

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

DISH NETWORK L.L.C.,
Petitioner,

v.

ENTROPIC COMMUNICATIONS, LLC,
Patent Owner.

CASE: IPR2024-00373

U.S. PATENT NO. 7,594,249

PATENT OWNER'S PRELIMINARY RESPONSE

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Exhibits

Exhibit Number	Description
Ex. 2001	Unsubmitted Excerpts of Ex. 1006, Dennis J. Rauschmayer, <i>ADSL/VDSL Principles</i> , 1999 (“ADSL/VDSL”)
Ex. 2002	’249 Patent Reexamination File Wrapper of Application No. 90/019,247
Ex. 2003	U.S. Patent No. 6,795,450 to Mills
Ex. 2004	U.S. Patent Publication No. 2002/0069417 to Kliger
Ex. 2005	U.S. Patent No. 6,005,861 to Humpleman

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 DISH Network L.L.C. (“DISH”) for claims 1-17 of U.S. Patent 7,594,249 (the “’249 Patent”). The Board should deny institution.

The ’249 Patent describes and claims a novel on-premises network implemented over existing coaxial cables. The ’249 Patent identified certain impediments that previously precluded high bandwidth communication between terminal devices in an on-premises coaxial deployment and proposed solutions to implement a functioning high-bandwidth network. The pre-existing impediments arise from the fact that, to distribute downstream signals, an on-premises network includes coaxial cabling and splitters; splitters receive signals at an input port and transmit signals, albeit at a reduced power, via tap ports. These tap ports are intentionally isolated from each other to prevent interference when devices connected to different ports communicate upstream with the cable head-end or other network signal source. This isolation, however, caused signal loss for terminal devices attempting to communicate with each other through the tap ports (which is required in an on-premises local network). Further, these splitters may have

imperfect connection points, creating micro reflections, which can produce multipath signals and, thus, interference.

While prior art solutions addressed communicating between on-premises units and a cable head end or central office (*i.e.*, data communication *outside* a network in a home or building), these solutions fail to address the impairments present in the *on-premises* wiring that restrict high bandwidth communication between terminal devices in a broadband local area data coaxial network. These prior art solutions were presented in the specification itself, were presented during prosecution, and also form the secondary references in the Petition's challenges.

The Petition improperly attempts to combine references that use fundamentally different, and incompatible, technologies and system architectures. For instance, the sole primary reference in the Petition, *Amit*, describes two embodiments the reference itself recognizes are incompatible: one with a notch filter and one without (the same filter the Petition maps to the claimed filter). Ex. 1005, 7:12-21. Although the structures of the different embodiments are defined by the presence or absence of this filter, the Petition picks and chooses teachings from disclosures relating to these separate embodiments as if they were disclosed as being present in a single system, without explaining why or how a POSITA would combine them, ignoring the actual teachings of *Amit* to match words in the challenged claims to prior art references.

As set forth in greater detail in Section IV.A, and more generally this preliminary response, *Amit* provides two operational modes, a first embodiment where the home network is “disconnected from the regional cable network” due to the presence of a notch filter, referred to as a “Single Home operation mode.” *Id.* In *Amit*’s other embodiment, each home network is connected to and managed by hardware external to the premise, namely at the regional headend or CMTS, referred to as a “Connected Home operation mode.” Ex. 1005, 8:45-9:8, 7:51-52. In this Connected Home mode (the mode without a notch filter), the CMTS assigns frequencies to each premise so that communication from the premise local network to the CMTS does not interfere with the transmission of signals from other local networks to the same CMTS. *Id.* Conversely, in the Single Home (the mode with the notch filter), the on-premise local network is disconnected from the regional cable network and there is no management functionality provided by the CMTS.

The Petition fails to address or consider the differences between these two modes, and not only improperly combines teachings of these two incompatible embodiments, but ignores the disconnection from the regional cable network, yet then looks to regional cable network references and teachings to address problems not actually contemplated by *Amit* or known at the time. This hindsight-driven analysis persists through the entire Petition.

In grasping for a motivation to combine, the Petition identifies purported

shortcomings in *Amit*, namely certain communication path reflections. But while the Petition treats these as problems, so as to invoke secondary references, *Amit* intentionally relies on those reflections, treating them as a benefit rather than a shortcoming to address. Ex. 1005, 14:1-5. This alleged “motivation” to combine is illusory.

Furthermore, the Petition improperly omits key disclosure from its own secondary references that belie the suggested motivation to combine. *Infra* Sections IV.B and IV.D. For instance, the Petition omits relevant disclosure from, both the ADSL/VDSL book and the DSL-Book that directly contradict the Petition’s purported “motivation to combine.” Whether the omission was intentional or inadvertent, the Petition presented its references in a manner that improperly shifts the responsibility to locate, provide, and evaluate the full disclosures of these references to the Board and Patent Owner. This is reason enough to deny institution. Absent Patent Owner’s independent investigation into the ADSL/VDSL book (screenshots of certain passages omitted by Petitioner are presented as Exhibit 2001), a proper obviousness analysis could not even occur. In view of a more fulsome view of the teachings of ADSL/VDSL, it becomes clear that a POSITA would **not** have made the alleged combination.

The same pattern holds with the final reference at issue in the Petition, *Jacobsen*. *Infra* Section VIII. True to form, the Petition ignores the actual teachings

of *Jacobsen*, again seeking to identify certain buzzwords, such as “equalization,” without addressing the actual *teachings* of *Jacobsen*. *Jacobsen*’s actual conclusions confirm that a POSITA would not have been led in the direction the Petition alleges.

The Petition’s reliance on ADSL/VDSL, the DSL book, and *Jacobsen* all represent an attempt to incorporate technology from the regional cable network (the network that *Amit*’s notch filter expressly seeks to sever ties with), into the on-premises network of *Amit*. These regional cable networks have very different considerations than any on-premises network. Namely, each external network reference is focused on delivering high-bandwidth content from one point to another (point-to-point), over a single channel, without any concern or consideration of any reflections or intervening equipment. The Petition simply fails to identify any rational basis in support of combining such teachings with the on-premises network relying on signal reflection that is *Amit*.

The Petition fails to carry its burden and rests entirely on hindsight in its self-serving omissions of the prior art. Accordingly, institution should be denied.

II. THE ’249 PATENT

A. The ’249 Patent - Overview

The ’249 Patent relates to “broadband communication networks and specifically network interface devices and the wiring” associated with those devices. Ex. 1001, 1:14-16. The ’249 Patent describes and claims “coaxial cable based local

area network[s],” specifically on-premises networks, and methods for device-to-device communication across those networks. *Id.* at 1:20-31.

The on-premises coaxial installations to which the ’249 Patent relates include a number of terminal devices, such as cable converter boxes, televisions, cable modems, and other customer premise equipment (“CPE”) that transmit and receive signals. *Id.* at 1:24-33. These on-premises cable networks often include “signal splitters,” which include an input port and multiple output ports. *Id.* at 1:39-57. These splitters receive a signal from the input port and provide a lower-power signal to all output ports. *Id.* at 1:46-58. Different types of splitters can provide for greater or less signal attenuation to the downstream¹ devices. *Id.* at 2:8-14. When normal cable signals are transmitted through these splitters, the signal loses strength (attenuates) as it is divided between the various output ports. *Id.* Further, the splitters isolate any signals sent “upstream” from one device from coupling to the output port connected to another device. *Id.* at 2:8-14.

¹ As the term is used herein, downstream applies to the direction away from the point of entry into the house, towards the terminal devices, and upstream applies to the direction towards the public cable network, away from the terminal devices. Ex. 1001, Abstract.

In traditional cable networks, this attenuation is not an issue, because “terminal devices do not communicate with each other, they only communicate through the [Point of Entry, or] POE with the cable head-end.” *Id.* at 2:15-18. But the '249 Patent contemplates these devices using the existing coaxial network to allow these terminal devices to communicate with each other. *Id.* at cl. 1. In this environment, the attenuation discussed above is very much a problem, because it impairs communication from device to device.

The '249 Patent proposes a unique solution to these issues: it includes “a frequency selective network interface device (i.e., the claimed filter) placed at the building point of entry (POE) to reflect upstream signals transmitted by terminal devices back into the building distribution whereby the signals may be received by other terminal devices.” *Id.* at 3:11-15. “By reflecting upstream signals back into the building as downstream signals, the network interface device provides a path for terminal devices to transmit to and receive from other terminal devices. This overcomes the problem of port-to-port isolation in the signal splitter/combiners.” *Id.* at 3:15-18. “Another function of the network interface device is to isolate signals generated within the building and prevent the transmission outside the building. Due to the frequency selectivity of the network interface, upstream and downstream signals for cable TV and cable modem service are not disturbed.” *Id.* at 3:19-27.

The inventors of the '249 Patent recognized and solved certain signal processing issues that arose from the inclusion of this specifically tuned filter in the local broadband coaxial network. In particular, the inventors identified: the pitfalls of impedance mismatching (*id.* at 4:18-5:13); how to select the type and number of filters to use in the network (*id.* at 5:13-63); how a reflection introduces a multipath signal with inter-symbol interference (ISI) (*id.* at 5:64-6:2); and that ISI can be mitigated through certain modulation techniques or processing techniques (*id.* at 6:4-48). At the time the '249 Patent was filed, no one else had identified these issues, and proposed the claimed solutions for a broadband local area network over coaxial cable. Contrary to the prior art identified herein, the inventors of the '249 Patent were the first to recognize these signal processing issues and propose the claimed solutions. The prior art challenges in the Petition fail to demonstrate otherwise and, therefore, institution of this *inter partes* review should be denied.

B. The '249 Patent - Prosecution History

The Petition glosses over the prosecution history in less than a page to avoid drawing attention to the fact that the primary reference *Amit* is cumulative. The *Kliger* reference cited during prosecution (U.S. Patent Publication No. 2002/0069417, submitted herewith as Ex. 2004), discloses network structure that renders *Amit* cumulative of the teachings already considered by the Patent Office.

The Petition proposes to modify this *Kliger*-type reference (i.e., *Amit*) in view of the same subject matter—various DSL-based systems—disclosed in the specification of the '249 Patent. Ex. 1001, 8:55-60. For the reasons set forth below, these challenges fail.

III. OVERVIEW OF THE PETITION'S CHALLENGES

The Petition's self-serving summaries of the prior art ignore a number of pertinent features and passages that are fatal to its analysis. For example, the Petition alleges in *Amit* that “every embodiment's” terminal devices may communicate using reflections off devices, including the splitter or the notch filter.” Petition at 13, n.6. However, *Amit* uses the presence/absence of the notch filter to delineate the two modes of operation. The Petition ignores the express teaching of *Amit* that describes two distinct operational modes: Single Home and Connected Home; whether a home operates in one mode or the other mode is determined by the presence or absence of a notch filter. Ex. 1005, 7:12-14 (“The HomeCN operation modes are determined according to the existence/not existence of notch filter at the home entrance.”).

At no point does the Petition acknowledge that the notch filter it relies on is only applicable for **half** of the teachings of *Amit*, nor does it even attempt to explain why teachings related to the Single Home embodiment would be combined with those of the Connected Home embodiment (or how such a combination could even function). This gating failure dooms the Petition, which mixes and matches

disclosures across embodiments to fit its desired result. *Abiomed, Inc v. Maquet Cardiovascular, LLC*, IPR2017-01204, Paper No. 8 (PTAB Oct. 23, 2017) (Denying institution of a Petition that treated “different embodiments as if they are interchangeable with one another”).

Similarly, the Petition provides only portions of ADSL/VDSL (Exhibit 1006), even omitting passages of the chapters it does present. Ex. 1006, 17 (excerpting only the beginning of Chapter 1, and excluding the remaining passages describing coaxial networks that begins on page 17). By withholding valuable information from the remaining passages of the book, the Petition improperly shifts the burden to the Patent Owner and the Board to gather the remaining information about what the reference as a whole actually says. *W.L. Gore & Assoc., Inc. v. Garlock, Inc.*, 721 F.2d 1540 (Fed. Cir. 1983), *cert. denied*, 469 U.S. 851 (1984) (A prior art reference must be considered in its entirety, i.e., as a whole, including portions that would lead away from the claimed invention.). And a quick glance at the passages the Petition failed to present confirms why: the omitted passages actually explain the reasons why a POSITA would **not** have made the “combination” the Petition presents. The systems described in Ex. 1006 and Ex. 1008 were far more unpredictable—and operated in fundamentally different realms than either *Amit* or the ’249 Patent—than the Petition would like the reader to believe. Ex. 2001, 7. This uncertainty, coupled with the fact that these DSL systems are completely silent with regard to any

reflected signal, would not have suggested any applicability of the references to the Single Home operation mode of *Amit*.

The Petition's hindsight bias is particularly egregious with respect to *Jacobsen*, which the Petition uses to suggest adding equalization to the system of *Amit*. However, *Jacobsen* is an academic article that compared single-carrier modulation with equalization to multi-carrier modulation and concluded that "multicarrier modulation [without equalization] appears to be better equipped than single-carrier modulation to accomplish [its] objective[s]." Ex. 1007, 15. *Jacobsen* sets forth the reasons why its multi-carrier modulation schemes (without any equalization) were preferable to the also-studied single-carrier with equalization. *Id.* at 9 (positing that "the computational complexity of the multicarrier system is significantly less than that of the single-carrier system" for its purposes), 12 (calculating single-carrier complexity), 13 (finding a complexity increase of a factor of 2.5), 14.

Moreover, *Jacobsen* only analyzes equalization in the context of single carrier systems. There is no teaching in *Jacobsen* of any suggestion of equalization of a multi-carrier signal. This underscores the impropriety of combining *Jacobsen* with *Amit* to arrive at the multi-carrier signals of the Challenged Claims.

Nevertheless, the Petition relies on *Jacobsen* for its teachings of equalization, and purports to use *Jacobsen* to modify *Amit*'s single-carrier system to arrive at the

Jacobsen-discredited single-carrier with equalization, or a non-contemplated multi-carrier with equalization system. Petition at 65; Petition at 62-75. The Petition's ignorance of the actual teachings of *Jacobsen* confirms the hindsight riddled lens through which it purports to view the prior art.

Finally, the Petition again excerpts select passages of the “DSL-Book,” another of its secondary references: the first three pages of its exhibit are pages 4, 12, and 90, in the reference. Ex. 1008, 4-6. By the 10th page of the exhibit, the Petition has already omitted 415 pages of text from the reference. These omissions make it impossible to analyze what the “DSL-Book,” as a reference in entirety, actually says. Petitioner's omissions force the Board and Patent Owner to guess as to what the omitted teachings look like and whether those teachings would lead a POSITA in a different direction than the combination Petitioner urges. *In re Magnum Oil Tools International, Ltd.*, 829 F.3d 1364, 1375 (Fed. Cir. 2016) (the burden in an IPR does not shift to Patent Owner).

The actual teachings of the “DSL-Book” confirms that its teachings, based in an ADSL system, are incompatible with *Amit*. The incompatibilities are the same as those noted above regarding the other ADSL reference (Ex. 1006, “ADSL/VDSL”). A POSITA thus could not (and would not) have combined the “DSL Book” with *Amit*, at least because it relied on a fundamental principle—the choice of operating frequencies—that was incompatible with *Amit*'s coaxial network. Ex. 1008, 12, 14

(showing significant signal attenuation at frequencies much lower than that of *Amit*, Fig. 13.6), 23 (confirming the carrier range is between 11.25 kHz and 271.6875 kHz). As with the Petition’s reliance on ADSL/VDSL, a POSITA would not look to the “DSL-Book” to make unnecessarily and operationally inconsistent changes to the teachings of *Amit*.

On the whole, the Petition simply identifies disparate teachings of different techniques and different architectures, without articulating any basis why the teachings of any specific reference would have motivated a POSITA to make any change to any other teaching.

IV. OVERVIEW OF THE PRIOR ART

A. *Amit*

Amit refers to its system as the Home Cable Network (“HomeCN”), and its network has two different architectures. Ex. 1005, 2:44-48, 7:5-35. The first architecture or operational mode, Connected Home, establishes a network in a premises (e.g., a house or a dwelling unit) that is connected to and interoperates with the regional cable network. In this operation mode, management functions are provided by the CMTS. *Id.*, 8:45-9:8, 7:51-52. Management functions include assigning a specified operating frequency to each home network to ensure that each local network’s signals do not interfere with others when arriving at the CMTS. *Id.* *Amit* explains in its inventions, “the headend assigns *the* carrier frequency and

bandwidth to each home network, and maximum power levels to each device on the home network.” *Id.* at 4:12-14. These management functions are centralized at the CMTS to ensure interoperability across the different local networks connected to the CMTS. *Amit’s* CMTS (in the Connected Home mode) would need to ensure that signals from one home network did not interfere with signals from another home, and so the CMTS would ensure each network communicated with the CMTS using a different frequency. This control adds levels of complexity to the network. *Id.* at 7:19-22. This management and control functionality of the CMTS is not available to the home network in the second mode.

Amit’s second operation mode, Single Home, is an on-premises network only, and the local network is “disconnected from the regional cable network.” Ex. 1005, 7:24-35. Which operational mode is used is determined by the presence or absence of a notch filter. Ex. 1005, 7:12-14 (“The HomeCN operation modes are determined according to the existence/not existence of notch filter at the home entrance”). When the notch filter is present, the home is “disconnected from the regional cable network, therefore its’ design is more simple (single home network).” *Id.* at 7:16-19. This trade off allows for a simpler operation of the home network, and reduces load on the network management system. *Id.* at 7:19-22.

However, *Amit* only describes its network as utilizing a single carrier frequency and is entirely silent regarding any multi-carrier system. *Amit* explains

“the headend assigns *the* carrier frequency and bandwidth to each home network, and maximum power levels to each device on the home network.” *Id.* at 4:12-14. In other words, *Amit*’s home network uses a single-carrier frequency assigned to it, and that carrier frequency is typically above 860 MHz (and more typically 900-960MHz), but in all scenarios, above 100 MHz. *Id.* at 8:17-49 (describing the frequency range, and how a frequency is specified for each home).

These two distinct embodiments are not compatible; in one, the notch filter (a component mapped to the claimed filter by the Petition) is present, and in the other, it is absent. In one, the regional cable network headend (CMTS) provides network management; in the other, it does not, as the on-premises network is disconnected from communicating with the CMTS. However, *Amit* is clear about one thing: in both embodiments, the network uses a single, pre-selected, carrier frequency.

The Petition eschews analyzing the actual technology of *Amit*. Instead, the Petition is forced to rely on an inconsistent interpretation of the reference and various secondary references, all of which relate to the infrastructure network, or the regional cable network outside the home. Such networks prioritize bandwidth and concurrent signal transmission even at the price of additional cost or complexity to ensure that cable and data are transmitted from the provider to each neighborhood CMTS. Such considerations would not have been reasonably pertinent to a POSITA looking at an on-premises network where the use and impact of signal reflection drives the

technical modifications. Instead, an on-premises network such as *Amit* would be driven by managing reflection, splitter impedance, and interference from other wiring within the home.

Upon an actual review of *Amit* the alleged combination is no longer technically rooted in the references, such that the Petition fails to establish why the POSITA would have modified *Amit*.

B. ADSL/VDSL²

ADSL/VDSL provides an overview of two contemplated changes to then-existing DSL-systems and describes the “challenges and limits of [then-existing] DSL technologies,” which were used to transmit data over twisted copper wires used for analog landline telephony. Ex. 1006 at 4. The textbook purports to describe “new and exciting high-speed access technologies using ordinary telephone lines, are especially well suited for the access portion...of such a network.” *Id.* at 3. In doing so, it focuses on “two specific DSL technologies,” ADSL and VDSL, “as well as “how networks are designed to use them.” *Id.*

However, the Petition presents only a subset of the over 300 pages that make up the text. *Compare* Ex. 1006, 91 (the last page of Ex. 1006 at page 91 indicating

² The excerpts of ADSL/VDSL provided by the Petition fail to tell the full story of the textbook; additional excerpts have been provided with this POPR as Ex. 2001.

page 306) *with* Ex. 2001, 3-5 (showing the entire table of contents of the book that is Ex. 1006). Petitioner withheld over two-thirds of the text from this proceeding. But “[a] reference ‘must [be] considered for *all* it taught, disclosures that diverged and taught away from the invention at hand as well as disclosures that pointed towards and taught the invention at hand.’” *Polaris Indus., Inc. v. Arctic Cat, Inc.*, 882 F.3d 1056, 1069 (Fed. Cir. 2018).

A Petitioner thus cannot selectively present the favorable disclosures of a reference and omit unfavorable disclosures. This would improperly place the burden on Patent Owner and the Board to sift through other evidence to perform the necessary obviousness inquiry. Moreover, Petitioner’s excerpted passages from Exhibit 1006 are not even one continuous chapter or section from the book. The excerpts span many sections, and include a number of gaps within chapters, as well as omitted chapters. Ex. 1006 at 17 (excerpting the middle of the description of cable modems, despite the numerous references to cable modems in the ’249 Patent), 78-79 (skipping an additional approximately 50 pages).

The omitted statements are relevant to the determination of whether a POSITA would have actually been motivated to make the alleged modifications the Petition advances. *Apple Inc. v. Samsung Elecs. Co.*, 839 F.3d 1034, 1051 n.15 (Fed. Cir. 2016) (en banc) (noting that, even if a reference “does not teach away, its statements regarding users preferring other forms of switches are relevant to a

finding regarding whether a skilled artisan would be motivated to combine the slider toggle in” that reference with the invention of a second reference). For example, one of the unprovided pages of the text confirms that one caution about the ADSL standards was it was continuing to develop, even as of the publication of ADSL/VDSL. Ex. 2001, 7. Moreover, it was expected that this development “may continue for many years to come.” *Id.* The suitability of ADSL and VDSL, and the techniques proposed to be used in these schemes were unknown, as the field was still developing. *Id.*; *id.* at 8. This nascent technology was not predictable and would not have suggested the alleged combination with any expectation of success.

The unsubmitted passage of ADSL/VDSL also explains that, in sharp contrast to the system in *Amit*, ADSL operates at a frequency between 30 kHz and 1.106 MHz, and VDSL operates between 1.1 MHz and 20 MHz. *Id.* at 10-11. Above these operating frequency ranges, the signal attenuation is too great to meaningfully communicate using the techniques described in ADSL/VDSL. *Id.* (explaining that above these frequencies, the PSD drops off too quickly).

Even the disclosure of ADSL/VDSL that the Petition did present counsels *against*, rather than for, the combinations Petitioner proposes. For instance, the passages of ADSL/VDSL submitted describe transmission over twisted pair copper lines for providing signal *to* the home network. Ex. 1006, 6. These external networks faced very different considerations than the reflected network of *Amit*. The

submitted passages are completely silent with regard to any reflected signal or whether any of its teachings would have been relevant to anyone looking to improve a reflected-signal-based network such as that of *Amit*.

Further, each of the DSL formats in the book, ADSL and VDSL, “require considerable processing power, which normally increases cost and complexity” of a system relying on such a transmission method. *Id.* This confirms that a POSITA would understand DSL systems to be complex and cautions against adding them to otherwise simple systems.

The submitted text also recognizes the difficulties in modifying existing communications over twisted pair copper lines to support the proposed ADSL/VDSL techniques. It asks the highly relevant question, “why try to piggyback *a brand new technology* on old lines rather than install fiber or high-speed wireless connections to homes?” *Id.* This “brand new technology” (i.e. the ADSL/VDSL techniques the Petition proposes to graft onto *Amit*) was still developing when the text published,³ and there is no evidence that the evolution was not still occurring at the relevant time of the obviousness inquiry. *Id.* This too

³ ADSL/VDSL appears to have been published in 1999. There’s no evidence that the technology was any closer to finalization by the time the ’249 Patent was filed.

confirms that a POSITA would understand DSL systems to be complex and cautions against adding them to otherwise simple systems.

C. Jacobsen

Jacobsen is a conference paper pondering a comparison “between the performances of single-carrier modulation with equalization and multicarrier modulation” on cable channels comparing the same bandwidth. Ex. 1007, 8. By sending data on multiple carrier frequencies, the ability to transmit the same data on multiple frequencies ensures that, regardless of interference at a certain carrier frequency, “good” data is still received without the need to provide any equalization.

Jacobsen concluded that “multicarrier modulation appear[ed] to be better equipped than single-carrier modulation [with equalization] to accomplish” the metrics the paper focused on. *Id.* at 15. Computational complexity considerations were at play. “[T]he complexity of a single-carrier QAM” plus equalization was “at least 2.5 times the complexity of a DMT [(multicarrier)] system operating at the same data rate.” *Id.* at 13. Therefore *Jacobsen* awarded the edge to multicarrier finding that for the same volume of data throughput “the computational complexity of the multicarrier system is significantly less than that of the single-carrier system” with equalization. *Id.* at 9. The ability to provide more per data unit time on a multicarrier system outweighed the benefit of equalization of the signal, as the same data could be transmitted multiple times to ensure receipt of “good data.” Said

otherwise, while equalization could help address signal interference, the ability to send the same information on different carriers ensured that the impact of interference was mitigated.

Moreover, *Jacobsen* is directed to a very different part of telecommunications. *Jacobsen* is a regional TV distribution network. The wiring is that of the infrastructure side—i.e., the wiring provides signals *to* a home, not within it. *Id.* at 10; Fig. 2. In both types of analyzed signals, *Jacobsen* is entirely silent with regard to any reflected signal.

D. DSL-Book

The Petition’s final reference is also completely silent with regard to communications using any reflected signal. The “DSL-Book,” like the ADSL/VDSL secondary reference, describes ADSL lines, which are used to provide signals from a Central Office (“CO”) to a cable subscriber’s home. Ex. 1008, 3, 10. With this reference the Petition once again provides only a portion of the full reference. Again this improperly shifts the burden to the Board and the Patent Owner to seek out and find the necessary information to conduct the obviousness inquiry.

The limited passages which were provided, however, are sufficient to confirm that VDSL and ADSL address communication between nodes *outside* of the home, *over short-distance copper twisted pair links*. *Id.* at 5. These external networks faced very different considerations than the reflected network of *Amit*.

And, as the book itself confirms, its teachings are limited in applicability: they are for “DSL-specific implementation[s].” *Id.* The DSL-Book further explains that there were no formal standards for ADSL, leaving any interoperability or implementation questions to be handled by stakeholders and working group members. *Id.* at 11. Like with ADSL/VDSL, the DSL-Book explains the operating frequency ranges of ADSL are between 10 and 500 kHz, depending on upstream vs. downstream transmission direction. *Id.* at 12. Above this frequency, signal attenuation becomes significant. *Id.* at 14. To account for this attenuation, the DSL-Book suggests using enhanced power levels. *Id.* at 21.

Finally, for both its discussion on error correction (*id.* at 27) and echo cancellation (*id.* at 29-30), the DSL-Book’s teachings are limited to DMT ADSL signals: multi-carrier signals. These multi-carrier signals have limited, if any, bearing on the single-carrier signals of *Amit*.

V. CURRENTLY PENDING REEXAMINATION

On September 11, 2023, a request for *ex parte* reexamination was filed against the ’249 Patent using the same primary references as this Petition, *Amit*. Ex. 2002, 783-794. On April 11, 2024, an interview was conducted, and a response was filed on April 20, 2024. Ex. 2002, 813, 820, 822-847. The entire Petition and submitted references were submitted to the examiner during the reexamination, and none of the additional art or arguments from this proceeding were applied in the office

action, confirming the unpersuasiveness of the alleged combinations submitted in the Petition.

The rejection includes two grounds, one based on *Amit* (Ex. 1005) and U.S. Patent No. 6,795,450 to Mills (Ex. 2003), and a second based on U.S. Patent Publication No. 2006/0218593 to Afshary and Mills.

The reexamination, much like the background of the '249 Patent, the prosecution leading to the '249 Patent, and the challenges presented in the Petition, relies on a first reference describing an on-premises coaxial cable network, and then a second reference describing various signal processing techniques from entirely different network architectures, completely divorced from on-premises coaxial broadband networks. As such, the art in the Petition is cumulative of the art already used in the reexamination.

Each of *Amit* and *Afshary* describe an on-premises coaxial network. However, as the office action admits, each lacks the requisite signal processing. As such, the office action turns to an incompatible reference, *Mills*, to fill the gaps of the primary references. However, *Mills*, like the secondary DSL references and *Jacobsen*, is fundamentally incompatible with the teachings of *Amit* and *Afshary*. For example, *Mills* requires the use of point-to-point communication channels that use constant idle bit streams between packet transmissions to maintain the established channel, until the channel is terminated. Ex. 2003 at 1:10-13. *Mills*, and the secondary DSL

references/*Jacobsen*, are all from different wiring topologies existing on the infrastructure side of the network. These secondary references all rely on purpose-built infrastructure provided by the cable operators to deliver signals from one point to another pre-determined point. Conversely, the networks of the '249 Patent are contemplated to operate on an on-premises coaxial cable topology with various splitters not designed for such connections.

Indeed, *Mills* is silent with regard to any signal reflection, or multi-path signal, or anything at all relevant to the actual operation of *Amit/Afshary*'s communications. *Mills* requires the presence of an established channel between two endpoints and fails in the event the link between the endpoints resets. Ex. 2003, 8:25-43. The reset of this link causes loss of data. *Id.* "The ***invention*** [of *Mills*] maintains a digital communications link without causing the link to reset." *Id.* at 10:5-6. These links are set up via a negotiation process between the two point-to-point nodes. *Id.* at 10:11-17. This is fundamentally different than transmissions to all connected nodes that form the basis for *Amit/Afshary*. So too are the out-of-home secondary DSL references and *Jacobsen* incompatible and fundamentally different than the network of *Amit*.

The reexamination prior art is consistent with the art voluntarily provided during prosecution in the '249 Patent's specification, as well as that identified by the examiner. Sections II.B and X.A. This repeated attack on the '249 Patent,

constructing the same alleged prior art “combination” (that has repeatedly been rejected) only underscores the hindsight that infects the Petition’s analysis.

VI. GROUND 1 FAILS

Ground 1 addresses only two claims, independent claim 1 and dependent claim 2.

A. The Petition relies on two incompatible embodiments of *Amit*

Amit describes two modes of operation, Connected Home operation mode and Single Home operation mode. Ex. 1005, 7:23-35. These modes are mutually exclusive, in that a home cannot operate in both without a physical change in hardware present in the network. Ex. 1005 at 7:12-14 (“The HomeCN operation modes are determined according to the existence/not existence of notch filter at the home entrance”).

This is relevant because for the filter of claim 1 (and the independent claims challenged in the other Grounds), the Petition relies upon the notch filter present **only** in Single Home operation mode. Petition at 10. Figure 2 of *Amit* depicts this notch filter as *optional*, confirming that there are two different distinct embodiments described in *Amit*.

The Petition then cites to the no-filter (Connected Home) configuration for other portions of its analysis, including the citations on pages 14 and 16 to 6:36-39 (describing the connection to the regional CATV plant, which only exists in

Connected Home operation mode), on page 21 to Figure 5, which depicts “frequency allocation” from the headend in Connected Home operation mode (Ex. 1005 at 5:28-29) (notably the Petition ignores the text describing Figure 5, which says when “working in the single home operation mode [components] always use the 900-906.25 MHz channel. These components do not support the frequency selection capability, and different channel bandwidth capability.” Ex. 1005 at 7:66-8:3), and on page 24 to 13:65-67 (the lead-in to the Petition’s citation explains “this problem usually exists *in a home that contains* some splitters *no notch filter*.” Ex. 1005 at 13:59-61).

At no point does the Petition even attempt to allege why these two incompatible embodiments would or could somehow be combined. *Abiomed, Inc. v. Maquet Cardiovascular, LLC*, IPR2017-01204, -01205, Paper 8 at 8-12 (PTAB Oct. 23, 2017) (denying institution where the Petition failed to provide adequate motivation to combine two incompatible embodiments); *Virtek Vision Int’l ULC v. Assembly Guidance Sys., Inc.*, 97 F.4th 882, 886 (Fed. Cir. 2024) (finding claims not obvious where the challenged failed to provide a motivation to combine two embodiments). Indeed, the primary distinction between the two embodiments is the presence or absence of the very notch filter upon which the Petition focuses.

Instead, the Petition baselessly (and incorrectly) alleges that the notch filter applies to all embodiments. Petition at 13. But that argument is inconsistent with

Amit itself: *Amit*'s two embodiments are distinguished by the presence or absence of a notch filter. Ex. 1005, 7:12-14 ("The HomeCN operation modes are determined according to the existence/not existence of notch filter at the home entrance."). The presence of the notch filter necessarily places the home in Single Home operation mode.

Ground 1 fails as it relies on incompatible embodiments of *Amit* without even attempting to articulate a basis to combine these two incompatible embodiments. Each subsequent ground relies on the analysis of Ground 1, such that the Petition in entirety can be denied for this reason alone.

B. *Amit* does not describe any allocation of frequency bins based on a signal to noise ratio (SNR)

Claim 1 of the '249 Patent, the sole independent claim challenged in Ground 1, requires, among other things, that "one of the terminal devices provid[e] frequency bins with more transmit bits which occupy parts of the channel where the *signal to noise ratio (SNR) is high*." Ex. 1001, Cl. 1. *Amit* fails to teach or suggest this element and the Petition provides no evidence of any disclosure of *Amit* of any SNR ratio.

1. *Amit* lacks any SNR disclosure

The Petition addresses this element at pages 20-22, yet in these three pages, fails to identify any disclosure of SNR or signal-to-noise ratios in *Amit*, let alone

“providing frequency bins with more transmit bits which occupy parts of the channel where the signal to noise ratio (SNR) is high,” as is required by the claims challenged in this ground. Instead, the Petition simply identifies disclosure in *Amit* that states that a modulation method *is* selected. Petition at 21-22 (citing Ex. 1005 at 8:30-39). The mere fact that modulation is selected based on channel conditions and equipment capabilities does not suggest that “the terminal devices providing frequency bins with more transmit bits which occupy parts of the channel where the signal to noise ratio (SNR) is high,” or suggest that the system in *Amit* even has the capability of doing so. The Petition cites to no evidence in *Amit* that the portions of a multicarrier channel with higher SNR would receive a different number of transmit bits than a portion of the channel with lower SNR. *Amit* is completely silent with regard to the criteria it uses.

2. *Amit* is a single carrier reference

Additionally, *Amit* is a single carrier reference, such that it does not suggest any providing of “*frequency bins* with more transmit bits which occupy parts of the channel where the signal to noise ratio (SNR) is high.” The Petition does not provide any suggestion that *Amit*’s single carrier system is capable of providing frequency bins.

Amit explains that its frequency planning (to the extent even relevant to this element) is *only* done in Connected Home operation mode (the mode without the

notch filter). Ex. 1005 at 8:44-49; 22:44-26:65; *supra* Section IV.A. And *Amit* explains its channel allocation process is based, in part, on the frequency allocation (i.e., frequency planning) therefore it also only occurs during Connected Home operation mode. Any frequency or channel allocation (which is not related to SNR) is part of the Connected Home operation mode, not the Single Home operation mode the mode with the notch filter. In the Single Home operation, the home is disconnected from the regional network and the CMTS where the management system sits. In this regard, the discussion about varying channel conditions and modify channels based on channel characteristics in the Petition at 21 is part of a different, incompatible mode of operation.

3. A POSITA would not have modified *Amit* as proposed

Nor does the Petition provide any basis to suggest that a POSITA would have been motivated to add cost or complexity to the teachings of *Amit* by including an ability to “provid[e] frequency bins with more transmit bits which occupy parts of the channel where the signal to noise ratio (SNR) is high,” as required by Claim 1.

Amit expressly states that “[t]he present invention presents a ***low cost solution, which is very important*** to enable a solution to the mass market.” Ex. 1005 at 17:10-10; *id.* at 18:24-44. Adding the capability to “provide frequency bins with more transmit bits” in high-SNR frequencies would have significantly increased the

complexity of *Amit*'s system. Any modification of *Amit* (in addition to being divorced from the teachings of *Amit*) would be contrary to the teachings of *Amit*.

Further, *Amit* never describes any variation of the number of transmit bits between channels or between “bins.” To the contrary: *Amit*'s system, and in particular the Single Home operation mode embodiment, is repeatedly described as being “simple,”. Ex. 1005, 7:16-22, 18:32, 26:13-14. There is no basis to add the ability to “provid[e] frequency bins with more transmit bits which occupy parts of the channel where the signal to noise ratio (SNR) is high” as compared to fewer transmit bits where the SNR is lower to the *simple* system of *Amit*. Instead, *Amit* describes a single allocation based on channel conditions. *Id.* at 8:30-33.

In an effort to remedy this lack of disclosure in *Amit*, the Petition alleges that the '249 Patent itself makes certain admissions about the prior art. Petition at 22. However, the cited passage is not from the background section where the patent discussed prior art (Ex. 1001, 8:22-29), but rather from the “Detailed Description of the Invention” of the '249 Patent, where the patent discusses the claimed invention.

In particular, while DMT and OFDM as modulation techniques—the techniques cited by Petitioner—existed prior to the '249 Patent, the cited section of the specification is entitled “Application of DMT and OFDM to the Present Invention.” Ex. 1001 at 7:61. This passage is not an admission that using OFDM/DMT in a broadband local area network using coaxial cable was known, but

rather simply that the modulation techniques existed in some other systems. “The mere fact that these possible arrangements existed in the prior art does not provide a reason that a skilled artisan *would* have” arrived at the claimed network. *Virtek v. Assembly Guidance*, 2024 WL 1292734, at *3; *Polaris Indus., Inc. v. Arctic Cat, Inc.*, 882 F.3d 1056, 1068 (Fed. Cir. 2018) (reversing improper reliance on “what a skilled artisan would have been able to do, rather than what a skilled artisan would have been motivated to do at the time of the invention.”).

It is undeniable that there is simply no mention of SNR in *Amit*. As a result, there is no basis to conclude that *Amit* teaches that “one of the terminal devices provid[es] frequency bins with more transmit bits which occupy parts of the channel *where the signal to noise ratio (SNR) is high.*” Ex. 1001, Cl. 1. For another, independent reason, Ground 1 fails.

VII. GROUND 2 (*AMIT* AND ADSL/VDSL) FAILS

The Petition challenges all three independent claims, and all dependent claims, in Ground 2. Petition at 27.

The Petition only addresses claim element [1.c.iii] for this Ground as it relates to independent claim 1 (seemingly confirming the above identified issues of Ground 1), relying on its analysis of *Amit* found in Ground 1 for the remaining elements. Petition at 36. For the same reasons set forth in Section VI, *Amit* in view of

ADSL/VDSL similarly fails to render obvious Claim 1 as the Petition’s theory rests on incompatible disclosures of *Amit*.

A. A POSITA would not combine ADSL/VDSL with *Amit*

A POSITA would not combine ADSL/VDSL with *Amit* because the two references involve networks that function in fundamentally different ways.

Amit itself describes two incompatible embodiments, but in both embodiments, *Amit* is a simple single-carrier system. Ex. 1005 at 4:12-14 (“the headend assigns *the* carrier frequency and bandwidth to each home network, and maximum power levels to each device on the home network.”), 8:45-46, 7:16-22, 18:32, 26:13-14. *Amit* also uses a carrier frequency that is greater than 860 MHz. *Id.* at 8:20-30. To accomplish this operation, *Amit* relies on the “home coaxial cable infrastructure” within the home (regardless of whether the home is connected or disconnected to the regional cable via the lack or presence of a notch filter respectively). *Id.* at 5:51-56, 7:12-14. These frequency ranges are selected to manage signal interference within the home, to mitigation attenuation due to home networking equipment, and to function in a reflected environment without impacting the cable television channels also traversing the network.

Conversely, ADSL/VDSL describes a multicarrier modulation system that transmits signals across conventional voice telephone lines—a twisted pair of copper wires—from a regional source to a home. ADSL/VDSL operates on a much lower

carrier frequency (to address different attenuation needs), across a different type of network, as compared to the coaxial system disclosed in *Amit*. Further, nothing in the networks used by ADSL/VDSL included the types of splitters at issue in *Amit*, nor does anything in ADSL/VDSL suggest even the possibility of using a reflected signal that is reflected into all branches of a network. As such, and as set forth below in more detail, there is simply no basis to conclude a POSITA would have been motivated to look to this textbook to address any challenges with, or otherwise modify, *Amit*.

1. ADSL/VDSL would not have suggested any changes to a POSITA regarding the teachings of *Amit*

In contrast to the teachings of *Amit*, ADSL/VDSL describes communication principles for an out-of-home, twisted pair (telephone wire) wide area networks. Ex. 1006, 4. The excerpts of ADSL/VDSL provided by the Petition fail to tell the full story of the textbook, and additional excerpts have been provided with this POPR. Ex. 2001. Considered in their full context, the disclosures of ADSL/VDSL actually illustrate why a POSITA would **not** have made the suggested combination.

Each of ADSL and VDSL (the communication principles of the textbook) “require considerable processing power, which normally increases cost and complexity” of a system relying on such a transmission method. Ex. 1006, 6. Conversely, *Amit*’s system is repeatedly described as being “simple”, in particular

the Single Home operation mode embodiment which includes the aforementioned “notch filter.” Ex. 1005, 7:16-22, 18:32, 26:13-14. Further, a POSITA would not have been led to apply the teachings of ADSL/VDSL to *Amit* because ADSL/VDSL itself suggested there was no reason to believe that doing so would work. ADSL/VDSL itself expressly confirms that the new flavor of DSL they were discussing was “a brand-new technology” at the relevant time, and that POSITAs at the time had questions about its own development—much less the applicability of its techniques to other networks entirely. As ADSL/VDSL put it, POSITAs were asking: “why try to piggyback ***a brand new technology*** on old lines rather than install fiber or high-speed wireless connections ***to homes***?” Ex. 1006, 6. This “brand new technology” (ADSL/VDSL) was thus still developing at the relevant time period, confirming that a POSITA would not only have not viewed it as a viable option to source a modification from, but would not have been able to have any expectation of success in any combination. *Id.* The Petition fails to address this: its analysis of “expectation of success” (Petition at 34-36) in combining developing ADSL/VDSL with the coaxial system of *Amit* amounts to nothing more than conclusory statements that certain technology was known; alleging, without support, that the proposed changes would have been successfully implemented.

Contrary to the Petition’s conclusory statements, the unsubmitted passages of ADSL/VDSL explain that one caution about ADSL technology was that it was

continuing to develop, even as of the publication of ADSL/VDSL. Ex. 2001, 7. Moreover, it was expected that this development “may continue for many years to come.” *Id.* The field was still developing and POSITAs were not aligned on how ADSL would function. Similar developmental efforts were ongoing for VDSL as well. *Id.* at 8. The Petition, and the declaration of Petitioner’s expert Dr. Acton, fail to address or account for these teachings of ADSL/VDSL that the Petition withheld.

- a. The Petition fails to allege sufficient motivation to modify the teachings of *Amit* to arrive at the claimed subject matter

The Petition’s motivation to combine section begins with a generic statement that a POSITA would make changes to *Amit*’s teachings to “more efficiently utilize high-speed communication networks,” despite the same sentence acknowledging that *Amit* already provided a high-speed network. Petition at 27-28. The Petition identifies nothing in *Amit*’s network or in the disclosure of *Amit* that would be the source of any inefficiency or that would require improvement. Further, efficiency is the type of generic concern that exists across all systems and thus cannot be the basis for a valid motivation to combine. *ActiveVideo Networks, Inc. v. Verizon Commc’ns, Inc.*, 694 F.3d 1312, 1328 (Fed. Cir. 2012). Reliance on this type of generic basis to make a change to a system, and to a system that already professes to accomplish the same high-speed communications, is further evidence that Petitioner has simply used the ’249 Patent’s own disclosures as a roadmap to arrive

at the challenged claims. *TQ Delta, LLC v. Cisco Sys.*, 942 F.3d 1352, 1361 (Fed. Cir. 2019); *In re Magnum Oil Tools Int’l, Ltd.*, 829 F.3d 1364, 1380 (Fed. Cir. 2016). The Petition’s three other “motivations” are likewise deficient.

First, the Petition alleges that because *Amit* explains that other prior art systems interfered with VDSL, and because *Amit* did not interfere with VDSL, that the systems are related and combinable. Petition at 28-29. This too misses the mark. That *Amit*’s system does not interfere with VDSL simply means that it operates on a different frequency spectrum and uses different carrier signals. Section VII.A.1.b. As such, the two are not related, and in fact must be different to preserve the lack of interference. These differences do not, as the Petition alleges, suggest any reason to combine the two teachings, nor does the fact that “*Amit* recognizes that ‘[t]here are several home networking solutions that have already been proposed’” suggest a reason to look at those other technologies *Amit* improved upon. Petition at 28. Instead, *Amit* is an improvement **over** those home-networking solutions. Ex. 1005, 28:67.

Second, the Petition then alleges that because *Amit* receives a signal from an outside network, a POSITA would look to that external network to improve the internal network. Petition at 29. This ignores the fact that, in the Single Home embodiment, which the Petition relies on as the only embodiment to disclose a notch filter, the notch filter disconnects the on-premises network from the regional cable

network. However, notwithstanding its desire to disconnect itself from the infrastructure network outside the premises, the Petition baselessly looks *exclusively* to infrastructure network references such as ADSL/VDSL.

In support of this about-face, the Petition simply parrots back that *Amit* is a coaxial cable network and ADSL/VDSL is a twisted pair network (albeit one that recognizes that cable networks also existed at the time). However, the Petition ignores the fact that *Amit* expressly distinguishes ADSL and VDSL as protocols that are used to connect the home to the network, versus its own teachings of connecting devices within the home. Ex. 1005, 19:18-22 (describing HomePNA (a different prior art protocol over existing telephone wires) as not being compatible with ADSL/VDSL). This too is not a motivation to combine. It simply is an acknowledgement that both types of networks existed. That a technology existed does not provide a motivation to use it to alter another technology let alone any expectation of success.

Third, the Petition incorrectly and repeatedly short-cites *Amit* in support of its hindsight-driven analysis.

The Petition alleges that “*Amit* teaches that the modulation method will change ‘according to the channel conditions and hardware capabilities.’” Petition at 30. But *Amit* never discloses any **changing** of modulation method; it simply says that a modulation method is **selected** according to channel conditions and hardware

capabilities. Ex. 1005, at 8:30-32. The word “change” in the Petition, which is not part of the quote, is solely attorney characterization, a result of the Petition’s hindsight-driven analysis.

Moreover, *Amit* provides no description on modulation based on hardware capabilities, what kinds of hardware would drive such a change, or how such a process would work. *Amit*’s lack of clarity regarding the very element that the Petition recognizes is a shortcoming of *Amit* underscores the hindsight driven hoops that the Petition jumps through to arrive at the Challenged Claims.

Similarly, the Petition alleges that “there *can* be ‘houses where there is a problem with reflection,’” such that it allegedly would be obvious to correct those problems in the manner claimed by the ’249 Patent. Petition at 30⁴ (citing Ex. 1005 at 2:51-53, 20:42-43). The Petition however, truncates this sentence of *Amit*, which fully reads, “[t]herefore this module can be inserted in houses where there is a problem with reflection.” Ex. 1005, 20:42-43. In other words, *Amit* discloses (and details) a module that addresses problems caused by reflection, to the extent such problems even existed. *Id.*, 19:65-20:43; *Polaris Industries*, 391 F.3d at 1068-69 (holding that the Board erred in “focus[ing] on what a skilled artisan would have

⁴ This short citing also appears again at page 63 of the Petition when trying to justify the combination with *Jacobsen*. It similarly fails there.

been *able* to do, rather than what a skilled artisan would have been *motivated* to do.” (citing *InTouch Techs., Inc. v. VGO Commc’ns, Inc.*, 751 F.3d 1327, 1352 (Fed. Cir. 2014))). Any alleged “reflection” problems, to the extent even a problem, of *Amit* were already identified and addressed by *Amit* and cannot be the basis to make an additional modification of *Amit*.

Fourth, this reflection that the Petition alleges is a problem, is actually the entire principle of operation of *Amit*. Ex. 1005, 6:41-44 (“It may be recommended to use splitters that deliberately have high reflection levels”); 14:1-5 (“the reflection from the notch filter is in the power of the signal or it might be higher. When this reflection is higher than the signal we can use this reflection as our main signal.”). The Petition fails to explain a basis to remove, modify, or otherwise inhibit these desired reflections.

The Petition therefore alleges that *Amit*’s disclosures would somehow suggest a need to look elsewhere for clarification on how *Amit* actually determines channel conditions as well as detail on how to solve the alleged reflected signal problems. However, these are not actually reasons to make any modifications to *Amit* as *Amit* already addresses these bases.

These three “primary” motivations are all generic and fail for the reasons set forth above. The Petition then provides four claim-specific motivations, related to OFDM, Equalization, FEC, and TDD. Petition at 30-34. Each of these four fails

not only because it is outcome driven (as these terms are claimed elements, and the self-serving characterization of, for example wanting to add OFDM to arrive at a system using OFDM is circular at best), but it fails to recognize the teachings of *Amit* itself.

- i. ADSL/VDSL's multicarrier teachings would not suggest any modification of *Amit* a single-carrier reference

While it is the Petition's burden to establish that a POSITA would have been motivated to combine *Amit* and ADSL/VDSL—and, as set forth above, it failed—here, there are specific reasons a POSITA would not have made the claimed combination. A POSITA would not have looked to a multi-carrier reference, such as ADSL/VDSL, to make any modification to *Amit*'s single-home network. *Amit* only describes the use of a single-carrier frequency. Ex. 1005 at 4:12-14. While *Amit* describes that in its connected home operation mode there may be FDM, this requires an ***absence*** of a notch filter as the entire principle of operation of this FDM mode is that the frequency assignment must be done by the head-end. *Id.* at 7:29-35, 8:45-49. When the home operates in single home mode, no such management by the headend is possible and the FDM discussions are not applicable.⁵

⁵ This is another instance of the Petition improperly combining the two different incompatible embodiments of *Amit*. Petition at 31 (“*Amit* further teaches that

In the absence of this FDM (from an inapplicable embodiment), *Amit* is a single-carrier system. Ex. 1005, 15:14-35. *Amit* explains that its teachings allow for frequency reuse. *Id.* at 9:29-35 (“The key element for efficient frequency allocation to the HomeCN is frequency reuse”). The entire operational premise of *Amit* is efficiently allocating frequencies, and it does so by assigning one per LAN. The Petition would disregard this operational focus of *Amit* to instead look to other, multi-carrier references, such as that of ADSL/VDSL, without addressing why disregarding these fundamental assumptions would happen.

This frequency allocation is intentionally done by the management system of *Amit*, allowing for the intelligent re-use of carriers across the different LANs connected to the CMTS. *Amit* does not contemplate how to reuse multiple carriers across its CMTS management system or consider any implications such a change would have on the CMTS or the existing cable plant. Ex. 1005, 3:31-35.

Contrary to the Petition’s conclusion, this single-carrier system would not be combined with a multi-carrier system such as that of ADSL/VDSL. Ex. 1006 at 27. *Amit* only describes an assignment of *the* carrier signal by the cable headend, but in the embodiment with the notch filter, there is no connection with the regional cable

“[t]he Channel Allocation method should be FDM,” and OFDM is a type of FDM.”).

network. *Id.* at 7:15-22. *Amit* provides no teachings of how any multi-carrier system would be compatible with its single carrier network.

Moreover, OFDM (which the Petition proposes to combine with *Amit*) existed long before *Amit* was filed; yet *Amit*'s goal of maintaining a simple system led *Amit* in a different direction, towards a simpler single-carrier system for the already-present hardware in the coaxial home network. Ex. 1005, 7:16-22, 18:32, 26:13-14. There is no basis to conclude that the existing hardware (including splitters and amplifiers of *Amit*'s already-in-place home network) would be compatible with a multi-carrier system such as that of ADSL/VDSL, or that replacing those systems would have maintained *Amit*'s principal goal of operation. Indeed, a hallmark of *Amit* was to use this "typical home coaxial cable infrastructure." Ex. 1005. In doing so, *Amit* intentionally selected a simpler approach.

The Petition's allegation that OFDM existed and could provide more complexity and more throughput does not alter *Amit*'s stated goal of maintaining a simple system. Instead, it amounts to simply an allegation that OFDM existed, and that alone is not a basis to make the alleged combination. *Virtek v. Assembly Guidance*, 2024 WL 1292734, at *3. Instead, *Amit* explains that it "**must** provide QPSK and QAM 16." Ex. 1005, 8:30-37. The Petition ignores this disclosure and, instead, replaces *Amit*'s **required** modulation methods (classified as signal-carrier methods by the Petition) with the multi-carrier modulation method of ADSL/VDSL.

Such a change would render *Amit* unsuitable for its principle of operation, confirming the combination would not be made. That the Petition proposes the combination, without even attempting to reconcile this requirement of *Amit* with the more complex different modulation schemes of ADSL/VDSL confirms the hindsight-tinted lenses through which the Petition interprets the prior art.

- ii. The Petition fails to allege a reason to add equalization

In addition to deviating from the stated simplistic goal of *Amit* (an independent basis for lack of motivation to combine), the Petition again relies on the same conclusory statements of “efficiency” as a basis to add equalization. Petition at 31-32. This too fails as lacking the requisite specificity. The mere allegation that equalization might “help provide a suitable signal path” is simply detached from the teachings of the references themselves. As the Petition admits, *Amit* already provides a suitable signal path by using the channel conditions to select a static modulation scheme. Petition at 32.⁶ Specifically, the alleged problem of limited

⁶ Notably, here the Petition, pointing to the same passage it short cited when alleging a change of modulation scheme, properly acknowledges the actual quote, that it is instead “selected” according to channel conditions.” Petition at 32 (citing Ex. 1005 at 8:30-32).

frequency resources (Petition at 32) was recognized and addressed in *Amit*, as the Petition admits, by selecting a static scheme that fits the worst conditions that exist. Ex. 1005 at 8:30-32.

The Petition simply cites to different disclosures of each of *Amit* and ADSL/VDSL, which both address the alleged problem of limited frequency resources (Petition at 32) in different manners, and concludes that the solution of *Amit* is not sufficient, without any basis to set aside *Amit*'s manner of addressing this problem. Petition at 32. *Amit* does not need to use equalization as claimed because it already solves the issue—it simply boosts the power of **all** signals. Ex. 1005 at 8:63, 12:29. Similarly, *Amit* already explains that it selects modulation based on channel characteristics and hardware capabilities, such that a POSITA would have recognized that *Amit* not only addresses this limited resource problem, *Amit* provides multiple solutions. There is simply no basis to conclude a POSITA would have looked to another reference to make any changes to *Amit*.

There is simply no articulated reason to add any equalization to *Amit* in this section of the Petition.

Moreover, as set forth below in Ground 3, single-carrier signals with equalization more than double the complexity of a system, suggesting that a POSITA would **not** have been motivated to add any equalization to the teachings of *Amit*.
Section VIII.

- iii. The Petition's remaining secondary motivations also fail

The Petition further points to FEC and TDD as a basis to make the alleged combination of ADSL/VDSL with *Amit*. Petition at 33-34. However, in each section, the Petition acknowledges that *Amit* already teaches FEC and TDD respectively. Therefore, there is no basis to look to a secondary reference to add such a teaching, when a solution to that problem already existed in *Amit*.

The Petition again only concludes that because certain teachings were independently known, their incorporation into *Amit* would be obvious. This is nothing more than a cursory analysis that fails to actually advance a cognizable theory. These secondary arguments similarly fail.

- b. The Petition fails to establish a reasonable expectation of success

Amit describes a system that operates in the approximately 900-960 MHz range. Ex. 1005, 8:20-30 (Single Home operation mode frequency range of 900-906 MHz). ADSL/VDSL also explains that ADSL operates at a frequency between 30 kHz and 1.106 MHz, and VDSL operates between 1.1 MHz and 20 MHz. Ex. 2001 at 10-11. The upper bound of ADSL and VDSL is important to note because at frequencies above that range, the signal attenuation is too great to meaningfully communicate using the techniques adopted in ADSL and VDSL. *Id.* (explaining

that above these frequencies, the PSD (Power Spectral Density) drops off too quickly).

As a result, while the teachings of ADSL and VDSL are applicable to their respective frequency ranges, there is no basis to take those teachings and apply them to the system of *Amit*, which requires a significantly higher operating frequency of above 860 MHz. Ex. 1005, 8:17-49. The difficulties associated with overcoming the increased signal attenuation inherent in attempting to apply the teachings of a reference describing ADSL or VDSL systems to a high-frequency coaxial cable network, including the dramatic change in PSD, are not addressed anywhere in the Petition or in Dr. Acton's declaration. Instead, the Petition again provides a cursory review of similarities and alleges that all of the proposed changes would have been easy because they were known technologies. The cursory analysis fails to account for the actual technical differences between the references, instead focusing on the mere fact that OFDM was a known modulation technique, or that equalization occurred. Petition at 34-36. This fails to demonstrate the obviousness of anything, and again only underscores the weakness of the motivation to combine analysis.

The conclusory hindsight driven statements of the Petition fail to satisfy the legal requirements of obviousness. *Virtek v. Assembly Guidance*, 2024 WL 1292734, at *3 (finding an error as a matter of law to find obviousness where the motivation to combine simply alleges two teachings were known in the art).

Ground 2 thus fails.

VIII. GROUND 3 (*AMIT* AND *JACOBSEN*) FAILS

Jacobsen fails to provide any motivation to add equalization to the teachings of *Amit*. To the contrary, *Jacobsen* compared two signal types, single-carrier with equalization and multi-carrier without equalization, and concluded that, for its purposes, the ***multi-carrier*** transmission methodology ***without equalization*** was preferred. As part of this, *Jacobsen* expressly states that “no equalizer is required in the multicarrier receiver.” Ex. 1007 at 10.

A POSITA reading *Amit*, which is a single-carrier reference, would not have been motivated by the teachings of *Jacobsen* to add equalization to its single-carrier disclosure. As such, Ground 3 similarly fails.

The Petition purports to challenge claims 1-2, 4-6, 8-10, 12-14, 16-17 in Ground 3, but only provides specific motivation for claims 1, 3-7,⁷ 10-13, 14 and 16. *Compare* Petition at 61 (challenged claims) *with* Petition at 64-65 (the alleged motivation to combine).

The Petition only relies on *Jacobsen* for [1.c.iii]/[5.a.iii], [5.a.ii], [10.c.iii] (generally the SNR limitations of Claims 1 and 5 and the equalization limitation of Claim 10), and certain dependent claims. As such, for the same reasons that *Amit*

⁷ Claims 3 and 7 do not appear to be challenged in the substance of Ground 3.

alone fails to teach the independent claims, the alleged combination of Ground 3 further fails as there is no identification of any teaching in *Jacobsen* that corrects the above identified deficiencies as it relates to where to position the filter of *Amit* or the multi-embodiment combination of *Amit* the Petition advances. Section VI.

1. *Jacobsen* would not have suggested any changes to a POSITA regarding the teachings of *Amit*

Jacobsen “present[s] a comparison between the performance of single-carrier modulation with equalization and multicarrier modulation on simulated cable television (CATV) channels.” Ex. 1007, 8. Crucially, the multicarrier system involved in this comparison did **not** include equalization. *Id.* at 10 (“no equalizer is required in the multicarrier receiver”). The results of this comparison found that “for a given data rate, the complexity of multicarrier is significantly lower than that of a single-carrier system” that included equalization. *Id.*

However, more importantly, *Jacobsen* concluded the multi-carrier modulation without any equalization is preferable, as it lacks the complexity of the single-carrier modulation with equalization. Ex. 1007, 8 (abstract), 9 (“the computational complexity of the multicarrier system is significantly less than that of the single-carrier system.”); 10 (“no equalizer is required in the multicarrier receiver”).

Jacobsen's teachings regarding single-carrier with equalization were found to be 2.5 times more complex than the multi-carrier system. Ex. 1007 at 13 (“the complexity of a single-carrier QAM system with an MMSE-LE receiver is at least 2.5 times the complexity of a DMT system operating at the same data rate.”). *Amit's* single-carrier system (without equalization) is repeatedly referred to as accomplishing *Amit's* stated goal of being “simple,” in particular the Single Home operation mode embodiment which includes the “notch filter.” Ex. 1005, 7:16-22, 18:32, 26:13-14. This leads to two conclusions: 1) a POSITA would not have been motivated to add equalization to the teachings of *Amit* as it would be contrary to *Amit's* simple-system goal, and 2) the result of *Jacobsen's* analysis would lead a POSITA to a multi-carrier system, and one without equalization, per the teachings of *Jacobsen*. There is simply no articulated basis to add the complexity associated with *Jacobsen's* equalization to the teachings of *Amit*, in particular in view of *Jacobsen's* finding against the use of equalization.

Moreover, *Jacobsen* uses a “6-MHz slot from 30-36 MHz as [the] simulated channel,” which is logical for the out-of-home system because most CATV systems provide an upstream channel that operates from 5 to 40 MHz. Ex. 1007 at 10. However, *Amit's* in-home network uses completely different frequency bands (*i.e.*, 900 to 960 MHz) and were intentionally selected to **avoid** interfering with the existing cable TV signals. In this regard, and in the face of silence from the Petition,

there is no evidence that a POSITA would look to *Jacobsen* to modify the teachings of *Amit*.

The Petition ignores the actual conclusions of *Jacobsen* (Petition at 65-66) and baselessly concludes that a POSITA would have made the combination “to help provide a suitable signal path.” Petition at 66. However, nothing in *Jacobsen* suggests any benefits of equalization. Instead, the cited passages of *Jacobsen* (Petition at 66, citing Ex. 1007 at 9 (*Jacobsen* at 306)) are describing the background technology, ignoring the fact that *Jacobsen* undeniably concluded that the increased complexity of equalization was not warranted.

- a. “Modulation” is not a reason to modify *Amit* in view of *Jacobsen*

Contrary to the Petition’s allegation, simply increasing bit-rate is not a reason to modify any teaching of *Amit* in view of *Jacobsen*. Petition at 63. The Petition ignores the actual conclusions of *Jacobsen* when it concludes that a POSITA “would have been motivated to apply *Jacobsen*’s teachings to arrive at single carrier QAM modulation with equalization.” Petition at 64. As set forth *supra*, a POSITA would have understood that *Jacobsen* teaches away from such a system or at a minimum does not suggest the proposed modification.

Moreover, the Petition further ignores the teachings of *Amit* when it concludes that a POSITA “would have been motivated to apply *Jacobsen*’s teachings to arrive

at multicarrier modulation that [] builds upon QAM by allowing for several subchannels having their own QAM constellation.” Petition at 64. The Petition changes *Amit* from a single-carrier system to instead have several subchannels, each having their own constellation, which is a multi-carrier system. As set forth above, a POSITA would not have been motivated to make such a change to *Amit*.

The Petition then concludes by implying that *Amit*’s reflected signals were a problem that needed changing, again ignoring that *Amit* seeks out the reflections and already addresses how to manage any ISI (as addressed above with regard to Ground 2). This threadbare analysis underscores the hindsight driven nature of the Petition.

b. “Equalization” is not a reason to modify *Amit* in view of *Jacobsen*

The Petition is also wrong to suggest that “equalization” is a reason to modify *Amit*. Petition at 66. As noted above, *Jacobsen* expressly teaches away from using equalizers in a single-carrier system. Ex. 1007, 15.

The Petition alleges, again driven by hindsight to complete its alleged “combination” and contrary to the actual teachings of the references, that because *Jacobsen* teaches ways of reducing reflections, that a POSITA would have been motivated to do so in *Amit*. Petition at 66. This allegation ignores that *Amit*’s reflections are not only a benefit to *Amit* (as opposed to a problem needing solving), but the entire focus of the invention. *Supra* Ground 2.

2. The Petition fails to establish a reasonable expectation of success in its proposed combinations.

The Petition, which omitted any claim language from its body (Petition at 10 ([1.a])) and was filed with a word-count certification of 13,998 words, provides four lines of explanation of any purported expectation of success for Ground 3. Petition at 67. Contrast this with the analysis of Ground 2, underscoring the blatant shortcuts taken to meet the word-count limitations.

While there is nothing inherently wrong with not reproducing the claim language in the Petition, due to the Petition's breaking up the claim elements into a variety of sub-elements, it becomes difficult to track the challenges presented in the Petition. The Board has full authority to deny institution for failing to comply with the word count limits, including the failure to include any words in the images at, for example, pages 38 and 39, which would put the Petition at well-more than 14,000 words. 37 C.F.R. § 42.24(a)(2) ("Petitions to institute a trial must comply with the stated word counts").

Instead of conforming to the requisite word-count limitations, the Petition improperly incorporates by reference the declaration of Dr. Acton. Petition at 67 ("for the reasons explained in Dr. Acton's declaration"). The five paragraphs cited are two and a half pages of text and are arguments not presented in the Petition itself.

These two and a half pages of text would also put the Petition well over its page limit.

The Petition concludes by allegedly relying on the same bases for expectation of success that were articulated for Ground 2. Petition at 67. Ground 2 does not involve *Jacobsen*. The articulated bases from Ground 2 have nothing to do with the teachings of *Jacobsen*, or any reasons why a POSITA would have been able to make the proposed combination of Ground 3. *In re Magnum Oil Tools Int’l, Ltd.*, 829 F.3d at 1380. However, if the Petition’s analysis of Ground 2 is relevant to the distinct combination of Ground 3, the same reasons set forth above for Ground 2 explain why a POSITA would not have had any expectation of success with Ground 3. The remaining bases are too conclusory to demonstrate that any POSITA *would* have combined *Jacobsen* with *Amit* to arrive at the claimed subject matter.

In addition to the procedural shortcomings of the combination, *Jacobsen* is entirely directed towards an out-of-home network. Ex. 1007 at 10 (Fig. 2; “delivering signals through bridge taps *to* fourteen homes”). The Petition fails to articulate any basis why a POSITA would have had any expectation of success in modifying *Amit*’s in-home network based on teachings of cable-TV frequency signal management out of the home as taught by *Jacobsen*. Indeed, these references involve different transmission medium, different signal strength and frequencies (and therefore different hardware), and one seeks reflections (*Amit*) where the other

would rather avoid them (Ex. 1007 at 8 (describing the ill-effects of signal reflection in the introduction)).

IX. GROUND 4 (*AMIT*, *JACOBSEN*, AND DSL-BOOK) FAILS

The Petition only asserts this combination against claims 2, 3, 7, 9, 10-13, 15, and 17. Of these, only claim 10 is independent.

The DSL-Book does not cure any of the issues identified above with regard to the combination of *Amit* and *Jacobsen*. For all of the reasons set forth above for Gound 3, a POSITA would not have been motivated to combine *Amit* and *Jacobsen*.

The DSL-Book does not provide any basis to arrive at the equalization of independent claim 10. The mere allegation that “channel distortion *could* cause inter-subchannel interference” does not provide a motivation to add the excessively complex equalization of *Jacobsen* to the simple network of *Amit*. Petition at 82 (citing Ex. 1008 at 18). The Petition then alleges that signal impairments “can” be overcome using equalization. This fails to provide any basis to conclude a POSITA actually would have added any equalization, when *Jacobsen* both expressly describes no equalization with its multicarrier teachings (Ex. 1007 at 10) and explains that the use of equalization adds 2.5x the complexity to the system (Ex. 1007 at 13).

Further, the DSL-Book’s equalization is an entirely different type of equalization than described in *Jacobsen*. The DSL-Book describes equalization on

a DMT signal, which is a multicarrier signal. Ex. 1008 at 19. But, as discussed *supra* at Section VI.B.2, every embodiment in *Amit* is a single-carrier system. The Petition fails to address any of the differences between the DSL-Book, *Jacobsen*, or *Amit*, and instead fixates on the fact that the concept of equalization is described in the DSL-Book and *Jacobsen*. This alone is insufficient to establish a basis to add this functionality, in particular in the face of *Jacobsen*'s findings against the use of such equalization.

Moreover, the DSL-Book further confirms that, at the frequencies of *Amit*'s communication network, which are frequencies intentionally selected to avoid interfering with the cable signals, significant signal attenuation occurs when using the techniques it describes. Ex. 1008 at 14 (indicating a signal attenuation of -140dB for the frequencies of *Amit*). This extreme signal degradation would have dissuaded any POSITA from looking at the teachings of the DSL-Book (or any DSL reference) as a way of modifying *Amit*.

The Petition's allegations in this Ground are textbook hindsight: ignoring the actual teachings of the various references in favor of conclusory statements driven by a desire to find claimed concepts in the prior art. A POSITA looking at *Amit* and *Amit*'s simple single-carrier system would not have been motivated by *Jacobsen*'s teachings that equalization in single-carrier systems would increase complexity by

2.5x to introduce a single-carrier equalization to *Amit*. Similarly, a POSITA would have understood that equalization was not part of *Jacobsen*'s multi-carrier analysis.

The POSITA then would not have been motivated, in view of the DSL-Book, to change the types of signal carriers, modulation, and equalization, to arrive at a system that included significantly more signal attenuation at the operating frequencies of *Amit*. That the Petition suggests otherwise only confirms the Petition is driven by hindsight bias.

The DSL-Book, like the ADSL/VDSL text of Ground 2, describes a fundamentally different networking and signal technique from that of *Amit*. Both “the DSL-Book” and “ADSL/VDSL” describe features of various DSL networks. For the same reasons as set forth in Section VI with regard to Ground 2, a POSITA would not have looked to a DSL-based reference to improve upon the teachings of *Amit*.

The Petition again provides conclusory analysis regarding any expectation of success. Petition at 81. The Petition again impermissibly incorporates by reference arguments from the expert's declaration to the Petition in a blatant attempt to circumvent the wordcount limitations. *Id.*

X. DISCRETIONARY DENIAL

A. 325(d)

All four grounds of the Petition rest on *Amit*. *Amit*, like the references considered during prosecution (Ex. 1002 at 32 (describing U.S. Patent Publication No. 2002/0069417 to Kliger (submitted herewith as Ex. 2004))) and like the background described in the specification (Ex. 1001 at 2:44-45 (citing U.S. Patent No. 6,005,861 to Humpleman (submitted herewith as Ex. 2005))) is cumulative of the prior art already overcome during prosecution.

Both Kliger and Humpleman described in-home coaxial networks, akin to the networks described in *Amit*. Ex. 2005 at 3:44-47; Ex. 2004, Fig. 1; Ex. 1005 at Fig. 2. Each reference describes a filter-type device that acts on a signal coming from within the home network. Ex. 2005 at 8:66-9:14, Fig. 5; Ex. 2004, ¶51 (HRU 44), Fig. 2; Ex. 1005 at Fig. 2. In this regard, *Amit* is cumulative of the art that was already before the examiner (both in the rejection, and through the Applicant's own statements in the specification). The Petition identifies no error in prosecution.

However, none of the three—Kliger from prosecution, Humpleman from the specification, or *Amit* from the Petition—disclose the specifically claimed location of the filter, the SNR-based allocation of transmit bits to frequency bins of claims 1 and 5, or the equalization of claim 10. While there is no doubt that the Petition's references were not themselves part of any rejection, the Petition undertakes no

effort to explain why its *Amit*-based challenges are not cumulative of the information that has already been considered during prosecution, both through the Applicant's statements in the specification and the examiner's prior art rejections. *Gardner Denver v. Utex Industries, Inc.*, IPR2020-00333, Paper 12 at 13-14 (PTAB Aug. 5, 2020) (denying institution upon finding that newly asserted references Kalsi and Kohl are no more relevant than references that were presented during prosecution); *Roku, Inc. v. Universal Elecs., Inc.*, IPR2019-01619, Paper 11, 16-17 (PTAB April 2, 2020) (denying institution upon finding that newly applied Zetts was cumulative to previously presented Kim, even though Kim was not considered for the same limitation in reexamination);

Moreover, each ADSL/VDSL and the DSL-Book were expressly referenced in the specification, such that they are identical to what was presented. Ex. 1001 at 8:55-60. Atop that, *Amit*, a common reference across all grounds of the Petition, is currently a primary reference in the reexamination.

These factors aggregate together to weigh in favor of denying institution under 35 U.S.C. § 325(d). “[T]he 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); *Cultec, Inc. v. Stormtech LLC*, Case IPR2017-00777 (PTAB Aug. 22, 2017) (Paper 7) (informative).

The Petition does not attempt to demonstrate any error made by the Examiner in allowing the claims over the art that is cumulative of the art that formed the basis of the rejections during prosecution. The Petition's failure to do so cannot be cured through additional papers *ex post facto*.

Moreover, denial under 325(d) is proper where there is overlap between the prior art of a Petition and the prior art of a reexamination. *Fox Factory, Inc. v. SRAM, LLC*, IPR2017-01439, Paper 7 (PTAB Dec. 8, 2017). Like in *Fox Factory*, the Petition “raises no allegation that the Examiner in the ['249 Patent's] Reexamination[, 90/019,247] has so far misapprehended or overlooked any as aspect of [*Amit*].” *Id.* at 8. There is no reason for the Board to redo the work that will already be undertaken by the examiner.

B. 314(a)

The Petition was filed after reexamination had already been instituted. The Petition presents substantially the same arguments as are in the reexamination of the '249 Patent. Indeed, the primary reference from the Petition, *Amit*, appears as a primary reference in the reexamination proceeding and the Petition acknowledges this. Petition at 1. The Petition simply repurposes the generic coaxial cable teachings that the reexamination relies on and adds other prior art that the '249 Patent itself already identified. Ex. 1001, 8:55-60. These follow-on challenges based on the exact same theories are exactly what Congress tried to avoid. *Nautilus Hyosung*

Inc. v. Diebold, Inc., No. IPR2017-00426, Paper 17 at 11 (PTAB June 22, 2017) (explaining that protecting patent owners from harassment can serve as a basis to deny institution). Congress recognized the problem of multiple, harassing attacks on the validity of a patent. H.R. Rep. No. 112-98, pt.1, at 48 (2011) (post-grant proceedings conducted under the AIA “are not to be used as tools for harassment or a means to prevent market entry through repeated litigation and administrative attacks on the validity of a patent. Doing so would frustrate the purpose of the section as providing quick and cost effective alternatives to litigation.”); *Harmonic Inc. v. Avid Tech, Inc.*, 815 F.3d 1356, 1367 (Fed. Cir. 2016) (“the PTO is permitted, but never compelled, to institute an IPR proceeding”).

Here, where the same patent is already the basis for reexamination, where the prior art of both the reexamination and the Petition are cumulative of the art overcome during prosecution, where the Petition makes a particularly weak showing on combinability of the disparate pieces of prior art, and where the reexamination examiner did not use the combinations from the IPR in any rejection, there is no evidence that the Board’s resources would be well-spent instituting this challenge.

XI. CONCLUSION

For the reasons set forth above, the IPR should not be instituted.

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

The undersigned hereby certifies that the foregoing contains 13,667 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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