respondents' models are clearly marked; (3)

⁵⁰ Staff argues that Cresta has not carried its burden to show that there is sufficient inventory of the accused products in the United States to be commercially significant. Staff argues against issuance of a CDO on this basis but says that a CDO, if issued, should be tailored to reflect the public interest factors in the same way as the LEO. SRB at 11-12. Respondents also argue that there is no evidentiary support for issuing a CDO. *See* RIB at 247-48 (citing *Mobile Devices, Associated Software & Components Thereof*, 337-TA-744, Comm'n Op. at 25-26, 2012 WL 3715788, at *16 (June 5, 2012).) In *Mobile Devices*, the complainant failed to show that inventory held by the respondents was commercially significant. The numbers of units to which Respondents have stipulated in this Investigation, however, are on their face commercially significant. *See* CX-1697C-CX-1703C; CX-1721C; CX-1730C; CX-1831C. The stipulations as to inventory are at least sufficient to shift the evidentiary burden to Respondents to show that the amounts of infringing inventory in the United States are commercially insignificant.

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the incremental value weighs in favor of Cresta because demand for its tuners will increase; (4) Respondents' lost sales will be minimal because they can manufacture their television sets with non-infringing tuners; (5)-(6) burdens on consumers would be minimal because there is a wide range of non-infringing televisions available on the market; (7) it is "highly likely" that Respondents' accused television sets contain an accused tuner; (8) remedial orders that do not include infringing television sets would permit circumvention of the exclusion orders by permitting importation of infringing tuners as part of a television set; (9) enforcement of an exclusion order including television sets would not pose an undue burden for Customs because "a majority of the infringing TV sets are imported under a small subset of HTS numbers and Customs can examine the other TV sets in a non-destructive manner by merely removing the back panel." *Id.* at 228-29.

Cresta also maintains that there should be no delay in issuance of remedial orders because the market, and Respondents in particular, will adjust quickly by manufacturing more television sets with non-infringing tuners. *Id.* at 229-30.

Cresta disputes the allegation that remedial orders should not issue because, as Respondents and Staff argue, Cresta has abandoned its product-based business. CIB at 224-25; CRB at 142-43. Cresta says it continues to engage in product-based activities and would agree to report periodically to the Commission on the status of its activities upon issuance of remedial orders. CIB at 224-25; CRB at 143. Cresta opposes inclusion of a service and repair provision. CRB at 143.

b. Respondents' Position

Respondents say no remedy is appropriate given the nature of Cresta's "patent assertion" business but that any LEO should (a) exclude the "accused downstream televisions, (b) include a

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certification provision, (c) include a repair and refurbishment exception, and (d) include quarterly reporting requirements regarding the continuing existence of a domestic industry.” RIB at 239. Respondents argue that the goal of fostering innovation would not be served by enjoining the importation of their television products. *Id.*

Respondents state that because Cresta’s case “is directed at showing infringement by the accused silicon tuners,” televisions that incorporate such tuners are “necessarily” downstream products. *Id.* at 240. Respondents say it makes no difference whether downstream products are specifically accused and that the Commission continues to apply the EPROMs factors to named respondents. *Id.* at 135. Accordingly, Respondents maintain that the EPROMs factors apply and identify several factors that, in their view, militate against exclusion of television sets.

Respondents say that EPROMs Factor 1 weighs against excluding what they refer to as “downstream products” because the tuners’ value as compared to the value of the imported televisions is miniscule – a fraction of one percentage point. CIB at 241. Respondents also assert that the qualitative value of the tuners is low because the “downstream televisions include numerous features and functionality that have nothing to do” with the patented inventions. *Id.* at 242. Respondents measure the value of the patented technology by the amount a buyer of the patents or a licensee is willing to pay. They state that Cresta only paid \$1.8 million for all the assets of Xceive, including the patents at issue, assigning only 10 percent, or less than \$180,000, as the value of those patents. *Id.* Respondents say that Cresta has failed to demonstrate the qualitative value of the tuners by showing how they contribute to the overall function and value of televisions. RRB at 136.

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Respondents say that EPROMs Factor 3 weighs against exclusion because Cresta would receive no incremental value from increased sales of silicon tuners, since it has ceased to produce tuners and has no license agreements for the asserted patents. *Id.* at 243.

Respondents say that EPROMs Factor 4 weighs against exclusion because the vast majority of the value of the excluded televisions is unrelated to the asserted patents. *Id.* at 244. Respondents say that to the extent an exclusion order precluded them from importing products or components for repair and warranty work, there would be an incremental detriment.

Respondents say EPROMs Factor 5 weighs against exclusion because the result will be an “irreplaceable reduction in the volume and variety” of television products, “imposing a burden on third parties,” including developers of innovative TV platforms. *Id.* at 244-45.

Respondents say EPROMs Factor 6 weighs against exclusion because an order excluding the Respondents’ televisions would result in a shortage in the United States and “significant market disruptions” that would persist for eight to 16 months. *Id.* at 245.

Respondents say that EPROMs Factor 9 weighs against exclusion because the TV tuners are housed within the television and cannot be identified by visual inspection; instead, the television set would have to be destroyed to identify the type of tuner. Respondents state that the “sheer magnitude” of an exclusion order affecting [REDACTED]

[REDACTED] would also place an undue burden on Customs. *Id.*

Respondents also state that any LEO should include a certification provision permitting Respondents to certify that certain imported products are not subject to exclusion, in order to assist Customs to identify products covered by the LEO. *Id.* at 246. Respondents say that the

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allegedly infringing technology is located within the tuner chips “which are housed inside sealed television assemblies and thus require destructive inspection.” *Id.*

Respondents state that any LEO should include a service and repair provision that allows Respondents to import equipment for continued service and repair of products sold before the date of issuance of the LEO. This would benefit U.S. consumers, Respondents say. *Id.* In addition, they say a LEO should include an adjustment period to address any disruption in television supply. *Id.* at 246-47.

Respondents state that any LEO should include a reporting requirement given “Cresta’s tenuous claim of domestic industry.” *Id.* at 247. The reporting requirement would compel Cresta to file a statement under oath for the life of the asserted patents stating whether a domestic industry exists and describing it. *Id.*

Staff’s Position

Staff says the EPROMs factors should not be applied because there are no downstream products at issue, “as television sets are accused products within the scope of the Notice of Institution and the manufacturers are named Respondents.” SIB at 67-68. Staff states that delay in entry of a LEO is justified in light of “a lack of strong evidence” that U.S. demand can be met by non-respondents. *Id.* at 68. Staff advocates a delay of approximately six months in the effective date of a LEO and “some tailoring to allow for repair and warranty replacement.” SRB at 11. Staff says that the evidence shows that “even with huge financial incentives in place” there will be constraints on the speed with which the market can respond to any exclusion order. *Id.*

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2. Recommendation

My consideration of remedy, like public interest and bonding, is relevant only if the Commission finds that there has been a violation of section 337. Assuming that there has been such a violation, I recommend that a LEO and a CDO be issued as requested against each of the Respondents, but that issuance of the remedial orders should be delayed by 12 months. I recommend further that the LEOs include a requirement that Respondents certify compliance with the order by identifying infringing and non-infringing articles, to alleviate the burden on Customs of identifying articles subject to the order.

Initially, Respondents maintain that no remedial orders should be issued because there is no domestic industry to protect, since Cresta has ceased production and has minimal ongoing activities. For the purpose of this discussion I assume that Cresta's activities are deemed to constitute a domestic industry and, accordingly, that there is a domestic industry to protect.

A second issue is whether the EPROMs factors apply. I agree with Staff that the EPROMs factors should not apply because there are no downstream products at issue. Televisions are named as accused products in the Complaint.

As a factual matter, moreover, the patented technology cannot be clearly confined to the tuners, as Respondents contend. Some features of the patented technology in some of the accused television sets may extend beyond the tuners. As discussed above in the context of infringement, the MaxLinear tuners do not themselves contain demodulators or decoder circuits, which are required limitations of several of the asserted claims, but Cresta alleges that these components are contained in the televisions incorporating the tuners. Similarly, certain of the Silicon Labs tuners do not contain all of the claimed demodulators or decoder circuits, and Cresta also alleges these components are contained in the accused televisions. This distinction

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could form the basis for EPROMs analysis of some but not all Respondents' television sets. Those television sets accused of infringement would not be included in the EPROMs analysis, because they would not be considered downstream products; those television sets not accused of infringement would be considered downstream products.

I analyze the application of the non-exclusive list of EPROMs factors below in case they are deemed relevant to some or all of the television sets imported by Respondents.

Factor 1 is the value of infringing articles compared to the value of downstream products in which they are incorporated. It is clear that the value of tuners is minute in comparison to the value of the television sets incorporating them. As Cresta points out, however, the qualitative significance of the tuners is substantial. *See* CRB at 145; CX-1991C at 98:3-6 ("television is not a television unless it has a tuner"). I agree. Moreover, I find no merit in Respondents' argument that the book value at the time Cresta purchased Xceive's assets is determinative.

Factor 2 is the identity of the manufacturer of downstream products. Since the manufacturers in this instance are all named Respondents, this factor does not weigh in the balance.

Factor 3 is the incremental value to the complainant of the exclusion of downstream products. [REDACTED]

[REDACTED]

[REDACTED]

Others, including Respondents, would be in a position to replace excluded products within a commercially reasonable time. This factor weighs against exclusion.

Factor 4 is the incremental detriment to Respondents of exclusion. Tailoring a LEO as recommended herein will eliminate any incremental detriment. This factor weighs in favor of

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exclusion, as the detriment to Respondents will be minimal. They will be afforded a reasonable period in which to increase or initiate production of non-infringing televisions and to serve the needs of consumers who already own infringing products.

Factor 5 concerns the burdens imposed on third parties resulting from exclusion of downstream products. For the reasons discussed with respect to the public interest, I conclude that any disruption resulting from exclusion of the accused products will be alleviated by the prompt substitution of non-infringing goods, and by tailoring the remedial orders as recommended. Retailers already carry comparable televisions made by non-respondents. *See* CX-1896C at Q/A 76, 193; CX-1479. Content providers offer their services through a variety of Internet-connected devices. *See* CX-1896C at Q/A 194. What is needed is a period of time in which suppliers can increase the numbers of non-infringing alternatives. This factor favors exclusion.

Factor 6 is the availability of alternative downstream products that do not contain the infringing articles. Again, as discussed with respect to the public interest, a wide variety of such products is available and additional products will be made available in the event exclusion orders are issued. *See* CX-1896C at Q/A 108-16, 150-53, 166-75.

Factor 7 is the likelihood that downstream products actually contain infringing articles and are thereby subject to exclusion. As discussed above with respect to infringement, it is likely that a substantial portion of Respondents' televisions contain infringing articles beyond the infringing tuners themselves. Every television set, moreover, includes a tuner. This is undisputed. *See* RX-1999C at Q/A 270. This factor weighs in favor of exclusion.

Factor 8 is the opportunity for evasion of an exclusion order that does not include downstream products. To be sure, without an order excluding television sets it would be difficult

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if not impossible to carry out an order excluding infringing tuners contained within the television. This factor weighs in favor of exclusion.

Factor 9 concerns the enforceability of an order by Customs. Here is a factual dispute: Cresta says infringing televisions could be identified readily by number or, at most, by removing the back panel and inspecting the contents. Respondents say the allegedly infringing technology is located within tuner chips that are housed inside sealed television assemblies, necessitating destructive inspection. Without resolving the factual dispute, it is clear that identifying infringing articles from among the huge number of items subject to a LEO in this case would place a significant burden on Customs. For this reason, I agree with Respondents that a certification requirement would be useful. The parties could be required to craft such a requirement jointly, including a provision for assuring that infringing products are properly identified as being subject to the LEO.

On balance, I find that the EPROMs factors weigh in Cresta's favor and that appropriate LEOs can be tailored to prevent disruption to the public and third parties while protecting Cresta's intellectual property rights.

As noted above, I find that Cresta has carried its burden with respect to the amount of inventory necessary to warrant issuance of a CDO. Respondents have adduced no evidence to counter the stipulations relied upon by Cresta and it is fair to infer, based on the \$10 billion in annual revenue and 50 percent market share enjoyed by Respondents, that the stipulated amount of their inventory is commercially significant.

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B. Bonding

1. Parties' Positions

Cresta states that the bond required under section 19 U.S.C. § 1337(j)(3) must be sufficient to protect the complainant from injury during the 60-day Presidential review period and that, "when reliable price information is available," the bond may be set by eliminating the differential between the complainant's domestic industry product and the respondent's infringing product. Where price comparisons are not readily available the Commission may set the amount of the bond at 100 percent. In addition, when a price comparison is impossible bond may be set based on a reasonable royalty. CIB at 230 (citations omitted).

[REDACTED]

Cresta proposes comparing the price of its domestic industry tuners (XC5000 and CTC70X) with the price of MaxLinear's and Silicon Lab's accused tuners. That calculation results in a requested bond of [REDACTED] for MaxLinear and a requested bond of [REDACTED] percent for Silicon Labs. CIB at 231; *Id.* n.208-210; CX-1172C.

Cresta challenges Dr. Vander Veen's assertion that the XC5000, as an [REDACTED] product, should be excluded from bond calculations. [REDACTED]

[REDACTED]

[REDACTED] CIB at 231-32. Cresta maintains that the Consent Order in Investigation No. 337-TA-917 [REDACTED]

[REDACTED]. CRB at 149. Cresta also states that the [REDACTED] [REDACTED] is irrelevant. *Id.* at 149-50.

Cresta proposes setting a bond of 100 percent for Respondents' infringing televisions. Cresta says it is not practical to base the bond on price differential because Cresta and the

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television manufacturer respondents (Samsung, LG, Sharp, VIZIO, SIO/Hon Hai, TPV, and Wistron) sell their products at different levels of commerce. Cresta sells tuners to television manufacturers; these Respondents sell to retailers or consumers. In addition, there are wide price differentials among different television models. These factors warrant setting a bond of 100 percent under Commission precedent, Cresta says. CIB at 232 (citing *Certain Voltage Regulators, Components Thereof & Prods. Containing Same*, Inv. No. 337-TA-564, Comm'n Op. at 79 (Oct. 19, 2007)).

Respondents say that Cresta will suffer no injury from the importation of accused products during the Presidential review period. RIB at 248-49. Respondents say that price comparisons are unhelpful, as Cresta has consented that it will not import or sell any tuners for importation into the U.S., and it has no licenses. Respondents say there is no current domestic industry product for comparison, and that the tuners account for a very small amount of the value of televisions in which they are incorporated. *Id.* at 249.

Respondents also allege that Cresta's price comparison is flawed. Respondents assert that the XC5000 [REDACTED] [REDACTED]. *Id.* (citing RX-1999C at Q/A 294). Respondents state that Cresta's price comparison with respect to MaxLinear's tuners is "grossly overstated." RRB at 137. The result, Respondents say, is that no bond is appropriate.

Staff notes that the typical bond is based on the price differential between the imported or infringing product and the domestic industry products, or on a reasonable royalty. SIB at 69. Staff notes that Cresta asserts an average sales price for its domestic industry items of [REDACTED], "but without explanation of how it arrived at that value." *Id.* at 70. Staff agrees that the XC5000 should not be included in Cresta's price calculation. Staff asserts that the maximum appropriate

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bond rate is [REDACTED] for MaxLinear tuners and [REDACTED] percent for Silicon Labs tuners. Staff says no bond is appropriate for the other Respondents' television products. *Id.* at 70. Staff says that the 100% bond proposed by Cresta for Respondents' accused televisions is unsupported and that, in the absence of evidence regarding the appropriate bond, no bond should be required. *Id.*

2. Recommendation

Assuming a violation, the question is whether Cresta is entitled to a bond and what the amount of such bond should be.

Cresta explains its calculation of average sales price. *See* CIB at 231; CX-1172C. Respondents state that that calculation is erroneous. *See* RX-0199C at Q/A 290-91. Respondents assert that the XC5000 should be backed out of the equation because [REDACTED]

[REDACTED] *See* RX-1999C at Q/A 292-93. Respondents' expert witness, Dr. VanderVeen, recalculates the average prices for Cresta tuners based on an average price for the CTC70X product of [REDACTED]. That amount (significantly lower than Cresta's average price of [REDACTED], is about [REDACTED] as Silicon Lab's [REDACTED]. *RX-1999C* at Q/A 290.

I find that the XC5000 is [REDACTED] [REDACTED] does not warrant protection during the 60-day Presidential review period. *See* 19 U.S.C. §1337(j)(3) (purpose of bond is "to protect complainant from any injury"). Accordingly, no bond is appropriate with respect to the XC5000. Backing the XC5000 out of the equation, the maximum appropriate bond rate for MaxLinear tuners would be around [REDACTED] and for Silicon Labs, [REDACTED]. *Id.* at Q/A 295.

I find, however, that no bond is appropriate for Respondents' accused televisions. The record contains no meaningful calculation concerning injury to Cresta from the sale of

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televisions incorporating infringing tuners. Cresta's expert witness, Dr. Button, does not attempt to quantify such injury or to explain why quantification is not possible. *See* CX-1896C. In these circumstances, no bond should be required. *See Certain Printing and Imaging Devices*, Inv. No. 337-TA-690, Initial Determination at 456, 2010 WL 4789992, at *290 (Sept. 23, 2010) (adopted as to bond determination, Comm'n Op. at 35 (Feb. 17, 2011)).

Moreover, as Dr. Vander Veen opines, Cresta has not had any new wafers made for its CTC70X product since the third quarter of 2013. Given the lack of a market for the CTC70X series, I agree that no bond is required to protect Cresta from injury during the Presidential review period. RX-1999C at Q/A 296. *See Certain Rubber Antidegradants, Components Thereof, & Prods. Containing Same*, Inv. No. 337-TA-533, Comm'n Op. at 39-40 (July 21, 2006) (Complainant failed to prove necessity of a bond).

VIII. PUBLIC INTEREST

Section 337 mandates consideration of the effect of exclusion on (1) public health and welfare; (2) competitive conditions in the U.S. economy; (3) U.S. production of articles that are like or directly competitive with those that are the subject of the investigation; and (4) U.S. consumers. 19 U.S.C. § 1337(d)(1). In general, relief under section 337 should be denied only when the adverse effect on the public interest outweighs the interest in protecting the patent holder. *Certain Battery-Powered Ride-On Toy Vehicles*, Inv. No. 337-TA-314, Comm'n Op. at 11. Such instances are rare in the history of the Commission.

Cresta seeks a LEO and a CDO against each Respondent. Cresta and Staff maintain that there is no evidence of a significant negative effect on the U.S. market that would result from the issuance of remedial orders in this Investigation. Staff notes that the U.S. demand could not be met by Cresta but that other importers of non-infringing televisions could meet the demand, over

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time. Respondents say that due to the magnitude of the remedial orders sought, the public interest factors support a delay in the application of remedial orders. Staff says a six-month delay in implementation of remedial orders would be appropriate; Respondents call for an eight to 16 month delay.

A. Parties' Positions

1. Public Health and Welfare

Cresta maintains that remedial orders in this Investigation would not have a negative effect on the public interest factors sufficient to override Cresta's interest in protecting its intellectual property. Cresta argues that the Commission has previously concluded that televisions and television components "are not the type of products that affect public health and welfare." CIB at 215 (citing and quoting *Certain Digital Televisions & Certain Prods. Containing Same & Methods of Using Same*, Inv. No. 337-TA-617, Comm'n Op. at 15 (Apr. 23, 2009)). Cresta says that exclusion of certain environmentally friendly televisions and those equipped to provide access to the disabled would cause no harm because there are many non-infringing alternatives available. CIB at 215.

Respondents assert that the requested exclusion order would remove from the U.S. market a significant portion of environmentally-friendly televisions sets as well as televisions equipped with advanced features for the disabled. RX-1676C at Q/A 172-79.

Staff maintains there would be no detrimental effect on public health and welfare. Staff says non-Respondents' televisions enhanced for use by disabled persons are available in the marketplace. Staff also states that some of the televisions manufactured by Respondents do not incorporate accused tuners, and that Respondents could shift their tuner design to avoid infringement. SIB at 63.

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2. Competitive Conditions in U.S. Economy

Cresta says there will be no harm to competitive conditions in the U.S. because the global market, which has an ample supply, will adjust to expand the supply of non-infringing televisions within the U.S., forestalling any contraction in the domestic supply or any significant price increases. Cresta says Respondents Silicon Labs and Maxlinear also have a strong economic incentive to design non-infringing television tuners. Cresta says that “Respondents could alleviate any impact on domestic TV supply by negotiating and agreeing to a fair license to the infringed patents.” CRB at 139-40.

Respondents state that entry of remedial orders in this Investigation would affect [REDACTED] of the U.S. market for flat panel televisions, amounting to [REDACTED] in annual revenue, and would be unprecedented. They assert that exclusion and cease and desist orders would significantly reduce the supply of television tuners and televisions, and that such products cannot be replaced with suitable alternatives within a commercially reasonable time. Respondents predict reduced supply, decreased choice for consumers, and higher prices. RX-1676C at Q/A 28-30.

Respondents assert that the supply of flat panel televisions to U.S. consumers would be affected for a period of eight to 16 months. RX-1676C at Q/A 69-70; Tr. at 1172:2-1176:14. Respondents state that domestic providers of over-the-top (“OTT”) and online video distributors (“OVD”) content would be adversely affected. Such technology innovators would be affected by reduced distribution channels and sales opportunities, Respondents say. Respondents also point to harm to their “hundreds of employees across the United States.” RIB at 236. Respondents state that Cresta’s estimate of the time it would take to replace infringing products with non-infringing tuners is speculative and unrealistic, given the magnitude of the requested exclusion order. RRB at 134.

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Staff says that the vast majority of Respondents' products are accused products. In 2013, Staff continues, those products represented a [REDACTED] share by unit volume of the U.S. flat panel television market and a [REDACTED] share of the market measured by sales. Nevertheless, Staff says that there is no evidence that a LEO will force any significant, long-term changes in the U.S. market. Staff says that temporary effects on certain market segments, such as video content providers, does not necessarily indicate an adverse impact, under Commission precedent. Staff notes the availability of suitable alternatives in the U.S. market, but says a delay in implementation of remedial orders would be necessary. SIB at 64.

3. U.S. Production of Competitive Articles

Cresta asserts that remedial orders could have a positive impact on U.S. production of televisions and television tuners. Cresta identifies Element Electronics as a domestic competitor in the television market that would be encouraged by issuance of remedial orders to increase production. Cresta says its own tuners could be used to the extent non-Respondent tuners are redirected into televisions destined for the U.S. market. CRB at 141.

Respondents state that remedial orders would have a limited impact on domestic production. Respondents point out that Cresta has no manufacturing facilities in the U.S. and has, in any event, not produced any wafers since the third quarter of 2013. Respondents also note that the consent order in Investigation No. 917 precludes the importation of Cresta silicon tuners into the United States. RIB at 237-38.

Staff says that increased domestic competition is unlikely to result from the issuance of remedial orders. Staff says Cresta's assertions concerning the benefit to domestic manufacturers is speculative and notes that Cresta itself is poorly situated to take competitive advantage of any change in market conditions resulting from remedial orders in this Investigation. SIB at 65-66.

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4. U.S. Consumers

Cresta maintains that American consumers would continue to have a large array of non-Respondent televisions available in the marketplace, and that non-Respondents such as Sony and Funai will fill any gap in high-end television products. CIB at 221; CX-1896C at Q/A 155.

Cresta says Respondents' large-screen televisions, smart televisions and 3-D televisions account for a relatively small segment of the U.S. market and exclusion of Respondents' models would have minimal impact. CIB at 222; CX-1896C at Q/A 167, 169, 171. Cresta also notes that consumers increasingly rely on devices other than televisions for viewing video content. CIB at 223; CX-1896C at Q/A 179.

Respondents reiterate their arguments that exclusion of Respondents' products would result in reduced supply and higher prices, as well as adversely affect related industries that create content for Respondents' televisions. RIB at 236; RX-1676C at Q/A 121-45.

Staff states that any market disruption due to issuance of remedial orders would be temporary and could be ameliorated by delaying implementation of the orders. SIB at 66. Staff responds to Respondents' argument that warranty, repair and replacement parts might be unavailable by noting that the remedy could be tailored to address this concern. *Id.* Specifically, remedial orders could be mitigated by allowing for the importation of certain repair and replacement parts, Staff says. *Id.*

B. Recommendation

The effect of exclusion orders on such a large segment of the television market [REDACTED] [REDACTED] in the United States could be significant in the short term. *See* Tr. at 1271:1-8, 1176:24-1177:5. Accordingly, based on the factors set forth below, I recommend that remedial orders be issued that ameliorate the potential disruption for

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consumers by delaying implementation of a LEO and CDO for a period of 12 months. The length of the delay is mandated by the scope of the excluded items but also takes into account the anticipated rapidity of the response by the television industry.

1. Public Health and Welfare

Respondents do not demonstrate any significant impact on public health and welfare that would result from remedial orders in this Investigation. Even if televisions were deemed essential to public health and safety, the typical U.S. household already has multiple televisions. CX-1896C at Q/A 64. Sub-segments of the television market that arguably affect public health and welfare can be served by existing non-infringing units or by replacing infringing products over a period of several months. This category includes television devices to accommodate the needs of disabled persons, as well as environmentally-friendly televisions. See CX-1896C at Q/A 65-67. The demand for such products could be met by non-Respondents and others, including Respondents using available non-infringing tuners. *See infra*.

2. Competitive Conditions in U.S. Economy

I agree with Respondents that LEOs and CDOs could significantly affect the availability and price of television tuners and products in the United States in the short term, but I find that such products can be replaced within a commercially reasonable period of time. Tr. at 1270:5-15. In the event that remedial orders are entered, the marketplace will begin to respond immediately to supply replacements for the infringing products. Tr. at 1271:24-1272:17. Due to a decline in global sales, there is an unutilized capacity of televisions that could be directed to the U.S. market in a commercially reasonable period of time. Such products are already in supply pipelines. *Id.* at 1273:2-1275:11; CX-1896C at Q/A 15, 103-05. Similarly, some non-Respondents have the capacity to manufacture between 50- and 100- million non-infringing

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tuners within a three-month period, which is not actually a large volume of tuners. Tr. at 1279:1-14; CX-1896C at Q/A 139, 144. There would be no significant shortfall in the supply of television tuners if an LEO were to issue. CX-1896C at Q/A 146.

It is difficult to estimate the amount of time that would be necessary to overcome any initial disruption to the television product supply in the short term. Cresta's expert witness estimated that it would take "a relatively small number of months" to replace a major portion of the excluded units. Tr. at 1276:17-25, 1278:5-8. Respondents call for an eight to 16 month delay. The recommended delay of 12 months appears to be commercially reasonable, based on the evidence of record. In part, the reason that replacement products could be obtained within this period is that there are several non-Respondent competitors already in the market. Non-Respondent television tuner integrated circuit producers have established relationships with fabless tuner producers who already work on similar products. Tr. at 1279:22-12; CX-1896C at Q/A 117-31.

The high value of the market represented by Respondents' television products in the United States will motivate non-infringing competitors as well as Respondents to replace excluded products promptly. Tr. at 1281:12-7; *see* CX-1896C at Q/A 68-70, 105-116, 132-133. I agree with Cresta's expert that "the market will do things as rapidly as it takes to make money." Tr. at 1283. For this reason, prices for televisions will not increase significantly, and "there's certainly not going to be a denial of choice." *Id.* at 1282:6-7, 1283:4-11; *see* CX-1896C at Q/A 75-102.

3. U.S. Production of Competitive Articles

It is unlikely that an exclusion order would lead to an increase in the domestic production of television tuners. Cresta does not demonstrate that there is a domestic manufacturer who

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could compete meaningfully for a share of the U.S. market, or that foreign manufacturers would shift their operations here. Tr. at 1183:19-1184:3-16. None of the Respondents produces its product in the United States or relies significantly on others who do. CX-1896C at Q/A 160. Cresta cannot simply step into the market given that it does not currently have a marketable tuner. The Consent Order in Investigation No. 337-TA-917 would be an additional obstacle not faced by Cresta's competitors. Tr. at 1183:5-18.

4. U.S. Consumers

For the reasons indicated above, it is likely that any temporary disruption in the television market will be addressed by non-infringing competitors within a commercially reasonable period, minimizing any increase in prices or reduction in the choice of television products available to the U.S. consumer. CX-1896C at Q/A 165-74, 183. As stated by Cresta's expert, "in any reasonable scenario, Respondents would not lose their total U.S. sales volume, and non-respondents could fill the remaining gap relatively quickly." CX-1896C at Q/A 155.

IX. MATTERS NOT DISCUSSED

This Initial Determination's failure to discuss any matter raised by the parties, or any portion of the record, does not indicate that it has not been considered. Rather, any such matter(s) or portion(s) of the record has/have been determined to be irrelevant, immaterial or meritless. Arguments made on brief which were otherwise unsupported by record evidence or legal precedent have been accorded no weight.

X. CONCLUSIONS OF LAW

1. The Commission has subject matter jurisdiction, *in rem* jurisdiction, and *in personam* jurisdiction.
2. There has been an importation into the United States, sale for importation, or sale

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within the United States after importation of certain television receivers and television tuners by Respondents Silicon Labs and MaxLinear and certain television sets by Respondents Samsung, Sharp, VIZIO, SIO/Hon Hai, TPV, and Wistron.

3. No domestic industry exists in the United States pursuant to Section 337(a)(2) with respect to the '585 patent or the '792 patent.

4. Certain Silicon Labs television tuners infringe claims 1, 2, and 3 of the '585 patent.

5. Certain Samsung, LG, and VIZIO televisions incorporating Silicon Labs tuners infringe claims 1, 2, and 3 of the '585 patent.

6. Certain MaxLinear television tuners infringe claims 1, 2, 3, 10, 12 and 13 of the '585 patent.

7. Certain Samsung and VIZIO televisions incorporating MaxLinear television tuners infringe claims 1, 2, 3, 10, 12 and 13 of the '585 patent.

8. No accused Silicon Labs television tuners have been shown to infringe any asserted claim of the '792 patent.

9. No Samsung, LG, and VIZIO televisions incorporating Silicon Labs tuners have been shown to infringe any asserted claim of the '792 patent.

10. Certain MaxLinear television tuners infringe claims 1, 2, 3, 7, 8, 25 and 26 of the '792 patent.

11. Certain Samsung and VIZIO televisions incorporating MaxLinear television tuners infringe claims 1, 2, 3, 7, 8, 25 and 26 of the '792 patent.

12. Claims 1 and 2 of the '585 patent are invalid pursuant to 35 U.S.C. § 102.

13. Claim 3 of the '585 patent is invalid pursuant to 35 U.S.C. § 103.

14. Claims 10, 11, and 12 of the '585 patent have not been shown to be invalid pursuant

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to 35 U.S.C. § 103.

15. Claims 1, 2, 3, 4, 7, 8, 10, 11, 12, 25, 26, and 27 of the '792 patent are invalid pursuant to 35 U.S.C. § 102.

16. There is no violation of Section 337 with respect to the '585 patent or the '792 patent.

XI. INITIAL DETERMINATION AND RECOMMENDED DETERMINATION

Based on the foregoing, and the record as a whole, it is my Final Initial Determination that there is no violation of Section 337 of the Tariff Act of 1930, as amended, 19 U.S.C. § 1337, in the importation into the United States, the sale for importation, or the sale within the United States after importation of certain television sets, television receivers, television tuners, and components thereof in connection with U.S. Patent No. 7,075,585 or U.S. Patent No. 7,265,792.

I hereby **CERTIFY** to the Commission my Final Initial and Recommended Determinations together with the record consisting of the exhibits admitted into evidence. The pleadings of the parties filed with the Secretary, and the transcript of the pre-hearing conference and the hearing, as well as other exhibits, are not certified, since they are already in the Commission's possession in accordance with Commission rules.

It is further **ORDERED** that:

In accordance with Commission Rule 210.39, all material heretofore marked *in camera* because of business, financial and marketing data found by the administrative law judge to be cognizable as confidential business information under Commission Rule 201.6(a), is to be given *in camera* treatment continuing after the date this Investigation is terminated.

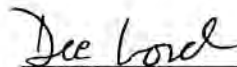
The initial determination portion of the Final Initial and Recommended Determination, issued pursuant to Commission Rule 210.42(a)(1)(i), shall become the determination of the Commission sixty (60) days after the service thereof, unless the Commission, within that period,

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shall have ordered its review of certain issues therein, or by order, has changed the effective date of the initial determination portion. If the Commission determines that there is a violation of 19 U.S.C. § 1337(a)(1), the recommended determination portion, issued pursuant to Commission Rule 210.42(a)(1)(ii), will be considered by the Commission in reaching a determination on remedy and bonding pursuant to Commission Rule 210.50(a).

Within ten (10) days of the date of this Initial Determination, Complainant and Respondents shall each submit to the Office of Administrative Law Judges a statement as to whether or not they seek to have any portion of this document deleted from the public version. Respondents shall submit *a joint statement* regarding confidential business information. Complainant and Respondents shall attach to their submissions a copy of this document with red brackets indicating any portion asserted to contain confidential business information, and the submissions shall include an index identifying the pages of this document where proposed redactions are located. The parties' submissions concerning the public version of this document need not be filed with the Commission Secretary but shall be submitted by both e-mail and paper copy to the Administrative Law Judge pursuant to Ground Rule 1.3.

SO ORDERED.



Dee Lord
Administrative Law Judge

**CERTAIN TELEVISION SETS,
TELEVISION RECEIVERS, TELEVISION
TUNERS, AND COMPONENTS THEREOF**

Inv. No. 337-910

PUBLIC CERTIFICATE OF SERVICE

I, Lisa R. Barton, hereby certify that the attached **ORDER** has been served by hand upon the Commission Investigative Attorney, **Peter J. Sawert, Esq.**, and the following parties as indicated, on

APR 10 2015



Lisa R. Barton, Secretary
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**CERTAIN TELEVISION SETS,
TELEVISION RECEIVERS, TELEVISION
TUNERS, AND COMPONENTS THEREOF**

Inv. No. 337-910

PUBLIC CERTIFICATE OF SERVICE PAGE 2

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San Francisco, CA 94111

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