

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

COMCAST CABLE COMMUNICATIONS, LLC,
Petitioner,

v.

ENTROPIC COMMUNICATIONS, LLC,
Patent Owner.

CASE: IPR2024-00441

U.S. PATENT NO. 8,792,008

PATENT OWNER'S PRELIMINARY RESPONSE

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Exhibit Number	Description
Ex. 2001	Joint Claim Construction and Pre-Hearing Statement (Case 2:23-cv-01050-JWH-KES)
Ex. 2002	Kishore Seendripu, <i>At MaxLinear, our drive towards excellence shows in all that we do</i> , The Silicon Review
Ex. 2003	U.S. Patent No. 9,210,362 to Reddy et al.
Ex. 2004	K. Scott Helms, et al., Leveraging Wideband and Full Spectrum Receiver Capabilities to Develop and Utilize Software-based Tools for Remote Spectrum Analysis and Troubleshooting
Ex. 2005	Excerpts from Deposition of Timothy Gallagher, held on July 19, 2023 in <i>Entropic Communications, LLC v. Charter Communications, Inc.</i> , Case 2:22-cv-00125-JRG
Ex. 2006	Broadcom Corporation, “Full-Band Capture Cable Digital Tuning” White Paper, June 2011
Ex. 2007	DOCSIS® Best Practices and Guidelines: PNM Best Practices: HFC Networks (DOCSIS 3.0)
Ex. 2008	DOCSIS® Best Practices and Guidelines: Proactive Network Maintenance Using Pre-equalization (Ver. 2)
Ex. 2009	Jim Walsh, et al., The Full (Band) Story: How Smart CPE Will Change HFC Maintenance Forever

I. INTRODUCTION

Patent Owner, Entropic Communications, LLC (“Entropic”), submits this Patent Owner Preliminary Response (“POPR”) pursuant to 37 C.F.R. § 42.107(a) to the *Inter Partes* Review (“IPR”) petition (“Petition”) filed by Comcast Cable Communications, LLC for claims 1-18 of U.S. Patent 8,792,008 (the “’008 Patent”). The Board should deny institution.

To ensure network services operate within acceptable bounds, network service providers need to understand the quality of signals as they are received at customer premises. Traditionally, service providers had to send a technician to the customer’s premises to investigate any issues on site. But this has several disadvantages. *First*, there is a limited window of time when technicians are working and/or customers will permit access to their premises, leaving a limited window of time to assess and monitor problems. *Second*, a customer already frustrated with service issues will be doubly frustrated by having to plan for the technician’s visit. *Third*, service providers and their technicians usually only become aware of a problem in the network when a customer calls to complain after having already experienced unacceptable quality or complete failure of their service. Given these and other problems, there was a need prior to the ’008 Patent for service providers to obtain an indication of the status of the network based on a measurement

performed in the equipment located at the customer's premises that reduced or eliminated the need for technicians to perform on-site diagnostics.

As relevant here, the '008 Patent discloses systems and methods that enable cable and satellite providers to remotely monitor the signal characteristics at a customer's premises, thereby allowing the cable and satellite providers to remotely diagnose service issues without having to wait for a customer complaint or send a technician to perform on-site diagnostics. The '008 Patent discloses that this monitoring functionality is built into the equipment already deployed to the customer premises and allows this monitoring to occur while customers use their equipment without interrupting services, such as television services or internet services. This transparent signal monitoring is achieved through ***concurrently outputting*** selected portions of a received signal to both a signal monitor/analyzer and a data processor, where the signal monitor/analyzer reports a determined characteristic back to the source of the signal. By concurrently outputting a received signal in this manner, the system disclosed by the '008 Patent allows a service provider (*i.e.*, the source of the signal) to monitor characteristics of the signal received at a customer's premises without interrupting service to the customer or sending technicians into the field to diagnose issues with the customer's service.

The prior art references of the Petition take different approaches to monitoring the signal received at the customer's premises, resulting in fundamentally different

architectures. The Petition therefore must recast the references using the challenged claims of the '008 Patent as a roadmap to argue the claims are merely “obvious.” Not only is this impermissible hindsight, objective indicia evidence, contemporaneous with the invention of the '008 Patent, proves that the challenged claims are decidedly *not obvious*. The cable industry, including competitors of the original assignee of the '008 Patent (MaxLinear, Inc.) possessed every incentive to address the very problem MaxLinear solved with its '008 patent, but they failed to identify a viable solution. It was only after MaxLinear's invention in the '008 Patent that the industry saw the way. After that, the claimed invention received significant industry praise and recognition, and it fundamentally changed how network service providers remotely monitored their networks. The industry's pre-invention failure and its post-invention praise underscores the non-obvious nature of the claimed invention and critically, the extent to which the Petition has to alter the prior art in its failed attempt to support its claims of obviousness. For example:

- Within Grounds A-C, the only explanation for why a POSITA would combine Kamieniecki and Konstantinos, as argued in the Petition, is *hindsight*; absent hindsight, there would be no reason to fundamentally alter the principle of operation of Kamieniecki's monitoring scheme as described in Petition.
- Also, in Grounds A-C, the Petition is blind to the fact that the proposed

combination would no longer have “a signal monitor operable to: [1] analyze said digitized signal to determine a characteristic of said digitized signal; and [2] report said determined characteristic to a source of said received signal.” These last two failures are born from the Petition’s failure to understand Kamieniecki’s set-top box. First, the Petition fails to understand that Kamieniecki’s set-top box operates solely in the *analog domain* and therefore cannot analyze digital signals as required by the claims. The Petition also fails to even recognize (much less explain) that its proposed replacement-of-components combination could not send information upstream because the combination rips that capability out of Kamieniecki in favor of replacing the Out of Band tuner of Kamieniecki with differently intentioned components from Konstantinos. This too is a critical failure as the challenged claims require “report[ing] said determined characteristic to a source of said received signal.”

- Grounds D and E are based on the Renken reference which is not prior art at all. Renken was published on August 23, 2012 and can only be prior art if its provisional application (filed February 18, 2011) supports the disclosures in the later-published Renken. But the Petition relies on

portions of Renken that lack any written-description support in the provisional.

- Substantively, Grounds D and E fail because the Petition fails to explain how Renken's receiver architecture "concurrently output[s] said first portion of said digitized signal to said signal monitor" without the benefit of hindsight.

In sum, the Petition cannot help but take a hindsight-biased approach to rearrange the prior art in combinations and alterations that do not make sense or are contrary to the references themselves. Moreover, even these flawed combinations fail to disclose the entire claimed invention, because each Ground fails to render obvious the claimed "concurrently output said first portion of said digitized signal to said signal monitor and said second portion of said digitized signal to said data processor." Ex. 1001, cl. [1E]; *also id.*, cls. [3D], [11D]. Accordingly, the Petition fails to articulate a *prima facie* case of obviousness for all challenged claims of the '008 Patent.

Because all Grounds fail to render obvious the independent claims of the '008 Patent, the entirety of the Petition should be rejected. *See Hartness Int'l Inc. v. Simplimatic Eng'g Co.*, 819 F.2d 1100, 1108 (Fed. Cir. 1987) (prior art that fails to demonstrate an independent claim as unpatentable similarly fails to demonstrate a dependent claim as unpatentable).

II. SUMMARY OF THE '008 PATENT

A. Background of the '008 Patent

The '008 Patent describes systems and methods for spectrum monitoring of a network-based service, such as cable or satellite television, using equipment located at the customer's premises. Ex. 1001, 1:54-2:17, 2:34-3:4, 4:51-5:11.

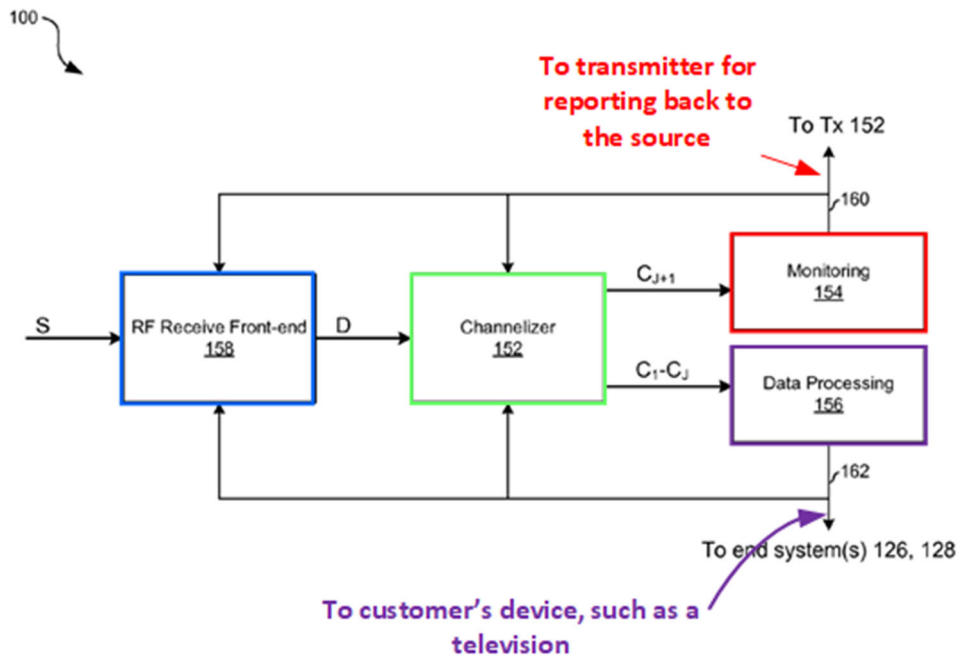
Traditionally, network-based service providers had limited options to provide support to customers and troubleshoot quality-of-service and other issues at a customer's location. *See id.*, 1:42-45. For example, when network parameters fell outside acceptable ranges such that the quality of service suffered, a provider would need to both investigate and fix the issue. *See id.*, 1:34-42. Unfortunately, conventional methods of monitoring were "too costly and impractical for use in customer-premises equipment ('CPE')," so providers instead sent technicians to customer premises to investigate the issue on site. *See id.*, 1:36-45. On-site visits are not only expensive and time consuming, they are intrusive and disruptive because the technician is inside the premises and service is interrupted while the technician diagnoses and fixes the problem. Accordingly, there was a need for a less expensive method by which network service providers could monitor the quality of service provided to a customer's premises without interrupting service. *See id.* ("Conventional methods and apparatuses for monitoring network parameters are too costly. . . .").

The '008 Patent met this need. The '008 Patent disclosed systems and methods for monitoring signals that can be implemented in equipment (e.g., a “customer premises gateway”) deployed by the provider at the customer’s premises. *Id.*, Abstract. These systems and methods allow service providers to remotely monitor the condition of the signal that is received by the customer equipment, without the need for a disruptive and costly service visit to the premises. *Id.*, 3:5-60. The receiver’s front-end circuitry is designed to receive and digitize a received signal, determine a characteristic of the digitized signal, and then report that measured characteristic back to the source. *Id.*

Specifically, the '008 Patent discloses a solution capable of performing spectrum monitoring. *See, e.g., id.*, Abstract, Figs. 1B and 1C. The solution includes an apparatus which (1) receives and digitizes a signal spanning a full spectrum signal inside an RF front-end **158**; (2) selects specific portions of the outputs of the front-end **158**, using a channelizer **152**; and (3) concurrently outputs one portion to a monitoring device **154** and another portion to a data processing device **156**. *Id.*, 2:5-3:10. The provider is thus able to monitor actual signal conditions at the customer’s premises (sent to the monitoring path) without interrupting service to the customer because signal continues to be provided to the data processor (along the other path). *Id.*, 4:7-10.

First, the front-end **158** (shown in blue below) receives an analog signal that spans an entire television spectrum (*e.g.*, signal S in Fig. 1B below, which includes the entire signal from the lowest frequency “ F_{lo} ” to the highest frequency “ F_{hi} ”). *Id.*, 3:15-16, 5:41-47, 5:60-62. The signal is digitized using one or more analog-to-digital converters (ADCs) located in the front-end **158**, resulting in digital signal “D” depicted in Figure 1B below. *Id.*, 3:16-19, 5:41-47, 5:58-65, cls. 1, 3, 11.

A channelizer **152** (shown in green below) then selects a portion of the digitized signal for output to a signal monitor or analyzer **154** (shown in red below) and a portion of the digitized signal for output to a data processor **156** (shown in purple below), which are output concurrently. *Id.*, 3:20-28, 4:7-10, Fig. 1B, cls. 1, 3, 11. The channelizer **152** may select for outputting to either or both of the parallel monitoring and data processing modules (1) all of signal D (*e.g.*, a signal spanning an entire television spectrum), or (2) any portion or portions of the signal D. *Id.*, 6:1-18.



Id., Fig. 1B (annotated).

The signal monitor/analyzer **154** receives the portion of the digitized signal output to its branch and determines one or more characteristics related to the quality of the channel over which the signal received, the quality of the transmitted, and/or the performance of the communication system. *Id.*, 3:33-45. For example, the signal monitor may determine the signal to noise ratio, signal strength vs. frequency, or any other quality that may help assess characteristics of the channel over which the signal was received. *Id.* After determining such characteristic(s), that information is reported back to a source of the signal (*e.g.*, cable or satellite provider of the signal). *See, e.g., id.*, 3:45-60 (specifically providing the example of a “headend”), cls. 1, 3, 11, Figs. 1B and 1C.

Claim 1 recites:

1. A system comprising:
 - an analog-to-digital converter operable to digitize a received signal spanning an entire television spectrum comprising a plurality of television channels, said digitization resulting in a digitized signal;
 - a signal monitor operable to:
 - analyze said digitized signal to determine a characteristic of said digitized signal; and
 - report said determined characteristic to a source of said received signal;
 - a data processor operable to process a television channel to recover content carried on the television channel; and
 - a channelizer operable to:
 - select a first portion of said digitized signal;
 - select a second portion of said digitized signal; and
 - concurrently output said first portion of said digitized signal to said signal monitor and said second portion of said digitized signal to said data processor.

Ex. 1001, cl. 1. Broadly, this claim recites a system that digitizes a received signal spanning an entire television spectrum to create a digitized signal, *id.*, cl. [1A]-[1B], and then portions of this digitized signal are selected. *Id.*, cl. [1E]. The selected portions of the digitized signal are concurrently output, with a first portion going to a signal monitor and a second portion going to a data processor. *Id.* Claims 3 and 11, the other two independent claims, recite similar elements. *See id.*, cl. [3C] (“digitizing said received signal from F_{lo} to F_{hi} to generate a digitized signal”), [3D] (selecting and then concurrently outputting a selected first portion to a signal analyzer and a selected second portion to a data processor); *see also id.*, [11C]

(“digitize said received signal from F_{lo} to F_{hi} to generate a digitized signal”), [11D] (reciting similar element as claim [3D]).

B. Claim Construction

The proper claim construction standard here is the *Phillips* standard. 37 C.F.R. § 42.100(b); *Apple Inc. v. Firstface Co.*, No. 2021-1001, 2021 WL 4156323, at *1 n.1 (Fed. Cir. Sept. 13, 2021).

The Petition identifies terms from claim 1 of the '008 Patent that were construed by the district court in the *Charter* case. Petition, 31. The parties in the *Comcast* case (2:23-cv-1050) however agreed that “operable to” should be given its plain and ordinary meaning. Ex. 2001, 2.

Nevertheless, Patent Owner’s arguments below do not turn on a specific construction of “operable to” so there is no need to construe that, or any other, term of the '008 Patent claims at this stage of the proceeding.

III. THE PETITION RELIES ON ART THAT IS FUNDAMENTALLY DIFFERENT FROM THE CLAIMED INVENTION AND THUS FAILS TO MEET ITS BURDEN

Each of Petitioner’s Grounds (A through E) rely on references with different approaches and different architectures for remote spectrum monitoring than those disclosed and claimed in the '008 Patent. The Petition and Petitioner’s expert gloss over those fundamental differences and propose hindsight-biased modifications that contradict the disclosures in the references themselves. The Petition must resort to

these hindsight-biased modifications because objective indicia clearly demonstrate that the claimed invention is a non-obvious advance over the prior art. Ultimately, each Ground fails to disclose each and every element of the challenged claims as shown in detail below.

A. Contemporaneous Evidence Underscores that the Petition’s Grounds are Guided by Hindsight

The common theme running through each Ground in the Petition is the impermissible use of hindsight, labeling what is missing from the prior art as “obvious,” when it is instead the point of novelty and invention. Far from “obvious,” the invention described in the ’008 Patent family fundamentally changed how network service providers remotely monitored the signal traveling through their network. Contemporaneous, *objective* evidence—not present-day subjective evidence from paid expert witnesses—proves this out.

The claimed invention in the ’008 Patent is built on a technology referred to as “Full-Spectrum Capture” (or “FSC”), which the original assignee of the ’008 Patent (MaxLinear) developed by at least 2010. *See* Ex. 1001, 5:45-47 (specifically referencing “Full-Spectrum Capture”); *see also* Ex. 2002 (describing by at least 2010 MaxLinear was using Full-Spectrum Capture technology to improve internet speeds) & Ex. 2003, Cover (displaying a priority date of April 17, 2009). Full-Spectrum Capture refers to the ability to process, or “capture,” the entire usable frequency

range—typically around 1 GHz—of the signal that is received at the customer’s premises. Ex. 2004, p. 2; *also* Ex. 2005, 20:20-21:3.

After developing Full-Spectrum Capture, MaxLinear engineers had an elegant, but simple, “Eureka!” moment when they realized that Full-Spectrum Capture could be leveraged “to capture and report local (end-user) cable-plant spectra” thereby “providing Cable and Multi-System Operators (MSO) new freedom in remotely monitoring, managing, and troubleshooting their networks.” Ex. 2004, p. 2. This was the invention of the ’008 Patent. According to Tim Gallagher, the first-named inventor on the ’008 Patent, the inventors realized that with the digital data already in an FSC-capable integrated circuit (IC) incorporated into equipment located at the customer’s premises, that they could use a “channelizer” and have a dedicated path from the channelizer to “circuits to measure power” and “to do things like monitor the spectrum, power, you know, basically the quality of a particular channel.” Ex. 2005, 18:25-20:2.

The invention’s dedicated path to the “monitoring circuit” uniquely permitted signal analysis to happen in parallel with a user watching a particular television channel. *Id.*, 20:6-13. In addition to monitoring the signal, the inventors realized that, if signal processing was happening in parallel, the customer premises equipment “could be sending information to the network all the time. And if you have this deployed in many cable modems then the network would get information

about their, you know, distributed cable systems in real-time” *Id.*, 20:14-19. Benefits abound from this real-time remote spectrum monitoring. For example, use of remote spectrum monitoring reduces the costs associated with network maintenance by reducing equipment costs and the number of “truck rolls,” which is sending technicians to investigate network issues. Ex. 2004, pp. 1-3. MaxLinear generally referred to this inventive use of Full-Spectrum Capture as Remote Spectrum Analysis. *Id.*

While the Petition would have the Board believe that the ’008 Patent was no more than an obvious extension of known technology, the objective, contemporaneous evidence proves the opposite. Even though Full-Spectrum Capture had been around since at least 2010 (maybe as early as April 2009), the industry *still* had not come to understand that FSC could support proactive network maintenance by June 2011 (which is around the priority date of the ’008 Patent). For example, well-known industry participant Broadcom Corporation had developed its own version of Full-Spectrum Capture, which it referred to as “Full-Band Capture.” Ex. 2006, p. 3 (“Full-Band Capture converts the entire analog 1 GHz cable signal to a digital signal.”); *also* Ex. 2007, p. 17, n. 1 (“Generically speaking, the industry calls CPE spectrum capture full-band capture (FBC). MaxLinear calls it Full Spectrum Capture™ (FSC).”). Broadcom in this 2011 paper, however, makes no mention of using its Full-Band Capture technology to support network maintenance,

even though there is an entire section titled “Benefits to Operators”—which would be the place, if anywhere, such operator benefits would be discussed. *See* Ex. 2006, p. 5 (making no mention of network maintenance or spectrum monitoring). If the invention were so “obvious,” surely smart Broadcom engineers would have made the “obvious” connection and proposed what is claimed in the ’008 Patent. They, of course, did not.

Documents from Cable Television Laboratories, Inc. (“CableLabs”), the same research group that puts out the industry’s DOCSIS standards, also prove the non-obviousness of the challenged claims. In addition to DOCSIS standards, CableLabs puts out industry “best-practices” documents for various technical topics, including proactive network maintenance (also known as “PNM”). The June 2011 version of that document (Ex. 2008), fully two years after MaxLinear’s Full-Spectrum Capture had been available, tells the industry that the then-best practice was to use “pre-equalization coefficients” to potentially isolate network issues. *See* Ex. 2008, p. 1. CableLabs clearly had not understood that FSC could be used, nor was it telling the industry to do so.

It was only *after* MaxLinear engineers made the novel and non-obvious invention of the ’008 Patent that CableLabs and the rest of the cable industry caught up and made a fundamental shift in how network service providers maintained their networks. The very next version of the CableLabs “proactive network maintenance”

best-practices document (released in 2016 (Ex. 2007), after the '008 Patent), lauded the importance of using Full-Spectrum Capture to support remote spectrum monitoring and that by using remote spectrum monitoring, it had “resulted in significant operational advantages not to mention operational cost savings” to network service providers. Ex. 2007, p. 18.

Although the Petition desires to characterize the challenged claims and their differences from the Petition’s cited art as simple now, that is only because “[m]any things . . . seem obvious after they have been done.” *Diamond Rubber Co. of New York v. Consol. Rubber Tire Co.*, 220 U.S. 428, 434–35 (1911). The objective evidence above proves that out. And, ultimately, the Petition fails to meet its burden because it fails to understand that the reasons the prior art and the challenged claims are different is not because of an obvious extension, but because of invention. The Petition’s hindsight cannot overcome that fact.

B. Grounds A-C: The Proposed Combination of Kamieniecki-Konstantinos Fails to Render Obvious the Challenged Claims

The Board can quickly dispose of these Grounds because the proposed combination of Kamieniecki and Konstantinos fails under the most superficial level of scrutiny. Although the Petition presents this combination as a simple substitution of components from Konstantinos into Kamieniecki, the proposed combination seeks to combine references that do not conduct the same form of remote spectrum

monitoring as the claimed invention. Therefore, the Petition distorts and disregards what the references disclose in an effort to make the references appear as if they operate like the claimed invention when they were never designed to do so. Moreover, in the Petition's attempt to hack together the two references, the Petition fails to recognize that the proposed combination is not functional for the purpose of the claimed invention (or the very purpose for which Petitioner combines the references). Although there are many failures throughout the Petition, four specific failures are addressed herein.

First, the Petition proposes hindsight-motivated changes to fundamental aspects of Kamieniecki's set-top box (STB) **110** without providing a sufficient motivation to do so. Kamieniecki determines signal quality information by the specific process of tuning through all the channels in the channel list. *E.g.*, Ex. 1009, Fig. 2, ¶¶ [0008], [0015], [0017], Fig. 2. This process can occur *only* while the STB **110** is in an idle or "off" state. *Id.* Thus, Kamieniecki's principle of operation is for signal monitoring to occur *only* while STB **110** is in an idle or "off" state by tuning through all the channels in the channel map. Furthermore, Kamieniecki's goal is to then report this signal quality information to the headed. Ex. 1009, Abstract, [0016], [0024]. The Petition tries to alter the essence of Kamieniecki to discard these principles in pursuit of the '008 Patent's invention involving constant monitoring even when not in an idle state. *See* Section III.B.2 *infra*. "[A] change in a reference's

‘principle of operation’ is unlikely to motivate a person of ordinary skill to pursue a combination with that reference.” *Plas-Pak Indus., Inc. v. Sulzer Mixpac AG*, 600 F. App'x 755, 759 (Fed. Cir. 2015) (citing *In re Mouttet*, 686 F.3d 1322 (Fed. Cir. 2012); *In re Ratti*, 270 F.2d 810 (CCPA 1959)). The Petition has failed to articulate a sufficient motivation to fundamentally change Kamieniecki as proposed.

Second, the Petition fails to explain how the proposed combination renders obvious “a signal monitor operable to: analyze said digitized signal to determine a characteristic of said digitized signal.” The Petition relies solely on Kamieniecki for this requirement, but the Petition fails to address the fact that Kamieniecki’s monitor **116** does not analyze *digitized* signals, only analog signals. *See* Section III.B.3 *infra*. Grounds A-C thus lack any disclosure of “determin[ing] a characteristic of said *digitized* signal,” meaning that Grounds A-C cannot render the challenged claims obvious. *Univ. of Strathclyde v. Clear-Vu Lighting LLC*, 17 F.4th 155, 160 (Fed. Cir. 2021) (“An obviousness determination generally requires a finding that ‘all claimed limitations are disclosed in the prior art,’ and ‘that a person of ordinary skill in the art would have been motivated to combine or modify the teachings in the prior art and would have had a reasonable expectation of success in doing so.’”) (internal citations omitted).

Third, the Petition fails to render obvious “a signal monitor operable to: . . . report said determined characteristic to a source of said received signal.”

Kamieniecki uses its OOB tuner as its only cable return path, (Ex. 1009, ¶¶ [0002], [0004], [0017]), but the Petition proposes to replace the OOB tuner with Konstantinos's multi-channel receiver, which has no such cable return path. Without the OOB tuner, the proposed combination would not be able to perform the function of "report[ing] said determined characteristic to a source of said received signal." The Petition's proposed replacement-of-components combination of Kamieniecki and Konstantinos entirely removes the only means Kamieniecki has to transmit anything back to the source, meaning Grounds A-C cannot meet this claim element. *See* Section III.B.4 *infra*.

Finally, the Petition fails to render obvious "concurrently output said first portion of said digitized signal to said signal monitor and said second portion of said digitized signal to said data processor" because the Petition has failed to identify where Kamieniecki or Konstantinos disclose outputting portions of the digitized signal concurrently to a data processor and a signal monitor. *See* Section III.B.5 *infra*. Kamieniecki discloses the opposite; Kamieniecki can only conduct signal monitoring while the STB 110 is "off" or idle (i.e., when data processing is not occurring). As for Konstantinos, the Petition is not clear as to what it is concurrently outputting. At best, the Petition relies on Konstantinos for concurrent output of television channels, which is just output to data processors in parallel, not concurrent output to a data processor in parallel and a signal monitor.

1. Overview of Kamieniecki, Konstantinos, and the Proposed Combination

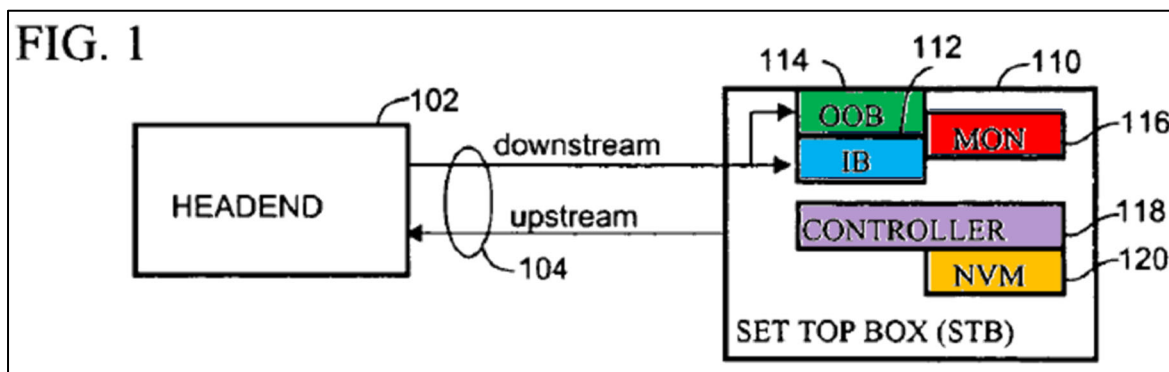
The Petition omits from its discussion of the prior art references critical features of both Kamieniecki and Konstantinos. For Kamieniecki, the Petition fails to explain that Kamieniecki: (1) operates solely in the *analog* domain and (2) the Out of Band (OOB) tuner enables bi-directional communications between the set-top box (STB) and the source of the received signal (e.g., the cable headend). '008 Patent, 3:55-57. As for Konstantinos, the Petition fails to explain how Konstantinos's multi-channel receiver would transmit information upstream to the headend. The Petition's failure to address these points reveals that, in the Petition's fervent desire to recast the prior art to operate like the claimed invention of the '008 Patent, it did not understand that the proposed combination would fail to disclose or render obvious multiple elements of the challenged claims. However, to better put into context the Petition's recasting of the prior art, a brief overview of the individual references and the proposed combination is provided.

a. Overview of U.S. Patent Publication 2005/0114879
(Kamieniecki)

Kamieniecki discloses a set-top box (STB) **110** which monitors and collects information about the quality of a received analog signal by iteratively tuning to each channel in the list when the STB is in an idle or "off" state. Ex. 1009, Abstract, Fig. 2, ¶¶ [0008], [0015], [0017], [0018]. As shown in Figure 1, STB **110** comprises:

an **in-band (IB) tuner 112** for receiving first signals from the cable operator, an **out-of-band (OOB) tuner 114** for receiving second signals from the cable operator, a **monitor (MON) 116** for generating information related to signal quality on the channels (either or both IB and OOB), a **controller (CONTROLLER) 118** for controlling the overall operation of the STB, and **non-volatile memory (NVM) 120** for storing information

Id., ¶ [0014] (color annotations added).



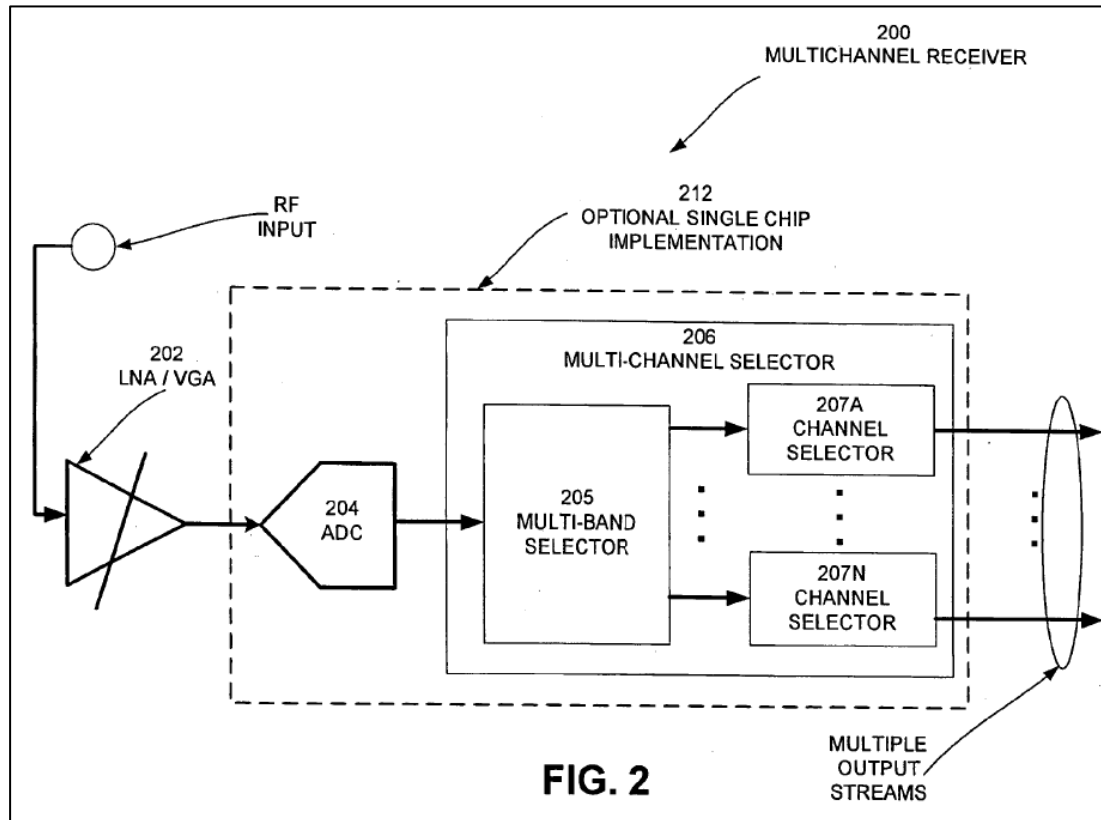
Monitor **116** is responsible for gathering information relating to signal quality. Importantly, monitor **116** only gathers this information when STB **110** is in an idle or “off” state by tuning through each channel in the channel list and applying a time stamp to the information. *Id.*, ¶¶ [0008], [0015], [0017], [0018], Fig. 2. Monitor **116** waits for an idle or “off” state “so as not to disturb any viewer experiences” *Id.*, ¶ [0017]. Once monitor **116** has gathered signal quality information, STB **110** is capable of sending this information back to the headend **102**, typically in response to a “poll” from the headend. *Id.*, ¶¶ [0017], [0024].

Kamieniecki's OOB tuner **114** is necessary for the STB to send information upstream. The out-of-band (OOB) communications channels—not the in-band (IB) channels—are what “enable a bi-directional flow of information between a subscriber's set-top box (STB) and the cable operator's headend.” *Id.*, ¶ [0002]; *see also id.*, ¶ [0004] (“A second tuner can be included in the STB if use of the cable return path is desired, or where out-of-band (OOB) channels will be used for communications between the headend and the set-top box”). These OOB communications channels are received and processed by the OOB tuner **114**. Without the OOB tuner **114** receiving instructions via the OOB channels, Kamieniecki's STB **110** would not be able to receive a poll from the headend instructing it to report signal quality information. *See id.*, ¶ [0017].

b. Overview of U.S. Patent Publication 2010/0120386
(Konstantinos)

Konstantinos is not about, and does not disclose any means of, monitoring a signal and reporting information *upstream* to any components outside the receiver, let alone to the headend. Konstantinos only discloses downstream signal processing. Konstantinos discloses a multi-channel receiver comprising an analog-to-digital converter (ADC) and a multi-band, multi-channel selector that is capable of selecting channels from an input signal. Ex. 1010, Abstract, ¶¶ [0043]-[0044]. In the embodiment illustrated in Figure 2, the ADC **204** of the multi-channel receiver is

capable of digitizing a downstream composite broadband RF input signal that spans from 50-1000 MHz. *Id.*, ¶ [0043]. The output of the ADC is then presented to a multi-channel selector **206**, which comprises a multi-band selector **205** and a series of channel selectors **207A-N**. *Id.*, ¶¶ [0044]-[0045].



Id., Fig. 2.

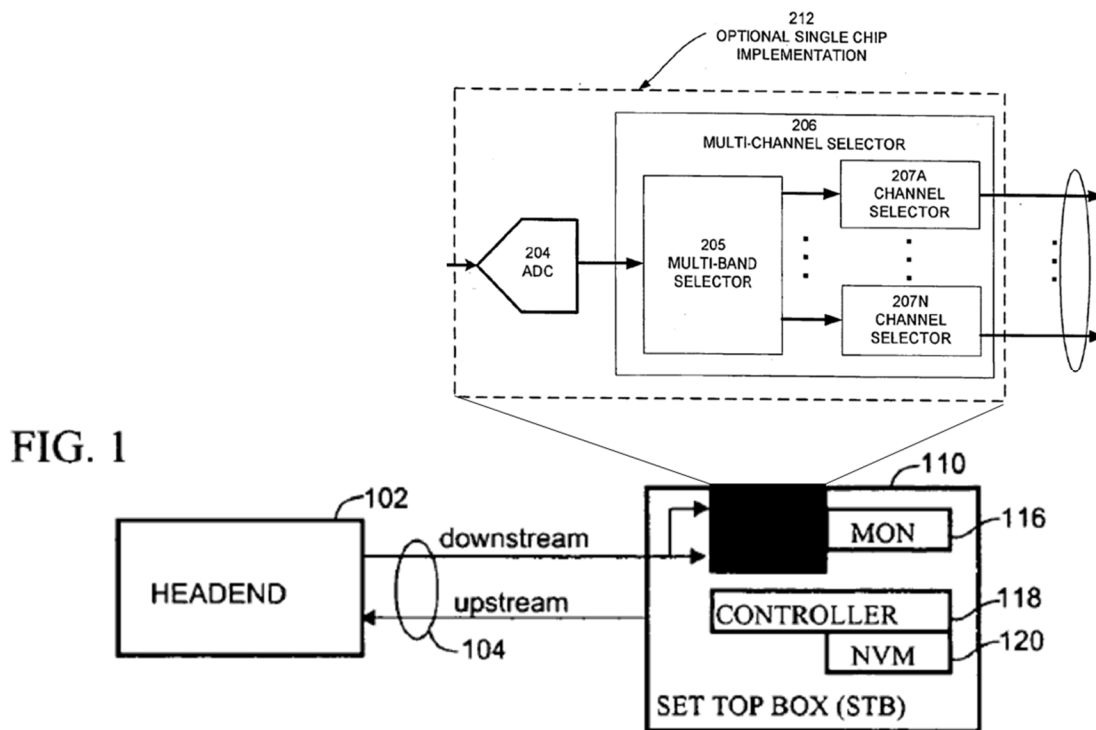
The multi-band selector **205** and channel selectors **207A-207N** may be configured to perform a two-step channel selection process. *Id.*, ¶ [0045]. In the first step, the multi-band selector **205** receives the ADC output and “realizes a coarse ‘channel’ selection” by splitting the signal into portions, or “bands,” of the original received TV band. *Id.* In the second step, the channel selectors **20A-207N** realize a

fine channel selection by selecting one channel only and delivering it at the output. *Id.*, ¶ [0046]. Ultimately, the number of channel selectors **207A-N** “determines the number of simultaneously received TV channels at the output.” *Id.*

In sum, Konstantinos is simply a receiver architecture concerned with how to effectively process multiple television channels contained within the downstream RF signal. It has no disclosure—and indeed no awareness—of the problem of on-premises signal monitoring for an operator. Unsurprisingly it therefore has no mechanism for upstream reporting of anything, let alone signal quality.

c. Overview of the Proposed Combination

The Petition’s proposed combination “replaces the IB and OOB tuners in Kamieniecki’s STB with Konstantinos’ multi-channel receiver.” Petition, 32. Thus, the Petition proposes a physical substitution of elements as illustrated below:



Ex. 1009, Fig. 1 & Ex. 1010, Fig. 2 (modified).

The Petition asserts that a POSITA would be able to make the proposed substitution because “Kamieniecki’s IB and OOB tuners use the same inputs (an RF signal) and same outputs (digital signal of the desired channel) as those of Konstantinos’ multi-channel receiver” Petition, 34-35. Thus, the Petition represents that these references are compatible and that components from Konstantinos could simply be substituted into Kamieniecki’s STB **110**. This substitution however appears simple only because the Petition disregards Kamieniecki’s and Konstantinos’s disclosures as described below.

2. The Petition Fails to Provide a Sufficient Motivation to Combine, and Thus Fundamentally Change, the Prior Art

The challenged claims require “a channelizer is operable to: . . . *concurrently output*” separate portions of the digitized signal where the “first portion” goes to a “signal monitor” and the “second portion” goes to the “data processor.” Ex. 1001, cl. [1E].

Yet, the Petition seeks to combine two references that do not disclose this concurrent output to a signal monitor and a data processor. *First*, Kamieniecki discloses the exact opposite as Kamieniecki’s architecture is an either-or proposition: either the STB **110** is “off” or idle, thus allowing Kamieniecki to gather signal quality information using monitor **116**, or the STB **110** is in use.¹ It cannot concurrently output to both a signal monitor and a data processor even though this is what the challenged claims require. *Second*, the Petition fails to cite or rely on

¹ Kamieniecki does not even contain a disclosure of a “data processor,” only of sending a signal to a user for viewing. The Petition concedes as much. *See* Petition, 40 (arguing that Kamieniecki “would obviously have a decoder with to decode the MPEG-2 stream”). Kamieniecki, however, does not concern itself with data processing as it is completely focused on determining signal quality information while the STB is in an idle or “off” state.

any disclosure in Konstantinos using or outputting to a signal monitor, whether concurrently with a data processor or otherwise. In short, Petitioner would have the Board combine a reference that does not concurrently output (Kamieniecki) with one that does not have signal monitoring (Konstantinos), let alone concurrent output to both a data processor and a signal monitor, to get to the challenged claims. This 1 + 1 = 5 proposal by Petitioner is fundamentally wrong.

Given this, the Petition is forced to make two fundamental changes to Kamieniecki in an attempt to render obvious the challenged claims. First, the Petition asserts that a POSITA would disregard Kamieniecki's principle of operation—that signal quality information is gathered only while STB **110** is idle—and do the exact opposite. This fundamental change weighs strongly against any motivation to combine. *Plas-Pak Indus.*, 600 F. App'x at 759. The Petition's only rationale for disregarding Kamieniecki's disclosure is a POSITA “would have recognized” that the combination's alleged ability to simultaneously tune to multiple channels would allow for signal analysis without waiting for an idle time. Petition, 43 (citing Ex. 1002, ¶ 145). This argument ignores the fact that Kamieniecki's STB **110** already has multiple tuners and the (at least theoretical) ability to process multiple channels simultaneously using its multiple tuners. Yet, despite possessing this ability, Kamieniecki still clearly states that the STB **110** should wait until the STB is idle to gather signal quality information. *See* Ex. 1009, ¶¶ [0008], [0015],

[0017], [0018], [0022], Fig. 2. Therefore, it does not follow that increasing the number of tuners by adding Konstantinos to the mix would motivate a POSITA to alter when Kamieniecki monitors the received signal.

The Petition fails to support such a fundamental change with anything but the conclusory (and thus insufficient) gap-filling testimony offered in the Lett Declaration. *Compare* Petition, 43, *with* Ex. 1002, ¶ 145. The Board has found that such conclusory opinions—specifically opinions that do not rely on any evidence besides the words of the expert—are due little evidentiary weight. *Xerox Corp. v. Bytemark, Inc.*, IPR2022-00624, Paper 9 at 16-17 (PTAB Aug. 24, 2022) (precedential) (citing 37 C.F.R. § 42.65(a) and collecting a series of Federal Circuit decisions).²

² This is not the first time that Mr. Lett has submitted a conclusory declaration that was due little evidentiary weight. *E.g.*, *TCL Elecs. Holdings Ltd. v. LG Elecs. Inc.*, IPR2023-00240, Paper 10 at 21 (PTAB May 22, 2023) (finding that Petitioner failed to support its assertion that the prior art disclosed a claim element stating, “Petitioner’s only supporting citation is to Mr. Lett’s testimony, but the cited testimony, which merely parrots the Petition, includes no further evidence or explanation.”).

The second fundamental change is that the proposed combination prevents Kamieniecki from achieving a key goal of Kamieniecki—that once signal quality information is gathered while STB **110** is idle, the information is reported to the headend. As explained in more detail below in Section III.B.4, the Out of Band tuner is the only mechanism in Kamieniecki to report signal quality information. Thus, by removing the OOB tuner and replacing it with Konstantinos’s multi-channel receiver, the proposed combination eliminates Kamieniecki’s ability to report information back to the source, which is one of the key goals of Kamieniecki. Ex. 1009, Abstract, ¶ [0016] (“The invention therefore provides a method to allow a set-top box (STB) *to collect statistics on plant health by monitoring* the forward (downstream) and reverse (upstream, return path) transport cable signals, *and reporting this information back to the cable headend.*”). The Petition fails to recognize this and therefore fails to explain why a POSITA would make such a fundamental change to Kamieniecki.

At base, Kamieniecki offers a complete signal-monitoring solution that gathers signal quality information by tuning through the channel list while the STB is idle and then reports that information. Ex. 1009, ¶¶ [0008], [0015], [0017], [0022], Fig. 2. Therefore, absent hindsight bias, a POSITA would not be motivated to fundamentally alter Kamieniecki simply because Konstantinos’s multi-channel receiver would increase the number of tuners, especially when Kamieniecki already

has multiple tuners and is at least theoretically capable of tuning to multiple channels simultaneously. *See Plas-Pak Indus.*, 600 F. App'x at 759 (“[A] change in a reference’s ‘principle of operation’ is unlikely to motivate a person of ordinary skill to pursue a combination with that reference.”). Considering the foregoing, the Petition has failed to articulate a sufficient motivation to combine Kamieniecki and Konstantinos in the manner proposed.

3. The Proposed Combination Fails to Render Obvious Either the “Analyze Said Digitized Signal to Determine a Characteristic of Said Digitized Signal,” “Digitize a Received Signal Spanning an Entire Television Spectrum Comprising a Plurality of Television Channels,” or Both

Assuming *arguendo* that a POSITA would be motivated to combine Kamieniecki and Konstantinos in the manner proposed (despite fundamentally changing Kamieniecki), the Petition fails to recognize that there would be no need to add the ADC from Konstantinos, or its proposed combination is incapable of analyzing a digital signal. Claim 1 of the '008 Patent recites “an analog-to-digital converter operable to digitize a received signal spanning an entire television spectrum comprising a plurality of television channels,” and “a signal monitor operable to: analyze said digitized signal to determine a characteristic of said digitized signal.” Ex. 1001, cl. [1B], [1C]. The Petition relies only on the ADC of Konstantinos to satisfy the “ADC” element and relies only on the monitor of Kamieniecki to meet the “signal monitor” element, arguing that Kamieniecki’s

“monitor **116** would receive a selected IB and/or OOB channel as a digital output stream from the Konstantinos receiver **200**.” Petition, 36-39.

But how can Kamieniecki’s analog-only monitor **116** process *digital* output streams from Konstantinos’s receiver? The Petition offers zero explanation. The Petition thus fails to carry its burden for this reason alone.

A deeper look at the references underscores the problem. Kamieniecki’s STB operates in the analog domain only: Kamieniecki does not disclose any analog-to-digital converter (ADC) nor anything like it. It cannot produce the digitized signals required by claim 1. This means that the IB and OOB tuners of Kamieniecki do not output a “digital signal of the desired channel” to the monitor **116** as the Petition assumes, (Petition, 34), but rather the tuners would output an analog channel to monitor **116** for determining signal quality information. It follows that monitor **116** of Kamieniecki is operable to process only analog signals, not digital ones.

Despite this fundamental problem, the Petition does not propose modifying Kamieniecki’s monitor **116** so that it can analyze digital signals. Instead, the Petition proposes a physical replacement of the analog IB and OOB tuners with the digital multi-channel receiver of Konstantinos. Petition, 33-34. In other words, Petitioner would have Kamieniecki’s analog-signal-processing monitor **116** receive and process digital signal outputs from the multi-channel receiver of Konstantinos, but fails to provide any explanation for how that could happen or why a POSITA would

be motivated to modify monitor **116** (or any other component) to be able to do so. Rather, a POSITA would not believe that an analog component could process digital signals. Thus, the Petition has failed to demonstrate that the prior art discloses or renders obvious the “a signal monitor operable to: analyze said digitized signal”

Kamieniecki’s references to “digital transmissions” in its Background section do not save Petitioner’s failure. *See* Ex. 1009, ¶ [0004]. A POSITA would understand the phrase “digital transmissions” in Kamieniecki to refer to the nature of the *contents*, not the signals carrying those contents. Kamieniecki explains digital transmissions by example: they are “MPEG-2 transport streams” and/or standards like the “digital video broadcast (DVB) standard or the Advanced Television Systems Committee (ATSC) standard.” *Compare* Ex. 1009, ¶ [0004], *with* Ex. 1026 at 130 (“The MPEG-2 Systems Standard defines an ATM-like method to transport *digital video, audio, and auxiliary data* in a multiple program transport stream (MPTS). It is the basis for the ATSC Digital Television Standard”) (emphasis added).³ That is, digital video refers to the concept of sending video as digital video like MPEG instead of old analog encoding. But this is completely distinct from the format of the modulated physical transport signal, which may be received/processed either as a signal level (analog) or represented as numbers (digital). A POSITA fully

³ Citations to Ex. 1026 use the superimposed exhibit page numbers.

understands that digital information streams (like MPEG-2 or DVB) are modulated onto an analog carrier signal at a specific band of frequencies (or “channels”) to create a frequency division multiplexed (FDM) signal (i.e., the claimed “received signal”). *See* Ex. 1026 at 58; *see also* Ex. 1001, 4:23-26.

The question relevant to this Petition is what is happening during the processing of physical signals. Thus, the question is the nature of the received physical signal making its way through Kamieniecki’s architecture—and that is analog-only. The FDM signal received by Kamieniecki’s IB and OOB tuners has not been digitized, and thus remains an analog form of the carrier wave. And it remains analog as it travels through Kamieniecki because Kamieniecki does not disclose an analog-to-digital converter or a digital-to-analog converter. Therefore, the STB operates in the same signal domain as the signal it receives, which is analog. To summarize, Kamieniecki’s monitor **116** is always operating on analog physical signals (regardless of whether those signals represent video encoded in an analog format like legacy television, or as digital video like MPEG-2, or otherwise).

It is clear Kamieniecki is analog-only because the Petition adds Konstantinos, specifically for its analog-to-digital converter, to overcome the issue. Indeed, if the Petition’s implication that Kamieniecki’s STB receives an already digitized signal were true then the Petition’s reason to add Konstantinos’s ADC would evaporate. Because the Petition relies on the ADC of Konstantinos rather than anything in

Kamieniecki to disclose the “digitize” element of claim 1, the Petition would also fail to demonstrate that the prior art meets that claim element. *See* Petition, 36-38 (relying solely on the ADC disclosed in Konstantinos).

In sum, the Petition has failed to identify where Kamieniecki, Konstantinos, or the proposed combination render obvious the “analyze said digitized signal to determine a characteristic of said digitized signal” element, the “digitize a received signal spanning an entire television spectrum comprising a plurality of television channels” element, or both.

4. The Proposed Combination Fails to Render Obvious “a Signal Monitor Operable to: . . . Report Said Determined Characteristic to a Source of Said Received Signal”

The Petition also fails to recognize that its hacked-together combination has no facility to transmit the determined characteristic back to the source of the received signal because the Petition proposes ripping out the Out of Band (OOB) tuner of Kamieniecki, making it impossible to meet element [1C].

The Petition relies on Kamieniecki’s ability to report signal quality information as meeting this element (Petition, 39-40), which Kamieniecki accomplishes by its OOB tuner. As Kamieniecki explains, the OOB tuner facilitates Kamieniecki’s bi-directional flow of information between the headend and the STB, and is what allows for use of the cable return path. Ex. 1009, ¶ [0002]; *see also id.*,

¶¶ [0004], [0017]. But the Petition’s proposed combination removes Kamieniecki’s OOB tuner, replacing it with Konstantinos’s multi-channel receiver. Petition, 32.

Without the OOB tuner, Kamieniecki has no means to send information back to the headend. The Petition fails to explain how Konstantinos’s multi-channel receiver, which replaced the OOB tuner, would still allow for Kamieniecki’s bi-directional flow of information. More specifically, the Petition fails to address how Konstantinos’s multi-channel receiver would process the OOB channel(s) so that the proposed combination could receive the poll from the headend to transmit the measured signal quality information. The Petition either fails to appreciate this issue or does not tell the Board about it—the Petition just assumes (incorrectly) it still can be done. Either way, the proposed combination cannot render obvious element [1C].

5. The Proposed Combination Fails to Render Obvious
“Concurrently Output”

Finally, the Petition fails to render obvious the last element of claim 1: “concurrently output said first portion of said digitized signal to said signal monitor and said second portion of said digitized signal to said data processor.” Ex. 1001, cl. [1E]. First, Kamieniecki does not disclose concurrently outputting to a signal monitor and a data processor because Kamieniecki gathers signal quality information *only* when the STB 110 is *idle* (i.e., when no data processing is occurring). See Ex. 1009, ¶¶ [0008] (“The information may, for example, be

collected when the STB is in an idle state . . .”), [0015] (“In a first step **204**, it is determined whether the STB is in an ‘off’ (or idle) state and, if not (N), the program loops until the STB is (Y) in the ‘off’ (or idle) state.”), [0018] (“The monitoring feature can be activated any time the STB is in an idle state and not being used.”), [0022] (“In order to monitor the forward transport, the STB can wait until the box is in an ‘off’ state (see FIG. 2, step **204**).”), Fig. 2. Kamieniecki’s lack of active-state processing is not a matter of preference; a different patent application confirms that Kamieniecki’s “set-top box *can only measure* while it is in an *idle state*.” Ex. 1012, p. 4 (emphasis added).⁴ In real-world operation, Kamieniecki waits for an idle STB state for a very important reason: to not disturb viewer experiences which would happen if monitoring was done, for example, while a user is watching TV. Ex. 1009, ¶ [0017] (“The monitoring feature can operate automatically in the background so as not to disturb any viewer experiences; i.e., when the STB is turned ‘off’ and in an idle state.”).

As for Konstantinos, the Petition does not identify or rely on any disclosure of a signal monitor, and therefore, the Petition does not identify any disclosure of concurrent output to a data processor and a signal monitor. In fact, the Petition appears unsure as to what it should rely upon from Konstantinos. See Petition, 43-

⁴ Citations to Ex. 1012 use the superimposed exhibit page numbers.

44. The Petition initially appears to identify that the output of selected “channels” from channel selectors **207A-N** is a concurrent output. Petition, 43 (citing Ex. 1010, ¶ [0046]). But then a few sentences later, the Petition identifies the output of an “interface circuit” as the concurrent output. Petition, 44 (citing Ex. 1010, ¶ [0121]). Petitioner’s own confusion or reluctance to commit to a position underscores that the proposed combination is something entirely different from the challenged claims. In any event, neither of these portions of Konstantinos disclose concurrent output to a signal monitor and a data processor. At best, Konstantinos discloses outputting multiple television channels in parallel, but this is just *data processing* in parallel. Nothing therein contemplates also concurrently outputting to a *signal monitor*.

Thus, as described above in Section III.B.2, the only way the proposed combination is able to allegedly concurrently output is if a POSITA disregards explicit disclosure from Kamieniecki about when to gather signal quality information and a POSITA rips out critical components from Kamieniecki. The Petition fails to articulate a sufficient motivation to make such fundamental changes. Therefore, the Petition has failed to render obvious the “concurrently output” element.

6. The Proposed Combination Fails to Render Obvious the Other Challenged Claims Because It Fails to Render Obvious Claim 1

Ultimately, the Petition has failed to demonstrate that claim 1 is obvious in view of the combination of Kamieniecki and Konstantinos. The Petition's analysis of claims 3 and 11 simply references its analysis of claim 1, therefore the Petition likewise fails to render obvious claims 3 and 11. Given the failure to render obvious all the independent claims, it is axiomatic that the Petition has failed to render obvious the dependent claims.

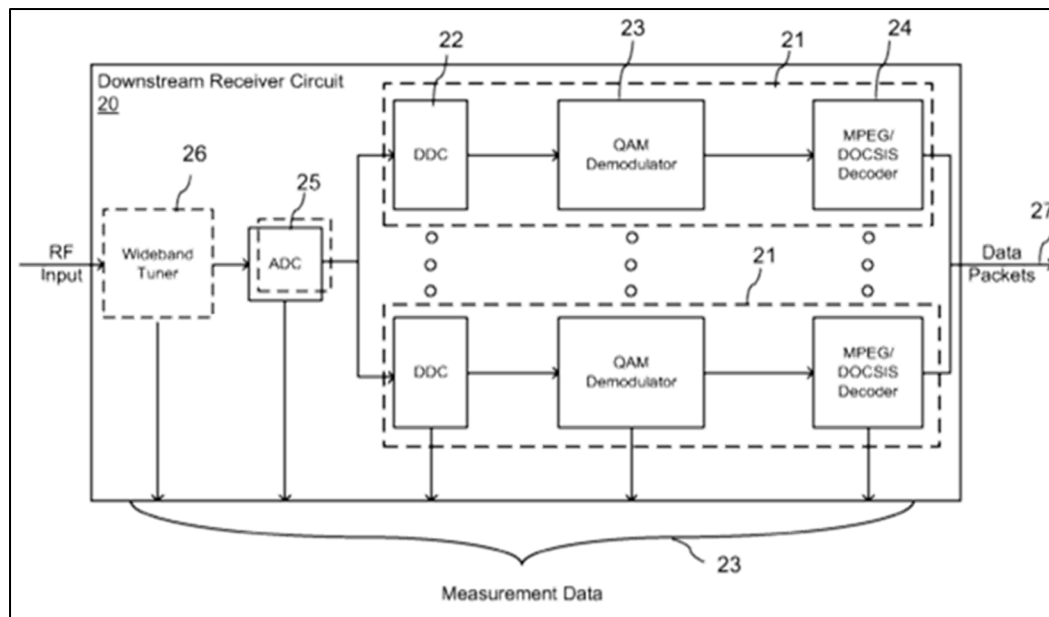
C. Grounds D-E: The Petitioner Fails to Establish that Claims 1-6, 9-14, and 17-18 Would Have Been Obvious in View of Renken

Grounds D and E of the Petition also fail for two reasons. First, the Petition appears to rely on disclosure in Renken that the cable modem transmits information to the Central Measurement Controller (CMC), which may be located at the headend. This, however, is not supported by the Renken Provisional and, therefore, it cannot be used to support the Petition's obviousness arguments as they are not prior art. Second, the Renken reference fails to render obvious the "concurrently output" element of claim 1. The Petition fails to render this element obvious because it attempts to rearrange the receiver architecture of Renken and recast it to look like the claimed invention of the '008 Patent.

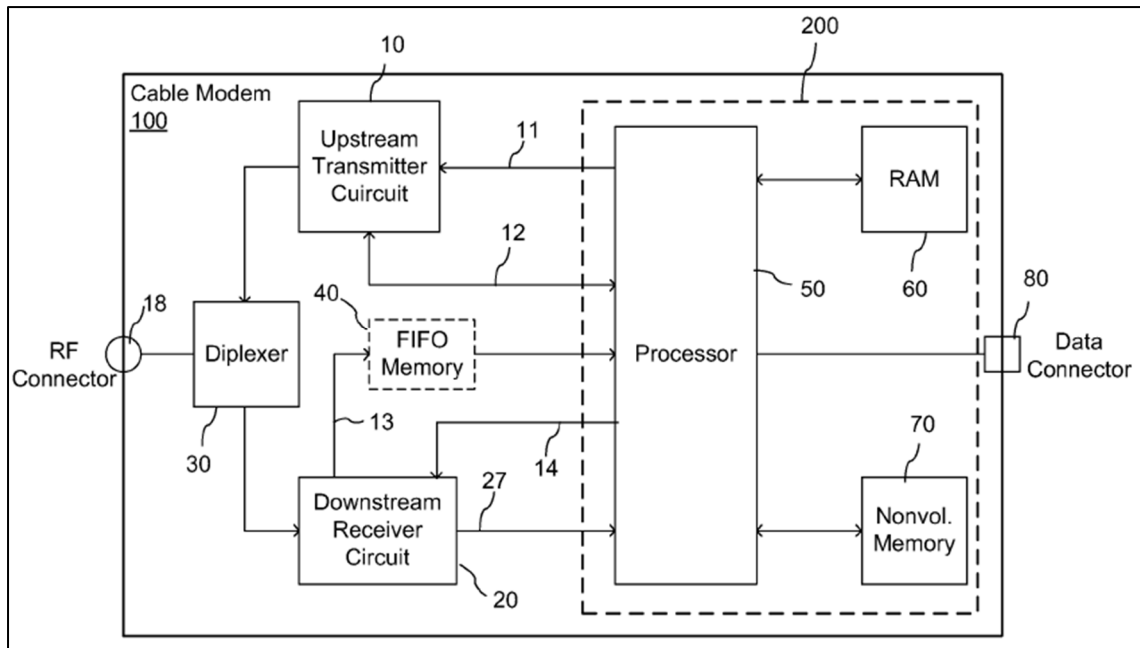
1. Overview of U.S. Patent 8,649,421 (Renken)

Renken discloses measurement-capable cable modems (MCCMs) for use in a cable network that seeks to leverage receivers **21** that are not processing data (“idle receivers”) in the MCCMs to perform network measurements and then send those measurements to a central point (e.g., a central measurement controller (CMC)). Ex. 1011, 8:35-40, 11:6-18. At this central point, information received from the MCCMs is processed and compared to detect errors in the network. *See* Ex. 1011, 22:22-39.

Renken uses a downstream receiver circuit **20** as shown in Figure 3 below to both process and measure the digitized signal.



Ex. 1011, Fig. 3. This downstream receiver circuit **20** outputs to processor **50**, which is a component of controller **200**, as shown in Figure 2:



Ex. 1011, Fig. 2 (displaying downstream receiver circuit **20** communicating demodulated downstream data **27** to processor **50**).

2. Renken is Not Prior Art to the '008 Patent

To show all of the subject matter contained in a reference is prior art, the petitioner must carry two burdens. First, under *Dynamic Drinkware LLC v. Nat'l Graphics, Inc.*, the Petitioner bears the burden of demonstrating that a pre-AIA 35 U.S.C. § 102(e) reference is entitled to the benefits of its provisional application's filing date. 800 F.3d 1375, 1378–82 (Fed. Cir. 2015). To do this, the petitioner must show two conditions are satisfied: (1) the provisional application must provide sufficient support for at least one claim in the reference patent or published patent application (*id.*, 1382); and (2) the provisional application must provide sufficient

support for the subject matter relied upon for prior art purposes in the reference patent or published patent application. *Id.*, 1381-82.

Second, in the context of an *inter partes* review, a petitioner bears the burden of first challenging whether a patent is entitled to an earlier effective filing date “by identifying, specifically, the features, claims, and ancestral applications allegedly lacking § 112, first paragraph, written description and enabling disclosure support for the claims based on the identified features.” *Unified Patents, LLC v. MasterObjects, Inc.*, IPR2020-01201, Paper 26 at 9 (PTAB Jan. 11, 2021) (collecting decisions). Then, the burden of production shifts to the patent owner “to make a sufficient showing of entitlement to earlier filing date or dates, in a manner that is commensurate in scope with the specific points and contentions raised by Petitioner.” *Id.*

Here, Petitioner has failed to carry both of its burdens.

As to the Petitioner’s first burden, Petitioner tacitly admits that there is no written description support in the Renken Provisional for transmitting information to the headend by stating “it would at least be obvious that results are sent to the headend.” Petition, 64. But obviousness is the wrong test; “a description that merely renders the invention obvious does not satisfy the [written description] requirement.” *Ariad Pharms., Inc. v. Eli Lilly & Co.*, 598 F.3d 1336, 1352 (Fed. Cir. 2010) (en banc). Petitioner’s “obviousness” argument and evidentiary support thus concedes

a lack of necessary written-description support for transmitting a measured characteristic to the headend.

Moreover, Petitioner only includes a citation to two different pages of the provisional application with no accompanying explanation. Petition, 64 (citing Ex. 1012, pp. 10, 13). Citations to a provisional application with no accompanying explanation, like that done by Petitioner here, is not sufficient to demonstrate that a later-filed disclosure is entitled to the provisional application's priority date. *See Google LLC v. Ikorongo Tech. LLC*, IPR2021-00058, Paper 14 at 15 (PTAB May 10, 2021) (denying institution because the Board found “the relationship between the cited portions of the two documents [was] unclear” because the petition did “not explain sufficiently the significance of the citations to the '187 provisional”).

Even if Petitioner's bare citation was procedurally sufficient, the substance of the Renken Provisional still cannot afford Renken an earlier priority date. Across the three pages cited by Petitioner and Dr. Lett, the Renken Provisional describes only that the MCCM is capable of sending measurements to the CMC and that upon receiving the measurements, the CMC can store or analyze the received measurements. *See* Ex. 1012, pp. 4, 10, 13. There is no discussion of sending messages to the headend, any relationship between the CMC and the headend, or any suggestion for the CMC to be located at the headend. The Renken Provisional is silent on that matter, and that disclosure—which exists only in the later-published

Renken—appears to be no more than subject matter conceived *after* the Renken Provisional was filed, reinforcing the fact that Renken *is not prior art*.

As to the Petitioner’s second burden, Petitioner has failed to identify any basis under which the claims of the ’008 Patent are not entitled to the September 8, 2011, filing date of U.S. Provisional Application No. 61/532,098 (the “’008 Provisional”), to which the ’008 Patent claims priority. Specifically, Petitioner does not identify any features, claims, or other information contained within the ’008 Patent that it asserts is not entitled to the priority date of the ’008 Provisional.

Because Petitioner has failed to carry its burden to both show that the Renken Provisional discloses the subject matter being relied upon and challenge the priority date of the ’008 Patent, the Petitioner has failed to show Renken’s disclosure of the CMC being located at the headend is prior art to the ’008 Patent. Therefore, the Petition fails to carry its burden to demonstrate a likelihood of prevailing on claim 1 because the Petitioner has failed to show Renken renders obvious “a signal monitor operable to: . . . report said determined characteristic to a source of said received signal.”

3. Renken Fails to Render Obvious “Concurrently Output”

The Petition identifies the “MCCM processor” as the claimed signal monitor for element [1C] (Petition, 63) and, for this element [1E], the Petition identifies each DDC or the DDCs collectively as the claimed “channelizer” (Petition 66-67). But

that is where any clarity of the Petition and the Lett Declaration ends. The Petition improperly shifts its burden to identify what in Renken meets the claim elements of [1E], but, regardless of what the Petition intended to argue, Renken misses the mark under any interpretation of Petitioner's confusing identifications.

The Petition first fails to meet its burden because it is inconsistent and incoherent in identification of the claimed "first portion of said digitized signal." Within the space of a handful of sentences, the Petition (as best as can be discerned) makes three different arguments for "first portion."

First, the Petition seems to identify the collection of "selected channels" from the entire set of DDCs as the "first portion." On page 66, the Petition argues that Renken's DDCs meets the "concurrently output" element because each DDC is "responsible for filtering out, or selecting, a particular downstream channel, and which collectively output (claimed 'concurrently output') the *selected channels*." Petition, 66 (emphasis added). But if that output alone meets the claim, then the set of selected channels must satisfy both the "first portion" (to the signal monitor) and the "second portion" (to a data processor).

On the very next page, the Petition subtly changes phrases. It identifies the alleged "channels/*signals* to be monitored" are the "first portion," while the alleged "*channels* to decode for viewing" as the "second portion of said digitized signal." Petition, 67 (emphasis added). Thus, some alleged channels/signals, and not just

some of the channel, are identified. But Petitioner does not specify further what it means.

The next sentence makes another shift, now identifying some “data” as the first portion: “the DDC or other downstream components [of Renken] (e.g., QAM Demodulator or MPEG/DOCSIS Decoder) send *data* to the monitor as directed by the measurement program, while a second DDC may concurrently select a *channel* (e.g., a television channel) to be decoded by MPEG/DOCSIS Decoder for viewing.” *Id.* (emphasis added).

In summary, Petitioner seems to present three possibilities for first portion: (1) some of the “selected channels” from the DDCs; (2) something called “channels/signals”; and (3) some “data.” The Petition does not make any of this clear, nor does Mr. Lett. *See* Ex. 1002, ¶¶ 215-217. It is the Petition’s burden to make out a cogent case—neither the Board nor Patent Owner is responsible for making sense of confused argument. *Google Inc. v. EveryMD.com LLC*, Case No. IPR2014-00347, Paper 9 at 24-26 (PTAB May 22, 2014); *see also Netflix, Inc. v. DivX, LLC*, 84 F.4th 1371, 1377 (Fed. Cir. 2023) (“[T]he Board should [] not have to decode a petition to locate additional arguments beyond the ones clearly made,” yet this is precisely what will be required if IPR is instituted.)). This law is wise—where neither the Petitioner nor its expert can make out a clear case, this is a tacit admission there is no case to be made to invalidate.

Even if the Board accepts the challenge to analyze the Petition’s meandering argument, the Grounds are properly rejected on substance. If the Petition is relying upon possibility (1)—the concurrent output of “channels” from the DDC as meeting element [1E]—Renken itself demonstrates this is impossible. In Renken’s architecture the channels are sent seriatim from DDC, to demodulator, to decoder, to processor. There is no pathway for simultaneous routing some of the channels to the decoder while others are routed to the processor. Figure 3 of Renken (the detailed drawing of the inner working of Downstream Receiver Circuit **20** from Fig. 2) shows that the channels selected by Renken’s DDCs are output to the QAM Demodulators, then to the MPEG/DOCSIS Decoders, and then out of the Downstream Receiver Circuit **20** as Data Packets **27**, as shown by the red arrow below:

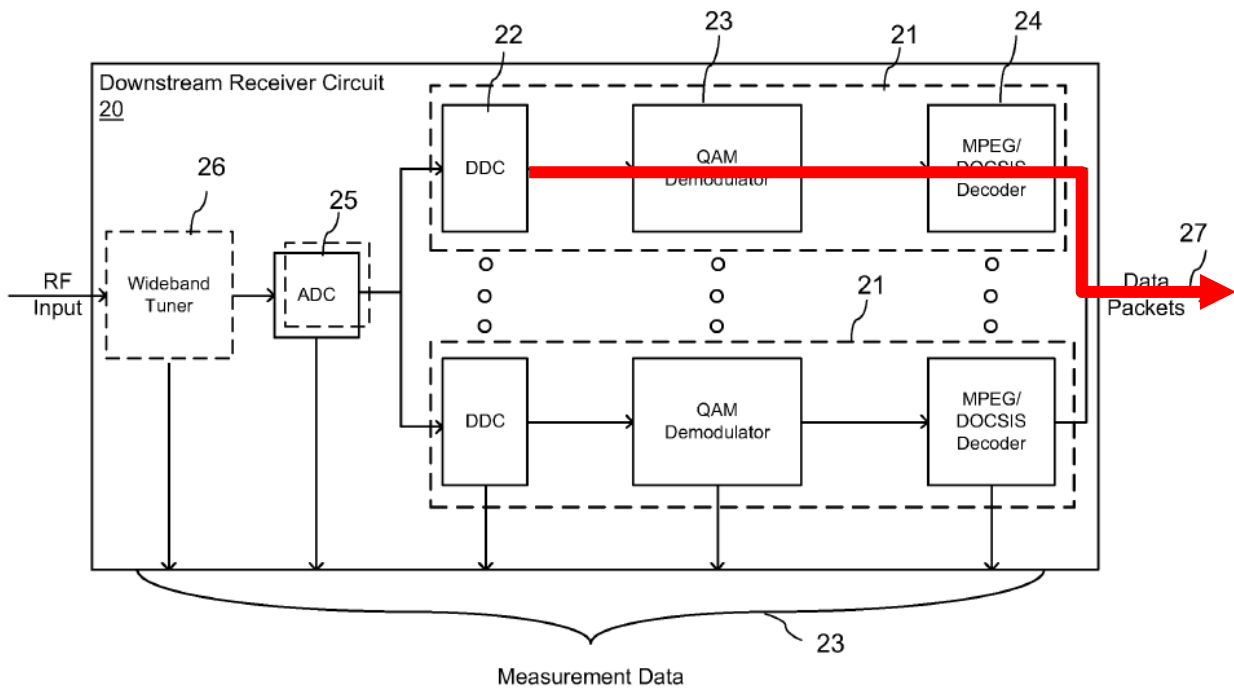
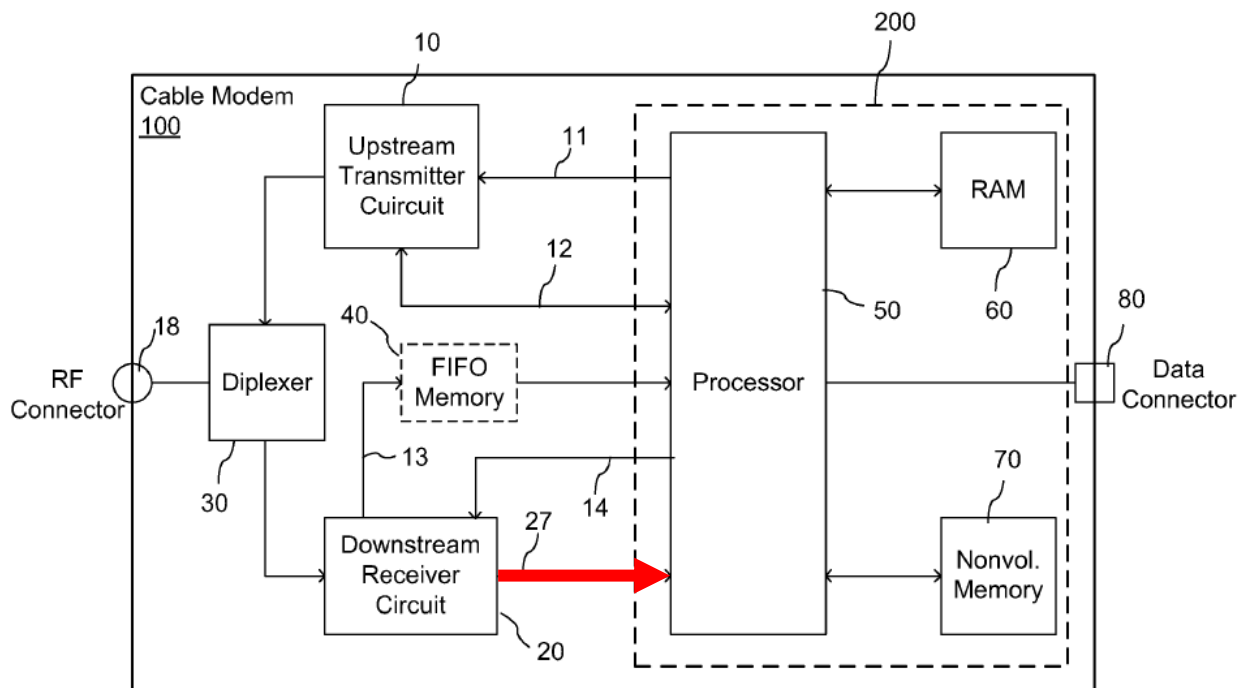


Fig. 3

Ex. 1011, Fig. 3 (red annotation added); *see also* Ex. 1012, Fig. 2. Subsequently, those Data Packets **27** are then sent to the Processor, as shown by the red arrow in Renken's Figure 2 below:



Ex. 1011, Fig. 2 (red annotation added); *see also* Ex. 1012, Fig. 1. The selected channels **first** go through the MPEG/DOCSIS Decoder and **then** go to the Processor.

If Petitioner is instead relying upon options (2) or (3), where some “channels/signals” or some “data” from the DDC/QAM Demodulator/MPEG/DOCSIS Decoder are simultaneously output along with the “channels” from the DDC and “data” as meeting element [1E], the Petition has failed to show how that meets the requirements of the claims and **still** misstates Renken’s disclosure. The Petition and Mr. Lett do essentially nothing to explain what they mean by “data” allegedly “sent to the monitor [Processor] as directed by the measurement program” (Petition, 67), and thus have failed to explain how this “data” is a “portion of **said digitized signal**” as recited by the challenged claims. For example, Petitioner and

Mr. Lett do not say whether they are relying on “Measurement Data **23**” shown at the bottom of Renken’s Figure 3 (Renken Provisional’s Figure 2) or some other data. Petitioner and Mr. Lett also do not support how that “Measurement Data **23**” is sent to the Processor, given that there is no element “23” in the higher-level view of Renken’s Figure 2.

At base, the Petition and Mr. Lett have not done enough to explain why they contend Renken renders [1E] obvious. It is not Patent Owner’s (or the Board’s) job to “sift through the information presented by Petitioners, determine where each element [of the challenged claims] is found in [the cited references], and identify any differences between the claimed subject matter and the teachings of [the cited references.]” *Google*, IPR2014-00347, Paper 9 at 25; *see also Netflix*, 84 F.4th at 1377. Moreover, the Petition cannot rely on the wholly conclusory Lett Declaration to support any failings in Renken because the unsupported statements of Mr. Lett are worth no evidentiary weight. *Xerox*, IPR2022-00624, Paper 9 at 16-17.

In any case, the Petition has failed to adequately explain that Renken discloses “a channelizer operable to . . . concurrently output said first portion of said digitized signal to said signal monitor and said second portion of said digitized signal to said data processor.”

4. The Proposed Combination Fails to Render Obvious the Other Challenged Claims Because It Fails to Render Obvious Claim 1

Ultimately, the Petition has failed to demonstrate that claim 1 is obvious in view of Renken. The Petition's analysis of claims 3 and 11 simply references its analysis of claim 1; therefore the Petition likewise fails to render obvious claims 3 and 11. Given the failure to render obvious all of the independent claims, it is axiomatic that the Petition has failed to render obvious the dependent claims.

D. Objective Indicia in the Form of Failure of Others and Industry Praise Demonstrate the Non-Obvious Nature of the '008 Patent

There are objective indicia that the challenged claims of the '008 Patent are not obvious. That evidence includes the failure of others and industry praise for the claimed inventions. Specifically, the evidence shows that MaxLinear's competitors and standard-setting organizations failed initially to understand that they could leverage digitizing the entire received spectrum to support remote monitoring but then, after MaxLinear's invention, they uniformly adopted the inventive technology.

Near the date of invention, Broadcom had developed its version of Full-Spectrum Capture, which it called Full-Band Capture. *See, generally*, Ex. 2006. But it was only after the application that issued as the '008 Patent published that Broadcom understood it could leverage Full-Band Capture data to remotely monitor the downstream spectrum. *Compare* Ex. 1001, Cover (displaying a publication date of Mar. 14, 2013), *with* Ex. 2009, pp. 1, 6-7 (explaining in an October 2013 article

authored in part by a Broadcom director that Full-Band Capture can turn a downstream device into a spectrum measurement tool). The fact that Broadcom failed to initially realize the possibility of remote spectrum monitoring only to later adopt the technology itself underscores the non-obvious nature of the claimed invention. *Apple Inc. v. Samsung Elec. Co., Ltd.*, 839 F.3d 1034, 1053 (Fed. Cir. 2016) (en banc) (“Industry participants, especially competitors, are not likely to praise an obvious advance over the known art.”); *Advanced Display Sys., Inc. v. Kent State Univ.*, 212 F.3d 1272, 1285 (Fed. Cir. 2000) (“when evidence in the record fully supports a finding that others in the industry failed to solve the problem, then objective considerations ‘may ... establish that an invention appearing to have been obvious in light of the prior art was not.’”) (quoting *Alco Standard Corp. v. Tennessee Valley Auth.*, 808 F.2d 1490, 1500–01 (Fed. Cir. 1986)).

CableLabs followed a similar path, at first failing like Broadcom to recognize the possibility of remote spectrum monitoring, but then, after MaxLinear’s invention, adopting it as an industry best practice. As discussed above, in June 2011, CableLabs recommended a different method of proactive network maintenance, but five years later in 2016, CableLabs recommended using remote spectrum monitoring as a best practice. *Compare* Ex. 2008, *with* Ex. 2007. When the cable industry praised remote spectrum monitoring in this way, the cable industry was praising the claimed invention, which is evidence that the claimed invention was non-obvious.

Apple, 839 F.3d at 1053 (“Evidence that the industry praised a claimed invention . . . weighs against an assertion that the same claimed inventor would have been obvious.”).

These industry failures before the invention and industry praise afterward are “the direct result of the unique characteristics of the claimed invention.” *Fox Factory, Inc. v. SRAM, LLC*, 944 F.3d 1366, 1373–74 (Fed. Cir. 2019). Here, there is a clear nexus between the characteristics of the claimed invention and the industry-recognized benefits of remote spectrum monitoring using Full-Spectrum Capture. An analysis, with reference to challenged claim 1, follows.

As described in Section III.A, the inventors of the ’008 Patent realized that Full-Spectrum Capture creates digital data when the received 1GHz downstream spectrum—which contained television and data channels—is digitized. Ex. 2005, 19:12-17, 20:23-21:3. Claim 1 recites “an analog-to-digital converter operable to digitize a received signal spanning an entire television spectrum comprising a plurality of television channels, said digitization resulting in a digitized signal.” Ex. 1001, cl. [1A].

Next, the inventors described that there could be separate processing paths, where one path that leads to a “monitoring function” that can measure the spectrum, power, or quality of the channel. Ex. 2005, 19:18-25, 20:6-13. Furthermore, the inventors wanted “to provide information to the network about the quality of the

signal that's coming into the cable modem" so they decided that the monitoring function should send "that information to the network [provider] all the time" so that the network provider "would get information about their, you know, distributed cable system in real-time." Ex. 2005, 19:15-17, 20:3-19. This is the claimed "signal monitor operable to: analyze said digitized signal to determine a characteristic of said digitized signal; and report said determined characteristic to a source of said received signal." Ex. 1001, cl. [1C].

The other processing path leads to a data processor capable of demodulating a channel to recover the information carried in that signal. Ex. 2005, 19:18-20:2, 21:16-23. This is the claimed "data processor operable to process a television channel to recover content carried on the television channel." Ex. 1001, cl. [1D].

Finally, the inventors wanted to ensure that the monitoring function could happen in the background so that signal monitoring could occur in real time without interrupting the customer's use of the CPE. Thus, to ensure that signal monitoring happened in the background, the inventors implemented the concept of a "channelizer," that selects individual channels and provides parallel "channelizer paths" to different functions (e.g., a demodulator or the monitoring function). Ex. 2005, 20:20-22:1. Claim 1 specifically recites this parallel output on different processing paths as the claimed channelizer is "operable to" "*concurrently output* said first portion of said digitized signal to said signal monitor and said second

portion of said digitized signal to said data processor.” Ex. 1001, cl. [1E] (emphasis added).

The Petition takes the position that claims 3 and 11 have identical scope and do not need to be analyzed independently. *See* Petition, 46-47, 56-58, 69-70, 74-75. Following the Petition’s lead, for this pre-institution stage only, the analysis above regarding claim 1 applies equally to claims 3 and 11. Thus, the claimed invention of the ’008 Patent shares a nexus with remote spectrum monitoring that leverages Full-Spectrum Capture, which was the subject of failures by others and, later, industry praise.

IV. CONCLUSION

At bottom, there is clear objective indicia that the claimed invention is a non-obvious improvement over the prior art. When this evidence is weighed against the fundamentally flawed obviousness arguments advanced by the Petition, it is clear that the Petition has failed to demonstrate a reasonable likelihood that the Petition will prevail on a single claim. Therefore, institution should be denied under 35 U.S.C. § 314(a).

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Certification of Word Count Under 37 C.F.R. § 42.24(d)

The undersigned hereby certifies that the foregoing contains 11,258 words according to the word count of the word-processing software used to prepare the foregoing.

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CERTIFICATE OF SERVICE

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