

UNITED STATES INTERNATIONAL TRADE COMMISSION

Washington, D.C.

**In the Matter of
CERTAIN WI-FI ROUTERS, WI-FI DEVICES, MESH
WI-FI NETWORK DEVICES, AND HARDWARE
AND SOFTWARE COMPONENTS THEREOF**

Inv. No. 337-TA-1361

**INITIAL DETERMINATION ON VIOLATION OF SECTION 337 AND
RECOMMENDED DETERMINATION ON REMEDY AND BOND**

Administrative Law Judge Doris Johnson Hines

(May 30, 2024)

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This is the final initial determination in *Certain Wi-Fi Routers, Wi-Fi Devices, Mesh Wi-Fi Network Devices, and Hardware and Software Components Thereof*, United States International Trade Commission Investigation No. 337-TA-1361. 88 Fed. Reg. 29693 (May 8, 2023) and 19 C.F.R. §§ 210.10(b) and 210.42(a)(1)(i).

I. INTRODUCTION

A. Procedural History

Netgear filed a complaint alleging violations of section 337 based on the importation into the United States, the sale for importation, and the sale within the United States after importation of certain Wi-Fi routers, Wi-Fi devices, mesh Wi-Fi network devices, and hardware and software components thereof. *See* 88 Fed. Reg. 29693 (May 8, 2023) and Complaint (EDIS Doc. ID 793590).

The Commission instituted this investigation to determine:

whether there is a violation of subsection (a)(1)(B) of section 337 in the importation into the United States, the sale for importation, or the sale within the United States after importation of certain products identified in paragraph (2) by reason of infringement of one or more of claims 1–5, 13–7, 31, and 32 of [U.S. Patent No. 7,936,714]; claims 1–22 of [U.S. Patent No. 10,681,698]; claims 1–19 of [U.S. Patent No. 10,278,179]; claims 1–8, 10, 11, and 13–21 of [U.S. Patent No. 9,468,025]; claims 1–4, 6–9, 14–19, 22–25, 27–30, and 35–37 of [U.S. Patent No. 10,327,242]; and claims 3, 4, 10, and 11 of [U.S. Patent No. 10,356,681], and whether an industry in the United States exists as required by subsection (a)(2) of section 337.

88 Fed. Reg. 29693.

The plain language description of the accused products or category of accused products defines the scope of the investigation and is “multi-band and mesh Wi-Fi routers and networking devices and components thereof.” *Id.* and 19 C.F.R. § 210.10(b)(1).

The notice of investigation named TP-Link Technologies Co., Ltd., TP-Link Corporation Limited, f/k/a TP-Link International Limited, TP-Link USA Corporation, and TP-Link Research

Institute USA Corp., d/b/a TP-Link Research America Corp., collectively, TP-Link, as respondents. *Id.* at 29693–94. The Office of Unfair Import Investigations is not a party to this investigation. *Id.* at 29694.

I initially set the target date for this investigation at sixteen months, which I extended to October 3, 2024, making this final initial determination due no later than June 3, 2024. Order No. 45 (EDIS Doc. ID 821015). Following briefing and a claim construction hearing, I issued a claim construction order. Order No. 33 (EDIS Doc. ID 810476). The parties filed a joint stipulation regarding importation and inventory of the accused products. Joint Stipulation (EDIS Doc. ID 805900).¹

Netgear’s complaint asserted infringement of 101 claims across six patents. *See* Complaint. Netgear moved several times for partial termination of the investigation by withdrawing various asserted patents and claims. *See* Order No. 25 (Initial Determination) (EDIS Doc. ID 808223), *unreviewed by* Comm’n Notice (12/11/2023) (EDIS Doc. ID 810139); Order No. 31 (Initial Determination) (EDIS Doc. ID 810404), *unreviewed by* Comm’n Notice (01/16/2024) (EDIS Doc. ID 812034); Order No. 40 (Initial Determination) (EDIS Doc. ID 811752), *unreviewed by* Comm’n Notice (0207/2024) (EDIS Doc. ID 813588); and Order No. 44 (Initial Determination) (EDIS Doc. ID 812308), *unreviewed by* Comm’n Notice (02/15/2024) (EDIS Doc. ID 814201). Netgear continues to assert claim 13 of the ’714 patent, claims 12, 15, 17 and 19 of the ’698 patent, and claim 11 of the ’179 patent. Order No. 44 at 1.

The parties filed pre-hearing briefs. Netgear Pre-hearing Br. (EDIS Doc. ID 811820); and TP-Link Pre-hearing Br. (EDID Doc. ID 811818). I held a prehearing conference, and the

¹ The parties marked the Joint Stipulation as JX-0010C.

evidentiary hearing was held from January 17–23, 2024.² The parties filed post-hearing briefs. Netgear Br. (EDIS Doc. ID 814136); TP-Link Br. (EDIS Doc. ID 814114); Netgear Reply (EDIS Doc. ID 814849); and TP-Link Reply (EDIS Doc. ID 814930).

B. The Parties

1. Complainant

Netgear, Inc. is a Delaware corporation with its principal place of business in San Jose, California. Complaint, ¶ 4. Netgear designs, develops, and sells broadband access products for home and business, including Wi-Fi routers, Wi-Fi systems, and mesh Wi-Fi network and modem products. *Id.*

2. Respondents

TP-Link Technologies Co., Ltd. is a Chinese corporation with its principal place of business in Shenzhen, Guangdong Province, China. TP-Link USA Corporation is a California corporation with its principal place of business in Irvine, California. TP-Link Corporation Limited f/k/a TP-Link International Limited is a corporation organized and existing under the laws of Hong Kong, with its principal place of business in Hong Kong. TP-Link states that TP-Link Research Institute USA Corp. d/b/a TP-Link Research America Corp. no longer conducts business operations. TP-Link Br. at 5. TP-Link’s accused multi-band and mesh Wi-Fi routers and networking device products are imported and sold in the United States by TP-Link USA Corporation. *Id.*

² The public transcript of the evidentiary hearing is available as EDIS Doc. IDs 812345 (day 1), 812347 (day 2), 812349 (day 3), 812418 (day 4), and 812500 (day 5). The confidential transcript is available as EDIS Doc. IDs 812344 (day 1), 812346 (day 2), 812348 (day 3), 812417 (day 4), and 812499 (day 5). The transcript is collectively referred to as “Tr.”

C. The Asserted Patents and Claims

Netgear asserts infringement of claims from the '714, '698, and '179 patents. The asserted patents are generally directed to wireless communications.

1. U.S. Patent No. 7,936,714

The '714 patent,³ JX-0001, is titled “Spectrum Allocation System and Method for Multi-Band Wireless RF Data Communications” and relates generally to spectrum allocation for multi-band RF data communications. '714 patent at 1:7–10. Because of problems with previous approaches, the patent states that the “present invention is directed to systems and methods for providing wireless data transmission spectrum allocation by utilizing separate bands for upstream and downstream wireless data communication.” *Id.* at 3:30–33. Netgear asserts claim 13, which recites:

- 13[pre] A method for increasing capacity of a wireless data communication system, said method comprising the steps of:
- [a] transmitting, at a base station, data on a first frequency in a frequency band expected to experience low interference;
 - [b] receiving, at said base station, data on a second frequency in a frequency band expected to experience high interference;
 - [c] wherein said first frequency and said second frequency are separated by at least one octave; and
 - [d] wherein at least a portion of said receiving and at least a portion of said transmitting occur at the same time.

'714 patent at claim 13; and Netgear Br. at 6.⁴

³ Because the application that issued as the '714 patent was filed before September 16, 2012, it is subject to the pre-AIA version of the statute. Leahy-Smith America Invents Act, Pub. L. No. 112-29, sec. 4(c), 125 Stat. 284, 296 (2011).

⁴ As with the asserted claims identified below, the lettering of the claim elements has been added.

2. U.S. Patent No. 10,681,698

The '698 patent,⁵ JX-0002, is titled “Dedicated Backhaul for Whole Home Coverage” and discloses “techniques for establishing and maintaining a dedicated backhaul for whole home coverage.” '698 patent at 2:36–38. The specification discloses that “[e]mbodiments of the invention variously apply optimization techniques, such as using the 5 GHz high band or low band as a dedicated backhaul; using the 2.4 GHz band as backup if the 5 GHz band fails to reach between nodes; using Ethernet when it is better than the 5 GHz and 2.4 GHz bands and it is available; and using a spanning tree protocol or a variant to avoid loops.” *Id.* at 2:48–54. Netgear asserts claim 12, 15, 17 and 19, which recite:

- 12[pre] A network device capable of establishing a backhaul communication among nodes in a mesh wireless network, the device including a network controller configured to perform operations comprising:
 - [a] performing an attempt to utilize a first channel in a default frequency band as a backhaul with second node in the network,
 - [b] wherein the backhaul is to provide communication of management functions between the nodes in the network, as opposed to a front haul that provides wireless data communication to clients in the network; and
 - [c] upon detecting that a received signal strength of the first channel from the second node is below a threshold, performing an attempt to utilize a different channel in the default frequency band and/or a different frequency band that has a lower frequency range than the default frequency band, to establish the backhaul with the second node,
 - [d] wherein, in any of said attempts, channels in a given frequency band are prioritized based on a corresponding received signal strength.

⁵ Because the application that issued as the '698 patent was filed after September 16, 2012, it is subject to the AIA version of the statute.

15 The device of claim 12, the operations further comprising:

- [a] measuring received signal strengths of probes from all nodes within a communication range; and
- [b] selecting the second node based on the measured received signal strengths of the probes.

17 The device of claim 12, the operations further comprising:

- [a] measuring a link quality among one or more of the nodes in the network; and
- [b] selectively causing a number of nodes in the network to form a particular connection topology based on the measured link quality.

19 The device of claim 17,

- [a] wherein the formed connection topology is a daisy chain topology if the link quality does not exceed a predetermined threshold.

'698 patent at claims 12, 15, 17, and 19; and Netgear Br. at 40–41.

3. U.S. Patent No. 10,278,179

The '179 patent,⁶ JX-0003, is titled “Dedicated Backhaul Link for a Robust Wireless Mesh Network” and generally relates to “techniques for implementing a local area wireless mesh network.” '179 patent at 1:43–44. Techniques are disclosed “to provide automated mesh point survey and guided installation for assisting the installation and configuration of a wireless mesh network.” *Id.* at 4:11–14. The '179 patent discloses wireless mesh networks that implement a backhaul communication between mesh points, which is dedicated to servicing data traffic between the mesh points. *Id.* at Fig. 19.

⁶ Because the application that issued as the '179 patent was filed after September 16, 2012, it is subject to the AIA version of the statute.

Netgear asserts claim 11, which recites:

11. [pre] A computing device comprising: one or more processors, that implements a mesh point in a wireless mesh network formed with a plurality of mesh points, the computing device being configured to perform a method comprising:
 - [a] establishing a forward wireless communication with a second mesh point;
 - [b] establishing a backhaul communication, separate from the forward wireless communication, with the second mesh point,
 - [c] wherein the forward wireless communication is established using a wireless communication technology using frequency bands selected from the group consisting of: a 2.4 GHz band, and a 5 GHz band, and
 - [d] wherein the backhaul communication is established using a communication technology selected from the group consisting of: a power line based communication, a 2.4 GHz or 5 GHz radio frequency (RF) technology using a dedicated radio, and a sub-1GHz RF technology; and
 - [e] constructing a list of backhaul candidates, each backhaul candidate having a score indicative of an estimated quality of a potential link between the first mesh point and the second mesh point;
 - [f] upon determining that a quality of service of the established backhaul has dropped to below a predetermined threshold, establishing an alternative backhaul communication with the second mesh point using a backhaul candidate with the highest score on the list.

'179 patent at claim 11; and Netgear Br. at 92–93.

D. The Accused Products

The accused products are grouped according to patent. The '714 patent accused products are TP-Link's Deco, Archer, and Omada products. Netgear Br. at 7–8. The '698 patent accused products are TP-Link's Wi-Fi 6, 6E, and 7 Deco products implemented with either Broadcom or Qualcomm Wi-Fi chips. Netgear Br. at 41. The '179 patent accused products are TP-Link's Deco M9 Plus, Deco W7200, Deco X3600, Deco X5700, Deco X68, Deco X90, Deco PX50 (powerline),

and Deco P9 (powerline) products. Netgear Br. at 109. TP-Link does not dispute Netgear's identification of accused products with respect to the '714 and '698 patents. *See* TP-Link Reply at 7–42 ('714 patent) and 44–86 ('698 patent). With respect to the '179 patent, TP-Link contends that Netgear asserts infringement by its Deco Wi-Fi 6 products. TP-Link Reply at 101.

E. The Domestic Industry Products

The domestic industry products are likewise grouped according to patent. The '714 patent domestic industry products are Netgear's Orbi Mesh Wi-Fi products and Nighthawk products. Netgear Br. at 31. The '698 patent domestic industry products are certain of Netgear's Orbi Mesh Wi-Fi products. Netgear Br. at 78. The '179 patent domestic industry products are certain of Netgear's Orbi Mesh Wi-Fi products. Netgear Br. at 138. TP-Link does not dispute Netgear's identification of the domestic industry products. *See* TP-Link Reply at 42 ('714 patent), 86 ('698 patent), and 122 ('179 patent).

II. JURISDICTION

A. Statutory Jurisdiction

Congress has directed that “[t]he Commission shall investigate any alleged violation of this section on complaint under oath or upon its initiative.” 19 U.S.C. § 1337(b)(1). Section 337(a)(1)(A) declares unlawful, *inter alia*, “[t]he importation into the United States, the sale for importation, or the sale within the United States after importation by the owner, importer, or consignee, of articles that – (i) infringe a valid and enforceable United States patent” 19 U.S.C. § 1337(a)(1)(B). The Commission has statutory authority to investigate Netgear's allegations of patent infringement with respect to TP-Link accused articles imported into the United States.

B. Personal Jurisdiction

By filing a complaint and participating in this investigation, Netgear has consented to personal jurisdiction of the Commission. *See Certain Toner Cartridges, Components Thereof, and Systems Containing Same*, Inv. No. 337-TA-1174, Order No. 40 (Initial Determination) at 34–35 (Jul. 23, 2020) (EDIS Doc. ID 716848), *unreviewed by*, Comm’n Notice (Sept. 8, 2020) (EDIS Doc. ID 719096). TP-Link appeared and participated in this investigation, thus submitting itself to the personal jurisdiction of the Commission.

I conclude that the Commission has personal jurisdiction over Netgear and TP-Link. *See, e.g., Certain Strontium-Rubidium Radioisotope Infusion Systems, and Components Thereof Including Generators*, Inv. No. 337-TA-1110, Initial Determination at 9 (Aug. 1, 2019) (EDIS Doc. ID 685112), *unreviewed in pertinent part by*, Comm’n Notice (Sept. 30, 2019) (EDIS Doc. ID 689653).

C. In Rem Jurisdiction

The Commission has *in rem* jurisdiction over accused products that have been imported into the United States. *See, e.g., Sealed Air Corp. v. United States Int’l Trade Comm’n*, 645 F.2d 976, 985–86 (C.C.P.A. 1981) (noting that the Commission has jurisdiction over imported goods). Because the parties have stipulated that the accused products have been imported into the United States, I conclude that the Commission has *in rem* jurisdiction over the accused products. Joint Stipulation at ¶¶ 3–6; *see Sealed Air Corp. v. Int’l Trade Comm’n*, 645 F.2d 976, 985–86 (C.C.P.A. 1981) (noting the Commission has jurisdiction over imported goods).

III. OWNERSHIP RIGHTS IN THE ASSERTED PATENTS

“To bring a complaint before the International Trade Commission, at least one complainant must be the owner or exclusive licensee of the subject intellectual property.” *Certain Active Matrix*

Organic Light-Emitting Diode Display Panels and Modules for Mobile Devices, and Components Thereof, Inv. No. 337-TA-1351, Comm’n Op. at 14, *quoting Roku, Inc. v. Int’l Trade Comm’n*, 90 F.4th 1367, 1372 (Fed. Cir. 2024) (cleaned up) (EDIS Doc. ID 821542).

The evidence demonstrates that Netgear is the owner by assignment of the asserted patents. JX-0007 (’714 patent recorded assignments); JX-0008 (’698 patent recorded assignments); and JX-0009 (’179 patent recorded assignments). Recording “creates a presumption of validity as to the assignment and places the burden to rebut such a showing on one challenging the assignment.” *SiRF Tech., Inc. v. Int’l Trade Comm’n*, 601 F.3d 1319, 1328 (Fed. Cir. 2010). TP-Link does not dispute this. *See* TP-Link Br. at 6–10.

Because the evidence demonstrates that Netgear is the owner by assignment of the asserted patents, I conclude that Netgear was an appropriate party to bring its section 337 complaint based on patent infringement.

IV. IMPORTATION

To prove a violation of section 337 by a respondent, the complainant must show that the respondent engaged in “[t]he importation into the United States, the sale for importation, or the sale within the United States after importation by the owner, importer, or consignee” of products accused of infringement. 19 U.S.C. §§ 1337(a)(1)(A)–(B). TP-Link stipulated that its accused products have been imported into the United States and does not dispute that the importation requirement of section 337 has been satisfied with respect to those products. Joint Stipulation at ¶¶ 3–6; *see also* TP-Link Br. at 5. I therefore find that the importation requirement of section 337 has been satisfied with respect to the accused TP-Link products.

V. LEVEL OF ORDINARY SKILL IN THE ART

A person of ordinary skill in the art is a hypothetical person who is presumed to be aware of all pertinent prior art. *Custom Accessories, Inc. v. Jeffrey-Allan Industries, Inc.*, 807 F.2d 955, 962 (Fed. Cir. 1992). Determining the appropriate level of skill for this hypothetical person involves considering the types of problems encountered in the art, prior art solutions to those problems, rapidity with which innovations are made, sophistication of the technology at issue, the educational level of active workers in the field, and the level of education of the inventors themselves. *Daiichi Sankyo Co. v. Apotex, Inc.*, 501 F.3d 1254, 1256 (Fed. Cir. 2007).

Netgear did not address the level of ordinary skill in its post-hearing briefs, but stated in its claim construction brief that for all asserted patents one of ordinary skill in the art:

would be a person with a bachelor's degree in a technical field such as electrical engineering, wireless communication, computer engineering, computer science, or physics, and/or 2-3 years of relevant practical experience in data communication or wireless networking systems. Either as an individual or as a team, [one of skill] would have access to, consult with, or otherwise possess, the skills and experience of individuals with additional specialties, such as in mechanical engineering, industrial and product design, and radio frequency transmission and reception.

Netgear Claim Construction Br. at 3 (EDIS Doc. ID 804326).

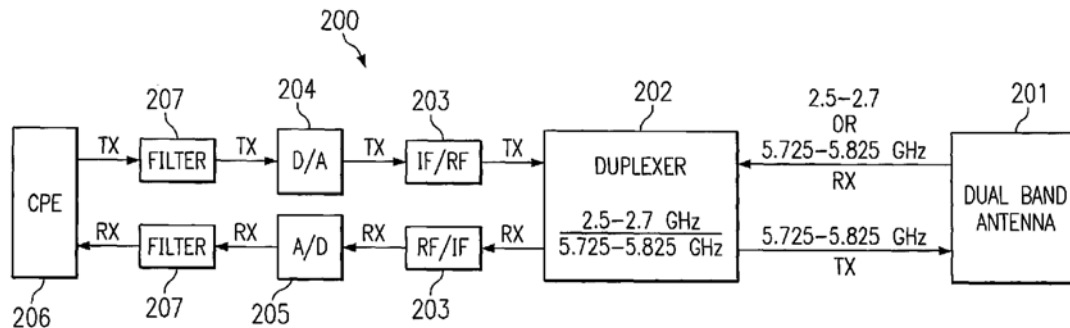
TP-Link did not address the skill level in its post-hearing briefs, but its expert, Dr. Bims, testified that the level of ordinary skill in the art he used was “a bachelor's degree from an accredited program in electrical engineering, computer engineering, computer science, or a related field, as well as three years of experience in the design and analysis of wireless communication systems or equivalent work experience.” Bims Tr. at 779:4–9. He also testified that the level of skill he identified “doesn't differ in any way that matters” from the level of skill that any of the other experts has identified. *Id.* at 779:14–18.

There is no material dispute between the parties as to the level of ordinary skill in the art and neither party contends that their different proposals would lead to any different outcome. To the extent I must determine the appropriate level of skill in the art, I adopt the definition proposed by TP-Link. *Cf. Genzyme Therapeutic Prods. Ltd. P'ship v. Biomarin Pharm. Inc.*, 825 F.3d 1360, 1372 (Fed. Cir. 2016) (failure to make a specific finding about the required level of skill in the art is not reversible error where the record did not show any meaningful differences in proposed definitions or that the outcome of the case would have been different based on which definition was selected).

VI. THE '714 PATENT

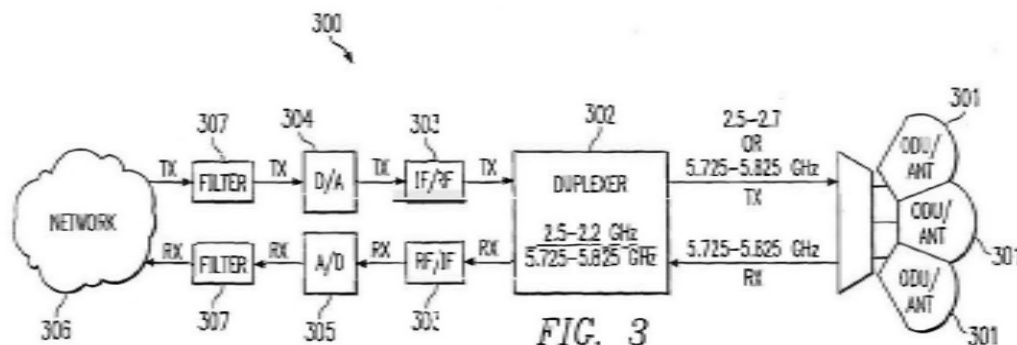
The '714 patent is titled “Spectrum Allocation System and Method for Multi-Band Wireless RF Data Communications” and relates generally to spectrum allocation for multi-band RF data communications. '714 patent at 1:7–10. The patent states that data transmission systems delivering high speed and/or high data capacity from the internet to an end user typically use RF transmissions on one frequency band, generally, transmitting and receiving on separate frequencies within the same band using either frequency division duplexing (FDD) or time division duplexing (TDD). *Id.* at 1:14–64. Because of problems with previous approaches, the patent states that the “present invention is directed to systems and methods for providing wireless data transmission spectrum allocation by utilizing separate bands for upstream and downstream wireless data communication.” *Id.* at 3:30–33. By using “separate bands, particularly bands separated by an octave or more,” the patent states that the “present invention increases the efficiency and capacity of a wireless data communication system by allowing use of the full bandwidth available, in each band, to an operator.” *Id.* at 4:18–22.

Figure 2 shows an embodiment of a subscriber unit 200 with a multi-band antenna 201 and a duplexer 202.



Id. at Fig. 2. Duplexer 202 “preferably accommodates upstream and downstream communications on at least two greatly different bands of operation” and in a “preferred embodiment duplexer 202 operates in two separate bands of operation, as opposed to transmitting and receiving on frequencies within the same band of operation, as with prior art duplexers.” *Id.* at 7:50–55. Figure 2 shows reception on 2.5-2.7 or 5.725-5.825 GHz bands and transmission on the 5.725-5.825 GHz band.

Figure 3 illustrates a base station, which includes a duplexer 302.



Id. at Fig. 3. The patent discloses that in a preferred embodiment, duplexer 302 enables “use of at least two different transmit and receive bands.” *Id.* at 8:52–54. According to the patent, a “preferred embodiment of duplexer 302 operates in separate bands of operation, as opposed to prior art duplexers which transmit and receive on frequencies within a single band of operation.” *Id.* at 8:56–60. Similar to Figure 2, Figure 3 shows transmission on 2.5-2.7 or 5.725-5.825 GHz bands and reception on the 5.725-5.825 GHz band.

Netgear asserts infringement of claim 13, which recites:

- 13[pre] A method for increasing capacity of a wireless data communication system, said method comprising the steps of:
- [a] transmitting, at a base station, data on a first frequency in a frequency band expected to experience low interference;
 - [b] receiving, at said base station, data on a second frequency in a frequency band expected to experience high interference;
 - [c] wherein said first frequency and said second frequency are separated by at least one octave; and
 - [d] wherein at least a portion of said receiving and at least a portion of said transmitting occur at the same time.⁷

’714 patent at claim 13.

A. Claim Construction

1. Agreed and Previously-Addressed Claim Terms

The parties agreed on the following construction, which was adopted:

⁷ The alphabetic identifiers for the claim elements have been added. TP-Link used different identifiers (13.1, 13.2, etc.), which will be noted as necessary.

Claim Term	Agreed Construction
frequency band	A generally contiguous portion of the electromagnetic spectrum which is regulated by a governmental entity, such as the Federal Communications Commission (FCC) for the United States.

Order No. 33 at 5.

The following terms were construed in the claim construction order:

Claim Term	Construction
receiving ... in a frequency band expected to experience [low/high] interference	the “receiving” and “transmitting” terms are construed to have their plain and ordinary meanings, which do not require exclusive bands for receiving and transmitting
transmitting ... in a frequency band expected to experience [high/low] interference	

Order No. 33 at 8–15.

2. Disputed Claim Term

The parties dispute the meaning of “frequency band expected to experience low interference” / “frequency band expected to experience high interference.” Their proposed constructions are:

Claim Term	Netgear's Construction	TP-Link's Construction
frequency band expected to experience low interference	Not indefinite. Plain and ordinary meaning, where a “frequency band expected to experience low interference” is relative to “a frequency band expected to experience high interference.”	Indefinite
frequency band expected to experience high interference		

Second Amended Joint Chart at 3 (EDIS Doc. ID 805163). I deferred ruling on this issue in the claim construction order because much of what the parties relied on in their claim construction briefing was in expert declarations, and the experts had not been subject to cross examination. Order No. 33 at 16. The parties presented witnesses at the evidentiary hearing who addressed this issue.

Claim 13 recites two frequency bands: (i) a first band “expected to experience low interference” and (ii) a second band “expected to experience high interference.” Netgear argues that “expected to experience high interference” is relative to “expected to experience low interference,” and that is the plain meaning of those phrases as used in the specification. Netgear Reply at 42–57. TP-Link asserts that the terms “expected to experience low” and “expected to experience high” are indefinite because the terms “low” and “high” are subjective and because “expected to receive” “only adds further subjectivity” to the claim. TP-Link Br. at 46–65.

a) Legal Standard

Patents are presumed valid, and a party asserting invalidity must prove it by clear and convincing evidence. *See* 35 U.S.C. § 282; *Spanston, Inc. v. Int’l Trade Comm’n*, 629 F.3d 1331, 1344 (Fed. Cir. 2010). “A patent is invalid for indefiniteness if its claims, read in light of the specification delineating the patent, and the prosecution history, fail to inform, with reasonable

certainty, those skilled in the art about the scope of the invention.” *Certain Bio-Layer Interferometers and Components* Thereof, Inv. No. 337-TA-1344, Comm’n Op. at 11 (Aug. 24, 2023) (EDIS Doc. ID 803150), quoting *Nautilus, Inc. v. Biosig Instruments, Inc.*, 572 U.S. 898, 901 (2014). As the Supreme Court noted in *Nautilus*, language has “inherent limitations.” 572 U.S. at 909. The “reasonable certainty” standard exists to strike a “delicate balance,” “afford[ing] clear notice of what is claimed,” while recognizing those inherent limitations. *Id.*, quoting *Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co.*, 535 U.S. 722, 731 (2002). The definiteness requirement thus “mandates clarity, while recognizing that absolute precision is unattainable.” *Nautilus*, 572 U.S. at 910. “As long as claim terms satisfy this test, relative terms and words of degree do not render patent claims invalid.” *One-E-Way, Inc. v. Int’l Trade Comm’n*, 859 F.3d 1059, 1066–67 (Fed. Cir. 2017) (reversing Commission’s determination that claims reciting “virtually free from interference” were indefinite). Thus, “a patentee need not define his invention with mathematical precision in order to comply with the definiteness requirement.” *Invitrogen Corp. v. Biocrest Mfg., L.P.*, 424 F.3d 1374, 1384 (Fed. Cir. 2005).

b) The Claim Language and Specification

Claim 13 recites “transmitting, at a base station, data on a first frequency in a frequency band expected to experience low interference” and “receiving, at said base station, data on a second frequency in a frequency band expected to experience high interference.” The claim, therefore, recites two different frequency bands and contrasts them by reciting that one is expected to experience low frequency while the other is expected to experience high interference. By reciting two bands, the language supports that low and high interference are relative to each other. And by reciting what each band is “expected to experience,” the claim language also supports that low interference or high interference are characteristics of the respective bands.

This is supported by the specification, which repeatedly discloses and highlights the contrast between bands expected to receive low interference (or noise) and bands expected to receive high interference. The specification describes a “dual band spectrum allocation system” “using unlicensed UNII bands for license-free data transmission from a subscriber to a hub” and “using relatively interference-free licensed bands for data transmissions from a hub to subscribers, thereby allowing use of greater bandwidth.” ’714 patent at 3:30–40. The specification further states that “a licensee may employ its relatively interference-free licensed spectrum bandwidth for high speed, relatively broadband, transmissions from a hub station to subscriber stations while employing an unlicensed band such as the 5.8 GHz band of the UNII bands for communications from subscribers to the hub.” *Id.* at 3:64–4:2.

The patent recognizes that “Internet or other network traffic is asymmetric, that is to say, there is more traffic coming from the network to subscribers than from subscribers to the network.” *Id.* at 4:5–7. As a result, “in the present system and method the less noisy licensed band frequency is preferably used to transmit data downstream from the hub to the subscriber while the noisier unlicensed band frequency is preferably used to transmit upstream data from a subscriber to the hub.” *Id.* at 4:7–12. The specification highlights this comparison in interference levels between bands, stating that “[b]y using a relatively noisier band, such as the UNII band, for upstream transmissions, a preferred embodiment of the present invention enables an operator to use the more expensive and complicated filter in the base station, and the less expensive, smaller filters in subscriber stations.” *Id.* at 5:40–44.

In describing the embodiment shown in Fig. 1, the specification states that “[t]he present system and method employ downstream (i.e. from the hub to subscribers) wireless data transmissions 102 and 104 in at least one band of operation, preferably a relatively interference-

free licensed band such as MMDS, ITFC or WCS while transmissions 101 and 103 in the upstream direction (i.e. from subscriber to the hub) take place in at least one license-free band, such as the UNIT bands.” *Id.* at 7:5–10. The specification also compares interference in upstream communications with that in downstream communications, again noting “the preferable employment of a relatively interference-free licensed band for higher-volume downstream transmissions.” *Id.* at 7:17–22.

The specification highlights the comparison between the frequency characteristics of communications bands in selecting appropriate bands for certain traffic. In particular, the specification makes clear that low interference bands are appropriate for high-volume traffic and high interference bands are appropriate for low volume traffic. The specification thus speaks in direct terms about the relative noise/interference characteristics of different bands as to how to best handle system traffic, whether it is to users or from users.

TP-Link asserts that “the ’714 patent’s specification does not provide any guidance regarding what level of interference a person of ordinary skill should consider ‘high’ or ‘low.’” TP-Link Reply at 49. This is based on TP-Link’s position that claim 13 requires actual interference levels. The specification, however, consistently supports that the interference levels are relative. TP-Link’s expert, Dr. Almeroth, agreed. Almeroth Tr. at 675:22–676:21 (“The examples from the embodiments in the specification, those examples are all relative” and presenting a slide stating, “only disclosure of interference is relative.”). Another of TP-Link’s experts testified that those of ordinary skill refer to “5G high” and “5G low” in a relative sense. Bims Tr. at 925:9–15 (referring to “5 GHz High” because “it’s higher than 5 GHz Low,” and “5 GHz Low” because “it’s lower

than 5 GHz High.”)⁸ Notwithstanding the testimony of its own experts, TP-Link argues that understanding the terms to refer to relative interference would be “rewriting the limitations.” TP-Link Br. at 51. Because that position is inconsistent with the intrinsic evidence and with the testimony of TP-Link’s experts, it is rejected.

TP-Link also argues that Netgear’s position means that “any two bands that have different interference levels” would meet the claim. TP-Link Br. at 51. TP-Link ignores, however, that the claim requires more than just a band “expected to experience low interference” and a band “expected to experience high interference.” The claim also recites that the bands must be separated “by at least one octave” and that transmission and reception must occur “at the same time.” ’714 patent at claim 13.

TP-Link also argues that because “the ‘high interference’ requirement could be satisfied by a band with very low interference” in one system and the “‘low interference’ requirement could be satisfied by a band with very high interference” in another system, characterizing this as an “untenable result.” TP-Link Br. at 52. But because the claim, as supported by the specification, does not recite specific interference measurements but recites relative interference, TP-Link’s framing of the issue is incorrect.

⁸ TP-Link contends that “‘interference’ itself is subject to different potential interpretations.” TP-Link Br. at 51, *citing* Almeroth Tr. at 651:23–652:20. In the cited testimony, however, Dr. Almeroth explained the concept of interference and provided examples outside the context of wireless communications, such as “construction sounds” and people “speaking and having a conversation.” *Id.* TP-Link’s suggestion that one of ordinary skill would not understand “interference” in the wireless context is unsupported by any cogent argument or credible expert testimony. Further, TP-Link never identified “interference” as a term needing construction and never argued that it is indefinite. *Broadcom Corp. v. Qualcomm Inc.*, 543 F.3d 683, 694 (Fed. Cir. 2008) (“litigants waive their right to present new claim construction disputes if they are raised for the first time after trial.”).

In view of the language of the claim and the specification’s consistent teachings of relative interference, one of ordinary skill would understand the term “expected to experience [low/high]” interference with reasonable certainty. *See Sonix Technology Co. Ltd v. Publications, Int’l, Ltd.*, 844 F.3d 1370, 1379 (Fed. Cir. 2017) (finding claim term “visually negligible” not indefinite because the specification provided “guidance on how to create visually-negligible indicators, and specific examples that provide points of comparison for the result.”). The claim language and specification support that the expected to experience low/high interference terms are not indefinite.

c) The Prosecution History

(1) The Low/High Terms

The prosecution history also supports that the low/high frequency claim terms are relative.⁹ Specifically, application claim 53, which ultimately issued as claim 13, initially recited “transmitting, at a base station, data on a first frequency in a low interference frequency band; and receiving, at said base station, data on a second frequency in a high interference frequency band.” JX-0004 (’714 file history) at .261. The Examiner rejected that claim (and others) as indefinite, stating that the “limitations, directed to ‘low interference frequency band,’ ‘high interference frequency band,’ ‘high noise frequency band’ and ‘low noise frequency band’ are unclear because in any frequency band interference and noise are subjects [sic] to constant change and cannot identify the frequency band, as at some point ‘low interference band’ can have higher interference than ‘high interference band.’” *Id.* at .278–279. The Examiner added that “the level of noise and interference depends on the direction of the transmission, as interference/noise measured in the

⁹ TP-Link’s expert on indefiniteness did not address the prosecution history, though he testified that it was “[a]bsolutely important to consider” it. Almeroth Tr. at 682:17–18; *see also id.* at 639–675 (direct testimony on indefiniteness not addressing the prosecution history).

same frequency band at the base and the subscriber station are different, making the limitations unclear.” *Id.*

In response, the applicant amended application claim 53 as follows:

53. (Currently Amended) A method for increasing capacity of a wireless data communication system, said method comprising the steps of:
transmitting, at a base station, data on a first frequency in a low-interference frequency band expected to experience low interference; and
receiving, at said base station, data on a second frequency in a ~~high-interference~~ frequency band expected to experience high interference;
wherein said first frequency and said second frequency are separated by at least one octave; and
wherein at least a portion of said receiving and at least a portion of said transmitting occur at the same time.

Id. at .298.

In addressing the rejection and explaining the claim amendment, the applicant “acknowledge[d] that interference and/or noise levels may change within a frequency band over time” and “amended the claims to additionally recite ‘expected’ high/low interference/noise frequency bands, where appropriate.” *Id.* at 303. The applicant identified support in the specification for the amendments, pointing to ¶¶ 14 and 29–31. *Id.* Those paragraphs correspond to 3:56–4:4 and 6:46–7:48 of the ’714 patent and address:

- using the “relatively interference-free licensed spectrum bandwidth for high speed, relatively broadband, transmissions from a hub to subscriber stations while employing an unlicensed band such as the 5.8 GHz band of the UNIT bands for communications from subscribers to hub”
- hub to subscriber “transmissions 102 and 104 in at least one band of operation, such as MMDS, ITTC or WCS while transmissions 101 and 103 in the upstream direction (i.e. from subscriber to hub) take place in at least one license-free band, such as the UNIT bands”

- “downstream (i.e. from the hub to subscribers) wireless data transmissions 102 and 104 in at least one band of operation, preferably a relatively interference-free licensed band such as MMDS, ITFC or WCS while transmissions 101 and 103 in the upstream direction (i.e. from subscriber to the hub) take place in at least one license-free band, such as the UNIT bands”

Those portion of the specification address relative interference levels as supporting the claim amendments, thus supporting such an interpretation of the claim.

Notably, the applicant amended the claim to recite the language that TP-Link asserts makes the claim indefinite. The Examiner expressly accepted the amendment as overcoming the indefiniteness rejection, stating that “[i]n light of Applicant’s amendment the rejection of claims ... under 35 U.S.C. 112, second paragraph, directed to ‘low interference frequency band’, ‘high interference frequency band’, is withdrawn.” *Id.* at .315.¹⁰ In the same Office Action, the Examiner demonstrated his understanding of “expected to experience [low/high] interference” by quoting and commenting on the newly-added limitations in rejecting the pending claims, including application claim 53, based on prior art. *Id.* at .316–317.

The applicant appealed the Examiner’s rejection. JX-0004 at .364 and .384–89. The Examiner and Board each discussed the high/low interference terms, demonstrating that they had no difficulty understanding their meaning and applying the claims to the prior art. *Id.* at .401–03

¹⁰ The prosecution history on this point is somewhat muddled because immediately after stating that the indefiniteness rejection was withdrawn, the Examiner rejected certain claims, including application claim 53, stating that limitations “directed to providing communications on ‘a first frequency’ or a ‘second frequency’ are unclear, because communication systems are typically utilize a spectrum of frequencies for communication” and that he would “interpret first/second frequencies as spectrums/group of frequencies, characterized by first or second frequency.” JX-0004.315. Because the Examiner did not address that rejection on appeal, the Board deemed the rejection withdrawn. *Id.* at .454.

(Examiner’s answer to appeal brief) and .455–56 (Board decision). The Board reversed the Examiner’s prior art rejection, and the claims were allowed. *Id.* at .455–59.

The Federal Circuit’s decision in *Nature Simulation Sys. Inc. v. Autodesk, Inc.* supports definiteness here. There, the court reversed district court’s indefiniteness finding where the Examiner had initially rejected the claims for indefiniteness, after which “in consultation with the Examiner,” the applicant amended the claim, and the rejection was withdrawn. 50 F.4th 1358, 1367 (Fed. Cir. 2022). That is what happened here—the applicant amended the claim and overcame an indefiniteness rejection and explained how the claim amendment was supported in the specification. The Federal Circuit reversed in *Nature Simulation* because the district court “gave no weight to the prosecution history showing the resolution of indefiniteness by adding the designated technologic limitations to the claims.” The prosecution history shows that the applicant resolved an indefiniteness issue by adding the high/low interference terms to the claims, supporting that those terms are not indefinite. *See also One-E-Way, Inc.*, 859 F.3d at 1064–1066 (relying on explanation in prosecution history as supporting that “virtually free from interference” was not indefinite).

The prosecution history supports that the low/high terms are not indefinite.

(2) Expected to Experience

TP-Link argues that the “expected to experience” term “further compounds the terms’ indefiniteness.” TP-Link Br. at 55. According to TP-Link, “expected to experience” requires an observer to form expectations based on “factors that a person could choose to consider.” *Id.* at 56.

As noted, the “expected to experience” language was added to the claim in response to an indefiniteness rejection. In explaining the claim amendment, the applicant “acknowledge[d] that interference and/or noise levels may change within a frequency band over time” and “amended the

claims to additionally recite ‘expected’ high/low interference/noise frequency bands, where appropriate.” *Id.* at .303. Based on this explanation, one reading the prosecution history would understand that the applicant was not claiming interference levels that could change over time but was instead reciting a characteristic of the claimed frequency bands—one with low interference and one with high interference with respect to each other. That is, the Examiner rejected the claim as reciting subjective frequency characteristics and the applicant amended the claims to recite an objective characteristic of relative frequency. The applicant added the “expected to experience” language to address that “interference and/or noise levels may change within a frequency band over time.” JX-0004.303. One of ordinary skill reading the “expected to experience” terms in light of the prosecution history would thus understand that they are not referring to the subjective expectations of an “observer,” but to a characteristic of the frequency band itself. *See* Haas Tr. at 1090:3–14 and 1085:6–1086:6.

TP-Link’s reliance on interference studies showing that actual interference may change over time or depend on the scenario, therefore, is irrelevant to determining which of two frequency bands is “expected to experience [high/low] interference.” TP-Link Br. at 58–60, *citing* RX-0242 and RX-0243. In addition, that the Examiner and Board understood and accepted the claim amendments as overcoming the indefiniteness rejection supports that the claim terms are not indefinite. *Sonix*, 844 F.3d at 1379–80.

The prosecution history thus refutes TP-Link’s argument on “expected to experience.”

(3) The Change of Law in *Nautilus*

TP-Link contends that “[a]ll the prosecution history ultimately reflects is that the Patent Office had misgivings about the definiteness of the claim’s language, but was hamstrung by liberal

claim construction and indefiniteness standards that led the Examiner to withdraw the rejection.” TP-Link Br. at 63. TP-Link’s unsupported conjecture is refuted by both the law and the record.

As to the law, TP-Link contends that the prosecution history should be disregarded because “the Examiner did not use the *Nautilus* ‘reasonable certainty’ standard that applies today.” TP-Link Br. at 62. TP-Link contends that “the Examiner’s withdrawal of an indefiniteness rejection under the [pre-*Nautilus*] insolubly ambiguous [standard] during the patent’s prosecution is legally irrelevant to the question now at issue” because the legal standard for indefiniteness subsequently changed with the Supreme Court’s *Nautilus* decision.” TP-Link Br. at 62–63. TP-Link points to the Manual of Patent Examining Procedure (MPEP) in effect during prosecution and its reference to the pre-*Nautilus* insolubly ambiguous standard. TP-Link Br. at 63, n.10, citing MPEP § 2173.02 (July 2008). In doing so, however, TP-Link crops the excerpt from the MPEP, which states that “when a claim remains insolubly ambiguous without a discernible meaning after all reasonable attempts at construction *must a court declare it indefinite.*” MPEP § 2173.02 (July 2008) (emphasis added). TP-Link’s omission of the latter clause is misleading.

TP-Link’s suggestion that the PTO applies the same standard in assessing indefiniteness as courts is wrong. The same version of the MPEP that TP-Link relies on states that “[d]uring patent examination, the pending claims must be ‘given their broadest reasonable interpretation consistent with the specification.’” MPEP § 2111, citing *Phillips v. AWH Corp.*, 415 F.3d 1303, 1316 (Fed. Cir. 2005). That is so because the “[a]pplicant always has the opportunity to amend the claims during prosecution” so “broad interpretation by the examiner reduces the possibility that the claim, once issued, will be interpreted more broadly than is justified.” *Id.* Another reason is the presumption of validity under 35 U.S.C. § 282, which attaches after a patent issues. *In re Morris*, 127 F.3d 1048, 1054 (Fed. Cir. 1997).

The PTO Board has recognized that the *Nautilus* decision did not “mandate a change in the Office’s approach to indefiniteness in patent-examination matters . . . where the claims are interpreted under the broadest reasonable interpretation standard and an opportunity to amend the claims is afforded.” *Ex Parte McAward*, Appeal No. 006416, 2015 WL 3669566 at *4–5 (PTAB Aug. 25, 2017). So too, for a century, have the courts. *Morris*, 127 F.3d at 1054 (“It would be inconsistent with the role assigned to the PTO in issuing a patent to require it to interpret claims in the same manner as judges”); *In re Zletz*, 893 F.2d 319, 321 (Fed. Cir. 1989) (stating that the Board wrongly applied the legal standard applicable to courts, not the PTO and that “during patent prosecution when claims can be amended, ambiguities should be recognized, scope and breadth of language explored, and clarification imposed”); *In re Prater*, 415 F.2d 1393, 1404–1405 (CCPA 1969) (recognizing distinction in indefiniteness standards between courts and PTO); *In re Carr*, 297 F. 542, 543–544 (D.C. Cir. 1924) (recognizing distinction between how courts and the PTO interpret claims). The standard used by courts assessing indefiniteness pre-*Nautilus*, therefore, is completely irrelevant to the standard used by the Examiner during prosecution and does not support ignoring the prosecution history, as TP-Link contends.

The prosecution history itself also refutes TP-Link’s argument. There is no reason to assume that after making an indefiniteness rejection, the Examiner would not maintain that rejection if he concluded that the amended claims continued to be indefinite. Instead, the Examiner stated the indefiniteness rejection was withdrawn. JX-0004.315. To the extent another indefiniteness rejection was made by the Examiner, the Board found it had been withdrawn. *Id.* at .454. In addition, in an earlier decision, the Board made new rejections, including an indefiniteness rejection. *Id.* at 253–54. Nothing in the record supports TP-Link’s argument that the Office was

“hamstrung by liberal claim construction and indefiniteness standards.”¹¹ Instead, the record supports that the Office freely made indefiniteness rejections when it deemed them appropriate and that those rejections were overcome by the applicant.

The prosecution history makes clear what the specification discloses—relative interference. The cases TP-Link cites to justify disregarding the prosecution history are inapposite and address instances in which indefiniteness was not specifically addressed during prosecution. *WSOU Investments LLC v. Google LLC*, No. 2022-1066, 2023 WL 6210607 at *8 (Fed. Cir. Sept. 25, 2023) (“[t]he office action cited by WSOU was unrelated to any indefiniteness rejection”); *TVnGO Ltd. (BVI) v. LG Elecs. Inc.*, 861 Fed. App’x 453, 458 (Fed. Cir. 2021) (prosecution history provided only “limited information.”)

d) Whether One of Ordinary Skill Would Be Able to Determine Which Frequency Band Has High/Low Interference With Reasonable Certainty

TP-Link asserts that construing the terms as relative still renders them indefinite. TP-Link Br. at 53–54. As an initial matter, TP-Link has not identified a credible instance in which, given two frequency bands, one of ordinary skill was unable to determine which band was “expected to experience high interference” and which band was “expected to experience low interference.” Every expert, except Dr. Almeroth, was able to apply the claim language to identify the frequency band “expected to experience high interference” and the “frequency band expected to experience

¹¹ TP-Link’s suggestion that a prosecution history pre-dating the *Nautilus* decision is entitled to less consideration is meritless. *Nautilus* itself supports considering the prosecution history in assessing whether a claim “fail[s] to inform, with reasonable certainty, those skilled in the art about the scope of the invention,” and on remand in *Nautilus* the Federal Circuit concluded that the prosecution history, which necessarily pre-dated *Nautilus*, “further illustrate[d] that the term [wa]s not indefinite.” *Biosig Instr., Inc. v. Nautilus, Inc.*, 783 F.3d 1374, 1379 and 1383 (Fed. Cir. 2015).

low interference.” Almeroth Tr. at 680:8–16 (acknowledging that TP-Link’s PTAB expert, Dr. Ding, was able to apply the claim terms), at 681:12–19 (same as to Dr. Bims), and at 681:20–682:11 (same as to Dr. Wicker); Bims Tr. at 928:15–929:4 (physical characteristics of band determine interference a band may experience); and Haas Tr. at 1083:13–1084:22 (identifying objective criteria for whether a band is expected to experience high or low interference). The fact that multiple experts, including TP-Link experts, were able to apply the high/low interference claim terms “provide[s] evidence that a skilled artisan did understand the scope of this invention with reasonable certainty.” *Sonix*, 844 F.3d at 1380.

Outside of this investigation, TP-Link itself has had no trouble identifying high/low interference, distinguishing between a band with “More radio interference” and a band with “Less radio interference”:



CX-0807.2 (TP-Link Webpage). So have others in the wireless communications industry. Haas Tr. at 1092:21–1093:12; CX0387.3 (Motorola Technical Brief); and CX-0386.3 (Understanding Wi-Fi Frequencies).

TP-Link argues that “Netgear does not and cannot explain how a person of ordinary skill is supposed to weigh and balance [the] criteria [used] to determine which band has ‘relatively’

high interference and which has ‘relatively’ low interference.”¹² TP-Link Br. at 53. As Dr. Haas explained, however, one of ordinary skill would readily be able to determine, consistent with the patent’s guidance, which band is “expected to experience high interference” and which is “expected to experience low interference” based on their licensing status and bandwidth. Haas Tr. at 1083:13–1085:18. Dr. Bims agreed that it is “well-known within the art” that certain frequency bands are expected to experience low and high interference “because of [their] physical characteristics.” Bims Tr. at 928:15–929:4. TP-Link’s argument that “a [person of ordinary skill] cannot decipher any such boundaries, because the claim terms lack objective limits” is refuted by this evidence. TP-Link Br. at 54.

TP-Link also asserts that “even Netgear’s own experts cannot agree on the factors that a person should use to arrive at an ‘expectation’ regarding interference,” claiming that Dr. Wicker testified that “it does not matter whether a band is licensed.” TP-Link Br. at 60–61. In the cited testimony, Dr. Wicker stated that based on their physical characteristics (the number of nonoverlapping channels), the 5 GHz band is expected to experience low interference and the 2.4 GHz band is expected to experience high interference. Wicker Tr. at 116:24–117:22; *see also id.* at 226:1–10. This would remain unchanged if the licensing status of the 2.4 GHz band was changed. *Id.* at 225:18–25.

TP-Link also argues that FCC regulation of wireless communications bands supports indefiniteness because if the FCC regulations change, consideration of whether a band is expected to experience high/low interference may change. TP-Link Br. at 54. Early in this investigation, however, *TP-Link* proposed that the term “frequency band” in claim 13 be construed as “a

¹² TP-Link’s framing misstates the issue, which is that “high” and “low” are relative to each other.

generally contiguous portion of the electromagnetic spectrum which is regulated by a governmental entity, such as the Federal Communications Commission (FCC) for the United States.” Joint Chart of Agreed and Disputed Terms for Construction, Attachment A (Aug. 29, 2023) (EDIS Doc. ID 803469). Netgear agreed with that construction, and it was adopted. Order No. 33 at 5.

In its pre-hearing brief, TP-Link noted that dependent claims 11 and 23 recite “wherein said interference frequency band expected to experience low interference is determined to be low interference and said interference frequency band expected to experience high interference is determined to be high interference according to regulation of each of said frequency bands by a governmental entity.” TP-Link Pre-hearing Br. at 132. TP-Link argued that “[t]hese dependent claims provide a criterion for which bands are ‘expected to experience [high/low] interference’: whichever the government regulation says are high/low interference,” which was missing from the independent claims. *Id.* Before its post-hearing briefing, TP Link thus proposed a construction specifically identifying FCC regulation and argued that such regulation supported the definiteness of certain dependent claims. TP-Link now asserts that FCC regulation supports indefiniteness. TP-Link’s stunning about-face on this issue is improper. *Traxcell Techs., LLC v. Sprint Commc’ns Co. LP*, 15 F.4th 1121, 1129 (Fed. Cir. 2021) (“[H]aving stipulated to [this construction], Traxcell cannot pull an about-face.”); *Finjan LLC v. SonicWall, Inc.*, 84 F.4th 963, 971 (Fed. Cir. 2023) (a challenge to a stipulated construction is improper). Given the parties’ stipulated construction, proposed by TP-Link and already adopted, and TP-Link’s arguments in its pre-hearing brief, TP-Link’s argument now that FCC regulation of bands supports indefiniteness is rejected.

e) Conclusion

TP-Link has not presented clear and convincing evidence that the claim terms “frequency

band expected to experience low interference” and “frequency band expected to experience high interference” are indefinite. Based on the parties’ briefs and arguments, “frequency band expected to experience low interference” and “frequency band expected to experience high interference” are given their plain and ordinary meanings, such that a “frequency band expected to experience low interference” is relative to “a frequency band expected to experience high interference.”

B. Infringement

In a section 337 investigation, the complainant bears the burden of proving infringement of the asserted claims by a preponderance of the evidence. *See Spansion, Inc. v. Int’l Trade Comm’n*, 629 F.3d 1331, 1349 (Fed. Cir. 2010). This standard “requires proving that infringement was more likely than not to have occurred.” *Warner-Lambert Co. v. Teva Pharm. USA, Inc.*, 418 F.3d 1326, 1341 n.15 (Fed. Cir. 2005).

“[W]hoever without authority makes, uses, offers to sell, or sells any patented invention, within the United States or imports into the United States any patented invention during the term of the patent therefor, infringes the patent.” 35 U.S.C. § 271(a). “Literal infringement requires the patentee to prove that the accused device contains each limitation of the asserted claim(s). If any claim limitation is absent, there is no literal infringement as a matter of law.” *Bayer AG v. Elan Pharm. Research Corp.*, 212 F.3d 1241, 1247 (Fed. Cir. 2000). For method claims, “infringement under § 271(a) occurs where all steps of a claimed method are performed by or attributable to a single entity.” *Akamai Techs., Inc. v. Limelight Networks, Inc.*, 797 F.3d 1020, 1022 (Fed. Cir. 2015), *citing BMC Res., Inc. v. Paymentech, L.P.*, 498 F.3d 1373, 1379–81 (Fed. Cir. 2007). To “prove direct infringement, a patentee must either point to specific instances of direct infringement or show that the accused device necessarily infringes the patent in suit.” *Acco Brands, Inc. v. ABA Locks Mfrs. Co., Ltd.*, 501 F.3d 1301, 1313 (Fed. Cir. 2007). “Direct infringement can be proven

by circumstantial evidence,” which “must show that at least one person directly infringed an asserted claim.” *Toshiba Corp. v. Imation Corp.*, 681 F.3d 1358, 1364 (Fed. Cir. 2012) (citations omitted). Direct infringement may be found where “an alleged infringer designs a product for use in an infringing way and instructs users to use the product in an infringing way.” *Id.* at 1365. Literal infringement is a question of fact. *Finisar Corp. v. DirecTV Grp., Inc.*, 523 F.3d 1323, 1332 (Fed. Cir. 2008).

“[A] violation of Section 337 may arise from an act of induced infringement.” *Suprema, Inc. v. Int’l Trade Comm’n*, 796 F.3d 1338, 1351 (Fed. Cir. 2015). Section 271(b) of the Patent Act states: “Whoever actively induces infringement of a patent shall be liable as an infringer.” 35 U.S.C. § 271(b). “To prevail on a claim of induced infringement, in addition to inducement by the defendant, the patentee must also show that the asserted patent was directly infringed.” *Epcon Gas Sys., Inc. v. Bauer Compressors, Inc.*, 279 F.3d 1022, 1033 (Fed. Cir. 2002). “Section 271(b) covers active inducement of infringement, which typically includes acts that intentionally cause, urge, encourage, or aid another to directly infringe a patent.” *Arris Group v. British Telecomms. PLC*, 639 F.3d 1368, 1379 n.13 (Fed. Cir. 2011). Liability for inducement requires proof that the party had “knowledge that the induced acts constitute patent infringement.” *Global-Tech Appliances, Inc. v. SEB S.A.*, 563 U.S. 754, 766 (2011).

1. Accused Products and Representativeness

The ’714 patent accused products are TP-Link’s Deco, Archer, and Omada products that operate on multiple bands, namely the 2.4 and 5 GHz frequency bands and in some circumstances the 6 GHz band. Netgear Br. at 7–8 and x–xi. The evidence supports that there are no material differences in the operation of the ’714 patent accused products for purposes of considering claim 13. Wicker Tr. at 111:6–13 (all of the Deco, Archer, and Omada products are multi-frequency

devices and implement Dual Band Dual Concurrent (DBDC) functionality in the same way); CX-2536C.28 (TP-Link Technical White paper, defining Dual Band Dual Concurrent operation as supporting “simultaneous operation on both 2.4GHz and 5GHz bands” and as the “typical working mode for multi-frequency routers”); CX-3177C (Pu Dep. Tr.) at 211:23–212:19 (Deco, Archer, and Omada products work in the 2.4 and 5 GHz bands at the same time). TP-Link does not disagree. Bims Tr. at 780:11–15 (testifying that he considered TP-Link’s Omada, Archer and Deco products and that his analysis was the same for all); *see also* RDX-0002.7 and .12 (Bims demonstrative identifying Deco, Archer, and Omada products as accused for the ’714 patent).

2. Direct Infringement of Independent Claim 13

TP-Link contends that its accused products do not infringe because they do not transmit data on a first frequency in a frequency band expected to experience low interference or receive data on a second frequency in a frequency band expected to experience high interference. TP-Link also contends that Netgear has failed to prove that its products operate such that at least a portion of said receiving and at least a portion of said transmitting occur at the same time. TP-Link Reply at 7–9.

a) Element 13[pre]

Element 13[pre] recites “[a] method for increasing capacity of a wireless data communication system, said method comprising the steps of . . .” ’714 patent at clam 13. Netgear contends this element is met. Netgear Br. at 9. TP-Link does not dispute that this element is met. *See* TP-Link Reply at 7–42.

The evidence supports that the ’714 patent accused products perform a method for increasing capacity of a wireless data communication system because they transmit and receive data on the 2.4 GHz and 5 GHz (or 6 GHz where applicable) frequency bands and using two (or

three) frequency bands increase capacity of a wireless data communication system. Wicker Tr. at 113:13–114:10 and 120:6–20; CX-2265.1 (Deco X90 Datasheet); CX-2237.1 (Archer C7 Datasheet); and CX-2566.2 (Omada EAP650 Datasheet).

The evidence supports that the '714 patent accused products meet element 13[pre].

b) Element 13[a]

Element 13[a] recites “transmitting, at a base station, data on a first frequency in a frequency band expected to experience low interference.” Netgear contends this element is met. Netgear Br. at 9–10. TP-Link does not dispute the first portion of this element, “transmitting, at a base station, data on a first frequency in a frequency band” is met. TP-Link Reply at 7–42.

The evidence supports that the '714 patent accused products are base stations. Wicker Tr. at 118:20–120:5. TP-Link's documents establish that its '714 patent accused products transmit data on a frequency within the 5 GHz band (and 6 GHz band, where applicable). Netgear Br. at 10, *citing* Wicker Tr. at 114:11–115:23, 120:6–20, 121:5–9; CX-2265.4 (Deco X90 datasheet); CX-2566.2 (Omada EAP650 Datasheet); CX-2237.6 (Archer C7 Datasheet); CX-2476C (Deco X90 internal specification); CX-2424C (Omada EAP650 internal specification); CX-2529C (Archer C7 internal specification); CX-2483C (Deco XE75 Pro Specification Sheet); CX-2314.33 (Archer BE9000 User Guide); CX-3179C (Wang Dep. Tr.) at 84:2–24; CX-3181C (Weng Dep. Tr.) at 82:21–24, 85:7–18, 88:13–20, and 90:24–91:2; CX-3174C (Liu Dep. Tr.) at 63:25–64:15, 106:13–107:10, 117:21–118:5, and 187:3–7; CX-3175C (Ma Dep. Tr.) at 175:25–176:22; and CX-3173C (Cai Dep. Tr.) at 124:15–125:9.

TP-Link disputes that the second portion of element 13[a] is met, namely, “frequency band expected to experience low interference.” TP-Link Reply at 9–27.

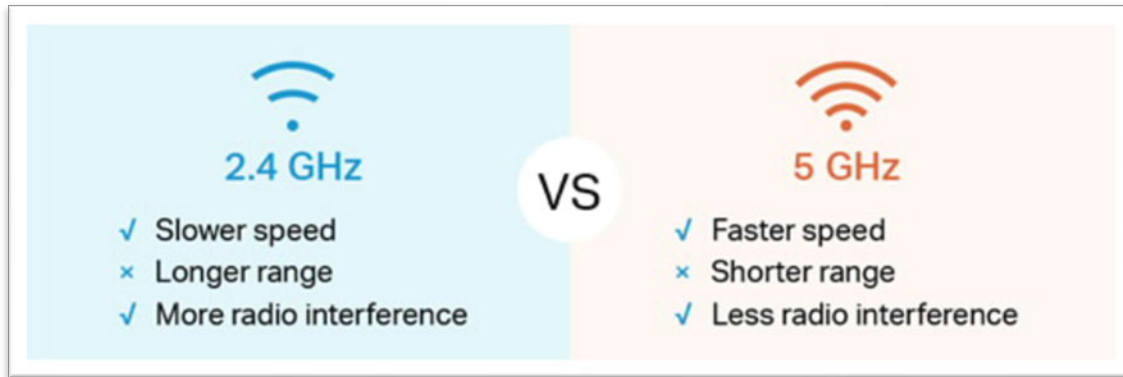
The evidence supports that the '714 patent accused products transmit data “in a frequency band expected to experience low interference” by transmitting data in the 5 GHz (and the 6 GHz, where applicable) frequency bands under the correct claim construction—i.e., “frequency band expected to experience low interference” is relative to “frequency band expected to experience high interference.”

The evidence supports that the 5 GHz and 6 GHz frequency bands are expected to experience low interference relative to the 2.4 GHz band, which is the frequency band expected to experience high interference. Wicker Tr. at 115:24–117:22. As Dr. Wicker explained, the 5 GHz band has over 20 non-overlapping channels, while the 2.4 GHz band has only three non-overlapping channels and “when we’ve got 20 nonoverlapping bands, we expect less interference than if we’ve only got three.” Wicker Tr. at 117:6–22; *see also* Haas Tr. at 1084:12–22.

This is supported by a TP-Link document posted on its website titled “2.4 GHz WiFi vs 5 GHz WiFi, What’s the Difference?” which states:

2.4 GHz WiFi suffers more radio interference since the 2.4 GHz band is overcrowded with all kinds of WiFi devices and non-WiFi devices such as microwave ovens. ISM band devices. Security cameras. Bluetooth devices. and more. 5 GHz WiFi is relatively less-crowded with less interference.

CX-0807.2. That same document describes the 5 GHz band as having “[l]ess radio interference” and the 2.4 GHz band as having “[m]ore radio interference”:



CX-0807.2; and Wicker Tr. at 117:23–118:4; *see also* CX-2377.1 (TP-Link Deco XE75 Press Release) (stating that the “6GHz band is also clean and congestion-free, being exclusive for WiFi 6E devices to eliminate interference from legacy devices”).

Other evidence supports that it is well understood that the 5 GHz band is expected to experience low interference while the 2.4 GHz band is expected to experience high interference. CX-0391.2 (Extreme Networks Webpage) (“The 5GHz frequency band sees a lot less interference than the lower 2.4GHz frequency band”); CX-0386.1 (HighSpeedInternet.com Webpage) (identifying 2.4 GHz band as “more susceptible to interference” and 5 GHz band as “less susceptible to interference”); CX-0387.3 (Motorola Technical Brief titled “5GHz IEEE 802.11a for Interference Avoidance”) (“802.11a 5GHz UNII has up to 300MHz of available spectrum for interference avoidance vs. 83MHz in 2.4GHz ISM”); and Haas Tr. at 1091:21–1093:12 (testifying about CX-0387).

TP-Link argues “by its plain language, claim 13 requires the existence of ‘expected’ interference levels during transmission and reception of data—thus, something or someone must form such expectations.” TP-Link Reply at 22 (emphasis removed). As explained above, there is nothing in the claim language requiring levels of interference or user expectations. Further, TP-Link’s expert testified that it was “well-known within the art” that certain frequency bands are

expected to experience low and high interference “because of [their] physical characteristics.” Bims Tr. at 928:15–929:4.

The evidence supports that the ’714 patent accused products meet element 13[a].

c) Element 13[b]

Element 13[b] recites “receiving, at said base station, data on a second frequency in a frequency band expected to experience high interference.” ’714 patent at claim 13. Netgear contends this element is met. Netgear Br. at 15–16. TP-Link does not dispute that the portion of element 13[b] reciting “receiving, at said base station, data on a second frequency in a frequency band” is met. *See* TP-Link Reply at 7–42.

As explained with respect to element 13[a], the evidence supports that TP-Link’s ’714 patent accused products are base stations. The evidence also supports that TP-Link’s ’714 patent accused products receive data on a frequency in the 2.4 GHz band. Wicker Tr. at 121:10–122:15 and 123:4–10. The same TP-Link documents and testimony supporting that its ’714 patent accused products transmit on the 5 or 6 GHz band identified above support that those products receive on the 2.4 GHz band.

TP-Link disputes that the portion of limitation 13[b] reciting “frequency band expected to experience high interference” is met. TP-Link Reply at 9–27. The evidence supports that the ’714 patent accused products receive data “in a frequency band expected to experience high interference” by receiving data in the 2.4 GHz band. As detailed above, the 2.4 GHz frequency band is expected to experience high interference relative to the 5 GHz and 6 GHz bands, which are the frequency bands “expected to experience low interference.”

TP-Link advances the same arguments as to “receiving, at said base station, data on a second frequency in a frequency band expected to experience high interference” as it does for

“transmitting, at a base station, data on a first frequency in a frequency band expected to experience low interference.” TP-Link Reply at 9–27; Bims Tr. at 788:13–797:21 (addressing limitations 13.2 (“transmitting...”) and 13.3 (“receiving...”) together). For the same reasons detailed above with respect to claim element 13[a], I find that TP-Link’s arguments on element 13[b] are unpersuasive.

The evidence supports that the ’714 patent accused products meet element 13[b].

d) Element 13[c]

Element 13[c] recites “wherein said first frequency and said second frequency are separated by at least one octave.” ’714 patent at claim 13. Netgear contends that this element is met. Netgear Br. at 16. TP-Link does not dispute this element. *See* TP-Link Reply at 7–42.

The evidence supports that the ’714 patent accused products transmit and receive data on first and second frequency bands “wherein said first frequency and said second frequency are separated by at least one octave,” which the ’714 patent explains “is an interval between two frequencies having a ratio of two-to-one.” ’714 patent at 4:22–27; Wicker Tr. at 123:11–124:21. The 2.4 GHz and 5 GHz/6 GHz frequency bands are separated by at least one octave because the ratio between frequencies in these bands “is more than a factor of 2.” Wicker Tr. at 124:2–15.

The evidence supports that the ’714 patent accused products meet element 13[c].

e) Element 13[d]

Element 13[d] recites “wherein at least a portion of said receiving and at least a portion of said transmitting occur at the same time.” ’714 patent at claim 13. Netgear contends that TP-Link does not dispute this element. Netgear Br. at 17. TP-Link contends that Netgear has failed to show that its accused products meet this element. TP-Link Reply at 27–42.

As to its contention that TP-Link does not dispute this element, Netgear points to the testimony of TP-Link’s expert, Dr. Bims, who did not testify that this claim element is not met by

TP-Link's '714 patent accused products. Netgear Br. at 17, *citing* Bims Tr. at 787:2–11. There, Dr. Bims confirmed that as to infringement, he addressed only the high/low interference claim elements. *See also* RDX-0002.21 (identifying only elements 13[a] and 13[b] (called elements 13.1 and 13.2) as not being met by TP-Link's products).¹³ While Netgear is correct that TP-Link did not present affirmative expert testimony that this claim element is not present in TP-Link's accused products, TP-Link argues, as it did in its pre-hearing brief, that Netgear has not shown that this element is met. *See* TP-Link Pre-hearing Br. at 33–40. This argument is addressed below.

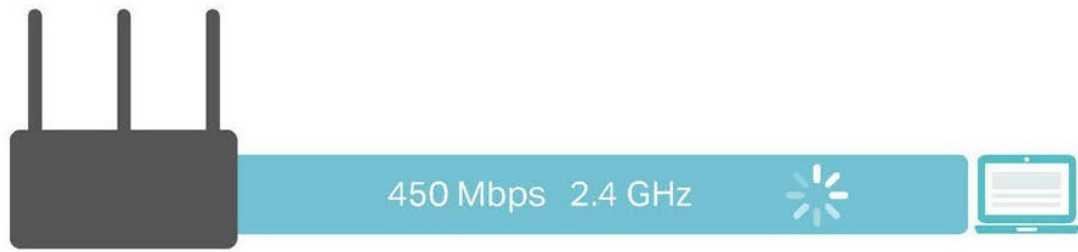
The evidence supports that the '714 patent accused products are all “Dual Band Dual Concurrent” or “DBDC” products. Wicker Tr. at 125:3–22. DBDC is described as simultaneous operation on both 2.4 and 5 GHz bands and as a “typical working mode for multi-frequency routers”. *Id.*; and CX-2536C.28. As TP-Link's corporate witness testified, this means the product “work[s] in both 2.4 and 5G bands at the same time” and “support[s] simultaneous operation on both 2.4-gigahertz and 5-gigahertz bands.” CX-3177C (Pu Dep. Tr.) at 211:23–212:19. This contrasts with another type of connection, not used by the '714 patent accused products, called “Dual Band Single Concurrent (DBSC),” which supports both 2.4 GHz and 5 GHz frequency bands, but “can only stably operate on one frequency band at a time.” CX-2536C.28; CX-3177C (Pu Dep. Tr.) at 211:8–10 (TP-Link Deco products do not supports DBSC). The evidence supports that TP-Link's products support DBDC operation and include a transceiver that operates, i.e.,

¹³ In one line of testimony, Dr. Bims stated that he had not seen evidence of packet-level overlap, if that is required by the “at the same time” language in claim 13. Bims Tr. at 788:3–7. This conclusory statement is not substantial evidence. *TQ Delta, LLC v. Cisco Systems, Inc.*, 942 F.3d 1352, 1358 (Fed. Cir. 2019). In addition, packet-level overlap is not required by the language of element 13[d].

transmits and receives, in both the 2.4 and 5 GHz bands at the same time. Wicker Tr. at 127:16–19

TP-Link internal technical documents (and documents for the chipsets TP-Link uses) show that the '714 patent accused products are designed for DBDC operation. For example, Dr. Wicker testified about TP-Link's Deco M5 product and documents supporting that it operates (i.e., transmits and receives) on the 2.4 and 5 GHz bands at the same time. Wicker Tr. at 127:13–129:10 (testifying about the Deco M5 and CX-2440C and CX-0287C); CX-2440C (Deco M5 Specification, indicating that it uses the Qualcomm [REDACTED] transceiver chip); and CX-0287C.11 (Qualcomm [REDACTED] Specification, stating that it is used for “dual band simultaneous operation,” “dual-band concurrent access-point applications” and incorporates “two dual-band, concurrent 802.11ac Wave-2 Wi-Fi subsystems” and showing that it has two separate radios, one operating at 2.4 GHz and one operating at 5 GHz); *see also* CDX-0001C.48. Dr. Wicker likewise testified that TP-Link's Deco XE5300 includes 2 chips, one operating at 2.4 GHz and a second operating at 5 GHz. Wicker Tr. at 129:11–20; CX-2480¹⁴; CX-0379C.13; CX-2539C.1; *see also* CDX-0001C.49. An internal TP-Link “PR Guide” for the AX3000 explains that it has simultaneous 2.4 and 5 GHz operation. Wicker Tr. at 130:22–131:1 and 131:11–23; CX-2378. TP-Link's Archer C7 webpage states that the product operates on both the 2.4 and 5 GHz bands “at the same time.” Wicker Tr. at 131:24–132:7; CX-2393.3–4; *see also* CDX-0001.51. A datasheet for TP-Link's A20 explains that a user can game and stream on multiple devices at the same time, distinguishing it from a “regular router,” as shown below:

¹⁴ Dr. Wicker testified that “[REDACTED]” in CX-2480C is a typo and should be [REDACTED] Wicker Tr. at 130:13–21 and 131:2–9.



Regular Router

Tri-Band
Archer A20

Wicker Tr. at 132:–133:2; and CX-2619.2 (AC4000 Datasheet). Additional TP-Link documents support that its '714 patent accused products transmit and receive data on 2.4 and 5 GHz bands at the same time. Wicker Tr. at 133:3–25 (2.4 and 5 GHz); CX-2237.2 (Archer C7 Datasheet); CX-2206 (Archer A7 Datasheet); CX-2238 (Archer C8 Datasheet); CX-2378 (TP-Link Product PR Guide); CX-2393.3–4 (Archer C7 V5 Datasheet); CX-2231.6 (AC4000 Datasheet); CX-2203.2 and .6 AC4000 Datasheet); CX-2375.14 (Deco X90 Datasheet); CX-2226.2 (BE19000 Datasheet); CX-2238.2 (AC1750 Datasheet); and CX-2237.2 (AC1750 Datasheet). The evidence also supports that certain of TP-Link's '714 patent accused products transmit on the 6 GHz band and receive on the 2.4 GHz band. Wicker Tr. at 137:13–138:10; CX-2243.2 (Deco BE95 Datasheet); CX-2242.3 (Deco BE85 Datasheet); CX-2250 (Deco PX50 Datasheet); and CX-2249 (Deco P9 Datasheet)).

The evidence supports that the '714 patent accused products are designed for simultaneous operation on the 2.4 GHz and 5 GHz (and 6 GHz, where applicable) frequency bands. This simultaneous operation by design supports that in operation, “at least a portion of said receiving and at least a portion of said transmitting occur at the same time,” when, for example, they transmit data to a device connected to the 5 GHz band (or 6 GHz band, where applicable) while receiving data from a device connected to the 2.4 GHz band. As Dr. Wicker explained, this occurs during normal working conditions of the '714 patent accused products, for example, when a client device, such as a laptop, tablet, or smartphone, is connected to an accused product on the 5 GHz (or 6 GHz) band and download data, such as when streaming a movie, while another client device, such as a smart home device, is connected to the 2.4 GHz band and upload data, such as when the smart home device uploads/streams a surveillance video feed or other information for display to a user. Wicker Tr. at 134:4–136:22; *see also* CDX-0001.56 (2.4 and 5 GHz) and CDX-0001C.58 (6 GHz). The evidence supports that many such client devices—more than 100 or 200—can be connected to TP-Link’s '714 patent accused products. Wicker Tr. at 136:23–137:8; CX-2242C; CX-2250C; CX-2253C; CX-2266C; CX-2370C–CX-2374C; CX-2376C; CX-2385C; CX-2386C; CX-2388C–CX-2390C; and CX-2549C.

TP-Link contends that documents relied on by Netgear do not show simultaneous transmission and reception, but show only simultaneous downlinks, i.e., simultaneous transmission from the TP-Link device. TP-Link Reply at 31–32, citing the Archer C4000 datasheet (CX-2231.3) as showing simultaneous transmission. That document, however, like CX-2619.2, excerpted above, shows simultaneous 2.4 and 5 GHz connections to devices that can both transmit and receive data and include wireless transmit and receive specifications. CX-2231.2 and .8; *see also* CX-2203.2 and .8; CX-2205.2 (showing transmission and reception) and .8; CX-2207.2 and

.8; CX-2208.2 and .8; CX-2230.2 and .8; CX2233.2 and .8; CX-2235.2 and .8; CX-2236.2 (showing transmission and reception) and .5; CX-2239.5 (showing transmission and reception) and .8; and CX-2240.4 and .8. In addition, as Dr. Wicker testified, the TP-Link products include a transceiver, such that they can both transmit and receive. Wicker Tr. at 127:16–21 and 129:11–20. The operations the products are designed to accomplish, transmitting and receiving using a transceiver, and the very name of the functionality that TP-Link’s products implement—Dual Band Dual Concurrent—support that TP-Link’s transmit and receive at the same time over two separate bands. And while TP-Link’s witnesses demurred on stating how the accused products operate (which they undoubtedly knew), they testified TP-Link does nothing to its products to prevent simultaneous transmission and reception. CX-3173C (Cai) at 125:19–126:1 (nothing prevents transmission and reception at the same time); CX-3181 (Weng Dep. Tr.) 87:16–21 (nothing prevents products from transmitting and receiving at the same time).¹⁵

TP-Link criticizes what it calls Netgear’s “hypothetical deployment” shown in the demonstrative slides that Dr. Wicker testified from, for example, CDX-0001C.55, contending that a demonstrative exhibit is not evidence and that “Dr. Wicker did not provide any analysis regarding how these hypothetical devices would work in practice.” TP-Link Reply at 35–36. Dr. Wicker’s

¹⁵ TP-Link cites testimony suggesting that simultaneous transmission and reception on multiple bands is a low-level operation that TP-Link would not know about. TP-Link Reply at 32, *citing* CX-3177C (Pu Dep. Tr.) at 209:24–210:14. There, Mr. Pu testified that there was “no issue” that MLO enables devices to simultaneously transmit and receive data over different frequency bands and channels but then stated that “if you were to look at it precisely as to simultaneously, whether it can simultaneously receive and transmit data, it would involve the scenario for the usage and also the driver implementation at the bottom layer.” This latter testimony from Mr. Pu is not understandable as to “precisely simultaneously.” In addition, Mr. Pu elsewhere clearly testified that TP-Link’s products simultaneously operate on the 2.4 and 5 GHz bands. CX-3177C (Pu Dep. Tr.) at 211:23–212:19.

testimony, however, was consistent with how TP-Link's witnesses testified its products operate and with how those products are described in TP-Link's documents. Further, TP-Link's argument that Netgear was required to show that a device "will constantly upload data" to the TP-Link device, TP-Link Reply at 35, reflects a fundamental mis-reading of claim 13, which recites that "at least a portion of said receiving and at least a portion of said transmitting occur at the same time," not that there is constant simultaneous transmission and reception, as TP-Link contends.

Dr. Wicker also tested certain of the '714 patent accused products. Wicker Tr. at 138:11–13. In that testing he connected two client devices to a TP-Link accused product, with one client device transmitting data to the TP-Link product on the 2GHz band and the other client device receiving data from the TP-Link product on the 5 GHz band. Devices called sniffers were placed between the client devices and the TP-Link product, which recorded the data packets they detected. Dr. Wicker considered the timestamp data of the transmitted and received data. Wicker Tr. at 138:18–140:11; and CX-1149. Dr. Wicker testified that transmission and reception data with the same timestamp indicated to him that "the transmission and the reception is going on at the same time." *Id.* at 141:1–2. He testified that "[i]t's not guaranteeing me that these particular packets, one being transmitted and one received at exactly the same time, this didn't have that kind of resolution, but it is showing me the transmission and reception is going on at the same time." *Id.* at 141:3–7. According to Dr. Wicker, claim 13 does not require overlap of specific packets but that transmitting and receiving occur at the same time. *Id.* at 141:8–17. I agree that claim 13 does not require packet-level overlap. And significantly, Dr. Wicker's testing ruled out that TP-Link's products operate in DBSC mode in which the device can only stably operate on one frequency band at a time. Wicker Tr. at 195:7–12 (use of sniffers ruled out that alternating transmitting and receiving occurs), and 229:13–20 (testing would have revealed dual band single concurrent

operation but did not show that); and CX-2536C.28 (defining DBSC operation); *see also* CDX-0001C.60 (and test result documents cited there).

TP-Link argues that “Dr. Wicker testified during cross-examination that the “at the same time” limitation requires proof of overlapping transmit and receive data packets in the accused TP-Link products. TP-Link contends that on re-direct and re-cross, Dr. Wicker changed his testimony and his infringement theory to no longer require packet overlap, this being, according to TP-Link “greatly and unfairly prejudicial.” TP-Link Reply at 28, *citing* Wicker Tr. at 178:20–179:3.

The problem is Dr. Wicker did not testify that packet overlap was required. The testimony TP-Link cites for that proposition is:

Q. Sir, does “at the same time” mean literally the base station is doing both transmission and reception at the same time?

A. Yes.

Q. Okay. And there needs to be an overlap; in other words, an instant in time in which transmission and recession [sic, reception] are occurring at the base station simultaneously, correct?

A. That’s my understanding, yes.

Wicker Tr. at 178:20–179:3. Dr. Wicker did not testify that the “at the same time” claim element requires proof of overlapping transmit and receive data packets, as TP-Link contends. In fact, when pressed, Dr. Wicker testified that claim 13 does not require individual data packets to overlap. *Id.* at 179:14–180:1. As a result, there is no change in “Dr. Wicker’s original theory” that was “greatly and unfairly prejudicial to TP-Link.” TP-Link Reply at 28.

After erroneously arguing that Netgear’s expert testified that “at the same time” “requires proof of overlapping transmit and receive data packets in the accused TP-Link products,” TP-Link argues that Netgear has not shown infringement because it has not shown proof of overlapping transmit and receive data packets. TP-Link Reply at 34 and 37. This argument is rejected as based

on a fundamentally flawed view of claim 13. To the extent that TP-Link is reading claim 13 as requiring proof of overlapping packets, that is inconsistent with the claim language, which simply recites “at least a portion of said receiving and at least a portion of said transmitting occur at the same time.” It is also inconsistent with what TP-Link stated in its pre-hearing brief, namely that “the receipt and transmission of simultaneous packets” is not a limitation that exists in the ’714 patent claims. TP-Link Pre-hearing Br. at 2–3.

TP-Link takes issue with Dr. Wicker’s testing of TP-Link’s products for the same reason. In particular, TP-Link argues that Netgear did not show overlapping packets because “packets move at the speed of light and therefore appear instantaneous to the human eye, even though there is a relatively large time gap between them (as large as 1000 times the duration of a single packet)” and that “data packets travel at the speed of light and Dr. Wicker timed the packets to only three decimal places (*i.e.*, in milliseconds)” and “they need to be measured at the level of microseconds (*i.e.*, six decimal places) or sub-microseconds to gather any meaningful information.” *Id.* at 34. To the extent TP-Link is arguing that one must measure one millionth of a second or less (at the microsecond or sub-microsecond level), to demonstrate infringement of claim 13, such granularity is not suggested, let alone required by claim 13 or the ’714 patent more generally. Dr. Wicker’s testing amply demonstrates what TP-Link’s documents show and witnesses testified—that its products transmit and receive over the 2.4 and 5 GHz bands (and 6 GHz bands where applicable) at the same time.

TP-Link contends that Dr. Wicker’s testing of accused products “is fundamentally unreliable because it is based on inaccurate timestamps.” TP-Link Reply at 37. I disagree. Netgear’s testing to the thousandth of a second is adequate to demonstrate simultaneous transmission and reception of data. TP-Link also contends that “Dr. Wicker’s basic test setup was

contrived, with no evidence that it reflects actual customer use.” TP-Link Reply at 38. Dr. Wicker’s set-up, however, had two client devices connected to a TP-Link accused product, one transmitting and one receiving. Wicker Tr. at 138:11–140:11. Aside from attorney argument, TP-Link provides no basis grounded in evidence why Dr. Wicker’s test set-up does not reflect how TP-Link’s products operate. Significantly TP-Link presented no evidence, by a fact or expert witness, providing any information or opinion that would call into question Dr. Wicker’s test set-up. Instead, TP-Link complains that “Dr. Wicker did not perform any testing similar to the use cases Netgear cites for infringement,” showing CDX-0001C.55, which illustrates a TP-Link Deco X90 receiving from a smart thermostat and camera each on the 2.4 GHz band and transmitting to a laptop and television on the 5 GHz band. TP-Link Reply at 38. TP-Link provides no reason (or evidence) suggesting that different client devices (such as the laptops used in Dr. Wicker’s test set-up) impact the transmitting and receiving operations.

TP-Link contends that “Netgear’s fundamental argument is that because one use device can be connected to an accused product on the uplink while another is connected on the downlink . . . there must be times when communications streams occur on the uplink and downlink at the same time.” TP-Link Reply at 30. TP-Link contends that “constant use, at the same time” of the uplink and downlink cannot be assumed. *Id.* Nothing in the claim language, however, requires “constant use, at the same time.” Instead, element 13[d] recites that “at least a portion of said receiving and at least a portion of said transmitting occur at the same time.” Further, the evidence supports that TP-Link’s ’714 patent accused products, which all implement Dual Band Dual Concurrent operation, transmit and receive over two different bands at the same time, as claimed.

Testing performed by TP-Link supports that its ’714 patent accused products transmit and receive on the 2.4 and 5 GHz bands at the same time. TP-Link does not dispute that this testing

takes place in the United States. Wicker Tr. at 146:12–14; *see* TP-Link Reply at 36 (otherwise addressing its testing). The evidence shows that in TP-Link’s testing, two cameras, Cam1 and KC20, transmit data to the TP-Link device on the 2.4 GHz band, and that two other devices, an Amazon Fire Stick and an Apple TV receive data from the TP-Link device on the 5 GHz band. CX-2573C; Wicker Tr. at 144:24–146:6. The test documentation indicates that simultaneous transmission and reception over the 2.4 and 5 GHz bands is tested by TP-Link. CX-2573C (identifying “live video” from the cameras and “playing constantly” on the Amazon Firestick and Apple TV). A TP-Link witness testified that in its testing, the streaming, to the Amazon Fire Stick and Apple TV, in the testing shown in CX-2573C, occurs constantly and that at least twice a day, the cameras are checked to make sure that they are sending data. CX-3174 (Liu Dep. Tr.) 76:23–77:23 (“Q. So, for example, while Netflix is streaming, at least twice a day you would also use a phone to check the video recording from the cameras C2 through C7? . . . A. Yes”); *see also id.* at 78:4–8 (same); 117:12–19 (during its testing, TP-Link ensures streaming is continuous); 117:24–118:11 (during TP-Link’s testing, smart home devices, such as cameras, are connected to the 2.4 GHz band); 186:21–187:10 (during TP-Link’s testing, video is constantly streaming on the 5 GHz band); and 188:2–10 (during testing live video from the cameras is checked).

TP-Link contends that “[n]one of TP-Link’s test results or cited deposition testimony concerning that testing indicate the existence of simultaneous communication streams on the uplink and downlink” because the “result indicates nothing about the timing of the two streams relative to each other and whether they were formatted to be sent in the same time slots.” TP-Link Reply at 37. As an initial matter, claim 13 says nothing about “time slots.” In addition, the identification of “playing constantly” on the 5 GHz transmitting band and “live video” on the 2.4 GHz receive band that was routinely checked establishes the timing of the streams relative to each

other—there is transmission and reception at the same time. TP-Link’s witness confirmed that under its test protocol, that this was happening would be checked twice a day. The evidence supports that the aim and outcome of TP-Link’s testing is to ensure that its products can transmit and receive at the same time on the 2.4 and 5 GHz bands. As Dr. Wicker testified, TP-Link’s testing shows that it is “transmitting on the 5-GHz band, receiving on the 2.4-GHz band, and doing it at the same time.” Wicker Tr. at 147:15–19.

The evidence supports that TP-Link performed similar testing in the United States on other of its products. Wicker Tr. at 148:1–12. CX-2546C (Archer BE550); CX-2547C (Archer BE800); CX-2550C (Deco BE85); CX-2572C (Archer A54); CX-2574C (Archer C54); CX-2575C (Archer A6); CX-2576C (Archer A8); CX-2577C (Archer A9); CX-2578C (Archer AX10); CX-2579C (Archer AX1100); CX-2580C (Archer AX21); CX-2581C (Archer AX3000); CX-2582C (Archer AX3200); CX-2583C (Archer AX4400); CX-2584C (Archer AXS0); CX-2585C (Archer AX55); CX-2586C (Archer AX73); CX-2587C (Archer AX75); CX-2588C (Archer AX80); CX-2589C (Archer AX90); CX-2590C (Archer AXE300); CX-2591C (Archer AXE75); CX-2592C (Archer AXE95); CX-2593C (Archer BE900); CX-2594C (Archer C20); CX-2595C (Archer C2300); CX-2596C (Archer CS9); CX-2597C (Archer C80); CX-2598C (Archer GX90); CX-2599C (Deco BE95); CX-2600C (Deco M4); CX-2601C (Deco M5); CX-2602C (Deco M9 Plus); CX-260SC (Deco PXS0); CX-2606C (Deco X20); CX-2607C (Deco X4300 Pro); CX-2608C (Deco XSO Outdoor); CX-2609C (Deco XSO-PoE); CX-2610C (Deco XSS); CX-2611C (Deco X60); CX-2612C (Deco X68); CX-2613C (Deco X90); CX-2614C (Deco XE200); CX-261SC (Deco XE7S Pro); CX-2616C (Deco XE7S); CX-2617C (Deco M3W); and CX-2618C (TL-WR902AC).

The evidence supports that TP-Link’s ’714 patent accused products meet element 13[d].

f) Evidence of Practice in the United States

The evidence supports direct infringement of claim 13 because each element of the claim is performed in the United States. As detailed above, the evidence supports that TP-Link, through its testing in the United States, has performed each element of claim 13. And while “a finding of infringement can rest on as little as one instance of the claimed method being performed during the pertinent time period,” the evidence supports substantial testing by TP-Link of its ’714 patent accused products in the United States, which testing performs each element of claim 13, thus demonstrating direct infringement. *Certain Mounting Apparatuses for Holding Portable Electronic Devices & Components Thereof*, Inv. No. 337-TA-1086, Comm’n Order at 4 (Mar. 18, 2019) (EDIS Doc. ID 670300), *quoting Lucent Techs., Inc. v. Gateway, Inc.*, 580 F.3d 1301, 1317 (Fed. Cir. 2009).

TP-Link’s testing in the United States is also circumstantial evidence that its customers perform the claimed method in the United States. The evidence supports that TP-Link’s testing in the United States is based on “how the end users of the product would use the product itself.” Wicker Tr. at 148:13–25, *quoting* CX-3174C (Liu Dep. Tr.) at 12:20–13:1; *see also id.* at 76:16–19 (TP-Link’s testing is based on “common sense” and “expecting how the end user will use the product.”) The evidence supports that it is “more likely than not one person somewhere in the United States had performed the claimed method using the [accused] products.” *Lucent*, 580 F.3d at 1318; *see also Alco Standard Corp v. Tenn. Valley Auth.*, 808 F.2d 1490, 1503 (Fed. Cir. 1986) (“Although the evidence of infringement is circumstantial, that does not make it any less credible or persuasive.”)

The evidence also supports “extensive sales of [the accused] products and the dissemination of instruction manuals for the [accused] products,” further supporting direct

infringement of claim 13 by TP-Link's customers. *Lucent*, 580 F.3d at 1318. Dr. Wicker testified that TP-Link sold over [REDACTED] units in the United States from the first quarter of 2022 to the second quarter of 2023. Wicker Tr. at 153:15–154:4. This large number of sales circumstantially supports that at least some TP-Link U.S. customers use the '714 patent accused products as recited in claim 13, that is, exactly as intended.

In addition, there is sufficient evidence for a finding of infringement “where an alleged infringer designs a product for use in an infringing way and instructs users to use the product in an infringing way.” *Toshiba Corp. v. Imation Corp.*, 681 F.3d 1358, 1365 (Fed. Cir. 2012). The evidence supports that TP-Link intends users in the United States to use client devices connected to both the 2.4 GHz and 5 GHz (or 6 GHz, where applicable) frequency bands at the same time, as shown by its user materials. Wicker Tr. at 149:1–152:19. The evidence demonstrates that TP-Link intends that, after a user sets up the '714 patent accused products, the user will connect client devices operating on both bands “simultaneously” or “at the same time”—a key feature highlighted by TP-Link in its marketing of the products. CX-2278.12–13 (Archer C7/A7 User Guide); CX-2375.14 (Deco X90 Product Introduction); CX-2390.8–9 (Deco X50-Outdoor Product Webpage); and CX-2369.2 (Deco M9 Plus Flyer). As Dr. Wicker explained, when client devices are connected to both the 2.4 GHz and 5 GHz (or 6 GHz band, where applicable) as directed, TP-Link's '714 patent accused products will transmit data on the 5 GHz (or 6 GHz) band and receive data on the 2.4 GHz band at the same time in normal working conditions. Wicker Tr. at 150:2–152:19.

At the evidentiary hearing, TP-Link presented no testimony, expert or otherwise, refuting Dr. Wicker's opinion that direct infringement has occurred in the United States. As discussed above, TP-Link has performed testing in the United States that meets the elements of claim 13 and there is overwhelming circumstantial evidence that TP-Link's customers perform the claimed

method in the United States. *Vita-Mix Corp. v. Basic Holding, Inc.*, 581 F.3d 1317, 1326 (Fed. Cir. 2009) (“[d]irect infringement can be proven by circumstantial evidence.”)

TP-Link asserts that reliance on circumstantial evidence is not appropriate because “it is uncontested that the accused products are all capable of substantial non-infringing uses,” and “[g]iven these substantial non-infringing uses, is well-settled that Netgear cannot rely on circumstantial evidence to try to show direct infringement.” TP-Link Reply at 39. TP-Link is wrong. “Because the concept of substantial non-infringing uses is applicable only in the context of contributory infringement, it plays no role in the analysis of . . . direct and induced infringement.” *Certain Digital Video Receivers & Hardware & Software Components Thereof*, Inv. No. 337-TA-1001, Comm’n Op. at 21 (Dec. 6, 2017) (EDIS Doc. ID 630893), *aff’d sub nom. Comcast Corp. v. Int’l Trade Comm’n*, 951 F.3d 1301 (Fed. Cir. 2020). “[A] person can be liable for inducing an infringing use of a product even if the product has substantial noninfringing uses” and “factual inferences about intended effects” can “rest on circumstantial evidence.” *Sanofi v. Watson Laboratories Inc.*, 875 F.3d 636, 646 (Fed. Cir. 2017).

TP-Link’s reliance on *ACCO Brands* is not persuasive. TP-Link Reply at 40–41. As detailed above, the evidence overwhelmingly supports that TP-Link’s ’714 patent accused products operate in DBDC mode such that they transmit in the 5 GHz (or 6GHz) band and simultaneously receive on the 2.4 GHz band. That is how they are designed to operate and TP-Link’s own testing in the United States confirms that operation.

The evidence supports direct infringement of claim 13 by both TP-Link and its customers.

3. Induced Infringement

“To establish liability under section 271(b), a patent holder must prove that once the defendants knew of the patent, they ‘actively and knowingly aid[ed] and abett[ed] another’s direct

infringement.” *DSU Med. Corp. v. JMS Co., Ltd.*, 471 F.3d 1293, 1305 (Fed. Cir. 2006), *quoting* *Water Techs. Corp. v. Calco, Ltd.*, 850 F.2d 660, 668 (Fed. Cir. 1988) (emphasis omitted). “While proof of intent is necessary, direct evidence is not required; rather, circumstantial evidence may suffice.” *DSU*, 471 F.3d at 1306, *quoting* *Water Techs.*, 850 F.2d at 668.

The Commission has found that “service of a section 337 complaint can be adequate to provide knowledge of the asserted patents.” *Certain Television Sets, Television Receivers, Television Tuners, & Components Thereof*, Inv. No. 337-TA-910, Comm’n Op. at 41 (Oct. 30, 2015) (finding contributory infringement) (EDIS Doc. ID 568157). The Commission has also found “an affirmative intent to infringe the patent” based on instructions provided to customers coupled with the respondents’ knowledge of the patent. *Certain Gas Spring Nailer Prods. & Components Thereof*, Inv. No. 337-TA-1082, Comm’n Op. at 62 (Apr. 28, 2020) (“Accordingly, we can infer from [Respondent’s] instructions, along with [Respondent’s] knowledge of the ’718 patent, ‘an affirmative intent to infringe the patent,’” *quoting* *Takeda Pharms. U.S.A., Inc. v. West-Ward Pharm. Corp.*, 785 F.3d 625, 631 (Fed. Cir. 2015)), *vacated on other grounds sub nom. Kyocera Senco Indus. Tools Inc. v. Int’l Trade Comm’n*, 22 F.4th 1369 (Fed. Cir. 2022)) (EDIS Doc. ID 709073).

Here, there is no dispute TP-Link had knowledge of the ’714 patent by at least May 2023, when it was served with the complaint in this investigation. Proof of Service of Complaint (EDIS Doc. ID 796193). The complaint alleges that TP-Link infringes the ’714 patent when users simultaneously use client devices connected to the 2.4 GHz and 5 GHz (or 6 GHz) bands, which results in TP-Link products transmitting data on the 5 GHz (or 6GHz) band and receiving data on the 2.4 GHz band at the same time. *See* Complaint, ¶¶ 6.4–6.5.

The evidence supports that TP-Link has continued to import into and sell products in the United States designed to transmit data on the 5 GHz band (and 6 GHz band, when applicable) and receive data on the 2.4 GHz band at the same time. And TP-Link continues to instruct users to enable both the 2.4 GHz band and 5 GHz bands (and 6 GHz band, when applicable) and connect client devices to both bands “at the same time” or “simultaneously.” Wicker Tr. at 149:1–152:19. As discussed, TP-Link encourages users to take advantage of simultaneous connections to the ’714 patent accused products to engage in high-bandwidth activities like streaming HD movies (where data will be transmitted on the 5 GHz (or 6 GHz) band) while using smart home devices and IP cameras (where data will be received on the 2.4 GHz band). *See* Wicker Tr. at 136:23–137:12.

TP-Link’s ’714 patent accused products are called “Dual-band” or “Tri-band” devices and are marketed for use with multiple client devices “simultaneously” or “at the same time” on both the 2.4 GHz and 5 GHz bands. Wicker Tr. at 131:24–134:3; CX-2393.3–4 (Archer C7 Webpage) (“Concurrent Dual Band Connections”); CX-2619.2 (AC4000 Datasheet) (“Tri-Band”); and *see also* CDX-0001C.54. And certain of TP-Link’s ’714 patent accused products are marketed as operating on the 6GHz band. Wicker Tr. at 137:13–138:10; CX-2243.2 (Deco BE95 Datasheet); CX-2242.3 (Deco BE85 Datasheet); CX-2250 (Deco PX50 Datasheet); and CX-2249 (Deco P9 Datasheet)).

At a minimum, TP-Link is willfully blind to the fact that it induces its customers to perform the claimed method. *Global-Tech Appliances, Inc. v. SEB S.A.*, 563 U.S. 754, 769 (2011). TP-Link argues that “[t]here is no evidence that TP-Link both subjectively believes there is a high probability that its products support simultaneous communication streams on the uplink and downlink, and took deliberate action to avoid learning that supposed fact.” TP-Link Reply at 42. The evidence supports, however, that TP-Link tests its products as it expects its users will use them

and in doing so operates its '714 patent accused products with “simultaneous communication steams on the uplink and downlink.” Wicker Tr. at 148:13–25 (TP-Link tests its products based on “expecting how the end user will also use the product.”) It is not credible for TP-Link to argue that it does not believe that its products support “simultaneous communication steams on the uplink and downlink” when its own testing unequivocally demonstrates that operation.

TP-Link’s advertising and user instructions support that TP-Link induces infringement. *Power Integrations, Inc. v. Fairchild Semiconductor Int’l, Inc.*, 843 F.3d 1315, 1335 (Fed. Cir. 2016) (“[W]e have affirmed induced infringement verdicts based on circumstantial evidence of inducement (e.g., advertisements, user manuals) directed to a class of direct infringers (e.g., customers, end users) without requiring hard proof that any individual third-party direct infringer was actually persuaded to infringe by that material”); and *Certain High-Density Fiber Optic Equipment and Components Thereof*, Inv. No. 337-TA-1194, Comm’n Op. at 33–36, 46, 50 (Aug. 23, 2021) (circumstantial evidence including marketing and customer instructions on how to assemble the accused product supports induced infringement) (EDIS Doc. ID 750094).

TP-Link argues that it does not encourage its customers to use the '714 patent accused products to simultaneously transmit and receive data. TP-Link Reply at 40–41. This argument is belied by the overwhelming evidence that TP-Link does exactly that. Wicker Tr. at 149:1–152:19; *and see* CDX-0001.067–70. TP-Link’s witness, Mr. Pu testified that TP-Link’s Deco, Archer, and Omada products “work[] in both 2.4 and 5G bands at the same time” and “support[] simultaneous operation on both 2.4-gigahertz and 5-gigahertz bands.” CX-3177 (Pu Dep. Tr.) at 211:23–212:19. And the record evidence supports that TP-Link consistently and publicly highlights that its products include “Concurrent Dual Band Connections” in which “[s]imple tasks ... can be handled by the 2.4 GHz band while bandwidth intensive tasks ... can be processed by the 5GHz band – all

at the same time.” CX-2393.3–4 (Archer C7 Webpage). The evidence supports that TP-Link’s ’714 patent accused products are not marketed or described as single-band devices, wired devices, or devices that operate on only one band at a time and are instead consistently marketed and described as operating on dual bands simultaneously. Wicker Tr. at 131:24–134:3 (confirming that devices that only operate on one band are not accused); CX-2238.4 (Archer C8 Datasheet) (“Simultaneous Dual Band”); CX-2231.2 (Archer C4000 Datasheet) (“With one 2.4 GHz and two 5 GHz bands, the Archer C4000 keeps all your devices connected Now, you can game and stream in 4K on multiple devices at the same time”), .6 (“Simultaneous Triple Band”); CX-2203.2 (Archer A20 Datasheet) (“With one 2.4 GHz and two 5 GHz bands, the Archer A20 keeps all your devices connected Now, you can game and stream in 4K on multiple devices at the same time”), .6 (“Simultaneous Triple Band”); CX-2226.2 (Archer BE800 Datasheet) (“Communicates with multiple devices via 12 streams and tri-band simultaneously”); and CX-2362.31 (Deco XE75 User Guide) (“2.4 GHz and 5 GHz Network.”) Nor are users directed to set up only one band for operation in the installation guides for the ’714 accused products. Wicker Tr. at 137:9–12 (reviewing exhibits and confirming that TP-Link does not tell users to use one frequency band at a time).

TP-Link argues “any documents that discuss “simultaneous connections” or connecting client devices “at the same time” only indicate that devices can be connected simultaneously on the 2.4 GHz and 5 GHz frequency bands, which is not sufficient to prove infringement.” TP-Link Reply at 41 (emphasis removed). But as Dr. Wicker explained, TP-Link does not merely highlight the availability of both bands in its instructions to customers, it touts the ability of its products to operate, i.e., transmit and receive, on both bands “simultaneously” or “at the same time.” Wicker Tr. at 149:1–152:19.

The evidence supports that TP-Link induces infringement of claim 13.

C. Technical Prong

1. Domestic Industry Products and Representativeness

Netgear identifies its '714 patent domestic industry products as its Orbi Mesh Wi-Fi and Nighthawk product lines. Netgear Br. at 31 and xv–xvi and CX-3064C.

Netgear asserts that no material differences exist in the operation of its '714 patent domestic industry products with respect to claim 13. *Id.* at 31; Wicker Tr. at 154:10–156:9 (all Netgear '714 patent domestic industry products implement simultaneous dual band feature); RX-0327C (Gielty Dep. Tr.) at 199:1–4, 199:16–21 (Orbi and Nighthawk products are capable of using the 2.4 and 5 GHz bands at the same time); CX-0377C.003 (Orbi Hardware Design Specification); CX-0370C.007 (RAX70 Hardware Design Specification); and CX-0374C.003 (MK83 Hardware Design Specification) While TP-Link disputes that Netgear's products practice claim 13, it does not dispute that Netgear's identified '714 patent domestic industry products operate the same way. TP-Link Reply at 42–46; and *see also* Bims Tr. at 797:25–798:14.

2. Claim 13

TP-Link argues that because the '714 patent domestic industry products' "functionality is substantially similar to the functionality of its accused TP-Link products with respect to their alleged practice of the '714 patent—and because TP-Link [sic, Netgear] relies on the same types of insufficient evidence to try to show Netgear's alleged practice of claim 13—Netgear has failed to prove the existence of a technical domestic industry for the same reasons that it has failed to prove infringement." TP-Link Reply at 42. That is, TP-Link advances the same arguments on technical domestic industry as it did in asserting non-infringement.

a) Element 13[pre]

Element 13[pre] recites “[a] method for increasing capacity of a wireless data communication system, said method comprising the steps of.” ’714 patent at claim 13. Netgear contends that its ’714 patent domestic industry products meet element 13[pre]. Netgear Br. at 32. TP-Link does not dispute that element 13[pre] is met. TP-Link Reply at 42–44.

The evidence supports that Netgear’s ’714 patent domestic industry products perform a method for increasing capacity of a wireless data communication system because they transmit and receive data on the 2.4 GHz and 5 GHz frequency bands and using two frequency bands increases capacity of a wireless data communication system. Wicker Tr. at 156:10–157:4; CX-0088.001 (Orbi 960 Series Datasheet); CX-0154C.001 (MS80 Datasheet); CX-0263C.001 (RAX70 Datasheet); *see also* CDX-0001C.78 (and evidence cited).

The evidence supports that Netgear’s ’714 patent domestic industry products meet element 13[pre].

b) Element 13[a]

Element 13[a] recites “transmitting, at a base station, data on a first frequency in a frequency band expected to experience low interference.” ’714 patent at claim 13. Netgear contends that its ’714 patent domestic industry products meet element 13[a]. Netgear Br. at 32–33.

TP-Link does not dispute that the portion of element 13[a] reciting “transmitting, at a base station, data on a first frequency in a frequency band” is met. TP-Link Reply at 42–44. The evidence supports that Netgear’s ’714 patent domestic industry products are base stations. Wicker Tr. at 159:5–15. Evidence, including Netgear’s internal technical specifications and datasheets, supports that Netgear’s ’714 patent domestic industry products transmit data on a frequency in the

5 GHz band. Wicker Tr. at 157:5–158:12; CX-0088.005 (RBKE963E Datasheet); CX-0263C.014 (RAX70 Datasheet); CX-0154C.006 (MS80 Datasheet); and CX-0183C (Nighthawk R8000P Box); *see also* CDX-0001C.80–81 (and evidence cited).

TP-Link makes the same arguments as to the next portion of element 13[a], “transmitting, at a base station, data on a first frequency in a frequency band expected to experience low interference,” for its ’714 patent domestic industry products as it did for the ’714 patent accused products. TP-Link Reply at 42–43; and Bims Tr. at 797:25–798:14. Those arguments fail for the same reasons discussed above with respect to element 13[a] as to infringement.

The evidence supports that Netgear’s ’714 patent domestic industry products transmit data “in a frequency band expected to experience low interference,” as recited in element 13[a]. As discussed, the 5 GHz band is expected to experience low interference relative to the 2.4 GHz band and thus is the “frequency band expected to experience low interference.” Wicker Tr. at 158:13–159:4 (addressing domestic industry); CX-0391.2 (“5GHz frequency band sees a lot less interference than the lower 2.4 GHz band”); CX-0386.1 (identifying 2.4 GHz wi-fi as “More susceptible to interference” and 5 GHz Wi-Fi as “Less susceptible to interference”); *see also* Wicker Tr. at 115:24–118:19 (addressing infringement); and evidence cited in CDX-0001C.80–82.

The evidence supports that Netgear’s ’714 patent domestic industry products meet element 13[a].

c) Element 13[b]

Element 13[b] recites “receiving, at said base station, data on a second frequency in a frequency band expected to experience high interference.” ’714 patent at claim 13. Netgear

contends that its '714 patent domestic industry products meet element 13[b]. Netgear Br. at 33–34.

TP-Link does not dispute that the portion of element 13[b] reciting “receiving, at a base station, data on a second frequency in a frequency band” is met. TP-Link Reply at 42–43. The evidence supports that Netgear’s '714 patent domestic industry products are base stations. Wicker Tr. at 159:5–15 and 161:4–6. Evidence, including Netgear’s internal technical specifications and datasheets, supports that Netgear’s '714 patent domestic industry products receive data on a frequency in the 2.4 GHz band. Wicker Tr. at 159:16–160:15; CX-0088.005 (RBKE963E Datasheet); CX-0263C.014 (RAX70 Datasheet); CX-0154C.006 (MS80 Datasheet); CX-0183C (Nighthawk R8000P Box); *see also* evidence cited in CDX-0001C.85–86.

With respect to the remainder of element 13[b], “receiving, at said base station, data on a second frequency in a frequency band expected to experience high interference,” TP-Link makes the same arguments for the domestic industry products as it did for the accused products. TP-Link Reply at 42–43; and Bims Tr. at 797:25–798:14 (using the same reasoning “applied for the TP-Link products.”) That argument fails for the same reasons discussed above with respect to infringement.

The evidence supports that Netgear’s '714 patent domestic industry products receive data “in a frequency band expected to experience high interference,” as recited in element 13[b]. The evidence supports that the 2.4 GHz frequency band is expected to experience high interference relative to the 5 GHz band and is therefore the frequency band “expected to experience high interference.” Wicker Tr. at 160:16–161:3 (regarding domestic industry); CX-0391.002 (“5GHz frequency band sees a lot less interference than the lower 2.4 GHz band”); CX-0386.001 (identifying 2.4 GHz wi-fi as “More susceptible to interference” and 5 GHz wi-fi as “Less

susceptible to interference”); *see also* Wicker Tr. at 115:24–118:19 (regarding infringement) and evidence cited in CDX-0001.87.

The evidence supports that Netgear’s ’714 patent domestic industry products meet element 13[b].

d) Element 13[c]

Element 13[c] recites “wherein said first frequency and said second frequency are separated by at least one octave.” ’714 patent at claim 13. Netgear contends that its ’714 patent domestic industry products meet element 13[c]. Netgear Br. at 34. TP-Link does not that dispute this limitation is met. TP-Link Reply at 42–44.

The evidence supports that the ’714 patent domestic industry products transmit and receive data on first and second frequency bands “wherein said first frequency and said second frequency are separated by at least one octave” because the ratio between frequencies in the 2.4 GHz and 5 GHz frequency bands is at least two. Wicker Tr. at 161:13–24.

The evidence supports that Netgear’s ’714 patent domestic industry products meet element 13[c].

e) Element 13[d]

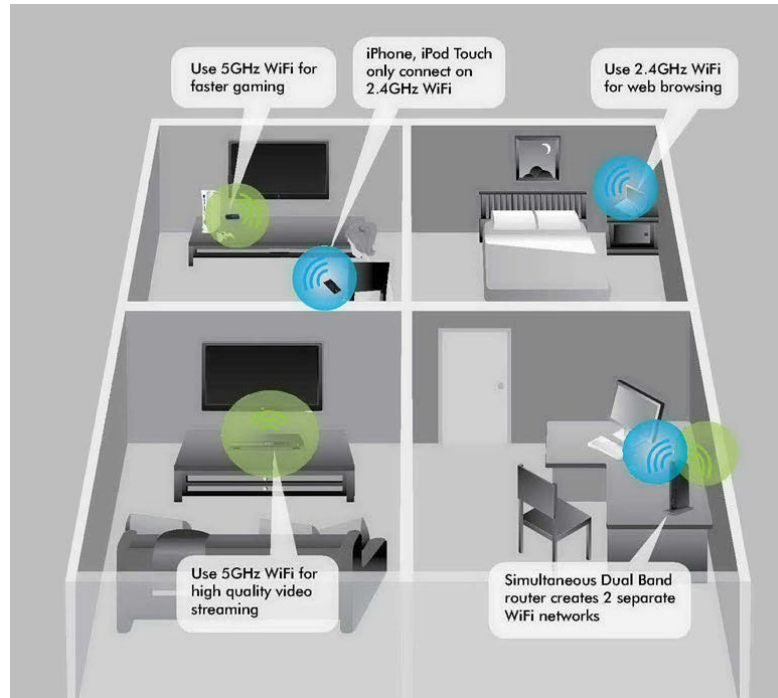
Element 13[d] recites “wherein at least a portion of said receiving and at least a portion of said transmitting occur at the same time.” ’714 patent at claim 13. Netgear contends that its ’714 patent domestic industry products meet element 13[d]. Netgear Br. at 34–38. Netgear contends that TP-Link does not dispute this element. Netgear Br. at 34. TP-Link contends that Netgear has failed to show that its accused products meet this element. TP-Link Reply at 43–44.

The evidence supports that Netgear’s ’714 patent domestic industry products transmit and receive data “wherein at least a portion of said receiving and at least a portion of said transmitting

occur at the same time.” Wicker Tr. at 161:25–166:13 and RX-0327C (Gielty Dep. Tr.) at 199:1–4 (Orbi and Nighthawk products can use 2.4 and 5 GHz bands “at the same time”) and at 199:16–21 (“Orbi and Nighthawk products transmit and receive on both bands simultaneously.”).

The evidence supports that certain of Netgear’s ’714 patent domestic industry products are “Dual Band Wireless Routers” or “Simultaneous Dual Band Routers” that operate on the 2.4 GHz and 5 GHz bands simultaneously. Wicker Tr. at 162:5–163:2 (testifying about CX-0629); CX-0629.1–2 (“Why Choose Simultaneous Dual Band,” identifying “Simultaneous Dual Band” as two separate Wi-Fi networks “operating simultaneously” and distinguishing from “Selectable Dual Band”); Wicker Tr. at 163:3–11 (testifying about CX-0377C); CX-0377C.003 (Orbi 960 Hardware Design Specifications, showing separate 2G, 5G and 6G communications); and CDX-0001C.92 (and evidence cited). The evidence supports that certain of Netgear’s ’714 patent domestic industry products can also operate on the 6GHz band and are designed for “Simultaneous Dual-band Wi-Fi” or “Simultaneous Tri-Band Wi-Fi” (for products with a 6 GHz frequency band) with “Optimized speeds for all Wi-Fi devices.” Wicker Tr. at 163:22–164:22; CX-0663.5 and .9 (RAX70 Datasheet); CX-0260C.5 (RAX50 Datasheet); CX-0154C.2 and .6 (MS80 Datasheet); CX-0280.1 (Orbi 860 Series Datasheet); CX-0088.1 and .5 (Orbi 960 Series Datasheet); CX-0264C.5 (RAX80 Datasheet); CX-0146C.1 (Netgear MK73 Datasheet); CX-0226C.5 (RAX35 Datasheet); and *see* CDX-0001C.93–94 (and evidence cited).

The evidence supports that Netgear’s simultaneous dual band routers provide two independent, dedicated networks and shows them operating, i.e., transmitting and receiving, simultaneously:



CX-0629.2 (showing high interference 2.4 GHz band in blue and low interference 5 GHz band in green). The evidence also supports that the multiple bands are set by default. CX-0340C.57 and Wicker Tr. at 167:20–25.

Because the '714 patent domestic industry products are designed for simultaneous operation on the 2.4 GHz and 5 GHz (and 6 GHz, where applicable) frequency bands, the “wherein at least a portion of said receiving and at least a portion of said transmitting occur at the same time” portion of claim 13 occurs when they transmit data to a device connected on the 5 GHz band (or 6 GHz band, where applicable) while receiving data from a device connected on the 2.4 GHz band. Wicker Tr. at 164:23–165:23. The evidence supports that “at the same time” operation occurs during normal operation of the '714 domestic industry products. *Id.*

TP-Link makes the same arguments with respect to “at the same time” for Netgear’s domestic industry products as it does for its accused products, that is, that Netgear failed to prove

that its domestic industry products meet this element. TP-Link Reply at 43–44. Those arguments fail for the same reasons discussed above with respect to infringement.

f) Evidence of Practice in the United States

The evidence supports that Netgear and its customers have performed the method of claim 13 in the United States. Wicker Tr. at 166:14–170:21.

As to Netgear, its testing shows that its '714 patent domestic industry products have performed the claimed methods in the United States by transmitting on the 5 GHz band and receiving on the 2.4 GHz band. Wicker Tr. at 168:23–169:5; CX-0395C (Orbi testing); CX-0396C (Orbi testing); CX-0397C (Orbi testing); CX-0398C (Orbi testing); CX-0399C (Orbi testing); CX-0425C (Orbi testing); CX-0426C (Orbi testing); CX-0427C (Orbi testing); CX-0428C (Orbi testing); CX-0429C (Orbi testing); and CX-0430C (Orbi testing).

The evidence also shows that Netgear's user manuals direct users to enable the 2.4 GHz band and 5 GHz band (and 6 GHz band, where applicable) when setting up the '714 patent domestic industry products. Wicker Tr. at 167:20–168:13; CX-0340C.57 (Orbi Quad-Band Mesh User Manual); *see also id.* at .140–160 (identifying 2.4, 5, and 6 GHz band default settings); *see also* CX-0089 (Orbi Quad-Band Mesh WiFi 6E User Manual); CX-0300C (Nighthawk AC 1900 User Manual); and CX-0341C (Nighthawk AXE7300 User Manual).

The evidence demonstrates that Netgear's users can connect client devices operating on both bands “simultaneously” or “at the same time” (CX-0281 (RS700 Box))—a key feature highlighted by Netgear in its datasheets describing the products as “Simultaneous Tri-band” or “Simultaneous dual band” products. Wicker Tr. at 163:22–164:22

Netgear's documents support that its '714 patent domestic industry products transmit and receive on the 2.4 and 5 GHz bands at the same time. Wicker Tr. at 168:14–22 and CX-0263C.5,

9 (RAX70 Datasheet). The RAX70 datasheet identifies “[f]aster download & upload speeds at the same time”:

Faster Upload & Download Speeds

Faster WiFi download & upload speeds at the same time.



CX-0263C.3. It also provides technical specifications, identifying transmission and reception (Tx/Rx) on the 2.4 and 5 GHz bands:

Technical Specifications

- WiFi 6 (802.11ax) Tri-Band WiFi (AX6600)
 - 2.4GHz AX: 2x2 (Tx/Rx) 1024/256-QAM 20/40MHz, up to 0.6Gbps
 - 5GHz AX: 2x2 (Tx/Rx) 1024/256-QAM 20/40/80MHz, up to 1.2Gbps
 - 5GHz AX: 4x4 (Tx/Rx) 1024/256-QAM 20/40/80/160MHz, up to 4.8Gbps

Id. at .14. The evidence supports that Netgear’s other ’714 patent domestic industry products also transmit and receive on the 2.4 and 5 GHz bands. CX-0260C.3, 5 and 12 (RAX50 Datasheet) (same); CX-0154C.2, 6 (MS80 Datasheet) (same); CX-0264C.3, 5, and 13 (RAX80 Datasheet) (same); CX-0280.1 (Orbi 860 Series Datasheet) (simultaneous tri-band Wi-Fi); CX-0088.1, 5 (Orbi 960 Series Datasheet) (identifying transmission and reception (Tx/Rx) on the 2.4 and 5 GHz bands); CX-0146C.1 (Netgear MK73 Datasheet) (simultaneous dual band Wi-Fi); and CX-0226C.11 (RAX35 Datasheet) (identifying transmission and reception (Tx/Rx) on the 2.4 and 5 GHz bands).

As Dr. Wicker explained, when client devices are connected to both the 2.4 GHz and 5 GHz bands, Netgear’s ’714 patent domestic industry products will transmit data on the 5 GHz band and receive data on the 2.4 GHz band at the same time in normal working conditions—for

example, when a laptop or cellphone streams a movie or otherwise downloads data on the 5 GHz band, while a smart home device (which typically operates on the 2.4 GHz band) uploads data, such as video from a camera or baby monitor, or status information from a smart thermometer or outlet. Wicker Tr. at 164:23–165:23. Netgear instructs users to connect devices to the 2.4 GHz and 5 GHz bands (and 6 GHz band, where applicable) and, for example, use the 5 GHz band for gaming and high quality video streaming, while using the 2.4 GHz band for iPhone, iPod Touch, and web browsing. Wicker Tr. at 166:14–167:2; and CX-0629.1–2 (Netgear Simultaneous Dual Band Information Sheet) (two separate Wi-Fi networks operating simultaneously). The evidence also demonstrates that there have been extensive sales of Netgear’s ’714 domestic industry products in the United States, supporting that the method of claim 13 has been performed in the United States by Netgear users. Wicker Tr. at 169:6–21 (identifying more than [REDACTED] units sold in the United States in fiscal year 2021 to 2022); and CX-0299C.

The evidence supports that TP-Link’s ’714 patent domestic industry products practice claim 13.

D. Validity

TP-Link argues that U.S. Patent Publication No. 2002/0045459 of Morikawa, RX-0094, anticipates and renders obvious claim 13, TP-Link Br. at 10–43, which Netgear disputes.¹⁶ Netgear Reply at 12–40. Morikawa published on April 18, 2002, and is prior art under 35 U.S.C. § 102(e). TP-Link Br. at 15. Netgear does not dispute that Morikawa is prior art.¹⁷ The only dispute is

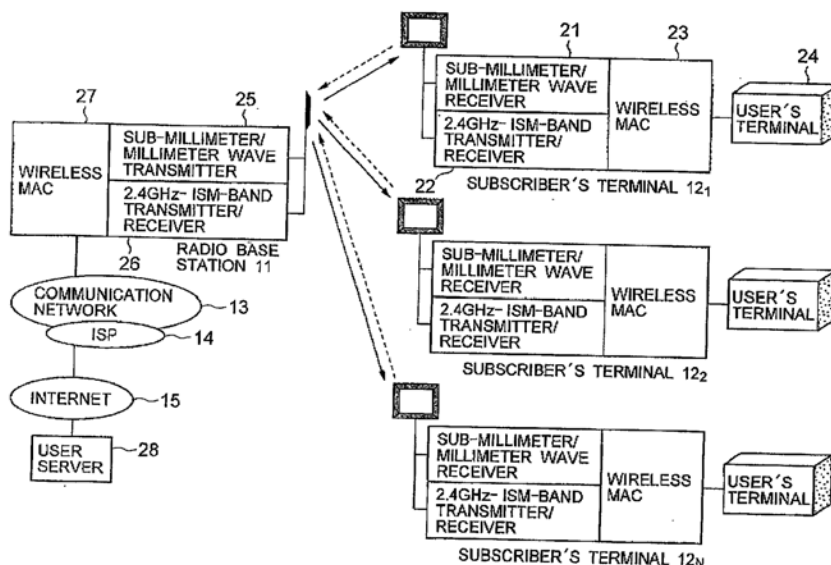
¹⁶ TP-Link also contends that claim 13 is invalid based on indefiniteness. TP-Link Br. at 10–65. The indefiniteness issue was addressed above.

¹⁷ Netgear filed a Notice of the PTAB’s decision declining to institute TP-Link’s petition for inter partes review of the ’714 patent, attaching the decision, EDIS Doc. ID 815866, to which TP-Link responded, EDIS Doc. ID 815972.

whether Morikawa discloses “wherein at least a portion of said receiving and at least a portion of said transmitting occur at the same time,” recited in element 13[d]. Netgear Reply at 12-40.

1. Overview of Morikawa

Morikawa is titled “Point-to-Multipoint Wireless Access System,” and discloses a wireless communication system in which a base station communicates with subscriber terminals. Morikawa at Abstract. Bims Tr. at 798:23–799:7. Fig. 1 of Morikawa is a block diagram of a point-to-multipoint access system.



Morikawa at Fig. 1

Morikawa’s base station 11 uses a downlink channel (solid line from base station 11 to subscriber terminal 12₁) to transmit data to a subscriber terminal and an uplink channel (dashed line from subscriber terminal 12₁ to base station 11) to receive data from the subscriber terminal. Morikawa at [0002]. Morikawa discloses that different bands can be used for uplink and downlink and, in particular, discloses a downlink on the 5 GHz band and an uplink on the 2.4 GHz band. *Id.* at [0022], [0025], and [0045]. Morikawa discloses that the uplink and downlink bands are more

than an octave apart. Bims Tr. at 800:24–801:2; and Wicker Tr. at 1034:15–1035:1. Fig. 1 of Morikawa shows user server 28, which responds to user requests from user terminals 24 through base station 11. Morikawa at [0027].

Morikawa discloses that “by separating the second wireless band for the up-link channels from the first wireless band for the down-link channels, the larger capacity data is transferred through one of the up-link and down-link channels by the higher frequency band, whereas the smaller capacity data is transferred through the other of the up-link and down link channels by the lower frequency band.” According to Morikawa, “[t]his achieves a lower cost wireless subscriber’s terminal which transmits smaller capacity data and receives larger capacity data.” *Id.* at [0010]; *see also id.* at [0044]. Morikawa states that its point-to-multipoint wireless access system can be “constructed at a lower cost, and effectively operate at a high speed.” *Id.* at [0025]; *see also id.* at [0007], [0010], [0016], and [0044].

2. Construction of “at the Same Time”

TP-Link argues that “at the same time” in claim 13 “refers to the base station’s use of two different uplink and downlink frequencies during a particular interaction with a subscriber unit or other device.” TP-Link Br. at 23. Netgear contends that this argument is based on a construction of “at the same time” that TP-Link did not advance earlier and that its argument “is both waived and wrong.” Netgear Reply at 13. Netgear is correct.¹⁸

¹⁸ TP-Link’s construction is also inconsistent with the construction it proposes in arguing non-infringement. TP-Link Reply at 28 (“‘at the same time’ requires proof of overlapping transmit and receive packets in the accused TP-Link Products”) and 36 (whether communications streams “were formatted to be sent in the same time slots”).

a) Waiver

TP-Link did not raise a construction of “at the same time” as meaning “during a particular interaction” before its post-hearing brief—not at the claim construction stage, in its expert report, or in its pre-hearing brief. Second Amended Joint Chart (not raising “at the same time” as a term for construction); and Motion No. 1361-023, Ex. A (Bims Rpt. at ¶¶ 232–35) (EDIS Doc. ID 811492) (Bims expert report, addressing claim 13 as “allowing simultaneous transmission and reception.”) TP-Link argued in its pre-hearing brief that the “at the same time” limitation is met by Morikawa based on alleged “bi-directional communication occurring simultaneously” using “frequency division duplexing (FDD).” TP-Link Pre-hearing Br. at 14–15 and 80–86. Dr. Bims did not advance TP-Link’s new construction at the hearing, testifying instead that “[w]hat this claim limitation requires is that . . . contemporaneous with transmission there’s also reception occurring.” Bims Tr. at 808:3–9 and 928:2–8 (“separate receiver and transmitter units at the base station allow for concurrent two-way uplink and downlink transmissions over separate frequency bands.”) TP-Link only advanced this new construction after the evidentiary record was closed.

“[L]itigants waive their right to present new claim construction disputes if they are raised for the first time after trial.” *Broadcom Corp.*, 543 F.3d at 694, *quoting Conoco, Inc. v. Energy & Env’t Int’l, L.C.*, 460 F.3d 1349, 1359 (Fed. Cir. 2006)) (“Qualcomm cannot be allowed to create a new claim construction dispute following the close of the jury trial.”) Although TP-Link cites *O2 Micro Int’l Ltd. v. Beyond Innovation Tech. Co.*, 415 F.3d 1303, 1312–13 (Fed. Cir. 2005) as supporting that its new construction should be considered, TP-Link Br. at 24, in *O2 Micro*, the parties in *O2 Micro* “disputed the proper construction of a term at a pre-trial *Markman*.” *Broadcom*, 543 F.3d at 694. Claim construction arguments not presented at or before trial are rejected. *Id.*

In addition, the Ground Rules in this investigation require parties to both raise claim construction issues and to identify contentions in their pre-hearing brief. Ground Rule 7.1 (“The parties ... shall jointly file a chart of ... disputed constructions by the date in the procedural schedule.”) and 11.2 (“Any contention not described in detail in the pre-hearing brief shall be deemed abandoned or withdrawn, except for contentions a party is not aware of and could not be aware of in the exercise of reasonable diligence when the pre-hearing brief was filed.”) TP-Link did not raise its proposed construction until after the hearing in this investigation. I find that TP-Link has waived this issue. *Certain Laser Imageable Lithographic Printing Plates*, Inv. No. 337-TA-636, Initial Determination at 20–23 (Jul. 24, 2009) (noting that the ground rules are “designed to prevent a shifting sands approach to claim construction, which, if permitted, would unfairly surprise and prejudice other parties at a late stage in an investigation”) (EDIS Doc. ID 408428).

b) Analysis

Even if not waived, TP-Link’s new construction is incorrect. TP-Link’s construction replaces “at the same time” with “during a particular interaction,” thereby improperly expanding the term to conflict with its plain language and to cover non-concurrent/non-simultaneous—i.e., sequential—transmission and reception that occurs “during a particular interaction.” TP-Link Br. at 24. In construing transmission and reception “at the same time” to cover sequential transmission and reception, TP-Link thus improperly rewrites claim 13. *Helmsderfer v. Bobrick Washroom Equip., Inc.*, 527 F.3d 1379, 1383 (Fed. Cir. 2008) (“Courts cannot rewrite claim language.”).

Further, TP-Link’s construction would improperly render claim 13 indistinguishable from independent claim 32, which recites “said transmitting and said receiving occur during the same communication session.” *AllVoice Computing PLC v. Nuance Commc’ns, Inc.*, 504 F.3d 1236, 1247 (Fed. Cir. 2007) (“[C]laim differentiation takes on relevance in the context of a claim

construction that would render additional, or different, language in another independent claim superfluous.”) (citations omitted). TP-Link previously recognized the difference between the claim language “at the same time,” in claim 13, and “during the same communication session,” in claim 32. TP-Link Claim Construction Br. at 6 (EDIS Doc. ID 803928) (recognizing the difference between “at the same time” in claim 1 and “during the same communication session” in claim 32).¹⁹ Now, however, in asserting its new construction, TP-Link does not address the fact that claim 32 already has the different, broader scope that TP-Link seeks to impose on claim 13, despite its narrower “at the same time” language.

TP-Link contends that the prosecution history supports its argument. TP-Link Br. at 24, *citing* JX-0004.305; *see also* TP-Link Br. at 26–28, *citing* JX-0004.371, 372, 455, and 480.²⁰ In particular, TP-Link argues that the applicant’s arguments overcoming the prior art support its newly-proposed construction.

“The doctrine of prosecution disclaimer precludes patentees from recapturing through claim interpretation specific meanings disclaimed during prosecution. Prosecution disclaimer, which can arise from arguments made during prosecution or claim amendments, only applies to

¹⁹ In its IPR petition, TP-Link distinguished claim 1 (“simultaneous transmission and reception”) from claim 32 (“concurrent, parallel transmission and reception during the same communication session”). See:

https://ptacts.uspto.gov/ptacts/public-informations/petitions/1554594/download-documents?artifactId=YFEGknejJ0ya2_XUOI9sHr_TgSu7x9CWRfodO_Qt_EBfRzFZnMfXN4

²⁰ TP-Link also contends that Netgear is asserting that “at the same time” requires “overlapping packet streams,” which it contends is inconsistent with the prosecution history. TP-Link Br. at 24, *citing* Wicker Tr. at 231:10–17. The double negative in the question, however, makes this testimony unclear. (“So you don’t – you’re not saying you don’t have to show overlapping packets at the base station, correct?”) In any event, Dr. Wicker made clear his view that “at the same time” does not require packet overlap. *See* Wicker Tr. at 1015:10–1016:12 and 1717:2–4.

unambiguous disavowals.” *Malvern Panalytical Inc. v. TA Instruments-Waters LLC*, 85 F.4th 1365, 1374 (Fed. Cir. 2023) (citations omitted and cleaned up).

The prosecution history does not unambiguously establish the redefinition TP-Link argues. Instead, in reversing the Examiner’s prior art rejection, the Board clearly recognized the difference between claims reciting “at the same time” and “during the same communication session.” JX-0004.454–55 (recognizing the difference in claim language), .456 (addressing “at the same time” vis-à-vis the prior art), and .457 (addressing “during the same communication session” vis-à-vis the prior art). In addition, when identifying support in the specification for these different claim terms, Netgear did not identify the same portions of the specification. JX-0004.367–68. Moreover, the fact that Netgear successfully argued that the prior art did not disclose a broader limitation, “during the same communication session,” does not support that Netgear equated that with the narrower “at the same time” limitation.²¹ To the extent not waived, TP-Link’s new construction of “at the same time” is not supported by the intrinsic evidence.

c) Evidence

TP-Link cites Morikawa’s disclosure of sequential request/responses in paragraphs 33–43 of Morikawa to argue that it discloses the “at the same time” limitation under its new construction. TP-Link Br. at 29–31. TP-Link’s expert, Dr. Bims, however, did not address paragraphs 33–43 of Morikawa in his testimony. *See* RDX-0002C.037–49 (Bims demonstratives, not addressing paragraphs 33–43 of Morikawa) and Bims Tr. at 799:17–818:17. In fact, Dr. Bims testified about paragraph 27 of Morikawa and then stated he would “proceed to paragraph 44.” *Id.* at 806:10–14.

²¹ The prosecution history supports that the applicant separately addressed “the same communication session” limitation of claim 32. JX-0004.381–82.

TP-Link also suggests that Dr. Bims applied its new construction to Morikawa. TP-Link Br. at 29–30. But Dr. Bims’s cited testimony has nothing to do with TP-Link’s new construction. For example, TP-Link cites Bims Tr. at 800:12–801:8 (and at 800:12–23). TP-Link Br. at 29. That testimony was not about the “at the same time” limitation. Instead, Dr. Bims testified there that Morikawa discloses two frequency bands separated by an octave. TP-Link also cites Bims Tr. at 821:21–822:19. TP-Link Br. at 30. That testimony does not address paragraphs 33–43 of Morikawa or apply TP-Link’s new construction to Morikawa’s disclosures and instead addresses “at the same time.” Bims Tr. at 822:10–19.

TP-Link also argues that its application of Morikawa under its new construction of “at the same time” is supported by Dr. Wicker’s analysis in opining on infringement. TP-Link Br. at 30. TP-Link cites testimony from Dr. Wicker suggesting that sequential packets are transmitted and received at the same time. *Id.*, citing Wicker Tr. at 214:25–215:8. During that same colloquy, however, Dr. Wicker testified that “[w]e know they are not received at the same time.” Wicker Tr. at 215:23; *see* Netgear Reply at 19–20. While TP-Link is correct that infringement and validity should be considered under the same construction, Dr. Wicker’s testimony on his testing does not support that Morikawa anticipates claim 13 under its new construction.

TP-Link’s attorney argument regarding paragraphs 33–43 of Morikawa is unsupported by expert testimony and is insufficient to meet its burden of proving invalidity by clear and convincing evidence. *Estee Lauder Inc. v. L’Oreal, S.A.*, 129 F.3d 588, 595 (Fed. Cir. 1997) (“[A]rguments of counsel cannot take the place of evidence lacking in the record”); *Invitrogen Corp. v. Clontech Labs*, 429 F.3d 1052, 1068 (Fed. Cir. 2005) (“Unsubstantiated attorney argument regarding the meaning of technical evidence is no substitute for competent substantive expert testimony”); *Enzo*

Biochem, Inc. v. Gen-Probe Inc., 424 F.3d 1276, 1284 (Fed. Cir. 2005) (“Attorney argument is no substitute for evidence.”)

Even if not waived, and even if not incorrect, TP-Link has not presented clear and convincing evidence that Morikawa discloses the “at least the same time” element of claim 13 under its newly-proposed construction.

3. Anticipation

TP-Link argues that “Morikawa also discloses the ‘at the same time’ element under Netgear’s restrictive read that requires communication streams on the uplink and the downlink at the same time.” TP-Link Br. at 31; *see generally id.* at 31–40.

“Anticipation requires that a single prior art reference disclose each and every limitation of the claimed invention, either expressly or inherently.” *SRI Int’l, Inc. v. Cisco Systems, Inc.*, 930 F.3d 1295, 1306 (Fed. Cir. 2019). TP-Link argues both express disclosure and inherency. They are addressed in turn.

a) Express Disclosure

TP-Link points to a specific statement in Morikawa as disclosing the “at the same time” claim element. TP-Link Br. at 31–33. There, Morikawa discloses that “using a 2.4-GHz ISM band through the up-link channel while a sub-millimeter or millimeter waveband through the down-link channel, saving the transmitter cost for the up-link channel to achieve a low-cost user’s terminal.” TP-Link Br. at 31–32 (citing Morikawa at [0044]). TP-Link focuses on the word “while” as disclosing “at the same time” transmission and reception. *Id.* The evidence does not support that this non-grammatical sentence is a disclosure of the “at the same time” limitation.

Morikawa’s sentence containing the word “while” begins with the words “In the above embodiment” and addresses a “request packet” and a “response packet group.” Morikawa at

[0044]; Wicker Tr. at 1010:5–1011:3. The evidence supports that that embodiment, shown in Fig. 1, is the same embodiment Dr. Bims testified about, and discloses a sequential request/response protocol in which the base station first receives a request and subsequently transmits a response. Summarizing the operations disclosed in paragraphs 32–43 of Morikawa, Dr. Wicker testified that it:

starts out with the user terminal, a request goes through various terminals to the user's server. The user's server formulates a response and sends that response back through the radio base station to the subscriber terminal, to the user terminal. So this is a sequential set of acts. In other words, we don't see anything simultaneous that's called for in the claims of the asserted patent. Instead, what we're seeing is a sequence of actions.

Wicker Tr. at 1015:10–1016:2; *see also* Wicker Tr. at 1011:8–1015:9 (detailing the operation of Morikawa in paragraphs 32–43). With respect to the arrows to and from base station 11 and subscriber terminal 12₁ in Morikawa's Fig. 1, the evidence supports that the arrow from the subscriber terminal 12₁ to the base station 11 represents a request and the arrow from the base station 11 to the subscriber terminal 12₁ represents a response, which “very much happen at different times, not the same time.” *Id.* at 1016:3–12.

Dr. Wicker testified that the request and response cannot be at the same time because “[y]ou can't have a response to the request until the request makes its way all the way to the user's server 28” and that Morikawa's operation is the opposite of transmitting and receiving at the same time. *Id.* at 1017:2–4 and 1016:3–12. Dr. Wicker's testimony about Morikawa's operation is un rebutted. Wicker Tr. at 1011:8–1017:4. Dr. Bims did not address Morikawa's disclosures of sequential operations in paragraphs 32–43. *See* Bims Tr. at 799:17–818:17.

Dr. Wicker also testified that at the base station 11, there is coordination of the transmission and reception through wireless MAC 27 and that this single MAC coordinates transmission and reception of the request and response, supporting the disclosure of sequential request and response

operation. Wicker Tr. at 1019:11–20. The evidence thus supports that Morikawa’s disclosure in paragraph 44 relates to its disclosure in paragraphs 32–43 of a sequential request/response protocol.

The evidence also supports that Morikawa’s use of the word “while” in paragraph 44 draws a contrast between the uplink and downlink. Wicker Tr. at 1010:5–9. That is, Morikawa uses the word “while” to draw a contrast between use of the 2.4 GHz up-link channel and the sub-millimeter or millimeter down-link channel. Wicker Tr. at 1010:5–16. TP-Link asserts that “[w]hile” is an ordinary English word that means ‘at the same time,’” TP-Link Br. at 31. That, however, is only true in some usages of the word. In particular, I agree with the examples provided by Netgear in which the word “while” draws a contrast and does not indicate simultaneity. Netgear Reply at 23 (the pitcher pitches the ball while the catcher catches it; the student takes the test while the professor grades it).

TP-Link also contends that “while” in Morikawa means “at the same time” because Netgear is “relying on the ’714 patent’s use of the word ‘while’ as disclosing the ‘at the same time.’” *Id.* at 32. The evidence supports, however, that although both the ’714 patent and Morikawa use the word “while,” the context surrounding their use of that word is different. Dr. Wicker explained that in Morikawa, “while” is being used to draw a “contrast,” while in the ’714 patent, it means “at the same time.” Wicker Tr. at 1070:2–19; *see also id.* at 1010:5–16. As Dr. Wicker explained, “You have to read the entire patent to understand what’s being described.” *Id.* 1071:13–16. And, as Dr. Wicker explained, in Morikawa, “while” indicates a contrast and “[i]t would not mean at the same time because that would not follow from the previous paragraphs” discussing requests followed by responses. Wicker Tr. at 1070:13–19.

TP-Link also asserts that Netgear does not point to anything in Morikawa that “prevents” transmission and reception at the same time, and that Morikawa’s disclosure of sequential request/responses “does not render Morikawa’s base station incapable of transmitting and receiving at the same time.” TP-Link Br. at 35. To demonstrate invalidity by clear and convincing evidence, TP-Link needs to do more than show that the prior art does not preclude the “at the same time” limitation. *Endo Pharms. Sols., Inc. v. Custopharm Inc.*, 894 F.3d 1374, 1380 (Fed. Cir. 2018) (“To meet its burden, Custopharm needed to do more than merely show that the prior art does not preclude lowering the dose of TU.”). That Morikawa does not prevent (or is not incapable of) performing the “same time” limitation does not mean it discloses transmission and reception “at the same time.” Wicker Tr. at 1056:11–1057:18. And while TP-Link argues that there is no disclosure in Morikawa preventing “at the same time” operation, TP-Link Br. at 35, the sequential request/response protocol of Morikawa supports that Morikawa does not disclose “at the same time” transmission and reception.

TP-Link’s position is also factually incorrect. TP-Link cites Dr. Bims’s testimony to assert that “the radios in Morikawa’s base station operate independently of each other.” TP-Link Br. at 35, *citing* Bims Tr. at 802:3–14. There, Dr. Bims stated:

Then, also, I would notice that within the base station highlighted in green there’s further detail about the structure of the base station. The base station has a transmitter that is transmitting in the licensed frequency band, and then also it has a transmitter and receiver structure that is operating in the 2.4-GHz band. So that’s telling the person of ordinary skill that the base station can transmit on a licensed band and transmit and receive on an unlicensed band at the same time given that these are independent radios that are both turned on for communication, and there’s no coordination between them to prevent them from transmitting at the same time.²²

²² Because Dr. Bims did not address the sequential request/response protocol of Morikawa, I do not credit his other testimony regarding what Morikawa discloses.

Dr. Bims's testimony that there is no coordination between the radios in Morikawa is directly contradicted by the disclosure of Morikawa, in which there is a sequential request/response protocol, and in which a single MAC layer coordinates transmission and reception. Wicker Tr. at 1019:7–20. TP-Link recognizes that Morikawa discloses a single MAC layer but then argues that paragraph 29 of Morikawa confirms that its “subscribers all operate independently of one another.” TP-Link Br. at 38 n.8. TP-Link chose to have its expert not testify on the communication protocol of Morikawa and he provided no testimony on paragraph 29. TP-Link's attorney argument is no replacement for evidence. Instead, the evidence supports that there is a sequential request/response protocol in Morikawa.

TP-Link contends that “Morikawa, which has the same architecture as Figure 1 of the '714 patent, should not be interpreted any differently.” *Id.* at 36. Using the '714 patent to argue that Morikawa discloses a missing limitation, however, is legal error, signaling impermissible hindsight. *Sensonic, Inc. v. Aerosonic Corp.*, 81 F.3d 1566, 1570 (Fed. Cir. 1996) (“To draw on hindsight knowledge of the patented invention, when the prior art does not contain or suggest that knowledge, is to use the invention as a template for its own reconstruction—an illogical and inappropriate process by which to determine patentability”); *see also Glaxo Grp. Ltd. v. Apotex, Inc.*, 376 F.3d 1339, 1348 (Fed. Cir. 2004). Even if TP-Link's argument was not legally improper, the evidence supports that the base station of the '714 patent is different from Morikawa's because the '714 patent base station includes the necessary components for the “at the same time” transmission and reception on two bands and Morikawa's does not. Wicker Tr. at 1017:16–1019:1 (“Q. Does Morikawa contain any disclosures of the filters, the duplexers, the transmission/reception paths that you were just talking about in Fig. 3 of the '714 patent? A. No.”).

TP-Link cites case law for the proposition that “expert testimony may shed light on what a skilled artisan would reasonably understand or infer from a prior art reference.” TP-Link Br. at 39, *quoting Acoustic Tech., Inc. v. Itron Networked Solutions, Inc.*, 949 F.3d 1366, 1373 (Fed. Cir. 2020). The only expert testimony shedding light on how one of skill would understand Morikawa came from Dr. Wicker. TP-Link’s expert did not testify on Morikawa’s disclosure relating to its sequential request/response communication protocol. *See* Bims Tr. at 799:17–818:17.

TP-Link also contends that “crediting Netgear and Dr. Wicker’s interpretation of Morikawa would require accepting a “senseless reading that disregards Morikawa’s explicit disclosure of ‘at the same time’ communication.” TP-Link Reply at 38. To the contrary, the evidence supports that there is no such explicit disclosure in Morikawa. This is not based on a “myopic view” of Morikawa, as TP-Link contends, TP-Link Br. at 38, but on the disclosure of Morikawa itself which, when explaining how communication occurs, discloses only a sequential request/response protocol.

TP-Link relies on the Federal Circuit’s decision in *Kennametal, Inc. v. Ingersoll Cutting Tool Co.*, 780 F.3d 1376, 1381 (Fed. Cir. 2015) for the proposition that “[a] reference can anticipate a claim even if it does not expressly spell out all the limitations arranged or combined as in the claim, if a person of skill in the art, reading the reference, would at once envisage the claimed arrangement or combination.” TP-Link Br. at 38–39 (internal quotations omitted). Under TP-Link’s application of *Kennametal*, despite that the only communication protocol disclosed in Morikawa is sequential request/response, one of ordinary skill in the art “would at once envisage” that simultaneous “at the same time” communications occur. This would require improperly ignoring the express teachings of Morikawa. *Otonomy, Inc. v. Auris Medical, AG*, 743 Fed. App’x 430, 439 (Fed. Cir. 2018) (affirming finding of no anticipation which would require ignoring “key

embodiments”); *see also Chemours Co. FC v. Daikin Indus., Ltd.*, 4 F.4th 1370, 1376–77 (Fed. Cir. 2021) (teaching away must be considered). On this point, it is significant that TP-Link’s expert did not address the communication protocol disclosure in Morikawa. *See* RDX-0002C.037–49 (Bims demonstratives, not addressing paragraphs 33–43 of Morikawa); and Bims Tr. at 799:17–818:17.

Further, the Federal Circuit has rejected TP-Link’s proposed application of *Kennametal*. In *Nidec Motor Corp. v. Zhongshan Broad Ocean Motor Co.*, issued the same year as *Kennametal*, the Federal Circuit clarified that:

Kennametal does not stand for the proposition that a reference missing a limitation can anticipate a claim if a skilled artisan viewing the reference would “at once envisage” the missing limitation. Rather, *Kennametal* addresses whether the disclosure of a limited number of combination possibilities discloses one of the possible combinations.

851 F.3d 1270, 1274 (Fed. Cir. 2015); *see also UCB, Inc. v. Actavis Laboratories UT, Inc.*, 65 F.4th 679, 688–689 (Fed. Cir. 2023) (application of *Kennametal* was legal error); *see also Wasica Finance GmbH v. Continental Automotive Systems, Inc.*, 853 F.3d 1272, 1285–86 (Fed. Cir. 2017). This was reiterated by the Federal Circuit in *Microsoft Corp. v. Biscotti, Inc.*, 878 F.3d 1052, in which the court addressed the “at once envisage” verbiage of *Kennametal* as applicable to “disconnected teachings” of a prior art reference. The Federal Circuit has made clear that the “at once envisage” language of *Kennametal* cannot replace a missing claim element in an anticipation analysis. Properly considering *Kennametal*, therefore, the evidence supports that one of ordinary skill would not immediately envisage transmit and receive communications “at the same time” from Morikawa because the communication protocol in Morikawa is sequential request/response.

Finally, while TP-Link contends that there are a limited number of possibilities (sequential vs. “at the same time”), TP-Link Br. at 41, that is a false framing of the issue. The “choice” TP-

Link argues is one that is counter to Morikawa's disclosure, not one that Morikawa disclos[ed as] a limited number of combination possibilities." *Nidec*, 851 F.3d at 1274.

The evidence does not support that Morikawa expressly anticipates claim 13.

b) Inherency

TP-Link argues that Morikawa would simultaneously transmit and receive data on two bands if used for internet applications such as streaming music, receiving an email, or servicing two overlapping webpage requests. TP-Link Br. at 13 and 36–37. Without actually saying so, TP-Link thus appears to argue that Morikawa inherently discloses the “at the same time” limitation in these scenarios.

“[A]nticipation by inherent disclosure is appropriate only when the reference discloses prior art that must *necessarily* include the unstated limitation” or else it “cannot inherently anticipate the claims.” *Transclean Corp. v. Bridgewood Servs., Inc.*, 290 F.3d 1364, 1373 (Fed. Cir. 2002) (emphasis in original). The “mere possibility is not enough.” *PersonalWeb Techs., LLC v. Apple, Inc.*, 917 F.3d 1376, 1382 (Fed. Cir. 2019), *quoting* *PAR Pharm., Inc. v. TWI Pharm., Inc.*, 773 F.3d 1186, 1195 (Fed. Cir. 2014) (“Inherency . . . may not be established by probabilities or possibilities.”).

Morikawa does not disclose how transmission and reception would occur in the scenarios identified by TP-Link. Wicker Tr. at 1060:12–1061:9 and 1072:11–23. And Dr. Wicker's unrebutted expert testimony establishes that Morikawa discloses only user terminals making a request to the corresponding user server and obtaining a response. Wicker Tr. at 1072:18–23 (“What's disclosed is a request sent to a user server and a response, that's it.”). TP-Link cites no testimony from its expert, Dr. Bims suggesting otherwise or explaining how Morikawa can be used as TP-Link suggests. Anticipation “cannot be predicated on mere conjecture.” *W.L. Gore &*

Assocs. v. Garlock, Inc., 721 F.2d 1540, 1554 (Fed. Cir. 1983). Nor can anticipation be based on “unrealized possibilities.” *Perricone v. Medicis Pharm. Corp.*, 432 F.3d 1368, 1379 (Fed. Cir. 2005).

The evidence does not support that it is necessary or inevitable that Morikawa would be used as TP-Link speculates. To the contrary, Dr. Wicker, testified that if Morikawa were used to stream music or receive an email, such communications would occur only on the 2.4 GHz band, between the 2.4 GHz transceiver on both the base station and user terminals, as shown in Fig. 1. Wicker Tr. at 1072:18–1073:10²³; *see also* Fig. 2. Dr. Bims confirmed that such single-band communication on the 2.4 GHz band (which is not transmission and reception on bands separated by an octave) does not meet the “at the same time” claim element. Bims Tr. at 929:16–930:12.²⁴

The evidence does not support that Morikawa inherently anticipates claim 13.

c) Plurality of Subscriber Units

TP-Link asserts that Morikawa anticipates the “at the same time” limitation because, “[i]n actual operation, Morikawa’s base station will be servicing any number of requests from [] subscribers, and thus will be constantly transmitting and receiving data at the same time.” TP-Link Br. at 36.

This “plurality of subscriber units” argument was the subject of Netgear’s Motion to Strike. Motion Docket No. 1361-31 (EDIS Doc. ID 813578). Netgear argues that “Dr. Bims’s testimony

²³ That testimony also refutes TP-Link’s argument that the Internet would be “paralyzed” or brought to a halt if Morikawa was not implemented with the claimed “at the same time” communications. TP-Link Br. at 39–40.

²⁴ Likewise, TP-Link’s reliance on Dr. Wicker’s testimony that, “in a point-to-multipoint system, the base station can receive and transmit at the same time,” TP-Link Br. at 12, *citing* Wicker Tr. at 1050:18–1051:5, does not mean that such a system would do so in different bands, as claimed.

about communication with Morikawa's plurality of subscriber units allegedly meeting the 'at the same time' limitation should be struck (including Tr. at 809:10–810:14), and TP-Link should be precluded from relying on this undisclosed theory in post-hearing briefing." Mot. at 4. TP-Link contends that "Dr. Bims's report fairly disclosed his opinion that Morikawa depicts a base station that communicates with a plurality of subscriber terminals." Opp. at 5–6 (EDIS Doc. ID 813247). While this is true, Dr. Bim's report, did not disclose a position that the "at the same time" limitation is met by base station communication with a plurality of subscriber units. Mot., Ex. A at 83–86. Instead, Dr. Bims's report can only be correctly characterized as contending that in Morikawa, communications between a single subscriber station and the base station meet the "at the same time" claim element. Motion No. 1361-31 is GRANTED.

In addition, in its motion in limine number 2, Netgear argued that the "plurality of user devices" theory in TP-Link's pre-hearing brief should be stricken because it was not presented earlier. Motion No. 1361-023 (EDIS Doc. ID 812370). In order No. 42, I held that motion in abeyance pending testimony at the evidentiary hearing (EDIS Doc. ID 812329). I agree with Netgear that this theory was not earlier presented by TP-Link in its expert report. The fact that Dr. Bims cited a paragraph of Morikawa in his report does not mean that he articulated how he believed Morikawa would operate with multiple subscriber units. TP-Link Opp. to MIL 2 at 9–10 (EDIS Doc. ID 812573). He did not and Dr. Bims's expert report shows he did not. Motion No. 1361-023 is GRANTED as to pages 80–81 and 85 of TP-Link's pre-hearing brief.

Even if not waived, Morikawa contains no disclosure about how transmission and reception occur between the base station and a plurality of subscriber units. TP-Link's assertion that the base station "will be constantly transmitting and receiving data at the same time" when used with multiple subscriber units is speculation. *W.L. Gore*, 721 F.2d at 1554 (anticipation "cannot be

predicated on mere conjecture.”) In reversing a finding of anticipation, the Federal Circuit in *W.L. Gore*, stated that it was “clear that the teachings of neither [of the prior art references] place the products claimed in the [asserted patent] in possession of the public.” *Id.* The same is true here. While TP-Link cites paragraph 23, 25–27, and 30 of Morikawa to support its position, none of those paragraphs disclose the timing of transmission and reception between the base station and multiple subscriber units or disclose that transmission and reception constantly occur “at the same time,” as TP-Link contends. TP-Link Br. at 36 and Morikawa at [0023], [0025–27], and [0030].

Rather, the evidence supports that the Morikawa base station does not transmit data to and receive data from a plurality of subscriber units “at the same time.” As discussed, the single MAC layer of Morikawa coordinates transmission and reception and “prevent[s] data collision[s]” between “between the data which a plurality of terminals transmitted.” Morikawa at [0029] and Wicker Tr. at 1019:7–20. Dr. Bims did not address Morikawa’s MAC-layer disclosures. In addition, the only evidence about technology for transmitting and receiving data between one base station and multiple subscriber units established that TDMA (time division multiple access) was used in 2001, such that “one mobile station in a system is transmitting in one time slot” and “other mobile station[s]” operate on “other time slots”—in other words, one subscriber unit communicates with the base station at a time, not “constantly” as TP-Link contends. Wicker Tr. at 1062:6–1064:12.

Even if not waived, the evidence supports that in multi-subscriber operation, Morikawa does not disclose the claimed “at the same time” communications.

4. Obviousness

TP-Link next argues that Morikawa renders claim 13 obvious. TP-Link Br. at 40–43.

a) Analysis

TP-Link contends that a person of ordinary skill “would understand that Morikawa uses FDD,” frequency division duplexing. TP-Link Br. at 41. Morikawa does not refer to FDD or frequency division duplexing. Wicker Tr. at 1073:11–20. TP-Link nevertheless asserts it would be obvious that Morikawa “uses FDD” because of “its dual-frequency architecture that uses two separate, independent radios,” TP-Link Br. at 41, citing Razavi (RX-0130), as support. But Razavi does not disclose that any system using two frequency bands and two radios uses FDD. Instead, Razavi “explains that FDD requires the use of bandpass filters to isolate the two paths, allowing simultaneous transmission and reception.” Razavi at 16 and Wicker Tr. at 1020:7–1021:5.

Morikawa, however, does not disclose any bandpass filters or other components necessary to “isolate the two paths” in its base station. *Id.* To the contrary, Morikawa discloses that the paths are not isolated; they instead share a common MAC. Morikawa at [0029]; Wicker Tr. at 1019:7–20. Morikawa’s disclosures are therefore inconsistent with Razavi’s description of FDD. Wicker Tr. at 1019:7–20 and 1020:7–1021:5. Dr. Bims did not address these inconsistencies between Morikawa’s disclosures and the requirements of using FDD.

TP-Link suggests, without evidentiary support, that Morikawa’s lack of bandpass filters should be overlooked because a person of ordinary skill would have “recognized that FDD requires the use of bandpass filters.” TP-Link Br. at 42. But this merely confirms that bandpass filters are required to use FDD and does not address the fact that Morikawa does not disclose or suggest using bandpass filters and instead discloses a sequential request/response protocol. While it may be true that person of ordinary skills would recognize that a reference disclosing use of FDD involves use of bandpass filters, it does not follow that one of ordinary skill would understand that Morikawa, which uses a sequential request/response protocol and a single MAC layer, would

change its structure and operation, as the use of FDD would require. The evidence TP-Link's cites, TP-Link Br. at 41–21 (Razavi at 16; Bims Tr. at 819:20–24; and Wicker Tr. at 1038:25–1039:19) shows only that FDD was known. Dr. Bims never proposed modifying Morikawa to make the necessary structural changes or explained why or how one of ordinary skill would have implemented such a change.

In addition, TP-Link's argument was, in substance, already considered and rejected during prosecution when the Board considered obviousness based on U.S. Patent No. 6,801,519 issued to Mangal. RX-0163; Wicker Tr. at 1021:12–1026:6; JX-0004 at 454–56; *see also* Bims Tr. at 927:8–928:1. Mangal discloses a dual-frequency architecture that uses two separate, independent radios. Wicker Tr. at 1022:11–1024:11; and Mangal at Fig. 1. These are the same supposed aspects of Morikawa, which does not disclose independent radios) that TP-Link alleges render obvious the “at the same time” limitation. Wicker Tr. at 1022:21–1023:17.

In reversing the Examiner's rejection, the Board stated:

As argued by Appellants, Mangal discloses that the base station 109 selects either the licensed sub frame 201 or the unlicensed sub frame 202 to provide communication and, upon selection, communication takes place only over the selected portion of the media access control (MAC) layer (Figs. 2-3; col. 6, 11. 35-38, 46-49). Mangal further discloses that upstream and downstream voice and internet communication are provided only on the selected licensed or unlicensed sub frame portion of the MAC layer.

JX-0004 at 456. The Board added that “even assuming that the Examiner's contention (Ans. 4) that simultaneous bi-directional communication is necessary for real time communication services, such as telephony, is correct, Mangal suggests that any such bi-directional communication would still take place in only one sub band, i.e., licensed or unlicensed, and not both bands as claimed.” *Id.* The evidence supports that the same is true in Morikawa.

While TP-Link contends that Dr. Wicker “crumbled under cross-examination,” all that TP-Link established was that Mangal may differ from the ’714 patent in more ways than just not disclosing the claimed transmission and reception “at the same time.” TP-Link Br. at 29, *citing* Wicker Tr. at 1043:34 [sic]–1045:1, 1047:18–1048:23 (Mangal discloses using just one band, while Morikawa uses two bands, albeit sequentially). That Mangal may have additional differences between its disclosure and claim 13 does not change the Board’s fundamental conclusion that a disclosure of two bands and separate radios does not disclose or render obvious the “at the same time” element of claim 13.

TP-Link also compares figures from Morikawa, the ’714 patent, and Razavi to argue that the use of arrows means “at the same time” transmission and reception. TP-Link Br. at 42. The use of arrows, however, does not say anything about the relative timing of transmission and reception; they just show that there is an uplink and a downlink. Wicker Tr. at 1024:18–22. Further, the evidence supports that parallel arrows are used for TDMA systems, a protocol in which transmission and reception occur at different times. Wicker Tr. at 1024:23–1026:2, addressing CX-3231 (U.S. Patent No. 6,842,438), Fig. 1, and 1:19–33. As Dr. Wicker explained, the arrows used in Morikawa does not mean transmission and reception are occurring “at the same time” in view of Morikawa’s disclosure because “[y]ou can’t have a response to the request until the request makes its way all the way to the user’s server 28.” Wicker Tr. at 1016:3–1017:4.

TP-Link asserts that Razavi “discloses the use of FDD in the context of cellular protocols, which Morikawa discloses.” TP-Link Br. at 42. This is TP-Link’s “cell phone theory,” which was the subject of Netgear’s motion in limine no. 2. *See* Motion No. 1361-023 at 4. Order No. 42 on the parties’ motions in limine stated that, if TP-Link sought to introduce this theory at the hearing, it had to “identify where in the report or transcript there is support for the objected-to-testimony.”

Order No. 42 at 3. TP-Link chose not to adduce direct testimony on this theory at the hearing. TP-Link cannot now bring it in through attorney argument in its post-hearing brief. This portion of Motion No. 1361-023 is GRANTED.

Even if permitted, while Morikawa states that it may be “modified” or “combined” with a “cellular telephone system,” TP-Link Br. at 42, *citing* Morikawa at [0089], Dr. Bims provided no testimony about “modifying” or “combining” Morikawa for use with a cellular system or explain how such a modification or combination would result in transmission and reception “at the same time.” Moreover, while Razavi discloses some cellular protocols that use FDD, Razavi discloses others that use TDD, where transmission and reception do not occur “at the same time.” Razavi at 29 (the DECT standard “operates with TDD in the frequency band 1880 MHz to 1900 MHz.”). There is no record evidence regarding how one of ordinary skill would have modified Morikawa or combined it with a cellphone system or any evidence establishing that this modified/combined system would have used FDD.

TP-Link also asserts that “it would have been common sense for a person of ordinary skill to use FDD with Morikawa to pursue Morikawa’s goal of increasing network speed and capacity.” TP-Link Br. at 43. TP-Link’s pre-hearing brief does not mention any purported motivation to implement FDD in Morikawa’s system based on “common sense” or to “increase[e] network speed and capacity.” TP-Link Pre-hearing Br. at 67–70, 80–86. This argument is therefore waived. Even if not waived, modifying or combining Morikawa with something else to implement FDD requires more than “common sense”—it requires altering Morikawa’s basic functionality, which uses a sequential request/response protocol and a single MAC layer. Again, Dr. Bims provided no testimony on modifying Morikawa to implement FDD or combining Morikawa with FDD technology. In cases such as this, involving complex communications technology, expert

testimony was necessary to establish invalidity. *Wyers v. Master Lock Co.*, 616 F.3d 1231, 1240 n.5 (Fed. Cir. 2010) (“[I]n cases involving complex technology . . . expert testimony may be critical, for example, to establish the existence of certain features in the prior art, or the existence (or lack thereof) of a motivation to combine references.” (citations omitted)). Here, TP-Link made the conscious choice not to provide such testimony. It cannot make up for that failure, or establish invalidity by clear and convincing evidence, through attorney argument.

Further, TP-Link cannot invoke “common sense” to modify or combine Morikawa with other technology to meet the “at the same time” limitation, after failing to provide evidence supporting such a modification or combination. *Arendi S.A.R.L. v. Apple Inc.*, 832 F.3d 1355, 1362 (Fed. Cir. 2016) (“[O]ur cases repeatedly warn that references to ‘common sense’—whether to supply a motivation to combine or a missing limitation—cannot be used as a wholesale substitute for reasoned analysis and evidentiary support, especially when dealing with a limitation missing from the prior art references specified.”). The cases cited by TP-Link do not hold otherwise. TP-Link Br. at 43. For example, in addressing *Perfect Web*, the case TP-Link relies on, the Federal Circuit held that “the limitation in question was unusually simple and the technology particularly straightforward” and the case should “be treated as the exception, rather than the rule.” *Arendi*, 832 F.3d at 1361–62. Similarly, *Paice LLC v. Ford Motor Co.*, 681 F. App’x 904, 913 (Fed. Cir. 2017), merely declined to disturb the PTAB’s conclusion that the disclosed engine starter and battery had to be connected for the starter to work, which was again, a straightforward inference. Neither case involved the technologically complex issue presented here of how Morikawa would be modified or combined with cellphone technology to implement FDD, despite its use of a sequential request/response protocol and shared MAC that is inconsistent with isolating frequency bands.

The evidence, including secondary considerations of commercial success and industry praise tied to the features of claim 13 of the '714 patent and addressed below, does not support that claim 13 is obvious.

b) Secondary Considerations

Netgear contends that objective indicia of non-obviousness, namely commercial success, industry praise, skepticism, and copying demonstrate that claim 13 would not have been obvious. Netgear Reply at 40–42. TP-Link disagrees. TP-Link Br. at 43–46.

“Objective indicia of nonobviousness must be considered in every case where present.” *Apple Inc. v. Samsung Elecs. Co.*, 839 F.3d 1034, 1048 (Fed. Cir. 2016). Evidence of such indicia “may often be the most probative and cogent evidence in the record,” *id.* at 1052, *quoting Stratoflex, Inc. v. Aeroquip Corp.*, 713 F.2d 1530, 1538 (Fed. Cir. 1983), and “guard against slipping into use of hindsight.” *Id.*, *quoting Graham v. John Deere Co.*, 383 U.S. 1, 36 (1966). Such evidence can “include: commercial success enjoyed by devices practicing the patented invention, industry praise for the patented invention, copying by others, and the existence of a long-felt but unsatisfied need for the invention.” *Id.*

To accord substantial weight to secondary considerations, the evidence must have a nexus to the claims, that is, there must be a legally and factually sufficient connection between the evidence and the patented invention. The patentee bears the burden of showing that a nexus exists. *Fox Factory, Inc. v. SRAM, LLC*, 944 F.3d 1366, 1373 (Fed. Cir. 2019). “A showing of nexus can be made in two ways: (1) via a presumption of nexus, or (2) via a showing that the evidence [of secondary considerations] is a direct result of the unique characteristics of the claimed invention.” *Volvo Penta of the Americas, LLC v. Brunswick Corp.*, 81 F.4th 1202, 1210 (Fed. Cir. 2023).

Netgear does not contend that there is a presumption of nexus, instead arguing that its evidence of secondary considerations is a direct result of the claimed invention. Netgear Reply at 40–42. In particular, Netgear contends that the '714 patent domestic industry and accused products are commercially successful, with combined revenue figures of over [REDACTED]. Wicker Tr. at 1026:16–1027:9. Netgear contends that this commercial success “has been driven by the claimed features,” pointing to a TP-Link Product PR Guide, which identifies as a “key selling point” simultaneous 2.4 and 5 GHz operation. Wicker Tr. at 1027:21–1028:7 and CX-2378 (identifying 8 key selling points, with simultaneous dual-band operation as the first one). Dr. Wicker referenced other TP-Link documents as well as Netgear documents touting the same feature. Wicker Tr. at 1027:8–21.

TP-Link counters that there is no nexus if the objective evidence relates to a feature that was known in the prior art. TP-Link Br. at 44, *citing Yita LLC v. MacNeil IP LLC*, 69 F.4th 1356, 1364 (Fed. Cir. 2013). TP-Link states that “the same feature of using a 2.4 GHz band and a 5 GHz band to increase bandwidth is expressly taught by Morikawa.” *Id.* As explained above, Morikawa does not teach simultaneous transmission and reception over two bands and instead discloses a sequential protocol. TP-Link also contends that the objective evidence “emphasized the increased system capacity that results from the availability of multiple bands.” *Id.* However, while the evidence supports that system capacity increased with the use of multiple bands, it also supports the benefit of simultaneous operation, i.e., transmission and reception, over multiple bands. *See* Wicker Tr. at 1028:17–19 and CX-2378. The evidence supports commercial success tied to the features of claim 13 of the '714 patent.

Netgear contends that there is industry praise for the '714 patent, noting reviews of Netgear products with an emphasis on the support of multiple bands. Netgear Reply at 41; Wicker Tr. at

1028:22–1029:5; *see also* CX-3214.5 (“seamless and consistent operations across 40 devices, making uploading and downloading content a breeze”) and CX-3201.7 (“multiple users gaming, streaming, or downloading simultaneously”). The evidence cited by Netgear shows industry praise for the features of claim 13 of the ’714 patent.

Netgear also contends that industry praise is demonstrated by citations of the ’714 patent in patents filed by other technology companies. Netgear Reply at 41 and Wicker Tr. at 1029:7–13. I agree with TP-Link that the citation of the ’714 patent 20 times over 10 years does not demonstrate industry praise. TP-Link Br. at 45.

Netgear also contends that there is evidence of skepticism because “the IEEE did not even recognize the possibility of using two bands at the same time for wireless communications until 2009,” long after the ’714 patent was filed. Netgear Br. at 41 and Wicker Tr. at 1030:7–23 and 1031:10–1032:8. TP-Link does not address this point, other than to state that “Netgear acknowledged that dual-band Wi-Fi functionality was mandated by the 802.11n standard in 2009.” TP-Link Br. at 45. Nonetheless, the timing of the 802.11n standard on its own does not necessarily support that there was skepticism. Netgear has not presented sufficient evidence of skepticism.

Netgear contends there is evidence of copying because TP-Link announced its dual-band simultaneous router one month after Netgear announced its product. Netgear Reply at 40. I agree with TP-Link that this time-frame is far too short to suggest copying and instead supports that TP-Link was introducing a product consistent with the 802.11n standard. TP-Link Br. at 45. The evidence does not support copying.

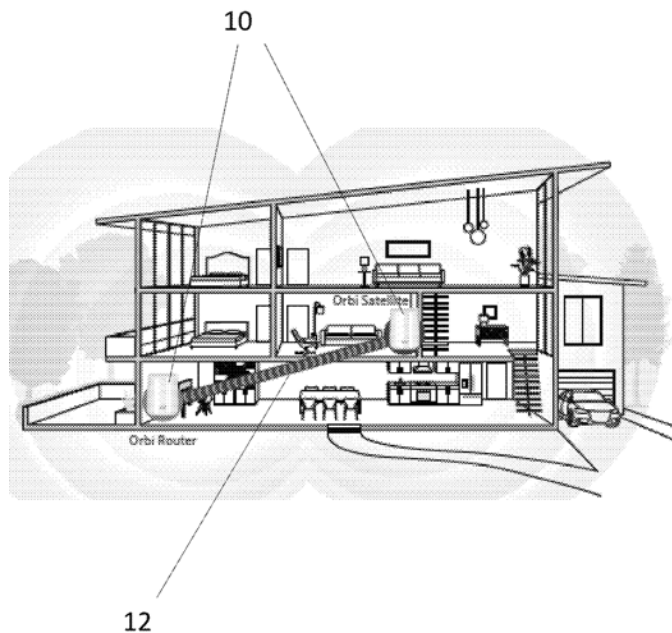
TP-Link argues that “all of Netgear’s assertions regarding secondary considerations are contradicted by the fact that the ’714 patent was sold at bankruptcy for only \$5,000.” TP-Link Br. at 46. Netgear counters that the sale occurred in 2004 before the ’714 patent issued and before

claim 13 was drafted. Netgear Reply at 41; *see also* '714 patent at cover (identifying issue date as May 3, 2011) and JX-0004.298 and 307 (identifying date claim that issued as claim 13 filed as August 12, 2008).²⁵ I agree with Netgear that the evidence of secondary considerations is not contradicted by the earlier sale of the '714 application.

The evidence demonstrates commercial success and industry praise tied to the features of claim 13 of the '714 patent, supporting non-obviousness.

VII. THE '698 PATENT

The '698 patent is titled “Dedicated Backhaul for Whole Home Coverage” and discloses “techniques for establishing and maintaining a dedicated backhaul for whole home coverage.” '698 patent at 2:36–38. Figure 1 is a schematic diagram showing a dedicated backhaul for whole home coverage in which a system of smart Wi-Fi nodes 10 includes a dedicated backhaul 12.



²⁵ TP-Link cites to testimony from the deposition of Mr. Karr, but that testimony was not identified as being designated. TP-Link Br. at 46 and *see* RX-0330C (Karr Dep. Tr.).

Id. at Fig. 1.

The specification discloses that “[e]mbodiments of the invention variously apply optimization techniques, such as using the 5 GHz high band or low band as a dedicated backhaul; using the 2.4 GHz band as backup if the 5 GHz band fails to reach between nodes; using Ethernet when it is better than the 5 GHz and 2.4 GHz bands and it is available; and using a spanning tree protocol or a variant to avoid loops.” *Id.* at 2:48–54. Further, in “embodiments of the invention, the dedicated backhaul is used if the received signal strength indication (RSSI) of the dedicated channel is above a threshold.” This threshold “can be defined and modified on the hardware after hardware qualification is done.” *Id.* at 3:6–10.

Figure 2 “is an example in which the dedicated 5 GHz band is used as a method of communication between two devices.” *Id.* at 3:52–53.

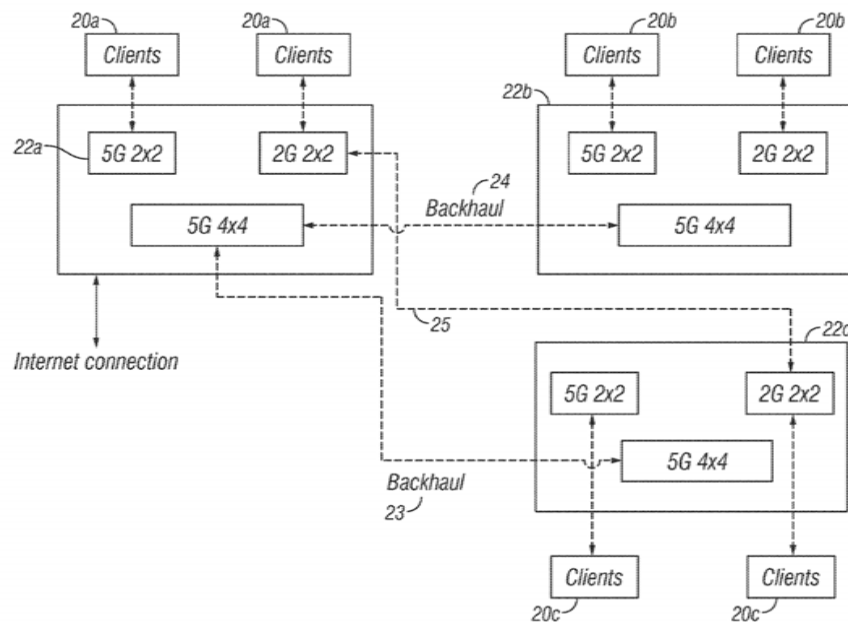


FIG. 2

Id. at Fig. 2.

Client devices 20a–20c are associated with respective nodes 22a–22c, which each include one or more 2.4 GHz radios and one or more 5 GHz radios. *Id.* at 3:54–55. The nodes are connected by dedicated 5 GHz backhaul connections 23 and 24, though a 2.4 GHz connection 25 may be used as a backhaul when a 5 GHz connection is not available. *Id.* at 3:56–59. The patent explains that “[t]hose skilled in the art will appreciate that any other connection may be substituted for the 5 GHz backhaul connection when such connection is not available, including for example another 5 GHz radio, a radio in a band other than 5 GHz and 2.4 GHz, etc.” *Id.* at 3:61–65. The patent also states that “[a] dedicated wireless band is the preferred method of wireless communication if the dedicated band is available for communication and the quality of the dedicated link is better than a defined threshold.” *Id.* at 4:28–31.

Netgear asserts claims 12, 15, 17 and 19 of the ’698 patent. Netgear Br. at 2. Independent claim 12 recites:

- 12[pre] A network device capable of establishing a backhaul communication among nodes in a mesh wireless network, the device including a network controller configured to perform operations comprising:
 - [a] performing an attempt to utilize a first channel in a default frequency band as a backhaul with second node in the network,
 - [b] wherein the backhaul is to provide communication of management functions between the nodes in the network, as opposed to a front haul that provides wireless data communication to clients in the network; and
 - [c] upon detecting that a received signal strength of the first channel from the second node is below a threshold, performing an attempt to utilize a different channel in the default frequency band and/or a different frequency band that has a lower frequency range than the default frequency band, to establish the backhaul with the second node,
 - [d] wherein, in any of said attempts, channels in a given frequency band are prioritized based on a corresponding received signal strength.

'698 patent at claim 12.²⁶

A. Claim Construction

1. Previously-Addressed Claim Term

The term “default frequency” was construed as follows:

Claim Term	Construction
default frequency band	a first selected frequency band

Order No. 33 at 28–32.

2. Disputed Claim Terms

Though not addressed during claim construction, the parties’ post-hearing briefs make clear that they dispute certain claim construction issues, in particular, whether the preamble of claim 12 is limiting and whether claim 12 recites a dedicated backhaul. *See* TP-Link Br. at 72 (“[t]he preamble is not limiting”); Netgear Reply at 76–77 (disputing that the preamble is not limiting); TP-Link Br. at 88 (“the claim does not require a dedicated backhaul”); and Netgear Reply at 85 (claim 12 is directed to a dedicated backhaul). These disputes are addressed below.

a) Whether the Preamble of Claim 12 Is Limiting

Whether a preamble is limiting is “determined on the facts of each case in light of the overall form of the claim, and the invention as described in the specification and illuminated in the prosecution history.” *Bio-Rad Labs., Inc. v. 10X Genomics Inc.*, 967 F.3d 1353, 1369 (Fed. Cir. 2020), *quoting* *Applied Materials, Inc. v. Advanced Semiconductor Materials Am., Inc.*, 98 F.3d 1563, 1572–73 (Fed. Cir. 1996). A preamble limits the claimed invention if it recites essential

²⁶ The paragraph identifiers have been added. TP-Link used different identifiers (element 12.1, 12.2, etc.), which will be noted as necessary. *See* TP-Link Br. at 72–92.

structure or steps, or if it is “necessary to give life, meaning, and vitality” to the claim. *Bio-Rad*, 967 F.3d at 1369. If, by contrast, the claim uses the preamble only to state a purpose or intended use for the invention, then the preamble is not limiting. *Id.* Further, if the body of the claim recites a complete invention such that deletion of the preamble does not affect the structure of the claimed invention, the preamble is generally not limiting. *Catalina Marketing Int’l, Inc. v. Coolsavings.com, Inc.*, 289 F.3d 801, 808–09 (Fed. Cir. 2002).

The preamble here recites “A network device capable of establishing a backhaul communication among nodes in a mesh wireless network, the device including a network controller configured to perform operations comprising.” In this apparatus claim, the preamble recites the claimed structure and the remaining claim elements recite operations the claimed network device is capable of performing. The preamble thus recites essential structure and is “necessary to give life, meaning, and vitality” to the claim. *Bio-Rad*, 967 F.3d at 1369.

The “nodes in a mesh wireless network” recited in the preamble also provides antecedent basis for “second node” and “the network” in elements 12[a] and 12[b]. ’698 patent at claim 12 and Akl Tr. at 1160:19–1161:6. This “is a strong indication that the preamble acts as a necessary component of the claimed invention.” *Bio-Rad*, 967 F.3d at 1371. The case TP-Link cites is inapplicable, as the preamble there did not provide antecedent basis for the term in the body of the claim. TP-Link Br. at 73, citing *Am. Med. Sys., Inc. v. Biolitec, Inc.*, 618 F.3d 1354, 1359 (Fed. Cir. 2010) (preamble nonlimiting because it “does not provide a necessary antecedent basis for the term ‘the tissue’”).

In addition, the body of claim 12 does not recite a structurally complete invention. The only structural recitations in claim 12 are provided by the recitation in the preamble of a “network device capable of establishing a backhaul communication among nodes in a mesh wireless

network, the device including a network controller.” The body of the claim, in contrast, recites the functional characteristics (e.g., “performing an attempt to utilize” and “detecting”) of the apparatus described in the preamble. *See* ’698 patent at claim 12. The preamble is therefore limiting because “[i]n supplying the only structure for the claimed apparatus, the preamble language supplies ‘essential structure,’ and the body does not define ‘a structurally complete invention’—which are two key reasons for preamble language to be deemed limiting.” *SIMO Holdings Inc. v. Hong Kong uCloudlink Network Tech. Ltd.*, 983 F.3d 1367, 1375 (Fed. Cir. 2021). And because claim 12 does not recite structural aspects of the apparatus anywhere other than the preamble, it is distinguished from the other cases TP-Link cites. *Cf. Sentient Sensors, LLC v. Cypress Semiconductor Corp.*, No. CV 19-1868 (MN), 2021 WL 289410, at *5 (D. Del. Jan. 28, 2021) (finding preamble nonlimiting because it included a “structurally complete invention, including, e.g., storage, processor, oscillators, gates, and converters”).

Accordingly, I find the preamble of claim 12 to be limiting.

b) Whether Claim 12 Recites a Dedicated Backhaul

Elements 12[a] and 12[b] recite: “[a] performing an attempt to utilize a first channel in a default frequency band as a backhaul with second node in the network, [b] wherein the backhaul is to provide communication of management functions between the nodes in the network, as opposed to a front haul that provides wireless data communication to clients in the network.” The parties dispute whether element 12[b] recites a dedicated backhaul. TP-Link Br. at 88 and Netgear Reply at 85.

One of ordinary skill would understand the plain and ordinary meaning of “wherein the backhaul is to provide communication of management functions between the nodes in the network, as opposed to a front haul that provides wireless data communication to clients in the network” in

element 12[b] to require that the attempt to utilize a backhaul on the default frequency band in element 12[a] is on a frequency band different from one that “provides wireless data communication to clients in the network.” Akl Tr. at 1121:3–23 (explaining that when a band includes “communication that’s client-based” the band is not “a backhaul as opposed to a fronthaul.”) While that understanding is plain from element 12[b], it is reinforced by claims 13 and 14, which depend from claim 12, and require “the front haul” to be a “radio” of the network. ’698 patent at claim 13 (wherein “said attempts” of claim 12 “are performed on a first radio” for the “default frequency band” but if “all said attempts” on the default frequency band fail, an attempt should be made “using a different radio”); claim 14 (“wherein said different radio is the same radio as the front haul.”) It follows that the frequency band used for “a front haul” radio is “as opposed to” the radio used for the “default frequency band,” such that the claimed “default frequency band” cannot be a frequency band used for “wireless data communication to clients in the network.” Akl Tr. at 1122:4–15.

TP-Link argues that the language “wherein the backhaul ... as opposed to a front haul” cannot be understood as meaning “the backhaul” is “exclusively dedicated to backhaul communications” because the term “dedicated backhaul” is used in the specification but the same term does not appear in claim 12. TP-Link Br. at 88. A patentee, however, can use one phrase in the specification (“dedicated backhaul”) and use a different phrase with the same effect (“the backhaul is ... as opposed to a front haul ... in the network”) in the claims. *See All Dental Prodx, LLC v. Advantage Dental Prods., Inc.*, 309 F.3d 774, 779 (Fed. Cir. 2002) (“the failure of the specification to specifically mention a limitation that later appears in the claims is not a fatal one when one skilled in the art would recognize upon reading the specification that the new language reflects what the specification shows has been invented.”) The extensive use of the phrase

“dedicated backhaul” throughout the ’698 patent specification would have informed the understanding of one of ordinary skill that “the backhaul is ... as opposed to a fronthaul ... in the network” requires a backhaul frequency band that is dedicated to communications between nodes and not used for device communications in the network. Indeed, the ’698 patent does not disclose any embodiment in which all frequency bands in a network are shared between a fronthaul and backhaul; at least one frequency band is always used for backhaul communications only “as opposed to” being used for front haul communications with clients. *See* ’698 patent at 2:4–27 (describing each embodiment in Figures 4–11 as expressly including “a dedicated backhaul”), 3:45–46 (“Fig. 2 is an example in which the dedicated 5 GHz band is used...”), and 4:1–4 (“In Fig. 3 ... nodes 27a, 27b are connected by a dedicated 5 GHz backhaul connection...”).

TP-Link’s argument that the ’698 patent claims do not require a backhaul band that is not used for fronthaul traffic is also inconsistent with its own technology tutorial. There, TP-Link described the “basic concept” of the ’698 patent as “connecting or trying to connect to the dedicated backhaul on 5G,” but if the “received signals strength of the 5G band is below a threshold, then you switch over to using the 2.4G shared backhaul.” Tutorial Tr. at 58:20–59:13; *see also id.* 58:20–23 (“And the ’698 patent...describes a solution where uses the 5G high band or low band as a dedicated backhaul. And then uses the 2.4 gigahertz band as backup if the 5 gigahertz band fails to reach between nodes.”) and Claim Construction Tr. at 192:2–3 (“the dedicated connection is this backhaul connection”). Dr. Bims agreed, stating the “subject matter of the ’698 patent, at a high level, is about a Wi-Fi -- a wireless mesh network, and in that wireless mesh network there is a dedicated backhaul, and that dedicated backhaul has a failover mechanism if the metric used to measure the backhaul falls below a threshold.” Bims Tr. at 825:16–21.

TP-Link argues that because “default frequency band” was not construed to mean “dedicated frequency band,” the separate phrase “the backhaul is ... as opposed to a fronthaul ... in the network” cannot be understood to require a frequency band dedicated for backhaul communications. TP-Link Br. at 88. The fact that “default frequency band” does not itself mean a “dedicated frequency band,” however, ensures that the separate “backhaul ... as opposed to a fronthaul ... in a network” requirement is not superfluous. Nor did the construction of “default frequency band” as a “first selected frequency band” conflict with the plain meaning of “the backhaul is ... as opposed to a fronthaul ... in the network.” The ’698 patent repeatedly describes network devices performing an attempt to utilize a first selected frequency band dedicated to backhaul communications, such as a 5 GHz band, “as opposed to” a shared 2.4 GHz frequency band used for front haul and backhaul in the network. ’698 patent at Abstract (“using the 5 GHz high band or low band as a dedicated backhaul; using the 2.4GHz band as a backup”) and 2:48–54. Dr. Bims agreed that this is the focus of the ’698 patent. Bims Tr. at 827:16–20 (“So the ’698 patent is focused on a wireless mesh network that uses a 5-GHz band as the -- for a dedicated backhaul, and it also can use the low band for a dedicated backhaul, and then it uses the 2.4-GHz band as a backhaul -- as a backup rather”).

Based on the evidence and arguments, I conclude that claim 12 and, in particular, element 12[b] is directed to a dedicated backhaul.

B. Infringement

Netgear asserts infringement of claims 12, 15, 17, and 19 of the ’698 patent. Netgear Br. at 4–41.

1. Accused Products and Representativeness

The '698 patent accused products are the Deco M9 Plus, Deco BE95, Deco XE75, Deco XE75 Pro, Deco BE85, Deco X5700, the Deco XE200, Deco X68, Deco XE5300, Deco X90, Deco W7200, and Deco X3600. Akl Tr. at 406:7–10; *see also* Netgear Br. at 41 and CDX-0002C.76. Netgear identified the Deco XE75 Pro as representative. Akl Tr. at 406:7–10. TP-Link does not dispute that the Deco XE75 Pro is representative. TP-Link Reply at 44–45.

The accused products are implemented with either Broadcom or Qualcomm Wi-Fi chips. Akl Tr. at 407:12–23. Netgear identifies the '698 patent accused products with Broadcom chips as Deco X90v1, Deco X3600v1, Deco X5700v1, Deco X68v1, Deco W7200v1.6, Deco W7200v2, Deco XE75v1, Deco XE5300v1, and Deco XE75 Prov1. Netgear identifies the '698 patent accused products with Qualcomm chips as Deco BE95v1, Deco BE85v1, Deco XE75v2, Deco XE75 Pro v2, Deco XE200v1. Netgear Br. at 42.

Netgear's infringement allegations differ with respect to the Qualcomm and Broadcom-based products. As to the Broadcom-based products, Netgear contends that their implementation of TP-Link's AWN module and the "preferred backhaul" functionality in TP-Link's APS module infringes. Netgear Br. at 48. As to the Qualcomm-based products, Netgear makes two allegations: (1) their implementation of TP-Link's AWN module and the "preferred backhaul" functionality in TP-Link's APS module infringes; and (2) their implementation of Qualcomm driver code, TP-Link's AWN module, and TP-Link's APS module infringes. *Id.*

The presentation of evidence on these issues was unnecessarily complicated by the fact that throughout this investigation, TP-Link was not straightforward with respect to the collection and production of its source code, the identification of what code is actually on and used in its

products, or on the production of its technical documents. This was the subject of multiple discovery conferences.

At the very first case management conference in this investigation, the issue of TP-Link's source code production was raised. TP-Link stated that it had collected "everything that relates to the functionalities that are accused," that there were "no gates being put down" with respect to source code production and it had done its best and had been diligent to collect relevant source code. 6/27/2023 Tr. at 39:25–40–11 (EDIS Doc. ID 799467).

At a subsequent conference, the parties discussed TP-Link's technical document production. TP-Link indicated that its code had been produced, stating, "So as noted, of course, there's the source code. That's the real place to look." 7/28/2023 Tr. at 12:25–13:1 (EDIS Doc. ID 801541). At a conference on August 30, TP-Link again indicated that its code had been produced, stating, "[t]he final word is source code. So we can give the best documents that we have, but the final word truly is the source code." 08/30/2023 Tr. at 28:18 (EDIS Doc. ID 803590).

It turned out, however, that despite its earlier representation and the code being "the real place to look" and the "the final word," TP-Link had not produced relevant code. During an October 16 conference, TP-Link's counsel explained that a makefile is a "separate file that tells you which pieces of code are loaded onto the product." 10/16/2023 Tr. at 11:7–9 (EDIS Doc. ID 806042). As of that date, TP-Link had not provided that information, stating instead "[i]f they would have wanted the makefile, they could have asked us for it. They know what makefiles are. Their experts certainly know what makefiles are. We're happy to provide it." *Id.* at 13:4–7. At the end of October, when there continued to be questions regarding the adequacy of TP-Link's source code production, TP-Link had to again be reminded of its obligation to produce code. 10/30/2023 Tr. at 35:7–17 (EDIS Doc. ID 807345).

I agree with Netgear’s comments that TP-Link’s strategy was to obstruct and obfuscate, while at the same time making arguments that Netgear has not shown that certain code is included on the devices or enabled. Tr. at 19:19–24 and *see id.* at 19:25–20:24. TP-Link’s discovery conduct unnecessarily complicated addressing the substantive issues in this investigation.

2. Claim 12

a) Element 12[pre]

Element 12[pre] recites “[a] network device capable of establishing a backhaul communication among nodes in a mesh wireless network, the device including a network controller configured to perform operations comprising.” ’698 patent at claim 12. Netgear contends that the ’698 patent accused products meet this claim element. Netgear Br. at 44–47. TP-Link does not dispute that element 12[pre] is met. TP-Link Reply at 44–86.

The evidence supports that the ’698 patent accused products are mesh access points (network devices) that are capable of establishing a backhaul communication among nodes in a mesh wireless network and that include a network controller—a Broadcom or Qualcomm Wi-Fi chip—that run the Adaptive Path Selection (APS) functionality. Akl Tr. at 408:1–22; CX-2268.4 (Wi-Fi 6E Deco Datasheet); and CX-3281C.11 (XE75 Pro Hardware Requirements).

The evidence supports that the ’698 patent accused products meet element 12[pre].

b) Element 12[a]

Element 12[a] recites “performing an attempt to utilize a first channel in a default frequency band as a backhaul with second node in the network.” ’698 patent at claim 12. Netgear asserts that the ’698 patent accused products meet this element. Netgear Br. at 24–47. TP-Link does not dispute that this element is met. *See* TP-Link Reply at 44–86.

The evidence supports that the '698 patent accused products are configured to attempt to utilize a dedicated backhaul band—a “first selected” frequency band—as part of APS, where the first node is a satellite, and the second node is the router or front access point (FAP). Ak1 Tr. at 408:23–412:19; CX-2779C.36–37 (APS Test Design); CX-2481C (internal technical specification); and CX-2765C.16 (identifying dedicated backhaul).

The evidence supports that the highest available frequency band each product is designed to operate on is the dedicated backhaul band. TP-Link provided an interrogatory response that identified the default frequency band used as a backhaul with respect to a second node in the network in its products. CX-3287C.1–3 (TP-Link Rog. Resp., annotated by H. Pu) (excerpted); CX-3176C (Pu Dep. Tr.) at 171:21–172:2 and 172:22–173:1 (confirming accuracy of table). For example, the Deco XE75 Pro is configured to support backhaul on 2.4G/5G/6G and 6G is the dedicated backhaul band, while the Deco BE95 supports backhaul on 2.4G/5G/6G1/6G2 and 6G2 is the dedicated backhaul band.

The evidence supports that the '698 patent accused products meet element 12[a].

c) Element 12[b]

Element 12[b] recites “wherein the backhaul is to provide communication of management functions between the nodes in the network, as opposed to a front haul that provides wireless data communication to clients in the network.” '698 patent at claim 12. Netgear contends that the '698 patent accused products meet element 12[b]. Netgear Br. at 47–48. TP-Link does not dispute that the '698 patent accused products meet element 12[b]. *See* TP-Link Reply at 44–86.

The evidence supports that the dedicated backhaul frequency band, addressed with respect to element 12[a], is used to communicate management information between network nodes. This can be done, for example, when a user manages Wi-Fi settings through the Deco App, which

pushes configuration or mesh management changes through the backhaul. Akl Tr. 412:24–414:17; CX-2268.3 (XE75 Pro Datasheet) (identifying remote management); and CX-2680.31 (XE75 Manual) (identifying app settings). The evidence supports that the dedicated backhaul is “as opposed to a front haul that provides wireless data communication to clients in the network” because it is used for management traffic and not user traffic. CX-3176C (Pu Dep. Tr.) 170:21–171:4 (the dedicated backhaul band is a “wireless backhaul band that is only used for data transfer of the access point (AP), and it is not open for users to use”); and Akl Tr. 414:3–5.

The evidence supports that the ’698 patent accused products meet element 12[b].

d) Element 12[c]

Element 12[c] recites “upon detecting that a received signal strength of the first channel from the second node is below a threshold, performing an attempt to utilize a different channel in the default frequency band and/or a different frequency band that has a lower frequency range than the default frequency band, to establish the backhaul with the second node.” ’698 patent at claim 12. Netgear contends that the ’698 patent accused products meet element 12[c]. Netgear Br. at 48–70. TP-Link disputes that the ’698 patent accused products meet this element. TP-Link Reply at 44–82. As noted, Netgear makes different infringement allegations for the Broadcom-based and Qualcomm-based accused products. Some of TP-Link’s non-infringement arguments also differ depending on the product. Initially, however, I address an issue of claim construction.

(1) Whether the ’698 Patent Accused Products “Establish” a Backhaul

Element 12[c] recites “upon detecting that a received signal strength . . . is below a threshold, performing an attempt to utilize a different channel . . . to establish the backhaul with the second node.” TP-Link contends that because “APS does not establish backhauls, but merely allocates traffic among backhauls previously established by AWN, Netgear cannot prove

infringement.” TP-Link Reply at 46. This argument relates to all of the ’698 patent accused products.

TP-Link contends that when a Deco satellite AP starts up, it runs the AWN module, which establishes backhaul connections with the selected AP. Thereafter, the APS module [REDACTED] [REDACTED] TP-Link Reply at 46–48. TP-Link contends that the claimed operation of “to establish” is not performed by APS because the link has already been established by AWN. TP-Link Reply at 46–54. The claim, however, explains that the backhaul provides communication of management functions between nodes. When an alternative backhaul is established, it is for the communication of those management functions. Nothing in the claim requires (or suggests) that a new link must be formed in order to establish an alternative backhaul for those communications. This is supported by the specification, which states that the 5 GHz band may be defined as a dedicated backhaul. ’698 patent at 3:45–46. This is shown in Fig. 2. If that dedicated wireless link falls below a quality threshold, the 2.4 GHz band may be used as a back-up option. *Id.* at 3:48–51. Fig. 3 shows that the previously-established 2.4 GHz connection is used as a backhaul when the dedicated backhaul is not available. This switch of the backhaul traffic to the 2.4 GHz previously-established connection is establishing a backhaul. TP-Link’s interpretation of “establish” in asserting non-infringement would improperly read the primary embodiment out of the claims. As a result, I reject TP-Link’s argument that using an existing link cannot be used to “establish the backhaul with the second node,” as recited in element 12[c]. *See* Netgear Br. at 57.

(2) The Accused Broadcom and Qualcomm Products and APS “Preferred Backhaul” Functionality

(a) Whether the APS “Preferred Backhaul” Functionality is Disabled in the Qualcomm-Based Products

The parties do not dispute that the APS “preferred backhaul” functionality is [REDACTED] in TP-Link’s Qualcomm-based products. Netgear Br. at 65 (TP-Link [REDACTED] [REDACTED]) and TP-Link Reply at 66. The parties dispute whether that matters for purposes of infringement.

The evidence demonstrates that the “preferred backhaul” functionality in the Qualcomm-based accused products is [REDACTED] Bims Tr. at 843:23–844:24; RDX-0002.82C, *citing* RPX-0070C; RPX-28C; RPX-0038C; and RPX-72C. TP-Link contends that this source code setting [REDACTED] the “preferred backhaul” functionality, “meaning there is no way for a user to enable the functionality without accessing and modifying the code of the TP-Link products, which no user can do.” TP-Link Reply at 66.

Netgear argues that [REDACTED]

[REDACTED] Netgear Br. at 67–68. While Mr. Baer testified that the Qualcomm-based products are “capable of using” the functionality because [REDACTED]

[REDACTED]

he did not state that a user would be able to access “the file system of the device” to modify the configuration setting. Baer Tr. at 301:10–303:2 In fact, Mr. Baer stated that he was “not testifying that [REDACTED]

[REDACTED] Baer Tr. at 342:1–5.

Netgear argues that “disabling an infringing feature when it is shipped does not avoid infringement” because claim 12 “is a device claim that requires ‘a network device capable of establishing a backhaul...’ and including a ‘network controller configured to perform operations...’” Netgear Br. at 66. Netgear argues that “the products need only be ‘reasonably capable of performing the claimed functions without significant alterations.’” *Id.*, citing *ParkerVision, Inc. v. Qualcomm Inc.*, 903 F.3d 1354, 1362 (Fed. Cir. 2018).

The Federal Circuit has recognized that “apparatus claims cover what a device *is*, not what a device *does*,” but has noted that

with computer- or software-based inventions, apparatus claims routinely depend on functional claiming to describe the apparatus. It is the functional terms that distinguish a general purpose computer, “which can be programmed to perform very different tasks in very different ways” from a special purpose computer that is programmed to perform the particular function. Therefore, what the device *does* (and how it does it) is highly relevant to understanding what the device *is*, in the computer/software context.

INVT SPE LLC v. Int’l Trade Comm’n, 46 F.4th 1361, 1376–77 (Fed. Cir. 2022) (citations removed). Further, “[i]n contexts involving software functionality,” the Federal Circuit has “never suggested that reasonable capability can be established without any evidence or undisputed knowledge of an instance that the accused product performs the claimed function when placed in operation.” *Id.* at 1376; see *Telemac Cellular Corp. v. Topp Telecom, Inc.*, 247 F.3d 1316, 1330 (Fed. Cir. 2001) (finding product did not infringe international calling patent, because “due to a restriction built into the software program stored in the telephone’s memory, a user of [defendant’s] system is prevented from directly placing international calls”). Instead, the court has “rejected finding infringement based on an accused product being ‘merely capable of being modified in a manner that infringes.’” *INVT SPE LLC*, 46 F.4th at 1376.

Here, even crediting Mr. Baer’s testimony that the “preferred backhaul” functionality is

[REDACTED], it cannot be disputed that the accused Qualcomm-based products are merely capable of being modified in a manner that infringes. That precludes a finding of infringement.

(b) Whether the Accused Products With APS “Preferred Backhaul” Functionality Detect a Received Signal Strength

Element 12[c] recites “upon detecting a received signal strength of the first channel from the second node.” TP-Link argues that “the evidence shows that the APS ‘preferred backhaul’ feature is based on [REDACTED], not received signal strength,” and “[b]ecause [REDACTED] [REDACTED] are fundamentally different metrics from ‘received signal strength,’ the accused [REDACTED] [REDACTED] does not infringe.” TP-Link Reply at 54. In making this argument, TP-Link focuses on a received signal strength indication (RSSI) measurement as distinguished from [REDACTED]. TP-Link Br. at 63, *citing* RDX-0002.88 and distinguishing the ’698 patent at 1:44–59 (addressing RSSI) and 8:34–40 (addressing RSSI) from 8:52–54 (addressing channel utilization). The evidence shows, however that in the context of the ’698 patent, the claimed received signal strength is not the same as RSSI. The ’698 patent states elsewhere that “the node checks signal strength of other APs using the content of the information element (hop count, data rate to main AP) and RSSI of the neighboring node.” *Id.* at 3:20–28. Contrary to Dr. Bims’s testimony, that portion of the specification clearly identifies other metrics as indicative of signal strength and distinguishes them from the more specific RSSI measurement. Bims Tr. at 850:19–851:25 and Akl Tr. at 374:18–24 and 549:25–550:8. Dr. Akl also explained that the ’698 patent discloses that interference is identified as a metric indicating signal strength as is channel utilization. Akl Tr. at 374:25–375:17 and 550:9–21 and ’698 patent 7:28–32 and 8:7–59.

Dr. Akl further explained that “it is common to use channel utilization as a way that would correspond to received signal strength,” Akl Tr. at 415:8–11, and that “band utilization is considered a received signal strength as it informs the system of the backhaul band’s ability to carry data,” *id.* at 490:15–17. Dr. Akl also testified that backhaul rate provides a received signal strength as it indicates the capacity of a link to carry data because if “you have a better signal, you can have more data so you can have a higher rate” and a low backhaul rate signifies the backhaul communication may be weaker as it could lead to bottlenecks in the network. Akl Tr. 496:6–15.

TP-Link contends that Dr. Akl did not provide any “correlation” between “received signal strength” and other metrics, such as [REDACTED]. TP-Link Reply at 57–60. That, however, is not relevant. An indication of a person’s fitness could be how much they can bench press. That would have no necessary correlation to how many pull ups they can do, which also may be an indication of fitness. Both metrics indicate fitness, and one is not related (or correlated) to the other. So too here, RSSI, [REDACTED], and [REDACTED] each indicate received signal strength though they are not correlated to each other.

Based on the claim language, specification and the parties’ arguments and evidence, I conclude that “a received signal strength” in element 12[c] includes [REDACTED].

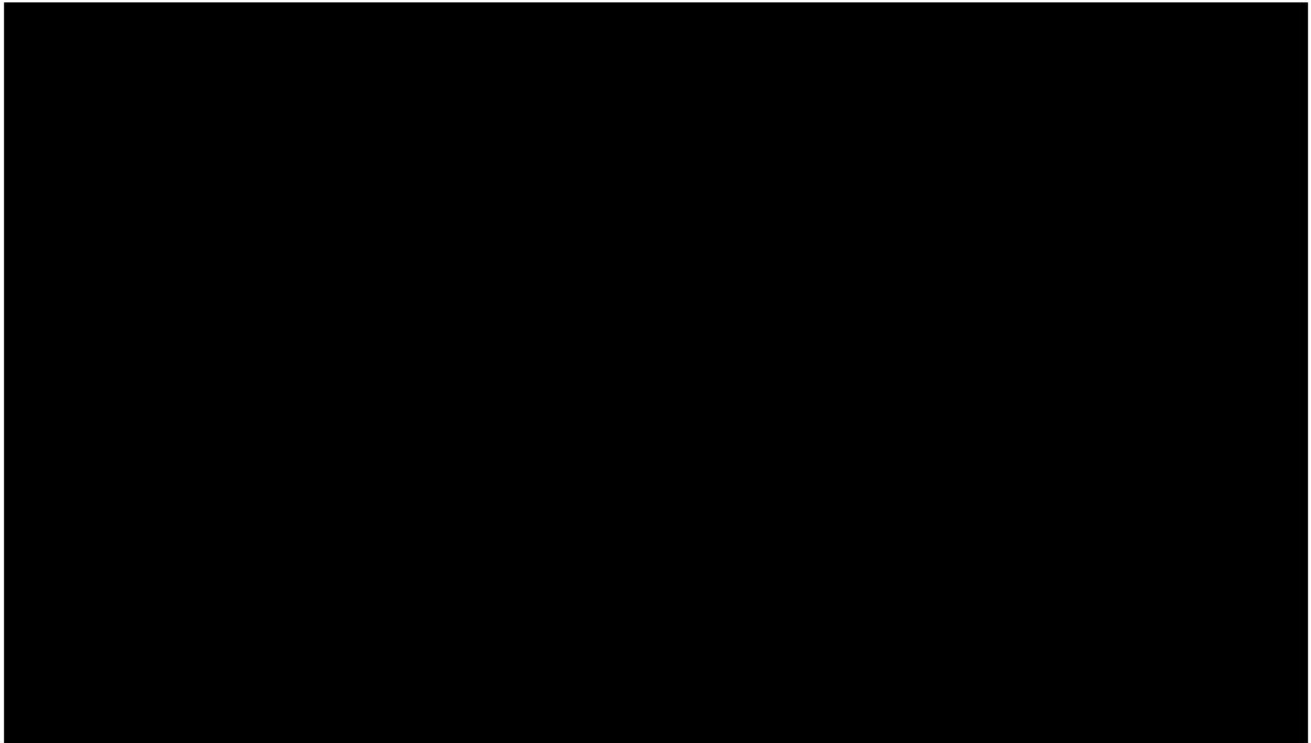
(c) The “Preferred Backhaul” Functionality

As noted with respect to element 12[a], the evidence supports that APS attempts to utilize a channel in the dedicated backhaul band as a backhaul used to communicate information to the router, that is, the claimed second node. The evidence supports that the APS code is loaded and

installed in the '698 patent accused products.²⁷ CX-3182C (Weng Dep. Tr.) at 329:8–21; Baer Tr. at 300:5–25 (APSD is packaged, loaded, and compiled); CX-0034C.1, .27 (Deco X90v1 Configuration Build File); and *see* CDX-0003C.44 (identifying APS configurations).

The evidence shows that as part of that, the '698 patent accused products detect [REDACTED] in the dedicated backhaul band. CX-2779C.36 (APS Module Test Design) and Baer Tr. at 297:14–299:8 (describing source code flow and check of [REDACTED]^p [REDACTED]). [REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED] CPX-0441C (TP-Link Code); RPX-0065C (TP-Link Code); Baer Tr. at 299:7–22 (identifying [REDACTED] [REDACTED] [REDACTED] in code on CDX-0003C.42); and Akl Tr. at 408:23–410:10. Mr. Baer illustrated the conditional logic of this functionality in CDX-0003C.41 below, where the variable [REDACTED] is yes and [REDACTED] selects the dedicated/preferred backhaul band:

²⁷ As noted, the evidence supports that the “preferred backhaul” functionality is disabled in the Qualcomm-based products.



CDX-0003C.41 (annotated); Baer Tr. at 297:14–298:9; CPX-0332C; CPX-439C; CPX-0440C; CPX-0441C; and RPX-0065C.

The evidence shows that when the '698 patent accused products detect that the [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]. Baer Tr. at 297:14–300:4; *see* Akl Tr. at 513:6–23 (“[REDACTED]

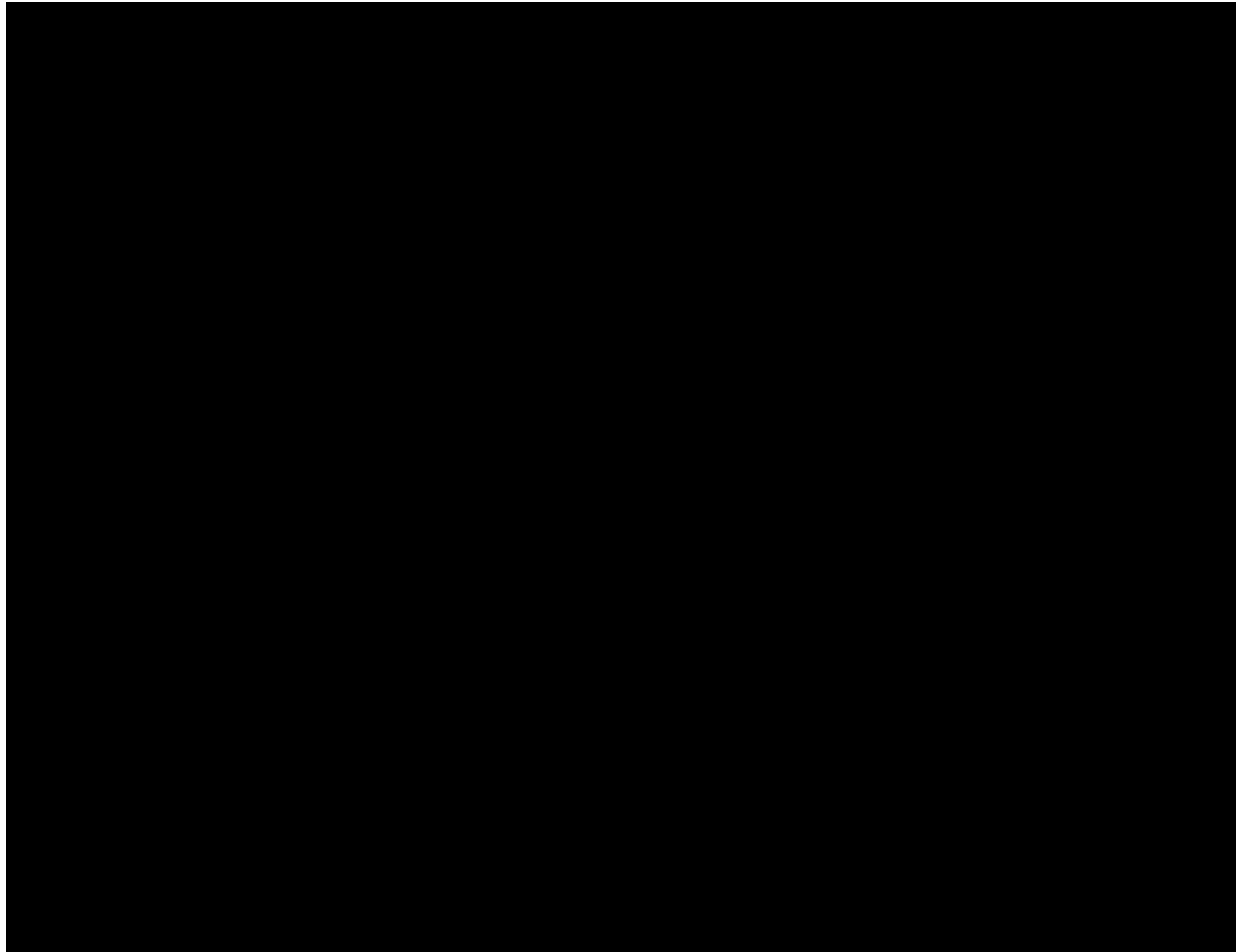
[REDACTED]”) and 553:3–22. [REDACTED]

[REDACTED]

[REDACTED]. Baer

Tr. at 298:10–299:6. This is annotated in red in CDX-0003C.93 below.

²⁸ As a matter of logic, becaus [REDACTED] Akl Tr. at 416:22–417:13 and 552:9–554:5. They are the flip sides of the same coin.



CDX-0002.93 (annotating flow diagram in CDX-0003C.41); Akl Tr. at 419:1–25, 553:23–554:5; and Baer Tr. at 297:14–300:4. The evidence thus supports that the '698 accused products, upon detecting a received signal strength ([REDACTED]) is below a threshold, perform an attempt to select a channel on a lower frequency band to establish a backhaul with the second node (i.e., the router).

The evidence supports that after APS determines what backhaul band to use—either the first selected dedicated backhaul band or an alternative channel in a lower frequency band—the backhaul is established by updating a database entry. CDX-0002C.92 (annotating CX-2779C.34–

35 (APS Test Design)); Akl Tr. at 417:14–418:25, 526:12–15, 529:8–530:1; *see also* CX-2779C.32, .38.

The evidence supports that the Broadcom-based accused products meet element 12[c]. The evidence also supports that but for [REDACTED], the Qualcomm-based products would meet element 12[c].

(d) Conclusion

The evidence supports that the Broadcom-based accused products meet element 12[c].

(3) The Accused Products With Qualcomm Driver Code

As noted, Netgear also argues that TP-Link products using Qualcomm driver code infringe claim 12.

(a) Whether the Qualcomm Driver Code is Compiled

TP-Link argues that its accused products with Qualcomm driver code do not infringe because the driver code is not compiled in the products. TP-Link Reply at 73–82; Bims Tr. at 837:8–13 and 839:5–840:3. Netgear contends that the Qualcomm driver code is compiled. Netgear Br. at 58–65. TP-Link did not argue in its pre-hearing brief that the Qualcomm driver code is not compiled. TP-Link Pre-hearing Br. at 160. Instead, although it is obviously in the best position to know what code is actually on its products, TP-Link said that its expert would explain at the hearing [REDACTED] This is in contrast to Broadcom driver code, which TP-Link stated [REDACTED] *Id.* TP-Link’s unwillingness to be straightforward with respect to this code on its products carried forward to the evidentiary hearing where I ordered the parties to further discuss the Qualcomm code and TP-Link agreed to the “correlation between the Qualcomm code and the TP-Link products” with the “caveat” that it could “argue that certain of that code is not compiled and included on the products and certain code is

not enabled.” Tr. at 261:12–263:1. Despite having waived this issue by not squarely raising it in its pre-hearing brief, I address TP-Link’s argument below.

TP-Link relies on testimony from Dr. Bims and Mr. Pu regarding whether the Qualcomm driver code is compiled. Dr. Bims testified a particular compile time flag is set for the Qualcomm code, but that he was unable to “identif[y] where that flag is defined anywhere in a TP-Link build.” *Id.* at 839:20–23. On cross examination, however, Dr. Bims admitted that the flag would not be defined in TP-Link’s build because it is “in the code on the computer that Qualcomm made available for review” and that he did not review the code made available at Qualcomm’s facility Bims Tr. at 908:4–908:19. Based on his testimony, I conclude that Dr. Bims was not in a position to definitively know whether Qualcomm driver code was compiled.

TP-Link’s corporate representative, Mr. Pu, was asked whether [REDACTED] [REDACTED]” to which Mr. Pu answered, “there is not.” Pu Tr. at 953:2–7 and 953:8–14. Mr. Pu later clarified that he was discussing Broadcom driver code, not Qualcomm driver code. Pu Tr. at 954:13–23. Based on his testimony, I conclude that Mr. Pu’s earlier and broader testimony regarding the functionality of the chip driver cannot be credited to the Qualcomm-based products because he later confirmed that he was addressing the Broadcom products.

Mr. Baer testified that the Qualcomm driver code is [REDACTED] in TP-Link’s APS feature, which he determined by personally reviewing the Qualcomm code and printing select portions. *See* Baer Tr. at 268:24–269:5 (time spent reviewing code), 303:3–305:19 (describing how TP-Link’s APS uses the Qualcomm driver code). I credit that testimony even if Mr. Baer did not identify a specific compile time flag. His testimony was credible and supported by scores of hours reviewing code. In addition, it is supported by TP-Link’s internal engineering documents,

which describe APSD for TP-Link's Qualcomm-based products, i.e., "[REDACTED]"²⁹ and show that the APSD module uses [REDACTED]

[REDACTED]

[REDACTED]

CX-3286C.24 ([REDACTED]). When confronted with this document, Mr. Pu admitted that the "driver" is "talking about Qualcomm driver code." Pu Tr. at 954:24–955:25.

The evidence supports that the Qualcomm driver code is compiled in the Qualcomm-based accused products.

(b) Operation of the Accused Products with Qualcomm Driver Code

The evidence supports that TP-Link's APS feature operates such that upon detecting that a link failed in its attempt to utilize a first channel in the dedicated backhaul band as a backhaul with a second node, APS will trigger an attempt to utilize a different channel in a lower frequency band. Baer Tr. at 303:3–306:7; Akl Tr. at 420:6–421:9; CX-2997C.38; CDX-0002C.96 (addressing code flow); and *see* CDX-0003C.49 and 52 (identifying Qualcomm code).

To determine whether a [REDACTED], APS relies on functionality implemented by Qualcomm in the driver. As Mr. Baer explained, the Qualcomm driver code [REDACTED]

[REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED]

²⁹ [REDACTED] stands for Qualcomm [REDACTED]. Pu Tr. at 955:1–14.

[REDACTED]. Baer Tr. at 303:22–304:13; CX-3286C.24 [REDACTED]
[REDACTED]) (confirming Qualcomm-based APS determines link state based on [REDACTED] received from
Qualcomm driver code). [REDACTED]

[REDACTED]. Baer Tr. at 304:14–306:7, 306:21–307:2; CPX-0157C; CPX-0075C; CPX-523C;
CPX-0521C; CPX-520C; and CX-3293C (stipulated correlation).

The evidence shows that upon detecting that the first channel in the dedicated (claimed
default) frequency band has a received signal strength [REDACTED] from the second node below a
threshold, APS [REDACTED]
[REDACTED]. Akl Tr. at 420:6–421:2 and *see* CDX-0002C.96 (identifying source
code flow).

(c) Conclusion

The evidence supports that the Qualcomm-based products using Qualcomm driver code
and APS meet element 12[c].

e) Element 12[d]

Element 12[d] recites “wherein, in any of said attempts, channels in a given frequency band
are prioritized based on a corresponding received signal strength.” ’698 patent at claim 12. Netgear
contends that this element is met in the ’698 patent accused products. Netgear Br. at 70–74. TP-
Link disputes that this element is met. TP-Link Reply at 82–86.

The evidence supports that in the ’698 patent accused products, the [REDACTED]
[REDACTED]
[REDACTED]. Baer Tr. at

308:13–311:14; Akl Tr. at 421:14–425:11; and *see* Bims Tr. at 834:22–23. Dr. Bims stated that the ACS “code is looping through all the channels, it’s collecting statistics about each of the channels, and then it finds the best channel based on the metrics.” Bims Tr. at 835:10–16. This operation is the same across all the ’698 patent accused products. Akl Tr. at 404:19–405:25. The implementation of ACS differs, however, in the Qualcomm-based and Broadcom-based accused products in terms of the metrics they use to prioritize channels.

The evidence supports that in Qualcomm-based products, [REDACTED] [REDACTED]. Baer Tr. at 308:13–309:10 (describing use of [REDACTED] to prioritize channels in ACS for Qualcomm-based Deco M9 Plus), 310:5–16 (describing use of [REDACTED] to prioritize channels in 6GHz band for other Qualcomm-based accused products), 345:20–346:12 (same), 349:20–350:7 (for 5 GHz band, channels are prioritized using [REDACTED]). In the Broadcom-based products, ACS selects the best channel for a given frequency band based on [REDACTED] [REDACTED]. Baer Tr. at 310:17–311:14. The evidence supports that prioritization of channels based on any of these metrics is “corresponding received signal strength.” Akl Tr. at 549:22–551:10, 422:1–12, and 423:17–424:21.

The parties do not dispute that this is how the accused products operate. TP-Link Reply at 83. TP-Link argues that “the alleged channel prioritization is performed by the root AP as part of an entirely separate process [REDACTED] [REDACTED] not “in any of said attempts,” as claim 12 requires.” TP-Link Reply at 83 (emphases removed), *citing* Bims Tr. at 832:1–12, 834:22–5, and 836:6–12. In other words, TP-Link contends that the claim language requires “the prioritizing occurring ‘in any of said attempts,’ that is, during the attempts by the satellite AP.” *Id.* at 86 (emphasis removed). According

to TP-Link, “[b]ecause it is undisputed that the alleged prioritizing occurs prior to any such attempts, the products do not infringe.” *Id.* Netgear contends that “[t]o the contrary,” element 12[d] “does not identify any device that prioritizes, and uses the past tense ‘prioritized’ to allow channel prioritization before the claimed ‘any of said attempts’” such that the ACS prioritizing meets element 12[d]. Netgear Br. at 73, *citing* Akl Tr. at 422:16–25.

TP-Link notes that the phrase “are prioritized” in element 12[d] is in the passive voice. TP-Link Br. at 85 and 91. TP-Link is correct. In the passive voice, the subject is acted on by the verb (the ball is thrown) as opposed to the active voice in which the subject performs the verb (the pitcher throws the ball). The passive voice, therefore, does not necessarily identify the subject that performs the verb. The Federal Circuit considered the use of passive voice in *Apple Inc. v. MPH Technologies OY*, in which the claim recited an “intermediate computer configured to receive from a mobile computer a secure message sent to the first network address.” The court stated that despite being written in the passive voice, the claim language required that the mobile computer send the message to the first network address (i.e., the claim language identified what entity performed the action) because the “phrase identifies the sender (i.e., the mobile computer) and the destination (i.e., the first network address)” and the “proximity of the concepts links them together, such that a natural reading of the phrase conveys the mobile computer sends the secure message to the first network address.” 28 F.4th 254, 261 (Fed. Cir. 2022). The court stated that it was “of no import” that the claim used passive voice because the “plain language establishes direct sending.” *Id.*

Here, the proximity of the concepts does not link the network device with the action of prioritizing. Instead, the claim language identifies the status of the channels “in any of said attempts,” that is, the “channels are prioritized based on a corresponding received signal strength” without regard to what device performs (or performed) the prioritizing or when that action was

performed. *See Unicorn Energy GmbH v. Tesla Inc.*, 2023 WL 322891 at *16 (N.D. Cal. Jan. 19, 2023) (the claims avoid stating which component separates the network medium from the energy storing component through their use of the passive voice, where it recited that the “the energy storing component [is] configured to cooperate with the communication interface such that the energy storing component is separated from the network medium”) and *Special Devices, Inc. v. OEA, Inc.*, 270 F.3d 1353, 1355 (Fed. Cir. 2001) (by phrasing the statutory bar in the passive voice, “it does not matter who places the invention ‘on sale;’ it only matters that someone—inventor, supplier or other third party—placed it on sale).

In its similar arguments on technical domestic industry, TP-Link analogizes the claim phrase “in any of said attempts, channels in a given frequency band are prioritized” with the phrase “in any of said attempts to decelerate the car, the brake is pressed.” TP-Link Br. at 90. In TP-Link’s example, however, the proximity of the concepts—decelerating and braking—links them together. Here, the attempts and the prioritization are not so linked. Consider instead, “in any of said attempts to decelerate the car, the horn is pressed.” Deceleration and pressing the horn are not linked such that the horn may be pressed before deceleration or during deceleration. That the horn is pressed indicates the status of the horn, not when it was pressed.

Further, and returning to the claim language, the passive voice language of element 12[d] contrasts with active voice language used elsewhere in the claim, namely “performing an attempt...” and “upon detecting ... performing an attempt...,” which identify actions that the claimed network device must be capable of performing. That the prioritizing can be performed by a component other than the network device and before an attempt by the network device to connect to a first channel or utilize a different channel is also supported by the specification, which specifically states that auto channel selection can be performed “during initial boot up” in which

“appropriate statistics, such as interferences” are collected. ’698 patent at 7:28–32. Because element 12[d] does not require that the network element perform channel prioritizing (which is supported by the language of the claim and the specification), the evidence supports that the ’698 patent accused products, in which channels “are prioritized” by the root AP (second node), meet element 12[d].

f) Conclusion

The evidence supports that the Qualcomm-based products using Qualcomm driver code and APS meet claim 12 and that the Broadcom-based products using “preferred backhaul” functionality meet claim 12.

3. Dependent Claim 15

Claim 15 depends from claim 12 and further requires “the operations further comprising: measuring received signal strengths of probes from all nodes within a communication range; and selecting the second node based on the measured received signal strengths of the probes.” Netgear asserts that the additional requirements of claim 15 are met by all asserted products. Netgear Br. at 75–76. TP-Link does not dispute that the additional elements of claim 15 are met. *See* TP-Link Br. at 44–86.

The evidence supports that the ’698 patent accused products use [REDACTED]
[REDACTED].
Baer Tr. at 288:9–16 (function [REDACTED] [REDACTED]
[REDACTED]
[REDACTED]) and CPX-215C (TP-Link Code). [REDACTED]
[REDACTED]
[REDACTED]

[REDACTED]. Baer Tr. at 288:17–291:20 ([REDACTED]
[REDACTED] CX-2757C.19–20 (Deco Networking
2.0)); Akl Tr. at 425:12–427:24; Baer Tr. at 288:9–291:20; CPX-0215C; and CPX-0216C. [REDACTED]
[REDACTED]
[REDACTED]. Akl. Tr. at 426:2–427:7
and CX-2757C.19–20.

The evidence supports that the additional requirements of claim 15 are met.

4. Dependent Claims 17 and 19

Claim 17 depends from claim 12 and further requires “the operations further comprising: measuring a link quality among one or more of the nodes in the network; and selectively causing a number of nodes in the network to form a particular connection topology based on the measured link quality.” Claim 19 depends from claim 17 and further requires “wherein the formed connection topology is a daisy chain topology if the link quality does not exceed a predetermined threshold.” Netgear asserts that the additional requirements of claims 17 and 19 are met by all accused products. Netgear Br. at 76–77. TP-Link does not dispute that the additional elements of claims 17 and 19 are met. *See* TP-Link Br. at 44–86.

The evidence supports that the ’698 patent accused products [REDACTED]
[REDACTED]
[REDACTED] Baer Tr. at 288:9–16 (function [REDACTED]
[REDACTED]
[REDACTED]). That topology may be a daisy-chain topology
if RSSI does not exceed a predetermined threshold. Baer Tr. at 290:1–11 (star or daisy chain
topology may be formed); CPX-0216C (TP-Link Code); TP-Link’s documentation confirms this,

explaining that [REDACTED] CX-2757C.19–20; and Akl Tr. at 428:6–23 (claim 17) and 429:6–18 (claim 19).

The evidence supports that the additional requirements of claims 17 and 19 are met.

C. Technical Prong

Netgear argues that its '698 domestic industry products practice claims 12, 15, 17 and 19 of the '698 patent. Netgear Br. at 78–89. TP-link disagrees. TP-Link Reply at 86–91.

1. Domestic Industry Products and Representativeness

Netgear's '698 patent domestic industry products are its Wi-Fi 7, Wi-Fi 6E, Wi-Fi 6, and Wi-Fi 5 Orbi products. Netgear Br. at 78 and xiii–xv. The evidence supports that Netgear's Orbi 850 is representative of its '698 patent domestic industry products. Netgear Br. at 78; Akl Tr. at 364:3–163 (no material differences between domestic industry products); Baer Tr. at 275:7–276:11 (no material differences in Netgear source code). TP-Link does not dispute that the Orbi 850 is representative. Bims Tr. at 853:7–10 (agreeing that the Orbi 850 is representative); and TP-Link Reply at 86.

2. Claim 12

a) Element 12[pre]

Element 12[pre] recites “A network device capable of establishing a backhaul communication among nodes in a mesh wireless network, the device including a network controller configured to perform operations comprising.” '698 patent at claim 12. Netgear asserts that its domestic industry products meet this claim element. Netgear Br. at 78. TP-Link does not dispute that this claim element is met. *See* TP-Link Reply at 86–91.

The evidence supports that the '698 patent domestic industry products are network devices including a controller (processor) capable of forming mesh Wi-Fi wireless networks with a first

selected 5 GHz backhaul or a backup 2.4 GHz backhaul. Akl Tr. at 377:14–378:22; CX-2704C.1 (Orbi 850 Manual); CX-0339C.145 (factory settings for Orbi 850) (listing available backhaul and fronthaul bands); and CX-0088.5 (Orbi 850 Datasheet, identifying processor).

The evidence supports that the '698 domestic industry products meet element 12[pre].

b) Element 12[a]

Element 12[a] recites “performing an attempt to utilize a first channel in a default frequency band as a backhaul with second node in the network.” '698 patent at claim 12. Netgear asserts that its domestic industry products meet this claim element. Netgear Br. at 79–80. TP-Link does not dispute that this claim element is met. *See* TP-Link Reply at 86–91.

The evidence supports that the '698 patent domestic industry products are configured so the 5 GHz high band is a “dedicated backhaul” that is used only for wireless backhaul connections between a satellite (the first node) and a router (the second node). The '698 patent domestic industry products attempt to utilize a first channel (channel 157) in that dedicated 5 GHz high band, which is “a first selected frequency band,” as a backhaul with the router (the second node). Akl Tr. at 378:23–381:19; CX-0274.17 (Orbi 860 messaging brief); CX-2710C.3 (Netgear Feature Discussion). The source code confirms that the '698 domestic industry products first attempt to utilize “the 5G backhaul.” Baer Tr. at 278:7–21; CPX-0004C (Orbi Source Code) at lines 311–315 and 318–319; and *see* CPX-0003C (Orbi Source Code).

The evidence supports that the '698 patent domestic industry products meet element 12[a].

c) Element 12[b]

Element 12[b] recites “wherein the backhaul is to provide communication of management functions between the nodes in the network, as opposed to a front haul that provides wireless data communication to clients in the network; and.” '698 patent at claim 12. Netgear asserts that its

domestic industry products meet this claim element. Netgear Br. at 80. TP-Link does not dispute that this claim element is met. *See* TP-Link Reply at 86–91.

As discussed with respect to element 12[a], the '698 domestic industry products are configured to use the 5 GHz high band as a dedicated backhaul band. The evidence supports that that backhaul band is used to communicate management functions from a user on the Netgear Orbi App, as well as other data and commands such as the onboarding feature and syncing Orbi routers and satellites. The 5 GHz dedicated backhaul is “as opposed to” the 2.4 GHz and 5 GHz low bands used for fronthaul communications that provide data to wireless client devices in a network. Akl Tr. at 381:20–383:9; CX-2714C.18 (Orbi Desktop Overview); CX-2666.2 (Orbi App Webpage); and CX-0274.17 (Orbi 860 Messaging Brief).

The evidence supports that the '698 patent domestic industry products meet element 12[b].

d) Element 12[c]

Element 12[c] recites “upon detecting that a received signal strength of the first channel from the second node is below a threshold, performing an attempt to utilize a different channel in the default frequency band and/or a different frequency band that has a lower frequency range than the default frequency band, to establish the backhaul with the second node.” '698 patent at claim 12. Netgear asserts that its domestic industry products meet this claim element. Netgear Br. at 80–82. TP-Link does not dispute that this claim element is met. *See* TP-Link Reply at 86–91.

The evidence supports that the '698 patent domestic industry products use Netgear's “Backhaul Switching” feature such that an Orbi satellite detects [REDACTED] [REDACTED] on channel 157 of the first selected 5 GHz (high) band and compares it to [REDACTED] threshold. When [REDACTED] is above the threshold, the '698 patent domestic industry products use the first attempted 5 GHz channel as the dedicated backhaul. If [REDACTED] is

below the threshold, the products attempt to utilize a different channel in the 2.4 GHz, i.e., lower frequency band. Akl Tr. at 383:10–385:1 (detect [REDACTED] and compare to threshold) and 385:22–386:17 (switch to a lower frequency band); CX-2710C.4; and CX-2709.

The evidence supports that [REDACTED] is a “a received signal strength” of the first channel from the router because it is the [REDACTED]. Akl Tr. at 384:19–385:10. And as with the attempt to utilize the 5 GHz band discussed in element 12[a], the “second node” for purposes of the attempt to utilize the 2.4 GHz band is the router. Akl Tr. at 376:12–17.

This evidence supports that this operation is reflected in the Orbi source code, in which on detecting that the [REDACTED] on the 5 GHz channel [REDACTED] threshold [REDACTED] a channel in the 2.4 GHz band is established as a new backhaul with the router (second node) and the 5 GHz backhaul is brought down. Akl Tr. at 385:11–21; Baer Tr. at 279:15–282:11 (describing operation of [REDACTED] function); and CPX-0004C (Orbi source code).

The evidence supports that the ’698 patent domestic industry products satisfy element 12[c] because they are configured to, “upon detecting that a received signal strength [REDACTED] of the first channel [channel 157 in the 5 GHz band] from the second node [the router] is below a threshold [REDACTED], performing an attempt to utilize a different channel in . . . a different frequency band [the 2.4 GHz band] that has a lower frequency range than the default frequency band, to establish the backhaul with the second node.”

The evidence supports that the ’698 patent domestic industry products meet element 12[c].

e) Element 12[d]

Element 12[d] recites “wherein, in any of said attempts, channels in a given frequency band are prioritized based on a corresponding received signal strength.” ’698 patent at claim 12. Netgear asserts that its ’698 patent domestic industry products meet this claim element. Netgear Br. at 82–86. TP-Link disputes that this claim element is met. TP-Link Reply at 86–91.

The evidence supports that the ’698 patent domestic industry products use ACS functionality, which prioritizes the channels on the 2.4 GHz band that an Orbi satellite will attempt to utilize. The evidence supports that the ACS module invokes the function [REDACTED] that prioritizes candidate channels on the 2.4 GHz frequency band, using [REDACTED] as the primary parameter. [REDACTED] prioritizes channels having the [REDACTED] [REDACTED] as a secondary tiebreaker parameter to prioritize channels if there are multiple channels found to have [REDACTED]. Akl Tr. at 388:15–392:18; Baer Tr. at 283:22–287:11; CPX-0004C (Orbi Code); and CPX-0561C (Orbi Code). The evidence supports that [REDACTED] is a second type of “received signal strength.” Akl Tr. at 415:2–11.

Similar to the accused products, Netgear’s ACS is run on a ’698 domestic industry product [REDACTED] and prioritizes and identifies the best channel in the 2.4 GHz band before a satellite (the claimed “network device”) will “attempt to utilize” the 2.4 GHz band as part of backhaul switching. Baer Tr. at 284:2–5 and 317:10–20; and Akl Tr. at 389:18–391:1. Accordingly, the channels in the 2.4 GHz band are “prioritized based on a corresponding received signal strength” in the attempt of element 12[c]. Akl Tr. at 390:20–391:21.

TP-Link does not dispute this operation of the ’698 domestic industry products and instead makes the same argument it made with respect to infringement, that is that Netgear’s products do

not meet this claim element because ACS runs on the router before a satellite attempts to use the 2.4 GHz band as part of backhaul switching. TP-Link Reply at 88. For the same reasons explained with respect to infringement, the evidence supports that the '698 patent domestic industry products meet element 12[d].

f) Conclusion

The evidence supports that the '698 patent domestic industry products meet claim 12.

3. Claim 15

Claim 15 depends from claim 12 and recites “the operations further comprising measuring received signal strengths of probes from all nodes within a communication range; and selecting the second node based on the measured received signal strengths of the probes.” '698 patent at claim 15. Netgear contends that the '698 patent domestic industry products meet claim 15. Netgear Br. at 87–88. TP-Link does not dispute that the additional requirements of claim 15 are met. *See* TP-Link Reply at 86–91.

The evidence supports that the '698 patent domestic industry products measure received signal strengths of probes from all nodes within range, and then select the best node based on [REDACTED], which are measured received signal strengths. Akl Tr. at 393:9–395:3; CX-2710C.23–25; and *see* RX-0328C (Gielty Dep. Tr.) 112:13–113:3 and 117:7–15.

The evidence supports that the '698 patent domestic industry products meet the additional requirements of claim 15.

4. Claims 17 and 19

Claims 17 depends from claim 12 and recites, “the operations further comprising measuring a link quality among one or more of the nodes in the network; and selectively causing

a number of nodes in the network to form a particular connection topology based on the measured link quality.” Claim 19 depends from claim 17 and recites, “wherein the formed connection topology is a daisy chain topology if the link quality does not exceed a predetermined threshold.” ’698 patent at claims 17 and 19. Netgear contends that the ’698 patent domestic industry products meet claims 17 and 19. Netgear Br. at 88–89. TP-Link does not dispute that the additional requirements of claims 17 and 19 are met. *See* TP-Link Reply at 86–91.

The evidence supports that the ’698 patent domestic industry products, when acting as a satellite, are configured to measure link quality [REDACTED] [REDACTED] and use that information to form a daisy chain topology if the link quality does not exceed a predetermined threshold. Akl Tr. at 395:9–397:12; CX-2710C.22 and 24. This operation is confirmed in Netgear’s code. Baer Tr. at 282:12–25 (identifying same functionality in source code including daisy chain threshold [REDACTED]); and CPX-0004C (Orbi Code).

The evidence supports that the ’698 patent domestic industry products meet the additional requirements of claims 17 and 19.

D. Validity

TP-Link argues that U.S. Patent No. 9,247,440 to Ho et al., RX-0122, invalidates claims 12, 15, 17, and 19 of the ’698 patent. TP-Link Br. at 65–105.³⁰ Netgear disagrees. Netgear Reply at 57–101.

³⁰ TP-Link filed a Notice of the PTAB’s decision to institute its petition for inter partes review of the ’698 patent. EDIS Doc. ID 817811.

TP-Link contends that “Ho anticipates—or, at minimum, renders obvious—asserted claims 12, 15, 17 and 19 of the ’698 patent.” TP-Link Br. at 65–66. TP-Link, however, never articulates any obviousness arguments separate from its anticipation arguments. Instead, TP-Link consistently just mentions obviousness along with its anticipation arguments. TP-Link Br. at 66 (the “scope and contents of the Ho reference are discussed below in this section on a limitation-by-limitation basis. As further discussed below on a limitation-by-limitation basis, there is no difference between the disclosure of the Ho reference and the claims at issue. Thus, Ho both anticipates and renders obvious [sic]”); *see also id.* at 72 (“Ho therefore anticipates or at least renders obvious claim 12”); at 74 (“Even if the preamble is assumed to be limiting, Ho nonetheless discloses it—or, at a minimum, renders it obvious”); at 80 (“Ho also discloses or renders obvious ‘performing an attempt to utilize a first channel in a default frequency band as a backhaul with second node [the CAP 102] in the network’”); at 85 (“As Dr. Bims explained, Ho discloses or renders obvious the ‘wherein’ clause of element [12.2]”); at 93 (claim 15); at 98–99 (claim 17); and 100 (claim 19).

Ground Rule 14.1 states that “[a]ny defenses of patent invalidity under 35 U.S.C. § 103 raised in a post-hearing brief must address the factors of *Graham v. John Deere Co. of Kansas City*, 383 U.S. 1 (1966), separately for each unique combination of prior references relied on. Obviousness arguments using ‘and/or’ or ‘or’ nomenclature to combine references are not preserved.” Order No. 2. In *Graham*, the Court explained that an obviousness analysis requires consideration of “the scope and content of the prior art . . . differences between the prior art and the claims at issue . . . and the level of ordinary skill in the pertinent art.” 383 U.S. at 17. While TP-Link mentions obviousness, it contends that “there is no difference between the disclosure of the Ho reference and the claims at issue” and thus does not provide the analysis required by *Graham* of identifying the differences

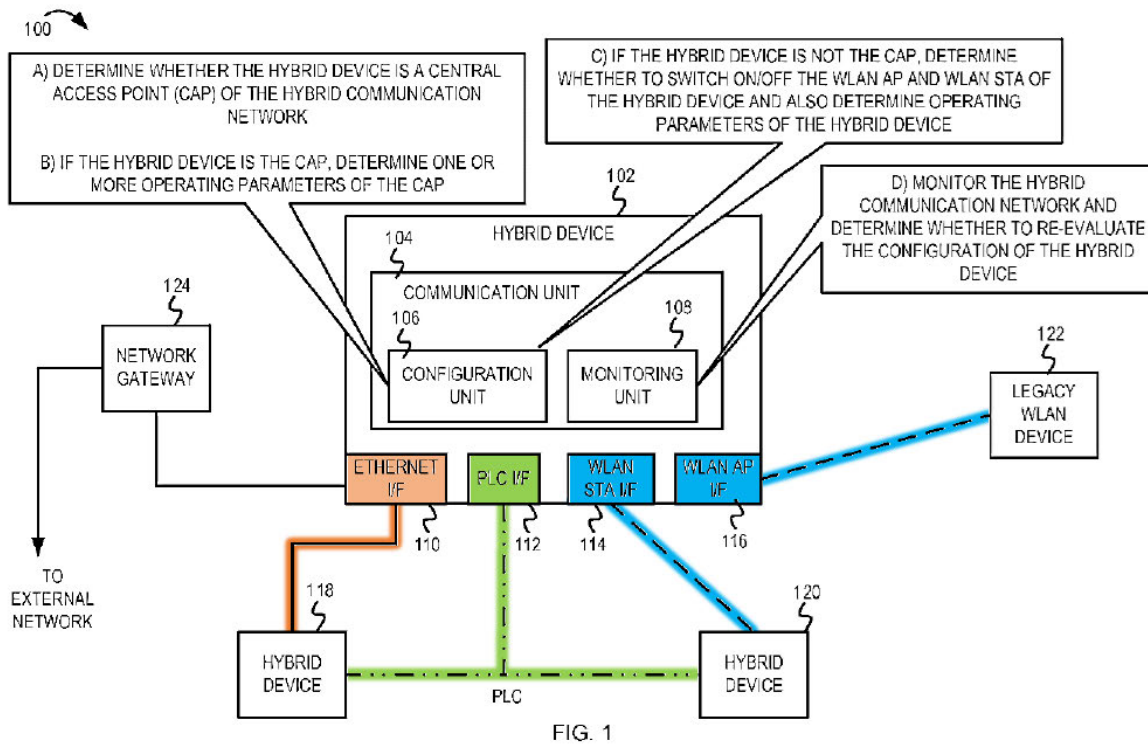
between the prior art and the asserted claims. Because TP-Link has not presented an obviousness analysis, its actual arguments—on anticipation—are addressed below.

1. Overview of Ho

The Ho patent issued on January 26, 2016, from an application filed on August 15, 2013. Ho at cover. Netgear does not dispute that Ho is prior art to the '698 patent under 35 U.S.C. §§ 102(a)(1)–(2). Netgear Reply at 57 (referencing the “Ho prior art reference”); Bims Tr. at 858:9–15.

Ho is titled “Automatic Configuration of a Network Device” and is directed to hybrid communication networks for a home network, including the automatic configuration of “hybrid devices.” Ho at Abstract. Ho’s hybrid devices are network devices that support multiple network interfaces and communication technologies. *Id.* at 2:26–33 (describing supported technologies). Supported technologies can include wireless local area networks (WLAN), wired powerline communication (PLC), or wired Ethernet. *Id.*

Figure 1 of Ho, as reproduced and annotated by Netgear, is “a conceptual diagram of an example hybrid communication network 100 including a mechanism for automatic configuration of hybrid devices 102, 118, and 120, a legacy WLAN device 122, and a network gateway 124.” *Id.* at 3:26–29. The hybrid devices in Figure 1 can be client devices such as laptops, tablets, or mobile phones. *Id.* at 4:9–14 and Akl Tr. at 1115:6–18. The hybrid devices 102, 118, and 120 are connected to each other using a wired PLC connection (green). Ho at 3:48–62.



CDX-0008C.11 (annotating Ho at Figure 1); Akl Tr. at 1115:6–1116:2.

A hybrid device in Ho can take on one of two main “personalities.” It can be a central access point (CAP), of which there is generally only one in the network. *Id.* 4:64–66. The CAP is connected to the network gateway over an Ethernet connection, for example, as shown in Figure 1. Ho 4:66–5:3. A hybrid device can alternatively be a non-CAP that connects to the internet through the CAP. *Id.* 5:43–46.

When a hybrid device is a non-CAP device, it must determine what Ho calls its “second-level personality.” *Id.* 8:11–13. The “second-level personality” dictates the configuration of the non-CAP hybrid device’s “WLAN access point (AP) module” (annotated blue above) and “WLAN station (STA) module” (also blue). *Id.* 16:43–50 and 2:54–65 and Akl Tr. at 1117:11–25. Ho identifies four second-level personalities of a non-CAP device, each with express requirements and restrictions. Ho at 8:13–23. Ho discloses that a non-CAP hybrid device has an “access point”

second-level personality when its “WLAN STA module of the hybrid device is disabled” such that it has a wired PLC connection to the CAP. *Id.* and Akl Tr. at 1117:11–25. A “relay” second-level personality means that the WLAN STA and WLAN AP module are both enabled, but the non-CAP is limited to relaying information from the CAP to client devices on “the same communication channel/band.” Ho at 8:13–23 and Akl Tr. at 1158:2–18. As a third second-level personality, a non-CAP device can have its WLAN AP module disabled and its WLAN STA module enabled so that it acts as an information “sink” or client device, and in a fourth second-level personality, a non-CAP device can have both its WLAN AP module and WLAN STA module disabled. Akl Tr. at 1173:13–20 (non-CAP device is not a networking node when acting as a client device).

2. Claim 12

The parties dispute whether Ho invalidates claim 12. TP-Link Br. at 72–93 and Netgear Reply at 63–89. TP-Link argues that Ho “anticipates or at least renders obvious claim 12.” TP-Link Br. at 72. As noted, TP-Link, did not present an obviousness argument separate from its anticipation argument. *See* TP-Link Br. at 65–92.

a) Element 12[a]

Element 12[a] recites “performing an attempt to utilize a first channel in a default frequency band as a backhaul with second node in the network.” In the claim construction order, “default frequency band” was construed as a first selected frequency band. Order No. 33 at 28–32. TP-Link contends that this element is met by Ho, TP-Link Br. at 79–85 (addressing element 12.2a), which Netgear disputes, Netgear Reply at 63–72.

In its pre-hearing brief, TP-Link contended that “[t]he selection [in Ho] of the 5 GHz band satisfies the ALJ’s construction of ‘default frequency band’ as a ‘first selected frequency band’

and stated that “the backhaul connection is formed by coupling the WLAN STA interface of the CAP 102 to the WLAN AP interface 116 of the non-CAP 120.” TP-Link Pre-hearing Br. at 199. TP-Link nevertheless now contends that element 12[a] is disclosed in Ho by selection of either the 2.4 or 5 GHz bands. TP-Link Br. at 80. There and elsewhere, TP-Link relies on Dr. Bims’s testimony at 861:6–17. TP-Link Br. at 80 (twice), 82, and 84. That specific testimony, however, was subject to a motion to strike, which was granted. Tr. at 861:19–862:7. TP-Link’s repeated reliance on stricken testimony as to whether Ho’s selection of the 2.4 GHz band meets this claim element (based on a theory not presented in its pre-hearing brief) was improper.

TP-Link also contends that “Ho’s 5 GHz band is ‘a first selected frequency band’ because the non-CAP hybrid device 120 (the claimed network device) would typically select the 5 GHz band first, to establish the backhaul with CAP 102 (the claimed second node), to achieve ‘better connectivity’ compared to establishing backhaul over the 2.4 GHz band.” TP-Link Br. at 82. The evidence does not support this assertion. Akl Tr. at 1118:17–23 (“[t]here’s really nothing in Ho that discloses that it would attempt to use the 5-GHz band as a first selected band.”).

Instead, Ho discloses that a frequency band that is attempted to be utilized as a first selected frequency band is the 2.4 GHz frequency band, as shown in Figure 4:

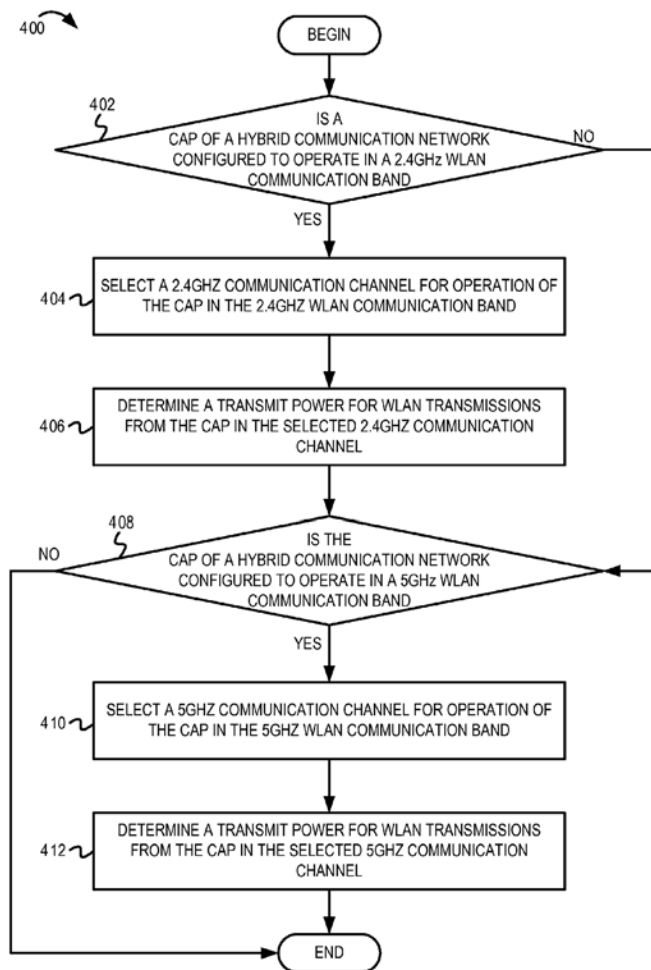


FIG. 4

Ho at Fig. 4 and 12:22–25 (“Fig. 4 is a flow diagram 400 illustrating example operations for selecting the band, channel, and power of the central access point (CAP BCP selection). The flow begins at block 402”); Akl Tr. at 1119:15–1120:1 (Fig. 4 of Ho shows that the 2.4 GHz band is attempted first) and 1183:2–10.

Ho teaches its non-CAP (central access point) hybrid devices attempt to utilize channels and frequency bands in the same manner as the CAP. Ho at 5:46–50 (“If the hybrid device 102 is not the CAP of the hybrid communication network 100, the configuration unit 106 can operate in

conjunction with the CAP to determine the operating parameters of the non-CAP hybrid device 102”), 6:3–8 (“operating parameters of the non-CAP hybrid device” are “at least in part, based on the operating parameters of the CAP”). Dr. Bims confirmed this. *See e.g.*, RDX-0002.107 (stating in the title “Each Hybrid Device Contains Same Structure As Central AP.”).

Despite Ho’s teachings otherwise, TP-Link asserts a person of ordinary skill would understand Ho’s 5 GHz band to satisfy the claimed “default frequency band” because it purportedly has “better connectivity” than the 2.4 GHz band. TP-Link Br. at 82.³¹ TP-Link’s argument, however, improperly conflates what frequency band Ho’s non-CAP hybrid devices are capable of selecting and using (which is not expressly required by claim 12) with the frequency band that a network device is “performing an attempt to utilize” as a “default frequency band” (as required by claim 12). Akl Tr. at 1120:2–9 (“the first frequency band should be, you know, the first attempted, not just the first [necessarily] used”); Order No. 33 at 31 (“the ‘default frequency band’ is a first-attempted frequency band, not just a frequency band that may be preferred.”).

The evidence supports that Ho teaches that devices will “perform an attempt to utilize” the 2.4 GHz band as a first selected band. Akl Tr. at 1119:15–1120:16 (addressing Fig. 4 and Ho’s attempt to utilize the 2.4 GHz band in step 402) and Ho at 12:22–57 and Fig. 4. In addition to Figure 4, Ho also explains that the 2.4 GHz band is attempted first to “improve the 2.4 GHz WLAN coverage, and to transmit on the 5 GHz WLAN communication band after the 2.4 GHz WLAN communication band is filled/occupied.” Ho at 18:38–46; *see also id.* 18:2–4 (“the MIB default setting can be the 2.4 GHz WLAN communication band”). That does not mean that the non-CAP

³¹ TP-Link’s argument appears to concede that Ho does not disclose a “default frequency band” inasmuch as it teaches a selection process depending on signal strength.

device will always actually use the 2.4 GHz band, because Ho's selection of frequency bands depends on which of the 2.4 or 5 GHz bands has "better connectivity." Ho at 18:38–46 and Akl Tr. at 1118:24–1119:14 ("So the reference itself, at least in this part, is choosing whichever one has the better one, but there is no 5 GHz that's going to -- that it's going to try first."); *see* Order No. 33 at 30 ("Based on the explicit claim language, the 'default frequency band' is the frequency band that is attempted first.").

TP-Link next cites Ho's disclosure that "data rates" can be used to "assess connectivity." TP-Link Br. at 82. TP-Link argues that this means Ho's 5 GHz band is "first selected" because the "5GHz band provides higher data rates (better connectivity) compared to the 2.4 GHz band." TP-Link Br. at 82, *citing* Akl Tr. at 1166:13–1167:3. TP-Link misconstrues Dr. Akl's testimony because Dr. Akl did not state that in Ho's system, the 5 GHz band provides higher data rates compared to the 2.4 GHz band, but rather that "generally" the 5 GHz band "could" operate better than the 2.4 GHz band, that it "depends," but it is "possible." Akl Tr. at 1166:13–1167:3. Ho, however, teaches that the "RSSI measurements for the 2.4 GHz WLAN communication band and the 5 GHz WLAN communication band may be the same." Ho at 16:8–12. Alternatively, the 2.4 GHz and 5 GHz bands may have "different" RSSI values "because of different propagation characteristics," without any reference to which frequency band is "better." Ho at 16:12–16. Ho does not suggest that a network device in its system will perform an attempt to utilize the 5 GHz as a default or first selected frequency band, as TP-Link asserts. Rather, in Ho, the 2.4 GHz band is the first attempted to be selected.

TP-Link argues Dr. Akl "was forced to abandon this purported distinction over Ho, and he conceded that the frequency band selected by the non-CAP 120 satisfies the ALJ's construction of 'first selected frequency band.'" TP-Link Br. at 83. Dr. Akl stated that connecting to the 2.4 or 5

GHz bands, whichever has better connectivity, would be a “first selected frequency band,” but not a “first selected frequency band” that is “attempted to be utilized” in the context of the other limitations of the claim. Akl Tr. at 1182:10–1183:17. Contrary to TP-Link’s suggestion in a footnote, TP-Link Br. at 83 n.12, this is consistent with Dr. Akl’s infringement opinions. The ’698 patent accused products are configured with the highest available frequency band dedicated to backhaul traffic and “as opposed to” a front haul, and that backhaul band is “first selected” in attempts to utilize a backhaul. *See* Netgear Br. at 45–46 and Akl Tr. at 408:23–412:23. Ho, in contrast, includes no such configuration. Akl Tr. at 1118:17–1119:14.

The evidence does not support that Ho’s disclosure of selecting the 5 GHz band meets element 12[a], reciting “performing an attempt to utilize a first channel in a default frequency band as a backhaul with second node in the network.”

b) Elements 12[a] and 12[b]

Elements 12[a] and 12[b] recite: “[a] performing an attempt to utilize a first channel in a default frequency band as a backhaul with second node in the network, [b] wherein the backhaul is to provide communication of management functions between the nodes in the network, as opposed to a front haul that provides wireless data communication to clients in the network.” TP-Link contends that Ho meets elements 12[a] and 12[b], TP-Link Br. at 79–89, which Netgear disputes, Netgear Reply at 63–89.

The evidence supports that Ho does not disclose a “network device” configured for “performing an attempt to utilize a first channel in a default frequency band as a backhaul, wherein the backhaul is to provide communication of management functions between the nodes in the network, as opposed to a front haul that provides wireless data communication to clients in the network” as required by elements 12[a] and 12[b]. TP-Link argues that Ho discloses these

requirements, mapping Ho's "non-CAP hybrid device" to the claimed "network device," and specifically where non-CAP hybrid devices are configured as either an "access point" or a "relay" in Ho's network. TP-Link Br. at 81, 74–79. The evidence, however, supports that Ho's "access points" and "relay" modes are incompatible with the requirements of elements 12[a] and 12[b].

TP-Link argues "it is undisputed that access points and relays are network devices, not client devices." TP-Link Br. at 75, *quoting* Akl Tr. at 1154:21–1155:3. There, however, Dr. Akl agreed that Wi-Fi access points "were known in the art at the time of Ho" and that those access points—in prior art references other than Ho—are "generally not considered client devices." *See* Akl Tr. at 1154:21–1155:3. But whether other prior art considered Wi-Fi access points as client devices is irrelevant because TP-Link has not proposed combining Ho with any other reference.

In the context of Ho, an "access point" or "relay" is a second-level personality of a device in the network. Ho at 8:1–23. Thus, "access points" and "relays" in Ho's system are combinations of user devices and access points that form a "hybrid communication network" in an ad hoc manner. Ho at 1:15–20, 3:24–26, and 4:9–14. This is distinct from the claimed "network device capable of establishing a backhaul communication among nodes in a mesh wireless network" which uses a default frequency band "as a backhaul with second node in the network" where "the network" comprises "nodes in a mesh wireless network." Akl Tr. at 1116:3–8 and 1160:21–23 (explaining "the network" in elements 12[a] and 12[b] refers back to "mesh wireless network"); Ho at Abstract, 8:13–23, 3:19–23, and 4:9–14.

Even if Ho's hybrid devices are considered "mesh nodes" in a "mesh network" as claimed, Ho's hybrid devices with an "access point" personality are not capable of "performing an attempt to utilize a first channel in a default frequency band as a backhaul with second node in the

network,” and Ho’s hybrid devices with a “relay” personality are not capable of attempting to utilize a “backhaul” that is “as opposed to a front haul ... in the network.”

As to Ho’s non-CAP hybrid devices with an “access point” personality, the evidence supports that they are not capable of “performing an attempt to utilize” a first channel in a default frequency band as “a backhaul with second node in the network,” as recited in claim 12. Ho teaches when a non-CAP hybrid device operates with an “access point” personality, its “WLAN STA” interface is disabled such that it will never attempt to utilize a wireless backhaul connection to the CAP device. *Id.*; Ho at 4:9–14; *see also* Akl Tr. at 1157:16–18 (“WLAN stands for wireless local area network”). Instead, because the WLAN STA interface is disabled, Ho’s non-CAP “access point” devices use a wired “power line communication” (PLC) to communicate information to the CAP. Akl Tr. at 1117:11–25 and Ho at 5:6–11 (stating a “PLC communication link” is an exemplary “wired communication link”).

Ho’s wired PLC connection does not satisfy the claimed backhaul recited in elements 12[a] and 12[b] because those elements require that “the backhaul is ... between nodes in the network,” and “the network” refers to a “mesh wireless network.” That is not satisfied by Ho’s wired PLC connections. Akl Tr. at 1117:11–25 (“a person of ordinary skill would understand that you don’t have a wireless mesh network in this case if you’re using a power line connection or an Ethernet connection”) and 1160:21–23 (explaining “the network” in element 12[a] and 12[b] refers back to “mesh wireless network”). TP-Link contends that “the network” does not refer to a “mesh wireless network” under the principle the “preamble is not limiting.” TP-Link Br. at 72–74.³² However, as

³² TP-Link appears to misunderstand Dr. Akl’s opinions as being based on a “mesh network” meaning a “fixed” network topology. TP-Link Br. at 77–79. That is wrong and irrelevant. The

discussed above, the preamble is limiting. The evidence supports that Ho does not disclose an “attempt to utilize” a “backhaul with second node in the network,” because Ho does not disclose an “access point” that attempts to utilize a backhaul that is “wireless” mesh network.

TP-Link argues Ho’s non-CAP hybrid device operating as a “relay” meets the network device of claim 12. TP-Link Br. at 75, 80. The evidence supports that a non-CAP hybrid device acting as a relay in Ho does not “perform[] an attempt to utilize” a frequency band as a backhaul, “wherein the backhaul is to provide communication of management functions between the nodes in the network, as opposed to a front haul that provides wireless data communication to clients in the network” as required by elements 12[a] and 12[b]. ’698 patent at claim 12.

Ho teaches that its non-CAP hybrid devices acting as a “relay” has both its “WLAN AP module” enabled and the “WLAN STA module enabled,” meaning that a non-CAP hybrid device relay can have a wireless connection to the CAP (the WLAN AP module) and a wireless connection to client devices the (WLAN STA module). Ho at 8:13–23 and Akl Tr. at 1121:3–1122:3, 1157:1–15. However, Ho teaches that in this “relay” configuration, a non-CAP hybrid device requires that both connections—to the CAP and to clients—are “operating on the same communication channel/band.” Ho at 8:13–23 and Akl Tr. at 1158:11–21; *see also* Akl Tr. at 414:1–5 (“The backhaul is the connection between two mesh points. Fronthaul is a connection between a mesh node and a client, like a phone or a laptop”).

One of ordinary skill would have therefore understood Ho’s non-CAP hybrid device acting as a relay will attempt to utilize a channel in a frequency band as a backhaul with a CAP that is

claim language recites “mesh wireless network,” not “mesh network,” which TP-Link’s argument omits. *See id.* (repeatedly referring to a “mesh network” and omitting “wireless”).

the same as a fronthaul that provides wireless data communication to clients in the network. That, however, is the opposite of what elements 12[a] and 12[b] require, i.e., performing an “attempt to utilize” a frequency band as a backhaul that is “as opposed to a fronthaul ... in the network,” that is, a dedicated backhaul. Akl Tr. at 1169:4–7 (Ho does not disclose a backhaul as opposed to a fronthaul, because it shared the same frequency band as client devices”); *see also id.* at 1116:9–1117:10 (“So if you have a client device, then it’s no longer a backhaul. In fact, it’s a fronthaul”).

The evidence supports that when Ho’s non-CAP hybrid devices act as either an access point or a relay, they do not meet the requirements of elements 12[a] and 12[b].

c) Conclusion

TP-Link has not shown by clear and convincing evidence that claim 12 is anticipated by Ho.

3. Claim 15

Claim 15 depends from claim 12 and recites “measuring received signal strengths of probes from all nodes within a communication range; and selecting the second node based on the measured received signal strengths of the probes.” TP-Link argues that Ho “discloses or renders obvious claim 15.” TP-Link Br. at 93–98. As noted, TP-Link did not present an obviousness argument separate from its anticipation argument. *See id.* Netgear disputes that the elements of claim 15 are disclosed in Ho. Netgear Reply at 89–97.

Ho discloses that a non-CAP hybrid device can measure signal strength (e.g., RSSI) from the CAP. Ho at 14:11–14 (“WLAN connection quality to the CAP”), 14:14–27 (“WLAN connection quality to the CAP”), 16:30–38 (“performance measurements between the non-CAP hybrid device and the CAP”); Bims Tr. at 865:11–866:2; and Akl Tr. at 1123:22–1124:10 (“the

disclosures in Ho that Dr. Bims relies upon are simply about a non-CAP hybrid device measuring its connection with a CAP hybrid device”).

TP-Link argues that one of ordinary skill would have understood Ho to use probes to measure received signal strength from “all nodes within a communication range” based on Ho’s statement that “examples refer to configuration of wireless local area network (WLAN) interfaces (e.g., IEEE 802.11 compatible interfaces).” TP-Link Br. at 94–95, *citing* Ho at 2:4–7. According to TP-Link, this incorporates by reference the 802.11s mesh standard, which states that “mesh discovery and peer link management requirement ... requires detection of potential mesh neighbors through Beacons or through active scanning using Probe Requests.” TP-Link Br. at 95, *quoting* RX-0127.114 (IEEE 802.11s-2008).

Anticipation requires that each and every element of a claim is disclosed, expressly or inherently, within the four corners of a single prior art reference. A prior art reference may, however, be considered for purposes of anticipation with additional subject matter that is incorporated by reference, but “whether and to what extent a host document incorporates material by reference is a question of law.” *Apple Inc. v. Int’l Trade Comm’n*, 725 F.3d 1356, 1362 (Fed. Cir. 2013). Here, Ho’s single reference to “IEEE 802.11 compatible interfaces” does not incorporate all IEEE 802.11 standards, which have many subparts, or the passage on page 114 of the specific 802.11s amendment to that standard that TP-Link relies on. Bims Tr. at 866:10–25 and RX-0127.114 (IEEE 802.11s-2008). *see Kyocera Wireless Corp. v. Int’l Trade Comm’n*, 545 F.3d 1340, 1351 (Fed. Cir. 2008) (rejecting argument that the “GSM standard” could be considered a single prior art reference, despite express incorporation by reference, because the standard included multiple individual subparts and the “incorporating document” did not identify any “specific material for incorporation” with “detailed particularity”). Ho’s reference to “802.11

compatible interfaces” is not an incorporation by reference as a matter of law, which requires a “a clear intent to incorporate by reference by using the root words ‘incorporat(e)’ and ‘reference.’” 37 C.F.R. § 1.57(c)(1). Ho includes no such language, and “[a] mere reference to” IEEE 802.11 “does not convey an intent to incorporate the material by reference.” 37 C.F.R. § 1.57(h)(1) and *Apple Inc.*, 725 F.3d at 1362 (reversing holding of invalidity where there was no affirmative incorporation by reference). Ho’s single reference to “IEEE 802.11 compatible interfaces” falls far short of identifying page 114 of the 802.11s standard that TP-Link relies on with respect to claim 15.

TP-Link also contends “Ho teaches a non-CAP hybrid device ‘may not necessarily associate with the CAP’ and may instead ‘associate with [another] non-CAP access point that provides the best performance.’” TP-Link Br. at 95–96, *citing* Ho at 21:65–22:4 15:5–14. TP-Link argues that “[f]or a non-CAP to assess which other node in the network provides ‘the best performance,’ the non-CAP would measure the received signal strengths of probes from all nodes within a communication range, as required by the claim.” TP-Link Br. at 95. But Ho does not teach the use of “probes” to determine “performance,” and TP-Link does not provide any evidence that detecting a single “non-CAP access point” is a detection of “all nodes within a communication distance.”

TP-Link has not shown by clear and convincing evidence that the additional requirements of claim 15 are disclosed by Ho.

4. Claim 17

Claim 17 depends from claim 12 and recites: “The device of claim 12, the operations further comprising: measuring a link quality among one or more of the nodes in the network; and selectively causing a number of nodes in the network to form a particular connection topology

based on the measured link quality.” 98 patent at claim 17. Netgear does not dispute that the additional elements of claim 17 are disclosed in Ho. *See* Netgear Reply at 57–101 (not discussing claim 17). The evidence supports that Ho discloses the specific elements recited in claim 17. *See* TP-Link Br. at 98–100, *citing* Akl Tr. at 1128:6–12; Bims Tr. at 867:11–868:21; and Ho at 14:11–27, 21:65–22:4. Because Ho does not invalidate claim 12, however, Ho does not invalidate claim 17 which depends from claim 12.

5. Claim 19

Claim 19 depends from claim 17, which depends from claim 12, and recites: “The device of claim 17, wherein the formed connection topology is a daisy chain topology if the link quality does not exceed a predetermined threshold.” ’698 patent at claim 19.

TP-Link argues that Ho “anticipates or renders obvious claim 19.” TP-Link Br. at 100. TP-Link, however, did not present an obviousness argument separate and different from its anticipation argument. Netgear disputes that the additional elements of claim 19 are disclosed in Ho. Netgear Reply at 97–101.

TP-Link contends the additional requirements of claim 19 are disclosed in Ho because its “non-CAP hybrid device” may “associate with another ‘non-CAP ... that provides the best performance,’ instead of associating directly with the CAP.”³³ TP-Link Br. at 100. While Ho teaches that a non-CAP hybrid device may connect with another non-CAP device, that occurs when the non-CAP hybrid device is operating in what Ho refers to as “mode B” in which the non-CAP hybrid device switches OFF its WLAN AP module and switches ON its WLAN STA module,

³³ Connecting a non-CAP hybrid client indirectly to the CAP does not disclose that the “formed connection topology is a daisy chain,” as recited in claim 19. Akl Tr. at 1127:16–1128:3.

meaning that the non-CAP hybrid device is operating as a client device. Akl Tr. at 1126:8–1127:24 and Ho at 19:35–43, 20:18–2, and 8:13–23.

Claim 19 recites “the formed connection topology” and refers back to claim 17, which recites “causing a number of nodes in the network to form a particular network topology.” As a result, “the formed connection topology” in claim 19 comprises “a number of nodes in the network.” TP-Link alleges that these “nodes” include Ho’s hybrid network devices operating as a client because claim 17 “does not require the nodes to be of any particular type.” TP-Link Br. at 104. Claim 19, through its dependence from claim 12, however, differentiates “nodes in the network” from “clients in the network.” ’698 patent at claim 12 (“wherein the backhaul is to provide communication of management functions between the nodes in the network, as opposed to a front haul that provides wireless data communication to clients in the network”) and Akl Tr. at 1127:16–1128:12. The indirect connections of non-CAP client devices in Ho, therefore, do not disclose a daisy chain topology of nodes in the network, as required in claim 19.

TP-Link also argues that “Dr. Akl concedes that Ho generally discloses a non-CAP connected to a CAP through other non-CAP devices, which us known as a daisy chain arrangement—and that is all the claim requires. TP-Link Br. at 104, *citing* Akl Tr. at 1172:13–1173:12. There, Dr. Akl was asked: “And a network, when you have three network devices connected in a serial manner, that's known as a daisy chain arrangement?” And he answered: “A. Yes, but it’s not the claimed one here.” And he was asked: “Q. Having a non-CAP connected to a non-CAP connected to a CAP, that would be a daisy chain arrangement, right?” And he answered: “A. Not the claimed one.” And he was asked: “Q. You agree, if you look at those three in a vacuum, that would be referred to as a daisy chain.” And he answered: “A. In vacuum, that is correct, but that’s not the only requirement that's part of the claim language as being part of a mesh wireless,

which is what I showed in terms of mode B. So I agree.” The evidence does not support that Dr. Akl conceded that Ho discloses the elements of claim 19.

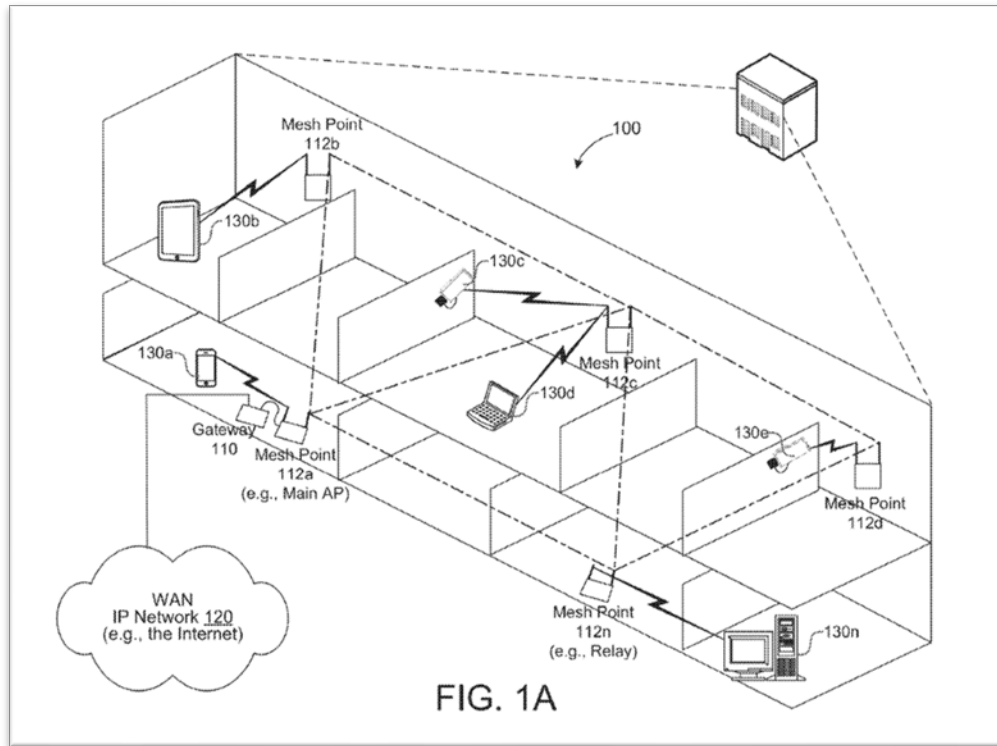
TP-Link has not shown by clear and convincing evidence that the additional requirements of claim 19 are disclosed in Ho.

6. Secondary Considerations

Because TP-Link did not articulate any separate obviousness theory for any of the asserted claims of the ’698 patent, secondary considerations are not relevant.

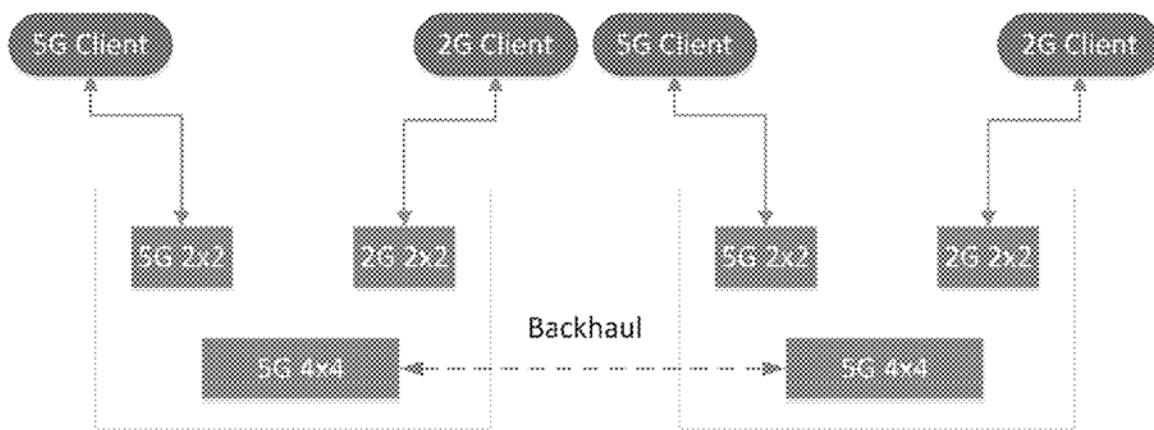
VIII. THE ’179 PATENT

The ’179 patent is titled “Dedicated Backhaul Link for a Robust Wireless Mesh Network” and generally relates to “techniques for implementing a local area wireless mesh network.” ’179 patent at 1:43–44. The ’179 patent incorporates by reference in their entirety and claims priority to U.S. Provisional Application Nos. 62/253,540 (RX-0021) and 62/336,503 (CX-2716). *Id.* at 1:7–15. The ’179 patent discloses techniques for providing “automated mesh point survey and guided installation for assisting the installation and configuration of a wireless mesh network.” *Id.* at 4:11–14. Figure 1A shows a wireless mesh network environment 100 “within which some embodiments may be implemented.” *Id.* at 4:65–67.



Id. at Fig. 1A. Environment 100 includes a gateway 110, a main mesh point 112a, additional mesh points 112b-112n, a wide area network (WAN), and a plurality of client devices 130a-130n. *Id.* at 4:67–53. The main mesh point 112a, which may operate in a “main access point (AP) mode,” is connected to the internet and directly or indirectly provides network access to the internet for other mesh points 112b-112n. *Id.* at 5:20–29. Client devices are thus also connected to the network. *Id.*

The '179 patent discloses wireless mesh networks that implement backhaul communications between mesh points. Figure 19 illustrates a backhaul link established between two mesh points in a mesh network:



Id. at Fig. 19; *see also id.* at 3:19–21. In addition to “data packet forwarding to and from the gateway and the Internet,” the mesh points can use circuits to form one or more dedicated backhaul links among them. Such backhaul links can be used “to perform control and management functions, for example, the controlling entity to instruct a mesh point to execute a roaming decision for a client.” *Id.* at 27:5–21. Forming a dedicated backhaul communication “can be utilized to provide more throughput,” or to increase the amount of data that can be transmitted and received during a specific time. *Id.* at 27:17–21. The ’179 patent explains that a dedicated backhaul communication between mesh points is preferred, but an alternative backhaul communication may be used if the dedicated backhaul communication is not functioning or has poor performance. *Id.* at 27:55–64 and 28:20–41.

Claim 11 is asserted and recites:

11[pre] A computing device comprising: one or more processors, that implements a mesh point in a wireless mesh network formed with a plurality of mesh points, the computing device being configured to perform a method comprising:

- [a] establishing a forward wireless communication with a second mesh point;
- [b] establishing a backhaul communication, separate from the forward wireless communication, with the second mesh point,

- [c] wherein the forward wireless communication is established using a wireless communication technology using frequency bands selected from the group consisting of: a 2.4 GHz band, and a 5 GHz band, and
- [d] wherein the backhaul communication is established using a communication technology selected from the group consisting of: a power line based communication, a 2.4 GHz or 5 GHz radio frequency (RF) technology using a dedicated radio, and a sub-1GHz RF technology; and
- [e] constructing a list of backhaul candidates, each backhaul candidate having a score indicative of an estimated quality of a potential link between the first mesh point and the second mesh point;
- [f] upon determining that a quality of service of the established backhaul has dropped to below a predetermined threshold, establishing an alternative backhaul communication with the second mesh point using a backhaul candidate with the highest score on the list.

'179 patent at claim 11.³⁴

A. Claim Construction

1. Previously-Decided and Agreed Claim Terms

Following briefing and a claim construction hearing, two terms in claim 11 were construed:

Claim Term	Construction
wherein the [forward wireless]/[backhaul] communication is established using a [wireless] communication technology . . . selected from the group consisting of: . . .	Selection from any one of the alternatives in the claimed group

³⁴ The paragraph identifiers have been added. TP-Link used different identifiers (element 11.1, 11.2, etc.), which will be noted as necessary. *See* TP-Link Br. at 102.

A computing device comprising: one or more processors, that implements a mesh point in a wireless mesh network formed with a plurality of mesh points, the computing device being configured to perform a method comprising:	Claimed computing device is configured to perform the claimed method and that other entities may also be configured to be involved in the recited steps.
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Order No. 33 at 21–25.

The parties previously disputed the meaning of the terms “forward wireless communication”/“backhaul communication, separate from the forward wireless communication,” TP-Link contending that the terms rendered claim 11 indefinite. Second Amended Joint Chart at 3 (EDIS Doc. ID 805163). Resolution of that issue was deferred in the claim construction order. Order No. 33 at 19–20. At the evidentiary hearing, TP-Link dropped its indefiniteness argument. Tr. at 757:10–758:10.

The parties’ agreed constructions are now:

Claim Term	Agreed Construction
forward wireless communication	client-facing wireless communication
backhaul communication, separate from the forward wireless communication	plain and ordinary meaning

Netgear Br. at 94; and TP-Link Br. at 138.

2. Disputed Claim Term

The parties dispute the meaning of “alternative backhaul communication.” Their proposed constructions are:

Claim Term	Netgear's Construction	TP-Link's Construction
alternative backhaul communication	Plain and ordinary meaning	The alternative backhaul communication is: (1) a distinct link relative to the forward wireless communication; and (2) an alternative backhaul communication, i.e., is established using a communication technology selected from the group consisting of: a power line based communication, a 2.4 GHz or 5 GHz radio frequency (RF) technology using a dedicated radio, and a sub-1GHz RF technology

Netgear Br. at 94 and TP-Link Br. at 139.

The parties' dispute centers on whether the alternative backhaul must be separate from the forward wireless communication and whether the alternative backhaul communication must be selected from the list of alternatives recited for the claimed backhaul communication. TP-Link argues "in the context of the '179 patent's claims and specification," a person of ordinary skill "would understand the plain meaning of the term 'alternative backhaul communication' to be 'a distinct link relative to the forward wireless communication that is established using a communication technology selected from the group consisting of: a power line based communication, a 2.4 GHz or 5 GHz radio frequency (RF) technology using a dedicated radio, and a sub-1GHz RF technology.'" TP-Link Br. at 139. TP-Link argues there must be distinct links because: (1) they are different claim terms; and (2) claim order requires establishing an alternative backhaul communication after establishing a forward wireless communication. TP-Link Br. at 139–47; and TP-Link Reply at 91–101. Netgear contends that alternative backhaul communication is "a communication between mesh points that is an alternative to the established backhaul." Netgear Br. at 95–107.

a) The Claim Language and Specification

Claim 11 recites “establishing a forward wireless communication with a second mesh point,” “establishing a backhaul communication, separate from the forward wireless communication, with the second mesh point” using one of the recited communication technologies, “constructing a list of backhaul candidates, each backhaul candidate having a score indicative of an estimated quality of a potential link between the first mesh point and the second mesh point,” and “upon determining that a quality of service of the established backhaul has dropped to below a predetermined threshold, establishing an alternative backhaul communication with the second mesh point using a backhaul candidate with the highest score on the list.”

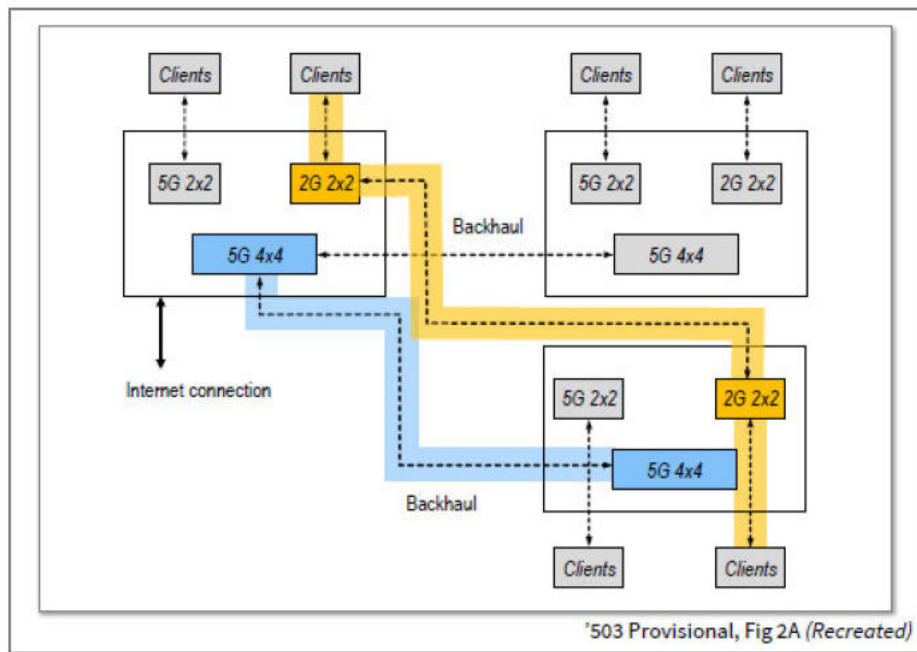
Nothing in the claim language mandates that the alternative backhaul communication be distinct from the forward wireless communication. Indeed, in not having the restriction that the backhaul communication has—that it is “separate from the forward wireless communication,” the claim suggests that the alternate backhaul communication can also be the forward wireless communication. The specification supports this construction, consistently using “backhaul communication” or “backhaul” to refer to a communication between mesh points. ’179 patent at 14:29–35, 27:6–14, and Fig. 19, and consistently identifying a dedicated backhaul as a link “separate from the forward wireless communication,” as claimed. ’179 patent at 10–14 and Fig. 19 (“in a number of implementations, the mesh points themselves in the mesh network can utilize one or more telecommunication circuits to form one or more dedicated backhaul links among the mesh points.”) The patent explains that “such backhaul links may be used to perform control and management functions, for example, the controlling entity to instruct a mesh point to execute a roaming decision for a client. In addition, or as an alternative, such backhaul links can be utilized

to provide more throughput, and/or to provide fault tolerance to the mesh network (e.g., to provide redundancy against temporary interference, etc.).”

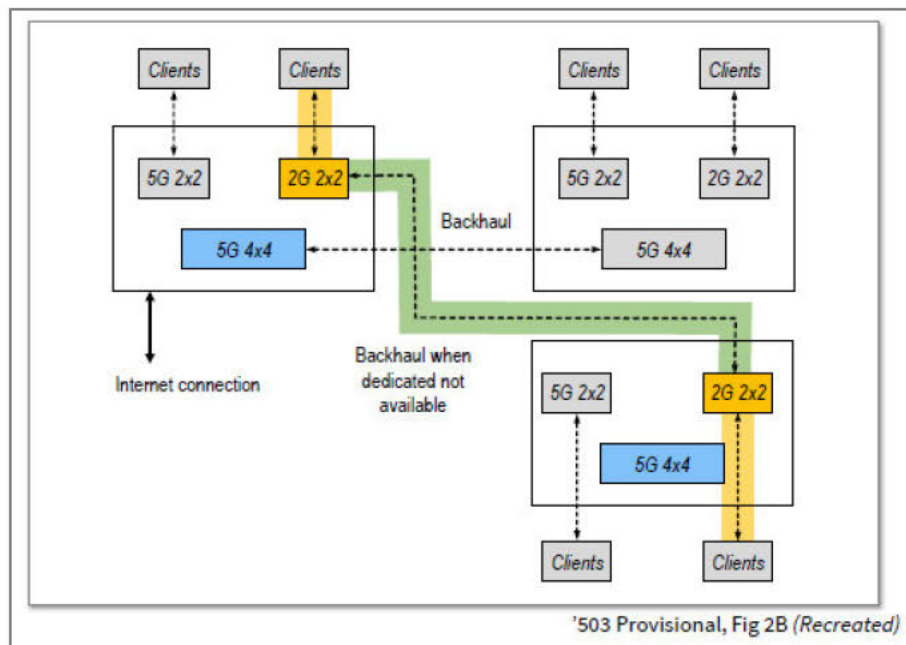
The specification identifies an “alternative backhaul” for a possible communication between mesh points as different from a currently established backhaul. *See* ’179 patent at 27:55–61 (“evaluat[e] current backhaul to determine whether switching to an alternative backhaul is desirable”), 28:20–23, 28:20–41, Fig. 22B (“switch to alternative as primary backhaul”), (“Consider the alternative as secondary backhaul”), 29:65–30:4 (“If the current backhaul is underperforming ... an alternative backhaul [is] considered”), Fig. 22C; Akl Tr. at 437:11–440:1.

The specification discloses that client facing resources may be used as an alternative backhaul. *Id.* at 28:54–67 (two mesh points use a “combination of different backhauls,” where “dedicated backhaul techniques” are used with “general purpose [i.e., client-facing]” 2.4 GHz and/or 5 GHz resources), and 30:7–10 (“utiliz[ing] ... client-facing resource as the backhaul”). The specification teaches that various communication technologies may be used to establish backhaul communications between mesh points. A dedicated radio or other dedicated circuit technology, a general-purpose/client-facing radio, and/or combinations thereof may be used. ’179 patent at 27:34–50. Various combinations are identified including a dedicated backhaul 5 GHz and general purpose 2.4 GHz; a dedicated backhaul 5 GHz and general purpose 5 GHz; and a dedicated backhaul 5 GHz, general purpose 2.4 GHz and general purpose 5 GHz. *Id.* at 28:54–67. In addition, the specification states that while it is not preferred to use general purpose (i.e., client facing) resources for backhaul purposes, they can be used. *Id.* at 29:59–10:18; *see also* Akl Tr. at 438:12–23 (testifying that the ’179 patent at 27:45–50 describes an embodiment that TP-Link’s construction would exclude).

Figures 2A and 2B of the '503 provisional application, which is incorporated by reference into the '179 patent, '179 patent at 1:12–15, support that an alternative backhaul can be established on a forward communication link. In Figure 2A, the dedicated 5 GHz band (blue) is used as the backhaul and the client-facing 2.4 GHz band (gold) is a backhaul candidate:



CDX-0002C.120 (annotating and cleaning up CX-2716.46) and and Akl Tr. at 432:20–433:11. As shown in Figure 2B, when the dedicated backhaul is unavailable, the client-facing 2.4 GHz frequency band is used as the alternative backhaul communication (green):



CDX-0002C.121 (annotating and cleaning up CX-2716.47) and Akl Tr. at 433:9–11.

TP-Link argues the claims track the embodiment disclosed in Figure 22C, which discloses a backhaul hierarchy in which: (1) a dedicated backhaul is established; (2) if the dedicated backhaul drops below a certain threshold, an alternative backhaul is considered; and (3) only if all alternative backhauls are also underperforming then is the general purpose wireless resource (i.e., client facing resource) considered. TP-Link Br. at 144, *citing* '179 patent 29:47–30:18.

Figure 22C shows an example of a “backhaul selection hierarchy” that “may be observed” in which there are additional alternative backhauls separate from the forward wireless communication. '179 patent at 29:59–60, 64–65 (“Flow chart 2250 is an example method for implementing a backhaul selection hierarchy.”). The disclosure of the example in Fig. 22C does not mandate that the claimed “alternative backhaul communication” is necessarily distinct from the forward wireless communication. In fact, it suggests that after exhausting other alternatives, a client facing resource can be used as an alternative backhaul. Moreover, even if the embodiment in Fig. 22C supports that the backhaul is separate from the forward wireless communication, it is

just one embodiment. The law is clear that “particular embodiments appearing in the written description will not be used to limit claim language that has broader effect.” *Innova/Pure Water, Inc. v. Safari Water Filtration Systems, Inc.*, 380 F.3d 1111, 1117 (Fed. Cir. 2004). As detailed above, the specification is clear that an alternative backhaul can be a forward wireless communication.

TP-Link’s proposed construction, which would prevent the alternative backhaul from being a client-facing communication, would improperly exclude embodiments disclosed in the specification. *Epos Techs. Ltd. v. Pegasus Techs. Ltd.*, 766 F.3d 1338, 1347 (Fed. Cir. 2014) (“[A] claim construction that excludes a preferred embodiment . . . is rarely, if ever correct and would require highly persuasive evidentiary support”). Here, that highly persuasive evidence does not exist; TP-Link’s proposed construction is not mandated by the claim language and is contradicted by the specification.

Further the claimed alternative backhaul communication and forward wireless communication do not have to be structurally distinct links for the terms to have different meaning and claim scope. To “preserv[e] claim integrity,” the “use of two terms in a claim requires that they connote different meanings, not that they necessarily refer to two different structures.” *Applied Medical Resources Corp. v. U.S. Surgical Corp.*, 448 F.3d 1324, 1333 n.3 (Fed. Cir. 2006). Whether two terms require separate elements to meet the claim is based on the intrinsic record. *See Bot M8 LLC v. Sony Interactive Ent. LLC*, No. 2022–1569, 2023 WL 5606978, at *4 (Fed. Cir. Aug. 30, 2023) (citing *Becton, Dickinson & Co. v. Tyco Healthcare Group*, 616 F.3d 1249 (Fed. Cir. 2010)). Under this framework, “a single element, feature, or mechanism can ordinarily satisfy multiple claim limitations, including by performing multiple claimed functions.” *Google LLC v. Pers. Audio, LLC*, 743 F. App’x 978, 985 (Fed. Cir. 2018) (“skip” and “go” commands

disclosed by same feature); *Powell v. Home Depot U.S.A., Inc.*, 663 F.3d 1221, 1231–32 (Fed. Cir. 2011) (finding a single structure met separately claimed “dust collection structure” and “cutting box interior”).

The plain language of claim 11 demonstrates that the two communications have different meanings without the claim requiring distinct links. “[F]orward wireless communication” is a “wireless communication” established using certain client-facing communication resources in element 11[c]. Tr. at 757:10–758:10. An “alternative backhaul communication” is established “using a backhaul candidate with the highest score” upon determining the established backhaul of elements 11[b]/11[d] has dropped below a threshold. The terms thus have different requirements and do not require separate links.

TP-Link argues that dependent claims 13 and 14 support its construction. TP-Link Br. at 143, 148–149. First, TP-Link argues that the claims support that alternative backhaul and forward wireless communications must be on separate links because “claim 13 redirects backhaul traffic to the forward wireless communication—which is established unconditionally according to claim 11—[but,] claim 14 reiterates that the alternative backhaul communication is established only under specific quality-of-service conditions, and only then is backhaul traffic redirected to it.” TP-Link Br. at 143. TP-Link’s argument ignores that the alternative backhaul communication was already established in claim 11—just like the forward wireless communication—upon determining the established backhaul fell below a threshold. Claims 13 and 14, therefore, at most add that backhaul traffic is redirected to a “communication” that was previously established in claim 11.

The intrinsic record thus does not require the forward wireless communication and alternative backhaul communication be structurally separate such that the same link may satisfy both.

b) Whether Ordering Is Required by Claim 11

TP-Link also argues that an “alternative backhaul communication” is a distinct link from the forward wireless communication because the elements of claim 11 must be performed sequentially as listed. TP-Link Br. at 141–42. TP-Link argues “[t]hat the three establishing steps are performed sequentially is not an assumption, but a fact readily determined based on the express claim language.” TP-Link Reply at 98–99.

As “a general rule [a method] claim is not limited to performance of the steps in the order recited, unless the claim explicitly or implicitly requires a specific order.” *Baldwin Graphic Sys., Inc. v. Siebert, Inc.*, 512 F.3d 1338, 1345 (Fed. Cir. 2008), citing *Interactive Gift Express, Inc. v. Compuserve Inc.*, 256 F.3d 1323, 1342–43 (Fed. Cir. 2001). Courts consider whether the claim language, as a matter of logic or grammar, must be performed in the order written. *Altris, Inc. v. Symantec Corp.*, 318 F.3d 1363, 1369–70 (Fed. Cir. 2003).

In *Loral Fairchild Corp. v. Sony Electronics Corp.*, 181 F.3d 1313 (Fed.Cir.1999), the claim recited “forming a first insulation layer over said plurality of first gate electrodes” and “forming implanted barrier regions in said semiconductor substrate in the intervals between said plurality of spaced-apart first gate electrodes, *the edges of said implanted barrier regions being aligned with the vertical edges of the insulation layer* on the respective first gate electrodes.” 181 F.3d at 1321. The Federal Circuit stated that by “the literal language of the claim, the edges of the implantation barrier regions are aligned with the edges of the insulation layer; hence, the insulation layer must already be in place in order to align the barrier regions with it during ion implantation.” *Id.* In *Mantech Envtl. Corp. v. Hudson Envtl. Servs., Inc.*, 152 F.3d 1368 (Fed.Cir.1998), a first claimed step recited “providing a plurality of mutually spaced wells intersecting said groundwater region” and a second step recited “providing a treating flow of acetic acid from one or more of

said wells into said groundwater region, to establish acidic conditions therein.” *Id.* at 1375–76. The court concluded that “[n]o monitoring or injecting of the groundwater can occur until wells are provided; hence, [the first step] must be performed first.” *Id.* at 1376.

Here, element 11[a] recites “establishing a forward wireless communication with a second mesh point” and element 11[b] recites “establishing a backhaul communication, separate from the forward wireless communication, with the second mesh point.” As a matter of logic and grammar, because the step of “establishing a backhaul communication” states that such communication is “separate from the forward wireless communication,” the first wireless communication must have already been established.

Netgear contends that the two communications are “separate” because they are established using different communication technologies. Netgear Br. at 104–105. But the “separate” requirement in element 11[b] is distinct from the requirements of elements [c] and [d], which recite the respective communications technologies used for the forward wireless and backhaul communications and recite there where those technologies overlap (the 2.4 and 5 GHz bands), the backhaul communication is established using “a dedicated radio.” As a result, the reference in element 11[b] to “the forward wireless communication” does not structurally contrast the backhaul communication, as Netgear argues, because that distinction is separately made in element 11[d].

The next three elements do not require any particular temporal order. Elements [11c] and [11d] define the communication technologies used to establish the forward wireless communication and backhaul communication in elements [11a] and [11b]. Element [11e] recites “constructing a list of backhaul candidates ... between the first and second mesh points,” but this element does not logically or grammatically tie back to either elements [11a] or [11b].

Constructing a list of backhaul candidates between a first and second mesh point can therefore occur before, during, or after establishing the forward wireless and backhaul communications.

The connection between constructing a list of backhaul candidates and establishing the two communications is that a backhaul candidate is affiliated with links between “the first mesh point and the second mesh point,” referring back to the two mesh points between which the two communications are established. This antecedent basis alone does not require a specific order. *Altiris*, 318 F.3d at 1369–70.

The claim language of element [11f], “upon determining that a quality of service of the established backhaul has dropped . . . establishing an alternative backhaul,” also recites a required ordering. The claim plainly states establishing an alternative backhaul if the quality of service of “the established backhaul” has dropped. This can only mean that the backhaul, recited in elements 11[b] and [d], is established before any alternative backhaul. Although element [11f] provides an order for an alternative backhaul relative to the backhaul communication, this order does not require that the alternative backhaul is a distinct link from the forward wireless communication recites in element [a], for the reasons explained above.

c) Whether the Markush Group of Element 11[d] Applies to Element 11[f]

TP-Link argues the “alternative backhaul communication” in element 11[f] must be established using the communication technologies recited in element 11[d]. TP-Link Br. at 147–49. Because the alternative backhaul communication can be a forward (i.e., client-facing, or non-dedicated) wireless communication, however, this argument fails for the same reasons explained above. In addition, the requirements of element 11[d] only apply to “establishing the backhaul communication,” which refers to “a backhaul communication, separate from the forward wireless

communication” in element 11[b], not to the separately recited alternative backhaul. *See* Akl Tr. at 438:24–440:1.

d) Conclusion

Based on the intrinsic and extrinsic evidence and the parties’ arguments, I conclude that the claimed alternative backhaul is not required to be (1) a distinct link relative to the forward wireless communication or (2) selected from the group recited in element 11[d]. I also conclude that claim 11 recites an ordering with respect to elements 11[a] and 11[b] and that element 11[f] happens after element 11[b].

B. Infringement

1. Accused Products and Representativeness

Netgear asserts that TP-Link’s Deco Wi-Fi 6 products infringe claim 11 and that the Deco X90 is representative. Netgear Br. at 108–109. TP-Link does not dispute representativeness but notes that Netgear does not assert infringement by its Deco Wi-Fi 6E, Deco Wi-Fi 7, Archer, or Omada products. TP-Link Reply at 101 and n.11. TP-Link disputes that its accused products meet element 11[e] and 11[f], which it identifies as element [11.6] and [11.7]. TP-Link Reply at 101–02 and 103–22.

2. Claim 11

a) Element 11[pre]

Element 11[pre] recites “A computing device comprising: one or more processors, that implements a mesh point in a wireless mesh network formed with a plurality of mesh points, the computing device being configured to perform a method comprising.” ’179 patent at claim 11. Netgear contends that this element is met by the ’179 patent accused products. Netgear Br. at 110–11. TP-Link does not dispute that this element is met. *See* TP-Link Reply at 101–22.

The evidence supports that the '179 patent accused products contain one or more Qualcomm or Broadcom processors for implementing a mesh point in a wireless mesh network using TP-Link's Auto-Wi-Fi Networking Module (AWN). Akl Tr. at 461:8–24; and *see* Akl Tr. at 407:12–23 (explaining BCM stands for Broadcom and QCA for Qualcomm for chipsets in accused products).

The evidence supports that the '179 patent accused products operate as a first mesh point and are configured to form connections with a second mesh point, such as a router (called CAP or FAP) directly connected to the Internet. Akl Tr. at 461:20–462:13 and 399:10–400:5 (TP-Link products are sold in bundles to form a network) and CX-2681.3. The evidence supports that the accused Deco X90 uses a Broadcom chipset to implement an access point, or non-router, as a first mesh point. Akl Tr. at 461:14–24 and CX-2765C.16 (Deco X90 specification with chip ).

The evidence supports that the '179 patent accused products meet element 11[pre].

b) Elements 11[a] and 11[c]

Element 11[a] recites “establishing a forward wireless communication with a second mesh point,” and element 11[c] recites “wherein the forward wireless communication is established using a wireless communication technology using frequency bands selected from the group consisting of: a 2.4 GHz band, and a 5 GHz band.” '179 patent at claim 11. Netgear contends that this element is met by the '179 patent accused products. Netgear Br. at 111–14. TP-Link does not dispute that this element is met. *See* TP-Link Reply at 101–22.

The evidence supports that the '179 patent accused products are tri-band mesh points configured to operate on three bands, e.g., 2.4GHz, 5GHz-1 (low) and 5GHz-2 (high). Two bands,

such as the 2.4 GHz and 5 GHz-1 (low) bands, are used for mesh-to-client communications,³⁵ and thus correspond to the claimed forward wireless communications. Akl Tr. at 462:18–463:6 and CX-2765C. The '179 patent accused products also use the 2.4 GHz and 5 GHz-1 (low) frequency bands as backhaul, or mesh-to-mesh connections. Akl Tr. at 463:7–464:2; CX-3142C, Exhibit A (TP-Link Rog. Responses); and CX-2681.3 (showing 2.4 and 5 GHz backhaul connections).

The '179 patent accused products establish the forward wireless communications on the 2.4 GHz and 5 GHz-1 (low) frequency bands, between mesh points using AWN, which is a “networking module ... [that] connects the different Deco units to form a network and allows the different units to either be a router or a satellite and establish connections.” Akl Tr. at 464:3–16.

[REDACTED]
[REDACTED]. Akl Tr. at 464:17–467:7 and CX-2757C.15 and .17. [REDACTED]

[REDACTED] on its available frequency bands for mesh-to-mesh communications, including the 2.4 GHz and/or 5 GHz-1 (low) forward wireless communications. Akl Tr. at 466:12–468:7; Baer Tr. at 287:16–291:20 (describing AWN functionality, including [REDACTED]
[REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED]
[REDACTED]); CPX-0215; CPX-0216; and *see* CDX-0003C.24–32.

The evidence supports that the '179 patent accused products meet element 11[a] and 11[c].

³⁵ For the accused P9 and PX50 Powerline products, the 5 GHz, rather than the 5 GHz-1 (low), frequency band is used for mesh-to-mesh and mesh-to-client communications. Akl Tr. at 463:7–18; CX-3142C.1; CX-2444C (Deco P9 Product Specification) (showing that P9 Deco’s connect on client-facing 2.4 GHz and 5 GHz); and CX-2445C (Deco PX509 Product Specification). The evidence supports that otherwise, they operate the same as the representative Deco X90.

c) Elements 11[b] and 11[d]

Element 11[b] recites “establishing a backhaul communication, separate from the forward wireless communication, with the second mesh point,” and element 11[d] recites “wherein the backhaul communication is established using a communication technology selected from the group consisting of: a power line based communication, a 2.4 GHz or 5 GHz radio frequency (RF) technology using a dedicated radio, and a sub-1GHz RF technology.” ’179 patent at claim 11. Netgear contends that this element is met by the ’179 patent accused products. Netgear Br. at 114–18. TP-Link does not dispute that this element is met. *See* TP-Link Reply at 101–22.

The evidence supports that a dedicated backhaul communication is established on the 5 GHz-2 (high) band, which is separate from the 2.4 GHz and 5 GHz-1 (low) bands that are used for forward wireless communications to client devices. Akl Tr. at 468:15–469:3 and CX-2765C.17 (identifying 5GHz-2 as “dedicated backhaul” in Deco X90); CX-2476C. (Deco X90 Specification); CX-3142C, Exhibit A (TP-Link Rog. Responses); and CX-2767C.20–21. The evidence supports the use of a separate radio for the dedicated backhaul band. Akl Tr. at 463:19–464:2 and CX-2681.3 and .66–.68.

The evidence supports that the ’179 patent accused products establish the 5 GHz-2 (high) frequency band (the dedicated backhaul) using AWN. Akl Tr. at 470:11–471:7 and CX-2757C.15, 17, 19–20 (Deco 2.0 Networking) (describing selection of optimal rootap and establishing frequency band communications with rootap).

The evidence supports that the ’179 patent accused products meet element 11[b] and 11[d].

d) Element 11[e]

Element 11[e] recites “constructing a list of backhaul candidates, each backhaul candidate having a score indicative of an estimated quality of a potential link between the first mesh point

and the second mesh point.” ’179 patent at claim 11. Netgear contends that this element is met by the ’179 patent accused products. Netgear Br. at 118–29. TP-Link disputes that this element is met. TP-Link Reply at 113–22.

The evidence supports that the ’179 patent accused products “construct[] a list of backhaul candidates” by scanning for neighbor mesh points while performing two AWN tasks: [REDACTED]. Akl Tr. at 471:8–15; CX-2757C.17 [REDACTED]); CX-2758C.2 [REDACTED]), CX-2759.2. [REDACTED]. [REDACTED]). Akl Tr. at 471:16–24; CX-2757C.19 [REDACTED] [REDACTED]); and CX-2758C.2.

[REDACTED]
[REDACTED]
[REDACTED].” CX-2757C.18; Akl Tr. at 476:22–477:15. [REDACTED]
[REDACTED] has one or more available frequency band(s)—e.g., 2.4 GHz, 5 GHz-1 (low), 5 GHz-2 (high)—that may be used as a potential backhaul communication back to the router/FAP. Akl Tr. at 471:18–24 CX-2757C.19–.20 ([REDACTED]); CX-2758C; CX-2759C; Baer Tr. at 288:9–16 ([REDACTED]
[REDACTED]
[REDACTED]”); and CPX-0215C lines 2993–3278. The evidence supports that the [REDACTED] are a list of backhaul candidates. Akl Tr. at 471:22–24.

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The evidence supports that each of the backhaul candidates in the AWN [REDACTED] has a score indicative of an estimated quality of a potential link [REDACTED]. Akl Tr. at 471:25–472:18; CX-2757C.20 (Deco 2.0 Networking, [REDACTED]); CX-2758C; CX-2759C; Baer Tr. at 288:9–291:16 [REDACTED] function on lines 2993–3278 [REDACTED]); and CPX-0215C at lines 2993–3278.

[REDACTED]
[REDACTED]
[REDACTED]. Akl Tr. at 471:25–472:18; CX-2757C.19 and .20; Baer Tr. at 288:17–23 (lines 3063–3066 calls the function [REDACTED] [REDACTED] and CPX-0215.2, lines 3063–3066. [REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED] Akl Tr. at 473:11–16 (“You can actually go through another satellite to get to the router”); CX-2757C.19–.20 (Deco 2.0 Networking); CX-2758C; CX-2759C; Baer Tr. at 291:14–20 [REDACTED] function at lines 3072–3460 [REDACTED]);and CPX-0215C at lines 3072–3460.

[REDACTED]

[REDACTED]

CX-2757C.19; Akl Tr. at 471:16–24; CX-2758C; CX-2759C; Baer Tr. at 288:17–21; CPX-0215C.2 lines 3063–3066; and CPX-0216C [REDACTED].

The satellite RE uses different metrics to select the best band:

[REDACTED]

CX-2757C.20; Akl Tr. at 471:25–472:18; CX-2758C; CX-2759C; Baer Tr. at 290:19–291:13; and CPX-0216C [REDACTED]).

[REDACTED]

[REDACTED]. Akl Tr. at 471:25–472:18 (describing flow of evaluations); CX-2757C.20; CX-2758C; CX-2759C; Baer Tr. at 289:2–291:20 (describing

0216C at lines 925–1099 and 1018–1041; and CPX-0215C at lines 3072–346-; *see also* CDX-0003C.28–32 and Akl Tr. at 471:8–473:3 and 478:8–20 (explaining that multiple metrics are used to determine a score).

TP-Link contends that its accused products do not meet element 11[e] because they do not construct “a list of backhaul candidates having a score indicative of an estimated quality of a potential link.” TP-Link Reply at 113. TP-Link contends that the claimed score must be a single numeric value that can be compared against other such values to determine which is highest. *Id.* at 114–115 (showing Bims demonstratives RDX-0002.128 and 129 with single numeric value scores).

TP-Link contends that this interpretation of “score” in element 11[e] is supported by the specification. Netgear contends that the specification refutes such an interpretation. Netgear Br. at 126–127. The ’179 patent specification discloses that multiple metrics may be considered when determining the quality of a potential backhaul candidate, including transmission rate, RSSI, and PER (packet error rate) numbers. ’179 patent at 28:20–53. Figs. 22A and 22B are consistent and indicate that multiple metrics may be used to evaluate backhaul candidates. *See* steps 2210, 2234, and 2238. The ’179 patent also describes that “one or more” of several parameters can be used to assess the quality of a link, including the speed of communication, the number of hops, and target throughput. *Id.* at 11:65–12:7. The purpose of these multiple evaluations is to determine the “selection of the best suitable backhaul link.” *Id.* at 27:51–55. Though the ’179 patent does not use the word “score,” these disclosures support that the claimed score is not necessarily a single numeric value but may be based on weighing multiple metrics. Indeed, nothing in the ’179 patent suggests let alone mandates that the claimed score is limited to a single numeric value. Akl Tr. at

442:3–20 and 472:19–473:3. Because the '179 patent supports that multiple metrics may be used, the evidence supports that TP-Link's use of the function [REDACTED] constructs a list of backhaul candidates, each backhaul candidate having a score indicative of an estimated quality of a potential link between the first mesh point and the second mesh point.

The evidence supports that the '179 patent accused products meet element 11[e].

e) Element 11[f]

Element 11[f] recites “upon determining that a quality of service of the established backhaul has dropped to below a predetermined threshold, establishing an alternative backhaul communication with the second mesh point using a backhaul candidate with the highest score on the list.”’179 patent at claim 11. Netgear contends that this element is met by the '179 patent accused products. Netgear Br. at 129–38. TP-Link disputes that this element is met. TP-Link Reply at 101–13.

TP-Link makes two arguments regarding why its accused products do not meet element 11[f]. First, TP-Link argues that its products do not “establish an alternative backhaul” upon determining that a quality of service is below a threshold. TP-Link Reply at 103–11. Second, TP-Link argues that its products do not use “quality of service” to establish an alternative backhaul. TP-Link Reply at 111–113. Because “a quality of service” determination is a precursor to whether an alternative backhaul is established, TP-Link's arguments are addressed in the reverse order of how they were presented.

(1) Whether the Accused Products Determine a Quality of Service

The first part of element 11[e] recites “upon determining a quality of service of the established backhaul has dropped to below a predetermined threshold.” ’179 patent at element 11[e]. The evidence supports that [REDACTED]

[REDACTED] a satellite RE through [REDACTED]
[REDACTED]
[REDACTED]. Akl Tr. at 473:21–474:20; CX-2757C.17 [REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]. CX-2757C.18; Akl Tr. at 474:4–25
[REDACTED]
[REDACTED]
[REDACTED] Akl Tr. at 475:1–18; CX-2757C.21 [REDACTED]
[REDACTED]. Netgear contends that this [REDACTED] is determining a quality of service
because [REDACTED].
[REDACTED]
[REDACTED]
Akl Tr. at 475:19–476:6; CX-2757C.18, 20; CX-2758C.2. [REDACTED]
[REDACTED]
[REDACTED] CDX-0002.199; Akl Tr. At 475:1–476:2 [REDACTED]
[REDACTED] CX-2757C.18;
CX-2758C.2.

TP-Link contends that the operation of the [REDACTED] functionality is not a “quality of service” determination. TP-Link Reply at 111–13. In particular, TP-Link contends that “[t]he

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED] TP-Link Br. at 112. According to TP-Link, the '179 patent does not indicate that “quality of service” encompasses whether a band is connected and instead identifies metrics such as rate when describing quality of service assessment. *Id.*, *citing* '179 patent at 28:66–29:41. According to TP-Link, its [REDACTED] functionality does not assess any such metrics and does not compare a QoS to any predetermined threshold. *Id.* According to Netgear, the '179 patent recognizes [REDACTED] [REDACTED] as a threshold for switching to an alternative backhaul and is therefore a “quality of service determination.” Netgear Br. at 133, *citing* '179 patent at 27:45–50.

A portion of the specification section cited by TP-Link states that “the mesh network can still monitor the noise and interference in the frequency band by checking the link statistics, and switch off to other available back-up channels when proper.” '179 patent at 29:54–58. This portion of the specification does not limit a quality of service determination to assessing particular metrics. The portion of the specification identified by Netgear states that “Fault tolerance mechanisms are built into the system such that, for example, when the dedicated link is not functioning or when the performance of dedicated link is significantly below the 2.4 GHz or 5 GHz radio that device uses to communicate to client, the best communication link can be used as the backhaul link.” This portion of the specification supports that link functionality is a quality metric. Further, the '179 patent does not indicate that determining “quality of service” is defined by or limited to assessing any particular metric. And the specification is clear that when a dedicated link is not functioning, a switch from the dedicated link can be made. In addition, as a matter of common sense,

determining that a link is not working is the ultimate quality of service determination. The specification therefore supports that [REDACTED], such as in TP-Link's [REDACTED] functionality is "determining" "a quality of service of the established backhaul," as claimed.

TP-Link also argues that its [REDACTED] [REDACTED] [REDACTED] TP-Link Reply at 112. In making this argument, TP-Link refers to its argument that its [REDACTED] functionality is not assessing particular metrics. *Id.* at 112–113 and not the [REDACTED] count. That count, however, is a set value.³⁶ When that value, or threshold is reached, there is a determination, as TP-Link recognizes, that the [REDACTED]. TP-Link Br. at 112 ("[REDACTED] exceeding a threshold merely corresponds to a connection on a particular uplink band not being found for 180 seconds," *citing* Bims Tr. at 886:15–888:6 and Pu Tr. at 945:4–947:5).

The evidence supports that the accused products determine that a quality of service of the established backhaul has dropped to below a predetermined threshold, as recited in element 11[e]

(2) Whether the Accused Products Establish an Alternative Backhaul Communication

The next portion of element 11[e] recites "establishing an alternative backhaul communication with the second mesh point using a backhaul candidate with the highest score on the list." '179 patent at claim 11. TP-Link contends that this portion of element 11[e] is not met because the accused [REDACTED] functionality "does not trigger establishing an alternative backhaul

³⁶ The parties disagree on the amount of time that will elapse before the [REDACTED]. Netgear identifies information showing it as [REDACTED], Netgear Br. at 131, and TP-Link identifies it as [REDACTED], TP-Link Reply at 112. The specific amount of time, however, is not determinative. Instead, the evidence shows that the [REDACTED] functionality will execute a number of times after which the [REDACTED].

at all.” According to TP-Link, the [REDACTED]” functionality [REDACTED]

[REDACTED] TP-Link Reply at 104. [REDACTED]

[REDACTED] TP-Link Reply at 104–11.

The evidence shows that [REDACTED]

[REDACTED]” [REDACTED]

[REDACTED] CX-2757.18. This functionality is described in a

TP-Link document that was designed “to sort out the workflow of networking modules.” *Id.* at .13.

[REDACTED]

CX-2757C.18. This operation is also shown in a flowchart of TP-Link’s operation in which after

the [REDACTED] functionality [REDACTED], the process flow moves to operations of [REDACTED]

[REDACTED]”

CX2757C.21. The evidence supports that [REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]. Akl Tr. at 476: 7–21; CX-2757C.18 [REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]; Baer Tr. at 287:16–293:16 and CDX-
0003C.28–32 (describing AWN scanning). [REDACTED]
[REDACTED]
[REDACTED]. Akl Tr. at
476:7–480:2; CX-2757C.18–21; and CX-2758C.2. [REDACTED]
[REDACTED]
[REDACTED]. Akl Tr. at 476:22–478:20CX-2757C.18–21;
CX-2758C.2. [REDACTED]
[REDACTED]
[REDACTED]. Akl Tr. at 476:7–478:4.

TP-Link argues that Netgear’s reliance on TP-Link’s own documents (CX-2757C) should not be credited and that Netgear “has no source code evidence” to support its assertion an alternate backhaul is selected. TP-Link Reply at 108. TP-Link adds that the “existence of two contrary words in a lone technical document cannot overcome the detailed and undisputed source code evidence showing how the feature [REDACTED] operates in the product.” TP-Link Reply at 109. TP-Link’s analysis, however, focused only on the [REDACTED] functionality, and not what happens after that functionality. *See* TP-Link Reply at 103–108 (addressing [REDACTED] code at RDX-

0002.145C and testimony of Mr. Pu regarding [REDACTED] functionality). Further, Netgear's assertion is not based on "two contrary words," but on a description of the product functionality consistent with the source code (CX-2757C.18), a description of [REDACTED] immediately following (CX-2757C.19), and a flow chart identifying that [REDACTED] occur after the [REDACTED] functionality (CX-2757C.21). Based on what is described in TP-Link's own technical document, I find that TP-Link's description of the operation of its products is incomplete. The evidence supports that *after* the [REDACTED] functionality [REDACTED].

The evidence supports that TP-Link's accused products meet element 11[f].

C. Technical Prong

1. Domestic Industry Products and Representativeness

Netgear identifies its '179 patent domestic industry products as the Wi-Fi 6E Orbi, Wi-Fi 6 Orbi, and Wi-Fi 5 Orbi products and identifies the Orbi 850 as representative. Netgear Br. at 138–39 and xi–xiii; and CX-3064C. TP-Link does not dispute that the Orbi 850 is representative. TP-Link Reply at 122–44.

2. Claim 11

a) Element 11[pre]

Element 11[pre] recites "A computing device comprising: one or more processors, that implements a mesh point in a wireless mesh network formed with a plurality of mesh points, the computing device being configured to perform a method comprising." '179 patent at claim 11. Netgear contends that this element is met by its '179 patent domestic industry products. Netgear Br. at 140. TP-Link does not dispute that this element is met. *See* TP-Link Reply at 122–44.

The evidence supports that the Orbi 850 has a Qualcomm processor that implements a mesh point, such as a satellite or router. Akl Tr. at 445:4–446:12; CX-0084.4 (Orbi Wi-Fi 6 data sheet); and CX-2470C (Netgear User Manual). The '179 patent domestic industry products are typically sold in a kit of multiple mesh devices that are configured to be used with each another to create a wireless mesh network. Akl Tr. at 446:3–12 and 367:12–368:5 (Orbi products are sold as a kit with more than one unit).

The evidence supports that the '179 patent domestic industry products meet element 11[pre].

b) Elements 11[a] and 11[c]

Element 11[a] recites “establishing a forward wireless communication with a second mesh point,” and element 11[c] recites “wherein the forward wireless communication is established using a wireless communication technology using frequency bands selected from the group consisting of: a 2.4 GHz band, and a 5 GHz band.” '179 patent at claim 11. Netgear contends that this element is met by its '179 patent domestic industry products. Netgear Br. at 140–43. TP-Link contends that the claim requires an ordering in which the forward wireless communication is established separate from (or before) the backhaul communication recited in element 11[b]. TP-Link Br. at 139–46. Netgear disputes that such ordering is required. Netgear Br. at 104–05.

Netgear contends that its domestic industry products “operating as a satellite RE (first mesh point) will use the 2.4 GHz client-facing radio to establish a 2.4 GHz frequency band connection with a second mesh point (e.g., central access point (‘CAP,’ or router connected to the internet)) when the dedicated 5 GHz [backhaul] underperforms through Netgear’s ‘backhaul switching’ feature.” Netgear Br. at 142. This is another way of saying that in the domestic industry products, a forward wireless communication is established on the 2.4 GHz band *after* the “backhaul

communication, separate from the forward wireless communication” is established. As noted previously in addressing claim construction, because element 11[b] recites “establishing a backhaul communication, separate from the forward wireless communication, with the second mesh point,” the forward wireless communication must be established before the backhaul communication. As a result, the evidence does not support that element 11[a] is met.³⁷

c) Elements 11[b] and 11[d]

Element 11[b] recites “establishing a backhaul communication, separate from the forward wireless communication, with the second mesh point,” and element 11[d] recites “wherein the backhaul communication is established using a communication technology selected from the group consisting of: a power line based communication, a 2.4 GHz or 5 GHz radio frequency (RF) technology using a dedicated radio, and a sub-1GHz RF technology.” ’179 patent at claim 11. Netgear contends that this element is met by the ’179 patent domestic industry products. Netgear Br. at 143–46. TP-Link does not dispute that this element is met. *See* TP-Link Reply at 122–44.

The evidence supports that the ’179 patent domestic industry products establish a backhaul communication between a satellite RE (first mesh point) and CAP/router (second mesh point) using a 5 GHz radio frequency (RF) technology on a dedicated radio that is structurally separate from the 2.4 GHz forward wireless communication as a part of Netgear’s “backhaul switching” feature. Akl Tr. at 451:16–453:18; CX-0274.17; CX-0339C.145; CX-2710.3–4C (establish backhaul on 5 GHz [REDACTED]); Baer Tr. at 278:7–12 ([REDACTED]) and 278:13–283:21; and *see* CDX-0003C.10 ([REDACTED]) and 11–

³⁷ The evidence supports that element 11[c] is met because the forward wireless communication is on a 2.4 GHz band. Netgear Br. at 140–43.

18. The 5 GHz (high) frequency band established using a dedicated 5 GHz backhaul radio is only accessible for mesh-to-mesh (backhaul) communications and is structurally separate (different band and radio) from the client-facing 2.4 GHz frequency band. Akl Tr. at 450:25–453:18.

The evidence supports that element 11[b] and element 11[d] are met.

d) Element 11[e]

Element 11[e] recites: “constructing a list of backhaul candidates, each backhaul candidate having a score indicative of an estimated quality of a potential link between the first mesh point and the second mesh point.” ’179 patent at claim 11. ’179 patent at claim 11. Netgear contends that this element is met. Netgear Br. at 146–50. TP-Link disputes that this element is met. TP-Link Reply at 130–44.

The evidence supports that Netgear’s “backhaul switching” feature is implemented by a source code module called [REDACTED], including the [REDACTED] Baer Tr. at 279:15–20; CPX-0004C; and *see* Akl Tr. at 370:21–371:4 and 449:17–450:3. A backhaul is established on the 2.4 GHz frequency band when the dedicated 5 GHz (high) radio fails to provide a connection with greater quality than source code variable [REDACTED] *See* Baer Tr. at 279:23–280:7, 282:6 ([REDACTED] [REDACTED]) TP-Link disputes this feature constructs a list of backhaul candidates or provides a score for the 2.4 GHz frequency band backhaul candidate. *See* TP-Link Br. at 134–44.

(1) List of Backhaul Candidates

The evidence supports that through [REDACTED] backhaul switching feature, the ’179 domestic industry products are configured to construct a list of backhaul candidates consisting of the 5 GHz-2 (high) dedicated radio and the 2.4 GHz client-facing radio. The source code for

_____ reflects this where _____.
_____. Akl
Tr. at 454:1–456:9; CX-2710C.3; and CPX-0004 at lines 1877 and 1878.

TP-Link argues that the dedicated 5 GHz (high) and the 2.4 GHz interfaces are not a list of backhaul candidates because there is only one _____, because backhaul candidates exclude established links. TP-Link Reply at 130–34. This argument is unpersuasive because, as noted in construing the claim, “constructing a list of backhaul candidates” is not required to be performed after the backhaul communication is established. Instead, the candidate list may be constructed before any backhaul is established. As a result, Netgear’s identification of _____ backhaul candidates meets the “constructing a list” portion of the claim.

(2) Score Indicative of an Estimated Quality

The evidence supports that in the _____ function, _____ are used. Akl Tr. at 456:10–457:14 and CPX-0004C at lines 1868–71. The evidence also supports that the _____ is indicative of the estimated quality of the dedicated 5 GHz (high) band because it is a measure of that band’s _____, which represents the signal strength on that band. Akl Tr. at 456:10–24. That _____ is compared to _____ *Id.*

TP-Link argues that Netgear’s products switch to the 2.4 GHz band when the 5 GHz _____ falls below a threshold _____ and that that threshold is not a “score indicative of an estimated quality of a potential link between the first mesh point and the second mesh point,” as required in the claim. TP-Link Reply at 134–44. The evidence supports that the threshold used by Netgear is not a score indicative of estimated quality. Instead,

██████████ is a ██████████ unrelated to any estimated quality of the 2.4 GHz band. Akl Tr. at 545:23–546:16. The evidence supports that this portion of element 11[e] is not met.

e) Element 11[f]

Element 11[f] recites: “upon determining that a quality of service of the established backhaul has dropped to below a predetermined threshold, establishing an alternative backhaul communication with the second mesh point using a backhaul candidate with the highest score on the list.” ’179 patent at claim 11. Netgear contends that this element is met by the ’179 patent domestic industry products. Netgear Br. at 150–56. TP-Link disputes that this element is met. TP-Link Reply at 134–44.

The evidence supports that because Netgear’s domestic industry products do not meet the “having a score” component of element 11[e], they also do not meet the “highest score” portion of element 11[f].³⁸

D. Validity

TP-Link argues that U.S. Patent Publication No. 2008/0304485 of Sinha et al. renders claim 11 obvious. TP-Link Br. at 107–37. Netgear disputes that Sinha renders claim 11 obvious. Netgear Reply at 116–54.³⁹

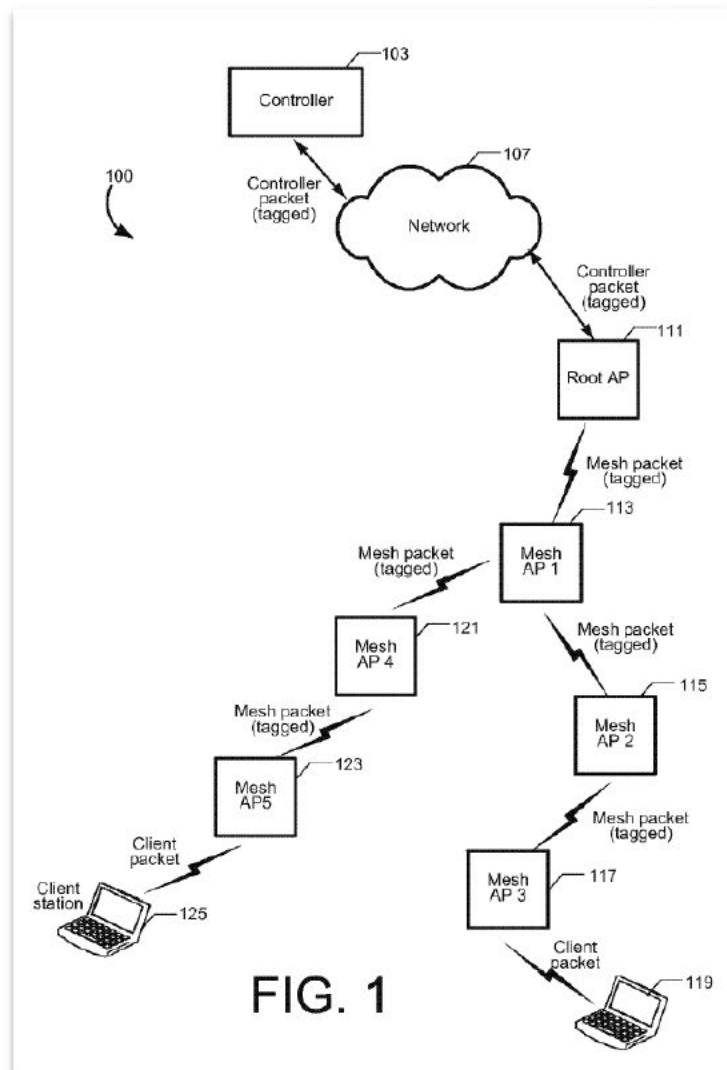
³⁸ With respect to this element, TP-Link also argues the claim requires three separate communication such that establishing a 2.4 GHz frequency band cannot meet both the “forward wireless communication” and “alternative backhaul communication” claim elements. TP-Link Br. at 125. As noted when addressing claim construction, however, the claim does not preclude the “alternative backhaul” from being “the forward wireless communication.”

³⁹ Netgear filed a Notice of the PTAB’s decision declining to institute TP-Link’s petition for inter partes review of the ’179 patent, which attached the PTAB’s decision. EDIS Doc. ID 817047.

1. Overview of Sinha

U.S. Patent Publication No. 2008/0304485 of Sinha et al. is titled “Centrally Controlled Routing With Tagged Packet Forwarding in a Wireless Mesh Network.” Sinha (RX-0098) at cover. Sinha was published on December 11, 2008. *Id.* Netgear does not dispute that Sinha is prior art to the ’179 patent under 35 U.S.C. § 102(a)(1). Netgear Reply at 116; *see also* TP-Link Br. at 107–08 and Bims Tr. at 895:11–15.

Sinha generally relates to routing data traffic within a wireless mesh network by implementing a tagging and forwarding process that is maintained by a controller. Sinha at [0019]–[0022] and Akl Tr. at 1137:7–20. Sinha’s Figure 1, reproduced below, shows a mesh network in which controller 103 remotely controls mesh access points 113, 115, 117, 121, and 123 via network 107 and root access point 111:



Sinha at Fig. 1.

Sinha discloses a “centrally determined routing method” that includes “receiving from each mesh point of a wireless mesh network information sufficient to determine a map of mesh points and one or more available wireless links between the mesh points.” *Id.* at [0019]. The method uses the information to implement “a centralized routing process to determine at least one path from the client [119, 125] to the root mesh point [111] ... [and] assigning an upstream tag to one or more determined paths.” *Id.* Sinha teaches that a “feature of centralized routing” is that “[s]everal routes may be calculated between two end points” and thus “provide a level of fault tolerance.”

Sinha at [0103]. The centralized routing process “determine[s] more than one route, with one route being the primary route, and the other paths being redundant, secondary routes to use in the case that the first route fails.” *Id.* at [0053].

2. Whether Claim 11 Is Rendered Obvious By Sinha

TP-Link argues that one of ordinary skill would have made certain obvious modifications to Sinha and would have been motivated to make them in view of Sinha’s disclosures. TP-Link Br. at 112–37. Netgear argues that TP-Link fails to show that Sinha discloses or renders obvious three features of claim 11, encompassing all claim elements:

- (1) “A computing device comprising: one or more processors, that implements a mesh point... being configured to perform the method” (element 11[pre]);
- (2) “establishing a forward wireless communication” and “establishing a backhaul communication, separate from the forward wireless communication” between mesh points (elements 11[a]–11[d]); and
- (3) backhaul candidates “having a score indicative of an estimated quality of a potential link” and using a “backhaul candidate with the highest score” (elements 11[e]–11[f])

Netgear Reply at 120. The parties’ arguments are addressed below.

a) Element 11[pre]

Element 11[pre] recites “[a] computing device comprising: one or more processors, that implements a mesh point ... being configured to perform the method.” The parties agree that the preamble is limiting. Order No. 33 at 24. Based on the arguments presented at claim construction, I found that “the claimed computing device is configured to perform the claimed method and that other entities may also be configured to be involved in the recited steps.” *Id.* at 25.

TP-Link contends that Sinha “teaches a wireless mesh network in which a central controller determines backhaul paths based on link quality and required quality of service (QoS).” TP-Link Br. at 108 (emphasis removed). TP-Link highlights remote controller 103 in Sinha’s Fig. 1 and

reiterates that Sinha discloses a “simple centrally controlled mesh network.” TP-Link Br. at 109 (emphasis removed). TP-Link argues that “Sinha’s central controller can be integrated in the Root AP [111] of the wireless mesh network.” *Id.*; *see also id.* at 122 (“For claim mapping purposes, Dr. Bims relies on Sinha’s central controller integrated in the root AP”). This is the crux of the dispute between the parties on this claim element—TP-Link argues that Sinha supports implementing a controller in the root AP, while Netgear argues that Sinha does not support that modification. TP-Link Br. at 109–10 and 121–24 and Netgear Br. at 123–29.

Sinha teaches using a controller 103, which in Fig. 1 is shown to be separate from the mesh points and connects to them remotely via a network 107. Akl Tr. at 1137:7–20, 1139:8–19, and 1140:8–1141:17; Bims Tr. at 895:16–24 (“[A]t the very top of Fig. 1 there is a controller that can connect to this wireless mesh network”); and *see* TP-Link Br. at 108–09. Sinha teaches that “in FIG. 1, the controller is able to communicate securely with each mesh AP, e.g., via a CAPWAP tunnel.” Sinha at [0034] and Akl Tr. at 1140:25–1141:9. CAPWAP, which stands for “Control And Provisioning of Wireless Access Points,” is a particular protocol that enables the remote controller and mesh APs to exchange messages “using a secure tunnel” between them. Sinha at [0034] and [0029]. Sinha refers to the mesh APs using this type of protocol to communicate with the controller as “lightweight APs.” Sinha at [0027]; Akl Tr. at 1140:25–1141:7; *see also* Sinha at [0026] (“CAPWAP is a later version of LWAPP (Light Weight Access Point Protocol) from Cisco Systems, Inc.”).

TP-Link relies on Sinha’s disclosure that “the invention is also applicable to mesh nodes that are not ‘lightweight,’” as supporting its proposed modification of Fig. 1, in which, according to Dr. Bims, “not lightweight” means incorporating controller 103 into the Root AP. TP-Link Br. at 110 and RDX-0002C.164 (showing proposed modification as moving controller 103 into root

AP 111). TP-Link relies on paragraph 131 of Sinha, which states that “the description has been mostly for mesh APs that are controlled by a controller with which the mesh AP has a secure tunnel, e.g., an LWAPP/CAPWAP tunnel. ... [T]he invention is also applicable to mesh nodes that are not ‘lightweight’ but rather include enough capability to not need an LWAPP or other protocol connection for a controller to function.” Sinha at [131]. Dr. Bims testified that “what Sinha teaches in paragraph 131 is that the controller in Fig. 1” “and connected over a network to the root AP can be integrated into the root AP.” Bims Tr. at 896:11–14. In such a configuration, “[t]he difference is that the non-lightweight root AP has an integrated functionality of the controller.” *Id.* at 897:1–2. TP-Link contends that paragraph 131 of Sinha is an express disclosure of incorporating controller 103 into root AP 111.

The evidence does not support this assertion. In paragraph 131, Sinha states that while its “description has been mostly for mesh APs that are controlled by a controller with which the mesh AP has a secure tunnel, e.g., an LWAPP/CAPWAP tunnel,” “the invention is also applicable to mesh nodes that are not ‘lightweight’ but rather include enough capability to not need an LWAPP or other protocol connection for a controller to function.” Sinha at [0131]. TP-Link argues that Dr. Akl did not contest that in “a not-lightweight architecture, Sinha’s central controller would be integrated in the root AP.” TP-Link Br. at 124. Dr. Akl testified, however, that paragraph 131 of Sinha describes communicating with “a remote controller”—i.e., one that is not incorporated into a mesh AP—but using “different technologies” other than the LWAPP [Light Weight Access Point Protocol]. Akl Tr. at 1140:16–1143:15. Further, Dr. Akl testified that instead of disclosing incorporating remote controller 103 into root AP 111, this disclosure of Sinha supports that “you can use other technologies for the mesh nodes to communicate with the remote controller” and that “it’s describing a process where you continue to want to communicate with a remote controller

with different technologies.” Akl Tr. at 1141:18–1142:7. I find that Dr. Akl’s testimony on this disclosure in Sinha is more credible than that of Dr. Bims and more closely aligns with what Sinha discloses. Sinha discloses not needing certain communications protocols “for a controller to function,” not that there will not be a remote controller 103 or that a controller will be integrated into the root AP 111. Indeed, paragraph [0131] of Sinha indicates that even after the modification there will be an external controller; it will simply be one in which the LWAPP/CAPWAP protocol is not needed.

Netgear argues that “even if paragraph [0131] discloses an embodiment incorporating a remote controller into the root AP, TP-Link’s obviousness argument fails for the independent reason that a [person of ordinary skill] would not have been motivated to modify Sinha’s lightweight embodiment depicted in Figure 1 in the way proposed by Dr. Bims in view of paragraph [0131].” Netgear Reply at 128. TP-Link’s argument on this point is not one of obviousness; instead, TP-Link contends that “it cannot be disputed” “that Sinha in fact teaches a not-lightweight architecture in which the central controller is located in the root AP.” TP-Link Br. at 124 and *see id.* at 110 (“Sinha also teaches a not-lightweight architecture . . . in which the central controller is integrated in the Root AP”).

Notwithstanding that TP-Link did not argue that it would be obvious to modify Sinha by incorporating a controller in the root AP, the evidence supports that it would not be. Dr. Akl pointed to various disclosures in Sinha that teach away from such a modification. Akl Tr. at 1142:8–1143:9. In particular, Sinha’s disclosure of centralized routing in paragraph [005] and of faster path convergence in paragraph [107] support that a controller is not integrated in the root AP. *Id.* at 1142:1–6 (paragraph [0005] of Sinha) and 1142:21–1143:2 (paragraph [0107] of Sinha).

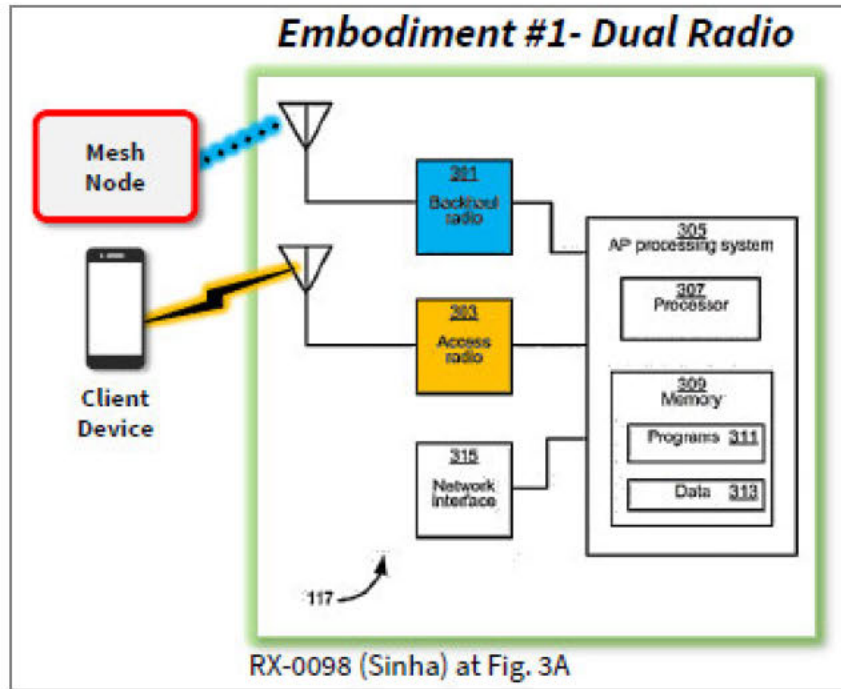
The evidence supports that Sinha does not disclose or render obvious element 11[pre].

b) Elements 11[a] and 11[b]

Elements 11[a] and 11[b] recite “establishing a forward wireless communication with a second mesh point” and “establishing a backhaul communication, separate from the forward wireless communication, with the second mesh point.” ’179 patent at claim 11. TP-Link contends that Sinha renders these elements obvious. TP-Link Br. at 110–20 and 124–27. Netgear contends that these elements are not met by Sinha. Netgear Reply at 129–44.

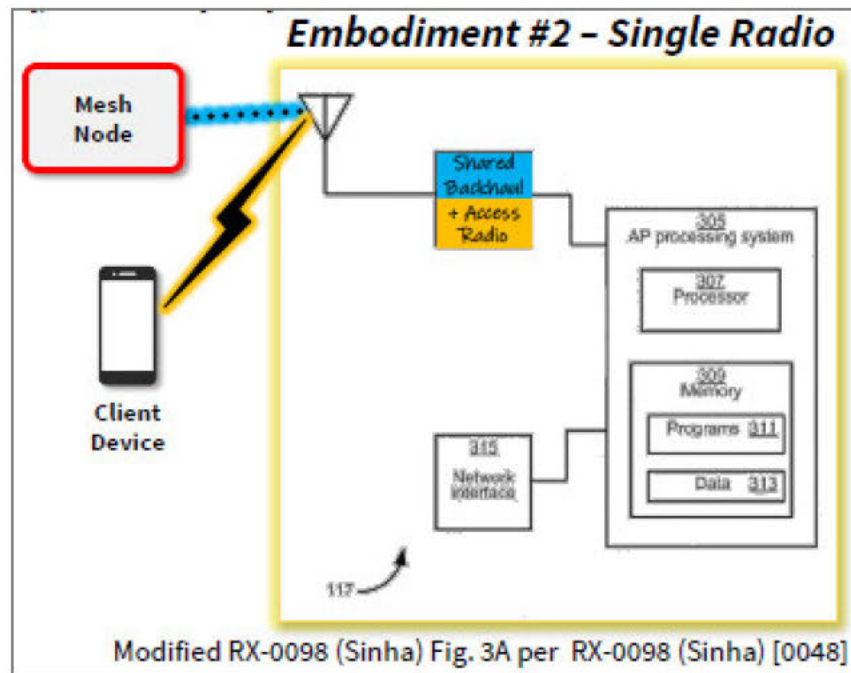
The parties agree that a “forward wireless communication” in element 11[a] is a “client-facing wireless communication” and that “a backhaul communication” is “separate from the forward wireless communication.” Netgear Br. at 94 and TP-Link Br. at 138. The parties do not dispute that Sinha does not expressly disclose a mesh point configured to establish both claimed communications with a second mesh point. Instead, Sinha discloses two alternative embodiments for its mesh points. Sinha at [0048] and [0025]; Bims Tr. at 897:16–898:7 (Sinha discloses a dual radio embodiment and a single radio embodiment); and Akl Tr. at 1138:4–18 (Sinha discloses a dual radio embodiment in which one radio is used for backhaul and one radio is used for client communications and a single radio embodiment in which a single radio is used for both backhaul and client communications).

In the dual-radio embodiment, the mesh point uses a 5 GHz backhaul radio 301, shown in blue, for backhaul communications and a 2.4 GHz access radio 303, shown in gold, for fronthaul communications, as reflected in annotated Figure 3A below:



CDX-0008C.50; Sinha at [0025], [0048], and Fig. 3A; and Akl Tr. at 1138:2–11. Because neither radio is accessible for both mesh-to-mesh and mesh-to-client communications, this dual-radio embodiment does not teach “establishing a forward [client-facing] wireless communication” between mesh points, as required by element 11[a]. Akl Tr. at 1143:16–1144:9.

In the single-radio “alternate embodiment,” the mesh point uses a single-radio, shown in blue and gold, for both backhaul and fronthaul communications, as shown in the annotated version of Figure 3A below:



CDX-0008C.50; Sinha at [0025], [0048], Fig. 3A; and Akl Tr. at 1138:12–18. Because the backhaul radio is also used for mesh-to-client communications, Sinha’s single-radio embodiment does not disclose “establishing a backhaul communication, separate from the forward [client-facing] wireless communication” using a “dedicated radio,” as recited elements 11[b] and 11[d]. Akl Tr. at 1143:16–1144:9. TP-Link does not disagree. *See* TP-Link Br. at 113 (discussing “Embodiment 1” and “Embodiment 2”).

TP-Link notes that both embodiments are disclosed in paragraph [0048] of Sinha, which states: “Those in the art will understand that while the architecture of FIG. 3A shows a separate access radio 303 and a separate backhaul radio 301 for the backhaul links of the network, each able to operate simultaneously at different frequency bands, in an alternate embodiment, the same radio is used for access and backhaul communication.” Sinha at [0048]. TP-Link contends that “combining the two Sinha embodiments yields a dual radio configuration” “in which the 5 GHz is

dedicated for backhaul, as in Sinha Embodiment 1, and the 2.4 GHz is shared between backhaul and fronthaul, as in Sinha Embodiment 2.” TP-Link Br. at 114.

TP-Link contends that one of skill “would have had ample motivation to combine the two Sinha embodiments to arrive at the dual-band combination.” TP-Link Br. at 115. TP-Link first notes that “the two Sinha embodiments are described together in the same paragraph” and points to the Federal Circuit’s statement in *Boston Scientific Scimed, Inc. v. Cordis Corporation*, 554 F.3d 982, 991 (Fed. Cir. 2009) that “[c]ombining two embodiments disclosed adjacent to each other in a prior art patent does not require a leap of inventiveness,” thus arguing that combining Sinha’s two embodiments would have been obvious. TP-Link Br. at 115. In *Boston Scientific*, however, the Federal Circuit did not hold, as a blanket proposition, that it is always obvious to combine embodiments disclosed adjacent to each other in a prior art reference. *Boston Scientific*, 554 F.3d at 991. Rather, the Federal Circuit’s obviousness analysis was still rooted in whether the combination itself was obvious, with a reasonable expectation of success, and whether there was a motivation to combine those embodiments. *Id.*

In *Boston Scientific*, the first embodiment was a drug-eluting polymer stent made of a drug-eluting polymer with a barrier topcoat (referred to as separate layers), and a second embodiment was a metallic stent with a drug-eluting polymer coating that was identified with the same numeral as the drug-eluting polymer in the first embodiment. *Id.* at 988. The Federal Circuit found that given the similarities between the two embodiments, one of ordinary skill would have found the combination a “predictable variation.” *Id.* The Federal Circuit also articulated a rationale for why one of ordinary skill would have been motivated to combine the two embodiments, namely that one of ordinary skill would have expected that adding the second coating layer from the first

embodiment to the stent in the second embodiment would have achieved the same benefit realized by using the second coating layer in the stent in the first embodiment. *Id.* at 991.

Unlike *Boston Scientific*, there is no evidence that the combination of Sinha's embodiments would have been a predictable variation of those embodiments. The combination urged by TP-Link results in an entirely different structure in which instead of a single radio for backhaul communications, as disclosed in both of Sinha's embodiments, the proposed modification has two radios for backhaul communications, making it "backhaul heavy" and limiting access to client resources. Akl Tr. at 1146:2–16.

TP-Link contends that there is motivation to combine Sinha's two embodiments, namely, improved fault tolerance (TP-Link Br. at 113–19) and increased bandwidth (TP-Link Br. at 118–19). As to fault tolerance, TP-Link argues that one of ordinary skill would have been motivated to combine the backhaul-only 5 GHz radio of Sinha's dual-radio embodiment and the shared 2.4 GHz backhaul/access radio of Sinha's alternative single-radio embodiment because "by establishing Sinha's primary backhaul paths in the 5 GHz band dedicated for backhaul, and establishing at least some of Sinha's alternate candidate backhaul paths in the 2.4 GHz shared band, backhaul communication is resilient to band failure and fault tolerance is improved in Sinha's wireless mesh network." TP-Link Br. at 113 and Bims Tr. at 899:7–16 ("the reason is for fault tolerance").

Sinha teaches that fault tolerance for a mesh network may be achieved by using multiple, redundant routes that act as backups to a primary route between mesh points should the primary route fail. Sinha at [0103], [0053], and [0109]. Sinha uses a single backhaul radio—either the dual-radio configuration backhaul only radio or the single-radio configuration shared backhaul/access radio—to form these primary and redundant backup paths between mesh points. *Id.*; *see also* Sinha at [0025], [0048], and Fig. 3A. Dr. Akl explained that because Sinha already discloses fault

tolerance through, for example, priority hop lists, one of ordinary skill in the art would not be motivated to find a different fault tolerance solution that would increase complexity by combining Sinha's single radio and dual radio configurations. Akl Tr. at 1145:8–24 (addressing fault tolerance in Sinha).

TP-Link contends that Dr. Akl “was forced to admit on cross-examination that the dual-radio combination relied on by Dr. Bims provides additional fault tolerance beyond the specific fault-tolerant features described in Sinha.” TP-Link Br. at 117–18, *citing* Akl Tr. at 1177:22–1178:6. On cross-examination, Dr. Akl recognized that one of Sinha's design goals is to improve fault tolerance and that Sinha achieved that goal by using a single frequency band (and corresponding radio) to form redundant alternative routes between mesh points. Akl Tr. at 1177:6–24; *see also* Akl Tr. at 1145:8–24. Dr. Akl also recognized that Sinha does not disclose achieving fault tolerance by using multiple backhaul frequency bands:

Q. But each of Sinha's embodiments only discloses using one band for backhaul, right?

A. I believe that is correct.

Q. So Sinha does not already provide redundancy on the band level, right?

A. I believe that is correct.

Q. Sinha does not already provide redundancy in terms of putting secondary routes on a different backhaul band, right?

A. I believe that is correct.

Akl Tr. at 1177:22–1178:6

Although Dr. Akl agreed that using different frequency bands for backhaul would have improved Sinha's fault tolerance, he explained that such a solution was not contemplated by Sinha, and instead originated with the '179 patent. Akl Tr. at 1179:24–1180:4 (“That is solving a problem

that’s not contemplated by Sinha, and that’s using – that’s exactly why it’s hindsight bias, because you’re taking the invention of the patents that are being asserted and creating a solution in Sinha when that is not contemplated in Sinha.”) *see also* Akl Tr. at 1138:2–1139:7 (the proposed modification is hindsight driven), and 1143:16–1146:23 (addressing hindsight bias).

TP-Link contends that its modification of Sinha argument is not hindsight-driven because the embodiments used in the combination—and the motivation to make the combination—are expressly disclosed in Sinha. TP-Link Br. at 117. TP-Link relies on *Certain Non-Volatile Memory Devices and Products Containing Same*, 337-TA-1046, Initial Determination at 105-107 (Apr. 27, 2018) (EDIS Doc. ID 646146) for the proposition that combining embodiments of a prior art reference would be obvious because the combination is supported by the prior art including “explicit motivation for this modification.” There, however, the ID found that “the same control logic inherent in the first embodiment could be used in the second embodiment.” *Id.* at 106. That is not the case with respect to the proposed modification of Sinha. The evidence supports that Sinha only recognizes the goal of fault tolerance in the context of forming multiple redundant paths in the network using a single backhaul radio. Akl Tr. at 1177:6–1178:6. Sinha does not disclose or suggest that such fault tolerance can be achieved using multiple frequency bands for the same backhaul path. Akl Tr. at 1177:25–1178:6 and 1179:13–1180:10.

TP-Link also argues that the proposed modification would improve bandwidth because it allows for backhaul traffic to be carried over multiple frequency bands rather than just one. TP-Link Br. at 118–19. TP-Link’s expert did not testify on this issue. *See id.* TP-Link points to testimony from Dr. Akl, given in the context of the ’698 patent, that “most of the traffic at a high level would be network infrastructure” as support for its argument that its proposed modification would improve backhaul bandwidth. TP-Link Br. at 118, *citing* Akl Tr. at 1112:23–24. Dr. Akl

testified, however, that TP-Link's proposed modification would negatively impact throughput by splitting resources that were serving only client communications into serving both client communications and mesh-to-mesh communications. Akl Tr. at 1144:10–17 and *see id.* at 1145:25–1146:16 (“you have limited access to resources, and that’s going to act as a bottleneck”).

The evidence supports that Sinha does not disclose or render obvious elements 11[a] and 11[b].

c) Elements 11[e] and 11[f]

Element 11[e] recites “constructing a list of backhaul candidates, each backhaul candidate having a score indicative of an estimated quality of a potential link” and element 11[f] recites “establishing an alternative backhaul ... using a backhaul candidate with the highest score on the list.” ’179 patent at claim 11. TP-Link contends that Sinha discloses these elements, TP-Link Br. at 129–37 (addressing elements 11.6 and 11.7), which Netgear contests, Netgear Reply at 144–54.

With respect to element 11[e], the entirety of Dr. Bim’s testimony was:

Q. Okay. Moving to 11[e], constructing a list of backhaul candidates, each backhaul candidate having a score indicative of an estimated quality of a potential link, between the first and second mesh points, did you find that in Sinha?

A. Yes. The controller, which can be integrated into the root AP, maintains, according to Sinha, at paragraph 58, a priority ordered list of routes. And, also, as backup, for lesser levels of quality of service, those -- that priority ordered list of routes can be utilized in case there is a break in the higher level of service.

Bims Tr. at 902:11–21.

As to element 11[f], Dr. Bims testified:

Going to the last element of claim 11, 11[f], the upon determining that a quality of service of the established backhaul has dropped below a predetermined threshold, do you see that disclosure in Sinha?

A. Yes. So the upon determining step is shown in Sinha through paragraph 58, in which the centralized routing process of the controller will determine one or more paths for the packets to follow. And then, as a backup for lesser levels in case

there is a break in the higher level. So only when there is a break in the higher level, that's when the controller will then access the list of candidates to determine the backup.

Q. Okay. Now continuing in 11[f] with the second part of the claim limitation, starting with establishing an alternative backhaul, RDX-2.178, did you find the second part of 11[f] found in Sinha?

A. Yes. So the second part of claim element 11[f] is to establish an alternative backhaul communication, in Sinha at paragraph 53, it says that there's a pointer to a list of at least one next hop arranged in priority order, and if one path is not available, meaning the initially established backhaul communication path, then the next priority hop is used. And that's the establishment of an alternative backhaul.

Bims Tr. at 902:23–903:21.

In arguing that Sinha discloses “constructing a list of backhaul candidates, each backhaul candidate having a score indicative of an estimated quality of a potential link,” as recited in element 11[e], TP-Link repeatedly points to Sinha’s disclosure in paragraph [0039] that “the controller can determine and receive link characteristics including, but not limited to one or more of data rates, noise level, quality of service (QoS), class of service (CoS), time delays, and so forth, and, in this manner, the controller 103 can centrally compute paths for different classes of traffic.” TP-Link Br. at 130, *quoting* Sinha at [0039]; *see also* TP-Link Br. at 131, 132–33, and 133. TP-Link reproduces Dr. Bims’s demonstrative slide (RDX-0002.176), which includes an annotated excerpt from Sinha paragraph [0039], TP-Link Br. at 130, but Dr. Bims did not testify at all on this disclosure in Sinha and Dr. Bims’s demonstrative slide is not evidence. As a result, TP-Link’s arguments about paragraph [0039] of Sinha are nothing more than “[u]nsubstantiated attorney argument regarding the meaning of technical evidence” that is insufficient to meet its clear and convincing evidentiary burden to prove invalidity. *Invitrogen*, 429 F.3d at 1058–59 (Fed. Cir. 2004) (rejecting an attempt to “substitute attorney argument for expert testimony” to meet a “clear

and convincing evidence” burden). I therefore conclude that TP-Link has failed to demonstrate by clear and convincing evidence that Sinha discloses elements 11[e] and 11[f].

d) Secondary Considerations

Netgear contends objective indicia of non-obviousness exist based on the “commercial success of the ’179 DI Products” and that a presumptive nexus exists between “objective indicia related to the ’179 DI Products and the claimed invention.” Because the evidence shows that Netgear’s ’179 patent domestic industry products do not practice claim 11, however, Netgear’s commercial success cannot be the result of it practicing that claim. As a result, secondary considerations do not support the non-obviousness of claim 11.

e) Conclusion

Notwithstanding there being no objective indicia of non-obviousness, TP-Link has not shown by clear and convincing evidence that claim 11 of the ’179 patent is obvious in view of Sinha.

IX. ECONOMIC PRONG

Section 337(a)(3) identifies the following criteria for determining the existence of a domestic industry:

(3) For purposes of paragraph (2), an industry in the United States shall be considered to exist if there is in the United States, with respect to the articles protected by the patent, copyright, trademark, mask work, or design concerned --

(A) significant investment in plant and equipment;

(B) significant employment of labor or capital; or

(C) substantial investment in its exploitation, including engineering, research and development, or licensing.

19 U.S.C. §1337(a)(3).

Because the statutory criteria are listed in the disjunctive, satisfaction of any one of them is sufficient to meet the economic prong of the domestic industry requirement. *Certain Printing and Imaging Devices and Components Thereof*, Inv. No. 337-TA-690, Comm’n Op. at 26 (Feb. 17, 2011) (EDIS Doc. ID 444708); *InterDigital Communications, LLC v. Int’l Trade Comm’n*, 707 F.3d 1295, 1303, n.4 (Fed. Cir. 2013).

Netgear contends that it has substantial investment in plant and equipment under section 337(a)(3)(A) and in labor and capital under section 337(a)(3)(B). Netgear Br. at 156–93. TP-Link disagrees. TP-Link Reply at 144–49.

A. Netgear’s Sales of Domestic Industry Products

In addressing technical domestic industry, Netgear contends that various of its domestic industry products practice various of the asserted patents. CX-3046C (identifying which models are asserted to be covered by which asserted patents). The evidence supports that from 2020 through the third quarter of 2023 (which Netgear identifies as the domestic industry period), Netgear had [REDACTED] in U.S. sales of products covered by the ’714 patent, [REDACTED] in U.S. sales of products covered by the ’698 patent, and [REDACTED] in U.S. sales of products covered by the ’179 patent. Mulhern Tr. at 572:5-24; and CX-3066C.3 (total U.S. sales per patent). In that period, Netgear had [REDACTED] in worldwide sales of products covered by the ’714 patent, [REDACTED] in worldwide sales of products covered by the ’698 patent, and [REDACTED] in worldwide sales of products covered by the ’179 patent. Mulhern Tr. at 573:3-16; CX-3069C.3 (total worldwide sales per patent).

B. Netgear’s Domestic Industry Activities

Netgear contends that it performs research and development, engineering, product development, testing, customer service, warranty, operations, repackaging, refurbishment, and

technical support activities in the United States. Netgear Br. at 159. Netgear groups these activities into four categories: (1) research and development, (2) product management, (3) technical support, and (4) operations. *Id.* Each is discussed in turn.

1. Netgear's Domestic Industry Activities

a) Research and Development

The evidence supports that Netgear's research and development activities in the United States include those performed by engineers on its domestic industry products, including overall product development, hardware and software development, product validation and testing, and design specifications, both pre- and post- launch. Mulhern Tr. at 577:16-578:3; Loi Tr. at 62:3-6; CX-2885C; CX-2901C; and CX-2866C. Of Netgear's [REDACTED] U.S. employees engaged in research and development activities, [REDACTED] are in departments that conduct research and development related to the domestic industry products. CX-2885C; CX-2901C; and CX-2866C. Certain of those departments are specific to its connected home products, or CHP, business unit, which covers the domestic industry products, while others, known as shared services, support both its CHP and small, medium business, or SMB, business units. Loi Tr. at 65:6-20 and 74:2-19.

Netgear engages third parties to assist in research and development, including individual contractors, who perform activities similar to Netgear's in-house personnel and who work at Netgear's headquarters. Loi Tr. at 63:20-64:20; CX-2895C; and CX-2903C (contractor expenses). Netgear also engages third-party professional services firms, which assist with software development and engineering services. RX-0331C (Loi Dep. Tr.) at 44:1-45:20; and CX-2895C.

b) Product Management

Netgear employs product managers who are responsible for the management of a product or family of products from design and engineering through commercial launch. Loi Tr. at 74:20-

75:7. They provide feedback to engineers on the design of the product and are “responsible for the products from inception of the product to [go-to-market] . . . all the way even to end-of-lifeing the product.” RX-0331C (Loi Dep. Tr.) at 41:14–42:11 and 165:19–166:15; *see also* RX-0334C (Cheng Dep. Tr.) at 13:12–14:14; and Loi Tr. at 74:20–75:7. The evidence supports that approximately [REDACTED] of product managers’ time is spent on product development, engineering, and testing activities, with the remaining time spent on activities such as market analysis and sales and marketing support. RX-0328C (Gielty Dep. Tr.) at 187:16–23.

c) Technical Support

The evidence supports that certain Netgear employees in the United States perform technical support activities for its domestic industry products and are responsible for oversight of the technical support department, relationships with third-party support partners, certain technical support, management of Netgear’s community forums, design and management of technical support training and certification programs, and management of Netgear’s subscription support service, which activities are directed from inside the United States. Loi Tr. at 75:8–77:7 and CX-2902C.

Specifically, Netgear provides technical support for the domestic industry products through in-house personnel and third-party contractors based both in and outside the United States. Loi Tr. at 75:13–76:1. The director responsible for the overall management of Netgear’s support partners is based in the United States. CX-2902C. Netgear also has U.S.-based employees with duties focused on development and enhancement of its support system infrastructure. *Id.* Netgear trains technical support personnel, which process was designed and is managed domestically. *Id.* Netgear also has U.S.-based employees who handle high-level escalations (Level 3) and provide technical support assistance through its online community forum as well as a subscription support service,

ProSupport. Loi Tr. at 75:13–76:15 and CX-2902C. Netgear’s online community forum allows users to “ask for advice, chat about technology, your experience with NETGEAR products, tips, ideas for future improvements.” CX-2972 and CX-2973. Netgear’s ProSupport service provides users with extended/premium warranties, priority technical support, access to Netgear personnel, product replacement, and accident damage coverage. CX-3010.

d) Operations

The evidence supports that Netgear engages in domestic activities to support its domestic industry products within its Operations department, including logistics and product distribution, supply chain management and purchasing, manufacturing and test engineering, and returns/remanufacturing/warranty fulfillment. Loi Tr. at 62:1–3, 72:24–73:5, and 78:18–80:11; RX-0331C (Loi Dep. Tr.) at 39:1–40:17; and CX-2901C. Netgear’s distribution and returns/warranty activities are coordinated from its headquarters and conducted by third-party APL Logistics at its California warehouse. CX-2992.11. At this facility, APL provides services for Netgear including serving as a distribution center, processing returns, and providing services such as reworking products. Loi Tr. at 63:5–10 and 78:18–80:11; RX-0331C (Loi Dep. Tr.) at 28:9–30:16, 40:12–41:3.

Netgear also partners with Tracelogix, a Tennessee-based customer support contractor, which assists with processing returns and providing replacement parts. Loi. Tr. at 63:11–16 and 77:14–78:17 and RX-0331 (Loi Dep. Tr.) at 33:20–35:7 and 201:9–202:3.

Netgear also contracts a third-party data center. When the complaint was filed, this work was performed at a third-party facility in [REDACTED]. Loi. Tr. at 80:18–81:13; RX-0331C (Loi Dep. Tr.) at 32:13–25 and 199:1–200:9; and CX-2886C. [REDACTED] formerly operated this location, which is now operated by [REDACTED] while [REDACTED] continues

to provide certain services related to the connection to the data center. These data center activities are not specific to research and development or administration, but instead support all Netgear's functions. RX-0331C (Loi Dep. Tr.) at 32:13–25 and 199:1–200:9.

e) Conclusion on Netgear's Domestic Activities

TP-Link does not substantively challenge Netgear's domestic activities. TP-Link Reply at 144–49. To the extent it does, TP-Link notes that Mr. Gielty, the vice president of software for Network's CHP product division, RX-0237C (Gielty Dep. Tr.) at 9:7–23, did not testify at the evidentiary hearing⁴⁰ and Mr. Loi, Netgear's vice president of financial planning and analysis, Tr. at 61:3–4, "signed the verification to the complaint without even verifying all of the facts therein." TP-Link Reply at 144.

As to Mr. Gielty, the parties agreed to submit deposition designations as exhibits, Pre-hearing Conference Tr. at 21–22, and after my approval, did so for Mr. Gielty. RX-0327C and RX-0328C. TP-Link identified designations from Mr. Gielty's depositions. *See id.* To the extent TP-Link wanted or needed additional testimony from Mr. Gielty, it should have called him as a witness. *See* Respondents' Tentative Witness List at 2 (identifying Mr. Gielty as a potential witness for TP-Link) (EDIS Doc. ID 805326). As to Mr. Loi, TP-Link misinterprets his testimony. Mr. Loi's verification was "formed after an inquiry reasonable under the circumstances," Complaint Verification at ¶ 3. Mr. Loi was not required to personally verify every fact, as TP-Link suggests.

⁴⁰ TP-Link also notes that Netgear's expert on economic domestic industry, Ms. Mulhern, had "ex parte" conversations with Mr. Gielty. TP-Link Reply at 144, *citing* Tr. at 568:9–10, 577:14–578:3, and 579:22–580:3 (Ms. Mulhern testifying on the genesis of information she relied on, including conversations with Mr. Gielty). There is nothing unusual or untoward about this, as TP-Link implies. Indeed, depending on the circumstances, it might be unusual for an expert to not have such conversations.

With respect to Netgear's domestic activities, addressed above, and Netgear's further reliance on Mr. Gielty's deposition testimony, addressed elsewhere in this initial determination, I find that such reliance was entirely appropriate. To the extent TP-Link suggests that Mr. Loi was not credible, I reject that contention. Mr. Loi was a credible witness.

C. Plant and Equipment

Netgear contends that it made significant investments in plant and equipment related to the domestic industry products under 19 U.S.C. § 1337(a)(3)(A) between January 1, 2020, and the first quarter of 2023, the domestic industry period. Netgear Br. at 166–70. Netgear contends that it supports its domestic industry products through qualifying activities performed in part through its investments in its Netgear's headquarters, research and development test house, and equipment. *Id.* Each is discussed below.

1. Netgear's Plant Expenses

Netgear contends that it has plant expenses through its investments in its headquarters and through a test house.

Netgear operates its 142,700 square-foot headquarters facility in California.



Loi Tr. at 61:7–10, 66:24–67:19; CDX-0005.3; and CX-2869C. Employees at this facility are involved in research and development, product management, technical support, and operations, as

well as sales, marketing, and administrative functions, to support the domestic industry products. Loi Tr. at 67:9–16; CDX-0005.4; and CX-2885C.

Netgear also operates a research and development test house in California.



Loi Tr. at 67:20–68:25 and CDX-0005.5. This facility is used by Netgear’s research and development employees for testing the domestic industry products. *Id.*

The evidence supports that from 2020 to January 2023, Netgear incurred [REDACTED] in rent for its headquarters, [REDACTED] in rent for its test house, [REDACTED] in insurance payments for both U.S. facilities, and [REDACTED] in utilities and fees for both facilities, for a total of [REDACTED]. Mulhern Tr. at 583:4–11; Loi Tr. at 67:4–68:25 and 69:1–71:10; CX-3078C (U.S. facilities expenses); CX-2867C (rent); CX-2889C–CX-2893C (insurance); CX-3153C (utilities); and *see* CDX-0004.009.

Because certain activities in Netgear’s headquarters are not cognizable and support non-domestic industry products, Ms. Mulhern allocated those expenditures to the qualifying activities and domestic industry products. Mulhern Tr. at 583:12–584:19. Ms. Mulhern first applied a headcount allocation based on the number of Netgear employees at Netgear’s headquarters engaged in qualifying activities compared to the total headcount. Mulhern Tr. at 583:19–584:12;

CX-3080C–CX-3081C; CX-2866C; RX-0328C (Gielty Dep. Tr.) at 187:16–23. This approach is consistent with Netgear’s internal practices. Loi Tr. at 72:3–9.

For 2023, Ms. Mulhern applied a ratio of the number of employees supporting the domestic industry products by department to the total number of employees at the headquarters facility, and applied this ratio to the headcounts for 2020–2022, as Netgear’s headcounts are consistent from year-to-year. Loi Tr. at 72:10–22; CX-3081C; and CX-2866C. For product management employees, Ms. Mulhern also applied a [REDACTED] time-based allocation to the headcount ratio to account for the portion of their time devoted to technical activities associated with product development of the domestic industry products. CX-3080C; RX-0328C (Gielty Dep. Tr.) at 187:16–23.

This type of allocation is accepted by the Commission. *See Certain Intraoral Scanners and Related Hardware and Software*, Inv. No. 337-TA-1090, Initial Determination at 148 (Apr. 26, 2019) (EDIS Doc. ID 677033), *vacated as moot by* Comm’n Notice (Aug. 20, 2019) (EDIS Doc. ID 685737) and *Certain Solid State Storage Drives, Stacked Electronics Components, and Products Containing Same*, Inv. No. 337-TA-1097, Comm’n Op. at 21-22 (Jun. 29, 2018) (EDIS Doc. ID 649139). TP-Link has not presented any evidence rebutting Ms. Mulhern’s headcount allocation.

Applying these allocations, the evidence supports that for the domestic industry period, Netgear’s U.S. plant investments associated with qualifying activities were approximately [REDACTED] million and exclusive of operations activities, were approximately [REDACTED] million. CX-3080C (facilities investments in research and development, technical product management, and technical support).

2. Netgear's Equipment Expenses

The evidence supports that Netgear invests in capitalized equipment used for its domestic industry activities. Loi Tr. at 71:15–72:2 and CX-2870C (capital equipment expenses). Such equipment includes laptops, computers, communication equipment, testing equipment, and software licenses. Mulhern Tr. at 585:2–5 and CX-2870C. The evidence supports that from 2020 through 2022, these investments totaled [REDACTED]. Mulhern Tr. at 584:22–585:19; CX-3082C (capitalized equipment investments); CX-2870C; and *see* CDX-0004C.10. The evidence supports that Netgear's investments in equipment associated with research and development departments totaled approximately [REDACTED] million and in technical support and operations equipment totaled approximately [REDACTED]. *Id.*

3. Netgear's Sales-Based Allocations

Because Mr. Loi testified that Netgear does not track its investments to specific products in the ordinary course of its business, Ms. Mulhern applied a sales-based allocation to Netgear's plant and equipment expenditures. Mulhern Tr. at 584:15–19 and 585:13–19; Loi Tr. at 65:23–66:14; and RX-0331C (Loi Dep. Tr.) at 159:20–160:7.

Ms. Mulhern testified that “a sales-based allocation is a well-accepted methodology for estimating a share of investments allocable to a particular function” and that “from an economic perspective, it has advantages in that it assigns more expenses to the products that command higher sales or more important to the firm.” Mulhern Tr. at 585:16–586:1.

Ms. Mulhern addressed a criticism that a sales-based allocation may not be appropriate in this case for research and development, stating that in “some situations there can be a concern that there could be a mismatch in timing between the R&D efforts and the sales” where “all of the R&D is undertaken for products that have not yet launched.” *Id.* at 586:4–14. Ms. Mulhern testified

that there is no concern about such a lag here because “Netgear’s R&D investments are ongoing throughout the product life cycle, including bug fixes and software updates for products that are currently being sold.” *Id.* at 586:15–21. According to Ms. Mulhern, this continuing work led her to conclude that “the mismatch or the lag in timing is not a concern here.” *Id.* at 586:21–22. Ms. Mulhern also testified that Netgear’s research and development is continuing, such as for its Wi-Fi 7 products, which were in development but yet launched when the complaint was filed. *Id.* at 586:23–587:3.

Ms. Mulhern identified sales-based allocation percentages with respect to U.S. sales based on both CHP revenue and total revenue for each of the asserted patents. For the ’714 patent, Ms. Mulhern identified:

'714 patent – U.S. sales	2020	2021	2022	Q1 2023
% CHP revenue				
% total revenue				

For the ’698 patent, Ms. Mulhern identified the following sales-based allocation percentages with respect to U.S. sales based on both CHP revenue and total revenue:

'698 patent – U.S. sales	2020	2021	2022	Q1 2023
% CHP revenue				
% total revenue				

For the ’179 patent, Ms. Mulhern identified the following sales-based allocation percentages with respect to U.S. sales based on both CHP revenue and total revenue:

'179 patent – U.S. sales	2020	2021	2022	Q1 2023
% CHP revenue				
% total revenue				

Mulhern Tr. at 587:4–25. For each of the patents, Ms. Mulhern identified sales-based allocation percentages with respect to worldwide sales based on both CHP revenue and total revenue. For the '714 patent, Ms. Mulhern identified:

'714 patent – worldwide sales	2020	2021	2022	Q1 2023
% CHP revenue				
% total revenue				

For the '698 patent, Ms. Mulhern identified the following sales-based allocation percentages with respect to worldwide sales based on both CHP revenue and total revenue:

'698 patent – worldwide sales	2020	2021	2022	Q1 2023
% CHP revenue				
% total revenue				

For the '179 patent, Ms. Mulhern identified the following sales-based allocation percentages with respect to worldwide sales based on both CHP revenue and total revenue:

'179 patent – worldwide sales	2020	2021	2022	Q1 2023
% CHP revenue				
% total revenue				

Mulhern Tr. at 588:1–15.

As between U.S. sales and worldwide sales, Ms. Mulhern testified that she used the appropriate allocation factor depending on the underlying activity. As an example, because Netgear's U.S. personnel are "engaged in activities with respect to R&D for the worldwide -- support the worldwide sales of the products," Ms. Mulhern "used worldwide-sales-based factors for the R&D function." *Id.* at 588:16–24. Thus, for research and development-related expenses, Ms. Mulhern applied a ratio of worldwide domestic industry product sales to worldwide CHP sales. CX-3076C (domestic industry worldwide sales revenue percentages per patent for 2020

through Q1 2023 by year); CX-3084C (sales-based allocation to '714 patent domestic industry products); CX-3085 (sales-based allocation to '698 patent domestic industry products: and CX-3086C (sales-based allocation to '179 patent domestic industry products).

The evidence supports that Netgear departments supporting both CHP and SMB (non-domestic industry) products dedicate about [REDACTED] of their time to CHP products. Loi Tr. at 74:7–19. As a result, for plant and equipment research and development-related investments in departments supporting both CHP and SMB products, Ms. Mulhern applied an [REDACTED] time-based allocation to those expenditures before applying the ratio of worldwide domestic industry products sales to worldwide CHP sales for “Total R&D and Technical Product Management Plant and Equipment” expenses for each year from 2020 through Q1 2023. CX-3084C ('714 patent, line [18]); CX-3085C ('698 patent, line [18]); and CX-3086C (179 patent, line [18]).

For technical support-related plant and equipment expenditures, Ms. Mulhern applied a sales-based allocation based on worldwide domestic industry product sales relative to worldwide CHP sales for the domestic industry products related to each asserted patent. CX-3076C; CX-3084C ('714 patent line [23]); CX-3085C ('698 patent, line [23]); and CX-3086C ('179 patent, line [23]). For operations-related plant and equipment expenditures, Ms. Mulhern likewise applied a sales-based allocation based on worldwide domestic industry product sales relative to worldwide CHP sales for the domestic industry products related to each asserted patent. CX-3076C; CX-3084C ('714 patent line [28]); CX-3085C ('698 patent, line [28]); and CX-3086C ('179 patent, line [28]).

TP-Link argues that “Netgear’s sales-based allocation theory does not align with the facts of the case” because “Netgear’s sales-based allocation allocates no investments to significant products that were commercially released after the time of the complaint such as all of Netgear’s

Wi-Fi 7 products, and therefore, overvalues products that have declined in sales or been discontinued.” TP-Link Reply at 149.

A “complainant is not obligated to use a particular allocation methodology.” *Certain High-Density Fiber Optic Equipment and Components Thereof*, Inv. No. 337-TA-1194, Comm’n Op. at 65 (Aug. 23, 2021) (EDIS Doc. ID 750094). In addition, “[w]hile [TP-Link] objects to the use of a sales-based allocation method, it suggested no alternative method and in the absence of a better alternative,” the sales allocation approach used by Netgear’s economic expert was reasonable. *Id.* In addition, the Commission regularly accepts sales-based allocations as supporting domestic industry based on research and development. *Cellular Base Station Communication Equipment, Components Thereof, and Products Containing Same*, Inv. No. 337-TA-1302, Initial Determination at 6 (Nov. 2, 2022) (EDIS Doc. ID 783920), *unreviewed by* Comm’n Notice (Dec. 2, 2022) (adopting “Apple’s sales-revenue-based allocation methodology”) (EDIS Doc. ID 785567) (accepting a sales-based allocation for research and development investments).

A sales-based allocation for Netgear’s research and development and product management expenditures is appropriate considering the nature of Netgear’s research and development activities, which continue throughout the product lifecycle. And while TP-Link contends that Netgear’s sales-based allocation “overvalues products that have declined in sales” and notes that significant Netgear products, “such as all of Netgear’s Wi-Fi 7 products,” were commercially released after the complaint was filed,” because Netgear made research and development investments in products that had not yet been launched at the time of the complaint, its sales-based allocation is conservative. Mulhern Tr. at 585:16–587:3. Under the circumstances, Netgear’s sales-based allocation is a reasonable way to allocate investments to its domestic industry products. *Certain Movable Barrier Operator Systems and Components Thereof*, Inv. No. 337-TA-1118,

Comm’n Op. at 28 and 29-33 (Jan. 12, 2021) (sales-based allocations need not provide a precise accounting so long as they are reasonable under the circumstances) (EDIS Doc. ID 730303). In contrast, TP-Link “offers no alternative data, expert opinions, allocations, calculations, or other evidence to counter [Netgear’s] sales-based allocations or calculations. Nor does [TP-Link] argue that [Netgear’s] data, allocations, or calculations are mathematically flawed, erroneous, or unreliable, apart from the issues addressed above.” *Movable Barrier Operator Systems*, Inv. No. 337-TA-1118, Comm’n Op. at 32 (affirming sales-based allocation methodology).

TP-Link also suggests that Netgear failed to quantify the value of its investments “on a patent-by-patent basis,” and states that “[t]he Commission has rejected this approach of aggregating a collection of different products that allegedly practice different patents.” TP-Link Reply at 144–45, citing *Certain Electronic Stud Finders, Metal Detectors and Electrical Scanners*, Inv. No. 337-TA-1221, Comm’n Op. (Mar. 14, 2022) (EDIS Doc. ID 765331); *Certain Elec. Imaging Devices*, Inv. No. 337-TA-850, USITC Pub. No. 4846, Comm’n Op. at 89 (Nov. 2018) (EDIS Doc. ID 662252) (separate economic domestic industries required when domestic industry products do not overlap with respect to asserted patents).

TP-Link, however, omits a critical point the Commission made in *Electronic Stud Finders*, namely that “the Commission has accepted reasonable allocation methods to estimate the amount of complainant’s investments that can be attributed to each asserted patent, as for example, an allocation based on sales.” *Electronic Stud Finders*, Inv. No. 337-TA-1221, Comm’n Op. at 50–51, *aff’d by Zircon v. Int’l Trade Comm’n*, No. 22-1649, slip op. at 18–19 (May 8, 2024) (noting that the complainant’s “revenue-based patent-by-patent breakdown” was not in the evidentiary record). The complainant in *Electronic Stud Finders* failed to present such an analysis. That specific finding was affirmed by the Federal Circuit. That, however, is not case here.

Ms. Mulhern provided a sales-based analysis on a patent-by-patent basis:

DI Product Sales by Asserted Patent	
[5]	'714 Patent
[6]	As % of CHP Revenue
[7]	As % of Total Revenue
[8]	'698 Patent
[9]	As % of CHP Revenue
[10]	As % of Total Revenue
[11]	'179 Patent
[12]	As % of CHP Revenue
[13]	As % of Total Revenue
[14]	'025 Patent
[15]	As % of CHP Revenue
[16]	As % of Total Revenue
[17]	'242 Patent
[18]	As % of CHP Revenue
[19]	As % of Total Revenue
[20]	'681 Patent
[21]	As % of CHP Revenue
[22]	As % of Total Revenue

CX-3076C.1. While that analysis included patents that have since been terminated from the investigation (the '025, '242, and '681 patents), there is no question that Ms. Mulhern performed a patent-by-patent analysis.⁴¹ The evidence supports that Netgear's sales-based allocations were appropriate.

4. Total Investments in Plant and Equipment

Applying the sales-based allocations to the investments in each activity, the evidence supports that Netgear's investments in plant and equipment investments allocated to the domestic industry products for each of the asserted patents between 2020 and Q1 2023 were:

⁴¹ Netgear contends that at the evidentiary hearing, "Netgear for the first time, unsuccessfully attempted to present arguments through Ms. Mulhern as to quantitative significance on a per patent basis." Netgear Reply at 144, *citing* Tr. at 559:5–562:3. The transcript portion TP-Link cites is to its objection to certain of Ms. Mulhern's demonstrative slides (CDX-0004.27, 28, 30, and 31) and certain numbers cited in those slides. Because I specifically overruled that objection, Tr. at 562:19–563:2, TP-Link's argument is baseless.

	'714 patent	'698 patent	'179 patent
R&D and product management			
Technical support			
Operations			
Total			

Mulhern Tr. at 581:23–582:20 and *see* CDX-0004C.8.

D. Labor and Capital

Netgear asserts that under 19 U.S.C. § 1337(a)(3)(B) it has made significant investments in the employment of labor and capital related to the domestic industry products during the domestic industry period. Netgear Br. at 170–75. Netgear identifies labor and capital expenditures in its personnel, research and development, and professional services contractors, and certain operations facilities. Each is addressed below.

1. Netgear Personnel

As to Netgear U.S. personnel, Ms. Mulhern identified [REDACTED] in-house personnel engaged in domestic industry activities: research and development [REDACTED]; product management [REDACTED]; technical support [REDACTED]; and operations [REDACTED], excluding individuals whose titles suggested sales and marketing activities. Mulhern Tr. at 590:5–23. From Netgear’s annual salary and bi-annual bonus data for these employees, including partial year salary for January through June 1, 2023, Ms. Mulhern pro-rated first year salaries based on their respective hire dates for employees with start dates after January 2020 and prorated 2023 salaries to reflect only those through March 31, 2023, the filing date of the complaint. Loi Tr. at 72:24–73:10 and CX-3089C (pro-rated salary data).

In addition to salaries and bonuses, Netgear incurs costs associated with employee benefits, estimated to be [REDACTED] of salary expenses based on Netgear’s historical actual expenses. Loi Tr. at 73:11–23. Using this estimate, Ms. Mulhern calculated total salary and benefit expenses for

Netgear U.S. employees supporting the domestic industry products. Mulhern Tr. at 591:2–20; CX-3090C (pro-rated salaries including benefits); and *see* CDX-0004C.16.

Ms. Mulhern calculated that inclusive of prorated salary, benefits, and bonuses, Netgear's total compensation to U.S. employees engaged in domestic industry activities totaled [REDACTED] during the domestic industry period. CX-3092C (compensation of U.S. employees). To allocate Netgear's labor investments to specific domestic industry products, Ms. Mulhern used a sales-based allocation methodology. Mulhern Tr. at 591:14–20; CDX-0004C.11, 16; CX-3094C ('714 patent); CX-3095 ('698 patent); and CX-3096 ('179 patent).

For research and development employees in departments supporting both CHP and SMB business units, Ms. Mulhern first applied a factor of [REDACTED] to estimate the proportion applicable to the CHP business unit. CX-3094C ('714 patent); CX-3095 ('698 patent); and CX-3096 ('179 patent). For research and development employees, Ms. Mulhern applied the ratio of worldwide domestic industry products sales to CHP sales worldwide. *Id.* For product management, she applied a factor of [REDACTED] to estimate the portion of the employee's time related to technical activities supporting product development. *Id.* She then applied the ratio of worldwide domestic industry products sales to worldwide CHP sales for labor investments associated with product management. *Id.* For technical support, Ms. Mulhern applied a sales-based allocation based on the ratio of worldwide domestic industry product sales to the worldwide sales in the CHP segment. *Id.* For operations, she applied the ratio of worldwide domestic industry product sales to total Netgear worldwide sales (both CHP and SMB segments). *Id.*

The evidence supports that Netgear's U.S. investments in labor allocable to the domestic industry products for the '714 patent during the domestic industry period totaled [REDACTED] during the domestic industry period, comprising [REDACTED] for research and development and

technical product development, [REDACTED] for technical support, and [REDACTED] for operations. The evidence supports that Netgear's U.S. investments in labor allocable to the domestic industry products covered by the '698 patent during the domestic industry period totaled [REDACTED], comprising [REDACTED] for research and development and technical product development, [REDACTED] for technical support, and [REDACTED] for operations. The evidence supports that Netgear's U.S. investments in labor allocable to the domestic industry products covered by the '179 patent during the domestic industry period totaled [REDACTED], comprising [REDACTED] for research and development and technical product development, [REDACTED] for technical support, and [REDACTED] for operations. Mulhern Tr. at 591:21–592:17; CX-3094C ('714 patent); CX-3095 ('698 patent); and CX-3096 ('179 patent); *see also* CDX-0004C.17. Netgear summarizes these expenses as follows:

	'714 patent	'698 patent	'179 patent
R&D and Product Management	[REDACTED]	[REDACTED]	[REDACTED]
Technical support	[REDACTED]	[REDACTED]	[REDACTED]
Operations	[REDACTED]	[REDACTED]	[REDACTED]
Total	[REDACTED]	[REDACTED]	[REDACTED]

Mulhern Tr. at 591:21–592:17.

2. Third-Party Research and Development and Professional Services Contractors and Operations

Netgear contends that it has qualifying expenses in capital through third-party research and development and professional service contractors and in operations. Netgear Br. at 173–76.

Netgear engages third-party independent contractors and professional services firms in support of the development of its domestic industry products. Mulhern Tr. at 592:18–593:3; Loi Tr. at 63:20–64:20; CX-2895C; and CX-2903C. Netgear's third-party contractors are engaged to provide research and development-related services to Netgear. The evidence supports that from

2020 to 2022, Netgear's research and development investments in U.S.-based independent contractors supporting the CHP segment were [REDACTED] and [REDACTED] for third-party professional services in the United States for a total of [REDACTED]. Mulhern Tr. at 592:18–593:3; CX-3123C (independent contractors); CX-3122C (research and development third-party contractors); and *see also* CDX-0004C.18.

As to operations, Netgear contends that it has qualifying expenses in an [REDACTED] data center, a Tennessee customer support facility, and a California warehouse facility.

The evidence supports that Netgear invested capital to support its domestic industry products through its third-party data center in [REDACTED]. Loi Tr. at 80:12–81:13.⁴² Between 2020 and 2022, Netgear paid two vendors, [REDACTED], approximately [REDACTED] for these data center services. Mulhern Tr. at 593:3–7; CX-3097C.1 (item [6]); and CX-2886C.

The evidence supports that Netgear's vendor, Tracelogix, operates a facility in Tennessee and is responsible for customer support returns. Loi Tr. at 63:11–16 and 75:8–76:1. Between 2020 and 2022, Netgear paid Tracelogix approximately [REDACTED] for these services. Mulhern Tr. at 593:3–7; CX-3097C.1 (item [8]); and CX-2887C.

Through its third-party contractor, APL, Netgear engages product return, reworking and refurbishment activities at a facility in California. Loi Tr. at 63:5–10 and 78:18–80:11 and RX-0331C (Loi Dep. Tr.) at 29:8–30:16. The evidence supports that between 2020 and 2022, Netgear's

⁴² Mr. Loi testified that in mid-2023, Netgear migrated those services [REDACTED].

investments at the APL facility totaled [REDACTED]. Mulhern Tr. at 593:3–7; CX-2896C; CX-2888C; and CX-3097C.1 (item [13]).

The evidence supports that from 2020 to 2022, Netgear’s investments of capital in operations activities were [REDACTED]. Mulhern Tr. at 593:11–21.

Applying a sales-based allocation of these investments to the asserted patents, Ms. Mulhern testified that for the ’714 patent, Netgear invested [REDACTED] in research and development and [REDACTED] in operations, for a total of [REDACTED]; for the ’698 patent, Netgear invested [REDACTED] in research and development and [REDACTED] in operations, for a total of close to [REDACTED]; and for the ’179 patent, Netgear invested [REDACTED] in research and development and [REDACTED] in operations, for a total of [REDACTED]. Mulhern Tr. at 593:22–594:6; CX-3099C (capital investments allocated to the domestic industry products for the ’714 patent); CX-3100C (capital investments allocated to the domestic industry products for the ’698 patent); CX-3101C (capital investments allocated to the domestic industry products for the ’1769 patent); CX-3076C (world-wide sales allocated by patent), CX-3097C (U.S. capital investments in third-party contractors); and *see* CDX-0004C.19.

Netgear summarizes these expenses as follows:

	'714 patent	'698 patent	'179 patent
R&D	[REDACTED]	[REDACTED]	[REDACTED]
Operations	[REDACTED]	[REDACTED]	[REDACTED]
Total	[REDACTED]	[REDACTED]	[REDACTED]

Mulhern Tr. at 593:11–21.

3. Total Investments in Labor and Capital

Adding Netgear’s investments in labor and capital results in:

	'714 patent	'698 patent	'179 patent
R&D and Product Management	[REDACTED]	[REDACTED]	[REDACTED]

Technical support				
Operations				
Total				

CX-3103C ('714 patent, lines [6], [8], [11], and [12]); CX-3104C ('698 patent, lines [6], [8], [11], and [12]); and CX-3105C ('179 patent, lines [6], [8], [11], and [12]).

E. Total Investments

Adding Netgear's investments in plant and equipment and labor and capital relating to domestic industry activities for each of the asserted patents results in the following:

'714 Patent	Plant and Equipment	Labor and Capital	Total
R&D and product management			
Technical support			
Operations			
Total			

'698 Patent	Plant and Equipment	Labor and Capital	Total
R&D and product management			
Technical support			
Operations			
Total			

'179 Patent	Plant and Equipment	Labor and Capital	Total
R&D and product management			
Technical support			
Operations			
Total			

Mulhern Tr. at 594:10–595:19. The evidence supports these investments by Netgear. In addition, these investments are not substantively challenged by TP-Link.

F. Significance of Netgear's Investments

1. Qualitative Significance

Netgear asserts that its investments in plant and equipment and labor and capital related to its domestic industry products are qualitatively significant. Netgear Br. at 179–183; and Mulhern Tr. at 595:20–597:23.

The evidence supports that while non-U.S. Netgear personnel and third-party contractors contribute to the development of the domestic industry products, Netgear's U.S. employees supporting its domestic industry products play a critical role in their development. Without the work performed by the U.S. research and development and product management teams at its U.S. facilities, the domestic industry products would not exist. Mulhern Tr. at 596:2–9. Specifically, Netgear's U.S. research and development personnel, including its chief technical officer, its chief technical officer for software, its vice president of product design, its vice president of wireless engineering, testing personnel, and various engineers, among others, are responsible for overall development of product specifications, including product design, software and hardware engineering and development, product security, quality assurance and certification of the domestic industry products. CX-2885C. In California, Netgear's engineers are responsible for designing, developing, and testing the domestic industry products. Loi Tr. at 62:3–6. Throughout this process, Netgear's product management team, which is responsible for the management of a product or families of products from the design and engineering phase through the commercial launch of the product, work with research and development and engineering to design and develop the products. Loi Tr. at 62:8–12; RX-0334C (Cheng Dep. Tr.) at 13:12–14:14; and RX-0328C (Gielty Dep. Tr.) at 188:8–19.

The evidence supports that Netgear's domestic activities are essential to the development of the domestic industry products, occur primarily at Netgear's U.S. headquarters and test house, and are performed by Netgear's U.S. personnel and contractors. The evidence therefore supports that Netgear has made qualitatively significant investments in plant and equipment and labor and capital associated with its domestic industry products during the domestic industry period. *See, e.g., Certain Table Saws Incorporating Active Injury Mitigation Technology and Components Thereof*, Inv. No. 337-TA-965, Order No. 10, ID at 17 (Mar. 22, 2016) (EDIS Doc. ID 579776), *not reviewed by* Comm'n Notice (Apr. 21, 2016) (EDIS Doc. ID 579254) (finding qualitative significance in the continued development, improvement, production and sales of domestic industry products); *see also Certain Raised Garden Beds and Components Thereof*, Inv. No. 337-TA-1334, Comm'n Op. at 48 (Apr. 1, 2024) (affirming finding in the ID of qualitative significance where research and development and testing in the United States were necessary to support ongoing product development and maintenance) (EDIS Doc. ID 817237).

The evidence also supports that Netgear provides U.S.-based technical support services, including oversight of third-party call center personnel, Level 3 technical support, management of Netgear's community forums, design and management of technical support certification programs, and management of Netgear's subscription support service. *Loi Tr.* at 75:8–77:7; *Mulhern Tr.* at 596:21–597:10; CX-2902C; CX-2972 ; CX-2973; and RX-0331C (*Loi Dep. Tr.*) at 123:8–124:16 and 202:7–203:18. The evidence supports that the overall management and direction of Netgear's technical support activities worldwide is conducted by a domestic Netgear employee. CX-2902C. Similarly, a Netgear U.S. employee is responsible for management of the Community forum in the United States. CX-2902C. In addition, Netgear's technical support agent certification program

is designed and managed by a U.S. employee, and Netgear's ProSupport subscription support service is managed in the United States. CX-2902C; *see also* CX-3010.

The Level 3 services provided by Netgear's technical support personnel (including those in the U.S.) address the most difficult support issues that customers have; this is the final layer of support has responsibility to successfully resolve customers' concerns. Loi Tr. at 75:15–22; RX-0331C (Loi Dep. Tr.) at 202:7–203:18. Although some of the Level 3 support for U.S. customers is performed outside the U.S., U.S. technical support employees are responsible for the overall management of the Level 3 support system and are engaged in providing that support. CX-2902C and RX-0331C (Loi Dep. Tr.) at 123:8–124:16 and 202:7–203:18.

Netgear's technical support in the United States also supports that its domestic industry activities are qualitatively significant. *Certain Devices for Improving Uniformity Used in a Backlight Module*, Inv. No. 337-TA-805, Initial Determination at 56-61 (Oct. 22, 2012) (finding the economic prong satisfied by investments in a technical support call center and service centers for LCD televisions) (EDIS Doc. ID 495597), *aff'd in relevant part* by Comm'n Op. at 26–27 (May 17, 2013) (EDIS Doc. ID 509436); *Certain Video Displays*, Inv. No. 337-TA-687, Order No. 20 at 11 (May 20, 2010) (finding the economic prong satisfied by investments in a call center, repair orders, warranty claims, and return authorizations for LCD and plasma televisions) (EDIS Doc. ID 426963).

TP-Link argues that “Netgear’s analysis for qualitative significance of plant and equipment expenses under subparagraph (A) focuses solely on *labor* activities and does not discuss any alleged qualitative significance of Netgear’s plant and equipment.” TP-Link Reply at 147 (emphasis in original). TP-Link disregards that the activities underlying Netgear’s plant and equipment labor activities occur in San Jose, the location of the Netgear headquarters facility and

test house, for which Netgear identified plant and equipment expenses. TP-Link's criticism is particularly irrelevant where, as here, all Netgear's domestic industry products are designed in the United States. Qualitative significance is evident where the domestic industry products would not in fact exist without the domestic industry activities. *Certain Percussive Massage Devices*, Inv. No. 337-TA-1206, Comm'n Op. at 11 and 14–15 (Jan. 4, 2022) (EDIS Doc. ID 759545).⁴³

TP-Link also asserts that "Netgear has not provided any analysis to determine what if any value is added to the DI products in the United States by its domestic activities or how Netgear's overall domestic expenditures compare to its total foreign expenditures." TP-Link Reply at 148. In circumstances in which a research and development-based or technical support-based domestic industry is demonstrated, a value-added analysis may not be meaningful. *Mulhern Tr.* at 603:18–604:10. Moreover, here, the value-added to the domestic industry products is self-evident they are designed and developed in the United States. There would be no domestic industry products without Netgear's qualifying activities that are performed in the United States.

The evidence supports that Netgear's investments are qualitatively significant.

2. Quantitative Significance

Netgear contends that its investments in plant and equipment and labor and capital related to its domestic industry products are quantitatively significant. *Netgear Br.* at 183–193.

The evidence demonstrates that the domestic industry products are important to Netgear, accounting for a significant proportion of worldwide and U.S. sales revenues. During the domestic industry period, the domestic industry products represented approximately [REDACTED] of Netgear's

⁴³ TP-Link trivializes Netgear's domestic industry investments by comparing Netgear's investments to its sales. TP-Link Reply at 147. TP-Link, however, does not cite to precedent establishing that this comparison is appropriate here or required by the Commission.

worldwide sales. CX-3076C (worldwide sales, line [25]); *see also id.* at line [7], identifying the '714 patent domestic industry products as representing [REDACTED] of worldwide sales, at line [10], identifying the '698 patent domestic industry products as representing [REDACTED] of worldwide sales, at line [13], identifying the '179 patent domestic industry products as representing [REDACTED] of worldwide sales. Over this same period, in the U.S., the domestic industry products accounted for [REDACTED] of Netgear's total sales. CX-3075C (U.S. sales, line [25]); *see also id.* at line [7], identifying the '714 patent domestic industry products as representing [REDACTED] of U.S. sales, at line [10], identifying the '698 patent domestic industry products as representing [REDACTED] of U.S. sales, at line [13], identifying the '179 patent domestic industry products as representing [REDACTED] of worldwide sales. The evidence thus supports that the genesis of a considerable proportion of Netgear's U.S. and worldwide revenue results from Netgear's domestic industry activities and demonstrates quantitative significance. Further, even without considering the '179 patent domestic industry products, the sales of the '714 and '179 domestic industry products, respectively representing [REDACTED] of U.S. sales, are quantitatively significant.

Quantitative significance is also demonstrated by comparing the number of Netgear U.S. personnel supporting the domestic industry products to its total U.S. employees engaged in those activities. Of the [REDACTED] U.S. Netgear employees in research and development, [REDACTED], or [REDACTED], are in departments supporting the domestic industry products. For product management employees, [REDACTED] of the [REDACTED] U.S. employees, or [REDACTED], have technical roles and are in departments supporting the domestic industry products. Of the [REDACTED] Netgear U.S. employees in technical support, [REDACTED], are in departments supporting the domestic industry products. Combined across the research and development, technical product management, and technical support departments, Netgear employees supporting the domestic industry products represent [REDACTED] of U.S. employees in those

job categories. Mulhern Tr. at 597:24–598:19; CX-2866C; CX-2901C–CX-2902C; CX-2885C–CX-2886C; CX-2865C; and CX-2905C.⁴⁴

A comparison with worldwide employees also supports quantitative significance. As of 2023, the [REDACTED] Netgear employees involved in research and development with respect to the domestic industry products represent [REDACTED] of Netgear’s total. For product management, that number is [REDACTED]. Collectively, [REDACTED] of Netgear’s research and development and technical product management personnel supporting the domestic industry products are based in the United States. Mulhern Tr. at 599:4–17.CX-2865C; CX-2901C; and CX-2902C.

A comparison of Netgear’s U.S. headcounts in technical support also demonstrates these investments are quantitatively significant. The evidence supports that a significant share of Netgear technical support personnel engaged in support of the domestic industry products are based in the United States. Mulhern Tr. at 601:22–602:12. In addition to the [REDACTED] U.S. and [REDACTED] foreign Netgear employees in Netgear’s relevant department, there are three additional Netgear employees based in Japan that also provide technical support for CHP products. Including these additional non-U.S. employees, the evidence supports that [REDACTED] of technical support employees identified by Netgear as supporting its domestic industry products are based in the United States. CX-3087C; CX-3107C (U.S. and worldwide headcount employees supporting domestic industry products).

The evidence also shows that Netgear’s U.S. labor investments in dollars spent on research and development and product management allocated to the domestic industry products are significant in comparison to its analogous worldwide labor investments. Using the same

⁴⁴ TP-Link faults Netgear for not identifying employees “at the product or product family level.” Netgear Reply at 149. That level of granularity, however, is not required. Under the circumstances, I find Netgear’s allocation reasonable.

methodology used to estimate Netgear's total U.S. labor investments in the domestic industry products, Ms. Mulhern estimated Netgear's total foreign labor investments in support of the domestic industry products. CX-3115C (salaries for non-U.S. employees); CX-3117C (bonuses for non-U.S. employees). Ms. Mulhern used a sales-based allocation to allocate those worldwide investments to the domestic industry products. CX-3119C (worldwide allocation to domestic industry products). To calculate Netgear's worldwide labor investments in research and development and product management allocated to the domestic industry products, she then combined the claimed U.S. labor investments with these foreign labor investments. Mulhern Tr. at 599:18–600:4 and CX-3120C. This comparison showed that U.S. research and development labor expenses were █████ of the worldwide total; U.S. product management labor expenses were █████ of the worldwide total; and combined research and development and product management labor expenses were █████ of the worldwide total. CX-3120C at lines [4], [8], and [11].

The evidence also shows that Netgear's U.S. research and development investments in equipment constitute a significant share of its worldwide equipment research and development investments. Mulhern Tr. at 598:14–599:3. From 2020 to 2022, research and development equipment investments allocated to the domestic industry products totaled █████ in the United States and █████ worldwide. For that period, therefore, Netgear's research and development equipment investments in the United States were █████ of its worldwide total. For 2020, that percentage was █████; for 2021 it was █████; for 2022, that percentage was almost █████, showing an increase over the domestic industry period. CX-2870C; CX-2901C; CX-3110C; *see also* CDX-0004C.25.

The evidence also supports quantitative significance of Netgear's U.S. labor and capital investments as compared to such investments worldwide. Mulhern Tr. at 601:6–21. For research

and development and product management investments allocated to the domestic industry products specifically in the U.S., in-house labor and third-party research and development capital investments were [REDACTED] from 2020 through 2022. CX-3125C, line [4]. Similarly, worldwide, the allocated labor and capital investments in these same categories were [REDACTED]. *Id.*, line [9]. The claimed domestic investments in research and development labor and capital are approximately [REDACTED] of worldwide investments allocated to the domestic industry products. *Id.* at line [11].

Similarly, U.S. in-house labor investments in technical support for the domestic industry products are quantitatively significant. Using the same methodology as with research and development labor investments, Ms. Mulhern estimated U.S. and foreign labor investments associated with technical support allocable to the domestic industry products. Mulhern Tr. at 602:13–603:4. Ms. Mulhern calculated U.S. investments in technical support allocable to the domestic industry products account for [REDACTED] of such worldwide investments. CX-3120C, line [15].

TP-Link contends that Netgear’s quantitative significance analysis is flawed because Netgear did not perform its analysis on a patent-by-patent basis. TP-Link Reply at 146–47. As noted above, “the Commission has accepted reasonable allocation methods to estimate the amount of complainant’s investments that can be attributed to each asserted patent, as for example, an allocation based on sales.” *Electronic Stud Finders*, Inv. No. 337-TA-1221, Comm’n Op. at 50–51, *aff’d by Zircon v. Int’l Trade Comm’n*, No. 22-1649, slip op. at 18–19 (May 8, 2024) (noting that the complainant’s “revenue-based patent-by-patent breakdown” was not in the evidentiary record). Further, Ms. Mulhern presented numerous calculations comparing the claimed U.S. domestic industry investments to worldwide investments, demonstrating in several different

ways the quantitative significance of Netgear's investments. Undertaking these calculations on a patent-by-patent basis is unnecessary because, from a mathematical perspective, the sales-based allocation methodology results in consistent percentages across patents. Mulhern Tr. at 600:5–601:2. In other words, the analysis for each patent would involve multiplying both the numerator and the denominator by the same sales-based allocation factor. As a result, the quantitative significance percentages would not change.

The various preceding comparisons demonstrate that Netgear's domestic industry investments are quantitatively significant.

G. Conclusion on Economic Domestic Industry

Based on the evidence presented, I find that Netgear has satisfied the economic prong of the domestic industry requirement under section 337(a)(3)(A) based on significant investments in plant and equipment related to its domestic industry products. I further find that Netgear has satisfied the economic prong of the domestic industry requirement under section 337(a)(3)(B) based upon significant investment significant investments in employment of labor and capital related to its domestic industry products. In view of its significant expenditures related to the domestic industry products alleged to be covered by the asserted patents, I find that Netgear has satisfied the economic domestic industry requirement under sections 337(a)(3)(A) and (B).

X. CONCLUSIONS OF LAW

1. The Commission has statutory jurisdiction.
2. The Commission has personal jurisdiction over the parties.
3. The Commission has *in rem* jurisdiction over the accused products.
4. Netgear is the owner by assignment of the asserted patents.
5. The importation requirement is satisfied for the accused products.
6. Claim 13 of the '714 patent has been shown to be infringed.

7. Claims 12, 15, 17 and 19 of the '698 patent have been shown to be infringed.
8. Claim 11 of the '179 patent has been shown to be infringed.
9. Claim 13 of the '714 patent has not been shown to be invalid.
10. Claims 12, 15, 17 and 19 of the '698 patent have not been shown to be invalid.
11. Claim 11 of the '179 patent has not been shown to be invalid.
12. The technical prong of the domestic industry requirement has been satisfied with respect to the '714 patent.
13. The technical prong of the domestic industry requirement has been satisfied with respect to the '698 patent.
14. The technical prong of the domestic industry requirement has not been satisfied with respect to the '179 patent.
15. The economic prong of the domestic industry requirement has been satisfied with respect to the '714, '698 and '179 patents.

XI. RECOMMENDED DETERMINATION ON REMEDY AND BOND

The Commission has broad discretion in selecting the form, scope, and extent of any remedy. *Viscofan, S.A. v. Int'l Trade Comm'n*, 787 F.2d 544, 548 (Fed. Cir. 1986); *see also Hyundai Electronics Industries Co. Ltd. v. Int'l Trade Comm'n*, 899 F.2d 1204, 1209 (Fed. Cir. 1990). By Commission rule, the administrative law judge must issue a recommended determination on the appropriate remedy if the Commission finds a violation of section 337 and on the amount of bond to be posted by respondents during Presidential review of any Commission remedy. *See* 19 C.F.R. § 210.42(a)(1)(ii). I address these issues below.

A. Limited Exclusion Order

Section 337(d)(1) provides that “[i]f the Commission determines, as a result of an investigation under this section, that there is a violation of this section, it shall direct that the articles concerned, imported by any person violating the provision of this section, be excluded from entry into the United States, unless, after considering the [public interest], it finds that such

articles should not be excluded from entry.” 19 U.S.C. § 1337(d)(1). The Commission is required to issue an exclusion order upon the finding of a section 337 violation absent a finding that the effects of any of the statutorily-enumerated public interest factors counsel otherwise. *Spansion v. Int’l Trade Comm’n*, 629 F.3d 1331, 1358 (Fed. Cir. 2010). The issue of public interest was not delegated to me by the Commission, so it is not addressed here. *Certain Automated Put Walls and Automated Storage and Retrieval Systems, Associated Control Software, and Component Parts Thereof*, Inv. No. 337-TA-1293, Comm’n Op. at 29, n.25 (Jul. 31, 2023) (EDIS Doc. ID 802614).

TP-Link has not requested any certification provisions or exemptions to a limited exclusion order. *See* TP-Link Reply at 149–54. If the Commission determines that there is a violation of section 337, I recommend that the Commission issue a limited exclusion order barring entry of TP-Link products that infringe claim 13 of the ’714 patent and claims 12, 15, 17 and 19 of the ’698 patent.

B. Cease and Desist Order

Section 337(f)(1) provides that in addition to, or in lieu of, the issuance of an exclusion order, the Commission may issue a cease and desist order as a remedy for violation of section 337. 19 U.S.C. § 1337(f)(1). A cease and desist order is generally issued when a respondent maintains commercially significant inventories in the United States or has significant domestic operations that could undercut the remedy provided by an exclusion order. *Certain Table Saws Incorporating Active Injury Mitigation Technology and Components Thereof*, Inv. No. 337-TA-965, Comm’n Op. at 4–6 (Feb. 1, 2017) (EDIS Doc. ID 602496). “A complainant seeking a cease and desist order must demonstrate, based on the record, that this remedy is necessary to address the violation found in the investigation so as to not undercut the relief provided by the exclusion order.” *Id.* at 5.

TP-Link has stipulated that it held more than [REDACTED] of accused products in domestic inventory in each of March and April of 2023, and also stipulated that it would not contend that its inventory lacked commercial significance. Joint Stipulation at ¶ 7. In addition, the evidence supports that TP-Link's domestic inventory is approximately [REDACTED] Mulhern Tr. at 605:1–10; CX-3057C; and CX-3128C–CX-3130C. The evidence supports that TP-Link's sale of accused products from its commercially significant domestic inventory would undercut the relief provided by a limited exclusion order. *Certain Microfluidic Devices*, Inv. No. 337-TA-1068, Comm'n Op. at 27 (Jan. 10, 2020) (EDIS Doc. ID 698855). TP-Link did not address any exemptions to a cease and desist order in its post-hearing briefing, so none are addressed here. *See* TP-Link Reply at 149–54.

Based on the evidence and arguments, I recommend issuance of a cease and desist order if the Commission finds a violation.

C. Bond During Presidential Review Period

When the Commission enters an exclusion order or a cease and desist order, a respondent may continue to import and sell its products during the 60-day Presidential review period under an amount determined by the Commission to be “sufficient to protect the complainant from any injury.” 19 U.S.C. § 1337(j)(3); *see also* 19 C.F.R. § 210.50(a)(3); and *Automated Put Walls*, Inv. No. 337-TA-1293, Comm'n Op. at 46. Netgear bears the burden of establishing the need for a bond. *Id.* at 47.

When reliable price information is in the record, the Commission often sets the bond by eliminating the differential between the domestic product and the imported product. *Id.* at 46. The Commission may also use a reasonable royalty rate to set the bond amount where one can be determined from the record. *Id.* Where the record establishes that the calculation of a price

differential is impractical or there is insufficient evidence in the record to determine a reasonable royalty, the Commission has imposed a 100 percent bond. *Id.*

Netgear argues that “[i]n the unique circumstances of this investigation, a price comparison cannot be drawn and a reasonable royalty cannot be determined. Thus, to protect Netgear from any further injury, the amount of the bond for the accused products should be set at 100% of the entered value of the infringing products during the PRP.” Netgear Br. at 195. Netgear argues that a reliable price differential analysis is impractical because (1) “because both Netgear and TP-Link offer extensive discounts and rebates on their products and both sell their products at the wholesale level and directly to consumers (with different average prices for the different channels), reliable average price comparisons are not available”; (2) “because there are scores of products-at-issue with a wide range of features and capabilities, the products-at-issue are available at a wide range of prices across models”; and (3) “even within product models, Netgear and TP-Link offer the products-at-issue at a wide range of prices across retailers and sales channels” and for consumer prices, retailers such as Amazon, Walmart, and Netgear’s/TP-Link’s respective websites “may have specific incentives, coupons, and discounts that impact the prices from day-to-day.” *Id.* at 196–97.

TP-Link argues that “[b]ecause data was available to Netgear, it should have performed a price differential analysis to calculate the appropriate bond” and because it did not, its proposal of a bond of “50% or less” is appropriate. TP-Link Reply at 150–54.

TP-Link’s expert agreed that this investigation involves 83 accused products and 78 domestic industry products and that those products have different features and prices. Rowe Tr. at 709:12–710:12. TP-Link’s expert testified that while some comparisons may be more informative than others, mathematically speaking, hundreds of comparisons could be made

between the domestic industry products list and the accused products list. *Id.* at 711:8–712:11. TP-Link’s expert also agreed that “using Netgear and TP-Link’s sales data” “to analyze price differentials isn’t practical in the investigation due to limitations in the data.” *Id.* at 712:12–16. As a result, TP-Link’s expert considered MSRP data and compared around six Netgear products to six TP-Link Products, arriving at a price differential of up to 50%. Rowe Tr. at 713:25–714:6; and TP-Link Reply at 153–54; *see also* RDX-0004C.5–16.

The available price information supports that meaningful price differential analyses were impractical. The relatively small number of price differentials performed by TP-Link’s expert include the caveat that the identified prices are those “before markdown.” *See* RDX-0004.014–.016. In addition, the information identified by TP-Link’s expert shows different prices than those identified for the same products depending on where that product was sold. Rowe Tr. at 717:3–718:10 (confirming different prices for the same product at Amazon and Walmart and confirming that “that kind of difference in price for the same product at one outlet to another is a fairly common thing”).

In circumstances in which basing the bond on price differentials between the parties’ products “would be very problematic because of the variety of products involved, . . . the wide variations in pricing, . . . and the many distribution methods employed . . . setting an individual bond amount for each kind of [infringing product] is not practical or justified.” *Certain Self-Cleaning Litter Boxes and Components Thereof*, Inv. No. 337-TA-625, USITC Pub. No. 4259, Initial Determination at 207–208 (Oct. 2011), *aff’d* by Comm’n Op. at 63 (EDIS Doc. ID 464343). Where a price comparison is not possible, the Commission has set a 100 percent during the Presidential review period. *Id.*, citing *Certain Erasable Programmable Read-Only Memories*, Inv. No. 337-TA-276, USITC Pub. No. 2196, Comm’n Op. at 132–133 (May 1989) (EDIS Doc.

ID 217183) (“the broad range of EPROM prices cited by the parties precludes using direct price comparisons as a basis of the bond amount”); *Certain Amorphous Metal Alloys and Amorphous Metal Articles*, Inv. No. 337-TA-143, USITC Pub. No. 1664, Comm’n Op. at 11–12 (1984) (Nov. 1984) (EDIS Doc. ID 235423) (“The imported articles have been sold at various prices”).

I find that that data was too sparse and impractical for purposes of price differential analysis in view of the large differences in pricing at the retail and wholesale levels as well as a large range of features and capabilities. Because a price differential analysis is impractical and because no party has suggested any other mechanism for assessing the appropriate bond, I recommend that the Commission impose a 100 percent bond during the presidential review period.

XII. INITIAL DETERMINATION ON VIOLATION

It is my initial determination that a violation of section 337 of the Tariff Act, as amended, has occurred by the importation into the United States, the sale for importation, or the sale within the United States after importation of certain Wi-Fi routers, Wi-Fi devices, mesh Wi-Fi network devices, and hardware and software components thereof based on infringement of U.S. Patent Nos. 7,936,714 and 10,681,698. I hereby certify this Initial Determination and Recommended Determination to the Commission.

The Secretary shall serve the confidential version of this Initial Determination and Recommended Determination upon counsel who are signatories to the Protective Order (Order No. 1) issued in this investigation. A public version will be served on all parties of record later.

Under 19 C.F.R. § 210.42(h), this Initial Determination shall become the determination of the Commission unless a party files a petition for review under 19 C.F.R. § 210.43(a) or the Commission orders on its own motion a review of the Initial Determination or certain issues therein under 19 C.F.R. § 210.44.

XIII. ORDER

Within seven days of the date of this document, the parties shall jointly submit a single proposed public version with any proposed redactions indicated in red. If the parties submit excessive redactions, they may be required to provide declarations from individuals with personal knowledge, justifying each proposed redaction and specifically explaining why the information sought to be redacted meets the definition for confidential business information set forth in 19 C.F.R. § 201.6(a). The proposed redactions should be made electronically, in a single PDF file using the “Redact Tool” within Adobe Acrobat. The proposed redactions should be submitted as “marked” but not yet “applied.” The proposed redactions should be submitted via email to JohnsonHines1361@usitc.gov and not filed on EDIS.

SO ORDERED.



Doris Johnson Hines
Administrative Law Judge

CERTIFICATE OF SERVICE

I, Lisa R. Barton, hereby certify that the parties listed have entered an appearance in the above captioned investigation, and a copy of the PUBLIC CERTIFICATE OF SERVICE was served upon the following parties via first class mail and air mail where necessary.

Document	Security	Document Type	Official Rec'd	Title
823596	Public	ID/RD - Final on Violation	06/12/2024 03:47 PM	Initial Determination on Violation of Section 337 and Recommended Determination on Remedy and Bond

Service Date: June 12, 2024

/s

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CERTIFICATE OF SERVICE

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