

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Marvell Semiconductor, Inc.,

Petitioner,

v.

Credo Technology Group Ltd.,

Patent Owner.

IPR2025-01220

U.S. Patent No. 11,032,111

**PETITIONER'S REPLY TO
PATENT OWNER'S RESPONSE**

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UPDATED EXHIBIT LIST

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1002	Certified Prosecution History for the '111 patent ("Prosecution History")
1003	Declaration of Michael S. Chen
1004	U.S. Patent App. Pub. No. 2019/0288881 to Berke et al. ("Berke")
1005	U.S. Patent No. 8,516,238 to Cornelius, et al. ("Cornelius")
1006	U.S. Patent No. 10,715,357 to Ran ("Ran")
1007	U.S. Prov. App. Serial No. 62/722,517 ("Ran Provisional")
1008	Excerpts from Stauffer, High Speed Serdes Devices and Applications ("Stauffer")
1009	U.S. Patent App. Pub. No. 2014/0237301 to Mejia et al. ("Mejia")
1010	PCI Express Base Specification Revision 3.0 (Nov. 10, 2010)
1011	Serial ATA Revision Specification 3.1 (July 18, 2011)
1012	Excerpts of IEEE 802.3-2015 Standard
1013	Declaration of June Munford re: Stauffer
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1017	U.S. Patent App. Pub. No. 2013/0223506 to Kolze
1018	U.S. Patent App. Pub. No. 2010/0232493 to Thirumoorthy
1019	U.S. Patent App. Pub. No. 2013/0201316 to Binder et al.
1020	U.S. Patent No. 5,648,972 to Gharakhanian
1021	U.S. Prov. App. Serial No. 63467_62723701 ('111 Patent Provisional)
1022	Excerpts from Gasca, et al., CMOS Continuous-Time Adaptive Equalizers for High-Speed Serial Links
1023	U.S. Patent No. 7,233,617 to Gorecki
1024	U.S. Patent App. Pub. No. 2003/0035497 to Gorecki et al.
1025	TE Connectivity, SFP+ High Speed Copper Cable Assemblies
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1028	U.S. Patent No. 8,665,941 to Eliaz
1029	U.S. Patent No. 8,600,039 to Chen et al.
1030	U.S. Patent No. 5,392,315 to Laud
1031	IAM – "IPBC Global 2025: Acting USPTO Director says IPR use needs to change"

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1033	In re Certain Active Electrical Cables and Components Thereof, Inv. No. 337-TA-1446, Document Details of EDIS No. 859233, Order Granting Non-Party Marvell Semiconductor Inc.’s Motion to Disqualify Fish & Richardson P.C. (Aug. 11, 2025)
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1047	Statement from U.S. Secretary of Commerce Howard Lutnick (Jun. 3, 2025)
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Grounds 1-5 disclose all limitations, as the Petition explained. PO attacks the prior art teachings based on unclaimed limitations and mischaracterizations. PO's attacks on the motivation to combine are similarly unavailing because they rely on bodily incorporation and other legally improper arguments, which are belied by the prior art and both experts.

I. GROUND 1 AND 2

A. Claims 1, 8, and 16: Berke teaches multiple registers for pre-equalizer coefficients, each corresponding to a different channel model

PO argues that Berke lacks the recited correspondence between registers/coefficient values and channel models because its whitelisted equalization coefficients are determined based on “measured performance,” not “knowledge of respective channel characteristics.” POR, 21-26, 32, 37-38, 44. While PO admits Berke discloses two pathways for populating the whitelists: “(1) knowledge gained during design, development, or manufacturing ...; and (2) knowledge gained during normal operation,” a key premise in PO's argument is that both pathways include only performance measurements rather than channel characteristics. POR, 22. This contradicts Berke and both experts.

Berke distinguishes the knowledge that is the basis for determining whitelisted pre-equalizer coefficients from the resulting performance. The whitelisted pre-equalizer coefficients are “*determined based upon*” design,

manufacturing, or normal operation knowledge, and “*result in*” robust performance. Ex-1004, ¶31. Paragraph 30 confirms this basis-versus-result distinction in two separate sentences—whitelisted coefficients “can be *determined based upon* knowledge gained during the design ... of serial channel” and certain settings “are *known to produce* ... a particularly robust [performance]” Ex-1004, ¶30 (emphasis added). These separate disclosures would have been meaningless if the gained knowledge was merely observed performance, as PO asserts (POR, 22).

The experts confirmed that Berke’s knowledge includes channel characteristics. Dr. Chen explained that Berke’s design/manufacturing knowledge includes characteristics of “circuit traces, connectors, and cables,” “compliance with standards,” “insertion loss and other signal degradations,” and “impedance,” while its normal operation knowledge includes “receiver equalization settings” and “environmental conditions such as temperature and noise levels.” Ex-1003, ¶¶54-55 (citing Ex-1004, ¶3, ¶¶12-13, ¶16, ¶¶18-19, ¶21). Dr. Williams corroborated Dr. Chen on deposition, testifying that design/manufacturing knowledge includes “the wire’s length, gauge, and metal composition,” “insulation and [] impedance,” “the characteristics of the connectors,” “[f]requency of operation, ... electrical characteristics,” and “package loss.” Ex-1050, 87:15-21, 87:22-88:8, 89:8-13, 90:15-91:1, 94:16-22, 95:14-96:15. Normal operation knowledge, he testified, includes “the actual operating temperature,” “capacitive injection of energy,”

“noise,” “reflection coefficients,” and “insertion loss.” Ex-1050, 90:15-91:20, 95:1-13.

Berke’s channel-characteristic knowledge is not “general background awareness of channel conditions,” as PO asserts (POR, 21-23)—it is the basis for determining equalization coefficients. Ex-1004, ¶¶30-31. Dr. Chen explained the causal relationship—robust performance is achieved when pre-equalizer coefficients compensate for the channel loss/distortion that results from a channel’s characteristics. Ex-1003, ¶53, ¶56; Ex-1050, 26:17-27:1. Therefore, measured robust performance indicates fit between a set of pre-equalizer coefficients and a channel model that represents the channel characteristics relied upon to determine the coefficients. Ex-1003, ¶56. In asserting that Petitioner’s theory “would render the ‘channel model’ limitation meaningless” (POR, 24), PO improperly ignores Berke’s teaching of determining whitelisted pre-equalizer coefficients based on known channel characteristics and verifying the fit between the coefficients and the channel model based on performance measurement.¹

¹ PO’s prosecution history argument (POR, 25) also fails. None of the Examiner’s references determines pre-equalizer coefficients for storage based on known channel characteristics and verifies channel model fit based on performance measurement. Ex-1002, 000334-40. Regardless, this argument carries little weight

PO's remaining attacks on Berke's "channel model" teaching (POR, 21-24) fare no better: they rest entirely on limitations found nowhere in the challenged claims. First, PO argues the claims imply "model-based selection," distinguishing Berke for using "real-time performance feedback" instead. POR, 23-24. But the challenged claims do not require using knowledge of a channel model or "input model" in selecting a register. Ex-1050, 105:21-107:11. PO's own expert admitted claim 1 does not require a certain manner of selecting (Ex-1050, 80:8-10) or "characterization of the channel" before selecting (*id.*, 91:21-92:15). Indeed, dependent claim 4 recites "said selecting includes ... determin[ing] a performance characteristic for each of the multiple registers" and PO does not dispute Berke satisfies it. Ex-1001, cl. 4; *see also* Ex-1050, 96:16-21. PO's own characterization of the '111 patent's invention also includes performance feedback as part of the selecting step. POR, 5 ("estimate or measure error signals"). PO cannot distinguish Berke for including a feature encompassed by the claimed invention.

Second, PO faults Berke for not "defin[ing], characteriz[ing], or index[ing] to discrete models." POR, 22-24. None of these operations is recited in the challenged claims, and the terminology has little meaning: Dr. Williams admitted

because it relies on speculation: the Examiner never explained why certain claims were found allowable or how "channel model" was interpreted.

“discrete models” just means models that differ from each other (Ex-1050, 96:22-97:9), declined to opine that claim 1 requires “defining” a channel model (*id.*, 97:17-19), agreed that “characterizing” a channel model can rest on “experimental tests,” and admitted that pre-equalizer coefficient values are “indexed” to different channel models so long as “they are different” (*id.*, 99:2-11, 105:8-13, 101:3-8). PO cannot distinguish Berke based on these concepts because it does not dispute Berke teaches whitelisted pre-equalizer coefficients that are different and contends they are determined experimentally (POR, 22-24).

Third, PO argues Berke “contradicts the notion of a one-to-one mapping” between coefficients and channel models because multiple whitelisted sets can serve as training starting points. POR, 24-25. This ignores that claim 1 requires correspondence with *channel models*, not *actual channel* on which training is performed. In any event, Berke is not limited to this scenario, describing it as a possibility: “[i]t is possible for multiple different sets of compensation values to result in acceptable BER ...” Ex-1004, ¶13. PO’s own expert confirms claim 1 “allow[s] the possibility that multiple candidate set[s] of initial pre-equalizer coefficient values ... can act as a starting point.” Ex-1050, 83:17-84:1.

PO also attacks Berke for teaching a “training algorithm [that] may need to be repeated multiple times.” POR, 21-22. However, this pertains to the training phase of limitation [1b], which PO does not dispute Berke satisfies (Pet., 26-27),

and has nothing to do with whether Berke uses channel characteristics to determine whitelisted coefficients.

Ultimately, all the claims require is that the initial coefficient values/registers correspond to different channel models (Ex-1001, cls. 1, 8, 16), which, according to PO's expert, is a very broad requirement. Ex-1050, 79:13-80:3 ("Inherently, equalizer coefficients would correspond to some channel model."), 85:15-21. Without importing unrecited limitations, PO has no reasonable basis to contend that this correspondence requirement is not met.

B. Claim 1: Berke's transmitter-side operations satisfy limitations [1a], [1b], and [1c].

PO argues that claim 1 requires "the selecting [1a], updating [1b], and using [1c] all occur within the same transceiver—not distributed across two different devices at opposite ends of a serial link" and Berke fails to satisfy this requirement. POR, 26-28, 37. This argument should be rejected for two independent reasons.

First, PO's interpretation contradicts its own characterization of the '111 patent's invention. According to the POR, the '111 patent's "selection of optimal starting point set of coefficients" and the training process for updating pre-equalizer coefficients each require "communication between a transmitter and a receiver" "via backchannel." POR, 5-6 (citing Ex-1001, 14:12-15:3, Fig. 8). PO's interpretation also excludes embodiments of the '111 patent (*see* Ex-1001, 7:21-24, 7:43-59, 9:34-47, 13:46-64, 14:12-15:3, Fig. 8; Ex-1050, 121:8-125:8), none of

which disclose all three steps performed within one transceiver. *Oatey Co. v. IPS Corp.*, 514 F.3d 1271, 1276 (Fed. Cir. 2008) (“[Courts] normally do not interpret claim terms in a way that excludes embodiments.”). Accordingly, claim 1’s “in a transceiver,” which follows “comprises,” should be interpreted as encompassing one or more transceivers. *TiVo, Inc. v. EchoStar Commc’ns Corp.*, 516 F.3d 1290, 1303 (Fed. Cir. 2008) (“As a general rule, the words ‘a’ or ‘an’ in a patent claim carry the meaning of ‘one or more.’”); *01 Communique Lab’y, Inc. v. LogMeIn, Inc.*, 687 F.3d 1292, 1294, 1299-1300 (Fed. Cir. 2012).

Second, the Petition sufficiently establishes how Berke’s transmitter-side transceiver performs all three steps of claim 1. Berke selects and updates pre-equalizer coefficients using back channel communication between the transmitter and the receiver. Ex-1004, ¶13, ¶¶19-20; Ex-1051, ¶3. The Petition explains that “Berke selects a whitelist set of equalization coefficients ... by configuring the serial channel with each set of coefficients ... and monitoring the performance.” Pet., 23. Here, the transmitter performs the “configuring” operation. Ex-1004, ¶¶13-14, ¶¶19-20, ¶¶30-33; Ex-1051, ¶4; Ex-1003, ¶52, ¶87, ¶¶101-102. The Petition further explains that “Berke describes a training phase during which variations of pre-equalizer coefficients ... are run and performance characteristics ... are recorded.” Pet., 26. Again, the transmitter runs variations of the coefficients in this process. Ex-1004, ¶20; Ex-1051, ¶5; Ex-1003, ¶58. PO concedes that

Berke's transmitter performs the "using" step. POR, 27. Therefore, Berke's transmitter-side transceiver performs all three steps of claim 1. Ex-1051, ¶¶3-6.

C. Claim 11: The Berke-Cornelius and Berke-Ran combinations each teaches "the port transceiver determines a performance characteristic."

PO admits Berke's receiver determines a performance characteristic: "Berke does teach evaluating performance metrics (eye height/width, BER) and selecting among whitelist sets based on performance." POR, 34. PO instead takes issue with how the performance characteristic is determined in Berke. According to PO, the determination "must occur across the chip-to-module boundary: the port transceiver (host receiver) must evaluate coefficient sets stored in the module's controller and select among them," whereas "Berke performs this evaluation and selection within a single endpoint system where the receiver directly observes the transmitter's signal." POR, 34.

First, PO's argument lacks support in claim 11, which merely recites "the port transceiver determines a performance characteristic" without limiting how the determination is performed. PO's attempt to import a manner-of-determination limitation should be rejected.

Second, to the extent PO argues that claim 11 excludes Berke's performance-evaluation method, "where the receiver directly observes the transmitter's signal" (POR, 34), it is contradicted by both experts. Dr. Chen

explains that Berke teaches “configuring the channel using each of multiple sets of whitelisted equalization coefficients ... and evaluating its performance level using a ‘receiver eye diagram’ with ‘eye height and eye width’ and/or ‘a BER of serial channel 100.’” Ex-1003, ¶69. Dr. Williams admitted on deposition that this method is encompassed by claim 11: “[t]here’s no restriction in the claim on how [the port transceiver] determines [the performance characteristic]” and it “allow[s] the port transceiver to observe the signals from the module transceiver and use that to evaluate the coefficient sets at the module transceiver.” Ex-1050, 135:13-136:16, 130:16-131:11.

Third, PO’s “chip-to-module boundary” argument fails because Grounds 1 and 2 rely on combining Berke with Cornelius or Ran. Ground 1 shows Cornelius teaches a chip-to-module link comprising a port transceiver and a pluggable module transceiver (Pet., 32-33), and it would have been obvious to apply Berke’s receiver-side performance determination teaching to Cornelius’s port transceiver (*id.*, 34-35, 39-40). Ground 2 shows Ran teaches a chip-to-module link that comprises a port transceiver and a pluggable module transceiver (Pet., 43-45) and that applying Berke’s receiver-side teaching to Ran’s port transceiver would have been obvious (*id.*, 48-49). By determining a performance characteristic at a receiver-side port transceiver based on signals from a transmitter-side pluggable

module transceiver (Pet., 39-40, 48-49), Grounds 1 and 2 each teaches a determination process occurring across a chip-to-module communication link.

D. Ground 1: A POSITA would have been motivated to combine Berke and Cornelius

PO's motivation-to-combine challenges are legally flawed and factually unsupported.

First, PO argues for claim 1 that there is no motivation to use Cornelius's SerDes teachings because Berke already teaches SerDes. POR, 28-29. But the Petition establishes that Berke teaches each limitation of claim 1, relying on Cornelius for more explicit SerDes teachings (explained at Ex-1003, ¶43) should PO dispute it. Pet., 17-19. PO does not dispute that Berke's high-speed serial communications are applicable to a SerDes context with a reasonable expectation of success, whether established by Berke alone or combined with Cornelius. POR, 28-29. This is dispositive of claims 1-7. The Petition relies on Cornelius's other teachings (e.g., regarding chip-to-module communications links) for claims 8-19. PO's remaining motivation-to-combine challenges (POR, 28-32) focus on these other teachings and are unrelated to claim 1-7's obviousness.

Second, PO argues that Ground 1 requires "transplanting" Berke's components "into Cornelius's cable plug" and "re-hous[ing]" Berke's system "in Cornelius's physical form factor." POR, 29. This rests on the flawed premise that an obviousness combination requires bodily incorporation of one reference into

another. *Allied Erecting & Dismantling Co., Inc. v. Genesis Attachments, LLC*, 825 F.3d 1373, 1381 (Fed. Cir. 2016) (“The test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference.”); *see also In re Keller*, 642 F.2d 413, 425 (CCPA 1981); *In re Mouttet*, 686 F.3d 1322, 1332 (Fed. Cir. 2012). Ironically, after PO complains that both Berke and Cornelius teaches SerDes, it now demands both references to have the same teaching, arguing that motivation is lacking because “[n]one of [Berke’s] elements exists in Cornelius’s cable plug” and there is no “teaching from Cornelius suggesting such a configuration.” POR, 29, 35-36. This improperly imposes the rigid teaching-suggestion-motivation (TSM) test that the Supreme Court repudiated in *KSR*. *KSR International Co. v. Teleflex Inc.*, 550 U.S. 398, 399-403 (2007).

PO’s argument also disregards Cornelius’s express teaching of components suitable to implement Berke’s techniques. Cornelius’s transceivers (e.g., clock and data recovery circuits) employ “equalizer circuits.” Pet., 36 (citing Ex-1005, 6:30-42). Berke’s FFE module, which PO alleges Cornelius to lack, is a type of equalizer circuit. Ex-1050, 34:4-12. Cornelius’s active plug includes a “cable microcontroller” “used to configure clock and data recovery circuits,” which performs analogous functions to Berke’s channel management module. Pet., 38 (citing Ex-1005, 6:11-42). Cornelius further teaches “training circuitry in the ...

cables” for “channel compensation [] such as equalization,” whose parameters “may be calibrated or ... stored as presets” and subject to “training,” disclosing coefficient storage and training architecture. Ex-1005, 11:45-62; Pet., 34. Dr. Chen explained that Berke’s teachings are readily applicable to Cornelius’s architecture. Ex-1003, ¶83, ¶89. PO’s alleged difference between Berke and Cornelius (POR, 29, 35-36) lacks credibility because it fails to analyze similarity between the aforementioned components. Ex-1050, 56:15-20 (admitting no similarity analysis).

Third, PO argues that Cornelius does not support Berke’s backchannel communication because its sideband bus is “low-speed” and not “described as carrying iterative equalization coefficient training instructions.” POR, 30-31, 36. These arguments are legally deficient. A feature that “is not a limitation” of the challenged claims is “not relevant to the obviousness determination.” *Senju Pharm. Co. v. Lupin Ltd.*, 780 F.3d 1337, 1347 (Fed. Cir. 2015); *see also Smith & Nephew, Inc. v. Rea*, 721 F.3d 1371, 1381 (Fed. Cir. 2013). Because the claims are silent as to the speed of equalization training, PO’s argument improperly injects an unclaimed feature into the obviousness analysis. Moreover, the Petition relies on Berke, not Cornelius, for teaching equalization training (Pet., 26-27); PO’s demand that Cornelius separately teach the same feature is untethered from the obviousness theory at issue and again improperly confines obviousness to the rigid TSM test. *KSR*, 550 U.S. at 399-403.

PO's argument is also factually flawed. PO asserts that Berke's "dedicated adaptation channel must carry real-time performance feedback," requiring "high-bandwidth, low-latency," but neither PO nor its expert quantifies this requirement or identifies support in Berke. POR, 30-31; Ex-2017, ¶¶69-72. Berke imposes no specific performance requirements on its back channel. *See* Ex-1004, ¶13, ¶19; Ex-1051, ¶7. PO's expert confirmed as much, admitting he did not "recall" "a minimum requirement on [Berke's] channel that is needed to transmit adaptation instructions" and had formed no opinion on such a requirement. Ex-1050, 67:13-68:11. Dr. Chen explains that communicating adaptation instructions does not demand a back channel with high bandwidth or low latency because adaptation instructions typically have a modest size and are only sent periodically. Ex-1051, ¶7.

PO argues that Cornelius's "low-speed management channel" cannot support Berke's "real-time performance feedback," which requires "different bandwidth, latency, and protocol characteristics." POR, 30-31. However, PO does not explain what these different characteristics are and how they are not supported by Cornelius. *Id.* Furthermore, Cornelius teaches the LSx bus (the alleged low-speed channel) only as a "specific embodiment," noting "other signal pins may be used." Ex-1005, 6:63-67. Both experts agree Cornelius's other pins include ones disclosed to be "high-speed." Ex-1050, 62:18-63:21; Ex-1051, ¶8; Ex-1005, 6:16-

20. PO does not contend this alternative high-speed channel is incompatible with Berke. Regardless of whether Cornelius's channel operates at high or low speed, a POSITA would have viewed it to be sufficient for communicating adaptation instructions, which involve only a modest volume of data and are only sent periodically. Ex-1051, ¶8.

Contrary to PO's argument (POR, 30-31), a POSITA would have understood Cornelius's channel is suitable for communicating adaptation instructions. PO admits the channel is "designed for reading and writing cable configuration ... data." POR, 30. Cornelius teaches that this configuration data includes "operational parameters" and "parameters for control" allowing "cables to adapt to new hosts and devices as the cable is used in various system applications." Ex-1005, 6:50-57. A POSITA would have understood these operational parameters to include equalization settings and parameters, because equalization adaptation is a prominent aspect of adapting to a new host. Ex-1051, ¶9. Berke's adaptation instructions include precisely the type of information Cornelius contemplates sending through its channel. *See, e.g.*, Ex-1004, ¶13, ¶19; Ex-1003, ¶58, ¶63; Ex-1051, ¶9; Ex-1050, 117:9-118:18.²

² PO further attacks Cornelius's loopback-based calibration teachings. POR, 31-32. This is beside the point because Ground 1 does not rely on loopback.

Finally, PO argues there is no reasonable expectation of success because Berke is directed to “endpoint-to-endpoint operation” where “the receiver has full observability and control of the channel’s effect on the transmitted signal,” and introducing a “cable-to-host boundary between [Berke’s] transmitter and receiver” “would require wholly re-engineering both devices.” POR, 36. On deposition, Dr. Williams admitted “endpoint-to-endpoint operation” simply requires “communication between receiver and transmitter regarding operation,” and the purported “full observability and control” is the result of a “training architecture.” Ex-1050, 72:22-73:3, 74:4-75:19. “Cable-to-host boundary” simply means “the side of the communication between a host and a cable that is the plug and jack.” Ex-1050, 76:3-10.

Berke and Cornelius are not incompatible. As explained in preceding paragraphs, Cornelius teaches communication of “operational parameters” between two ends of a serial channel (Ex-1005, 6:50-57), providing PO’s “endpoint-to-endpoint operation.” Cornelius further teaches “training circuitry in the hosts, cables, and other devices”—a training architecture. Ex-1005, 11:45-62. Meanwhile, Berke’s “information handling system” encompasses architectures in which the transmitter and receiver communicate across the boundary between a host (e.g., “one or more printed circuit board[s]”) and a cable (e.g., “one or more

transmission cables”) via “one or more connectors.” Ex-1004, ¶12; Ex-1051, ¶10.

No “re-engineering” is required to combine Berke and Cornelius.

E. Ground 2: A POSITA would have been motivated to combine Berke and Ran

The POR does not separately challenge the motivation to combine Berke and Ran as to claims 1-7. *See* POR, 37. As to claims 8, 11, and 16, PO’s arguments are legally and factually deficient.

First, PO argues “a POSITA would [not] graft Berke’s multi-register whitelist of empirically-determined coefficient sets onto Ran’s management entity” because Ran’s management entity has “no native coefficient storage.” POR, 38. This again rigidly applies the TSM test and improperly demands Ran to have teachings that Petitioner relies on Berke for. *KSR*, 550 U.S. at 399-403. This also ignores the Petition’s explanation that registers were one of a limited number of common options for storing pre-equalizer coefficients and a POSITA would have had good reasons to implement them in Ran’s system. Pet., 65-66 (cross-referenced at Pet., 47-48). PO argues that “attempting to import Berke’s whitelist architecture into Ran’s management entity framework would change the fundamental operation of both reference” because “Berke’s system operates within a single endpoint” while “Ran’s system operates through a multi-register relay protocol.” POR, 39-40; Ex-1050, 143:18-144:1. But PO’s “single endpoint” argument is self-contradictory: PO previously alleged that “Berke’s training system

is designed for endpoint-to-endpoint operation” (POR, 36) which Dr. Williams testified refers to Berke’s “communication between receiver and transmitter” that are not “on the same device.” Ex-1050, 72:22-73:3, 68:15-21, 70:13-71:3 (admitting Berke’s transmitter 110 and receiver 130 are “endpoints”).

Berke teaches that its back channel communication “can include a third party device or mechanism that provides system management ... or another embedded controller.” Ex-1004, ¶19. Ran’s management entity is such a mechanism, facilitating communication between transmitter and receiver—for example, relaying a request from an optical module’s receiver to a host’s transmitter to adjust operation parameters like equalizer settings. Pet., 68; Ex-1006, 6:37-44, 11:65-12:31. Berke thus expressly contemplates using a mechanism like Ran’s management entity for back channel communication. Ex-1051, ¶11. This confirms Berke and Ran are not directed to “fundamentally different adaptation architectures,” and combining them would have produced predictable results.

Second, PO argues that a POSITA would not have applied Berke’s technique to Ran because (1) Ran already addresses the problem it recognizes and (2) Berke’s “comprehensive sweep” training is incompatible with Ran’s “one-tap-at-a-time” adaptation. POR, 39-41. PO’s first argument has been rejected by courts. *See, e.g., Intel Corp. v. PACT XPP Schweiz AG*, 61 F.4th 1373, 1381 (Fed.

Cir. 2023) (holding that a reference’s existing solution to a problem does not negate motivation to apply another reference’s alternative solution).

PO’s second incompatibility argument is contradicted by Berke and Ran. Dr. Williams testified that Ran is called “one-tap-at-a-time” because it cannot change more than one tap (or equalization coefficient) at a time. Ex-1050, 140:16-141:17. But Ran expressly teaches changing multiple taps at once. *See, e.g.*, Ex-1006, 6:6-11 (“Writing this register has the effect of ... chang[ing] the equalization setting of ***one or more equalizer taps*** as requested.”) (emphasis added). Dr. Williams called Berke “comprehensive sweep” because he believed it “does not allow changing one equalization coefficient at a time.” Ex-1050, 141:18-142:22. But Berke allows changing the settings on one equalization coefficient (a “knob”). Ex-1004, ¶25 (“For example, control logic module 140 can identify ***a particular knob*** or set of knobs which, when set with different settings, results in a widely varying BER.”), ¶26. The purported “fundamental architectural mismatch” (POR, 41) between Berke and Ran is simply wrong.

II. GROUNDS 3 AND 4

A. Claims 2 and 9

For claims 2 and 9, PO reiterates its “channel model” position, arguing that Petitioner’s reasoning imposes two separate requirements on Berke’s whitelisted coefficients—high performance and fitting channel characteristics—but Berke only

teaches the former. POR, 45. This mischaracterizes Berke, which teaches that the whitelisted coefficients are determined based upon knowledge of channel characteristics, where measured robust performance verifies fit between a set of pre-equalizer coefficients and a channel model representing the characteristics. *Supra* §I.A.

PO next argues that Stauffer's package loss is used in "offline channel analysis" and "not part of any channel model used for selecting equalization coefficients during system operation." POR, 46. This perpetuates PO's tactic of importing unrecited limitations into claims. Claims 2 and 9 do not require *using* a channel model *to select* coefficients *during system operation*—they merely require that some channel models are for channels "with different insertion loss and package loss characteristics." Ex-1001, cl. 1, 2, 8, 9. Stauffer teaches that package loss information "are supplied by the chip manufacturer." Ex-1008, 000031; Ex-1003, ¶141. PO's expert admitted package loss features are intended to be known during design of a channel. Ex-1050, 95:14-96:15. Package loss is thus among the "knowledge gained during the design, development, or manufacturing" that Berke uses to determine its whitelisted pre-equalizer coefficients and is captured by Berke's channel models. Ex-1004, ¶30; *supra* §I.A; Pet. 25-26. Absent the imported limitations, PO provides no reason that claims 2 and 9 are not satisfied.

B. Claims 5, 12, and 18

Claims 5, 12, and 18 require “the performance characteristic is an error signal energy.” Stauffer teaches measuring channel performance using the root-mean-square value (RMS)—the square root of mean square error (MSE), which was a well-known measure of error signal energy. Pet., 53-54. Stauffer thus teaches or suggests using error signal energy, as measured by MSE, as a performance characteristic. Pet., 54. A POSITA would have found it obvious to apply Stauffer’s teachings to Berke and use error signal energy as one of the channel performance metrics. Pet., 54-55.

PO’s expert admitted on deposition that MSE was a typical measure of equalizer performance he has used since the 1970s. Ex-1050, 27:2-11, 32:12-17. PO cannot reasonably contend non-obviousness based on claims 5, 12, and 18’s limitations, which merely recite a performance characteristic well known for decades.

PO distinguishes Stauffer for teaching “root-mean-square value” (RMS) in the context of random jitter, arguing (1) it cannot be corrected by equalization and (2) is not equivalent to error signals. POR, 46-48. These arguments are beside the point because the Petition relies on Stauffer’s general teaching of using RMS to assess channel performance—not its discussion of random jitter. Pet., 53-55. RMS and MSE were widely used and not limited to random jitter. Ex-1050, 146:16-

147:3 (admitting RMS was widely applied to “[v]oltage, current, power” and not limited to random jitter); Ex-1027, 000001 (“For more than 50 years, the mean-squared error (MSE) has been the dominant quantitative performance metric in the field of signal processing.”); Ex-1022, 000033 (teaching that MSE was among “used for adapting the equalizer”). PO’s attempt to confine RMS and MSE to random jitter is thus contradicted by the prior art, PO’s own expert, and decades of established signal-processing practice.

PO next attacks Petitioner’s motivation-to-combine showing, arguing MSE uses different data from Berke’s existing eye diagram and BER metrics. POR, 48-49. But PO’s own expert contradicted this on deposition, admitting MSE “can be calculated from the same waveform” as the eye diagram. Ex-1050, 33:16-22; *see also id.*, 28:3-7, 31:5-32:11. PO further argues the mere availability of MSE does not motivate a POSITA to adopt it. POR, 48-49. But rather than “mere availability,” the Petition explains prior art teaching of using MSE in equalizer adaptation (Pet., 54 (citing Ex-1022, 000033)), the convenience of calculating MSE with the same data (Pet., 54), and MSE’s consistency with Berke’s vertical eye closure and its goal of identifying robust coefficient settings (Pet., 55). PO has failed to rebut these reasons, so its motivation-to-combine challenge lacks merit.

III. GROUND 5

A. **Claims 1, 8, and 16: The Ran-Mejia-Stauffer combination teaches multiple registers for pre-equalizer coefficients, each corresponding to a different channel model**

PO argues that Mejia does not teach using channel models solely because Mejia's preset search process "requires testing all of the presets to see which one works best." POR, 50-51, 55, 58. According to PO, "[i]f each of Mejia's presets corresponded to a particular channel model, then there would be no need to test every preset to see how it performs." POR, 51.

As explained above, claim 1 is not limited to a certain manner of selecting initial pre-equalizer coefficient values, and selection by testing the performance of different coefficient sets is expressly required by claim 4. *Supra* §I.A; Ex-1004, cl. 4. PO does not dispute that Mejia's preset search process satisfies claim 4's limitation (Pet., 72-73). In addition to contradicting the claim language, PO's narrow interpretation of claims 1, 8, and 16 is flawed because it excludes the '111 patent's own purported invention. PO admits that the '111 patent's selecting step includes "testing each set of preset coefficients." POR, 5; Ex-1001, 14:12-56, Fig. 8. PO cannot distinguish Mejia based on a feature encompassed by the claimed invention.

PO's argument is also misplaced because it conflates current channel conditions with "channel model." PO argues that testing each preset suggests

Mejia “knows nothing about the channel.” POR, 50. But claim 1 does not require pre-existing knowledge about the current channel. As the Petition explains and the POR does not rebut, Mejia’s different presets respectively compensate for channel loss from different channel characteristics, and correspond to channel models representing those characteristics. Pet., 62-63. The preset search process determines which preset—or its corresponding *channel model*—best fits the *current channel conditions*. Mejia’s level of knowledge about the current channel has no bearing on its presets’ correspondence to channel models.

B. Claim 11: The Ran-Mejia-Stauffer combination teaches “the port transceiver determines a performance characteristic”

As to claim 11, PO focuses on Mejia’s teaching of “recommend[ing] the best equalization preset value(s) based on information from the RX (Receive) circuit” (Ex-1009, ¶31), arguing it “fails to identify which entity provides the recommendation” and that entity “is not the RX (Receive) circuits.” POR, 57. However, the limitation at issue is “determin[ing] a performance characteristic” and PO’s focus on the recommending entity is beside the point.³ Mejia expressly

³ PO’s argument also lacks merit as it provides no reason that Mejia’s receiver somehow cannot make a recommendation based on local performance information, especially when combined with Ran’s teaching of the receiver requesting a set of initial pre-equalizer coefficient values. Pet., 79; Ex-1003, ¶216.

teaches the information that is the basis of the preset recommendation is “from the RX (Receive) circuits.” Ex-1009, ¶31. PO does not dispute that Mejia’s receiver determines this information, as its expert admitted on deposition. *See* Ex-1050, 139:5-10. PO thus fails to rebut Dr. Chen’s explanation that Mejia evaluates and selects presets based on performance characteristics like margin and BER, determined *at the receiver side*. Ex-1003, ¶216; Ex-1009, ¶¶31-32; Pet., 79.

PO further attacks Mejia for not disclosing the entity that “corresponds to the claimed port transceiver” and Ran for not disclosing “[t]he selection mechanism for the initial condition.” POR, 56-57. But this is exactly where the combination comes in. *In re Keller*, 642 F.2d 413, 426 (C.C.P.A. 1981) (“[O]ne cannot show non-obviousness by attacking references individually where ... the rejections are based on combinations of references.”). Ran teaches a port transceiver on the receiver side. Pet., 44, 75, 79. Mejia’s preset search technique provides a way of implementing Ran’s functionality of selecting a preset. Pet., 64. Applying Mejia’s preset search to Ran means the receiver-side determination of performance characteristics applies to Ran’s port transceiver, satisfying limitation [11b]. Pet., 79.

C. A POSITA would have been motivated to combine Ran, Mejia, and Stauffer

PO’s challenge to the motivation to combine Ran, Mejia, and Stauffer repeats a single argument: “Ran and Mejia each teach their own detailed

procedures for selecting coefficients,” and “Mejia’s ‘preset search’ procedures would [not] fit into Ran’s five-step request-response selection procedures.” POR, 51-55. This fails because Ran’s and Mejia’s teachings are complementary, and the Petition has established how and why they fit together.

Ran teaches selecting one preset from multiple but does not limit how the selection is performed. Pet., 64; Ex-1006, 10:6-14, FIG. 3B. PO agrees, stating “[i]t is true that Ran does not expressly limit how the coefficient selection is performed” (POR, 52) and “[t]he selection mechanism ... in Ran is entirely undisclosed” (POR, 56). PO’s purported “five-step request-response selection procedures” is outlined in the declaration of Dr. Williams (Ex-2017, ¶116), who admitted this is “a procedure for *communicating* an adjustment to equalizer settings from a receiver to a transmitter” that does not involve “making the decision as to which preset to select” or “evaluating the performance of different presets.” Ex-1050, 144:6-145:15 (emphasis added).

Therefore, the key premise of PO’s argument—that Ran already discloses a process for selecting equalizer presets—is wrong. Mejia fills in Ran’s gap: a preset search technique for evaluating the performance of different presets and selecting one suited to a communication channel’s characteristics. Pet., 62, 64; Ex-1009, ¶10, ¶31. The combination of Ran and Mejia thus does not “replace or modify

Ran’s selection procedures” (POR, 52) or require fitting Mejia’s “preset search” into Ran’s five-step procedures (POR, 53).

The Petition explains how Mejia is combined with Ran: Mejia’s preset search technique “provides a way of implementing Ran’s functionality [of selecting one preset from multiple].” Pet., 64. It further explains Mejia’s technique’s benefits—it “allows identifying and selecting pre-equalizer coefficients that best fit the characteristics of a channel and provide optimum performance”—and motivations to apply Mejia’s teachings to Ran to capture these benefits. Pet., 64. The Petition also establishes motivation from the benefits of having presets correspond to different channel models. Pet., 64-65. Given PO’s failure to address these motivations (*see* POR, 51-55) and establish incompatibility between Ran and Mejia, PO’s challenge to combining Ran, Mejia, and Stauffer should be rejected.

IV. SECONDARY CONSIDERATIONS

Credo provides evidence of licensing activities. POR, 58. But “little weight can be attributed to [licensing] evidence if the patentee does not demonstrate a nexus between the merits of the invention and the licenses of record.” *Iron Grip Barbell Co. v. USA Sports, Inc.*, 392 F.3d 1317, 1324 (Fed. Cir. 2004). Credo relies solely on press releases describing broad licensing transactions—precisely the type of evidence the Federal Circuit has found insufficient to establish nexus. *See In re*

Cree, Inc., 818 F.3d 694, 703 (Fed. Cir. 2016) (press releases describing licenses apparently entered to resolve litigation were insufficient to establish nexus).

Absent evidence that the licenses were driven by the specific merits of the claimed invention—rather than the cost of litigation or value of other portfolio patents—Credo’s secondary-indicia evidence lacks the required nexus and should be given little weight.

Date: August 18, 2026

Respectfully submitted,

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CERTIFICATE OF COMPLIANCE

Pursuant to 37 C.F.R. § 42.24(d), the undersigned certifies that the foregoing Petitioner's Reply to Patent Owner's Response contains 5,531 words and therefore complies with the 5,600 word type-volume limit specified by 37 C.F.R. § 42.24(c)(1). The word count does not include those portions excepted by 37 C.F.R. § 42.24(c) and was calculated by Microsoft Word.

Date: August 18, 2026

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CERTIFICATE OF SERVICE

The undersigned hereby certifies that on August 18, 2026, true and correct copies of the Petitioner's Reply to Patent Owner's Response and Exhibits 1050-1051 were served in its entirety via email on all parties to this proceeding at the addresses indicated:

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