

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

AMPHENOL CORP.,
Petitioner

v.

CREDO TECHNOLOGY GROUP LTD.,
Patent Owner

Case IPR2025-00834
Patent 11,012,252

PATENT OWNER'S PRELIMINARY RESPONSE

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LIST OF EXHIBITS

- EX-2001 Order No. 6: Setting Procedural Schedule, *In the Matter of Certain Active Electrical Cables and Components Thereof*, Inv. No. 337-TA-1446, issued May 19, 2025
- EX-2002 September 1, 2023 Letter re Credo Technology Group, Ltd.’s Intellectual Property
- EX-2003 USPTO, “FAQs for Interim Processes for PTAB Workload Management,” *available at* <https://www.uspto.gov/patents/ptab/faqs/interim-processes-workload-management>
- EX-2004 “Credo Introduces PAM4 DSP for High Performance Data Centers and Enterprise Networks,” March 17, 2021, <https://credosemi.com/credo-introduces-pam4-dsp-for-high-performance-data-centers-and-enterprise-networks/>
- EX-2005 “AEC Applications,” <https://credosemi.com/products/hiwire-aec/applications/>
- EX-2006 “Credo Introduces 800G HiWire ZeroFlap AECs to Support AI Backend Networks,” October 10, 2024, *available at* https://s205.q4cdn.com/511065572/files/doc_news/2024/10/credo-introduces-800g-hiwire-zeroflap-aecs-to-support-ai-backend-networks.pdf
- EX-2007 Respondents’ Initial Invalidity Contentions, *In the Matter of Certain Active Electrical Cables and Components Thereof*, Inv. No. 337-TA-1446, served June 26, 2025
- EX-2008 Exhibit B-1, Patent Invalidity Chart (Lugthart414), Respondents’ Initial Invalidity Contentions, *In the Matter of Certain Active Electrical Cables and Components Thereof*, Inv. No. 337-TA-1446, served June 26, 2025
- EX-2009 Exhibit B-2, 252 Patent Invalidity Chart (Tang), Respondents’ Initial Invalidity Contentions, *In the Matter of Certain Active*

Electrical Cables and Components Thereof, Inv. No. 337-TA-1446, served June 26, 2025

EX-2010	RESERVED
EX-2011	RESERVED
EX-2012	Exhibit B-11, 252 Patent Invalidity Chart (Aronson727, TI-Retimer), Respondents' Initial Invalidity Contentions, <i>In the Matter of Certain Active Electrical Cables and Components Thereof</i> , Inv. No. 337-TA-1446, served June 26, 2025
EX-2013	U.S. Pat. No. 10,148,414 ("Lugthart414")
EX-2014	U.S. Pat. Pub. No. 2007/0237464 ("Aronson464")
EX-2015	RESERVED
EX-2016	Bert Reiser & Ruthie Wu, Why the International Trade Commission is such an appealing forum for patent disputes," <i>Reuters</i> (June 11, 2025), https://www.reuters.com/legal/legalindustry/why-international-trade-commission-is-such-an-appealing-forum-patent-disputes-2025-06-11/
EX-2017	United States International Trade Commission, Section 337 Statistics: Average Length of Investigations, Updated 4/11/2025, https://www.usitc.gov/intellectual_property/337_statistics_average_length_investigations.htm
EX-2018	RESERVED
EX-2019	RESERVED
EX-2020	U.S. Pat. No. 7,401,985 ("Aronson985")
EX-2021	Declaration of Dr. Tim Williams

I. INTRODUCTION

The request for *inter partes* review from Amphenol Corp. (“Amphenol” or “Petitioner”) should be denied for multiple reasons. First, the Petition’s mappings fail to disclose key claim features of claim 1, namely “respective transceivers each employing fixed, cable independent, equalization parameters” recited in limitation [1.E]. Petitioner recognizes the deficiencies of the alleged prior art with respect to this feature and improperly attempts to compensate with conclusory expert testimony from Dr. Min. Second, the Petition fails to establish that a POSITA would have combined its alleged prior art references. The combinations described in the Petition are amorphous and prejudice Patent Owner, who now must decipher the true metes and bounds of the Petition’s combination. Moreover, Petitioner’s combination analysis depends on conclusory statements and lacks any motivation or expectation of success.

Given these failures, the Petition fails to establish a reasonable likelihood that Petitioner will prevail in demonstrating the unpatentability of any of the challenged claims. Accordingly, institution should be denied.

II. CLAIM CONSTRUCTION

All claim terms in this proceeding are to be construed according to the *Phillips* standard. *Phillips v. AWH Corp.*, 415 F.3d 1303 (Fed. Cir. 2005); 37

C.F.R. §42.100. No claim construction is necessary to deny institution. Patent Owner's arguments for denial do not hinge on the outcome of an actual controversy about any claim construction expressed in the Petition. *See Wellman, Inc. v. Eastman Chem. Co.*, 642 F.3d 1355, 1361 (Fed. Cir. 2011) (“[C]laim terms need only be construed to the extent necessary to resolve the controversy.”). As detailed below, the defects in the Petition are readily identifiable without defining any specific claim term. Patent Owner reserves the right to construe any claim features should the Board indicate that it may benefit from a construction.

III. STANDARD FOR GRANTING *INTER PARTES* REVIEW

The Board may grant a petition for *inter partes* review only where “the information presented in the petition ... shows that there is a reasonable likelihood that the petitioner would prevail with respect to at least 1 of the claims challenged in the petition.” 35 U.S.C. §314(a); 37 C.F.R. §42.108(c). Petitioners bear the burden of showing that this statutory threshold has been met. *See* Office Patent Trial Practice Guide, 77 Fed. Reg. 48,756, 48,756 (Aug. 14, 2012). Critically, Petitioners must fulfill this burden based on “information presented in the petition” (35 U.S.C. §314(a)), and the law forbids Petitioners from subsequently adding theories/arguments that should have been part of their initial Petition. *Intelligent Bio-Systems, Inc. v. Illumina Cambridge, Ltd.*, 821 F.3d 1359, 1369 (Fed. Cir.

2016) (citing to 35 U.S.C. § 312) (“It is of the utmost importance that petitioners in the IPR proceedings adhere to the requirement that the initial petition identify ‘with particularity’ the ‘evidence that supports the grounds for the challenge to each claim.’”); *see also* *Cuozzo Speed Techs., LLC v. Lee*, 136 S.Ct. 2131, 2154 (2016) (Alito, J. concurring in part and dissenting in part) (“Thus, if a petition fails to state its challenge with particularity—or if the Patent Office institutes review on claims or grounds not raised in the petition—the patent owner is forced to shoot into the dark. The potential for unfairness is obvious.”).

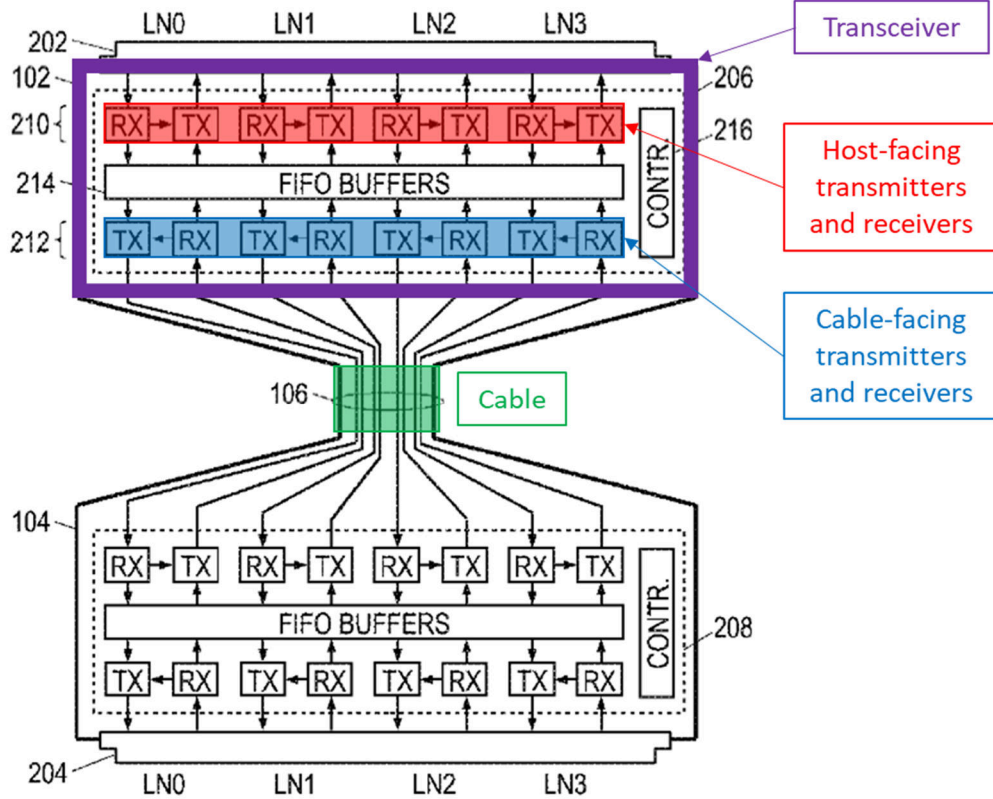
As such, the original Petition must establish a *prima facie* case of obviousness with regard to its proposed combinations of references. It is well settled that “rejections on obviousness cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness.” *KSR Intn’l Co. v. Teleflex Inc.*, 550 U.S. 398, 418 (2007) (quoting *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006)); *PersonalWeb Techs., LLC v. Apple, Inc.*, 848 F.3d 987, 993 (Fed. Cir. 2017) (explaining that it is insufficient to allege “that a skilled artisan, once presented with the two references, would have understood that they could be combined.”).

As explained in more detail below, the Petition does not establish a reasonable likelihood that the Petitioner will prevail in demonstrating the

unpatentability of any of the challenged claims as (1) key claim features are missing from the Petition's mappings, and (2) the Petition fails to establish a *prima facie* case of obviousness with regard to its proposed combinations of references, which are based only on conclusory statements. Dr. Tim Williams provides additional supporting testimony in his declaration. EX-2021, ¶¶1-73.

IV. SUMMARY OF THE '252 PATENT

The '252 Patent is directed to an active ethernet cable (AEC) that provides “a high-bandwidth communications link between devices in a routing network.” EX-1001, Abstract, 3:44-46. The AEC of the '252 Patent includes connectors 102, 104 that each “include a powered transceiver that performs clock and data recovery (CDR) and re-modulation of data streams in each direction” thus providing “consistently robust data transfer over extended cable lengths ... without consideration of the electronics manufacturers of the network interfaces.” *Id.*, 3:61-4:26, FIG. 2 (reproduced below). A “host-facing transmitter and receiver set 210 employ fixed equalization parameters that are cable-independent, i.e., they are not customized on a cable-by-cable basis.” *Id.*, 4:60-5:5. These equalization parameters can include “filter coefficient values for pre-equalizer filters in the transmitters, and gain and filter coefficient values for the receivers.” *Id.*; EX-2021, ¶38.



EX-1001 ('252 patent), FIG. 2¹.

The transceiver sets 210 and 212 are described as follows:

In at least some contemplated embodiments, the host-facing transmitter and receiver set **210** employ fixed equalization parameters that are cable-independent, i.e., they are not customized on a cable-by-cable basis. The center-facing transmitter and receiver set **212** preferably employ cable-dependent equalization parameters that are customized on a cable-by-cable basis. The cable-dependent equalization parameters may be adaptive or fixed, and initial values for these parameters may

¹ Annotations to this and other figures in this paper are noted in colored markings and text.

be determined during manufacturer tests of the cable. The equalization parameters may include filter coefficient values for pre-equalizer filters in the transmitters, and gain and filter coefficient values for the receivers.

EX-1001 ('252 patent), 4:60-5:5; EX-2021, ¶¶39-40.

V. LEVEL OF ORDINARY SKILL IN THE ART

A person having ordinary skill in the art (“POSITA”) as of the priority date of the '252 Patent would have had an undergraduate degree in electrical engineering or electrical and computer engineering, or equivalent knowledge, training, or experience, with at least three years of experience working in high speed data communication. A higher level of education may substitute for less experience, and *vice versa*. EX-2021, ¶¶18-19. In contrast, Petitioner asserts that “a person having ordinary skill in the art (‘POSA’) would have had a Bachelor of Science in electrical or computer engineering with at least three years of experience in digital communication system design. A higher level of education may substitute for less experience.” Pet. 6-7.

The scope of experience in Patent Owner’s definition—specifically in high-speed data communication—is more relevant to the subject matter of the '252 patent than the focus on digital communication system design, proposed by Petitioner. *See supra*, §IV. In particular, as discussed above in §IV, the '252

patent discloses techniques for “a high-bandwidth communications link between devices in a routing network”—problems that require deep understanding of both analog and digital signal processing in high speed networks. *Id.*; *see also* EX-1001, Abstract, 3:44-46. In addition, the ’252 patent involves advanced concepts such as equalization, clock and data recovery (CDR), and signal remodulation—indicating a high level of technical sophistication in high-speed data communication. *Id.*; EX-2021, ¶¶18-19. Petitioner’s POSITA definition describes only “digital communication system design”—an overly broad field that does not account for the unique high-speed applications of the ’252 Patent. *Id.* *Graham v. John Deere Co.*, 383 U.S. 1, 13-17 (1966) (“Patentability is to depend, in addition to novelty and utility, upon the ‘non-obvious’ nature of the ‘subject matter sought to be patented’ to a person having ordinary skill in the pertinent art”) (emphasis added). Accordingly, Patent Owner’s definition should be adopted for purposes of evaluating the prior art and the validity of claims of the ’252 patent.

VI. OVERVIEW OF THE ALLEGED PRIOR ART

A. Lugthart

Lugthart is directed to “[s]ystems and methods for high speed communications,” to include “transceiver architectures and techniques for re-timing, multiplexing, de-multiplexing and transmitting data.” EX-1005, Abstract.

The Petition relies on a particular embodiment of Lugthart, FIG. 1A, which depicts a “schematic diagram of ... a transceiver” (the Petition’s annotated figures reproduced below). *Id.*, 4:64-65; Pet., 8-12, 14-21. Specifically, Petitioner identifies Lugthart’s equalizers 11a/11b and finite impulse response (FIR) filters 27a/27b within Lugthart’s FIG. 1A transceiver. EX-1005, 7:63-67, 8:58-10:8; Pet., 8-12, 14-21; EX-2021, ¶41.

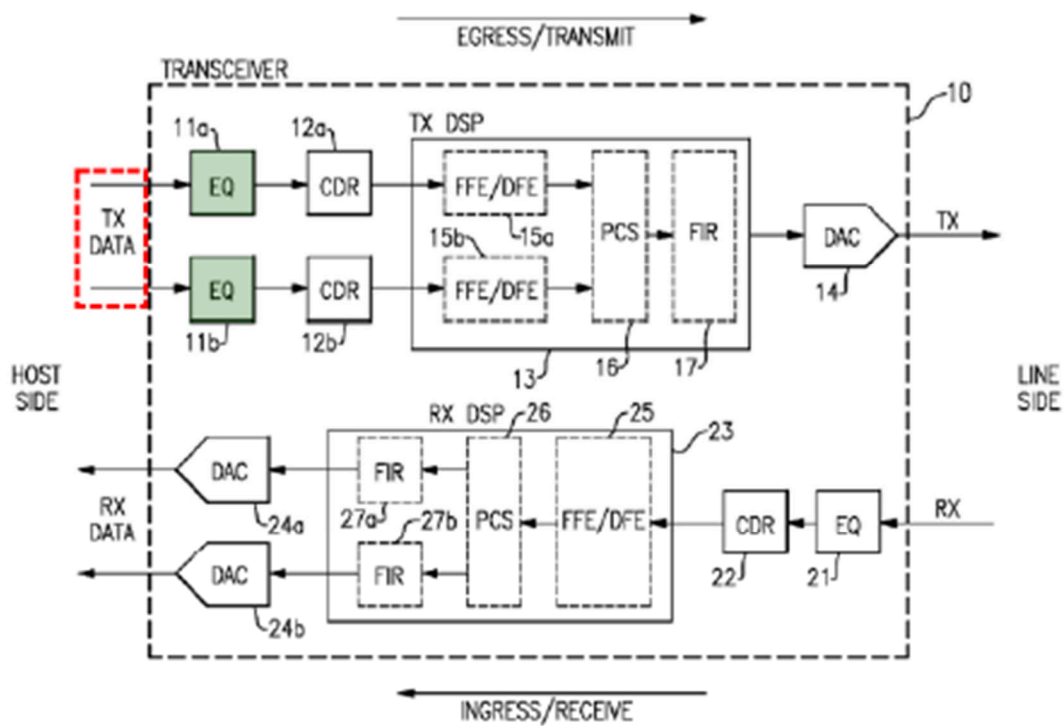


FIG.1A

EX-1005, FIG. 1A (annotated at Pet., 15).

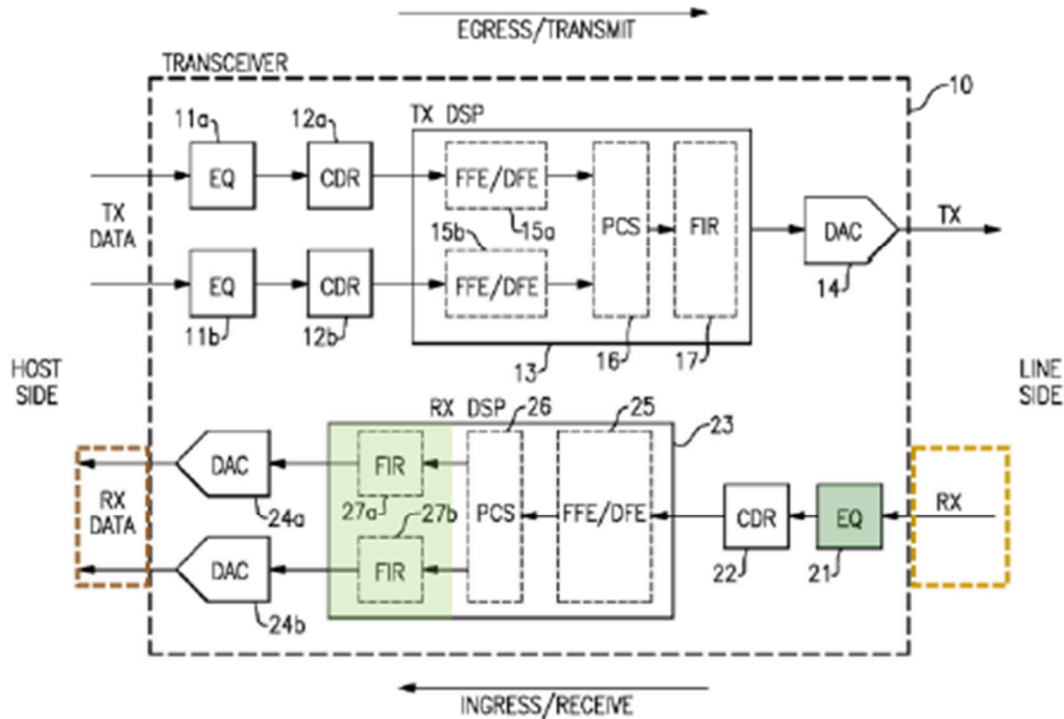


FIG.1A

EX-1005, FIG. 1A (annotated at Pet., 16).

Lugthart describes that equalizers 11a/11b “provide signal equalization to compensate for transmission line losses on the host side” by “boosting high frequency components of a signal relative to low frequency components of the signal.” EX-1005, 8:58-66. Lugthart does not provide any further detail of how this boosting is performed by equalizers 11a/11b, and nowhere states that this boosting is performed independently of cable characteristics. *Id.*; EX-2021, ¶42.

Lugthart is similarly terse with respect to FIRs 27a/27b, only describing that a digital signal processor (DSP) 23, including FIRs 27a/27b, can be used to “process (for example, filter or otherwise recover and condition) data recovered by

the receive path CDR circuit 22, and to deserialize the data to generate output signals having a desired modulation format for host side transmission.” EX-1005, 9:19-51. Lugthart does not describe with any specificity what functions FIRs 27a/27b perform within DSP 23 in FIG. 1A. *Id.* Nowhere does Lugthart describe that FIRs 27a/27b perform their functions with any specific parameters or coefficients, or that their functionality is performed independently of any cable characteristics. *Id.*; EX-2021, ¶43.

B. Aronson

Aronson describes an “active cable that is configured to communicate over much of its length using one or more optical fibers” that includes equalization to provide “compensation for high frequency loss in the host-board traces.” EX-1006, 2:29-3:3, 14:16-15:24; EX-2021, ¶44.

The Petition relies on Aronson’s FIGS. 12A and 12B (reproduced below) which are directed to an “active copper cable transmitter integrated circuit” and an “active copper cable receiver integrated circuit,” respectively. EX-1006, 3:62-65, 14:16-15:24, FIGS. 12A-12B; Pet., 12-14, 17-27; EX-2021, ¶45. Below, specific areas of Aronson relied upon by Petitioner are explained in greater detail.

1. Aronson’s alleged cable-independent equalization parameters

The Petition relies on Aronson’s “adjustable equalization” component in the FIG. 12A transmitter when mapping to cable-independent equalization parameters,

which compensates for “host board traces.” Pet., 17; EX-1006, 14:16-23; EX-2021, ¶46. Other than this general description of correcting host board traces, there is no explicit disclosure of cable-independent equalization parameters in the FIG. 12A transmitter of Aronson. *Id.*

The Petition cites to 15:1-8 of Aronson when discussing host board traces that are corrected by the FIG. 12B receiver, but this section of Aronson is concerned with “cable high frequency rolloff, rather than the host PCB traces.” Pet., 17; EX-1006, 15:1-8. In contrast with the cited disclosure of Aronson that describes the adjustable equalization component (15:1-8), the Petition’s annotated figure highlights Aronson’s preemphasis/output driver component which “help[s] overcome high frequency losses on long PCB traces.” Pet., 17; EX-1006, 15:17-24. Aronson’s description of the preemphasis/output driver is terse, and limited to explaining that the output driver provides “optional preemphasis.” Aronson does not describe implementation details such as the parameters or coefficients it uses for the “optional preemphasis.” EX-1006, 15:17-24. This disclosure also does not suggest anything about cable-independent equalization in Aronson. *Id.*; EX-2021, ¶47.

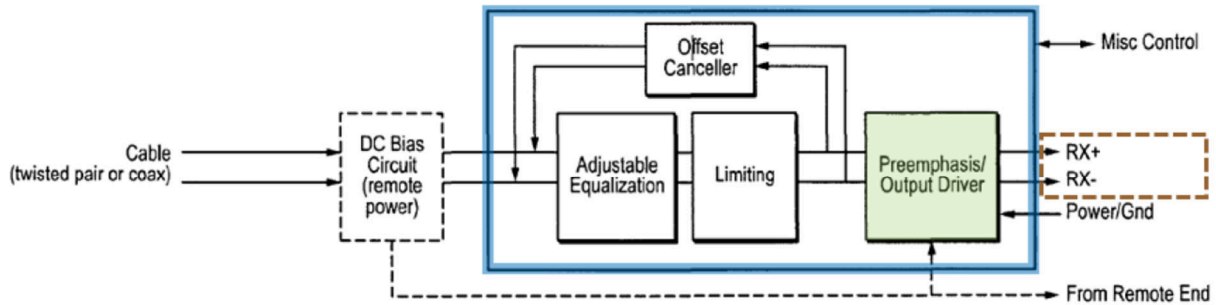


FIG. 12B

EX-1006, FIG. 12B (annotated at Pet., 17).

2. Aronson's alleged fixed equalization parameters

The Petition concedes that Aronson does not depict fixed equalization in its FIG. 12A transmitter and FIG. 12B receiver. Pet., 18. Instead, the Petition notes that Aronson describes that equalization “could” be fixed. *Id.* There is no explicit disclosure of fixed equalization parameters in Aronson. Pet., 18-20; EX-2021, ¶48.

3. Aronson's alleged cable-dependent equalization parameters

The Petition also identifies the preemphasis/output driver of Aronson's FIG. 12A transmitter and adjustable equalization component in Aronson's FIG. 12B receiver when mapping to the claims' cable-dependent parameters. Pet., 20-28; EX-2021, ¶49.

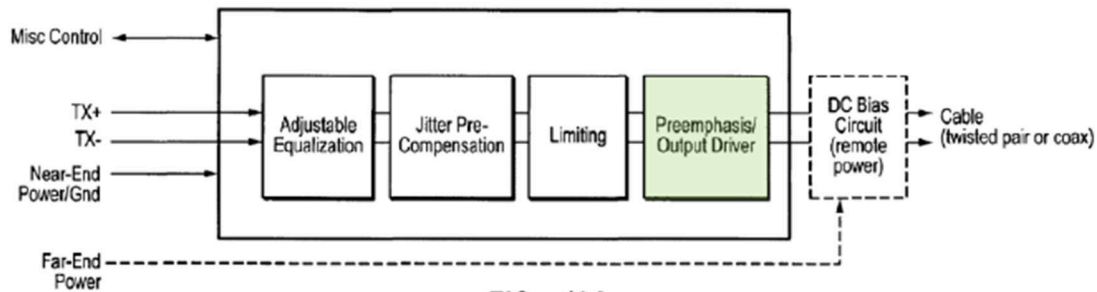


FIG. 12A

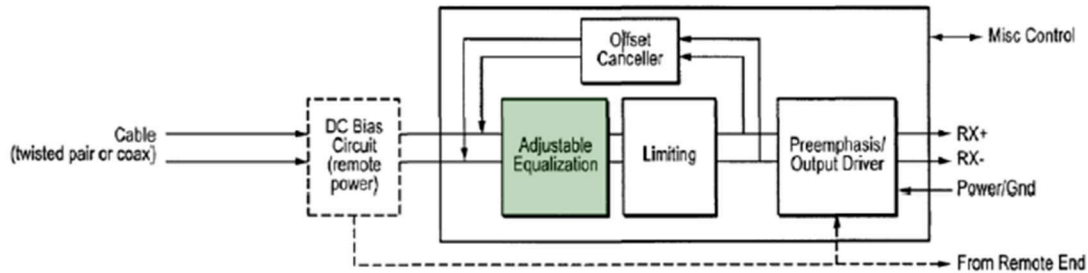


FIG. 12B

EX-1006, FIGS. 12A, 12B (annotated at Pet., 27).

Again, Aronson's description of both components in FIG. 12A/12B is terse. EX-1006, 14:33-39, 15:1-8. With respect to the preemphasis/output driver of FIG. 12A, Aronson describes that this component "provides preemphasis to the high frequency content of the transmitted signal to overcome the larger loss on the cable of these high frequencies." EX-1006, 14:33-39. Aronson suggests that "gains of 12 dB or larger may be used" in performing this function, but notes that gain "can be adjusted at factory setup individually to match the particular length of the characteristics of the copper cabling." *Id.*; EX-2021, ¶50.

With respect to the adjustable equalization component of FIG. 12B, Aronson describes that this component is provided to "compensate for the cable high frequency rolloff, rather than the host PCB traces in the case of the driver."

Aronson does not explicitly disclose any parameters or coefficients for its adjustable equalization component. *Id.*; EX-2021, ¶51.

C. Tang

Tang is directed to networking data cables supporting Ethernet communications between transceivers in host devices (*e.g.*, servers, routers, switches). EX-1007, [0001]-[0002], [0014]-[0017]. The Petition does not allege that Tang discloses or suggests the fixed, cable-independent, equalization parameters of the claims (it does not), and instead relies on the disclosure of Aronson in combination. Pet., 71-74, 85; EX-2021, ¶52.

D. TI-Retimer

TI-Retimer is a Texas Instruments DS125DF1610 retimer chip datasheet that Petitioner alleges was published March, 2017². EX-1008, 1. The Petition does not allege that TI-Retimer discloses or suggests the fixed, cable-independent, equalization parameters of the claims (it does not), and instead relies on the disclosure of Aronson in combination. Pet., 71-74, 85; EX-2021, ¶53.

² Patent Owner reserves the right to raise arguments against the authenticity and public availability of TI-Retimer in its Patent Owner Response, should institution be granted.

VII. PETITIONER HAS NOT SHOWN A REASONABLE LIKELIHOOD THAT IT WOULD PREVAIL IN PROVING THE OBVIOUSNESS OF ANY CHALLENGED CLAIM

A. The prior art does not disclose or suggest the claimed fixed, cable-independent, equalization parameters

The '252 Patent claims require: (1) respective transceivers each employing (2) fixed (3) cable-independent (4) equalization parameters for each of (5) the remodulation of the transit data stream as the outbound data stream, and (6) the clock and data recovery performed on the electrical input signal. EX-1001, Claim 1. The Petition fails to demonstrate that the prior art discloses or renders obvious these specific requirements.

1. Lugthart does not disclose the claimed fixed, cable-independent, equalization parameters

As an initial matter, the Petition fails to provide evidence that Lugthart teaches the claimed fixed, cable-independent equalization parameters. Although the passages cited by the Petition generally describe CDR and remodulation, they fail to disclose or suggest any specific requirement for the parameters used for each. Pet., 16-17; EX-1005, 7:58-10:8. Importantly, the Petition fails to identify any specific equalization parameter or produce any intrinsic evidence that Lugthart teaches fixed, cable-independent, equalization parameters, and instead concludes without any support or citation from Lugthart, that a POSITA would have understood these parameters to exist because Lugthart's equalizers and FIRs allegedly "compensate for host-side distortion/losses." Pet., 14-16; EX-2021, ¶54.

The Petition's failure to provide any clear evidence of equalization parameters within the prior art is not the result of any ambiguity in the '252 Patent, which clearly explains that suitable equalization parameters include "filter coefficient values for pre-equalizer filters in the transmitters, and gain and filter coefficient values for the receivers." EX-1001, 5:2-5. Even with these clear examples, the Petition makes no attempt to produce evidence of similar equalization parameters within Lugthart. Pet., 14-16. This is because Lugthart does not provide any detail on the parameters used by equalizers 11a/11b and finite impulse response (FIR) filters 27a/27b (what the Petition alleges as disclosing fixed, cable-independent, equalization parameters)³. *Id.*; see also EX-1005, 7:49-9:5; EX-2021, ¶55.

The failure of Petitioner and Dr. Min to produce any evidence in Lugthart of fixed, cable independent, equalization parameters is also not surprising because, as explained in Patent Owner's discretionary denial briefing, the Office has already determined that Lugthart does not disclose these features during the prosecution of

³ Petitioner alleges that Lugthart at 8:58-60 supports the notion that "DSP 23's FIR filters 27a/27b ("FIRs 27a/27b") pre-equalize the signals conveying outbound data stream RX." Pet., 15. This citation from Lugthart does not discuss FIRs 27a/27b, nor the FIRs' alleged ability to pre-equalize the outbound data stream. *Id.*

the '252 Patent. Indeed, the Examiner considered the features recited in limitation [1.E] (then claim 3) to be allowable over a rejection based on Lugthart, confirming that Lugthart failed to disclose or suggest fixed, cable-independent, equalization parameters. EX-1002; 155-157 (IDS citing Lugthart), 193-99 (Non-Final Office Action including rejections based on Lugthart), 227-33 (Notice of Allowance identifying Lugthart as the “closest reference”); Paper 6, 42-69. Therefore, Petitioner’s contention that Lugthart teaches fixed, cable-independent, equalization parameters is not just incorrect, but is also contradicted by the prosecution history. Pet., 16-17.

Indeed, Petitioner tacitly admits Lugthart’s deficiencies by relying on the disclosure of Aronson. Pet., 17-20. In so doing, both grounds of the Petition rise and fall with Aronson, which itself fails for the reasons discussed below⁴. *See infra*, §VI.A.2; EX-2021, ¶56.

2. The Petition fails to establish that Aronson (with or without Lugthart) renders obvious the claimed fixed, cable-independent, equalization parameters

Again, as with Lugthart, the Petition fails to provide evidence that Aronson teaches the claimed fixed, cable-independent equalization parameters. *See infra*,

⁴ Amphenol does not rely on Tang and TI-Retimer to address the claim features in limitation [1.E]. Pet., 29-40 (Ground 1), 74-84 (Ground 2).

§§VII.A.2.b, VII.A.2.c; Pet., 17-18 (*citing* EX-1006, 14:16-23, 15:1-8, 15:17-24); EX-1003, ¶136. The Petition improperly infers the existence of such parameters within Aronson, overlooking areas of Aronson that contradict this inference. *Id.*; EX-2021, ¶57.

a) Aronson is cumulative art that is not pertinent to the claimed features

Multiple references each cumulative to Aronson were also before the Office during the prosecution of the '252 Patent. As explained in Patent Owner's discretionary denial briefing, (1) the Examiner considered this near identical disclosure *before* and *after* the Applicant-initiated claim amendments that led to allowance (EX-1002, 2-3, 69-70), and (2) the Examiner identified references material to patentability in both Notices of Allowance, and in each instance, did not identify either of these references as being relevant (*id.*, 122-125, 231-233). Paper 6, 42-69. The Examiner's decision to not use either Aronson-like reference is not surprising, as Aronson is directed to solving a problem irrelevant to either CDR or remodulation. Rather, Aronson is predominantly concerned with "jitter precompensation" (or the correction of random and deterministic timing errors). EX-1006, 11:1-12:36, 14:23-27. Aside from generally describing CDR and remodulation (like Lugthart), Aronson does not disclose or suggest that fixed, cable-dependent, equalization parameters are used for each. EX-1006, 20:13-20, 20:37-44.

b) Aronson does not disclose fixed, cable-independent, equalization parameters

Like Lugthart, the Petition fails to provide evidence that Aronson teaches the claimed fixed, cable-independent equalization parameters—the Petition simply alleges that parameters exist in Aronson because of the presence of “[h]ost board traces.” Pet., 17-18. Even if Petitioner was improperly given the opportunity to expand their very limited reliance on Aronson in the Petition (14:16-23, 15:1-8, 15:17-24), there is no disclosure in Aronson’s FIG. 12A/12B that could be used to supplement these mappings and disclose or suggest such parameters⁵. EX-1006, 14:14-15:24. Aronson’s limited discussion of preemphasis gain is with respect to FIG. 12A’s preemphasis/output driver. EX-1006, 14:33-36, FIG. 12A; Pet., 17-18. Even if this disclosure was improperly credited with suggesting fixed, cable-

⁵ It is Petitioner’s burden to clearly establish their invalidity theories in the Petition. *Sanofi-Aventis Deutschland GmbH v. Mylan Pharms. Inc.*, 66 F.4th 1373, 1378 (Fed. Cir. 2023) (citing *In re Magnum Oil Tools Int’l, Ltd*, 829 F.3d 1375 (Fed. Cir. 2016); *Intelligent Bio-Sys., Inc. v. Illumina Cambridge Ltd.*, 821 F.3d 1359, 1369 (Fed. Cir. 2016) (“It is of the utmost importance that petitioners in the IPR proceedings adhere to the requirement that the initial petition identify ‘with particularity’ the ‘evidence that supports the grounds for the challenge to each claim.’”).

independent, equalization parameters (it should not be), this disclosure still fails to satisfy the claim language as it suggests only the features of Aronson's transmitter (not the receiver; the claims require "the respective transceivers each employing ..." the claimed parameters, e.g., both the transmitter and the receiver). *Id.*, see also EX-1001, Claim 1; EX-2021, ¶57.

In short, explicit disclosure of any equalization parameters does not exist in Aronson. Petitioner attempts to compensate with an inherency theory disguised as obviousness and supported by conclusory expert testimony.

c) The Petition's inference of cable-independent equalization parameters relies on inherency and conclusory expert testimony

The Petition's inference of cable-independent parameters in Aronson based on the presence of host-board traces is akin to inherency—something that "must be carefully circumscribed in the context of obviousness." Pet., 17; *Par Pharm., Inc. v. TWi Pharms., Inc.*, 773 F.3d 1186, 1195 (Fed. Cir. 2014) see also *In re Rijckaert*, 9 F.3d 1531, 1533-34 (Fed. Cir. 1993); *In re Oelrich*, 666 F.2d 578, 581 (Fed. Cir. 1981); *Hansgirg v. Kemmer*, 26 CCPA 937, 940-941 (CCPA 1937) ("The mere fact that a certain thing *may* result from a given set of circumstances is not sufficient [to establish inherency]." (internal quotations omitted)). One can only properly infer that cable-independent equalization parameters are inherently present as a solution to host-board traces in Aronson when they are the "natural

result” of these traces—logical reasoning that is deeply ingrained in the Federal Circuit’s precedent. *Id.* Aside from a mere seven lines from Aronson’s disclosure, and an expert simply saying so, Petitioner fails to produce any evidence as to why a POSITA would have understood that host-board traces illicit any naturally following solution—let alone cable-independent equalization parameters. Pet., 17 (citing EX-1006, 14:16-23); EX-2021, ¶58. There is simply nothing in Aronson that supports such a conclusion.

To cure this deficiency, Petitioner turns to Dr. Min to disguise its inherency theory as obviousness and gap-fill the lack of explicit disclosure in Aronson.

Compare EX-1003, ¶136 with Pet., 17; EX-1006, 14:16-23; EX-2021, ¶58.

However, Dr. Min’s testimony simply repeats the Petition’s alleged obviousness analysis and says that “[h]ost board traces are independent of the cable, so parameters compensating for them are cable-independent”—word-for-word the same argument in the Petition. *Compare* EX-1003, ¶137 with Pet., 17; *see infra* §VI.A.3. This is inherency masquerading as obviousness. Petitioner and Dr. Min must demonstrate that there are no other reasonable solutions to host-board traces, and thus, a POSITA would naturally seek to correct these traces with only cable-independent equalization parameters. *Id.* It is Petitioner’s burden to prove this theory—not the Patent Owner’s burden to dispute it. *Mylan Pharms*, 66 F.4th 1373, 1378; *Magnum Oil Tools*, 829 F.3d 1375; *Intelligent Bio-Sys.*, 821 F.3d

1359, 1369.

In contrast to Petitioner’s assertions, Aronson describes cable-dependent equalization. EX-1006, 14:33-39 (“The amount of gain can be adjusted at factory setup individually to match the particular length of the characteristics of the copper cabling”), 15:1-8 (“Adjustable but factory set equalization is of particular interest because the cable length and characteristics will be established at the time of the cable manufacture”). Petitioner’s theory (whether inherency or obviousness) overlooks that Aronson’s equalization disclosure is focused on cable transmission-side communication which is dependent on cable characteristics. *Id.* No explanation is provided in the Petition as to why a POSITA would discard Aronson’s explicit teachings, absent a single conclusory statement with respect to host board traces. Pet., 17; EX-2021, ¶59.

d) Petitioner’s inference that equalization parameters in Aronson are fixed is unfounded as Aronson frequently describes adjustable equalization

Aronson frequently discloses that equalization can be “adjustable” or “adaptable,” and explains that adjustable equalization “is of particular interest because the cable length and characteristics will be established at the time of the cable manufacture”— suggesting that any parameters associated with this equalization would have been adjustable, and that they would have depended on cable length and characteristics (such that they are not cable-independent). EX-

1006, 15:1-8, 15:17-24 (emphasis added); EX-2021, ¶60. Adjustable parameters that depend on cable characteristics are neither “fixed” nor “cable-independent,” as claimed.

Additionally, Aronson discloses that the amount of “gain” used in preemphasis “can be adjusted at factory setup individually to match the particular length of the characteristics of the copper cabling,” further indicating that any parameters in Aronson would have been adjustable and cable-dependent. EX-1006, 14:33-39 (emphasis added). Finally, Aronson even suggests that CDR may be eliminated entirely “if the active cable sufficiently limits jitter because of the choice of fiber ... [or] length,” implying that CDR isn’t even performed in some embodiments of Aronson for certain cables (such that the existence of CDR itself is cable-dependent in Aronson). EX-1006, 20:13-20; EX-2021, ¶61. Accordingly, contrary to Petitioner’s inferences, if Aronson suggests any equalization parameters (it does not), it clearly suggests adjustable, cable-dependent equalization parameters—not fixed cable-independent, equalization parameters.

Although Aronson discloses that equalization “could” be fixed, the mere possibility of fixed equalization is insufficient to demonstrate the obviousness of using fixed equalization parameters when combining Aronson’s disclosure into Lugthart (assuming *arguendo* that these references are combinable, and that equalization parameters even exist in Aronson). *In re Gordon*, 733 F.2d 900, 902

(Fed. Cir. 1984) (“The mere fact that the prior art could be so modified would not have made the modification obvious unless the prior art suggested the desirability of the modification.”); *Belden Inc. v. Berk-Tek LLC*, 805 F.3d 1064, 1073 (Fed. Cir. 2015) (“[O]bviousness concerns whether a skilled artisan not only could have made but would have been motivated to make the combinations or modifications of prior art to arrive at the claimed invention.”). Although Dr. Min claims that the decision to use fixed or adjustable equalization is a tradeoff, this analysis is discussed in a vacuum and is not related to the combination of Lugthart and Aronson, and specifically, why a POSITA would implement fixed equalization in Lugthart in light of Aronson’s explicit preference for adjustable equalization. EX-1003, ¶¶139-140. For example, the Petition’s design choice remarks are not described in the context of Lugthart-Aronson combination system, or any features thereof, and thus simply provide an abstract tradeoff discussion disconnected from the references and claimed features. *See* Pet., 18-19; EX-2021, ¶62.

Indeed, even if a tradeoff between fixed and adjustable equalization existed, the mere existence of such a design choice does not establish a basis for why a POSITA would discard the explicit teachings of Aronson, absent impermissible hindsight (something that Dr. Williams confirms). *KSR*, 550 U.S. at 421 (“A factfinder should be aware, of course, of the distortion caused by hindsight bias and must be cautious of arguments reliant upon ex post reasoning”) (citing

Graham v. John Deere Co., 383 U.S. 1, 36, 86 as “warning against a temptation to read into the prior art the teachings of the invention in issue and instructing courts to guard against slipping into use of hindsight”); *see also Zoltek Corp. v. United States*, 815 F.3d 1302 (Fed. Cir. 2016); *Princeton Biochemicals, Inc. v. Coulter, Inc.*, 411 F.3d 1332, 1337 (Fed. Cir. 2005); EX-2021, ¶63.

Because the Petition fails to provide any explicit disclosure or non-conclusory testimony to support the existence of fixed, cable-independent, equalization parameters in Lugthart and Aronson, the Petition’s mappings fail. Petitioner’s inferences miss the mark as (1) Petitioner’s inference of cable-independent parameters depends on an inherency theory that fails, and (2) Aronson promotes adaptive equalization, such that an inference of fixed equalization parameters is improper. Again, because both grounds of the Petition rely on Aronson with respect to limitation [1.E], both grounds fail.

3. The Petition is over-reliant on conclusory expert testimony, particularly in areas where the alleged prior art is deficient

Dr. Min’s testimony simply repeats the Petition’s analysis in multiple critical areas where the Petition draws inferences from the prior art references’ explicit disclosure. No additional support or corroboration is provided by Dr. Min in validating these inferences, and his declaration is simply an unsupported opinion which should be entitled to little weight.

The Board has rightly held that conclusory expert opinions are “entitled to

little weight.” *Xerox Corp. v. Bytemark, Inc.*, IPR2022-00624, Paper 9 at 15 (PTAB Aug. 24, 2022) (precedential) (citing *Upjohn Co. v. Mova Pharm. Corp.*, 225 F.3d 1306, 1311 (Fed. Cir. 2000) (“Lack of factual support for expert opinion to factual determinations, however, may render the testimony of little probative value in a validity determination.”)); *see also Ashland Oil, Inc. v. Delta Resins & Refractories, Inc.*, 776 F.2d 281, 294 (Fed. Cir. 1985)); *Carella v. Starlight Archery & Pro Line Co.*, 804 F.2d 135, 138 (Fed. Cir. 1986). The Director has similarly recognized that an over reliance on expert testimony favors a denial of institution. EX-2003 (“extensive reliance on expert testimony and/or reasonable disputes between experts on dispositive issues may suggest that the questions are better resolved in an Article III court”).

Petitioner’s evidence of fixed, cable-independent, equalization parameters in Lugthart largely relies on conclusory expert testimony from Dr. Min that repeats the same arguments in the Petition nearly word-for-word. *Compare* EX-1003, ¶134 *with* Pet., 16. There is nothing of substance in Dr. Min’s testimony that explains why the compensation of host-side distortion or losses renders obvious fixed, cable independent, equalization parameters. *Id.* It is Petitioner and Dr. Min’s burden to prove this relationship, yet neither offer evidence of fixed, cable independent, equalization parameters in the prior art. *Mylan Pharms*, 66 F.4th 1373, 1378; *Magnum Oil Tools*, 829 F.3d 1375; *Intelligent Bio-Sys.*, 821 F.3d

1359, 1369.

For Aronson, Petitioner again turns to Dr. Min to gap-fill the lack of disclosure, and Dr. Min again repeats the Petition’s analysis largely word-for-word, claiming that Aronson “compensat[es] for high frequency loss in ... host board traces.” *Compare* EX-1003, ¶136 with Pet., 17; EX-1006, 14:16-23. Dr. Min simply says that “[h]ost board traces are independent of the cable, so parameters compensating for them are cable-independent”—again word-for-word the same argument in the Petition. *Compare* EX-1003, ¶137 with Pet., 17. Again, Petitioner and Dr. Min fail to offer any evidence of fixed, cable independent, equalization parameters in the prior art and, thus, fail to meet their burden to prove what they assert. *Mylan Pharms*, 66 F.4th 1373, 1378; *Magnum Oil Tools*, 829 F.3d 1375; *Intelligent Bio-Sys.*, 821 F.3d 1359, 1369.

For both Lugthart and Aronson, all Dr. Min offers is his unsupported opinion. Petitioner uses Dr. Min’s testimony to validate Petitioner’s mistaken inferences in the art, and upon inspection, this testimony from Dr. Min simply repeats the same mistaken inferences. Tellingly, no additional evidence or corroboration is provided in Dr. Min’s testimony for these inferences. This is because the Petition’s inferences are simply incorrect and the related conclusory expert testimony should be given little weight.

B. Petitioner fails to establish that Lugthart and Aronson are combinable

The Petition simply alleges that “[t]o the extent Lugthart-993 is considered to not expressly teach or suggest using cable-independent parameters for pre-equalizing and equalizing signals to and from the host, Aronson does” and that “Aronson also teaches that these cable-independent parameters are fixed.” Pet., 17-18 (emphasis removed); EX-2021, ¶64. This is nothing more than a conclusory statement that does not explain how or why a POSITA would incorporate Aronson’s teachings into Lugthart.

It is well settled that “rejections on obviousness cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness.” *KSR Intn’l Co. v. Teleflex Inc.*, 550 U.S. 398, 418 (2007) (quoting *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006)); *PersonalWeb Techs., LLC v. Apple, Inc.*, 848 F.3d 987, 993 (Fed. Cir. 2017) (explaining that it is insufficient to allege “that a skilled artisan, once presented with the two references, would have understood that they could be combined.”). Petitioner must demonstrate a plausible theory on how the primary reference, Lugthart, would have operated after the modification based on Aronson’s disclosure. *PersonalWeb Techs.*, 848 F.3d at 993-994 (“Indeed, the Board nowhere clearly explained, or cited evidence showing, how the combination of the two references was supposed to work” ... “complexity or obscurity of the

technology or prior-art descriptions may well make more detailed explanations necessary.”).

The Federal Circuit also emphasized the need for explicit combination analysis in *In re Nuvasive, Inc.*, where the court vacated the PTAB’s obviousness determination in an IPR for relying on “only one conclusory statement.” *In re Nuvasive, Inc.*, 842 F.3d 1376, 1382 (Fed. Cir. 2016). In its decision the court stated that “[t]he factual inquiry whether to combine references must be thorough and searching, and [t]he need for specificity pervades [our] authority.” *Id.*, at 1381–82 (quoting *In re Lee*, 277 F.3d 1338, 1343 (Fed. Cir. 2002)) (emphasis added and internal quotes omitted). The court further explained that “First, the PTAB must make the necessary findings and have an adequate evidentiary basis for its findings Second, the PTAB must examine the relevant data and articulate a satisfactory explanation for its action including a rational connection between the facts found and the choice made.” *Id.* at 1382 (emphasis added and internal quotes omitted).

It is not the job of the Patent Owner (and the Board) to ascertain the scope and nature of the Petition’s combination and provide the necessary supporting analysis—it is firmly the Petitioner’s burden to demonstrate how and why the disclosures of Lugthart and Aronson would have been combined. *Mylan Pharms*, 66 F.4th 1373, 1378; *Magnum Oil Tools*, 829 F.3d 1375; *Intelligent Bio-Sys.*, 821

F.3d 1359, 1369. Here, there are numerous unanswered questions with respect to the scope, motivation, and expectation of success of the combination.

First, what exactly is being combined into Lugthart from Aronson is unexplained in the Petition, which simply alleges that a POSITA would implement Lugthart “in the same manner” as Aronson. Pet., 17-29. The Petition frequently references Aronson’s FIGs 12A and 12B, with Petitioner identifying particular components within these figures as allegedly being relevant to the ’252 Patent’s claims (for example, the “Preemphasis/Output Driver” of FIG. 12A and the “Adjustable Equalization” component of FIG. 12B). *Id.* Yet, no explanation is provided as to where these components would have been incorporated into Lugthart’s transceivers. *Id.* To the extent Petitioner would argue that Lugthart’s alleged parameters would have been modified “in the same manner” as Aronson, without the need of any particular component in Aronson’s transmitters and receivers, (1) this theory is not clearly established in the Petition, and (2) Lugthart does not disclose any parameters to modify, as explained above, rendering the combination inoperable. *Id.*; *see supra* §VII.A.1. Petitioner alleges that a POSITA would implement Lugthart “in the same manner” as Aronson, yet Petitioner completely fails to explain what that “manner” would have been. *Id.*; *KSR*, 550 U.S. 398, 418; *PersonalWeb Techs.*, 848 F.3d at 993-994; EX-2021, ¶65.

Second, the Petition’s arguments for a POSITA’s expectation of success in

implementing the combination are circular. Pet., 29. In a single paragraph, Petitioner alleges that a POSITA would have expected success in combining Aronson into Lugthart because “Lugthart-993 already discloses cable-dependent and cable-independent parameters” and “every above-discussed design choice was well-known as demonstrated by Aronson and numerous other references.” *Id.* These statements assume (1) that both Lugthart and Aronson disclose the claimed fixed, cable-independent, equalization parameters, despite the fact that both references lack any explicit disclosure, as explained above, and (2) simply because concepts are allegedly well-known, combining such known concepts would automatically have had a reasonable expectation of success. *Id.*; *see supra* §VII.A.1; EX-2021, ¶66. But if such logic were applied, combining all well-known concepts would have had a reasonable expectation of success.

More, even if one were to accept Petitioner’s alleged motivation to combine the references or the alleged inherent features in the asserted references, the Petition’s one paragraph explanation of an expectation of success is woefully insufficient. Indeed, reliance on an implicit showing of reasonable expectation of success may not be sufficient to establish a *prima facie* showing of obviousness. *Eli Lilly & Co. v. Teva Pharms. Int’l GmbH*, 8 F.4th 1331, 1344, 2021 USPQ2d 862 (Fed. Cir. 2021) (A finding that a patent challenger in an *inter partes* review had demonstrated a motivation to combine references does not

necessarily imply that the challenger had also met its burden of showing a reasonable expectation of success.). The lack of a reasonable expectation of success is compounded by the lack of a clear explanation of which features from Aronson are being combined into the Lugthart system (the Petition presenting FIGS. 12A-B of Aronson, but describing only that Lugthart would have been implemented “in the same manner” as Aronson). Pet., 17-29; EX-2021, ¶65.

Finally, Petitioner’s combination motivation is further strained by the fact that fixing Lugthart’s equalization, as allegedly taught by Aronson, would have changed of Lugthart’s principle of operation, which is firmly rooted in higher accuracy equalization obtained through adaptive and configurable equalization. EX-1005, 4:25-29, 28:40-47, 28:57-63, 46:30-39. Indeed, Lugthart explains that adaptive equalization is preferred for “relatively high data rates,” despite the higher sophistication. *Id.*, 31:27-45, 46:30-39. Petitioner and Dr. Min’s own evidence confirms that the benefits of adaptive equalization were well known in the art. Pet., 18-19; EX-1003, ¶139-140; EX-1011, ¶[0011] (“Adaptive equalization is attractive as it will automatically compensate for the different changes that can be introduced by different links. This enables interoperability of different subsystems in the system.”); EX-1017, 1:39-42 (“Due to the often complex mix of factors causing distortion on real-world links, adaptive equalization has generally been favored over static equalization to compensate for such distortion.”); EX-1014,

¶[0036], (“Accordingly, there is a need for an adaptive equalization scheme that provides optimum level of equalization. There is a need for an adaptive equalization scheme that detects when the equalizer is trapped in a failure state. There is also a need for an adaptive equalization scheme that allows the equalizer to recover from the failure state.”) (emphasis added); EX-2021, ¶67.

Petitioner and Dr. Min’s allegation of a “tradeoff” between adaptive and fixed equalization overlooks that Lugthart clearly indicates what side of the tradeoff it prefers. Lugthart does not prefer the lower cost and simplicity of fixed equalization. EX-1005, 4:25-29, 28:40-47, 28:57-63, 31:27-45, 35:60-67, 46:30-39. Lugthart clearly prefers the accuracy of adaptive equalization at higher data rates. *Id.* The proposal to fix Lugthart’s equalization (as allegedly disclosed in Aronson) would have destroyed the accuracy of Lugthart’s equalization at these high data rates—a principle central to Lugthart’s operation and purpose. *Id.* Combinations that change the “basic principles under which the [prior art] was designed to operate ... fail to support a conclusion of obviousness.” *Plas-Pak Indus. v. Sulzer Mixpac AG*, 600 Fed. Appx. 755, 758-759 (Fed. Cir. 2015); *see also In re Mouttet*, 686 F.3d 1322 (Fed. Cir. 2012); *In re Ratti*, 270 F.2d 810, 46 C.C.P.A. 976, (CCPA 1959)); EX-2021, ¶68.

The Petition thus fails to establish a *prima facie* case of obviousness with regard to its proposed combination of Lugthart and Aronson, and for this additional

reason, institution should be denied.

C. Petitioner fails to establish that Tang, TI-Retimer, and Aronson are combinable

As an initial matter, the Petition relies solely on Aronson’s disclosure with respect to claim limitation [1.E]. Pet., 71-74 (discussion of “cable-independent,” “fixed,” and “cable-dependent” equalization parameters that all cite to Ground 1 analysis of Aronson), 87 (referring the reader to the combination analysis for Ground 2, which refers the reader to Ground 1); EX-2021, ¶69. Accordingly, the Petition’s mappings to the features of limitation [1.E] in Ground 2 are entirely contained within the Petition’s Ground 2 combination analysis for Tang, TI-Retimer, and Aronson (which itself is dependent entirely on the combination analysis for Lugthart and Aronson in Ground 1, as evidenced by frequent *supra* cites). *Id.*; Pet., 71-74; *see supra*, §VII.B. Indeed, for each and every feature described in the combination of Tang, TI-Retimer, and Aronson the Petition refers the reader to the analysis with respect to Lugthart and Aronson. *Id.* Accordingly, Petitioner’s combination of Tang, TI-Retimer, and Aronson is deficient for the same reasons as discussed above⁶.

⁶ It is Petitioner’s burden to clearly establish their combination theories in the Petition. *Mylan Pharms. Inc.*, 66 F.4th 1373, 1378 (citing *Magnum Oil Tools*, 829

VIII. CONCLUSION

For the foregoing reasons, Patent Owner respectfully requests that the Board deny institution of Grounds 1-2 of the Petition, and thus decline to institute *inter partes* review of any claim of the '252 Patent.

F.3d 1375; *Intelligent Bio-Sys.*, 821 F.3d 1359, 1369. The only combination theories presented in the Petition for Tang, TI-Retimer, and Aronson in Ground 2 depend on the Petition's earlier analysis in Ground 1 (Lugthart-Aronson). Any subsequently presented combination theories expanding the Petition's Ground 2 combination analysis (past the analysis in Ground 1) are new arguments.

Respectfully submitted,

Date: August 12, 2025

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CERTIFICATION UNDER 37 C.F.R. §42.24(d)

Under the provisions of 37 C.F.R. §42.24(d), the undersigned hereby certifies that the word count for the foregoing Patent Owner's Preliminary Response to Petition totals 6,780, which is less than the 14,000 allowed under C.F.R. §42.24(b)(1).

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CERTIFICATE OF SERVICE

Pursuant to 37 CFR § 42.6(e)(4), the undersigned certifies that on August 12, 2025, a complete and entire copy of this Patent Owner's Preliminary Response and accompanying exhibits were provided by email to Petitioner by serving the correspondence email address of record as follows:

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