

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: IPR2024-00431
U.S. PATENT NO. 7,295,518

PATENT OWNER SUR-REPLY

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TABLE OF PATENT OWNER’S EXHIBITS

Exhibit No.	Description
2001	Declaration of Mr. Albert Garrett
2002	Deposition Testimony of Mr. James Bertonis (Oct. 30, 2024)
2003	Excerpts from Samuel H. Russ, <i>Signal Integrity Applied Electromagnetics and Professional Practice</i> (“Signal-Integrity”)
2004	GNS Wireless, <i>Coaxial Cables</i> , https://www.gnswireless.com/productcategory/products/coaxial-cables/ (last visited May 20, 2024) (“Coaxial-Products”)
2005	Order Granting In Part and Denying In Part DirecTV’s Motion to Dismiss Under 35 U.S.C. § 101; <i>Entropic Commc’ns, LLC v. DISH Network Corp.</i> , No. 2:23-cv-01043-JWH-KES, ECF No. 575 (C.D. Cal. Feb. 25, 2025)
2006	Deposition Testimony of Mr. James Bertonis (April 11, 2025)

I. INTRODUCTION

Petitioner fails to establish a motivation to combine *Afshary* and *Mirfakhraei*. A POSITA would have understood that the drawbacks of adding *Mirfakhraei*'s multi-carrier modulation to *Afshary*'s network far outweigh any of Petitioner's alleged "improvements." Although the ID sought development of the drawbacks and benefits, only Mr. Garrett conducted such reliable analysis. *See* ID, 34. In contrast, Mr. Bertonis used a result-oriented approach to reconstruct the Challenged Claims by comparing *Afshary* and *Mirfakhraei* to the '518 Patent as a motivation to combine. Further, regarding the lists of modifications required to implement *Mirfakhraei*'s multi-carrier modulation on *Afshary*'s network, Petitioner uses its Reply (Paper 18) to backfill its positions with "the capabilities of a POSITA." Reply, 21-22. Petitioner's new arguments should be ignored.

Previously, the Patent Owner Response (Paper 13) ("POR") detailed why a POSITA would not have been motivated to combine *Afshary* and *Mirfakhraei*. In response, Petitioner uses the Reply to introduce another new theory regarding the signaling method of the alleged combination. Namely, Petitioner argues that a POSITA "would have understood" that *Mirfakhraei*'s handshake protocol, which is a critical feature in Petitioner's Grounds, is "not a substitute for TDMA but instead would operate within the TDMA scheme used by *Afshary*." Reply, 21. This new theory should also be disregarded as improper Reply evidence. But if considered,

Petitioner’s new argument underscores the PO’s position that *Mirfakhraei* would not have motivated a POSITA to arrive at the claimed network of the ’518 Patent.

Lastly, the Reply repeats the same mistakes as the Petition (Paper 2) and fails to address PO’s technical evidence. Petitioner over-generalizes “channel impairments” over “network communications” to incorrectly conclude that *Mirfakhraei* is analogous art, contrary to Federal Circuit precedent. Reply, 3-4. *Mirfakhraei* provides a system that communicates over *twisted pair*, and it does so in a point-to-point system *without any splitters* or tap ports—far removed from the ’518 Patent’s branched, in-home coaxial network where communication occurs “between the splitter tap ports.” Ex. 1001, Cl. 1. Based on these fundamental differences, *Mirfakhraei* is not “reasonably pertinent” to the problem solved by the ’518 Patent nor is *Mirfakhraei* from the same “field of endeavor” as the ’518 Patent.

II. PETITIONER FAILS TO RENDER THE CLAIMS OBVIOUS

A POSITA would not have been motivated to combine *Afshary* and *Mirfakhraei*. Petitioner’s arguments are unpersuasive and fail to explain why a POSITA would have made the alleged combination.

First, Petitioner fails to establish that any alleged benefits of *Mirfakhraei* outweigh the negative impact to *Afshary*’s network. Petitioner does not dispute *Afshary*’s goal as providing a simple networking solution. Reply, 15-18; POR, 32-33. Further, Petitioner’s single conclusory statement that a multi-carrier system *can*

be more efficient than a single-carrier system is insufficient and does not substantively refute Mr. Garrett's complete analysis that *Mirfakhraei's* multi-carrier modulation **would** add complexity and costs to *Afshary's* network. Reply 16, 17.

Second, Petitioner conflates impairments between *Afshary's* network and its medium while avoiding *Afshary's* disclosure. Regarding the medium, *Afshary's* coaxial cables provide "a very clear, clean medium." A POSITA would not have been motivated to turn to *Mirfakhraei's* network that uses telephone lines, to improve *Afshary*. Regarding network components, *Afshary's* network includes various mechanisms (e.g., filters) to address channel impairments. Unlike Petitioner, PO supports each of these positions with *Afshary's* actual disclosure.

Finally, a POSITA would not have been motivated to insert *Mirfakhraei's* bit-loaded multi-carrier modulation because *Afshary* already provides a reliable and robust system. After reading *Afshary's* disclosure, a POSITA would have understood that the use of multi-carrier modulation in *Afshary's* network would contradict *Afshary's* goals without furthering Petitioner's proffered motivation of providing a robust network. This is not a case where there is "no dispute" that *Mirfakhraei*, as the secondary reference, would improve *Afshary*. See Reply, 14 (citing *Intel Corp. v. PACT XPP Schweiz AG*, 61 F.4th 1373 (Fed. Cir. 2023)).

A. *Mirfakhraei's* Multi-Carrier Modulation Frustrates *Afshary's* Goals and Outweighs Any Alleged Improvements

Petitioner fails to establish that any alleged benefits of *Mirfakhraei* outweigh the negative impact to *Afshary's* expressed simplicity and costs concerns from multi-carrier modulation. Notably, Petitioner does not dispute *Afshary's* goal as providing a simple, low-cost home networking solution. Reply, 15-18; POR, 32-33. Further, Petitioner's single conclusory sentence that a multi-carrier system can be less complex than a single-carrier system does not outweigh the detailed analysis of Mr. Garrett regarding the negative impacts on *Afshary's* goals. See Reply, 16-17 ("The 'computational complexity of [a] multicarrier system [*can be*] significantly less than that of [a] single-carrier system.'") (citing Ex. 1018, 305-306; Ex. 1036, ¶ 39).

At bottom, the technical evidence of record strongly favors PO. The only credible evidence of record (*i.e.*, Mr. Garrett's analysis) establishes that *Mirfakhraei's* multi-carrier modulation would add unwanted complexity, add hardware costs, and add operational costs to *Afshary's* network. POR, 31-35 (citing Ex. 2001, ¶¶ 82-91). A POSITA would recognize these issues and would understand them to be significant considerations when making changes to *Afshary's* network, in addition to the drawbacks. Petitioner does not substantively refute any of Mr. Garrett's analysis related to the added complexity or costs from implementing *Mirfakhraei's* multi-carrier modulation in *Afshary's* network.

Despite the opportunity, Petitioner's Reply does not overcome PO's evidence showing the drawbacks, including the extensive costs and added complexity, of adding *Mirfakhraei* to *Afshary* and how such combination vitiates the entire purpose of *Afshary* (*i.e.*, providing a cost-effective system). *See* POR, 31-33.

B. Petitioner Ignores *Afshary*'s Disclosure Showing that a POSITA Would Not Look to *Mirfakhraei*'s Twisted Pair Network

Petitioner mischaracterizes PO's argument and still fails to address *Afshary*'s disclosure. Reply, 11 ("PO alleges that *Afshary*'s network would not suffer from channel impairments based on *Afshary*'s description of coaxial cables as 'a very clear, clean medium.'"). First, regarding the medium, *Afshary* explains that telephone lines suffer from various issues while coaxial cables "are a very clear, clean medium." POR, 60; Ex. 1006, [0024]; *see* Ex. 2006, 33:20-34:14 (explaining that *Afshary* uses a higher operating frequency to avoid interference). Based on this disclosure, a POSITA would **not** have been motivated to turn to *Mirfakhraei*'s network because *Mirfakhraei*'s network operates over telephone lines. Further, Mr. Bertonis directly contradicts *Afshary*'s disclosure by arguing that "coaxial cable communication medium can be a harsh environment." Ex. 1002, ¶ 54. Petitioner did not address either argument: (1) a POSITA would not turn to a reference that uses telephone lines when *Afshary* highlights issues with this medium, and (2) Mr.

Bertonis uses hindsight reconstruction rather than the teachings of *Afshary* as evidenced by his positions that contradict *Afshary*'s disclosure.

Second, regarding network components, a POSITA would not have been motivated to turn to *Mirfakhraei* because *Afshary* already addresses these channel impairments. *See* Reply, 11-12. Petitioner's response confuses the communication medium (that is, the wiring) with the network as a whole. Reply, 14. These are not the same, as *Afshary* itself explains. On one hand, coaxial cables provide a clean **medium** to communicate; this is directly pulled from *Afshary*'s disclosure, which supports Mr. Garrett's position. POR, 61-62 (citing Ex. 1006, ¶ [0024]). On the other hand, to provide a robust network and ensure reliable transmission, *Afshary*'s **network** includes various mechanisms to address impairments. Petitioner errs by conflating the clean medium of *Afshary* versus the network of *Afshary*. In other words, *Afshary*'s network uses coaxial cabling as a clean medium, and *Afshary* uses various components including its filters to address channel impairments in its network (*e.g.*, reflections caused by splitters). POR, 55 (citing Ex. 1006, [0042]; Ex. 2001, ¶ 122). Unlike Petitioner, PO bases both positions on *Afshary*'s disclosure.

C. *Afshary* Already Provides a Reliable Communication Network

A POSITA would not have been motivated to include *Mirfakhraei*'s bit-loaded multi-carrier modulation because *Afshary* already provides a reliable and robust system. *See* Reply, 14 (arguing that multi-carrier modulation would further

improve transmission robustness and efficiency); POR, 56-59 (detailing how *Afshary* provides a robust, cost-effective system). Petitioner's reliance on *Intel Corp. v. PACT XPP Schweiz AG*, 61 F.4th 1373 (Fed. Cir. 2023) fails to consider the disclosure of *Afshary*. Reply, 14. In *Intel*, there was "no dispute" that both references were related to multiprocessor systems and the secondary reference disclosed a way to improve multiprocessor systems. *Id.* at 1381. The facts here are distinguishable; based on *Afshary*'s disclosure, a POSITA would have understood that the use of multi-carrier modulation in *Afshary*'s network would contradict *Afshary*'s goals of providing a simple, low-cost home network. See Section II.A. And further, the parties dispute whether *Mirfakhraei*'s multi-carrier modulation would lead to the alleged improvements or be outweighed by the various issues caused when implementing such modulation scheme in *Afshary*'s network.

Petitioner attempts but fails to refute PO's position that *Afshary* uses single-carrier modulation schemes to provide a reliable system. See Reply, 13. Petitioner's arguments ignore the disclosure of *Afshary* and contradicts its original position regarding *Afshary*'s modulation scheme. First, *Afshary* explains that its network uses single-carrier modulation schemes (e.g., FSK and BPSK) "to keep costs low and the system robust." POR, 58-59 (citing Ex. 1006, [0037]). The Petition originally agrees that *Afshary* relies on these single-carrier schemes and states that (1) *Afshary*'s LAN adapter "provid[es] baseband **single-carrier** modulation and

demodulation,” and (2) “Afshary’s cable LAN adapter...**does not include** a multi-carrier modulator or multi-carrier demodulator.” Petition, 44 (citing Ex. 1002, ¶ 146); *see* Ex. 2006, 32:17-19 (agreeing that *Afshary* does not disclose the use of multi-carrier modulation). Petitioner contradicts itself to argue that these schemes somehow show that *Afshary* is ready for multi-carrier modulation. *See* Reply, 13 (“Afshary’s multiple forms of modulation suggest a readiness for use with bit-loaded multi-carrier modulation.”). *Afshary*’s disclosure supports the opposite.

As further detailed in Section II.D, Mr. Garrett explains that *Afshary* would require several modifications with an overhaul to its circuit to support multi-carrier modulation. POR, 37-40. A POSITA would recognize these requirements and, contrary to Petitioner’s argument, would not recognize *Afshary*’s single-carrier modulation schemes as indicating “readiness for use with bit-loaded multi-carrier modulation.” Reply, 13. *Afshary* uses specific “digital modulation scheme[s]” to keep costs low while using components that are designed to support single-carrier modulation schemes. Ex. 1006, [0037]. Despite this explicit identification of single-carrier modulation schemes, Petitioner argues that a POSITA would replace this scheme with multi-carrier modulation without considering any of the technical downsides described in depth by Mr. Garrett. This argument is not persuasive as it is contrary to *Afshary*’s teachings.

D. Petitioner Introduces a New Theory to Supplement the Insufficient Combination Originally Presented in the Petition

As PO's technical evidence has shown, a POSITA would not have been motivated to combine *Afshary* and *Mirfakhraei* because *Mirfakhraei*'s multi-carrier modulator and demodulator would not work in *Afshary*. POR, 36-40. For example, Mr. Garrett explained how *Mirfakhraei*'s modulators would require several improvements in the baseband layer of *Afshary*, which the Petition did not address. POR, 37. Moreover, Petitioner's combination omitted a controller, provides no synchronization mechanism, and does not even acknowledge, let alone consider, the many other components that are required to implement multi-carrier modulation. POR, 37-40 (explaining that the combination would require buffers, additional controls, and an overhaul of *Afshary*'s circuit). Notably, Petitioner does not refute Mr. Garrett's analysis that these components and modifications are required for multi-carrier modulation. A POSITA would recognize these considerations and not be motivated to combine *Afshary* and *Mirfakhraei*.

Mr. Bertonis confirms the accuracy of Mr. Garrett's analysis. Namely, Mr. Bertonis agreed that additional components are needed to implement multi-carrier modulation on *Afshary*'s network, which would also increase costs. To implement multi-carrier modulation, the network would require "a more powerful processor, because multi-carrier [modulation] requires more signal processing." Ex. 2006,

40:2-41:15. Mr. Bertonis also confirms Mr. Garrett’s position that *Afshary* identifies costs as a goal in its network. *Id.* at 42:14-16.

For the first time with its Reply, Petitioner now relies on “the capabilities of a POSITA” to address the long list of modifications identified by Mr. Garrett. Reply, 21-22 (“[T]he alleged modifications to *Afshary*’s ASIC are well within the capabilities of a POSITA.”). But this is too late. Petitioner chose not to include the details required to establish a legally sufficient motivation to combine with an operable system. The burden is not on either PO or Mr. Garrett to show that the functionality—which Petitioner failed to address—“could not be incorporated into *Afshary*’s ASIC.” Reply, 22. When PO and Mr. Garrett pointed out the considerations that motivate a POSITA against making the proposed combination, Petitioner waives its hands and argues that PO did not explain why the required changes “are not within the capabilities of a POSITA.” Reply, 22.

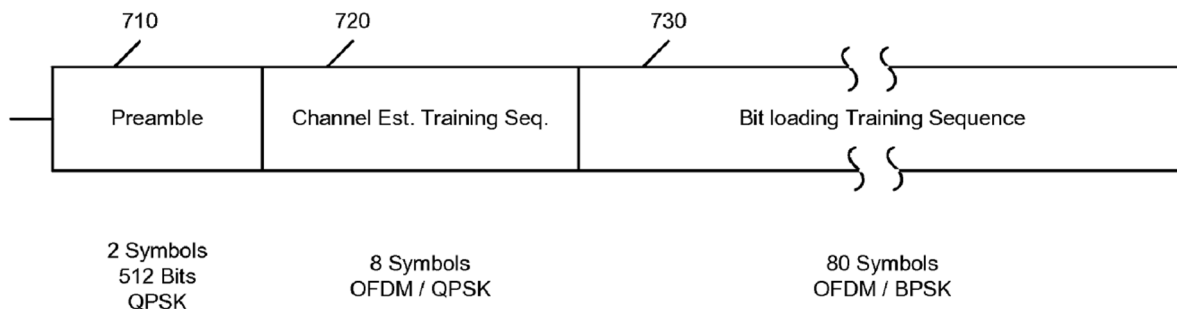
Moreover, Petitioner’s argument that the claims do not recite these modifications is unpersuasive. Reply, 22. The claim limitations have no effect on whether a POSITA would have been motivated to combine *Afshary* and *Mirfakhraei* in view of the modifications to *Afshary*’s network that are required. As PO identifies shortcomings in the cited references and the combination, Petitioner consistently cited to the ’518 Patent to fill gaps—a clear tactic of hindsight reconstruction.

Petitioner advances the same improper approach for the signaling technique used by *Afshary's* network for *Mirfakhraei's* bit loading scheme. As PO previously outlined, neither Petitioner nor Mr. Bertonis established how *Mirfakhraei's* “DMT bit loading scheme,” which was used in a point-to-point twisted pair network, would properly characterize its bit loading scheme on *Afshary's* multi-point network that communicates across coaxial splitter. POR, 40-44. Petitioner still fails to explain its combination. Petitioner initially relies on *Afshary's* disclosure in isolation for the signaling techniques. Reply, 19. But this is not relevant to how the combination would transmit *Mirfakhraei's* bit loading scheme. Reply, 19. When addressing the combination, Petitioner introduces a new theory that “a POSITA would have understood” the combination to function in a particular way. Reply, 19. This conclusion is insufficient, and the Petition fails for not including this evidence before.

Despite this improper Reply, the new theory fails to address the problems identified in the POR because there is no discussion on how or why *Mirfakhraei's* style of bit loading, which is based on its point-to-point connection, would operate when connecting to multiple endpoints in *Afshary's* network. First, there is no explanation why a POSITA would have simply assumed the messaging technique Petitioner now advances. Reply, 19-20. Moreover, PO originally explained that Mr. Bertonis offered no guidance on how the combined system would calculate the

signal to noise ratio (“SNR”). POR, 43. Neither Petitioner nor Mr. Bertonis address this issue. Even if this new theory is considered, Petitioner still fails to provide sufficient evidence for its position.

Finally, Petitioner relies on the ’518 Patent to demonstrate that “a POSITA would know how to implement probing messages in its LAN.” Reply, 16. This again reveals Petitioner’s hindsight reconstruction by relying on the disclosure of the ’518 Patent to remedy gaps in how the combination of *Afshary* and *Mirfakhraei* would configure probe messages. Reply, 20. Similarly, Mr. Bertonis compares *Afshary*’s network and *Mirfakhraei*’s bit-loading to the ’518 Patent and uses this comparison to support a motivation to combine. Ex. 2006, 50:14-17, 50:25-51:2. This is not only clear hindsight reconstruction by using the ’518 Patent as a roadmap, but also Petitioner and Mr. Bertonis are wrong. Unlike *Afshary* or *Mirfakhraei*, the ’518 Patent describes both the structure and the function of its probe messages. In one example, the ’518 Patent “shows an example of a bit loading probe message.” Ex. 1001, Fig. 7 (reproduced below).



Ex. 1001, Fig. 7.

The '518 Patent also provides a detailed explanation of its probe messages, even specifying the number of symbols present in the bit loading training sequence. Ex. 1001, 10:6-9 (“The bit loading training sequence 730 is 80 symbols transmitted in the frequency domain using BPSK modulation and is used to compute the actual bit loading needed for data traffic.”); *see id.*, 9:59-10:20. While Petitioner improperly uses the disclosure of the '518 Patent as a roadmap, the '518 Patent details the structure and implementation of the probe messages, going far beyond any disclosure in either *Afshary* or *Mirfakhraei*. Thus, Petitioner’s reliance on the '518 Patent to show that “a POSITA would know how to implement probing messages” should be given no weight as impermissible hindsight reconstruction.

III. LEVEL OF ORDINARY SKILL IN THE ART

Petitioner ignores the disclosure of the '518 Patent when arguing that it is “unclear” why a POSITA would need coaxial cable experience. Reply, 27 (“[T]he type of experience, or why it is necessary, is unclear.”); *see* POR, 10-11. This experience is necessary because the claims require coaxial cables and the '518 Patent is entirely directed to coaxial cables. The title, abstract, background, technical field, and detailed description all refer to coaxial cable as central to the field of work. POR, 11; Ex. 2001, ¶¶ 37-43. Moreover, the claims themselves are not only limited to coaxial cable, but further limited to communication *between* network devices across tap ports of a coaxial splitter. Ex. 1001, Cl. 1 (reciting cable wiring that

include “a plurality of segments of coaxial cable connecting between the splitter tap ports and the network devices” and requiring “network devices [to] communicate with each other through the cable wiring using multi-carrier signaling”). This evidence shows the need for experience with coaxial cabling.

But Petitioner does not address this evidence. Petitioner simply concludes that “PO provides no sound basis for rejecting Petitioner’s level of skill.” Reply, 25. Not so. PO’s level of ordinary skill is rooted in the ’518 Patent. In contrast, Petitioner does not provide a “sounds basis” for its own position that the level of ordinary skill does not require coaxial experience despite all evidence to the contrary. Reply, 25. Moreover, Mr. Bertoni’s position contradicts Petitioner’s argument that coaxial experience is not necessary. Namely, Mr. Bertoni explained that two years of experience with coaxial experience is not explicitly required because his definition of the level of skill in the art already includes experience with coaxial cables. *See* Ex. 2006, 12:9-11, 15:15-19. Both experts agree with PO that the level of ordinary skill in the art must include experience with coaxial cables.

Based on Petitioner’s failure to substantively respond to the disclosure of the ’518 Patent or explain why coaxial cable experience is **not** required, especially when its own expert applied a level of skill that included coaxial experience, the Board should adopt PO’s level of skill, requiring coaxial experience. And under PO’s level of skill, Petitioner’s motivation to combine is even weaker. A POSITA, with coaxial

experience, would recognize the differences between coaxial cabling and twisted pair and the issues with communicating across tap ports of coaxial splitters. *See* Ex. 2001, ¶¶ 64-72.

IV. ANALOGOUS ART

The Reply fails to save *Mirfakhraei*; it is neither “reasonably pertinent” to the problem of the ’518 Patent nor of the same “field of endeavor.” *In re Clay*, 966 F.2d 656, 658-59 (Fed. Cir. 1992). Both Grounds fail because both rely on *Mirfakhraei*, and *Mirfakhraei* is not analogous art. *See* Petition, 17.

A. ***Mirfakhraei* is Not Reasonably Pertinent to the Problems that the ’518 Patent Addresses**

The ’518 Patent solves impairments specific to on-premises communications between network devices *over existing coaxial cable wiring*. POR, 24-26. The Reply continues to ignore the coaxial context, including the claim language, which is directed towards communication between network devices through tap ports of a splitter. Ex. 1001, Cl. 1; Ex. 2001, ¶ 47 (showing the communication between network devices via two tap ports of a coaxial signal splitter). Moreover, Petitioner applies the wrong framework under the “reasonably pertinent” prong. Petitioner cannot establish that *Mirfakhraei* and the ’518 Patent are analogous under this prong by pointing to a solution rather than the *problem* addressed by the ’518 Patent. For these reasons, the Reply fails to establish that *Mirfakhraei* is reasonably pertinent to

the problem of addressing impairments specific to on-premises communications between network devices over existing coaxial cable wiring.

1. Petitioner Ignores the Problems of the '518 Patent and Improperly Considers the Solution

The '518 Patent itself explains that it addresses “impairments present *in the home wiring* that restricts high bandwidth communication.” Ex. 1001, 4:28-33; *Google LLC, et al. v. CyWee Group Ltd.*, IPR2018-01257, Paper 87, 56 (PTAB Jan. 9, 2020) (relying on the specification under the “reasonably pertinent” prong). Moreover, the claims are specifically directed towards communication between network devices through tap ports of a splitter. Ex. 1001, Cl. 1; Ex. 2001, ¶ 47 (showing the communication between network devices via two tap ports of a coaxial signal splitter). The '518 Patent requires communication across two tap ports of the same coaxial splitter; the '518 Patent is directed towards on-premise networking. *Id.*

Petitioner’s alleged problem of “variable attenuation across channel others” is improperly broad and ignores the '518 Patent’s consistent disclosure. Reply, 10; Ex. 1001, 1:27-29. The signal impairments described in the '518 Patent result from using existing on-premises coaxial networks, and the '518 Patent provides a solution to these issues while claiming coaxial cables. POR, 16-17. Moreover, the '518 Patent specifically distinguished its problem and proposed a solution from references like *Mirfakhraei*. The '518 Patent explains that solutions existed to address issues

in cable head end communications. Ex. 1001, 4:28-33. But these references did *not* address “impairments present in the home wiring,” which the ’518 Patent solves. *Id.*

2. Petitioner Only Now Addresses the “Reasonably Pertinent” Prong While Applying the Wrong Framework

PO previously identified the Petition’s failure to provide any argument that *Mirfakhraei* is reasonably pertinent to the problem that the ’518 Patent solves. POR, 24. Now, only after the PO identified this shortcoming, Petitioner adds new arguments and cites to Mr. Bertonis’ new declaration. *See* Reply, 99 (citing Ex. 1036, ¶¶ 23-24). Petitioner was required to present this theory, and the evidence supporting it, in the Petition. 37 C.F.R. § 42.23(b); *Intelligent Bio-Systems, Inc. v. Illumina Cambridge Ltd.*, 821 F.3d 1359, 1369 (Fed. Cir. 2016) (“[T]he initial petition [must] identify ‘with particularity’ the ‘evidence that supports the grounds for the challenge.’”). Having failed to do so, Petitioner cannot now try to backtrack and explain how *Mirfakhraei* is analogous when it should have been included in the Petition—to give the PO and Mr. Garrett a full opportunity to respond.

But even if considered, Petitioner applies the wrong framework. To avoid addressing the problems that are reasonably pertinent to the ’518 Patent, Petitioner improperly argues that the *solutions* of *Mirfakhraei* and the ’518 Patent are the same. *See* Reply, 9 (arguing that multi-carrier modulation is agnostic to the cause of the impairments and *Mirfakhraei* “teaches the same solution—bit-loaded multi-carrier

modulation”). Petitioner identifies the problem as “deal[ing] with encountered transmission impairments, *whatever their cause.*” Reply, 10. This statement highlights the issue. The cause (*i.e.*, impairments from communicating across splitters in a coaxial environment) *is* the problem that the ’518 Patent addresses.

Unlike the claimed coaxial network of the ’518 Patent, *Mirfakhraei* provides a single point-to-point communication system that does not use a branched topology and does not use splitters. Ex. 2001, ¶¶ 71-72, 79; Ex. 2002, 78:6-16. *Mirfakhraei* does not suffer from inter-port isolation or imperfect connections at splitters because its system does not include these components. Ex. 2001, ¶ 79. *Mirfakhraei* does not utilize the same network as the ’518 Patent and does not suffer from the same variable attenuation as addressed by the ’518 Patent. Ex. 2001, ¶ 79. *Mirfakhraei* cannot be reasonably pertinent to solving an issue that does not affect its network.

Finally, Petitioner alleges that PO attempts to exclude *Mirfakhraei* under both prongs for “essentially the same reason: that that *Mirfakhraei* is allegedly focused on a twisted-pair telephone line rather than coaxial cable network.” Reply, 10. To the contrary, the difference in medium is just one of many differences that prove that *Mirfakhraei*’s “twisted-pair, no-splitter, non-local” system is not reasonably pertinent to the problems that the ’518 Patent addresses—impairments in the home wiring caused by communicating across splitters in a coaxial network. *Donner Tech. v. Pro Stage Gear, LLC*, 979 F.3d 1353, 1360 (Fed. Cir. 2020).

The problem and solution of overcoming signal impairments in the '518 Patent is not reasonably pertinent to the problem and solution of overcoming signal impairments in *Mirfakhraei* as they deal with fundamentally different problems.

B. *Mirfakhraei* and the '518 Patent Do Not Share the Same Field of Endeavor

For two reasons, Petitioner incorrectly concludes that *Mirfakhraei* and the '518 Patent share the same field of endeavor. First, the '518 Patent's field of endeavor is specific to coaxial cables. This conclusion does not restrict the '518 Patent's disclosure to its patentable distinction but instead accurately reflects the disclosure. Petitioner ignores this disclosure of the '518 Patent to broadly conclude that its field of endeavor is "network communication." *See* Reply, 3.

Second, *Mirfakhraei* is directed to twisted pair communications, not coaxial cables like the claims of the '518 Patent. Petitioner's use of boilerplate statements does not outweigh *Mirfakhraei*'s disclosure. Furthermore, even if *Mirfakhraei* is not limited to twisted pair, Petitioner fails to establish that *Mirfakhraei* is the same field of endeavor of the '518 Patent because Petitioner does not (and cannot) establish that *Mirfakhraei* is in the field of endeavor of coaxial cables.

1. PO Does Not Improperly Narrow the Field of Endeavor of the '518 Patent

Petitioner's argument that PO is "attempting to narrow the field of endeavor" should be ignored. Reply, 1. Instead, when properly considering the complete

disclosure of the '518 Patent, the field of endeavor of the '518 Patent is not so broad as to encompass all “network communications” as Petitioner contends. Reply, 3. The field of endeavor of the '518 Patent is rather specific to on-premises local area broadband *coaxial cable networks* and even more specific to communication between network devices over the tap-ports of a coaxial splitter.

Every aspect of the '518 Patent's disclosure supports this conclusion. POR, 16-18 (detailing how the title, abstract, technical field, background, and claims support coaxial cables as the field of endeavor). Namely, the '518 Patent explicitly defines the technical field as “broadband communication networks and specifically to communications using coaxial cable building wiring.” Ex. 1001, Cl. 1, 1:26-29. Further, claim 1 recites “a plurality of segments of *coaxial cable* connecting between the splitter tap ports and the network devices.” *Id.*, Cl. 1. Petitioner does not respond to this evidence or explain why the '518 Patent is not specific to coaxial cabling.

While Mr. Bertonis acknowledged the overwhelming amount of evidence limiting the '518 Patent to coaxial cabling, his analysis of *Mirfakhraei* demonstrates his results-oriented approach. *See* Ex. 2006, 13:16-14:8 (considering the title), 14:12-21 (considering the claims, which are specific to coaxial cable), 15:12-14 (considering the abstract). Mr. Bertonis relies on the broad title, field of invention, and claims of *Mirfakhraei* to argue that *Mirfakhraei* is not limited to twisted pair. *See* Ex. 1036, ¶ 17; Ex. 2006, 17:10-12, 18:18-24, 20:14-23. Moreover, Mr. Bertonis

agreed that, if *Mirfakhraei* did specify twisted pair, he would have considered that in his opinion. *See, e.g., id.* at 20:24-21:1 (“If [the claims] were limited to twisted pair, would you consider that in your analysis? Sure, I would consider it.”); 21:10-21 (same for *Mirfakhraei*’s field of the invention).

But when presented with the same considerations in the ’518 Patent—all of which specifically identify coaxial cables—Mr. Bertonis changes his approach and argues that the ’518 Patent is not limited to coaxial cables. This directly contradicts his approach in *Mirfakhraei* where he uses *Mirfakhraei*’s failure to specify twisted pair in its title, field of invention, or claims, to support his opinion that *Mirfakhraei*’s field of endeavor should not be limited to twisted pair networks.

Petitioner applies this flawed analysis to conclude that the ’518 Patent’s field of endeavor “includes, but is not limited to, ‘communications using coaxial building wiring.’” Reply, 3-4 (citing Ex. 1001, 1:26-28). Petitioner only supports this position by selectively citing claim 1 while ignoring the limitation of the “coaxial cable connecting between the splitter tap ports and the network devices.” Ex. 1001, Cl. 1. Petitioner also fails to address the ’518 Patent’s title: “Broadband Network for ***Coaxial Cable*** Using Multi-Carrier Modulation.” Ex. 1001, Cover. It cannot be said that Petitioner’s approach in ignoring the title and claims (along with other instances of coaxial-specific disclosure) “complies with *Airbur*’s holistic approach.”

Reply, 3-4. The field of endeavor of the '518 Patent is wired networking systems *using coaxial cables* and the splitters and their tap ports. POR, 16-18.

Petitioner mischaracterizes this conclusion and alleges that PO is “restrict[ing] the field of endeavor” to the patentable distinction of “transmitting and analyzing probe messaging for adaptive bit loading.” Reply, 6. Petitioner takes a sentence out of context from PO’s *introduction* explaining how *Afshary* “lacks critical attributes of the Challenged Claims, including transmitting and analyzing probe messaging for adaptive bit loading.” POR, 3. Contrary to Petitioner’s argument, PO never limited the '518 Patent’s field of endeavor to the use of probe messages for adaptive bit-loading. As explained in the POR and Section IV.B.1, the field of endeavor of the '518 Patent is wired networking systems using coaxial cables and the splitters and their tap ports. POR, 16-18.

2. Petitioner’s Attempt to Broaden the '518 Patent’s Field of Endeavor Should be Ignored

Petitioner’s attempt to broaden the '518 Patent’s field of endeavor should be ignored because it conflates the two prongs of the analogous art test. Specifically, Petitioner argues that “a POSITA looking to solve the problem facing the '518 patent inventors” would look to *Mirfakhraei*. Reply, 5; Ex. 1036, ¶ 5; Ex. 2006, 52:7-17 (considering the problem that the '518 Patent addressed in the field of endeavor prong). As relevant to the “reasonably pertinent” prong, PO details how Petitioner’s

argument is wrong. *See* Section IV.A. Moreover, Petitioner’s use of the ’518 Patent’s citations to references that use bit-loading in its specification does not “support a broad field of endeavor.” Reply, 5, 6. This instead shows Petitioner’s hindsight reconstruction by using the disclosure of the ’518 Patent to arrive at the Challenged Claims, a common theme throughout the Reply.

Petitioner uses the ’518 Patent’s citations to non-coaxial references to conclude that the ’518 Patent can apply to different mediums (like twisted pair), despite the plain limitations in the claims themselves. *See* Reply, 5. The ’518 Patent cites dozens of references in its specification, explains the shortcomings, and claims an inventive system to solve existing issues on on-premises coaxial networks. POR, 1-4. Mr. Bertonis likewise used the ’518 Patent as a roadmap by relying on the references cited in the background to support his analogous art opinion. Ex. 1036, ¶ 12; Ex. 2006, 52:22-53:1. In the parallel district court litigation, the court confirmed PO’s position that “Claim 1 solves a specific problem *in the coaxial network* area because it facilitates device-to-device communication—something that was not previously possible.” Ex. 2005, *Entropic Commc’ns, LLC v. DISH Network Corp.*, No. 2:23-cv-01043-JWH-KES, ECF No. 575, at 23-25 (C.D. Cal. Feb. 25, 2025).

3. *Mirfakhraei's* Field of Endeavor is Not Coaxial Cables

Petitioner does not dispute PO's evidence showing that *Mirfakhraei* is entirely directed to conventional telephone line (twisted pair) communications. POR, 20. Petitioner instead uses broad, boilerplate statements that do not outweigh the entirety of *Mirfakhraei's* disclosure. Reply, 7-8. But even if this boilerplate language indicates that *Mirfakhraei* is not limited to twisted pair, the inquiry does not end. Petitioner must show that *Mirfakhraei* is the same field of endeavor of the '518 Patent, which is specific to systems using coaxial cables. Petitioner does not (and cannot) establish that *Mirfakhraei* is in the field of endeavor of coaxial cables. For this reason, Petitioner must broadly characterize the field of endeavor as "network communications" to capture the non-analogous *Mirfakhraei* reference. Mr. Bertonis used this same flawed approach by selectively relying on broad statements in the title and claims to conclude that *Mirfakhraei* is not limited to twisted pair networks. Ex. 1036, ¶ 17. But when faced with the '518 Patent, which **does** limit the network medium, Mr. Bertonis came to the same broad conclusion that the '518 Patent is in the field of network communications and not limited to coaxial cables.

As discussed in Section IV.B.1, this is not the correct field of endeavor, and Petitioner fails to establish that *Mirfakhraei* is analogous art under either prong.

V. CONCLUSION

A POSITA would not have been motivated to make the proposed combination of *Afshary* and *Mirfakhraei*. Further, *Mirfakhraei* is not analogous art to the '518 Patent and therefore cannot serve as the basis for obviousness. Petitioner fails to establish any claim is unpatentable.

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

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CERTIFICATE OF SERVICE

I hereby certify that on April 25, 2025, a true and correct copy of the foregoing was caused to be served on the following counsel of record for Petitioner by electronic mail at the following addresses:

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