

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

SILICON LABORATORIES, INC.
Petitioner

v.

CRESTA TECHNOLOGY CORPORATION
Patent Owner

Case IPR2015-00626
Patent 7,265,792

PATENT OWNER'S RESPONSE

Mail Stop "PATENT BOARD"
Patent Trial and Appeal Board
U.S. Patent and Trademark Office
P.O. Box 1450
Alexandria, VA 22313-1450

TABLE OF CONTENTS

I.	INTRODUCTION	1
II.	THE INVENTION OF THE '792 PATENT	1
III.	PROPRIETY OF THE PETITION IN LIGHT OF IPR2014-00809	3
IV.	PERSON OF ORDINARY SKILL IN THE ART (POSITA)	4
V.	CLAIM CONSTRUCTION	5
A.	Claim Construction Standard	5
B.	Claim Constructions Previously Adopted By The Board	5
C.	“A Select Signal Indicative Of A Format Of The Input RF Signal”	6
VI.	THE CHALLENGED CLAIMS ARE PATENTABLE	10
A.	Ground 1: Claim 29 Is Not Obvious Under The Combination Of Thomson And Harris	11
B.	Ground 2: Claims 24 And 25 Are Not Obvious Under The Combination Of Thomson, Harris, And Grumman	15
1.	Claim 24 Is Not Obvious Under The Combination Of Thomson, Harris, And Grumman	15
i.	Neither Thomson Nor Harris Disclose Storing A Plurality Of Finite Impulse Response Filters In Memory Or A Signal Processor Indexing A Memory To Retrieve One Of The Plurality Of Finite Impulse Response Filters	16
ii.	Grumman Does Not Disclose Storing A Plurality Of Finite Impulse Response Filters In Memory, Each Of Said Plurality Of Finite Impulse Response Filters Corresponding To A Format Of Said	

	Input RF Signal Or A Signal Processor Indexing A Memory To Retrieve One Of A Plurality Of Finite Impulse Response Filters	20
iii.	Thomson, Harris, And Grumman Cannot Be Combined To Render The Claim Obvious	31
2.	Claim 25 Is Not Obvious Under The Combination Of Thomson, Harris, And Grumman	35
C.	Ground 3: Claims 26 And 28 Are Not Obvious Under The Combination Of Thomson, Harris, And Zenith	38
1.	Claim 26 Is Not Obvious Under The Combination Of Thomson, Harris, And Zenith	38
i.	The Combination Of Thomson, Harris, And Zenith Does Not Disclose “A Select Signal Indicative Of A Format Of The Input RF Signal” Under Cresta’s Construction	38
ii.	The Combination Of Thomson, Harris, And Zenith Does Not Disclose “The Signal Processor Selecting A Finite Impulse Response Filter In Response To The Select Signal”	41
2.	Claim 28 Is Not Obvious Under The Combination Of Thomson, Harris, And Zenith	43
D.	Ground 4: Claim 27 Is Not Obvious Under The Combination Of Thomson, Harris, Zenith, And Birleson.....	49
E.	Ground 5: Claims 18 And 19 Are Not Obvious Under The Combination Of Thomson, Harris, Oku, Ericsson, And Nguyen	52

1.	Claim 18 Is Not Obvious Under The Combination Of Thomson, Harris, Oku, Ericsson, And Nguyen	52
i.	Providing Differential Output Signals Is Not An Obvious Design Choice.....	52
ii.	Thomson, Harris, Oku, Ericsson, And Nguyen Cannot be Combined To Render The Claim Obvious	55
2.	Claim 19 Is Not Obvious Under The Combination Of Thomson, Harris, Oku, Ericsson, And Nguyen	56
VII.	DR. HOLBERG’S TESTIMONY SHOULD BE AFFORDED LITTLE, IF ANY, WEIGHT	57
VIII.	SECONDARY CONSIDERATIONS	59
IX.	CONCLUSION.....	60

TABLE OF AUTHORITIES

Cases

<i>Apple, Inc. v. ITC</i> , 725 F.3d 1356 (Fed. Cir. 2013)	60
<i>Augme Techs., Inc. v. Yahoo! Inc.</i> , 755 F.3d 1326 (Fed. Cir. 2014)	7
<i>C.W. Zumbiel Co., v. Kappos</i> , 702 F.3d 1371 (Fed. Cir. 2012)	34
<i>DePuy Spine, Inc. v. Medtronic Sofamor Danek, Inc.</i> , 567 F.3d 1314 (Fed. Cir. 2009)	34
<i>Exxon Chemical Patents, Inc. v. Lubrizol Corp.</i> , 64 F.3d 1553 (Fed. Cir. 1995)	7
<i>Illumina, Inc. v. Trustees of Columbia University in the City of New York</i> , IPR2012-00006, 2013 WL 2023631 (PTAB Mar. 12, 2013).....	5
<i>In re Am. Acad. of Sci. Tech Ctr.</i> , 367 F.3d 1359 (Fed. Cir. 2004)	5, 9
<i>In re Cuozzo Speed Techs., LLC</i> , 793 F.3d 1268 (Fed. Cir. 2015)	5, 9
<i>In re Gordon</i> , 733 F.2d 900 (Fed. Cir. 1984)	34
<i>In re Kahn</i> , 441 F.3d 977 (Fed. Cir. 2006)	31
<i>In re Suitco Surface, Inc.</i> , 603 F.3d 1255 (Fed. Cir. 2010)	10
<i>InTouch Techs., Inc. v. VGO Commc'ns., Inc.</i> , 751 F.3d 1327 (Fed. Cir. 2014)	32

<i>KSR Int’l Co. v. Teleflex Inc.</i> , 550 U.S. 398 (2007).....	31, 53
<i>Leo Pharm. Prods., Ltd. v. REA</i> , 726 F.3d 1346 (Fed. Cir. 2013)	59
<i>Microsoft Corp. v. Proxyconn, Inc.</i> , 789 F.3d 1292 (Fed. Cir. 2015)	9
<i>Net MoneyIN, Inc. v. VeriSign, Inc.</i> , 545 F.3d 1359 (Fed. Cir. 2008)	29
<i>PharmaStem Therapeutics, Inc. v. ViaCell, Inc.</i> , 491 F.3d 1342 (Fed. Cir. 2007)	32
<i>See In re Omeprazole Patent Litig.</i> , 536 F.3d 1361 (Fed. Cir. 2008)	36
<i>Silicon Labs., Inc. v. Cresta Tech. Corp.</i> , IPR2014-00728, Paper 53 (PTAB Oct. 21, 2015).....	11, 17, 45
<i>Straight Path IP Group, Inc. v. Sipnet EU S.R.O</i> , No. 2015-1212 (Fed. Cir. Nov. 25, 2015)	9, 46
<i>Unigene Labs., Inc. v. Apotex, Inc.</i> , 655 F.3d 1352 (Fed. Cir. 2011)	37, 53
<i>Unilever, Inc. v. Procter & Gamble Co.</i> , IPR2014-00506, 2014 WL 3368964 (PTAB July 7, 2014).....	3
<i>United States v. Adams</i> , 383 U.S. 39 (1966).....	55

Statutes

35 U.S.C. § 325(d)	3, 4
37 C.F.R. § 42.100(b)	5
37 C.F.R. § 42.108	1

Other Authorities

MPEP § 2143	36
-------------------	----

I. INTRODUCTION

Pursuant to the Board’s Decision – Institution of Inter Partes Review (Paper 9) (“Institution Decision”), entered August 14, 2015, and 37 C.F.R. § 42.108, Patent Owner Cresta Technology Corporation (“Cresta” or “Patent Owner”) submits this Response in opposition to the Petition for Inter Partes Review of United States Patent No. 7,265,792 (“the ’792 patent”) filed by Silicon Laboratories, Inc. (“Silicon Labs” or “Petitioner”). Claims 18-19 and 24-29 of the ’792 patent are at issue in this proceeding. For the reasons discussed below, Silicon Labs has not established the invalidity of the challenged claims.

II. THE INVENTION OF THE ’792 PATENT

Unlike AM/FM radio stations which employ fairly uniform worldwide standards as to their technical parameters—such as frequency range and bandwidth of each radio station’s signal—television stations in different countries tend to have different technical parameters. More than a dozen different analog television formats have existed in different countries, as well as numerous different digital formats. Most of these formats are incompatible with each other. Ex. 2032, ¶35; *see also* Ex. 2003, ¶32. As a result, there was a need in the industry for a universal television receiver that had the following characteristics: small, relatively inexpensive, and reliable so as to be accepted by manufacturers of television sets around the world. Ex. 2032, ¶37. A universal television receiver also had to have

good performance. *Id.* Unlike AM/FM radios where interference can be an occasional nuisance, television interference can cause the picture to be unacceptably poor. *Id.*; *see also* Ex. 2003, ¶34. Television receivers have unique characteristics. Ex. 2032, ¶38; *see also* Ex. 2003, ¶35. The television industry needed a receiver system design that would take into account all of the mutually conflicting requirements of various transmission standards for television signals, the technological and operational constraints, and deliver the necessary performance. Ex. 2032, ¶39; *see also* Ex. 2003, ¶36. The invention covered by the '792 patent meets this industry need by providing a cost effective, small-sized, integrated, multi-standard television universal receiver that receives a Radio Frequency (RF) television signal. Ex. 1001 at 2:28-45. The claims at issue in this proceeding achieve this by consolidating signal processing into a single signal processor that can handle multiple different input signal formats. *E.g., id.* at cls. 1, 18-19, and 24-29.

By contrast, the prior art solved the problem by providing multiple, static channel filters each dedicated to a particular standard and format, as the '792 patent itself discusses. *Id.* at 1:52-54; 2:4-13. Crucially, the particular prior art references cited by Silicon Labs in this proceeding are also examples of the known approaches detailed in the '792 patent. For example, Zenith discloses a selection between a set of fixed channel filters (included within its demodulators), as was

typical in the prior art. Ex. 1011 at 1:11-22; Figs. 1-2. Silicon Labs' expert agreed that Zenith included the stock channel filters. Ex. 2033 at 57:4-58:9 ("The digital demodulator 18 [in Zenith] would include a digital channel filter. Right? A. Yes."). As another example, Harris teaches using multiple static signal processors and only one set of finite impulse response filter coefficients at a time. *See, e.g.*, Ex. 1005 at 7; Ex. 2033 at 64:9-65:6 (Figure 6 of Harris discloses a parallel bank of DDFs); *see also* Ex. 2032, ¶76. Similarly, Thomson discloses entirely separate signal processing paths for analog and digital formats. *See* Ex. 2032, ¶76.

III. PROPRIETY OF THE PETITION IN LIGHT OF IPR2014-00809

As discussed in detail in Cresta's Preliminary Response, Silicon Labs had the opportunity to challenge claims 18-19 and 24-29 of the '792 patent in IPR2014-00809. *See* Preliminary Response at 1-8. And, in fact, the Board specifically denied institution of *inter partes* review on claims 26 and 27. This proceeding is an improper attempt by Silicon Labs to raise "substantially the same prior art of arguments previously presented to the Office" and should be rejected on that ground alone. 35 U.S.C. § 325(d); *Unilever, Inc. v. Procter & Gamble Co.*, IPR2014-00506, 2014 WL 3368964, at *5 (PTAB July 7, 2014). However, the Board declined to exercise its discretion to deny the Petition under 35 U.S.C. § 325(d). *See* Institution Decision at 15-16. For the reasons discussed in the Preliminary Response, Cresta disagrees with that portion of the Institution

Decision. Cresta expressly reserves the right to raise the propriety of Silicon Labs' improper attempt to circumvent 35 U.S.C. § 325(d) on appeal, including but not limited to any appeal of this proceeding to the Federal Circuit.

IV. PERSON OF ORDINARY SKILL IN THE ART (POSITA)

A POSITA at the time of the invention of '792 patent would have at least a Bachelor of Science degree in Electrical Engineering plus at least two years of professional experience in implementing radio-frequency circuits for television applications. Ex. 2032, ¶¶18-25; *see also* Ex. 2003, ¶19. Cresta does not agree with Silicon Labs' argument that a POSITA would need only a Master of Science degree in Electrical Engineer with only experience in mixed signal system design, including analog front ends and subsequent digital signal processing of various analog and digital signal formats of video and audio content, with no experience in radio-frequency circuits for television applications. Petition at 18. Radio-frequency circuits for television applications require experience with the unique challenges that are presented with such designs. Ex. 2032, ¶¶21-22; *see also* Ex. 2003, ¶¶20, 22. Because of these unique design challenges, a POSITA would have at least two years of professional experience in implementing radio-frequency circuits for television applications. Ex. 2032, ¶22.

V. CLAIM CONSTRUCTION

A. Claim Construction Standard

“During inter partes review, claims are given their broadest reasonable interpretation in view of the specification of which are part. 37 C.F.R. § 42.100(b).” *Illumina, Inc. v. Trustees of Columbia University in the City of New York*, IPR2012-00006, 2013 WL 2023631, at *3 (PTAB Mar. 12, 2013). The standard for claim construction at the Patent Office is different from that used during a U.S. District Court litigation. *See In re Am. Acad. of Sci. Tech Ctr.*, 367 F.3d 1359, 1364 (Fed. Cir. 2004); *In re Cuozzo Speed Techs., LLC*, 793 F.3d 1268, 1279 (Fed. Cir. 2015); 37 C.F.R. § 42.100(b).

B. Claim Constructions Previously Adopted By The Board

In the Institution Decision, the Board construed “input RF signal” as “a signal having a frequency between 10 KHz and 100 GHz that is put in [to the frequency conversion circuit].” Institution Decision at 7-12. The Board construed “frequency conversion circuit” as its plain and ordinary meaning. *Id.* at 12. The Board construed “encoding information in one of a plurality of formats” as requiring that each received input RF signal encode information in exactly one format. *Id.* at 12-13. The Board construed “processing in accordance with the format” to require processing in accordance with the exactly one format in which each received input RF signal is encoded. *Id.* at 13-14. The Board construed

“signal processor” as “a digital module that processes signals in the digital domain.” *Id.* at 14. Lastly, the Board construed “indexes” as “points to a block of memory when retrieving a set of coefficients [of filter functions].” *Id.* at 14-15.

For the purposes of this Response only, and in the interest of streamlining the disputes that are most pertinent to the specific claims challenged in this proceeding, Cresta applies the claim constructions provided by the Board in the Institution Decision. Cresta does not agree that those claim constructions are the broadest reasonable interpretation for many of the terms at issue. *See, e.g.,* Ex. 2032, ¶¶49-67. Cresta expressly reserves the right to challenge those claim constructions, including but not limited to any appeal of this proceeding to the Federal Circuit. Cresta further expressly reserves the right to argue a different claim construction in litigation and in ITC proceedings for any term of the '792 patent, as appropriate in that proceeding.

C. “A Select Signal Indicative Of A Format Of The Input RF Signal”

Cresta proposes a construction for one claim term in this Response. The term was not proposed for construction in either the Petition or the Preliminary Response. The broadest reasonable interpretation of “a select signal indicative of a format of the input RF signal” is “a signal that performs a selection and that comprises information about the format of the input RF signal.” This term is found in claim 26. The full claim 26 reads: “26. 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.” Notably, Cresta’s proposed construction is not inconsistent with the construction of “signal processor” adopted by the Board, which is “a digital module that processes signals in the digital domain.” Institution Decision at 14. The Board’s construction of “signal processor” does not preclude the select signal from performing a selection and comprising information about the format of the input RF signal.

Cresta’s proposed claim construction is consistent with the plain meaning of the claim language. For example, the claims use both the terms “indicative of” and “in response to.” Therefore, “indicative of” must mean something different than “in response to,” since different words are used. *See, e.g., Augme Techs., Inc. v. Yahoo! Inc.*, 755 F.3d 1326, 1332-34 (Fed. Cir. 2014) (affirming construction that “embedded” computer code did not cover “linked” computer code because the plain claim language made a distinction between the two types); *Exxon Chemical Patents, Inc. v. Lubrizol Corp.*, 64 F.3d 1553, 1557 (Fed. Cir. 1995) (A court “must give meaning to all the words in [the] claims.”). “Indicative of” generally means indicating information about. *See, e.g., Ex. 2034* (“indicative” defined as “1. serving as a sign or indication (of)” and “indicate” defined as “2. to be a sign or

token of”). For example, the select signal could include information about the format of the underlying data by specifying specific parameters of the data format or the filter functions needed to process it. In contrast, an operation “in response” to a signal describes taking actions based on the presence or absence of the signal. A signal “indicative of” something must provide information about the subject being indicated, more than simply a state of being. The claims describe what the select signal is, and then what the signal processor does with that signal. Cresta’s proposed construction accurately describes the pertinent features of the “standard select signal” that the signal processor uses to select the appropriate finite impulse response filter as required by the claim language.

This construction is also consistent with the specification. The specification explicitly describes the standard select signal as “a signal . . . indicating which television format and standard the input signal is encoded.” Ex. 1001 at 6:17-22. In one embodiment, the select signal directly corresponds with a format chosen by the user. *Id.* at 6:6-10. Further, the specification describes the select signal itself as containing information about the underlying signal—for example, how the signal is encoded. This information is used to reprogram the signal processor in response to that signal with the required information. The specification also gives an example of distinguishing between digital and analog signals by searching for

information specific to each signal. *Id.* at 6:10-16. Different format-specific information is contained in the output demodulators. *Id.* at 6:16-18.

Additionally, this construction is consistent with the plain and ordinary meaning of the term as would be interpreted by one of skill in the art in the context of the patent. Dr. Opris explains that a person of ordinary skill would understand the select signal to contain information about the particular television standard. Ex. 2032, ¶69. Further, the difference in the claim language between “indicative of” and “in response to” would be understood by a person of ordinary skill to demonstrate that the select signal must reflect the television standard. *Id.*, ¶70.

Therefore, Cresta’s proposed construction of “a select signal indicative of a format of the input RF signal” is consistent with the “broadest reasonable interpretation consistent with the specification . . . as it would be interpreted by one of ordinary skill in the art.” *In re Am. Acad. of Sci. Tech Ctr.*, 367 F.3d 1359, 1364 (Fed. Cir. 2004); *In re Cuozzo Speed Techs., LLC*, 793 F.3d 1268, 1279 (Fed. Cir. 2015). While this claim construction standard is more flexible than that applied in a district court action, the interpretation cannot be unduly broad or untethered to the specification. *Microsoft Corp. v. Proxyconn, Inc.*, 789 F.3d 1292, 1300 (Fed. Cir. 2015); *see also Straight Path IP Group, Inc. v. Sipnet EU S.R.O*, No. 2015-1212 (Fed. Cir. Nov. 25, 2015) (reversing PTAB claim construction as contrary to the plain meaning and the specification). In *Proxyconn*, the Federal Circuit

cautioned that the Board should not “construe claims during IPR so broadly that its constructions are unreasonable under general claim construction principles.” *Proxyconn*, 789 F.3d. at 1298. Read in context, a “a select signal indicative of a format of the input RF signal” cannot simply be any information output from a demodulator. *Proxyconn*’s guidance that “claims should always be read in light of the specification and teachings in the underlying patent,” strongly counsels in favor of adopting Cresta’s proposed construction. *Id.* In particular, the *Proxyconn* court found that when the specification consistently referred to a claim term in a particular way, and when there was no disclosure contrary to that usage, it was error for the Board to construe the term more broadly than supported by the specification. *Id.* at 1300; *In re Suitco Surface, Inc.*, 603 F.3d 1255, 1260 (Fed. Cir. 2010) (“The PTO’s construction here, though certainly broad, is unreasonably broad. The broadest-construction rubric coupled with the term ‘comprising’ does not give the PTO an unfettered license to interpret claims to embrace anything remotely related to the claimed invention.”).

VI. THE CHALLENGED CLAIMS ARE PATENTABLE

The challenged claims all ultimately depend on claim 1, which is not explicitly at issue in this proceeding, but was at issue in IPR2014-00809. In its Preliminary Response, as well as in briefing in IPR2014-00809, Cresta detailed reasons why the cited prior art does not render the foundational claims invalid, and

therefore why the cited prior art could also not invalidate challenged claims 18-19 and 24-29. *See, e.g.*, Preliminary Response at 19-40. The Institution Decision did not credit these arguments. Institution Decision at 18-20. Further, on October 21, 2015, the Board rendered a Final Written Decision in IPR2014-00809 finding that, among other claims, claim 1 of the '792 patent was invalid. *Silicon Labs., Inc. v. Cresta Tech. Corp.*, IPR2014-00809, Paper 56 (PTAB Oct. 21, 2015).

For the purposes of this Response only, and in the interest of streamlining the disputes that are most pertinent to the specific claims challenged in this proceeding, Cresta is directing this Response specifically to issues raised in the challenged claims. Cresta does not agree that any claim of the '792 patent is invalid, and in particular disagrees with the Final Written Decision in IPR2014-00809 and the portions of the Institution Decision addressing claim 1. Cresta expressly reserves the right to appeal those invalidity determinations, including but not limited to any appeal of this proceeding to the Federal Circuit.

A. Ground 1: Claim 29 Is Not Obvious Under The Combination Of Thomson And Harris

Claim 29 reads: “29. The television receiver of claim 1, wherein the input RF signal comprises an RF signal received from terrestrial broadcast, an RF signal received from satellite broadcast, and an RF signal received from cable transmission.” Silicon Labs argues that Thomson discloses this limitation, not Harris. Petition at 35. Cresta agrees that Harris does not disclose this limitation.

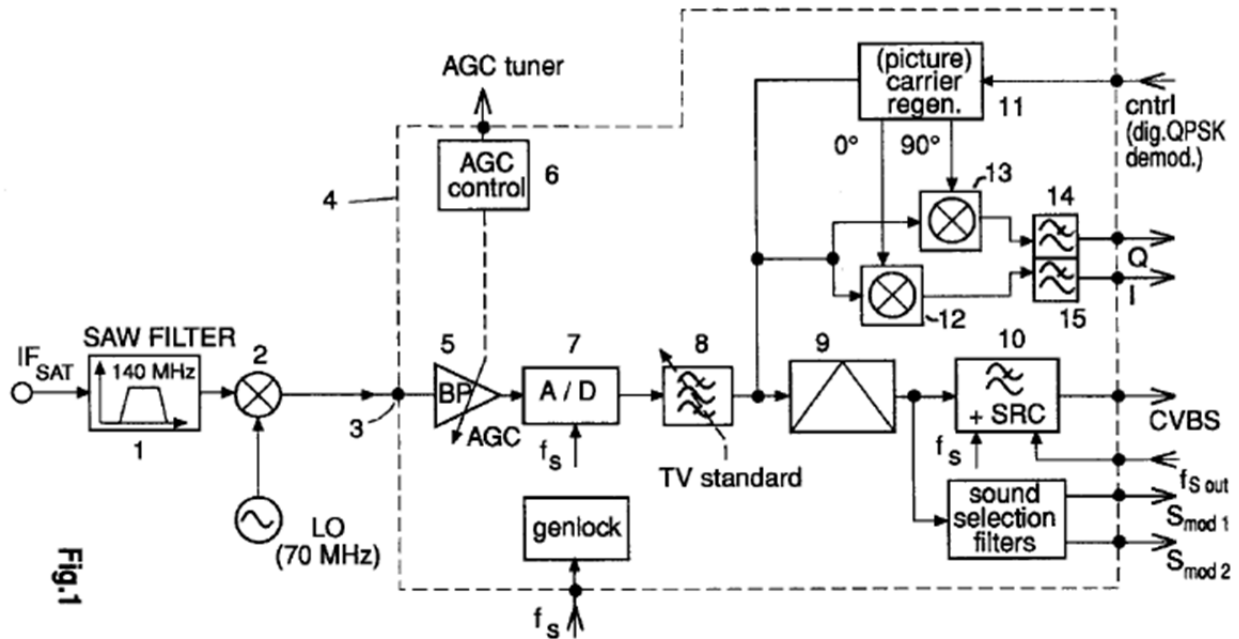
Silicon Labs relies solely on the following excerpt from Thomson:

Nowadays, a multi-standard TV receiver should be able to function as a satellite broadcast [sic] receiver. For that reason the outdoor unit supplies the satellite channels already down-converted in a frequency band covering 950 – 1750 MHz which should be handled by a multi-standard tuner. To take advantage of the double-conversion tuner the 1st-IF frequency should be around 2 GHz. In contrary [sic] to the terrestrial and cable transmission, the video signals are FM modulated

Ex. 1004, 1:55-2:3.

Thomson is directed only to “using a common A/D converter *only* for analog and digital transmission via satellite.” Ex. 1004 at 1:29-33. Similarly, it describes its insight as applicable to the design of a “satellite TV receiver.” *Id.* at 1:22-27. Although it Thomson’s design operates only on incoming broadcast satellite signals, the satellite TV receiver “should also include the classical analog satellite reception with FM modulated signals.” *Id.* at 1:27-28. The objective of Thomson is therefore to deal with satellite transmissions in both analog and digital formats, *not* to provide the capability to process satellite broadcast signals along with terrestrial and cable broadcast signals as required by claim 29. *See, e.g., id.* at 1:42-43 (“The proposed architecture allows a digitizing of the Sat-IF signals no matter that they are analog or digital ones.”).

The satellite-specific nature of Thomson is also demonstrated by Thomson's Figure 1, which "shows a block diagram of a television receiver *working according to the present invention.*" *Id.* at 2:24-25.



Id. at Fig. 1. In this figure depicting "the present invention" of Thomson, the input signal is labeled " IF_{SAT} ," representing an input frequency from a satellite broadcast – explicitly not a cable or terrestrial broadcast. Figure 2, the only other drawing in Thomson, is another depiction of the workflow in Thomson where IF_{SAT} is processed to create a "pre-filtered Sat-IF signal." *Id.* at Fig. 2. There is no "RF signal received from terrestrial broadcast" or "RF signal received from cable transmission" depicted in either Figure. Simply put, the system described in Thomson operates exclusively on satellite signals, not terrestrial or cable signals.

In the Institution Decision, the Board considered the claim language, and, in particular whether the claim requires the input RF signal to contain all three types of signals simultaneously:

Implicit in Petitioner's assertion is the interpretation that claim 29 requires the frequency conversion circuit to receive each of the three enumerated RF signals (i.e., terrestrial broadcast, satellite broadcast, or a cable transmission) individually, and does not require the frequency conversion circuit to receive a single RF signal that includes each of the three RF signals. Such interpretation is consistent with the Specification of the '792 patent. See, e.g., Ex. 1001, 4:53–55 (“[t]he input RF signals can be received from terrestrial broadcast or cable transmissions”).

Institution Decision at 21. Cresta agrees with this interpretation: the claim does not require the simultaneous presence of all three types (which would not make sense for a variety of technical reasons that are not relevant here because all parties as well as the Board agree that this is not the proper interpretation), but does require the capability of processing each of the three types.

Thomson does not disclose this claim limitation. Thomson does not disclose processing an RF signal received from terrestrial broadcast or cable transmission. Thomson is restricted to satellite signals only. In particular, the section of Thomson cited by Silicon Labs, which discusses a “frequency band covering 950 –

1750 MHz which should be handled by a multi-standard tuner,” Ex. 1004 at 1:58-2:1, does not disclose terrestrial broadcasts or cable transmission. At most, it discloses that the “multi-standard tuner” could handle both analog and digital satellite signals. Silicon Labs provides no guidance on how Thomson could be combined with any other reference (including Harris) to disclose the entirety of the claim limitation. Silicon Labs provides no motivation to combine Thomson with any other reference (including Harris) to disclose the entirety of the claim limitation. Consequently, Silicon Labs has not established the invalidity of this claim.

B. Ground 2: Claims 24 And 25 Are Not Obvious Under The Combination Of Thomson, Harris, And Grumman

1. Claim 24 Is Not Obvious Under The Combination Of Thomson, Harris, And Grumman

Claim 24 reads: “24. The television receiver of claim 1, wherein the plurality of finite impulse response filters are stored in a memory, and the signal processor indexes the memory to retrieve one of the plurality of finite impulse response filters.” Silicon Labs argues that Grumman discloses two memory storage banks that store coefficient data values for a set of finite impulse response filters. Petition at 35-38. Silicon Labs argues that “A person of ordinary skill in the art would have been motivated to implement the FIR filter of Harris using the Grumman architecture.” *Id.* at 38. Silicon Labs further asserts that “a POSITA

would have been motivated to implement the adaptive filter of Thomson using the FIR filter disclosures of Harris and Grumman, especially in light of the ease and efficient approach of indexing memory storing a set of FIR filter coefficients.” *Id.* at 39. However, Silicon Labs is mistaken, both as to what Grumman alone discloses, and also as to the references in combination.

i. Neither Thomson Nor Harris Disclose Storing A Plurality Of Finite Impulse Response Filters In Memory Or A Signal Processor Indexing A Memory To Retrieve One Of The Plurality Of Finite Impulse Response Filters

Silicon Labs does not argue that any other reference in the cited combination, other than Grumman, discloses the required limitations pertaining to storing finite impulse response filters in memory or indexing that memory with a signal processor to retrieve one of the finite impulse response filters. Petition at 35-39; *see also* Ex. 2033 at 75:20-23 (“[Y]ou rely on Grumman for the finite impulse response filters of [a similar claim of the ’585 patent]. Is that right? A. Yes.”). Further, the Board only considered the disclosure of Grumman for those elements. Institution Decision at 21-23. Cresta agrees that neither Thomson nor Harris discloses the relevant limitations.

For example, nothing in Thomson discloses that Thomson’s bandpass filter 8 includes a memory storing a plurality of finite impulse response filters. Dr. Opris explains that a POSITA would have understood that the Thomson bandpass

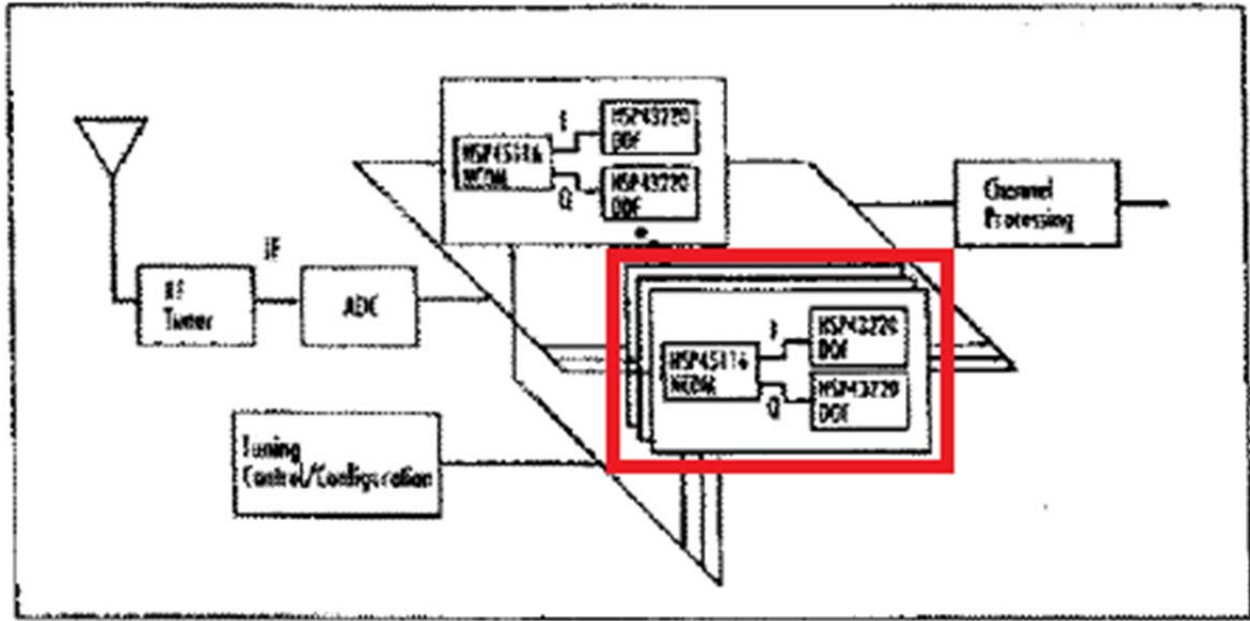
filter 8 has two filters in parallel (one for analog TV and one for digital TV). Ex. 2032, ¶76.

Furthermore, Thomson does not teach or suggest a single path process using a signal processor to operate on an input RF signal by retrieving one of a plurality of finite response filters stored in a memory, where each filter corresponds to a format of the input RF signal. To the contrary, Thomson teaches parallel, simultaneous path processing of a digital and an analog format, as the Board recognized in its Final Written Decision in IPR2014-00728. *Silicon Labs., Inc. v. Cresta Tech. Corp.*, IPR2014-00728, Paper 53 at 20-21 (PTAB Oct. 21, 2015) . Thomson discloses one path for analog format processing and the other path for digital format processing, using a bank of parallel bandpass filters. Ex. 1004 at 2-3; Fig. 1. Each bandpass filter is processing the signal, one according to an analog format and the other according to a digital format. *Id.* For example, if the RF input signal is in an analog format, the analog bandpass filter will provide useful signal outputs that the demodulator will be able to use to produce a comprehensible baseband signal. In that situation, the digital bandpass filter will provide useless signal outputs that the demodulator will not be able to use to produce an intelligible baseband signal.

Dr. Opris explains that at the time of the invention, a bank of parallel bandpass filters, each processing the signal in accordance with a different format

(e.g. analog format or digital) in a parallel processing path, was the conventional means to provide a multi-format bandpass filter. *See* Ex. 2003, ¶76. Dr. Opris explains that a POSITA reading the Thomson reference would have understood that the Thomson bandpass filter 8 has two circuits in parallel (one for analog TV and one for digital TV). Ex. 2032, ¶76. Each of the outputs of each of these two circuits feeds its respective demodulator. Ex. 2003, ¶76. Fundamentally, Silicon Labs has not provided any evidence that a bandpass filter providing a *single* path process for a plurality of input RF signal formats was known at the time of the '792 patent invention, either in Thomson or anywhere else. *Id.*, ¶77. A POSITA would have concluded that Thomson discloses that the bandpass filter includes two parallel circuits, one for analog television IF signals and another one for digital television IF signals. *Id.*

Similarly, nothing in Harris, nor any other evidence introduced in this proceeding, discloses that Harris includes a memory storing a plurality of finite impulse response filters. Harris discloses: “As shown in Figure 6, the channelized receiver is constructed with multiple sets of similar hardware that tune to the center frequencies of many channels of interest.” Ex. 1005 at 6. Figure 6 of Harris depicts multiple parallel finite response filters, shown as stacked circuit boards each receiving the input signal and outputting signals in parallel:



Id. at 7 (Fig. 6) (red outline added). Dr. Opris explains that a POSITA would understand Harris to lack a memory storing a plurality of finite impulse response filters. Ex. 2032, ¶¶76-77. Silicon Labs' expert also agrees. Ex. 2033 at 64:9-64:25 ("You believe that those items in the center of Figure 6 [of Harris] are a parallel bank of DDFs. Right? . . . A. . . . Yes, I believe they do contain the DDFs."); *id.* at 65:1-6 ("Q. And looking at Figure 6, there appear to be several of them in parallel. Right? A. What do you mean by parallel? Q. Do you have an understanding of the term parallel? A. Yes, I do. And, yes, they are.").

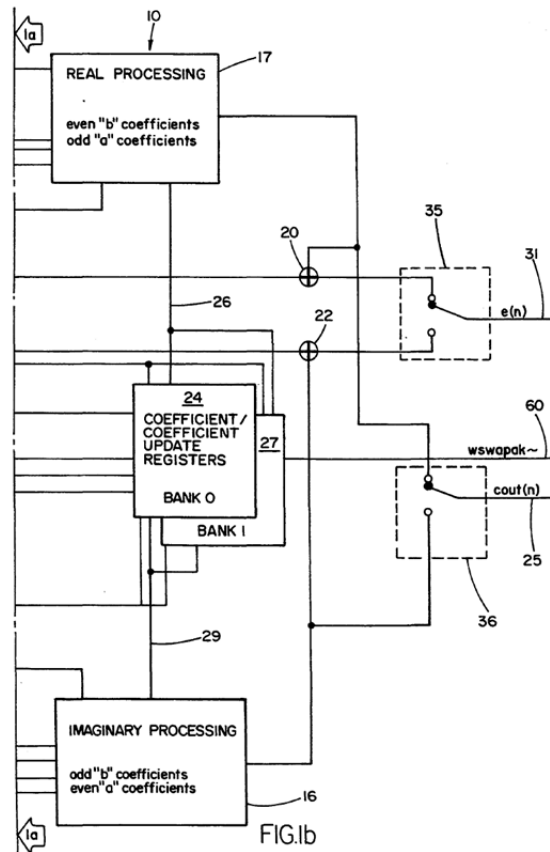
Furthermore, Harris does not teach or suggest a single path process using a signal processor to operate on an input RF signal by retrieving one of a plurality of finite response filters stored in a memory, where each filter corresponds to a format of the input RF signal. To the contrary, Harris teaches and suggests parallel,

simultaneous path processing. Harris discloses: “As shown in Figure 6, the channelized receiver is constructed with multiple sets of similar hardware that tune to the center frequencies of many channels of interest.” Ex. 1005 at 6. Figure 6 shows parallel finite impulse response filters, shown as stacked circuit boards (see modified Figure 6 above). Ex. 2033 at 64:9-65:6 (Figure 6 of Harris discloses a parallel bank of DDFs). A POSITA reading the Harris reference would have understood that each of the parallel finite impulse response filters is separate circuitry and therefore that there is no memory storing a plurality of filters. Ex. 2032, ¶¶76-77. Furthermore, Silicon Labs has not provided any evidence that it was known at the time of the ’792 patent invention that Harris, or any other reference, teaches or suggests a memory storing a plurality of finite response filters.

ii. Grumman Does Not Disclose Storing A Plurality Of Finite Impulse Response Filters In Memory, Each Of Said Plurality Of Finite Impulse Response Filters Corresponding To A Format Of Said Input RF Signal Or A Signal Processor Indexing A Memory To Retrieve One Of A Plurality Of Finite Impulse Response Filters

Grumman discloses a single finite response filter that processes an incoming data signal “ $y(n)$ ” having real and imaginary data (e.g. a pulsed radar return signal). *See, e.g.*, Ex. 1008 at 5:33-44 (“ $Y(n)$ is a multiplexed digital signal having a real input data portion and imaginary data portion.”). Figure 1b of

Grumman shows “IMAGINARY PROCESSING” unit 16 and “REAL PROCESSING” unit 17 that operate in parallel, in a single finite impulse response filter, to process the $Y_{in}(n)$ signal:



Id. at Fig. 1b; *see also id.* at 5:33-35 (the entirety of Fig. 1b depicts “the complex adaptive finite impulse response filter”); 5:44-53 (the single filter is composed of a real circuit and an imaginary circuit).

In particular, Grumman’s Figure 3 shows a single “adaptive filter” that adjusts the filtering by an input error “signal $e(n)$ 11” generated by comparing the “desired” input $d_{in}(n)$ 9” to the outputted “ $c_{out}(n)$ ” of the adaptive filter:

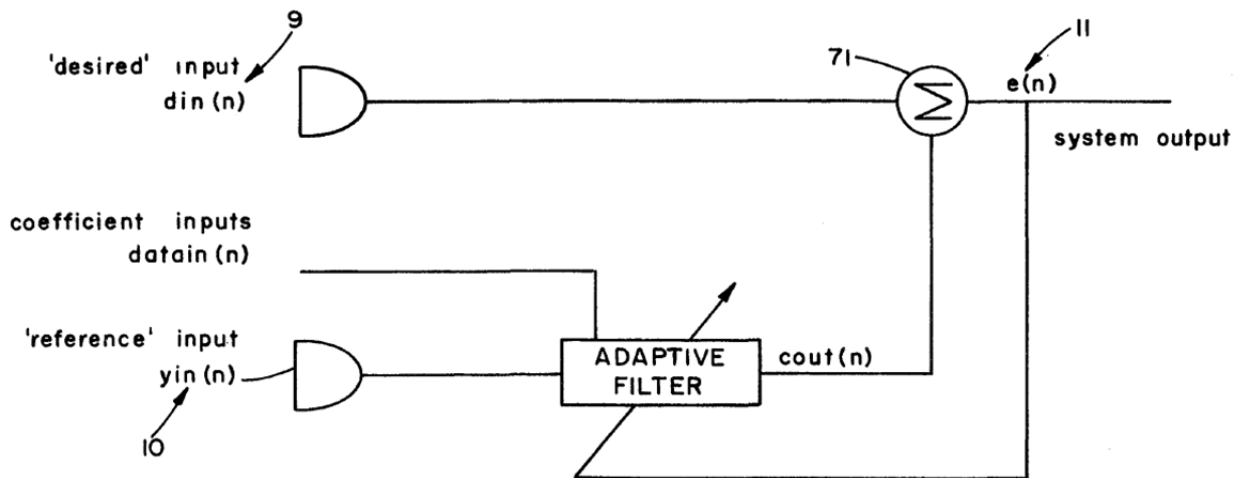


FIG.3

Id. at Fig. 3 (original figure rotated). Grumman discloses that a host computer adjusts the input “coefficient input datain(n)” based upon the “e(n)” system output. Ex. 1008 at 2:38-42 (in order to properly perform adaptive filtering, an error signal, which is calculated as the sum of the filter output signal and a “desired” input signal, must be provided as an output to the host processor to calculate the updated weight coefficients).

Grumman does not disclose these claim limitations for at least two separate reasons.

(1) Grumman Does Not Disclose Storing A Plurality Of Finite Impulse Response Filters In Memory Corresponding To A Different Format

Silicon Labs relies on Grumman’s disclosure of a memory bank 0 and a memory bank 1 for teaching this element. *See* Petition at 35-39. But Silicon Labs

is incorrect when it asserts that Grumman teaches storing two separate finite impulse response filters in memory banks 0 and 1. This two-bank architecture is only a subcomponent of the single Grumman filter. It does not create or define two separate finite impulse response filters. Grumman discloses a memory storage means (bank 0) for storing a first set of adaptive weights (odd number “a” coefficients) and a fourth set of adaptive weights (even number “a” coefficients). The Grumman filter includes another memory storage means (bank 1) for storing a second set of adaptive weights (odd number “b” coefficients) and a third set of adaptive weights (even number “b” coefficients). Ex. 1008 at 4:7-23; Fig. 2. The coefficients may be recalculated based on an error signal “e(n),” but in every case the coefficients remain constituents of a single finite impulse response filter. *Id.* at Fig. 3; 7:11-31. Grumman consistently teaches that the coefficients are not the filter, but instead are used by the single finite impulse response filter to process the input signal. *Id.* at 4:7-9 (“The *coefficient data values* of the adaptive weight circuits are stored in two memory storage banks *for access by the filter* or host processor.”) (emphasis added); 7:32-8:34; Fig. 2. Grumman’s claims further confirm that Grumman does not teach a plurality of finite impulse response filters but instead a *single* finite impulse response filter. *See, e.g., id.* at 16:40-18:50 (claims 1-9) (claiming a single finite impulse response filter capable of using

adaptive weights (*i.e.*, coefficients), where the adaptive weights are specific to either the real or imaginary data component).

This distinction is not just in Grumman. It is also in the '792 patent. The clear division of a single finite impulse response filter into two subcomponents, real and imaginary, is found in the language of claim 25: “25. 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.” Ex. 1001 at cl. 25 (emphasis added). Thus, the claims of the '792 patent themselves consider real and imaginary parts to be subcomponents of a single finite impulse response filter. By contrast, Silicon Labs improperly attempts to label the real component of Grumman a standalone finite impulse response filter and the imaginary component a standalone finite impulse response filter.

Dr. Opris explains that Grumman does not disclose a plurality of finite impulse response filters where each of the finite impulse response filters corresponds to a different input RF signal format, and therefore also does not disclose a memory storing a plurality of finite response filters. Ex. 2032, ¶77 Moreover, Dr. Opris explains that Silicon Labs' reliance on the memory bank 0 and memory bank 1 to show a memory storing a plurality of finite responses filters

is misplaced because Grumman teaches that these memory banks do not store a plurality of finite impulse response filters, but instead the coefficients for a single finite impulse response filter. *Id.* That is, the multiple coefficients are depicted as an input to the single “adaptive filter.” They are not the adaptive filter and do not comprise finite impulse response filters by themselves.

Furthermore, Grumman does not disclose format-specific finite impulse response filters. Claim 24 requires, via its dependency on claim 1, that each finite impulse filter corresponds to a different format. Ex. 1001 at cl. 1 (“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 [filters] corresponding to a format of the input RF signal.*”) (emphasis added). In contrast, Grumman’s two sets of coefficients relate to just one format. Ex. 1008 at 1:6-15. Grumman uses two sets of coefficients to provide adaptability for a single format, not to provide a plurality of finite impulse response filters, each finite impulse response filter corresponding to one of a plurality of formats as required by claims 24 and 1. *See* Ex. 2032, ¶78.

Moreover, even a disclosure in Harris of different filters that correspond to different formats does not disclose this element in the context of claim 24. Read as also requiring the limitations in parent claim 1, claim 24 requires finite impulse response filters that correspond to a particular format to be stored in memory and indexed by the signal processor. Grumman teaches only storing coefficient portions of a single filter in memory, so the combination of Harris and Grumman would not disclose the limitation. *See id.*, ¶78.

(2) Grumman Does Not Disclose A Signal Processor Indexing A Memory To Retrieve One Of A Plurality Of Finite Impulse Response Filters

As pointed out above, Grumman discloses a single finite response filter that processes an incoming data signal “ $yin(n)$ ” having real and imaginary data (e.g. a pulsed radar return signal). *See, e.g.*, Ex. 1008 at 5:33-44 (“ $Yin(n)$ is a multiplexed digital signal having a real input data portion and imaginary data portion.”). Figure 1b of Grumman shows “IMAGINARY PROCESSING” unit and16 “REAL PROCESSING” unit 17 that operate in parallel, in a single finite impulse response filter, to process the $Yin(n)$ signal.

Moreover, Figure 2 of Grumman depicts in detail the components of the real and imaginary processing units and how they operate in parallel together to form the single finite impulse response filter. In particular, Grumman teaches how the two processing units 16 and 17 work together to process the incoming complex

signal $yin(n)$ using a sets of coefficients (even “a” coefficients shown as boxes a_{30} - a_0 , odd “b” coefficients shown as boxes b_{31} - b_1 , odd “a” coefficients shown as boxes a_{31} - a_1 , and finally even “b” coefficients shown as boxes b_{30} - b_0):

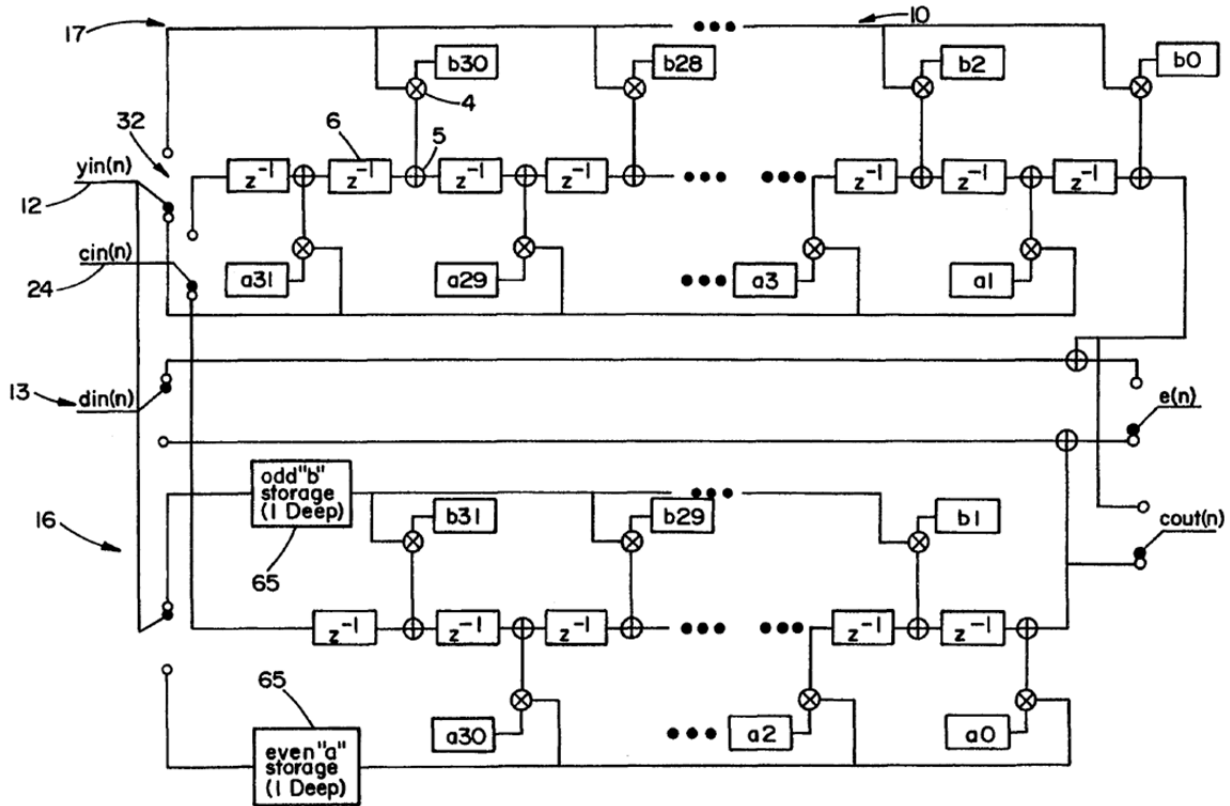


FIG.2

Id. at Fig. 2. The figure and accompanying text in the specification show that the single finite impulse response filter 10 operates so that the processing unit 16 (lower half of Fig. 2) multiplies odd “b” coefficients while processing unit 17 (upper half of Fig. 2) multiplies odd “a” coefficients, or in the alternative operates so that the processing unit 16 (lower half of Fig. 2) multiplies even “a” coefficients while processing unit 17 (upper half of Fig. 2) multiplies even “b” coefficients. *See also id.* at 4:34-38 (“FIG. 2 shows a general block diagram conceptually

illustrating *the* adaptive filter having *two sets of parallel paths*; one set for processing the real data portion of the input signal and the other set for processing the imaginary portion of the input signal.”) (emphasis added); *see also id.* at 7:32-8:34.

Silicon Labs alleges in the Petition that the claimed “signal processor” may be all of the real processing circuitry and the imaginary processing circuitry disclosed in Grumman combined. Petition at 45 (“[T]he signal processor of Grumman (*e.g.*, the real processing circuitry 17 and imaginary processing circuitry 16) indexes memory by swapping between bank 0 and bank 1 to retrieve a selected set of adaptive weights corresponding to a unique FIR filter.”). This interpretation reads “signal processor” out of the claim by labeling all disclosed circuitry in the prior art reference a “signal processor,” even though there are multiple sub-component paths within the larger Grumman system that individually perform signal processing on either the real or imaginary component of the signal. For the same reasons, this interpretation does not meet the Board’s construction of “signal processor,” which is “a digital module that processes signals in the digital domain.” Institution Decision at 14.

Dr. Opris also explains that Grumman discloses a parallel, simultaneous workflow within the single finite impulse response filter. Ex. 2032, ¶79. Because Grumman relies on parallel processors, operating to simultaneously process the

workflow within the single finite impulse response filter, Grumman does not disclose the “signal processor” element of claim 24. *See* Ex. 1001 at cl. 11 (“24. The television receiver of claim 1, wherein the plurality of finite impulse response filters are stored in a memory, and *the signal processor indexes the memory* to retrieve one of the plurality of finite impulse response filters.”) (emphasis added). That is, there is no one “signal processor” that will index all of the memory locations disclosed in Grumman. *See Net MoneyIN, Inc. v. VeriSign, Inc.*, 545 F.3d 1359, 1371 (Fed. Cir. 2008) (“[U]nless a reference discloses within the four corners of the document not only all of the limitations claimed but also all of the limitations arranged or combined in the same way as recited in the claim, it cannot be said to prove prior invention of the thing claimed and, thus, cannot anticipate under 35 U.S.C. § 102.”). As reviewed in Section II of this Response, the replacement of parallel channel filters by a single signal processor was one way that the invention of the ’792 patent solved many of the problems with the prior art. This approach is reflected in the claim language and the various functions that the “signal processor” performs, both in the independent claims as well as in claims 18-19 and 24-29.

At deposition, Silicon Labs’ expert agreed that this element was not present in Grumman. Ex. 2033 at 75:9-10 (“I am relying on Grumman just for the finite impulse response filters.”); *id.* at 75:1-16 (“Q. So the said signal processor here in

[a parallel claim in the '585 patent], you don't find that claim element in Grumman. Is that right? A. I didn't . . .").

Further, the combination of Thomson, Harris, and Grumman does not rectify this gap and would not disclose a "signal processor [that] indexes the memory to retrieve one of the plurality of finite impulse response filters" as required by claim 24. Silicon Labs' expert agreed that the signal processors in Harris (*i.e.*, the DDFs) only store a single set of coefficients at a time. *See* Ex. 2033 at 63:18-24 ("Q. Is it fair to say that one way to reconfigure the DDF in Harris would be to load a new set of coefficients into the coefficient RAM? A. Yes, that would be one way. Q. Is there any other way described in the Harris reference? A. I don't think so."). Additionally, Harris teaches a parallel bank of signal processors that are used when multiple signals need to be processed concurrently. *Id.* at 64:9-65:6. A person of ordinary skill would not be motivated to change a fundamental aspect of Harris to add additional memory indexing of filter coefficients that would not be required or beneficial in the system of Harris. Thomson fares no better because it teaches two separate signal processors operating in parallel. One signal processor in Thomson processes analog format signals and the other processes digital format signals. By contrast, the plain language of this claim requires a single signal processor. The Petition is utterly silent on what that single signal processor would be in the combination of Thomson, Harris, and Grumman. *See* Petition at 37-39.

iii. Thomson, Harris, And Grumman Cannot Be Combined To Render The Claim Obvious

A person of ordinary skill in the art would not have had a reason to combine Thomson, Harris, and Grumman in the manner suggested by Silicon Labs. In particular, a person of ordinary skill would not have implemented the finite impulse response filter of Harris using the Grumman architecture to swap separate finite impulse response filter coefficients corresponding to one of a plurality of input RF signal formats. Silicon Labs has not provided any reasons to make this modification, nor has Silicon Labs' expert provided in any supporting evidence. Instead the Petition simply states:

Because digital FIR filter processing requires operating on coefficient weights, digital FIR filter processing requires both processor and memory resources. A natural design choice for a person of ordinary skill in the art would have been to store the set of coefficients of a plurality of FIR filters in memory using an index for easy and efficient access by a processor as taught by Grumman.

Petition at 38-39.

The Petition lacks an articulated or apparent reason supported by “some rational underpinning” to modify and combine the purportedly known elements in the manner suggested by Silicon Labs. *See KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 418 (2007) (quoting *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006)).

Obviousness requires a “reasonable expectation of success.” *PharmaStem Therapeutics, Inc. v. ViaCell, Inc.*, 491 F.3d 1342, 1360 (Fed. Cir. 2007). In these proceedings, as in district court litigations, the challenger bears the burden of identifying “sufficient reasons or motivations to combine the asserted prior references.” *InTouch Techs., Inc. v. VGO Commc’ns., Inc.*, 751 F.3d 1327, 1348 (Fed. Cir. 2014). Instead, and as demonstrated in the block quote above, Silicon Labs leaves it to the Board to ascertain what gaps to fill in, and then presents vague statements regarding what the prior art suggests. Petition at 38-39.

It is also not clear from the Petition how the prior art would be modified and combined, let alone how such modification and combination would have rendered any of the challenged claims obvious. Silicon Labs’ vague statement that “a person of ordinary skill in the art would have been motivated to implement the FIR of Harris using the Grumman architecture” (Petition at 39) leaves to the imagination what the combination of the finite impulse response filter of Harris using the Grumman architecture would be. But there are multiple potential combinations. For instance, one combination would be to substitute the single Grumman finite impulse response filter for all the Harris finite impulse response filters. Another combination would be to substitute the Grumman finite impulse response filter for each of the Harris finite impulse response filters. Cresta and the Board are left to guess what the operative combination is. But both combinations

have serious problems that demonstrate both that the combination would not make sense, and that the combined system would not disclose all claim elements. *See, e.g.,* Ex. 2032, ¶80.

If the combination is to substitute the single Grumman finite impulse response filter for all of the Harris finite impulse response filters, an objective of Harris to “tune to the center frequencies of many channels of interest,” Ex. 1005 at 6, would be obstructed. As detailed above, Grumman does not disclose operating on signals that may be in multiple different input formats, nor does Grumman disclose processing multiple format signals together. Silicon Labs cites the advantage of storing a coefficient in memory as “easy and efficient access by a processor as taught in Grumman.” Petition at 39. However, there is no explanation of why this same benefit would apply to Harris, which had an entirely different system of filters from Grumman. Indeed, even if storing filter coefficients in the memory banks 0 and 1 was appropriate for Grumman, there is no indication that the system of Harris needed or would benefit from a similar scheme, or why the multiple filter system of Harris should be abandoned in favor of a single filter system of Grumman, particularly when neither reference discloses an adaptive filter that can process different input formats.

If the combination is to substitute the Grumman filter for each of the Harris filters, the purpose of Grumman’s memory access system, to provide error

correction of a single finite impulse response filter, would be thwarted. If a proposed modification would render the prior art reference unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed modification. *In re Gordon*, 733 F.2d 900 (Fed. Cir. 1984); *DePuy Spine, Inc. v. Medtronic Sofamor Danek, Inc.*, 567 F.3d 1314, 1326 (Fed. Cir. 2009) (“Although predictability is a touchstone of obviousness, the ‘predictable result’ discussed in KSR refers not only to the expectation that prior art elements are capable of being physically combined, but also that the combination would have worked for its intended purpose.”). Non-obviousness is found “if the prior art . . . would not have worked for its intended purpose or otherwise taught away from the invention.” *DePuy Spine*, 567 F.3d at 1326; *see also C.W. Zumbiel Co., v. Kappos*, 702 F.3d 1371, 1384-85 (Fed. Cir. 2012) (finding claim non-obvious where the cited prior art did not teach the combination and in fact taught away from such combination). Grumman’s approach of using separate processing units, taking different coefficients, within a single adaptive finite impulse response filter, is designed to correct for error within the same finite impulse response filter. Swapping the single filter found in Grumman for multiple filters would hinder Grumman’s intended purpose of correcting for error of a finite response filter. Further, there would be no reason to add storage of finite impulse response filters to a memory, or to add indexing of that memory, because Harris discloses a working system with

finite impulse response filters that use parallelized hardware and do not require additional memory.

2. Claim 25 Is Not Obvious Under The Combination Of Thomson, Harris, And Grumman

Claim 25 reads: “25. 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.” Silicon Labs contends that this claim limitation is disclosed by Grumman, and does not assert that any other reference discloses it. Petition at 40-42. Cresta agrees that no other reference at issue in this proceeding discloses first and second computing units processing real and imaginary parts of a finite impulse response filter as required by the claim language. Silicon Labs alleges that “A person of ordinary skill in the art would have been motivated to implement the adaptive filter in Thomson according to the highly efficient real and imaginary parallel implementation of Grumman.” *Id.* at 41. Although Harris is cited by Silicon Labs as part of the combination for this claim, the Petition is silent on any role of Harris in the combination. *Id.* at 40-42.

Dr. Opris explains that Thomson and Harris only contain a channel filter that processes the real data. Ex. 2032, ¶86. Dr. Opris further explains that Grumman discloses a single finite response filter that processes an incoming data

signal “yin(n)” having both real and imaginary data (e.g. a pulsed radar return signal). *Id.* (citing Ex 1008 at 5:33-44; Fig. 2).

Silicon Labs has not explained why a person of ordinary skill would be motivated to combine Grumman with Thomson and Harris when the complex Grumman filter is not needed. This is insufficient. *See In re Omeprazole Patent Litig.*, 536 F.3d 1361, 1380 (Fed. Cir. 2008) (reasoning that even though a certain modification could have been possible, it would not have been obvious because a POSITA “would not have seen any need” to make the modification); MPEP § 2143 (summarizing Omeprazole, noting that the modification at issue was not obvious even though it “would have been technologically possible”).

Furthermore, Silicon Labs’ only cited motivation to combine is “efficiency.” *See, e.g.*, Petition at 41-42 (“Grumman’s adaptive FIR filter architecture is very efficient, especially in the context of minimizing any delays caused by selecting a different set of FIR coefficients by indexing memory.”); *id.* at 42 (“The Grumman FIR filters permit processing of ‘complex digital signals more quickly and efficiently’”). But this claim of efficiency does not map to the particular claim limitations. Silicon Labs does not establish that the efficiency benefits cited by Grumman come from providing separate computing units that process real and imaginary components of a finite impulse response filter. Further, Silicon Labs has not established that the purported efficiency benefits apply when compared to a

baseline system (like Thomson, Harris, or the combination of the two), that contains only a computing unit with a real processing circuit, and would require the additional construction of additional circuitry to add an additional computing unit that would process an imaginary part of a finite impulse response filter. *See* Ex. 2032, ¶86. This would only add needless costs and complexity to Thomson, Harris, or the combination of the two. *Id.*

As with claim 24, this claim depends on claim 1 and thus also contains 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.*” Ex. 1001 at cl. 1 (emphasis added). Grumman’s system only processes a single signal in one format and does not disclose multiple finite impulse response filters with different input formats. *See* Ex. 2032, ¶78. The limitation of a plurality of finite impulse response filters having different formats would have to come from Harris, if anywhere. However, as detailed at the beginning of this section, there is no mention in the Petition of how Harris relates to this claim limitation or how, in the context of this particular limitation, Grumman and Harris would be combined. This is clearly insufficient to establish the invalidity of the claim. *Unigene Labs., Inc. v. Apotex, Inc.*, 655 F.3d 1352, 1361 (Fed. Cir. 2011) (“[T]o establish a prima facie case of obviousness based on a

combination of elements in the prior art, the law requires a motivation to select the references and to combine them in the particular claimed manner to reach the claimed invention.”) (quotation omitted).

C. Ground 3: Claims 26 And 28 Are Not Obvious Under The Combination Of Thomson, Harris, And Zenith

1. Claim 26 Is Not Obvious Under The Combination Of Thomson, Harris, And Zenith

Claim 26 reads: “26. 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.”

i. The Combination Of Thomson, Harris, And Zenith Does Not Disclose “A Select Signal Indicative Of A Format Of The Input RF Signal” Under Cresta’s Construction

As detailed earlier in Section III.C, the broadest reasonable interpretation of the claim term “a select signal indicative of a format of the input RF signal” is “a signal that performs a selection and that comprises information about the format of the input RF signal.” Silicon Labs only identifies Zenith as supplying this limitation and does not contend that it is met by Thomson or Harris. Petition at 43-46. However, neither Zenith nor the combination as a whole disclose this limitation under Cresta’s proposed construction.

Silicon Labs identifies the “standard selection circuit” as Zenith’s μ P (microprocessor) 22 shown in Fig. 2 of Zenith. Petition at 44. Similarly, its expert identified the output of Zenith’s μ P as the “select signal.” Ex. 2033 at 37:24-38:6 (“[C]an you identify for me the select signal, 2.2, in Figure 2? A. That would be the output of the microprocessor. Q. Can you just identify that on the figure? And what did you identify? A. The output of the microprocessor block 22.”).

Zenith’s μ P 22 does not generate a select signal indicative of a format of the input RF signal under Cresta’s proposed construction. To the contrary, SYNC DET 20 detects the presence or absence of analog sync signals when the switch 42 is in position A. *I.e.*, SYNC DET 20 is a one-bit signal in this situation. When the switch 42 is in position D, the oscillator in the non-selected demodulator, the analog demodulator, is disabled. This causes the SYNC DET 20 signal to not reflect the format of the input RF signal. In this case, Zenith’s μ P 22 will continue to generate a signal to keep the switch 42 in position D even if the format of the input RF signal is an analog signal.

At best, Zenith’s μ P 22 generates a select signal indicative of the output of the SYNC DET 20, but does not generate a select signal indicative of a format of the input RF signal. That is, the potential “select signal” is a *control* signal, and not an *information* signal. As such, it does not “comprise information about the format of said input RF signal” as required by Cresta’s proposed construction. For

example, if the incoming signal is in a digital format, the SYNC DET 20 signal will indicate the absence of an analog format signal. Zenith's μ P 22 will send a control signal to switch 42 to change positions. But it will not contain any information about the nature of the digital signal. It is a single bit of information, as Silicon Labs' expert admits. *See* Ex. 2033 at 53:12-17 ("Q. So you say the output from the microprocessor is a state signal? A. Right. Q. It's essentially like a bit, like a one or a zero? A. Probably. Yeah.").

Dr. Opris provides a comprehensive explanation of the SYNC DET 20 signal in the context of this claim limitation. *See* Ex. 2032, ¶¶89-97. Dr. Opris determines that a person of ordinary skill would not consider the one-bit output signal in Zenith's μ P 22 to be indicative of an input format. *Id.*, ¶92. Further, the circuit loop described in Zenith is simply inapplicable to digital input signals. With a digital signal, the output of SYNC DET 20 (or the output of Zenith's μ P 22) has no relation to the format of the input RF signal, and certainly does not contain information about the format of the input RF signal. *Id.*, ¶¶93-97.

In sum, Zenith's μ P 22 does not generate a "select signal indicative of a format of the input RF signal," as required by Cresta's proposed construction of this term, and therefore the combination of Thomson, Harris, and Zenith does not render claim 26 (or its dependent claims 27 and 28) obvious.

ii. The Combination Of Thomson, Harris, And Zenith Does Not Disclose “The Signal Processor Selecting A Finite Impulse Response Filter In Response To The Select Signal”

Silicon Labs recognizes that there is no disclosure in Zenith of a signal processor that receives a select signal and selects a finite impulse response filter in response, and instead identifies the combination of Harris and Thomson as disclosing this limitation. Petition at 45 (“Accordingly, Harris discloses a signal processor selecting a finite impulse response in response to the select signal of Thomson.”). Cresta agrees that this limitation is wholly absent from Zenith, including specifically that Zenith does not disclose either a signal processor or a selection from among finite impulse response filters. Silicon Labs suggests that the combination of Thomson and Harris could be modified further by implementing “a standard selection circuit as disclosed in Zenith to output the TV select signal of Thomson.” *Id.* at 45. However, Silicon Labs has provided insufficient reasons to combine the cited references in the manner suggested.

Even if there were reasons to combine, one fundamental problem with the proposed combination is that none of the cited references disclose the selection of a finite impulse response filter. Moreover, there is no suggestion of any advantage to selecting a finite impulse response filter. Zenith does not teach the selection of a finite impulse response filter because it does not disclose finite impulse response filters in general, and instead only teaches selecting between one of two

demodulators that contain the standard prior art fixed channel filters that the '792 patent improved on. *See, e.g.*, Ex. 1011 at Figs. 1-2; Ex. 2033 at 57:4-58:9 (“The digital demodulator 18 [in Zenith] would include a digital channel filter. Right? A. Yes.”). Similarly, Thomson does not teach finite impulse response filters at all. *See generally* Ex. 1004. Harris teaches a parallel bank of channel filters, Ex. 1005 at 7, but no selection is needed between the various channel filters because the bank is designed to operate on any signal in parallel. *Id.* at 6 (“As shown in Figure 6, the channelized receiver is constructed with multiple sets of similar hardware that tune to the center frequencies of many channels of interest.”).

The Petition elides the differences between the references. In particular, the Petition fails to recognize the absence of any teaching in any of references for “selecting a finite impulse response filter,” much less “said signal processor selecting a finite impulse response filter in response to said select signal” as required by the claim language. The Petition argues that a selection of a *channel filter* in Thomson suggests modifying Harris to select from among a plurality of finite impulse response filters. Petition at 45. But there is no evidence that Thomson suggests that type of selection. Instead, a POSITA would recognize that Thomson does not select the circuits but instead operates the circuits in parallel as disclosed in prior art Figure 1 in the '792 patent. Ex. 2032, ¶76. Moreover, Silicon Labs’ analysis ignores that Harris discloses operating a set of finite impulse

response filters in parallel such that there would be no need to select from among them. And Silicon Labs does not address that there is no need for any selection because of the parallel architecture. *Id.*

Another fundamental problem with the proposed combination is the lack of a disclosure of a single claimed “signal processor” as required by the claims. The innovation of the ’792 patent was to replace the multiple independent channel filters of the prior art with a single reprogrammable signal processor to reduce cost and complexity. None of the references cited in this ground, alone or in combination, provide any teaching or suggestion of using a single signal processor. *See also* Section VI.B.1.ii.(2) above.

2. Claim 28 Is Not Obvious Under The Combination Of Thomson, Harris, And Zenith

Claim 28 reads: “28. The television receiver of claim 26, wherein the format/standard selection circuit generates the select signal by detecting carrier signals identifying one of the formats of the input RF signals.”

Silicon Labs identifies the “format/standard selection circuit” as being Zenith’s μ P (microprocessor) 22 shown in Zenith’s Figure 2. Petition at 47-48. Silicon Labs does not rely on Thomson or Harris for this limitation. *Id.* However, Zenith’s μ P 22 does not detect carrier signals in the input RF signal. As detailed more fully in the section above, Zenith’s μ P 22 detects the presence or absence of analog sync signals when the switch 42 is in position A, producing SYNC DET.

Crucially, *nowhere in Zenith is SYNC DET described as a “carrier signal.”* The concept is entirely lacking from Zenith.

Silicon Labs is left to speculate that Zenith detects carrier signals simply because it describes “the presence of syncs associated with a demodulated analog signal.” Petition at 47-48; Ex. 1011 at 3:15-18. But Silicon Labs does not identify what the particular carrier signal is. Nor does it explain how or why a “sync” could be a carrier signal. Silicon Labs cites no evidence for how or why a “sync” could be a carrier signal. Nor does it provide any rationale for why Zenith would use the terminology “sync” when it purportedly actually means a carrier signal. This is a complete failure of proof.

Furthermore, Zenith’s SYNC DET 20 signal does not identify one of a plurality RF signal formats, but merely determines the presence of the sync signals in the demodulated analog signal. At best, the Zenith SYNC DET 20 only identifies the output of the analog demodulator. There is no equivalent disclosure corresponding to any other format.

Moreover, as Dr. Opris explains, the claimed carrier signal is a component of the input RF signal and not an output from the “demodulated analog signal” as disclosed in Zenith. *See* Ex. 2032, ¶102. At deposition, Silicon Labs’ expert confirmed that the carrier signal is not part of the demodulated analog signal:

Q. What is a carrier signal?

A. It would be, by way of example, a local radio station is KLBJ, 590 AM band, and it's transmitted on a carrier signal of 590 kilohertz, I believe. So that is a – the carrier is the signal that is used to carry the modulation.

Q. So the carrier signal is part of the transmission modulation?

...

A. Yes.

Q. ... The output of the digital demodulator, is that also a baseband signal?

...

A. Yes.

Q. ... And so the output of the analog demodulator and the digital demodulator, they do not include transmission modulation. Right?

A. Correct.

Ex. 2033 at 50:9-51:1. This interpretation is consistent with the Board's construction of the term "baseband signal" in IPR2014-00809. *See Silicon Labs., Inc. v. Cresta Tech. Corp.*, IPR2014-00809, Paper 56 at 14 (PTAB Oct. 21, 2015) ("[W]e construe 'baseband signal' as a signal without transmission modulation."). Similarly, Silicon Labs' expert admitted that the output of SYNC DET 20 is defined by the output of the analog demodulator, which he testified earlier does not have a carrier signal. *Id.* at 52:14-21 ("Q. So the RFN is a received analog modulated signal, it goes through the system, it goes through the demodulator, the

information is demodulated, there is some underlying television content information in the signal, and *the sync debt [SYNC DET 20] operates on that demodulated underlying analog information?* A. *Yes.*”) (emphasis added).

During redirect examination at Dr. Holberg’s deposition, Dr. Holberg pointed to the U.S. Patent No. 7,075,585 (the “’585 patent”) at 5:12-15, “In the present embodiment, auto-detection is implemented by detecting in the baseband signals the presence or absence of carrier signals which uniquely identify the television standards,” as a basis for asserting that Zenith’s SYNC DET 20 detects carrier signals within the scope of claims 15 and 20. Ex. 2033 at 125:7-126:25. This testimony was flatly inconsistent with his earlier testimony in the deposition. Additionally, Dr. Holberg had no cogent explanation for why the well-known term “carrier signal” had purportedly been redefined by this section of the specification. *Cf. Straight Path IP Group, Inc. v. Sipnet EU S.R.O*, No. 2015-1212, slip op. at 8 (Fed. Cir. Nov. 25, 2015) (“When claim language has as plain a meaning on an issue as the language does here, leaving no genuine uncertainties on interpretive questions relevant to the case, it is particularly difficult to conclude that the specification reasonably supports a different meaning.”). Furthermore, Silicon Labs has not proposed a construction for “carrier signal.” If Silicon Labs were correct that the ’585 patent provided a custom definition or lexicography of “carrier signal” that was the antithesis of the plain meaning of the term in the art, it

should have proposed the term for construction, and by not doing so in the Petition it has waived its argument.

Moreover, this sentence from the '585 patent does not appear in the '792 patent. Instead, the corresponding sentence is “In the present embodiment, auto-detection is implemented by detecting in *the first and second output signals* the presence or absence of carrier signals which uniquely identify the television formats and standards.” Ex. 1001 at 6:11-16 (emphasis added). The '792 patent never states that the carrier signal may be in the baseband signal. The '792 patent discloses instead that the “output signals” are *not* baseband signals, but are instead signals that are produced *before* the baseband signals and may form the source for signals that ultimately become baseband signals. *Id.* at 3:15-18 (“The output signals can be coupled to demodulators and/or decoders to generate the baseband signals and subsequently the video/audio signals for display or recording.”). The output signals have not yet passed through a demodulator. *E.g., id.* at 4:32-35 (“When the incoming RF signal is in the analog television format, receiver 100 provides first and second output signals which can be decoded to generate the video and audio signals for display.”); *see also id.* at 4:36-39. In contrast, SYNC DET 20 in Zenith is produced from ANALOG DEMODULATOR 20:

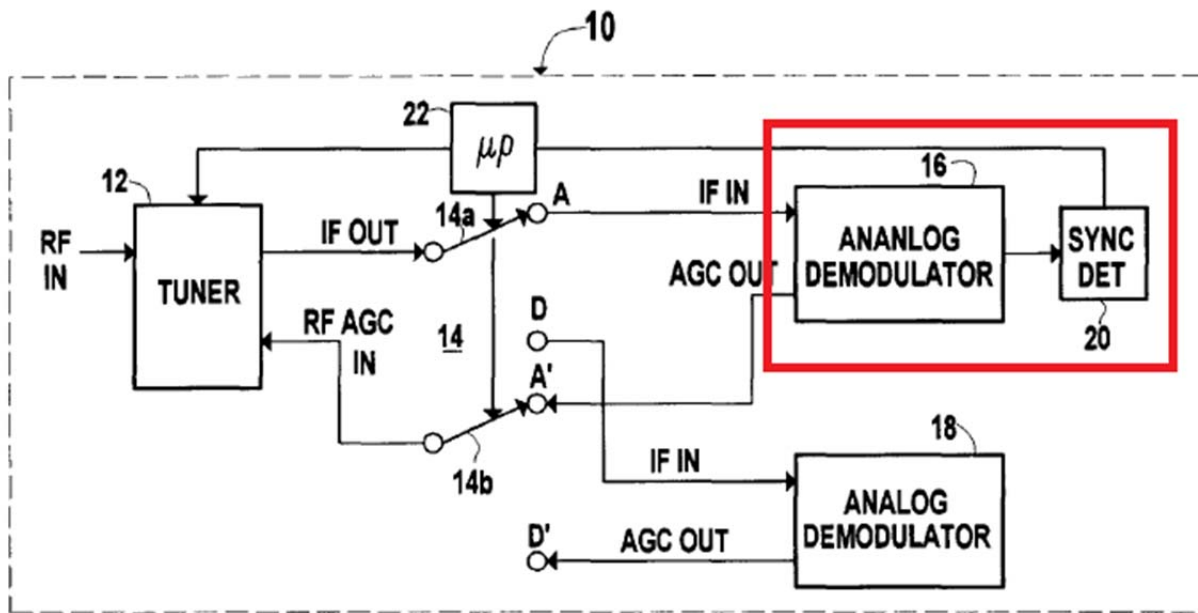


FIG. 1

Ex. 1011 at Fig. 1 (red outline added).

Additionally, Zenith's μP 22 is a digital microprocessor which is unsuited for carrier detection. Zenith's μP 22 samples only the output of SYNC DET 20 and SYNC DET 20 only samples the output of the analog demodulator 16. Dr. Opris explains that carrier detection by either Zenith's μP 22 or SYNC DET 20 is not possible because there is no carrier signal present because the analog demodulator 16 has removed it. Ex. 2032, ¶103.

In sum, Zenith does not generate a select signal “by detecting carrier signals identifying one of the formats of the input RF signals” as required by claim 28.

D. Ground 4: Claim 27 Is Not Obvious Under The Combination Of Thomson, Harris, Zenith, And Birleson

Claim 27 reads: “27. The television receiver of claim 26, wherein the format/standard selection circuit generates the select signal in response to an input signal from a user.” Silicon Labs only alleges that Birleson supplies this limitation by disclosing “an automatic carrier detect (ACD) circuit.” Petition at 49. Cresta agrees that no other reference discloses the limitation. According to Silicon Labs, the relevant portion of Birleson is a single paragraph directed to an automated system for “signal testing.” *Id.* at 57-58. The paragraph reads:

Signal testing may be initiated by a channel change. IN that case, every time a new channel is selected, both SIFFa 106 and SIFFb 109 are switched into the circuit and ACD 30 compares signal levels on lines C and D. Following the test, I²C 124 either switches SIFFb 109 out or leaves it in the signal path depending on whether an analog or digital signal is detected.

Ex. 1015 at 11:20-27.

The '792 patent discloses several distinct embodiments for the standard selection circuit. Ex. 1001 at 6:6-7 (“Format/standard selection circuit 133 can be implements in one of many ways.”). In particular, manual selection is explicitly distinguished from automatic selection. *Id.* at 6:7-12 (“The selection of the correct format and television standard can be made *manually* by the user of the television

system, such as by activating a switch, or the selection can be made *automatically* by providing an *auto-detection capability* in receiver 100.”) (emphasis added). Thus, the ’792 patent teaches that a manual selection and an automatic selection are alternative embodiments that will not be claimed together.

This distinction is carried through to the issued claims of the ’792 patent. Claim 27 requires manual selection by a user. *Id.* at cl. 27 (“27. The television receiver of claim 26, wherein the format/standard selection circuit generates the select signal in response to an input signal from a user.”). By contrast, claim 28 requires automatic selection by detection of a carrier signal – *not* manual selection by a user. *Id.* at cl. 28 (“28. The television receiver of claim 26, wherein the format/standard selection circuit generates the select signal by detecting carrier signals identifying one of the formats of the input RF signals.”). The corresponding section of the specification describes this precise method of carrier detection as being the mechanism in one auto-detection embodiment to implement the select signal. *Id.* at 6:11-15 (“*In the present embodiment, auto-detection is implemented* by detecting . . . *carrier signals* which uniquely identify the television formats and standards.”). Manual selection by a user is not included in the embodiment that corresponds to claim 28 and is instead required by claim 27.

Birleson does not teach that the “format/standard selection circuit generates the select signal in response to an input signal from a user” as required by claim

27. The purpose of the ACD 30 in Birleson is to detect if the incoming channel is an analog signal and if it is, then detect if it has a suppressed carrier or if it has scrambled signal. Ex. 1015, 10:52-56. The most that Silicon Labs can assert is that “a user could initiate *signal testing* by changing the input source.” Petition at 50 (emphasis added). But “signal testing” is not generating the select signal in response to an input signal from a user. Birleson does not teach changing the input source as argued by the Petition, but instead that the “[s]ignal testing may be initiated by a channel change.” Ex. 1015, 11:20. At best, Birleson teaches an ACD 30 that detects which analog signal has a suppress carrier or has a scramble signal and this detection could be initiated when the channel is changed by a channel selector. Birleson does not teach that the user may determine the select signal that is generated by a standard selection circuit.

Dr. Opris agrees that Birleson does not disclose that the “standard selection circuit generates said select signal in response to an input signal from a user” as required by the claim language. Ex. 2032 at ¶¶104-09. Instead, Birleson discloses a form of auto-detection (*i.e.*, “signal testing” in the language of Birleson) that corresponds to the embodiment of claim 28 and which is distinguished from the manual selection required in claim 27. *Id.*

E. Ground 5: Claims 18 And 19 Are Not Obvious Under The Combination Of Thomson, Harris, Oku, Ericsson, And Nguyen

1. Claim 18 Is Not Obvious Under The Combination Of Thomson, Harris, Oku, Ericsson, And Nguyen

i. Providing Differential Output Signals Is Not An Obvious Design Choice

Although Silicon Labs proposes a combination of *five separate references* for claims 18 and 19, it nevertheless acknowledges that none of the five separate references—neither Thomson, Harris, Oku, Ericsson, nor Nguyen—disclose differential output signals for video and audio that read on the claim 18 limitation “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.” *See* Petition at 56; Ex. 1009 ¶ 86. Instead, Silicon Labs relies on design choice. *Id.* In particular, it identifies as the first output terminal the output of driver 22 in Oku. Petition at 52. The output of driver 22 in Oku is single-ended. Ex. 2032, ¶112.

Silicon Labs’ reasoning is flawed. Mutual exclusivity has to do only with the fact that reception of analog TV is mutually exclusive with reception of digital TV. *Id.* However, the mutual exclusivity of analog TV reception and digital TV

reception does not explain why a POSITA would have modified the single-ended output of driver 22 in Oku. *Id.*

The Petition fails to provide any fact-based analysis for why producing this limitation in a combination of five different references would have been a simple design choice. An bare assertion that something would have been an obvious design choice is insufficient. To reach a conclusion of obviousness, by contrast, requires “more than a mere showing that the prior art includes separate references covering each separate limitation in a claim under examination.” *Unigene Labs., Inc. v. Apotex, Inc.*, 655 F.3d 1352, 1360 (Fed. Cir. 2011) (citing *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 418 (2007)). “Rather, obviousness requires the additional showing that a person of ordinary skill at the time of the invention would have selected and combined those prior art elements in the normal course of research and development to yield the claimed invention.” *Id.*

Moreover, Silicon Labs has failed to point to substantial evidence that a POSITA would have a reason to combine the teaching of Thomson, Harris, and Oku. The Petitioner argues that “Oku discloses a television receiver include a first digital-to-analog convert.” Petition at 52. Petitioner argues that “Oku also includes a first driver circuit.” *Id.* Petitioner argues that “Oku discloses a second driver circuit.” *Id.* at 53. Petitioner argues that “Oku discloses a second digital-to-analog converter (DAC 16).” *Id.* at 54. Petitioner argues that “Oku discloses a

third driver circuit.” *Id.* Petitioner states: “Although the output of DAC 16 is coupled to driving circuit 17 to drive a monitor, it would have been a mere design choice to input digital signals encoding audio information into a digital-to-analog converter when audio signals are desired.” *Id.* But Silicon Labs does not point to any evidence for the claim limitation, “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.” *E.g., id.* at 55-57.

Contrary to the disclosure in Oku, claim 18 of the ’792 patent requires that “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.” Ex. 1001 at cl. 18 (emphasis added). The plain claim language requires that the first output terminal provide signals indicative of **both** video **and** audio information and the second output terminal provide signals indicative of **both** video **and** audio information. Ex. 2032, ¶111. This is consistent with the ’792 patent disclosure that shows a first terminal 104 providing video and audio information signals and a second terminal 106 providing

video and audio information signals. Ex. 1001 at Fig. 1; 3:55-63. But as shown in Figure 4, Oku teaches that the first driving circuit 17 provides a first output terminal having *only* a video information signal and that the second driving circuit 22 provides a second output terminal having *only* an audio information signal. Ex. 1018 at Fig. 4. Neither Oku's output terminal of driving circuit 17 nor Oku's output terminal of driving circuit 22 reads on the claim limitation "the first and second output terminals provide differential output signals indicative of video *and* audio information."

**ii. Thomson, Harris, Oku, Ericsson, And Nguyen
Cannot be Combined To Render The Claim Obvious**

A POSITA would not have a reason or be motivated to make Silicon Labs' proposed *five reference* combination of Thomson, Harris, Oku, Ericsson, and Nguyen to obtain the receiver as recited in claims 18 and 19. Thomson is concerned with the problem of processing analog signals using FM-modulation and processing digital signals using QPSK-modulation. Ex. 1004 at 1:34-39; Ex. 2003, ¶105. Thomson does not use a digital-to-analog converter coupled between the signal processor and a demodulator as required by claims 18 and 19. *Id.* Thomson's objective is to provide FM-modulation and QPSK-modulation using a common A/D converter. Ex. 1004 at 1:29-33; Ex. 2003, ¶105. Teachings that would have "deter[re]d] any investigation in to such a combination" would then have led a POSITA away from using the combination. *United States v. Adams*,

383 U.S. 39, 52 (1966) (upholding nonobviousness where references teach away from the claimed combination). Dr. Opris explains that concerns for minimizing the number of electronic components would have deterred a POSITA from making Silicon Labs' proposed modification. Ex. 2003, ¶105. In addition, a POSITA would have no expectation of success by inputting an analog signal to Thomson's satellite analog TV demodulator, which only accepts digital signals and is processing in the digital domain. Ex. 2003, ¶105. In sum, a POSITA would not include the Oku digital-to-analog converters and driver circuits in the Thomson system to obtain the receiver as recited in '792 patent claims 18 and 19.

2. Claim 19 Is Not Obvious Under The Combination Of Thomson, Harris, Oku, Ericsson, And Nguyen

Thomson, Harris, Oku, Ericsson, and Nguyen fail to teach "a low pass filter" as recited in claim 19. Instead, Silicon Labs argues that such an insertion would be a "mere design choice." Petition at 59.

Dr. Opris explains that this proposed modification of adding a low pass filter is not needed and would not provide any functionality. The signal has already been bandwidth limited. A POSITA would not have a reason to make the modification. Ex. 2032, ¶113. Moreover, Dr. Opris explains that adding needless electronic components would add costs without any reason. *Id.* Specifically, reduction of EM radiation would not be a concern that would motivate a POSITA to add a low pass filter in this context. *Id.*, ¶114.

VII. DR. HOLBERG'S TESTIMONY SHOULD BE AFFORDED LITTLE, IF ANY, WEIGHT

Silicon Labs' paid expert in this case, Dr. Holberg, lacks ordinary skill in the art of the invention, and thus is not qualified to provide an opinion on any issues in this *inter partes* review. Ex. 2003, ¶22. Dr. Holberg admitted in his deposition in a parallel proceeding that he lacks critical knowledge and experience of a person ordinary skill, including: 1) Dr. Holberg has no experience in designing radio-frequency circuits in general or radio-frequency circuits for television applications: no RF IC experience at all (Ex. 2008 at 24:6-8; 24:24-25:2; 33:7-17); no RF experience while at Silicon Labs (*id.* at 16:10-13); 2) Dr. Holberg is not familiar with fundamental RF circuit design concepts: low-IF (*id.* at 153:15-154:14); superheterodyne (*id.* at 25:8-9), tuner (*id.* at 27:6-10), baseband (*id.* at 28:8-13), and he incorrectly relates the definition of the unit of power "dBm" to a certain impedance (*id.* at 59:2-5); 3) None of Dr. Holberg's patents are directed to television receivers, (*id.* at 36:5-p39:1; Ex. 2035 at 300:20-301:12); 4) Dr. Holberg is not familiar with fundamental RF television circuit design criteria, *e.g.* sensitivity, signal-to-noise ratio, or linearity (Ex. 2008 at 48:5-51:20; 58:13-16); 5) Dr. Holberg is not familiar with fundamental RF integrated circuit design tools such as Cadence—Dr. Holberg did not know how to launch the Cadence tool or that the color of the wires are light blue (*id.* at 65:22-67:17); and 7) Dr. Holberg

could not explain how subsampling works or how it is being used by the Thompson reference (*id.* at 87:9-101:5).

At his deposition in this proceeding, Dr. Holberg's credibility was again called into question. For example, Dr. Holberg provided inconsistent answers regarding how much Silicon Labs has paid him. Ex. 2033 at 18:1-8 ("A. My rate at Silicon Labs is \$275 an hour for everything I've been doing for them for a number of years. So it would include that, yes. Q. . . . Are there any other matters that you work on for Silicon Labs where you're paid a different rate than \$275 an hour? A. No.'). By contrast, in an expert report submitted in a proceeding in the United States District Court for the Northern District of California, Dr. Holberg reported getting paid \$400 per hour for work done for Silicon Labs. Ex. 2031, ¶10 ("I am being compensated at my normal rate of \$400 per hour for my trial preparation work in connection with this matter.').

Moreover, Dr. Holberg did not draft his report; his lawyers did. Ex. 2033 at 16:9-12 ("Q. When it came time to physically write the report, was the report written by the team at Lee & Hayes? A. They drafted it, yes.').

Accordingly, a person skill in the art would not give any weight to Dr. Holberg's declaration, and neither should the Board.

VIII. SECONDARY CONSIDERATIONS

Before Cresta's subsidiary Xceive introduced its commercial product, Silicon Labs had attempted to develop its own digital TV tuner technology but did not succeed, a fact which is apparent from several patents filed by Silicon Labs before 2008 naming Richard Johnson as inventor. *See, e.g.*, U.S. Patent Nos. 6,778,117; 7,358,885; 7,414,480; 7,425,995; 7,447,493; 7,548,742; 7,558,546; 7,557,413 (Exhibits 2014-21 in IPR2014-00728). No commercial tuner offered by Silicon Labs has ever used Johnson's approach, but somehow, just one year after seeing Cresta's product, Silicon Labs managed to introduce its first digital tuner in 2009. Ex. 2036 at 2.

Demonstrating that an invention filled a long-felt but unmet need is considered evidence that the claimed invention would not have been obvious to a POSITA at the time of the invention. *Leo Pharm. Prods., Ltd. v. REA*, 726 F.3d 1346, 1359 (Fed. Cir. 2013). Dr. Opris explains that meeting all the requirements of a universal receiver was a very complex task as evidenced from the fact that, despite the long felt need, no such product was created until after Xceive and Cresta's innovations. Ex 2003, ¶45. Dr. Opris describes at length the challenges and complex tasks involved in creating a universal receiver. *Id.*, ¶¶32-45.

Industry praise for a product also may be considered as evidence that the claimed invention would not have been obvious to a POSITA at the time of the

invention. *Apple, Inc. v. ITC*, 725 F.3d 1356, 1366 (Fed. Cir. 2013). Xceive was named as a winner of the 2008 ECN Readers Choice Tech Award: “Xceive Corporation’s SN5000A SiliconNOW tuner module helps bridge the gap between CAN tuner architecture and silicon-based TV tuner architecture.” Ex. 2037 at 1.

IX. CONCLUSION

For the forgoing reasons, Petitioner Silicon Labs has failed to satisfy its burden of proof. Claims 18-19 and 24-29 of Cresta’s ’792 patent are not unpatentable under the grounds asserted in the *inter partes* review.

Dated: Nov. 30, 2015

Respectfully submitted,

/s/ Michael R. Fleming

Michael R. Fleming (Reg. No. 67,933)
Benjamin Haber (Reg. No. 67,129)
Irell & Manella LLP
1800 Avenue of the Stars, Suite 900
Los Angeles, CA 90067
Tel: (310) 277-1010
Fax: (310) 203-7199
Email: MFleming@irell.com

CERTIFICATE OF SERVICE
BY ELECTRONIC MAIL

Pursuant to 37 C.F.R. § 42.6, the undersigned certifies that on Nov. 30, 2015, a copy of the foregoing document **Patent Owner's Response, Exhibit List, and Exhibits 2020-37** were served by electronic mail, as agreed to by the parties, upon the following:

<i>Lead Counsel for Petitioner</i> SILICON LABORATORIES, INC.	<i>Back-up Counsel for Petitioner</i> SILICON LABORATORIES, INC.
<p style="text-align:center">Peter Ayers peter@leehayes.com</p> <p style="text-align:center">LEE & HAYES, PLLC 13809 Research Blvd., Suite 405 Austin, Texas 78750</p>	<p style="text-align:center">John Shumaker jshumaker@leehayes.com</p> <p style="text-align:center">Brian Mangum brianm@leehayes.com</p> <p style="text-align:center">LEE & HAYES, PLLC 13809 Research Blvd., Suite 405 Austin, Texas 78750</p>

/s/ Susan Langworthy
Susan Langworthy