

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 PRELIMINARY RESPONSE
PURSUANT TO 37 C.F.R. § 42.107

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EXHIBIT LIST

Cresta Ex 2001	Decision – Institution of <i>Inter Partes</i> Review in IPR2014-00809
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Cresta Ex 2003	Declaration of Ion E. Opris, Ph.D. regarding the Validity of US Patent No. 7,265,792 (IPR2014-00809)
Cresta Ex 2004	Ex 2051 Second Declaration of Ion E. Opris Ph.D. regarding Ex 2050 (IPR2014-00809)
Cresta Ex 2005	Paul Rako, Silicon TV Tuners: The Game is On, September 23, 2010
Cresta Ex 2006	Silicon Labs, Developing Economical, Mainstream Television Designs with Next-Generation Silicon TV Tuner ICs
Cresta Ex 2008	Oral Deposition of Douglas R. Holberg, Ph.D., December 17, 2014
Cresta Ex 2010	HSP43220 Data Sheet, September 2000, Decimating Digital Filter
Cresta Ex 2011	HSP43220, December 1996, Decimating Digital Filter

STATEMENT OF MATERIAL FACTS IN DISPUTE

MaxLinear did not submit a statement of material facts in this Petition.

Accordingly, no response is due pursuant to 37 C.F.R. § 42.23(a), and no facts are admitted.

I. INTRODUCTION

The Board should deny Silicon Laboratories' petition and not institute review of the 7,265,792 patent. The Board denied Silicon Laboratories First Petition for institution of inter partes review of '792 patent claims 26 and 27. *See* Ex.2001, *Silicon Laboratories, INC. v. Cresta Technology CORPORATION*, IPR2014-00809. Paper No. 10, Decision Institution of *Inter Parties* Review (P.T.A.B. October 24, 2014). Unsatisfied with the Board's decision, Silicon Laboratories filed this second petition, the Instant Petition, presenting the same prior art and similar arguments for foundation claim 1, and presenting similar arguments for claims 26 and 27, but hoping for a different result. In this petition, Silicon Laboratories has simply swapped in new references, all of which were available to Silicon Laboratories at the time of filing of the First Petition.

In the First Petition, Silicon Laboratories chose not to challenge claims 18, 19, 24, 25, 28 and 29, but instead to wait strategically until Silicon Laboratories had the benefit of not only the PTAB institution decision but also our patent owner response before filing this second petition, the Instant Petition. By filing this second petition, the Instant Petition, almost eight months later, Silicon Laboratories has not only denied the Board the benefit of judicial economy, but is also presenting the same prior art and similar arguments for arguments for foundation claim 1. At the same

time, Silicon Laboratories is challenging claims 18, 19, 24, 25, 28 and 29 by presenting similar arguments and new references, all of which were available to Silicon Laboratories at the time of filing of the first petition.

Under 35 U.S.C. § 325(d), the Board "has broad discretion to deny a petition that raises substantially the same prior art or argument's presently presented to the Office." *Conopco, Inc. v. The Procter & Gamble Co.*, No. IPR2014-00506, Paper No. 17, Decision Denying Institution of *Inter Partes* Review at 6 (P.T.A.B. July 7, 2014). Silicon Laboratories should not be allowed to burden the Board and Cresta Technology Corporation with grounds repetitive of those in the First Petition and filed almost eight months after the First Petition.

Finally, in order for the Board to grant Silicon Laboratories' petition, Silicon Laboratories must prove that there is a reasonable likelihood that at least one of the claims challenged in the Petition is unpatentable. See 37 C.F.R. § 42.108(c). The petition fails to meet this standard for any of the challenged claims and for several different reasons. For example, the Petitioner: (1) fails to show that each element of the claim is found in the references; (2) relies on expert testimony that is conclusory and unreliable; (3) fails to properly establish inherency; (4) fails to provide sufficient reasons for combining references; and (5) attempts to combine references that are fundamentally incompatible. The Petition should be denied because Silicon

Laboratories has failed to meet its threshold burden to prove that there is a reasonable likelihood that at least one of the claims challenged in the Petition is unpatentable.¹

II. THE BOARD SHOULD DENY INTUITION OF THE PETITION UNDER 35 U.S.C. § 325(d)

The Instant Petition relies on substantially the same arguments that the Board considered and rejected in the First Petition. Under Section 325(d), the Board should deny petitions that challenge a patent based on previously-rejected grounds and cumulative and duplicative art, otherwise petitioners will be given an unwarranted and unfair procedural advantage in pending infringement litigation. See 35 U.S.C.

§ 325(d). Section 325(d) authorizes the Office to reject petitions or grounds for *inter partes* review that seek to reargue positions previously lost:

In determining whether to institute or order a proceeding under this chapter, chapter 30, or chapter 31, the Director may take into account whether, and reject the petition or request because, the same or substantially the same prior art or arguments previously were presented to the Office. 35 U.S.C. § 325(d).

¹ Should the Board institute proceedings in this matter, Cresta Technology does not concede the legitimacy of any arguments in the Petition that are not specifically addressed herein. Cresta Technology expressly reserves the right to rebut any such arguments in its Patent Owner Response

The legislative history of Section 325(d) confirms that this is exactly what Congress intended. For instance, Senator Jon Kyl stated that Section 325(d) "allows the Patent Office to reject any request for a proceeding, including a request for ex parte reexamination, if the same or substantially the same prior art or arguments previously were presented to the Office with respect to that patent." 157 Cong. Rec. S1042 (daily ed. Mar. 1, 2011) (Statement of Sen. Kyl). The Board should reject the Instant Petition because the Office already considered many of the asserted arguments.

In the Instant Petition, for claims 26 and 27, Silicon Laboratories makes essentially the same arguments that the Board rejected in its institution decision regarding the First Petition. The Board fully considered these arguments, and it should not allow Silicon Laboratories to reargue them in this petition. As an example, in Ground 8 of the First Petition, Silicon Laboratories contends that claims 26 and 27 were obvious over Thomson, Harris and Balaban. See Ex. 2002, p48-49. The Board rejected this ground because, among other reasons, Silicon Laboratories had "not supported this contention adequately." Ex. 2001, p26-27.

Armed with the Board's guidance as to the flaws in the First Petition, Silicon Laboratories once again attempts to invalidate claims 26 and 27 with a combination involving Thomson and Harris. See Pet. p7, 42-47 and 49-51. Specifically, in Ground 3, Silicon Laboratories asserts that claim 26 would be obvious over Thomas and

Harris in view of Zenith. While Silicon Laboratories substitutes Zenith for Balaban, its argument remains the same that Thomas includes a standard selection circuit but does explicitly teach the circuit because the construction of the circuit is well known to a POSITA. Pet. 42-47.

In a similar fashion, apparently unsatisfied with the Board's decision not to institute its proposed ground to invalidate claim 27 in the First Petition, Silicon Laboratories asserts in Ground 4 that claim 27 would be obvious over Thomas and Harris in view of Zenith and Birleson. While Silicon Laboratories substitutes Zenith and Birleson for Balaban, its argument remains the same that user selection has been a preferred method. Pet. p49-51.

The Board should decline Silicon Laboratories' attempts to reargue the same grounds that the Board rejected in the First Petition. While Silicon Laboratories now presents combinations of references slightly different from those in the First Petition, its grounds are based on the same reasoning and the same alleged teachings for the alleged invalidation of certain claims. In addition, the secondary references Silicon Laboratories introduces in the Instant Petition were available to Silicon Laboratories at the time it filed the First Petition.

In the First Petition, Silicon Laboratories chose not to challenge claims 18, 19, 24, 25, 28 and 29, but instead chose to wait strategically until Silicon Laboratories had the benefit of not only the PTAB institution decision but also our patent owner

response before filing this second petition, the Instant Petition. By filing this second petition, the Instant Petition, almost eight months later, Silicon Laboratories has not only denied the Board the benefit of judicial economy, but also is presenting the same presenting the same prior art and similar arguments for arguments for foundation claim 1.

In particular, claim 18, 19, 24, 25, and 29 depend from claim 1. Claim 15 depends from claim 13 which in turn depends from claim 10. Claim 29 depends from claim 26 which depends from claim 1. By challenging dependent claims 18, 19, 24, 25, 28 and 29, Silicon Laboratories once again attempts to invalidate claim 1 with the same prior art and similar argument presented in the First Petition by contending obviousness with a combination involving Thomson and Harris. See Pet. p23-35. Although Silicon Laboratories labels these grounds as "Foundational Claims" in the petition, Silicon Laboratories is implicitly asserting that claim 1 is unpatentable. See *In re Cuozzo Speed Technologies, LLC*, Slip Op. 2014-1301, page 10 (Fed. Cir. February 4, 2015). Specifically, Silicon Laboratories in contending that claim 1 is obvious over Thomson and Harris, by presenting the same references and substantial similar arguments raised in the First Petition.

While at the same time, Silicon Laboratories is challenging claims 18, 19, 24, 25, 28 and 29 by presenting similar arguments and new references, all of which were available to Silicon Laboratories at the time of filing of the first petition. For

example, in Ground 1, Silicon Laboratories asserts that claim 29 would be obvious over Thomas in view of Harris; in Ground 2, Silicon Laboratories asserts that claims 24 and 25 would be obvious over Thomas in view of Harris; in Ground 3, Silicon Laboratories asserts that claims 26 and 28 would be obvious over Thomas and Harris in view of Grumman; in Ground 4, Silicon Laboratories asserts that claim 27 would be obvious over Thomas and Harris in view of Grumman and Birleson; and in Ground 5, Silicon Laboratories asserts that claims 18 and 19 would be obvious over Thomas and Harris in view of Oku, Ericsson and Nguyen. While Silicon Laboratories adds these references, its argument remains the same that Harris discloses a reconfigurable, reprogrammable signal processor that implements a plurality of finite impulse filters. Pet. p23-35.

The Board should decline Silicon Laboratories' attempts to reargue the same grounds that the Board rejected in the First Petition. While Silicon Laboratories now presents combinations of references slightly different from those in the First Petition, its grounds are based on the same reasoning and the same alleged teachings for the alleged invalidation of certain claims. In addition, the secondary references Silicon Laboratories introduces in the Instant Petition were available to Silicon Laboratories at the time it filed the First Petition. If the Board accepts these types of redundant, repetitive grounds, it will encourage parties to engage in a pattern of serial IPR filing. Parties will file petition after petition, making the same arguments as to the same

claims, in continued attempts to get claims into IPR. Such a practice will overburden the Board with cumulative and redundant petitions. It is also prejudicial to patent owners who would have to continually defend against repetitive IPR challenges. The only way for patent owners to stop the flow of these IPR challenges would be to file litigation, to the extent that such an option was warranted. See 37 C.F.R. § 42.101(b). The Board should stop petitioners from filing cumulative petitions such as the Instant Petition.

III. 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. 2003,² ¶ 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. A universal television receiver also

² Exhibit 2003 is testimonial evidence submitted in IPR2014-00809 and thereby, 37 C.F.R. § 42.107(c) does not apply because it is not "new testimonial evidence."

had to have good performance. Unlike AM/FM radios where interference can be an occasional nuisance, television interference can cause the picture to be unacceptably poor. Ex. 2003, ¶ 34. Television receivers have unique characteristics. 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, technological and operational constraints, and deliver the necessary performance. 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, 1:51-52, 3:38-40, and 3:46-47.

IV. CLAIM CONSTRUCTION

A. Applicable Law

"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. The Trustee of Columbia University*, IPR2012-00006, 2013 WL 2023631, at *3 (PTAB, March 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, 1369 (Fed. Cir. 2004); 37 C.F.R. § 42.100(b). Cresta Technology 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.

In the first filed *Inter Partes* Review proceeding for the '792 patent, the Board construed the following terms: RF Signals, Format, Baseband Signal and Signal Processor. Ex. 2001 p7–9. The Petitioner adopts these constructions for the purposes of this Petition. Pet. p23. The Patent Owner disagrees with these constructions as explained below.

B. "Input RF signal"

IPR2014-00809, the Board construed "RF signal" as signals having a frequency between 10 kHz and 100 GHz." Ex. 2001, p7. We respectfully disagree that the construction of "input RF signal" as any signal having a frequency between 10 kHz and 100 GHz because that construction is unreasonably broad even under the broadest reasonable construction in light of the specification standard.

We respectfully disagree that '792 has provided a definition or basis that the claim limitation, "input RF signal" is any signal having the above frequency range. In column 1, lines 35-38, the '792 patent states: "receiver receives the incoming television signal in radio frequency (RF) and converts the incoming RF signal to an intermediate frequency (IF) signal." Ex. 1001, 1:35-38. There, the Board relies upon '792 patent's abbreviation for "radio frequency." Ex. 2001, p7. The '792 patent's use of "RF" for "radio frequency" is not a definition for "input RF signal." In addition, the usage of

the language in the context of the complete sentence conveys that the incoming RF signal is external to the receiver and is provided to the input of the receiver. This is further confirmed by Figure 1 that shows the RF signal as an external input signal for "input RF signal." Nothing in the '792 patent provides any basis that the input RF signal should be construed to be any signal having a radio frequency.

Moreover, the Board is dissecting the claim term by not addressing that the complete claim limitation which is recited as "input RF signal" must be construed in light of the specification. By relying solely on the frequency range of radio frequency spectrum, the Board is not addressing the complete limitation "input RF signal" in the light of the '792 patent specification. When construing the claim language, the entire limitation, "input RF signals," must be construed in light of the specification.

In column 1, lines 34-38, the '792 patent explains that the conventional television receiver includes two main components and then states that the first component of the television receiver receives an incoming signal and converts the incoming radio frequency (RF) signal to an intermediate frequency (IF) signal. Ex. 1001, 1:34-38. In column 4, lines 49-50, the '792 patent, referring to Figure 1, states that the "receiver 100 includes a frequency conversion circuit 110 (or tuner circuit 110)." Ex. 1001, 4:49-50. In column 4, lines 52-57, the '792 patent states the "[f]requency conversion circuit 110 receives input RF signals ... [and] operates to

convert the input RF signal to an intermediate frequency (IF) signal". Ex. 1001, 5:52-57.

Turning to Figure 1, the figure shows the "incoming RF signal" as an "RFIN" being inputted into Terminal 102 of the frequency conversion circuit 110. In column 4, lines 51-55, the '792 patent is disclosing the invented television receiver shown in Figure 1 and explains that on input terminal 102, "the input RF signals can be received from terrestrial broadcast or on a cable line transmissions." Ex. 1001, 4:51-55.

Accordingly, the '792 patent provides the basis under the broadest reasonable interpretation in light of the specification standard for the claim limitation, "input RF signal." The '792 patent provides the ordinary and customary meaning as well as the clear usage of the claim limitation as an external signal to the frequency conversion circuit, as not being processed by the frequency conversion circuit and a signal that has been provided by a medium of propagation (e.g. atmosphere, cable, etc.).

Accordingly, "input RF signal" should be construed in accordance with its ordinary and customary meaning and the clear usage of the term within the intrinsic evidence, as a signal that is an incoming signal that comes out of the medium of propagation and is external to the frequency conversion circuit without any processing by the frequency conversion circuit.

This construction is consistent with the '792 patent claims. The '792 patent claim 1 recites "a frequency conversion circuit for receiving an input RF signal and for converting the input RF signal to intermediate frequency signal ...". The '792 patent claim 29 depending from claim 1 recites "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."

Petitioner argues that the '792 patent specification's use of the term, "input RF signal" makes clear that "input RF signal" is not limited to a signal received through a medium of transmission. Pet. p21-23. To the contrary, the citations only reinforce Patent Owner's construction. The Petitioner contends that the '792 patent specification uses the term "input signal" citing '792 specification 4:3-7, 6:22-31, 14:44. Pet. p21. However, the '792 patent specification does not use the term "input signal" in 4:3-7, but instead uses the term "differential input signals." The '792 patent specification does use the term "input signal" in 14:44, but the "input signal" is not referring to the "input RF signal, but instead a signal generated by the user to select the format.

The '792 patent specification does use the term "input signal" in 6:22-31, There, the '792 patent specification is referring to the "input RF signal." However, this citation does not provide any evidence that the '792 specification's use of the term "input signal" means an internal signal to the circuit. When the '792 patent

specification uses the term, "input RF signal", the '792 patent specification is consistently referring to an input RF signal that is a signal external signal to the tuner. Ex. 1001, 1:34-37, 1:42-43, 3:59, 4:53. In particular, the '792 patent specification clearly states that the "input RF signal" is an external signal transmitted via a terrestrial broadcast or cable transmission. Ex. 1001, 4:53-55. The petitioner is incorrect that the term usage is to simply indicate that the signal is an input to the circuit. The Petition's citation to '792 specification 2:32-40 only shows that the "input RF signal" contains encoded information.

The Petitioner correctly points out that the '792 patent specification uses the term "input RF signal" citing '792 specification 1:43, 2:32-40, 4:53-56, 5:52. Pet. p21. Contrary to the Petitioner's contention, the usage of the term is not simply to indicate that "input RF signal" is an input to the circuit. For example, referring to the Petition citation to the specification 1:43, the complete sentence is as follows" "In general,, the conventional television receiver includes a tuner for receiving the input RF signal and converting the RF signal to an IF signal by one or more frequency conversions." Ex. 1001, 1:42-45. In the previous paragraph, '792 specification explains that "input RF signal" is an external signal received through a medium of transmission stating that the television receiver "receives "terrestrial broadcast, cable television or satellite broadcast television signals and to process the television signals" Ex. 1001, 1:14-18. Finally, the Petition admits that the '792 patent in 3:57-59

discloses that the input RF signal is an incoming RF signal to the television receiver 100. Pet. p22. . The '792 patent specification in following paragraph clearly states that the "input RF signal" received by television receiver 100 is an external signal transmitted via a terrestrial broadcast or cable transmission. Ex. 1001, 4:53-55.

The Petitioner argues that claim 1 does not require the source of the claimed input RF signal". Pet. p22-23. However, this argument does not address the proper claim construction of the claim term, "input RF signal." The '792 patent claim 1 recites "a frequency conversion circuit for receiving an input RF signal and for converting the input RF signals to an intermediate signal having an intermediate frequency (IF)...." The '792 patent claim 29 depending from claim 1 recites "the input RF signal comprise RF signal received from terrestrial broadcast, an RF signal received from satellite broadcast, and an RF signal received from cable transmission." In light of the '792 specification usage of the term "input RF signal" the broadest reasonable interpretation of claim term, "input RF signal", is a signal that is an external signal received through a medium of transmission.

C. "a frequency conversion circuit for receiving an input RF signal and for converting the input RF signal to an intermediate frequency signal"

The construction of "frequency conversion circuit for receiving an input RF signal and for converting the input RF signal to intermediate frequency signal" under the broadest reasonable interpretation in light of the specification standard is that the

claim limitation requires a frequency conversion circuit receiving a transmitted RF signal that has not been further processed or converted. The '792 patent provides the basis under the broadest reasonable interpretation in light of the specification standard for the claim limitation. In that, the '792 patent provides the ordinary and customary meaning as well as the clear usage of the claim limitation as the frequency conversion circuit receives external signals that have not been processed by the frequency conversion circuit comprised of signals that have been provided by a medium of propagation (e.g. atmosphere, cable, etc.) Accordingly, "frequency conversion circuit for receiving an input RF signal" should be construed in accordance with its ordinary and customary meaning and the clear usage of the term within the intrinsic evidence as a frequency conversion circuit that receives an incoming signal that comes out of the medium of propagation and is external to the frequency conversion circuit without any processing.

D. "the input RF signal encoding information in one of a plurality of television signal formats"

The construction of "the input RF signals encoding information in one of a plurality of television signal formats" under the broadest reasonable interpretation in light of the specification standard is that the claim limitation requires receiving one television format RF signal at a time.

Petitioner argues the Patent Owner provides no basis for construing the indefinite article "a" to mean "only one" and as a result, the Patent Owner's

construction does not reflect the broadest reasonable construction of the term. Pet. p24. However, the claim does not read "a one", but instead reads "one of a plurality of television formats". The article "a" modifies "plurality" not "one". Based upon the Petitioner argument the article "a" carries the meaning that the term, "plurality", is open ended and not the term "one". Thus, the Petitioner's argument that "a" means "one or more" has no merit. The plain language of "one" means that the claim limitation requires the input RF signal is encoded in one format.

E. "signal processor"

The construction of "a signal processor for processing ... in accordance with the television signal format ... the signal processor applies **one** of a plurality of finite impulse response filters ... each of the plurality of finite impulse response filters corresponding to a format" (emphasis added) under the broadest reasonable interpretation in light of the specification standard is that the claim limitation requires that the signal processor processes only **one** format and does not process a plurality of formats in parallel. This construction is consistent with '792 patent claims. The '792 patent claim 1 recites the claim term, 'the television signal format" that is referring to the claim term "one" television signal format, recited earlier in the claim. Also, the '792 patent claim 1 recites "the signal processor applies **one** of a plurality of finite impulse response filters... each of the plurality of finite impulse response filters corresponding to **a** format." Emphasis added. This is consistent with the '792 patent

specification that discloses that when the input RF signal is an analog format the DSP 131 only operates to process the signal according to analog format processing and when the input RF signal is a digital format the DSP 131 only operates to process the signal according to digital format processing. Ex. 1001, 6:24-48.

Petitioner argues the Patent Owner provides no basis for construing the indefinite article "a" to mean "only one" and as a result, the Patent Owner's construction does not reflect the broadest reasonable construction of the term. Pet. p24. However, the claim does not read "applies a one", but instead reads "applies **one** of a plurality of finite impulse response filter to ... the intermediate signal". The article "a" modifies "plurality" not "one". Based upon the Petitioner argument the article "a" carries the meaning that the term, "plurality", is open ended and not the term "one". Thus, the Petitioner's argument that "a" means "one or more" has no merit. The plain language of "one" means that the claim limitation requires the signal processor to process one RF signal at a time.

V. PERSON OF ORDINARY SKILL IN THE ART'S LEVEL OF SKILL

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. 2003, ¶ 19. We do not agree with the Petitioner's argument that a POSITA would need only a Master of Science degree in Electrical Engineering 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. Pet. p18. Radio-frequency circuits for television applications require experience with the unique challenges that are presented with such designs. Ex. 2003, ¶ 20 and 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.

VI. RESPONSE TO GROUNDS OF CHALLENGE

A. Foundational Ground: Claim 1 is not obvious over Thomson in view of Harris

Thomson is a five-page European patent application, EP 0 696 854, with a filing date of July 29, 1995 and a date of publication of February 14, 1996, that discloses a receiver for satellite television signals. Though it purports to deal with digital television, most of the claimed architecture is analog, unlike the architecture in the '792 patent. Saliently to the '792 patent, Thomson does not disclose a frequency conversion circuit for receiving input RF signals and converting them to IF signals, an anti-aliasing filter, a signal processor for processing in accordance with one format, and finite impulse response filters.

The preamble of Claim 1 is limiting. The "television receiver" is a well-defined structural element. Claim 1 recites a television receiver that is structure comprising a

frequency conversion circuit for receiving an input RF signal encoded in one of a plurality of television signal formats, an analog-to-digital converter, a signal processor for processing in accordance with the television signal format and a signal output circuit. The "television receiver cannot be ignored.

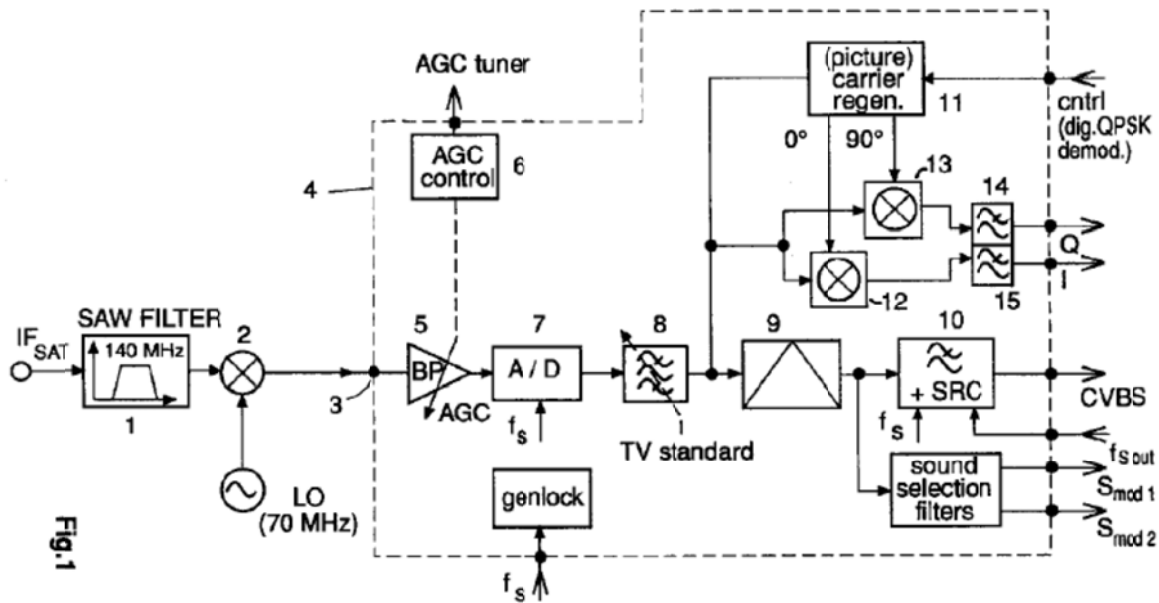
Moreover, Thomson does not teach the claim limitation, "television receiver. ' Petitioner argues that Thomson describes a "multi-standard tuner" in col 1:55 to column 2:19. Pet. p25-26. There, Thomson only states that: "Nowadays, a multi-standard TV receiver should be able to function also as a satellite broadcast receiver." Thomson only teaches and discloses the apparatus as shown in Figure 1 which is an apparatus that receives an IF input.

The second element of claim 1 of the '792 patent recites the following: a frequency conversion circuit for receiving an input RF signal and for converting the input RF signals to an immediate frequency signal having an intermediate frequency (IF), the input RF signal encoding information in one of a plurality of television signal formats.

Thomson does not teach a frequency conversion circuit for receiving input RF signals. To the contrary, Thomson describes an apparatus that receives input IF signals. Thomson does not teach a frequency conversion circuit for receiving an input RF signal and for converting the input RF signal to an intermediate frequency signal having an intermediate frequency (IF), the input RF signal encoding

information in one of a plurality of television signal formats. The '792 patent claim 1 requires this limitation, under the plain meaning construction of the "frequency conversion circuit" claim limitation. Moreover, "input RF signal" should be construed in accordance with its ordinary and customary meaning and the clear usage of the term within the intrinsic evidence as a signal that is an incoming signal that comes out of the medium of propagation and is external to the frequency conversion circuit without any processing by the frequency conversion circuit.

Thomson does not teach a frequency conversion circuit for converting RF signals to IF signals, but instead, only teaches an apparatus for receiving IF input. Thomson's Figure 1 shows only circuitry for further down converting the IF_{sat} using the SAW Filter 1 and mixer 2 to another IF signal at input 3. Thomson's Figure 2 a) shows the IF_{sat} signal down converted to a frequency of 140 MHz and Figure 2 e) shows the IF signal down converted to a frequency of 70 MHz. Ex. 2003, ¶ 63. Thomson teaches: "In Figure 1, the incoming IF signal which may come from an outdoor station is fed to SAW (surface acoustic wave) filter 1." Ex 1004, 2:30-32.



Id. at Fig. 1. The input to the Thomson apparatus is an IF_{sat} signal that has already undergone down conversions by undisclosed components. Dr. Opris states that this is not the input RF signal anticipated by Thomson, because RF is what comes out of the medium of propagation, not what comes out of a down conversion. Ex. 2003, ¶ 63. As he stated in his declaration, "In the Thomson patent, Thomson is very clearly teaching about an IF_{sat} signal which has been down converted." *Id.*

Accordingly, the input signal to the Thomson apparatus is not an input RF signal as claimed in the '792 patent, because the input signal has already been down-converted to an IF.

In IPR2014-00809, the Board suggested that the claimed "input RF signals" reads on the Thomson IF_{sat} signal. Ex. 2001, p9-10. However, the term "input RF signals", construed in accordance with its ordinary and customary meaning and the

clear usage of the term within the intrinsic evidence is a signal that is an incoming signal that comes out of the medium of propagation and is external to the frequency conversion circuit without any processing by the frequency conversion circuit, does not read on the Thomson IF_{sat} signal. As pointed out above, input to the Thomson receiver is an IF_{sat} signal that has already undergone down conversions by undisclosed components. Dr. Opris states that this is not the input RF signal anticipated by Thomson, because RF is what comes out of the medium of propagation, not what comes out of a down conversion. Ex. 2003, ¶ 65. As he stated in his declaration, "In the Thomson patent, Thomson is very clearly teaching about an IF signal which has been down converted. Thomson's Figure 1 shows only an IF_{sat} signal inputted into the SAW Filter 1." *Id.* Accordingly, the input signal to the Thomson apparatus is not an input RF signal as claimed in the '792 patent, because the input signal has already been down-converted to an IF signal.

Petitioner argues that Thomson teaches a frequency conversion circuit that receives the RF signal from an "outdoor unit" that feeds the IF Sat signal to circuitry depicted in Figure 1. Pet. p23. However, Thomson's disclosure of this "outdoor unit" is skeletal at best. It is referenced only twice, and both of those references are quoted above. Thomson does not teach the circuitry of the outdoor station or the circuitry located elsewhere that generates the IF signal. Ex. 2003, ¶ 66. Dr. Opris states that Petitioners' expert, Dr. Holberg, has offered no testimony or evidence in his

declaration suggesting that a person of ordinary skill in the art would be able to implement the Thomson receiver if it is understood to include the "outdoor unit" that down-converts the satellite signal to IF. Ex. 2003, ¶ 67. There is no express teaching of an RF frequency conversion circuit to be anticipated by Thomson, because Thomson is silent on this missing claimed element.

In addition, the outdoor station does not necessarily have to be a frequency conversion circuit for receiving input RF signals and for converting said input RF signals to intermediate signals for the Thomson IF signal receiver, and thereby not inherent. The outdoor station may generate the Thomson IF input signal by a variety of sources including a signal generator. Ex 2003, ¶ 68.

The missing claim element, the frequency conversion circuit, is not inherently disclosed by Thomson. A patent claim can only be anticipated under 35 U.S.C. § 102 if "each limitation of a claim is found in a single reference, either expressly or inherently." *Atofina v. Great Lakes Chem. Corp.*, 441 F.3d 991, 999 (Fed. Cir. 2006). Inherent disclosure requires that the prior-art reference "necessarily include the unstated limitation." *Id.* at 1000. Absent a showing that "prior art necessarily functions in accordance with, or includes, the claimed limitations," inherent disclosure cannot be found. *Bettcher Indus. v. Bunzl USA, Inc.*, 661 F.3d 629, 639 (Fed. Cir. 2011); see also *Rexnord Indus., LLC v. Kappos*, 705 F.3d 1347, 1355 (Fed. Cir. 2013) ("[A]nticipation by inherent disclosure is appropriate only when the reference

discloses prior art that must necessarily include the unstated limitation, or the reference cannot inherently anticipate the claims"). "To establish inherency, the extrinsic evidence 'must make clear that the missing descriptive matter is necessarily present in the thing described in the reference, and that it would be so recognized by persons of ordinary skill. Inherency, however, may not be established by probabilities or possibilities. The mere fact that a certain thing may result from a given set of circumstances is not sufficient.'" *In re Robertson*, 169 F.3d 743, 745 (Fed. Cir. 1999). The Federal Circuit further emphasizes, "[t]he concept of 'inherent disclosure' does not alter the requirement that all elements must be disclosed in an anticipatory reference in the same way as they are arranged or combined in the claim." *Therasense, Inc. v. Becton, Dickinson & Co.*, 593 F.3d 1325, 1332 (Fed. Cir. 2010).

Here, the missing descriptive matter, a frequency conversion circuit for receiving input RF signals and for converting said input RF signals to intermediate signals, is not necessarily present in the Thomson reference and thus does not meet the high standard for inherency. Thomson does not teach receiving RF signals as set forth in claim 1 of the '792 patent, but instead, Thomson teaches receiving an IF input.

The Thomson receiver does not receive an "input RF signal encoding information in one of a plurality of television signal formats," under the Board's construction of the claim limitations "input RF signal" and "format." Claim 1 of the

'792 patent requires receiving an input RF signal in one of a plurality of television signal formats. Since Thomson teaches receiving IF inputs, Thomson does not teach "input RF signal encoding information in one of a plurality of television signal formats" as set forth in claim 1. Thomson does not teach converting RF signals to an intermediate frequency, as recited in this limitation, since Thomson teaches receiving IF input. Ex. 2003, ¶ 69.

The third element of claim 1 of the '782 patent recites the following: "input RF signal encoding information in one of a plurality of television signal formats" and "a signal processor for processing ... in accordance with the television signal format". The plain and ordinary construction of the claim language provides that the signal processor only processes the intermediate signals in accordance with one television signal format.

Petitioner has failed to show that Thomson teaches or discloses this element. Thomson does not teach a signal processor for processing in accordance with one television signal format. Although Thomson teaches adjusting to provide minimum remainder of adjacent channel signals, Petitioner contends that the bandpass-filter 8 shown in Figure 1 is an adaptive filter, and thereby is a signal processor. Pet. p28-31. Petitioner then argues that it is known in the art that an adaptive filter is a filter which can change its characteristics by changing its filter coefficients citing to paragraph 25 of the Holberg's declaration. Pet. p31-32.

There are several problems with this argument. Thomson does not teach a signal processor that processes in accordance with one television signal format instead of processing in accordance with a plurality of formats. The totality of what the Thomson reference says about bandpass filter 8 is as follows: "The following bandpass filter 8 (see Fig. 2g) with an adaptively controlled bandwidth selects the designed signal with a minimal remainder of the adjacent channel signals." Ex. 1004, 3:16-19. Thomson is silent as to the apparatus through which the filter 8 adapts itself. For this reason, bandpass filter 8 is not a signal processor because it cannot fulfill, as shown in Fig. 1, the "adaptive" function. Ex. 2003, ¶ 72. POSITA would have serious difficulties in implementing the adaptive filter 8 in Thomson. The only indication in Thomson about the adaption is Figure 2g) that shows that the bandpass filter can have a variable shape. As explained by Dr. Opris, Thomson is silent about the criteria for changing the filter shape and the algorithm and apparatus for doing so automatically, as required by the term "adaptive". *Id.* In sum, the disclosure of the Thomson bandpass filter 8 does not teach a signal processor for processing said digitized signals, as required by the '792 patent.

Next, Petitioner argues that the bandpass-filter 8 shown in Figure 1 processes the digital representation of the intermediate frequency signal in accordance with the television signal format of the input RF signals. Pet. p17-18. Petitioner contends the Thomson bandpass filter 8 executes one filter function if the RF input signal is an

analog TV format, as indicated by the status of the TV standard input and another filter function if it is a digital TV format. Pet. p30-31.

Nothing in Thomson discloses that the Thomson bandpass filter 8 processes in accordance with the TV standard of the signal. Ex. 2003, ¶ 74. Holberg claims that the words "television standard" on Figure 1 indicate that the bandpass filter is processing in accordance with format. This is far from clear or convincing, in light of the total absence of any support for the same in the specification. The Federal Circuit recently confirmed that unsupported, conclusory dictates of paid experts cannot support invalidity assertions. The Federal Circuit stated that the expert must "explain in detail how each element is disclosed in the prior art reference" and that "general and conclusory testimony is not enough to be even substantial evidence in support of a verdict." *Whitserve, LLC v. Computer Packages, Inc.*, 694 F.3d 10, 24 (Fed. Cir. 2012). Also 37 C.F.R. § 42.65(a) states "[e]xpert testimony that does not disclose the underlying facts or data on which the opinion is based is entitled to little or no weight."

Moreover, nothing in Thomson discloses that the bandpass filter 8 processes the digitized signals intermediate signals accordance with one television signal format of said input RF signals and generates digital output signals indicative of information encoded in said input RF signals. Thomson does not disclose that bandpass filter 8 processes only in accordance with the one analog television signal format when the

Thomson apparatus receives an analog television signal format RF signal. Ex. 2003, ¶ 75. Nor does Thomson disclose that bandpass filter 8 processes only in accordance with the one digital television signal format when the Thomson apparatus receives a digital television signal format RF signal. *Id.*

Thomson discloses two parallel paths for processing, one for analog format processing and the other for digital television format processing after the Thomson bandpass filter 8. Thus, Thomson does not process only in accordance with one format, but instead processes in accordance with both analog and digital formats in parallel. In particular, Thomson shows the demodulating process as a two parallel path processing, one for digital format (digital format processing path that outputs Q and I) and the other for analog format (analog format processing path that outputs CVBS, S_{mod1} and S_{mod2}). Ex1004, Figure 1. Nothing in Thomson discloses that the Thomson bandpass filter 8 processes only the digitized intermediate signals in accordance with one digital television signal format of said input RF signals. To the contrary, Thomson suggests that same parallel path processing, one for analog format processing and the other for digital format processing. Dr. Opris explains that a bank of parallel bandpass filters, each processing the signal in accordance to a different format (e.g. analog format or digital format) in a parallel processing path was, at the time of the invention, the conventional means to provide a multi-format bandpass filter. Ex. 2003, ¶ 76. Upon cross examination, Dr. Holberg admitted that the Thomson

bandpass filter 8 could operate as a bank of parallel bandpass filters. Ex. 2008, p137.

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). Each of the outputs of each of these two circuits feeds its respective demodulator. Ex. 2003, ¶ 76. Furthermore, the Petitioner has not provided any evidence that it was known at the time of the '792 patent invention how to implement and enable a bandpass filter to process in accordance with one format of the input RF signal. Ex. 2003, ¶ 77. In view of scant disclosure and Thomson Figure 1 showing the two parallel analog and digital paths, a POSITA would have concluded that Thomson is disclosing that Thomson bandpass filter 8 includes two parallel circuits, one for analog television IF signals and one for digital television IF signals. *Id.* Even so, the Thomson bandpass filter 8 still does not read on the claimed signal processor because Thomson would be processing in accordance with at least two formats and not in accordance with one format.

Moreover, Thomson does not inherently disclose that the bandpass filter 8 processes the digitized intermediate signals in accordance with one format of said input RF signals and generates digital output signals indicative of information encoded in said input RF signals. Because the bandpass filter 8 can be processing in accordance with at least two formats, the missing element is not necessarily present

that the Thomson bandpass filter 8 processes the digitized intermediate signals in accordance with one format of said input RF signals.

The fourth element of claim 1 of the '782 patent recites the following: "the signal processor applies one of a plurality of finite impulse response filters... each of the plurality of finite impulse response filters corresponding to a format." Petitioner admits that Thomson does not disclose the use of FIR filter, but relies on the Harris reference for teaching of FIR filters. Pet. p31.

Petitioner does not rely on the Harris reference other than for implementing the functions of bandpass filter 8 of Thomson with the Harris DDF processor. Pet. p31-32. Petitioner proposes that it would have been obvious to one of ordinary skill in the art to modify Thomson by incorporating the FIR filters of Harris into the Thomson's bandpass filter 8. Pet. p32. Even if a POSITA would have reason to make this modification, the resulting combination fails to teach all the limitations as claimed. Thomson does not teach or suggest a frequency conversion circuit as argued above. Also, the Petitioner proposed modification of the Thomson's bandpass filter 8 having parallel circuits for each format would have not resulted in a signal processor for processing in accordance with one television signal format, but instead a bandpass filter for processing in accordance with more than one format where each parallel circuit incorporates FIR filters. Ex. 2003, ¶ 80.

Moreover, a POSITA at the time of the invention would not have made the Petitioner's proposed modification. There must be a clear and explicit articulation of reasons why the claimed invention would have been obvious. *KSR International Co. v. Teleflex Inc.*, 550 U.S. 398, 418 (2007). A "rejection on obviousness cannot be sustained with mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness. *In re Kahn*. 441 F.3d 977, 988 (Fed. Cir. 2006). See *KSR International Co. v. Teleflex Inc.*, 550 U.S. 398, 418 (2007) (quoting Federal Circuit statement with approval).

The Harris DDF or Harris DDF in combination with a microprocessor interface does not provide a basis that it would have been obvious to a POSITA to bridge the Thomson gap for the following reasons: a) the Harris DDF is a low pass filter not a bandpass filter; b) the Harris DDF is not an adaptive filter; c) the Harris DDF cannot be made adaptive by the Harris microprocessor interface; and d) Harris is a cellular phone application and as a result Petitioner's proposed substitution of the Thomson bandpass filter 8 with the Harris DDF would not have obtained predictable results.

The Harris DDF is a low pass filter not a bandpass filter. Ex. 2003, ¶ 82. Harris states that output of the ADC feeds a down converter and the down converter is comprised of two HSP43220 Digital Decimating Filters (DDFs). Ex. 1005, p4,

2:3rd full par, and Ex. 2003, ¶ 82. Harris states: "The quadrature components of the NCOM output are each filtered by the DDFs which implement a low pass filter."

Ex. 1005, p4, 2:4th full par. Harris Figure 4 shows a Top level block diagram of the Harris HSP43220 DDF. Ex. 1005, Fig. 4. As explained by Dr. Opris pointing to the HSP43220 datasheet, the Harris HSP43220 DDF is not a bandpass filter but instead

"a linear phase low pass decimation filter" which is optimized for filtering narrow band signals." Ex. 2003, ¶ 82. Dr. Opris further explains a POSITA would not have recognized that the substitution of the Harris DDF for the Thomson filter 8 would have yield desired results. Ex. 2003, ¶ 82. Dr. Opris further explains that even when preceded by Harris' HSP45116, the Harris DDF cannot be combined with Thomson for two reasons: 1) the HSP45116 is limited to a maximum of 33Msps input data sampling rate; and 2) Harris does not provide an apparatus to up convert to the original frequency location the signal downconverted by the HSP45116.*Id.*In

conclusion, a lowpass filter such as the HSP43220 DDF cannot be used instead of the Thomson's bandpass filter 8, and thereby a POSITA would not have a reason to make the Petitioner's proposed modification because such a combination would not have predictably yielded the '792 claimed invention.

The Harris DDF is not an adaptive filter. Ex. 2003, ¶ 83. Dr. Opris explains that the Harris DDF is not a signal processor running a program because the DDF does not have an Arithmetic Logic Unit. *Id.* Dr. Opris further explains that the

coefficients are stored on the DDF chip prior to operation. *Id.* Dr. Opris points out that the DDF is hard-wired to function as a filter. *Id.* Dr. Opris states that there is no provision for adaptively changing the coefficients while maintaining uninterrupted, proper filter operation. Ex. 2003, ¶ 83 citing Ex. 2010, figs. 1, 2 and 3 and Ex. 2004³ citing Ex. 2011. Dr. Opris states that the coefficients of the HSP 43220 filter are fixed once they are loaded. Ex. 2003, ¶ 83 relying on ("The coefficients are loaded into the Coefficient RAM over the control bus (C_BUS)." Ex. 2010, p9 and Ex. 2004 citing Ex. 2011. Dr. Opris states that the coefficients are not generated inside of the HSP 43220, and the HSP 43220 does not provide any type of information about the signal which would help some external apparatus adapt the coefficients of the filter or the number thereof. Ex 2003, ¶ 83. Dr. Opris finds that in order for the HSP 43220 to be functional, its coefficients must be pre-set by external means. *Id.*

Moreover, the Harris DDF cannot be made adaptive by the Harris microprocessor interface as argued by Petition. Pet. p37. Harris states: "the DDF can be rapidly reconfigured via a standard microprocessor interface." Ex. 1005, p5, 2:2nd full par. However, this single sentence does not mean that the microprocessor interface can be used to make the Harris DDF adaptive. As explained by Dr. Opris,

³ Exhibit 2004 is testimonial evidence submitted in IPR2014-00809 and thereby, 37 C.F.R. § 42.107(c) does not apply because it is not "new testimonial evidence."

there is no mechanism through which the microprocessor interface or the Harris HSP43220 DDF would somehow extract information from the incoming signal, and "adapt" the coefficients of the filter accordingly. Ex. 2003, ¶ 84 and Ex. 2004 citing Ex. 2011. Dr. Opris states that the sole purpose of the microprocessor interface is to preload the coefficients into the Harris DDF control register shown in Figure 5 (citing Ex. 2010, Fig. 5 and p9-10 and Ex. 2004 citing Ex. 2011) and cannot be used to load the coefficient during the operation of the Harris DDF while providing an uninterrupted, proper filter operation. Ex. 2003, ¶ 84 and Ex. 2004 citing Ex. 2011.

Harris is a cellular phone application and as a result Petitioner's proposed modification of the Thomson bandpass filter 8 with the Harris DDF would not have obtained predictable results. Harris only discloses cellular telephones, mobile radio and wireless LAN as example applications for the Harris receiver. Ex. 1005, p1, 2:8-10. Harris is completely silent about television receivers. As explained by Dr. Ion Opris, it is extremely challenging to design television digital receivers as compared to a cellular system for several reasons. Ex. 2003, ¶ 85. First, consumers demand a much higher quality of the television reception for television viewing than for the reception for cellular phones. This requires more accurate channel filtering due to high sensitivity (meaning an ample video signal-to-noise ratio even with weak input signals) and high selectivity (meaning high RF front-end linearity and high-quality RF front end filtering) requirements. *Id.* (citing Ex. 2006, p4)). The '792 patent has a filing date

of July 1st, 2004. Exhibits 2005 and 2006 show that at least 6 years after the time of the '792 invention, Petitioner recognized some of the same challenges faced by a POSITA in designing television receivers at the time of the '792 filing. Mr. Eric Garlepp, the Petitioner's senior product manager recognized that designing television receivers must achieve clear TV broadcast reception that demand unique design requirements for television applications. Ex. 2005, p4-5. The keys to achieving clear TV broadcast reception are sensitivity (the ability to have an ample video signal-to-noise ratio even with weak input signal to correctly receive the broadcast) and selectivity (the ability to block or exclude content on nearby "blocker" channels). Ex. 2006, p4. To achieve these two characteristics, the Petitioner states that a TV receiver must have a low noise figure, high RF front-end linearity and high quality RF front-end filtering. *Id.* Petitioner points out that in order to achieve high selectivity, a tuner needs both high linearity and high quality filtering in the RF front end. *Id.* Dr. Opris explains that these heightened television receiver design requirements would not be compatible with a substitution of the Thomson bandpass filter 8 with the Harris DDF and, as result, the proposed substitution would not have any expectation of success or predictable results. Ex. 2003, ¶ 85.

Dr. Opris explains that there are other reasons that Petitioner's proposed substitution of the Thomson bandpass filter 8 with the Harris DDF would not have obtained predictable results. First, television RF signals have extremely large

bandwidth compared to the cellular phone RF single bandwidth. Ex. 2003, ¶ 86.

This requires the channel filter of the '792 patent to process a much larger bandwidth signal than the filter for the cellular phone receivers. Ex. 2003, ¶ 86. In fact, Thomson discloses the bandwidth of the twice down-converted IF signal has a bandwidth of 27 MHz. Ex. 1004, gist of invention, 2:6 and Fig. 2a-c. In contrast, Harris discloses the bandwidth of the down-converted IF signal has a bandwidth in the range of 10 KHz. Ex.1005, p. 6, 1:14-36. Dr. Opris testifies that the Harris channel filter could not be a simple substitute for the Thomson bandpass filter 8 with predictable results because the Harris channel filter would be inadequate to filter the Thomson television IF signal because the Thomson television IF signal is many orders of magnitude of greater bandwidth. Ex. 2003, ¶ 86. Moreover, Dr. Ion Opris testifies that Harris provides no guidance to a POSITA to bridge this gap. *Id.*

Second, television filtering requires an extremely large sampling rate compared to the cellular phone filtering sampling rate. Ex. 2003, ¶ 87. In fact, Thomson discloses that the twice down-converted IF signal is sampled at a rate of 100 MHz. Ex. 1004, 3:6 and Fig. 2f. In contrast, Harris discloses that the down-converted IF signal is sampled at a rate of up to 33 MSPS. 1005, p4, 2:31-47 and p6, 1:14-36. Dr. Opris testifies that 33 MSPS is a sample rate of 33 MHz. Ex. 2003, ¶ 87. Dr. Ion Opris testifies that the Harris channel filter could not be a simple substitute for the

Thomson bandpass filter 8 because the Harris channel filter has an inadequate sample rate to filter the Thomson television IF signal. Ex. 2003, ¶ 87.

"Although predictability is a touch 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. *DePuy Spine, Inc. v. Medtronic Sofamor Danek, Inc.*, 567 F.3d 1314, 1326 (Fed. Cir. 2009). Non-obviousness is found "if the prior art would not have worked for its intended purpose or otherwise taught away from the invention." *Id.*; 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). A determination of obviousness must be based on evidence available at the time of invention – *not on hindsight*. *KSR*, 550 U.S. at 421 ("A factfinder should be aware, of course, of the distortion caused by hindsight bias and must be cautious of arguments reliant upon ex post reasoning.") (citing *Graham v. John Deere Company of Kansas City Calmar, Inc.*, 383 U.S. 1, 86 S.Ct. 684, 15 L.Ed.2d 545, 148 USPQ 459 (U.S., 1966); see also *Amgen Inc. v. F. Hoffmann-La Roche Ltd.*, 580 F.3d 1340, 1363 (Fed. Cir. 2009) (affirming determination of non-obviousness where the supporting testimony was based on "hindsight, not of reasonable expectation of success at the time of the invention.")).

Neither Thomson nor Harris provides any reason for a POSITA to modify the Thomson bandpass filter 8 with the Harris DDF processor because there would not have been any reasonable expectation of success at the time of the invention. Harris is not a bandpass filter but a low pass filter and would not have worked for its intended purpose. As shown above there are heightened TV design requirements (video signal-to-noise ratio, high RF front-end linearity and high-quality RF front end filtering) that are not required by the Harris cell phone receiver design. In addition, Thomson expressly teaches much larger bandwidth requirements and extremely larger sampling rate requirements than the Harris design. The Thomson bandwidth and sampling rate requirements would have pointed a POSITA away from using the Harris design.

The evidence shows that not only a POSITA would not have a reasonable expectation of success by substituting the Thomson bandpass filter 8 with the Harris DDF, but that Harris would not have worked for the intended Thomson purpose and would not suggest to a POSITA that such a substitution would have predictably yield the '792 claimed invention as recited in claim 1. Ex. 2003, ¶ 89. In summary, a POSITA would not have a reason to use the Harris DDF processor as a substitute for the Thomson bandpass filter 8. *Id.*

Petitioner argues that Thomson describes in 3:16-18 and Fig. 2g an adaptive filter that has a filter function that corresponds to a unique frequency range of each

format. Petitioner further argues that it would be an obvious design choice to implement the Harris processor for the Thomson's bandpass filter 8. Pet. p30. Dr. Opris testifies that Harris does not address the unique design requirements of television receivers and further points out that there is nothing in Harris' disclosure suggests that Harris' finite impulse response filters are suitable for television receiver applications. Ex. 2003, ¶ 90. In view of the heightened TV design requirements (video signal-to-noise ratio, high RF front-end linearity and high-quality RF front end filtering) as well as Thomson's teaching of the bandwidth requirements and extremely large sampling rate, Dr. Opris testifies that a POSITA would not have had a reason to use the Harris finite impulse response filters as a substitute for the Thomson bandpass filter 8 in order to have obtained the television receiver as required by '792 patent claim 1. *Id.*

The evidence shows that not only a POSITA would not have a reasonable expectation of success by substituting the Thomson bandpass filter 8 with the Harris DDF, but that Harris would not have worked for the intended Thomson purpose and would not suggest to a POSITA that such a substitution would have predictably yield the '792 claimed invention as recited in claim 1. Ex. 2003, ¶ 89. In summary, a POSITA would not have a reason to make the combination of Thomson and Harris as proposed by the Petitioner to obtain the '792 patent claimed invention.

B. Ground 1: Claim 29 is not obvious over Thomson in view of Harris

Those arguments made for Section VI. A. are maintained for this Ground and incorporated herein, but will not be repeated here for brevity. Petitioner argues that Thomson teaches in column 1:55- column 2:3 that Thomson discloses 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." Pet. p35. However Thomson only states: "Nowadays, a multi-standard TV receiver should be able to function as a satellite broadcast receiver. Ex. 1004, 1:55-56. Thomson does not disclose the satellite receiver. Moreover, Thomson does not disclose a terrestrial or cable receiver. Thomson teaches only the apparatus shown in Figure 1 having an IF input.

C. Ground 2: Claims 24 and 25 are not obvious over Thomson and Harris in view of Grumman.

Those arguments made for Section VI. A. are maintained for this Ground and incorporated herein, but will not be repeated here for brevity. Petitioner argues that because Grumman discloses storing coefficients for two FIR filters in memory, one set of coefficients for one FIR filter stored in BANK 0 and another set of coefficients for another FIR stored in BANK 1, Grumman teaches claim limitations, the plurality of finite impulse filters are stored in a memory, as recited in '792 patent claim 24. Pet. p35-36.

Grumman does not teach plurality of finite impulse filters are stored in a memory. In contrast, Grumman discloses a finite impulse response filter comprises of two parallel data paths, one which filters the real data stream and a second which filters the imaginary data stream. Ex. 1008, 5:8-11. The Grumman figures 1a and 1b show two parallel processing circuits, real processing circuit 17 and imaginary processing circuit 16. Ex. 1008, 33-53 and Fig.1a and 1b. Grumman shows BANK 0, memory 24, and BANK 1, memory 27, in Figure 1b. Grumman discloses that Figure 2 shows a block diagram of a 32 complex weight FIR filter 10 having a real processing circuit 17 and imaginary processing circuit 16. Ex. 1008, 7:32-35. Grumman further discloses the two parallel data paths, a first parallel data path for real data input and a second parallel data path for imaginary data input. Ex. 1008, 7:35-63. Grumman discloses that the "real and imaginary data portions of $Y_{in}(n)$ are multiplied with the corresponding coefficients stored in the coefficient memory banks **24, 27**. Ex. 1008, 8:12-14. Thus, Grumman discloses that memory 24 and 27 store real coefficients and imaginary coefficients. In sum, Grumman teaches a FIR filter with two parallel processing paths, but fails to teach a plurality of finite impulse filters are stored in a memory, as recited in '792 patent claim 24.

Moreover, a POSITA would not have a reason to use the Grumman finite impulse response filter in the Harris DDF processor then provide the combination as a substitute for the Thomson bandpass filter 8. In particular, a POSITA combining

Harris and Grumman would not have expected predictable results because Grumman teaches that a complex adaptive FIR filter having an internal processing architecture that features two parallel paths takes maximum advantage of the time available to do the required calculations. In contrast, as explained by Dr. Opris pointing to the HSP43220 datasheet, the Harris HSP43220 DDF is "a linear phase low pass decimation filter" which is optimized for filtering narrow band signals." Ex. 2003, ¶ 82. A POSITA would not have any reason to use the Grumman memory banks 24 and 27 in the Harris DDF architecture nor would a POSITA would have expected the use of the Grumman memory banks 24 and 27, respectively storing real and imaginary data would have yielded predictable result in a DDF not employing parallel processing.

D. Ground 3: Claims 26 and 28 are not obvious over Thomson and Harris in view of Zenith.

Those arguments made for Section VI. A. are maintained for this Ground and incorporated herein, but will not be repeated here for brevity. In addition, neither Thomson, Harris nor Zenith teaches a "format/standard selection circuit generating a select signal indicative of a format of said input RF signal and the signal processor selecting a finite impulse response filter in response to the select signal" as recited in claims 26 and 28, or "the format/standard selection circuit generating the select signal by detecting carrier signals identifying one of the formats of said input RF signal" as recited by claim 28.

Petitioner identifies the "standard selection circuit" as being Zenith's uP 22 shown in Zenith's Figure 2. Pet. p43-44. However, the Zenith's uP 22 does not generate a select signal indicative of a format of said input RF signal and Zenith's uP 22 does not detect carrier signals in the input RF signal. To the contrary, the Zenith's uP 22 detects the presence or absence of analog sync signals when the switch 42 is in position A. The Zenith's uP 22 detects the output of SYNC DET 20 which is the indication of analog sync signal when the switch 42 is in position A, but the Zenith's uP 22 does not detect an indication of analog sync signal when the switch 42 is in position A. When the switch 42 is in position D, the oscillator in the non-selected demodulator, the analog demodulator, is disabled. Ex. 1001, abstract. This results in the SYNC DET 20 to continue not to detect the absent of syncs no matter whether the format of the input RF signal is analog or digital. In other words, the Zenith's uP 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 analog signal. At best, Zenith's uP 22 generates a select signal indicative of the output of the SYNC DET 20, but does not generate a select signal indicative of format of the input RF signal. In sum, the uP 22 does not generate "a select signal indicative of a format of said input RF signal and the signal processor selecting a finite impulse response filter in response to the select signal", as required by Claim 26 and 28 or generate "the select signal by detecting carrier signals identifying one of the formats of said input RF signal" as recited by claim 28.

A POSITA combining Thomson and Zenith would not have obtained predictable results, for the following reasons.

First reason: Petitioner identifies the "standard selection circuit" as being Zenith's uP 22 (Ex. 1011, Fig. 2). The uP 22 is fed by the SYNC DET 20. Let's take an ordinary example: the user is watching digital TV on a TV set which can receive either analog TV or digital TV. A FIR filter corresponding to digital TV is selected (with a bandwidth of approx. 6 MHz), and the SYNC DET 20 does not detect the presence of syncs. Now the user decides to watch digital TV. Now the user changes to analog TV (which has a bandwidth of 27 MHz). **Because the narrower FIR filter for digital TV is selected, it will not process according to the analog TV format, it will cut off most of the information, and therefore its output will not be properly demodulated by the analog TV demodulator.** As a result, the SYNC DET 20 will continue not to detect the presence of syncs, and the uP 22 will not be able to generate "a select signal indicative of a format of said input RF signal", as required by Claim 26 and 28 or generate "the select signal by detecting carrier signals identifying one of the formats of said input RF signal" as recited by claim 28.

Second reason: Patent Owner's position is that in Thomson both the analog TV demodulator and the digital TV blocks 11-15 are simultaneously enabled. But if that is not true, then when switching from watching digital TV to analog TV the analog TV demodulator would be disabled and, irrespective of the FIR filter selected,

there would be no signal output that the SYNC DET 20 could detect. In this case again, the uP 22 will not be able to generate "a select signal indicative of a format of said input RF signal", as required by Claim 26 and 28 or generate "the select signal by detecting carrier signals identifying one of the formats of said input RF signal" as recited by claim 28.

E. Ground 4: Claim 27 is not obvious over Thomson and Harris in view of Zenith and Birleson.

Those arguments made in Sections VI.A and VI.D are maintained for this Ground and incorporated herein, but will not be repeated here for brevity. Birleson does not teach that the "standard selection circuit generates said select signal in response to an input signal from a user" as required by claim 27. The purpose of the ACD 30 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. Petitioner further argues that "a user could initiate signal testing by changing the input source." Pet. p50. However, Birleson does not teach changing the input source as argued by the Petitioner, 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.

Petitioner further argues that a POSITA would combine "the user input functionality from Birleson with the select circuit of Zenith." Pet. p51. However, a POSITA would not have a reason to use the ACD 30 to provide a user format selection because Birleson teaches the ACD 30 is used for determining with an analog signal has a suppressed carrier or a scramble signal and not for the purpose of allowing the user to determine the format of an RF signal.

F. Ground 5: Claims 18 and 19 are not obvious over Thomson and Harris in further view of Oku, Ericsson, and Nguyen.

Those arguments made in Section VI.A are maintained for this Ground and incorporated herein, but will not be repeated here for brevity.

Petitioner 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." Pet. p52. Petitioner argues that "Oku also includes a first driver circuit." *Id.* Petitioner argues that "Oku discloses a second driver circuit." Pet. p53. Petitioner argues that "Oku discloses a second digital-to-analog converter (DAC 16)." Pet. p54. 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.* Petitioner 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." Pet. p55-57

Contrary to Oku teachings, the '792 patent claim 18 limitation, "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", requires that the first output terminal provide signals indicative of video **and** audio information and the second output terminal provide signals indicative of video and audio information. 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, Fig. 1 and 3:55-63. As shown in Figure 4, Oku teaches the first driving circuit 17 provides a first output terminal having only a video information signal and Oku teaches the second driving circuit 22 provides a second output terminal having only an audio information signal. Ex. 1018, Fig. 4. Neither Oku's output terminal of driving circuit 17 nor Oku's output terminal of driving circuit 22

reads on "the first and second output terminals provide differential output signals indicative of video **and** audio information" as recited in '792 patent claim.

Moreover, a POSITA would not have a reason or be motivated to make the Petitioner's combination of Thomson and Harris in further view of Oku, Ericsson, and Nguyen to obtain the receiver as recited in '792 patent 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, 1:34-39 and Ex. 2003, ¶ 105. Thomson does not use a digital-to-analog converter coupled between the signal processor and a demodulator as required by '792 patent claim 13. *Id.* Thomson's objective is to provide FM-modulation and QPSK-modulation using a common A/D converter. Ex. 1004, 1:29-33 and 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 the minimizing of the number of electronic component would have in fact deterred a POSITA in making the Petitioner's 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 have a reason or be

motivated to 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.

Finally, Thomson, Harris, Oku, Ericsson, and Nguyen fail to teach "a low pass filter" as recited in claim 19. Petitioner does not content otherwise. Instead, Petitioner argues that such an insertion would be a "mere design choice". Pet. p59. Dr. Opris explains the minimizing of the number of electronic component would have in fact deterred a POSITA in making the Petitioner's proposed modification. Ex. 2003, ¶ 105. If it would have been a manner of design choice, a POSITA would chose not to add the low pass filter.

VII. CONCLUSION

For the foregoing reasons, the Board should not institute this IPR.

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Respectfully submitted,

/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
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Pursuant to 37 C.F.R. § 42.6, the undersigned certifies that on May 16, 2015, a copy of the foregoing document PATENT OWNER PRELIMINARY RESPONSE PURSUANT TO 37 C.F.R. § 42.107 and Exhibits 2001-2006, 2008, 2010 and 2011 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>Peter Ayers peter@leehayes.com</p> <p>LEE & HAYES, PLLC 13809 Research Blvd., Suite 405 Austin, Texas 78750</p>	<p>John Shumaker jshumaker@leehayes.com</p> <p>Brian Mangum brianm@leehayes.com</p> <p>LEE & HAYES, PLLC 13809 Research Blvd., Suite 405 Austin, Texas 78750</p>

/Michael R. Fleming /
Michael R. Fleming, Reg. No. 67,933
Irell & Manella LLP