

Filed on behalf of: Netgear, Inc.

Entered: July 9, 2024

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

TP-LINK CORPORATION LIMITED,
Petitioner,

v.

NETGEAR, INC.,
Patent Owner.

Case IPR2023-01469
Patent 10,681,698 B2

PATENT OWNER'S RESPONSE

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<i>Xerox Corp. v. Bytemark, Inc.</i> , IPR2022-00624, Paper 9 (Aug. 24, 2022)	63

Exhibit List

Exhibit	Description
2001	Declaration of Zygmunt J. Haas, Ph.D. (“Haas Decl.”)
2002	<i>Curriculum Vitae</i> of Zygmunt J. Haas, Ph.D.
2003	Order No. 33: Construing Certain Claim Terms, <i>Certain Wi-Fi Routers, Wi-Fi Devices, Mesh Wi-Fi Network Devices, and Hardware and Software Components Thereof</i> , Inv. No. 337-TA-1361 (Dec. 15, 2023) (“ITC CC order”)
2004	Email from Board to Counsel Authorizing Patent Owner’s Request for Counsel Withdrawal in IPR2023-01393 et al. (Mar. 20, 2024)
2005	Declaration of Blake R. Davis in Support of Patent Owner’s Unopposed Motion for <i>Pro Hac Vice</i> Admission Under 37 C.F.R. § 42.10(c)
2006	Second Declaration of Zygmunt J. Haas, Ph.D. (“Haas 2nd Decl.”)
2007	Deposition transcript of Zhi Ding, Ph.D., <i>TP-Link Corp. v. Netgear, Inc.</i> , IPR2023-01469 (P.T.A.B. May 31, 2024) (“Ding Dep.”)
2008	Initial Determination on Violation of Section 337 and Recommended Determination on Remedy and Bond, <i>In re Certain Wi-Fi Routers, Wi-Fi Devices, Mesh Wi-Fi Network Devices, & Hardware & Software Components Thereof</i> , No. 337-TA-1361 (U.S.I.T.C. May 30, 2024) (Redacted Public Version)
2009	TP-Link Respondents’ Petition for Review of the Initial Determination of Violation of Section 337, <i>In re Certain Wi-Fi Routers, Wi-Fi Devices, Mesh Wi-Fi Network Devices, & Hardware & Software Components Thereof</i> , No. 337-TA-1361 (U.S.I.T.C. June 11, 2024) (Redacted Public Version)

Exhibit	Description
2010	Summary of TP-Link Respondents' Petition for Review of the Initial Determination of Violation of Section 337, <i>In re Certain Wi-Fi Routers, Wi-Fi Devices, Mesh Wi-Fi Network Devices, & Hardware & Software Components Thereof</i> , No. 337-TA-1361 (U.S.I.T.C. June 11, 2024) (Redacted Public Version)
2011	Oscar Bejarano & Edward W. Knightly, <i>IEEE 802.11ac: From Channelization to Multi-User MIMO</i> , IEEE COMM'NS MAG., Oct. 2013, at 84–90

I. Introduction

Patent Owner Netgear, Inc., respectfully submits this Response to the Petition for *inter partes* review (“IPR”) of U.S. Patent No. 10,681,698 (“’698 patent”), filed by TP-Link (“Petitioner”). The Petition presents two invalidity grounds against the independent claims of the ’698 patent, one based on Gatewood and one based on Ho. Both should be rejected.

As to the Gatewood Ground, the Board properly found in the Institution Decision (“Decision” or “DI”) that it is “weak” on the merits (DI 9-10), including because Gatewood fails to disclose performing attempts to utilize different channels as a backhaul with the same second node as required by independent claims 1 and 12. *Id.* 24-27. And, although Petitioner’s Gatewood ground is purportedly one of obviousness, “Petitioner has not proposed a modification to Gatewood using Ho, Handforth, or Sinha for the backhaul limitation.” *Id.* 26.¹ Likewise, there are no motivations to combine. *Id.* 27. The record with respect to those independent claims has not changed, and the Board should find all challenged claims patentable over the Petition’s Gatewood ground. Moreover, if the Board reaches the dependent claims with respect to Ground 1, Petitioner’s

¹ Unless otherwise indicated, all emphases are added and internal quotation marks and citations are omitted.

arguments against challenged claims 2-6 and 13-17 based on Gatewood fail for multiple additional reasons. Tellingly, following the Board's Decision, Petitioner withdrew its invalidity arguments based on Gatewood in the co-pending litigation at the ITC and challenged the '698 patent only based on Ho.

The Petition's second Ground, based on Ho alone, should also be rejected. The Petition cherry picks portions of Ho's hybrid wireless network and stitches them together to satisfy the claims, but ignores fundamental requirements of Ho's disclosed system that make the described network incompatible with the inventions of the challenged claims. Indeed, that is what the ITC recently determined too.

Petitioner presented the same single-reference obviousness arguments based on Ho to the ITC and, after thoroughly analyzing Ho's system, the ITC determined that all challenged claims of the '698 patent in that proceeding (claims 12, 15, 17, and 19) were not anticipated or rendered obvious by Ho. In so doing, the ITC found among other things that "the backhaul is ..., as opposed to a front haul ... in the network[]" recited in the independent claims is "directed to a dedicated backhaul," which Ho fails to disclose or render obvious. Ex.2008, 131-149. The ITC also correctly determined that Ho failed to disclose or render obvious dependent claims 15, 17 and 19 for multiple independent reasons. Notably, TP-Link did not appeal those validity findings to the Commission. The Board should

reach the same conclusion here and find TP-Link has failed to meet its burden of showing that any challenged claim is unpatentable over Ho.

II. Background

A. Overview of the '698 Patent

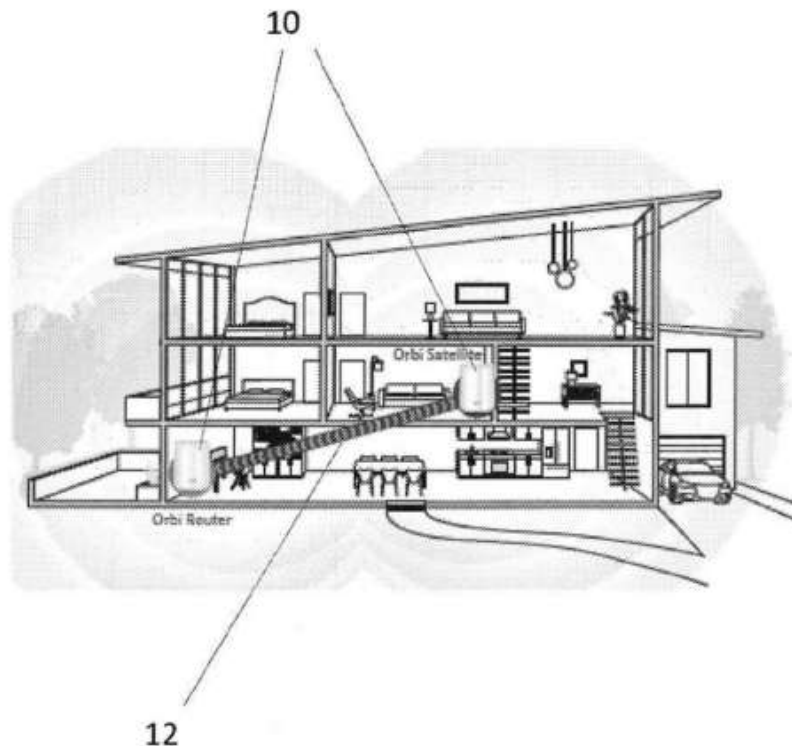
The '698 patent (Ex.1001), is titled “Dedicated Backhaul for Whole Home Coverage” and relates to home wireless communication networks. The specification discloses that home wireless networks “can comprise an access point (AP) with links to various repeaters.” Ex.1001, 1:31-32. Also referred to as “mesh networking,” the “access points are connected wirelessly and exchange data frames with each other to forward traffic to/from a gateway point, such as the AP.” *Id.*, 1:34-37.

The '698 patent explains that while mesh networks were known, they can be “difficult to set up and maintain, especially where intermediate links between the edge and the access point are added, such as when intermediate repeaters relay traffic between the AP and a remote repeater that is out of range of the AP.” *Id.*, 1:37-41. To address that problem, the '698 patent discloses “optimization techniques” for the communications between access points in mesh networks including the use of a channel within a frequency band, such as the “5 GHz high band,” as a “dedicated backhaul” that is used by a first and second AP only for communications between them. *Id.*, 1:45-51, 3:45-51 (explaining the 5GHz “high

band is defined in US as channels 100 to 140+149 to 165”). In other words, a channel is “dedicated” to backhaul because it is used exclusively for backhaul between APs as opposed to being also used for front haul communications between an AP and client devices. *See id.*, 3:45-65, 9:9-17, Fig. 2.

If a channel is being used as a dedicated backhaul, the '698 patent explains that there could be a need for a “backup” backhaul between the first and second node, such as a channel on the 2.4GHz band, if the “5 GHz band fails to reach between nodes[]” or it is otherwise detected that the received signal strength of the backhaul band is too low. *Id.*, 1:45-51; *see also id.*, 2:50-51, 3:48-50.

Figure 1, reproduced below, illustrates a home network with a backhaul (12) between a router and satellite (10).



Ex.1001, Fig. 1

In this example, the backhaul frequency channel that is first attempted to be utilized between the satellite and router is a “dedicated backhaul” frequency channel in the 5GHz band. *Id.*, 1:51-53. However, if it is detected that the “the dedicated wireless link falls below the quality threshold, the 2.4 GHz band may be used as a backup option.” *Id.*, 3:48-50.

This use of 5GHz as the dedicated backhaul and 2.4GHz as an alternative backhaul between the same two nodes is described in greater detail with respect to Figure 2 of the '698 patent, reproduced below. *Id.*, 3:52-53.

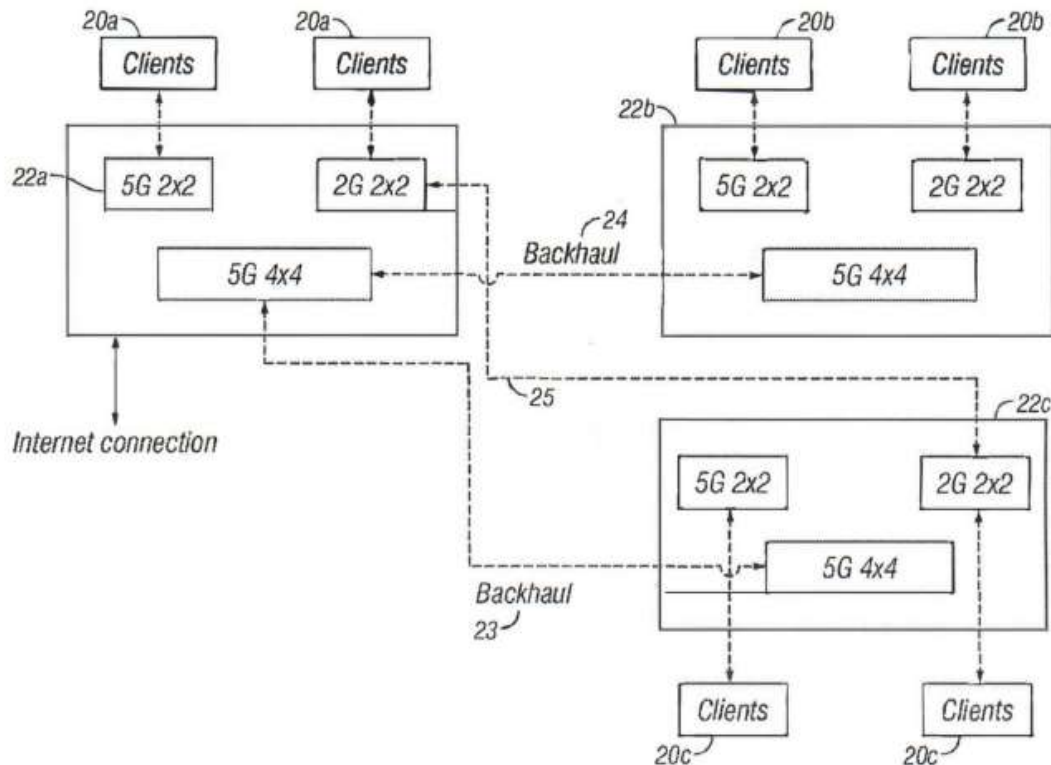


FIG. 2

Ex.1001, Fig. 2

Specifically, the access points in a mesh network are nodes 22a-22c, each including “2.4 GHz radios” and “5 GHz” radios for connecting to client devices, and “[t]he nodes are connected by dedicated 5 GHz backhaul connections 23, 24[]” or “[a] 2.4 GHz connection 25.” *Id.*, 3:55-65. As depicted, the dedicated 5GHz backhaul is not connected to any client facing radios, whereas the 2.4GHz radios have both backhaul and fronthaul connections. The nodes are configured to attempt to utilize a channel in the dedicated 5GHz channel, but if the quality of the wireless link is detected to be below a threshold, the 2.4GHz channel is attempted in the alternative. *Id.*, 3:48-51, 4:28-31, 4:44-50. In these attempts, the channels used are

prioritized based on a received signal strength in order to select the best channel for backhaul. *See id.*, Figs. 5-6.

In addition to the above examples, the specification uses a dedicated backhaul in every disclosed embodiment, and the phrase “dedicated backhaul” appears at least 35 times in the written description. Ex.2006 (Haas 2nd Decl.) ¶34.

B. Prosecution History

The application that issued as the '698 patent was originally filed with 22 claims, and issued after Patent Owner overcame one non-final rejection by the Examiner.

The originally-filed claims were rejected in a first Office Action as indefinite for reciting “and/or” and as anticipated or obvious over Mallik² and Ho.³ Ex.1004, 123-26.

Without amending the claims, the Applicant overcame the rejection by explaining the term “and/or” means “A alone, B alone, or A and B together” and the prior art failed to disclose or render obvious the “upon detecting...” element in the independent claims. *Id.*, 167-68. The Examiner agreed and allowed the claims, finding that the claims “are allowable in view of the remarks filed on 10/25/2019”

² U.S. Patent Application Publication No. 2013/0194948 (Ex.1007).

³ U.S. Patent Application Publication No. 2015/0049616.

including the prior art did not show “switching for a mesh wireless network backhaul communication, upon detection that the received signal strength of the first backhaul channel is below a threshold.” Ex.1004, 877.

C. Person of Ordinary Skill in the Art

For the '698 patent, a person of ordinary skill in the art (“POSA”) would be a person with a bachelor’s degree in a technical field such as electrical engineering, computer engineering, computer science, or physics, and/or 2-3 years of relevant practical experience in wireless communication, data communication, or wireless networking systems. Ex.2006 ¶29. This is materially the same as what is asserted in the Petition (Pet. 6), and the challenged claims are valid under any reasonable level of ordinary skill. Ex.2006 ¶30.

III. Claim Construction

A. “the backhaul is ..., as opposed to a front haul ... in the network” should be construed to require a dedicated backhaul.

Independent claims 1 and 12 recite “performing an attempt to *utilize a first channel in a default frequency band as a backhaul* with second node in the network, 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 Board preliminarily found that the claim language “as opposed to a front haul” is merely “a comparison between the communications that the backhaul

provides (‘management functions’) and those provided by the front haul (‘wireless data communication to clients in the network’).” DI 15. The Board noted that “Patent Owner identifies some embodiments in which the *dedicated backhaul* is not used for front-haul communications” but asserts that these embodiments are “merely exemplary.” *Id.* 16. As explained below, a “dedicated backhaul” is, by definition, not used for front-haul communications, and is not simply an exemplary feature of some embodiments. A “dedicated backhaul” is a focus of “the invention” of the ’698 patent that is part of every embodiment, and a POSA would have understood claims 1 and 12’s recitation of “the backhaul is ..., as opposed to a front haul ... in the network[.]” is directed to a dedicated backhaul.

Notably, that was also the conclusion of the Administrative Law Judge (ALJ) in the pending ITC investigation. Following the Board’s Decision, the ALJ construed the phrase including “the backhaul is ..., as opposed to a front haul ... in the network[.]” to be “directed to a dedicated backhaul.” Ex.2008, 102. Tellingly, Petitioner TP-Link did not seek review of the ALJ’s construction to the Commission, and thus that construction is now final and cannot be appealed. *See* Ex.2010, 6-9 (no dispute regarding claim construction for ’698 patent requiring dedicated backhaul); *Finnigan Corp. v. Int’l Trade Comm’n*, 180 F.3d 1354, 1362 (Fed. Cir. 1999) (“A party seeking review in this court of a determination by the Commission must ‘specifically assert’ the error made by the ALJ in its petition for

review to the Commission.”). The ITC’s construction requiring a dedicated backhaul should be adopted here too, because it is supported by the claim language, the specification, and extrinsic evidence.

Starting with the claim language, the ALJ correctly determined that “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’” requires “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.’” Ex.2008, 99-100. And there is no dispute that when a band in the network is *not* used for “wireless data communication to clients in the network,” that band is a “dedicated backhaul.” *See, e.g.,* Ex.1002 (Ding Decl.) ¶47 (agreeing “a band dedicated for backhaul communication” is one “not also used for front-haul client-facing communication”); Ex.2006 ¶37.

The Board preliminarily interpreted “as opposed to a front haul” in the claims refers to the “communications” a front haul could provide, rather than reciting “anything about the frequency bands.” DI 15. That interpretation is contradicted by claims 2/13 and 3/14. Those claims, which depend and take antecedent basis from claims 1/12, require “the front haul” recited in the

independent claims to be a “radio” of the network. Ex.1001, cls.2, 13 (wherein “said attempts” of claims 1 and 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 “utilizing a different radio”), 3, 14 (“wherein said different radio is **the same radio as the front haul**[]”). As the ALJ found, 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 attempt to utilize a channel on the “default frequency band” cannot be on a frequency band used for “wireless data communication to clients in the network.” Ex.2008, 100 (agreeing claims 13 and 14 reinforce that the independent claim requires a dedicated backhaul); Ex.2006 ¶38; *see also* Ex.2007 (Ding Dep.), 106:12-22 (agreeing that a POSA would understand references to “bands” or “channel” in the ’698 patent claims are “disclosing a radio”).

The extensive use of the phrase “dedicated backhaul” throughout the ’698 patent specification also would have informed the understanding of a POSA that “the backhaul is ... as opposed to a fronthaul ... in the network” requires a backhaul frequency band dedicated to communications between nodes and not used for device communications in the network. Ex.2006 ¶¶39, 42-43; Ex.2008, 100-101. To start, the ’698 patent is titled “Dedicated Backhaul for Whole Home Coverage.” The title of the ’698 patent indicates that a “relevant artisan would

understand the claims require” using a dedicated backhaul, e.g., “utiliz[ing] a first channel in a default frequency band as a backhaul ..., as opposed to a front haul ... in the network[.]” *See Wastow Enters., LLC v. Truckmovers.com, Inc.*, 855 F. App’x 748, 750-51 (Fed. Cir. 2021) (construing the term “device” to mean a “universal folding boom trailer” because the “patent’s title—‘Universal Folding Boom Trailer’—also indicates that a relevant artisan would understand that the claims require a universal folding boom trailer[.]”); *see Ruckus Wireless, Inc. v. Innovative Wireless Sols., LLC*, 824 F.3d 999, 1003 n.2 (Fed. Cir. 2016) (“We have used the title of a patent to aid in claim construction.”); *see also, e.g., Forest Laboratories, LLC v. Sigmapharm Laboratories, LLC*, 918 F.3d 928, 933 (Fed. Cir. 2019) (partly relying on the patent’s title when limiting claim’s scope); *UltimatePointer, L.L.C. v. Nintendo Co.*, 816 F.3d 816, 823 (Fed. Cir. 2016) (same).

The title’s focus on a “dedicated backhaul” is reflected in the remaining sections of the specification. For example, the Field of Invention states that “the invention relates to a dedicated back haul for whole home coverage.” Ex.1001, 1:22-23; *see Verizon Servs. Corp. v. Vonage Holdings Corp.*, 503 F.3d 1295, 1308 (Fed. Cir. 2007) (“When a patent ... describes the features of the ‘present invention’ as a whole, this description limits the scope of the invention.”). The Summary recites “[a] dedicated backhaul for whole home coverage.” Ex.1001,

1:43-45. Each of the figures and embodiments in the specification emphasize the use of a dedicated backhaul as part of “the invention.” *E.g., id.*, 1:63-2:32, 2:4-27 (describing each embodiment in Figures 4-11 as expressly including “a dedicated backhaul ... according to the invention[.]”), 2:37-40 (“FIG. 1 is a schematic diagram showing a dedicated backhaul for whole home coverage according to the invention.”), 3:52-53 (“FIG. 2 is an example in which the dedicated 5 GHz band is used”), 4:1-5 (“In FIG. 3 ... nodes 27a, 27b are connected by a dedicated 5 GHz backhaul connection....”); Ex.2006 ¶43.⁴

The Board’s Decision indicated preliminarily that the “dedicated backhaul” described in the specification was for “merely exemplary” embodiments. DI 16. That is not the case, as Petitioner admitted to the ITC. There, Petitioner explained “*all of the disclosed embodiments describe using the 5 GHz as a dedicated backhaul*, with other bands being utilized only as backup options.” Ex.2009, 73 (also arguing the ’698 patent’s provisional applications only recite embodiments using a dedicated backhaul).⁵ The ALJ concluded the same, finding “the ’698

⁴ The term “dedicated backhaul” appears no fewer than 35 times in the specification. Ex.2006 ¶43.

⁵ The ALJ further noted that TP-Link itself “described the ‘basic concept’ of the ’698 patent as ‘connecting or trying to connect to the dedicated backhaul on 5G[.]’

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.” Ex.2008, 101.

In sum, the ’698 patent “uniformly refers to” the use of a dedicated backhaul as “an aspect of the invention as a whole[,]” and “a skilled artisan would understand the claimed invention requires” a dedicated backhaul. *Chewy, Inc. v. Int’l Bus. Machs. Corp.*, 94 F.4th 1354, 1360 (Fed. Cir. 2024) (construing “selectively storing advertising objects[.]” to require that the advertising objects are “pre-fetched” objects); Ex.2008, 100-101. The Board should therefore construe “the backhaul ... as opposed to a front haul ... in the network” in claims 1 and 12 to require a dedicated backhaul.

Ex.2008, 101. The ALJ also quoted TP-Link’s expert, Dr. Bims, as agreeing that 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....***”). *Id.*; *see also id.*, 102 (finding Petitioner’s ITC expert “Dr. Bims agreed that [dedicated backhaul] is the focus of the ’698 patent.”).

B. “default frequency band” should be construed as “a first selected frequency band”

Before institution, the ALJ construed the term “default frequency band” to mean a “first selected frequency band.” Ex.2003, 27-32. That construction should be adopted here, too, because it is supported by the intrinsic record.

To start, the ALJ correctly determined “[b]ased on the explicit claim language, the ‘default frequency band’ is the frequency band that is attempted first.” *Id.*, 30. Claims 1 and 12 recite “establishing a backhaul communication between nodes in a mesh wireless network[.]” Ex.1001, cls.1, 12. To establish the backhaul communication, an attempt is made “to utilize a first channel in a default frequency band as a backhaul with [a] second node in the network[.]” *Id.* If the “received signal strength of the first channel” of the default frequency band “is below a threshold,” an attempt is made “to establish the backhaul with the second node[.]” using “a different channel in the default frequency band” and/or “a channel in a different frequency band that has a lower frequency range than the default frequency band[.]” *Id.* A different frequency band with a lower frequency range is used as a backup “upon detecting that a received signal strength of the first channel,” if the default frequency band is below a threshold. *Id.* Thus, the claims support that the “default frequency band” refers to the “first selected frequency band.”

The ALJ also correctly found that “[t]he specification is consistent with the claims that a first frequency band is attempted for backhaul communications and if the signal strength is below a threshold, a different frequency band may be attempted.” Ex.2003, 30. In particular, the specification does not use the term “default frequency band” but “discloses operations like those recited in the claims.” *Id.* It explains 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.” Ex.1001, 4:28-31. And as a more particular example, the ’698 patent teaches that “[i]n embodiments of the invention, ... [a] 5 GHz dedicated band is preferred if the [received signal strength indicator] RSSI meets predetermined thresholds.” *Id.*, 5:1-3. “If 5 GHz does not work ..., the system tries using 2.4G as a last resort.” *Id.*, 5:5-7. This disclosure is consistent with claims 1 and 12 in which a backhaul attempt is made on a first selected frequency band (e.g., the 5GHz band), and then attempted on a “frequency band with lower frequency range,” such as the 2.4GHz band. Ex.2006 ¶45.

The specification further outlines example operational flows for establishing a backhaul communication wherein an attempt is made on a first selected frequency band before resorting to an alternative. For example, “[a] scan is performed on all radios[]” and “[i]f base radios are detected (106), they are

associated to a base in a dedicated 5 GHz and 2.4 GHz band (108).” Ex.1001, 4:51-56. The system checks if the base radio’s RSSI is above a threshold, and if so, a dedicated radio is used as a backhaul. *Id.*, 4:56-58. “The system then tries to associate a dedicated 5 GHz radio” and makes another RSSI threshold comparison. *Id.*, 4:58-61. If the RSSI is below the threshold, then “2.4 GHz is used as a backhaul,” if available and if the band’s RSSI is above a threshold. *Id.*, 4:61-66; *see also id.*, 5:10-28, Figs. 4-5.

Thus, although the specification does not use “default frequency band expressly,” the ALJ correctly found that the specification’s detailed descriptions of the methodology of establishing a backhaul communication and its corresponding embodiments implicitly define “default frequency band” as a “first selected frequency band.” *See Grace Instrument Indus., LLC v. Chandler Instruments Co.*, 57 F.4th 1001, 1010 (Fed. Cir. 2023) (finding, despite minimal usage of a term in the specification, that it was implicitly defined by the specification’s detailed descriptions and embodiments).

IV. Ground II: Claims 1-22 are patentable over Ho.⁶

Ground II of the Petition is based on Ho alone, and based on Petitioner's construction that the "the claims do not claim a dedicated backhaul." Pet. 4 (citing Ex.1002 ¶47). The Petition does not identify any dedicated backhaul in Ho. *See* Pet. 9-13, 44-57 (no discussion of any dedicated backhaul band). But, as discussed above in Section III.A, the phrase "the backhaul is ..., as opposed to a fronthaul ... in the network" in independent claims 1 and 12 is directed to and requires a dedicated backhaul. The Petition failed to argue, let alone prove, that Ho discloses or renders obvious a dedicated backhaul. Nor could it have. Ho teaches that all bands in the network are available for front haul wireless data communications to clients in the network. The Petition also does not argue that modifying Ho to include a dedicated backhaul would have been obvious, or provide any motivations for why a POSA could have and would have made such a modification. Thus, Petitioner has not met and cannot meet its burden to show that Ho renders any claim obvious.

Furthermore, even if the claims were not construed to require a dedicated backhaul, Petitioner failed to meet its burden for other limitations of the

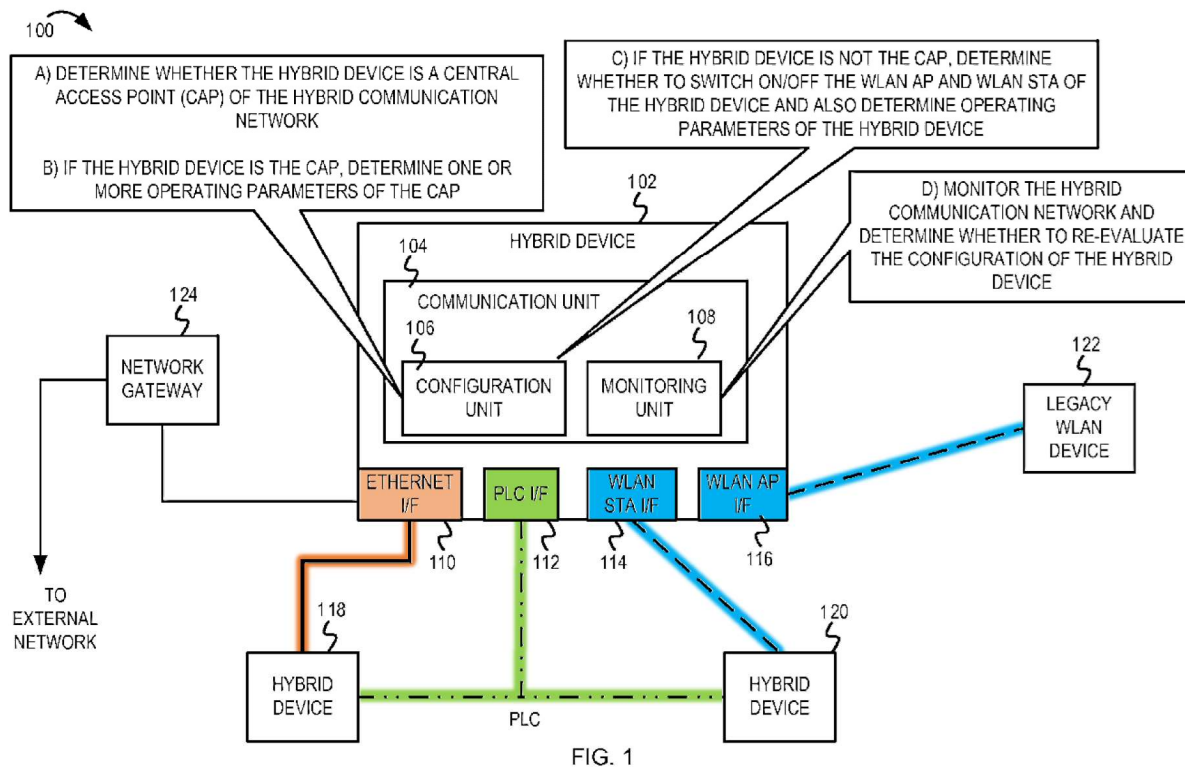
⁶ For convenience, Patent Owner addresses the Grounds in the same order as they are addressed in the Institution Decision.

independent claims and dependent claims, too. The Petition thus fails to show that Ho discloses or renders obvious any claim of the '698 patent.

A. Overview of Ho

Ho is directed to hybrid communication networks for a home network, including the automatic configuration of “hybrid devices.” Ex.1009 (Ho), Abstract. Ho's hybrid devices support multiple network interfaces and communication technologies. Ho, 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, reproduced and annotated below, is “a conceptual diagram of an example hybrid communication network 100” including “hybrid devices 102, 118, and 120, a legacy WLAN device 122, and a network gateway 124.” *Id.*, 3:24-29. The hybrid devices in Figure 1 can be client devices such as laptops, tablets, or mobile phones. *Id.*, 4:9-14; Ex.2007, 45:3-12. The hybrid devices 102, 118, and 120 are all connected to each other using a wired PLC connection (green). Ho, 3:48-62.



Ex.2006 ¶46 (annotating Ho Figure 1)

A hybrid device can take on one of two main “personalities.” First, a hybrid device can be a centralized access point, or CAP, of which there is generally only one in the network. Ho, 4:64-66; *see* Ex.2007, 49:11-18. The CAP is connected to the network gateway by an Ethernet connection as shown in Figure 1. Ho, 4:66-5:3. Second, a hybrid device can be a non-CAP that connects to the internet through the CAP. *Id.*, 5:43-46.

When a hybrid device determines that it 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 (enabled or disabled) of the non-

CAP's "WLAN access point (AP) module" (annotated blue above) and "WLAN station (STA) module" (also blue). *Id.*, 16:43-50, 2:54-65; Ex.2006 ¶50; Ex.2007, 54:12-15. The WLAN-AP module of a non-CAP hybrid device is used to *provide* wireless network access via the WLAN-STA module of other devices, e.g., fronthaul communications to client devices like laptops and mobile phones. *E.g.*, Ho, 3:58-62; Ex.2006 ¶50. Conversely, the WLAN-STA module of a non-CAP hybrid device is used to *receive* wireless network access from the WLAN-AP module of other devices, such as the CAP. Ho, 3:58-62; Ex.2007, 62:7-14 (agreeing "WLAN STA module is used in Ho ... for wireless downstream connections from the non-CAP hybrid device towards the CAP[']"). Thus, a non-CAP hybrid device must have its WLAN-STA module enabled in order to have a wireless backhaul connection to the CAP. Ho, 3:58-62; Ex.2007, 63:3-8 (Petitioner's expert testifying "It's quite clear that ... a non-CAP hybrid device 120 would connect to the CAP device when the CAP device's WLAN AP interface is connected with the WLAN station interface of the hybrid device."), 66:8-22, 113:17-19; Ex.2006 ¶52. If the WLAN-STA module of a non-CAP is disabled, the non-CAP uses a wired connection instead. *See* Ho, 18:58-60; Ex.2007, 71:11-73:4.

Ho lists four second-level personalities of a non-CAP device, each with express requirements and restrictions:

1) an access point (e.g., a WLAN AP module of the hybrid device is enabled and a WLAN STA module of the hybrid device is disabled), *2) a relay* (e.g., the WLAN AP module and the WLAN STA module of the hybrid device are enabled and are operating on the same communication channel/band), *3) a sink* (e.g., the WLAN AP module of the hybrid device is disabled and the WLAN STA module of the hybrid device is enabled), or *4) disabled* (e.g., the WLAN AP module and the WLAN STA module of the hybrid device are disabled).

Ho, 8:13-23.

Ho discloses that a non-CAP hybrid device has an “access point” personality when its “WLAN STA module of the hybrid device is disabled” such that it has a wired PLC connection to the CAP. *Id.*; Ex.2006 ¶52. A “relay” personality means that the WLAN STA and WLAN AP module are both enabled, but it is limited to relaying information from the CAP to the non-CAP (backhaul) to client devices (fronthaul) on “the same communication channel/band.” Ho, 8:13-23; Ex.2006 ¶53. Additionally, a non-CAP device can have its WLAN AP module disabled and act as an information “sink”—i.e., it acts solely as a client device. Ex.2006 ¶52.

B. The Petition fails to show Ho discloses or renders obvious independent claims 1 and 12.

1. Ho does not disclose or render obvious “the backhaul ... as opposed to a fronthaul ... in the network” in elements [1.1]/[12.1].

The Petition does not satisfy its burden of showing Ho discloses or renders obvious claim element [1.1]/[12.1]. Specifically, the Petition fails to demonstrate

any disclosure in Ho that discloses or renders obvious attempting to utilize a channel in a “default frequency band” as a wireless backhaul with a second node, where the backhaul is “as opposed to a fronthaul ... in the network,” i.e., a dedicated backhaul. *See supra* Section III.A.

The Petition contends Ho’s “5GHz” WLAN frequency band is the claimed “default frequency band.” Pet. 49 (“The frequency band (e.g., 5 GHz band) selected by the non-CAP hybrid device (network device) for backhaul communication with the CAP (second node) is the claimed ‘default frequency band.’”). The Petition does not provide any argument or evidence that Ho’s 5GHz band is dedicated to backhaul communications. Ex.2006 ¶57. Petitioner’s expert admitted that his opinions were formed on the basis that “the claim does not require dedicated band, and that’s very important in my analysis.” Ex.2007, 102:6-8. *see also id.*, 102:15-104:3, 105:1-10 (admitting no analysis in declaration that Ho’s 5GHz band is not used for fronthaul). Dr. Ding likewise admitted that his declaration supporting the Petition does not identify any dedicated backhaul in Ho. *Id.*, 102:15-104:3, 105:1-7.

It makes sense that Ho’s network does not utilize any “dedicated” backhaul, because Ho describes an ad-hoc “[h]ybrid communication network” designed with maximum flexibility with devices utilizing different protocols and interfaces for connections to a CAP and to other wireless devices. *See, e.g.*, Ho, 1:6-20; Ex.2006

¶¶59-60. For example, Ho's hybrid communication network expressly includes "legacy" devices that can only support one communication interface, such as only supporting the 2.4GHz or 5GHz band. Ho, 4:18-23, 3:41-48, 8:50-55, 2:14-18. Thus, both communication bands must be available for client connections in Ho's network. Ho likewise taught that some devices may be "single band single radio (SBSR)" devices that only support either the 2.4GHz or 5GHz frequency band. Ho, 17:18-23. Ho's teaching that all available frequency bands should be available for client communications, cannot disclose or render obvious elements [1.1]/[12.1] because there is no use of a channel in a default frequency band as a "backhaul ... as opposed to a front haul." Ex.2006 ¶¶58-61.

Indeed, the Petition does not identify any disclosure or suggestion in Ho that the WLAN AP module of a CAP uses any channel of any band as a dedicated backhaul—i.e., that any such channel is not also used for "front haul" as claimed. To the contrary, when a CAP configures its WLAN AP module, it selects a communication channel "for operation of the CAP" in the 2.4GHz and/or 5GHz bands. Ho, 12:32-45. And when Ho teaches "[t]he CAP can be configured to operate on the preferred communication channel in the 2.4 GHz WLAN communication band[]" and/or "in the 5 GHz WLAN communication band[]," it is for any purpose including client communications—not just backhaul. Ho, 12:42-45, 13:7-9, Figs. 1, 4, 5, 13:52-17:2 (describing how non-CAP hybrid devices

operating as a client/sink use the same band as “access points” and “relays”);
Ex.2006 ¶59.

Furthermore, the Petition does not set forth any argument why a POSA would have or could have found it obvious to implement Ho's non-CAP hybrid devices in a mesh network using a frequency band that is dedicated to backhaul “as opposed to a fronthaul” as claimed. *See* Pet. 48-53 (no obviousness arguments or motivations to combine for elements [1.1]/[12.1]). Indeed, it would not have been obvious because Ho's described hybrid network is incompatible with a dedicated backhaul. Ex.2006 ¶61. Specifically, TP-Link's Petition does not address any of the four “second level personalities” that a non-CAP hybrid device can take—1) a sink/client, 2) a relay, 3) an access point, or 4) disabled (Ho, 8:13-23), none of which are capable of attempting to utilize a wireless dedicated backhaul as claimed.

a. Ho's “sinks”/clients are not capable of forming a wireless backhaul.

Ho describes a sink configuration when a non-CAP device's STA module is enabled and the AP module is disabled. Ho, 8:13-23. In Ho, the “WLAN STA module” is the “WLAN *client* station ... interface.” *Id.*, 3:35-41, 8:13-23 (explaining that when the “WLAN STA module” is enabled and the AP module is disabled, the WLAN module is configured as a “sink” or client station); *see also id.*, cl.5 (configuring a device as a “client”). A client non-CAP device does not

provide access to any other devices because its AP module is turned off. *Id.*, 8:19-22; Ex.2006 ¶62.

Thus, when a non-CAP device is configured as a client/sink, its connection to any other device is a ***front-haul***, not a backhaul. Ex.2006 ¶62; *see also* Ex.2007, 46:2-5 (“It wouldn’t make sense for client devices to look for – to build its own backhaul.”). Thus, any band that Ho’s non-CAP hybrid devices connect to as a client/sink cannot be a dedicated backhaul. And Ho does not restrict the bands or channels that a client/sink device can connect to in Ho’s disclosed network. Ex.2006 ¶63.

b. Ho’s “relays” are not capable of forming a dedicated wireless backhaul.

Ho’s devices having a “relay” personality likewise cannot disclose or render obvious claims 1 and 12, in particular because Ho’s relay devices are incapable “performing an attempt to utilize” a frequency band as a backhaul “***as opposed to a front haul*** that provides wireless data communication to clients ***in the network***[]” as required by elements [1.1]/[12.1]. Rather, Ho discloses that any device operating as a “relay” will exclusively attempt to utilize a backhaul channel and band that is the ***same*** as a front haul in the network.

To explain, 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.” Ho 8:13-23. This means a non-CAP hybrid device relay can have a

wireless connection to the CAP (via its WLAN STA module) and a wireless connection to client devices (via its WLAN AP module). Ho, 8:13-23; Ex.2006 ¶64; *see supra* Section IV.A. However, Ho expressly teaches that in this “relay” configuration, a non-CAP hybrid device requires that both connections—to the CAP (i.e., backhaul) and to clients (i.e., front haul)—are “***operating on the same communication channel/band.***” Ho, 8:13-23; Ex.2006 ¶64; *see also* Ex.1002 ¶86 (“[A] backhaul communication provides MAP-to-MAP communication and is not a front-haul client-facing communication that provides wireless data communication to clients in the network.”). This same-channel requirement for the backhaul and front haul for Ho’s “relay” personality is explicit and repeated throughout Ho. For example, Ho explains a non-CAP can only be “configured as a relay” when the non-CAP operates on a “preferred channel” that ***matches*** the operating channel of the CAP. Ho, 16:60-64 (“If the preferred channel of the non-CAP hybrid device ***matches*** the channel on which the CAP currently operates, the non-CAP hybrid device can be configured as a relay.”), 15:55-58 (non-CAP can “become a relay” only if the “preferred channel ... is the same as the CAP’s channel”). Conversely, if the non-CAP does ***not*** operate on the same channel as the CAP, i.e., “the preferred channel of the non-CAP hybrid device does ***not match*** the channel on which the CAP currently operates,” then the non-CAP can only be configured as “an access point.” *Id.*, 16:64-17:2; *see also* Ex.2007, 80:22-81:21.

A POSA would have therefore understood Ho's non-CAP hybrid device acting as a "relay" thus only operates on just one channel, which is used for both backhaul and fronthaul communications. Ex.2006 ¶¶64-65.

Put another way, Ho's devices acting as relays are not capable of attempting to utilize a channel in a default frequency band as a backhaul that is "as opposed to a front haul ... in the network."

c. Ho's "access point" non-CAPs are not capable of forming a wireless backhaul.

Ho's non-CAP hybrid devices operating 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." Ex.2006 ¶¶66. Ho teaches when a non-CAP hybrid device operates with an "access point" personality, its "WLAN STA" interface must be disabled, meaning it will not attempt to utilize a wireless backhaul connection to the CAP device. *Id.* ¶¶52, 66; Ho, 4:9-14. Instead, because the WLAN STA interface is disabled, Ho's non-CAP "access point" devices necessarily use a *wired* "power line communication" (PLC), to communicate information to the CAP. Ex.2006 ¶¶52, 66; Ex.2007, 23:9-11 (testifying PLC is a "wired protocol"), 24:18-22, 38:4-10, 71:6-17 (admitting Ho's "access point[s]" use PLC or another wired connection like MoCA to connect back to the CAP). These wired backhuls in Ho cannot constitute the claimed backhaul, which must "provide communication of management functions *between the nodes*

in the network,” where “the nodes” takes antecedent basis from and refers to the “nodes in a mesh *wireless* network[]” recited in the preambles. Ex.1001, cls.1[pre], 12[pre]; Ex.2007, 93:3-6 (agreeing “[t]he nodes referred to in the ‘wherein’ clause refers to the nodes ... in a mesh network[]”); Ex.2008, 98 (the “second node” and “the network” have antecedent basis in the preamble’s “nodes in a mesh wireless network”); *see also Advanced Software Design Corp. v. Fiserv, Inc.*, 641 F.3d 1368, 1374 (Fed. Cir. 2011) (finding preamble can provide context for interpreting other elements in a claim).

The Petition tacitly concedes that Ho’s devices with an “access point” personality with a wired backhaul cannot satisfy the claimed backhaul by relying exclusively on a wireless link between a non-CAP and CAP as disclosing the claimed backhaul. Pet. 49 (“[T]he backhaul communication between the CAP and non-CAP devices is highlighted in **magenta**.”); Ex.2006 ¶66. Indeed, Petitioner’s expert admitted on cross examination that he did not rely on the “access point” personality in forming his opinion. Ex.2007, 71:18-72:5. That is because, as Dr. Ding explained, only the “relay” secondary personality describes a “mesh network formation or configuration that Ho’s teaching allows us to construct.” *Id.*, 71:18-72:5.

d. Ho's "disabled" non-CAP's cannot satisfy the claims

The only remaining configuration for a non-CAP in Ho is where it is "disabled." Ho, 8:22-23. A "disabled" non-CAP has all of its WLAN modules disabled and therefore does not form a wireless backhaul with the CAP as claimed. *Id.*; Ex.2006 ¶67.

Because none of Ho's four non-CAP "personalities" can satisfy elements 1.1/12.1, and claims 1 and 12 are therefore patentable over Ho.

2. Ho does not disclose or render obvious attempting to utilize a different channel as a backhaul with a second node[1.2]/[12.2].

Even if the claims are not construed to require a dedicated backhaul, Petitioner also does not show that Ho discloses or renders obvious claim element [1.2]/[12.2]. Claim element [1.2]/[12.2] requires an attempt to utilize one of two alternatives for a backup backhaul with a second node. It can either be (1) in a different channel than the dedicated backhaul but in the same (default) frequency band, or (2) it can be in a channel in a lower frequency band. *See* Ex.1001, cls.1, 12 (attempting to utilize "a different channel in the default frequency band and/or a channel in a different frequency band that has a lower frequency range than the default frequency band[>"). Petitioner distorts the reference to cobble together an argument that Ho discloses both types of backup backhauls. But Ho does not disclose either.

- a. **Ho does not disclose or renders obvious “performing an attempt to utilize a different channel in the default frequency band ... to establish the backhaul with the second node.”**

First, Ho does not disclose or render obvious “performing an attempt to utilize a different channel in the default frequency band ... to establish the backhaul with the second node[.]” The Petition asserts that when the signal received from the CAP is “deemed inadequate,” the “non-CAP hybrid device will again attempt to select another ‘preferred channel’ (claimed different channel) having the ‘highest RSSI’ to re-establish backhaul communication with the CAP.” Pet. 55-56 (quoting Ho, 14:38-41, 16:30-33, 16:54-57). The Petition is wrong for three reasons.

First, Ho teaches when the WLAN link to the CAP is inadequate, the non-CAP’s WLAN STA *is disabled* or it connects to a different access point as a sink/client. Ex.2006 ¶71; Ho, 14:38-41, 15:38-43, 17:25-29, 19:35-43. In other words, after a non-CAP hybrid device’s first attempt to connect wirelessly to the CAP fails, the non-CAP will not perform any more attempts to wirelessly connect to the CAP. Ex.2006 ¶¶71-73. Indeed, Petitioner admits in the context of claim elements [6.2]/[17.2] and claims 8/19 that when a non-CAP determines that the strength of the signal to the CAP is inadequate, the non-CAP connects to an entirely different node, a relay, rather than connecting to the CAP. Pet. 64, 68.

Further, it is not possible in Ho for the *non-CAP* to select a new channel in the same frequency band for communication to the CAP because the *CAP* operates on only one channel per band, and Ho teaches the CAP preselects that operating frequency channel *before* the non-CAP connects. Ex.2006 ¶72; *see also* Ex.2007, 80:5-11 (“CAP in the hybrid networks does its own configuration in the beginning.”). When discussing the preamble and claim element [1.1]/[12.1], Petitioner acknowledges that the CAP itself decides which channel to operate on within each band. Pet. 47-48 (citing Ho, 13:24-41). It then broadcasts this selection to other devices, which can connect (or not) to the CAP on that preselected channel. Ho, 13:39-41; Ex.2006 ¶48. Notably, the CAP does not perform any kind of selection of a backup channel in case of failure with a given non-CAP. Ho, 13:24-41; Ex.2006 ¶¶72-73. There is no disclosure in Ho that the CAP operates on multiple channels to allow for selection of a best channel by non-CAP devices. Rather, the non-CAP devices can select channels on which to wirelessly connect to *client* devices, i.e., where the non-CAP is acting as an “access point”—not when connecting to the CAP. Ex.2006 ¶¶74-75.

Second, a non-CAP searching for “candidate channels” that have “preferred performance” is not an attempt to “re-establish backhaul communication with the CAP[,]” nor is there ever a scenario in Ho where a non-CAP would “re-establish” backhaul communications on a *different* channel as required by the claims. Pet.

56-57, 54 (quoting Ho, 14:11-20); Ex.2006 ¶76. To the contrary, the non-CAP scans all channels—not just the one selected for use by the CAP—to find a preferred channel to operate on. Ho, 18:63-19:27; Ex.2006 ¶75. The non-CAP then decides, based on the preferred channel, whether to connect wirelessly to the CAP *at all*. Ex.2006 ¶75. This is because the CAP preselects what channels it is operating on before any non-CAP hybrid device will determine its candidate channels. *Id.* ¶73; Ex.2007, 80:5-21 (“CAP in the hybrid networks does its own configuration in the beginning ... [a]nd so here the non-CAP simply comes in and look at the candidate”). Thus, as Ho teaches, after determining its “preferred channel,” the non-CAP “compare[s] the preferred channel with *the channel on which the CAP currently operates*, and determine[s] whether to configure the non-CAP ... as an access point or a relay.” Ho, 16:53-60.

This “access point” or “relay” refers to the second level personality of the non-CAP, personalities that the Petition ignores entirely, that dictates whether the non-CAP is capable of connecting wirelessly to the CAP. Ex.2006 ¶¶50-53, 76. Specifically, if the “preferred channel” does not match the CAP’s channel, the non-CAP disables its WLAN STA module and operates as an AP. Ho, 16:64-17:2. But Ho’s non-CAP hybrid devices operating as an “access point” cannot satisfy claims 1 or 12 because they *disable* their ability to have a wireless backhaul to the CAP (which the Petition maps to the claimed “second node”). *See supra* Sections IV.A,

IV.B.1.b; Ex.2006 ¶¶52, 76. Instead, a non-CAP access point connects to the CAP using a *wired* PLC backhaul. Ex.2006 ¶¶52, 66; Ho, 18:52-62; Ex.2007, 71:6-17 (admitting Ho's "access point[s]" use PLC or another wired connection like MoCA to connect back to the CAP).

Conversely, if the "preferred channel" matches the CAP's channel, then the non-CAP operates as a relay. Ho, 16:60-17:2, 8:17-19; Ex.2006 ¶¶64-65, 75. But as discussed in Section IV.B.1.b, a relay *cannot* connect to the CAP on a "*different channel*" than any previous backhaul because Ho's relay devices are restricted to only operate on "the channel on which the CAP currently operates," which has not changed. Ho, 16:50-17:2; Ex.2006 ¶¶64-65. In sum, each time a non-CAP runs its configuration algorithm, it can either (1) connect to the CAP using a wired PLC backhaul connection (because the preferred channel does not match the CAP), (2) wirelessly connect to the CAP on the *same* channel that it was originally connected to, or (3) connect to a non-CAP as a client using fronthaul. Ex.2006 ¶76. No scenario satisfies the requirements of claims 1 and 12, which require attempting an alternative or backup second channel in the 5GHz band for use as a backup backhaul with the second node.

Third, Petitioner cites to Ho's disclosure of the CAP selecting "the operating channel(s)" in the event the CAP is capable of 40 MHz channels as purportedly disclosing that connections from a non-CAP to the CAP can be on

different channels in the same band. Pet. 11 (citing Ho, 13:24-41). But Ho never discloses that the CAP operates on multiple channels at 5GHz. Ex.2006 ¶49.

Rather, the cited discussion relates to the possibility of choosing a channel in multiple bands: “e.g., the 2.4 GHz WLAN communication band or the 5 GHz WLAN communication band.” Ho, 13:30-33. In contrast, Ho repeatedly refers to the CAP selecting a single channel *per frequency band*, including in Figure 4. Ho, Fig. 4, steps 404 (“Select *a* 2.4GHz communication channel...”), 410 (“Select *a* 5GHz communication channel...”), 406 (“*the* selected 2.4GHz communication channel”), 412 (“*the* selected 5GHz communication channel”); Ex.2006 ¶48.

Thus, the Petition does not establish any disclosure in Ho of using a backup backhaul link in the default frequency band as recited in elements [1.2]/[12.2]. Ex.2006 ¶¶70-76. The Petition also does not contend that a POSA would have or could have modified Ho to satisfy this requirement.

- b. Ho does not disclose or render obvious “performing an attempt to utilize ... a channel in a different frequency band that has a lower frequency range than the default frequency band, to establish the backhaul with the second node.”**

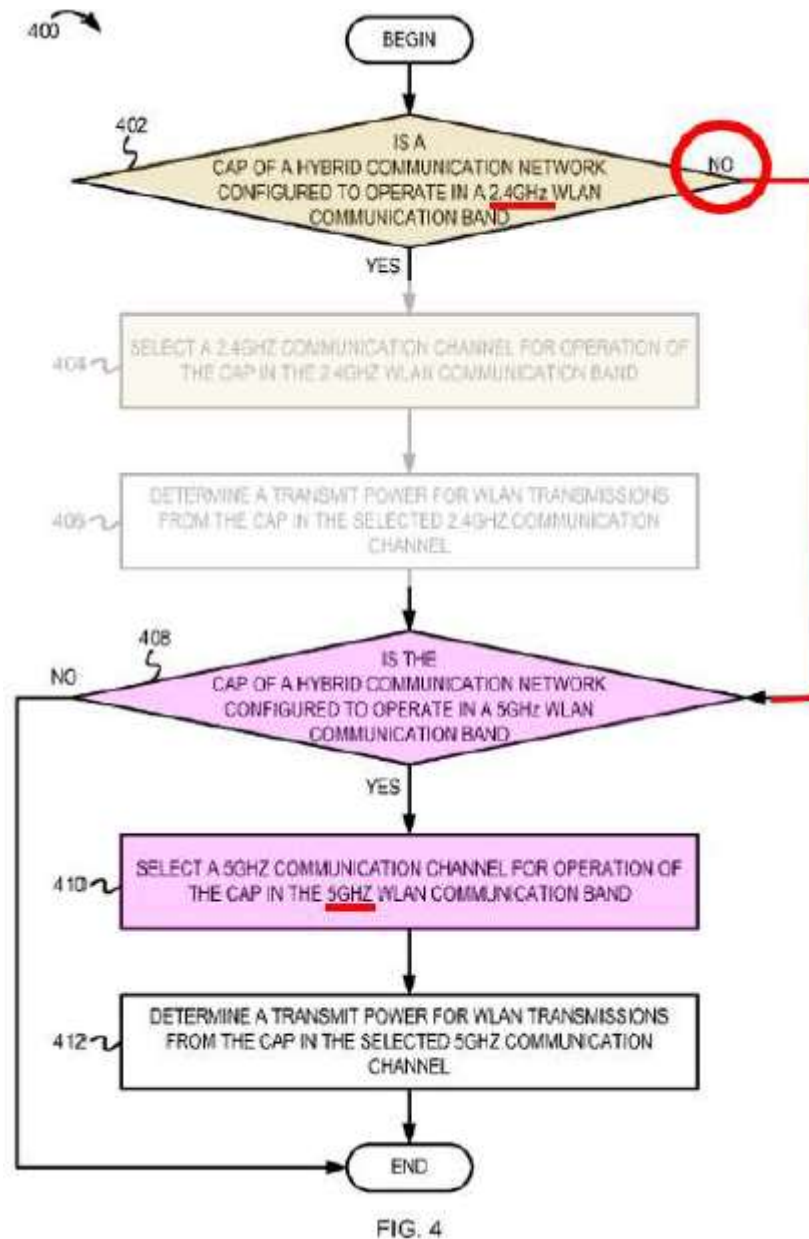
As an alternative to its “different channel” theory, Petitioner argues that Ho discloses claim element [1.2]/[12.2] using the alternative “backhaul with the second node”—i.e., in a “different frequency band that has a lower frequency range than the default frequency band.” Pet. 56. Petitioner asserts, “[i]f the CAP

establishes backhaul in both the 2.4 GHz and 5 GHz bands, and the non-CAP established backhaul with the CAP over the 5 GHz band in its first attempt, as discussed above, the new ‘preferred channel’ is a channel in the 5 GHz band or in the lower 2.4 GHz band.” *Id.* (citing Ho, 18:38-46). Petitioner is wrong. Ho does not disclose a non-CAP hybrid device attempting to use a channel in a lower frequency band than the default frequency band as a backhaul with the second node.

As an initial matter, Petitioner’s reliance on this two-band embodiment is incompatible with Petitioner’s construction of “default frequency band.” *Id.* 49-52. Specifically, Petitioner contends that “default frequency band” should be construed as a “preset frequency band used automatically in the absence of a choice made by the user.” *Id.* To satisfy this construction, Petitioner relies on Ho’s embodiments using “a single band for backhaul.” *Id.* 50-51. Accordingly, under Petitioner’s construction, the non-CAP cannot communicate with the CAP on a “different frequency band.” Ex.2006 ¶78.

Nor can Petitioner show that Ho’s two-band embodiment is compatible with the ITC’s construction of “default frequency band.” Specifically, to meet the “lower frequency range” portion of claim element [1.2]/[12.2], Petitioner relies on the backhaul moving from the 5GHz band to the 2.4GHz band. Pet. 56. But Petitioner has not shown, and cannot show, that Ho’s 5GHz band is the “first

selected” frequency band. Ex.2006 ¶79. Instead, Petitioner attempts to show the 5GHz band is the most likely band to provide a successful link to the CAP. Pet. 49-52. But even taking this argument as true, it does not follow that the most likely to be successful band is what is first attempted. To the contrary, Ho expressly teaches that the non-CAP will always *attempt* to connect to the 2.4GHz band first, as shown by Figure 4, which Petitioner relies on for disclosure of the default frequency band.

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As shown in this flowchart, the 2.4GHz band is first attempted in box 402, and then the 5GHz band is attempted in box 408. Ex.2006 ¶79. But that is the opposite of what claims 1 and 12 require, i.e., attempting to utilize a channel in a *lower* frequency band. Thus, Petitioner has not shown that the 5GHz band constitutes the

claimed “default frequency band,” which must be the first selected frequency band, with respect to claim element [1.2]/[12.2].

Petitioner's theory that a non-CAP would move a backhaul from 5GHz to 2.4GHz also ignores the basic operation of Ho's non-CAP hybrid devices. As discussed above for elements [1.1]/[12.1], a non-CAP device has a secondary personality based on whether its WLAN AP and STA modules are enabled or disabled. Ho, 8:13-23. Petitioner does not address any of these secondary personalities. Instead, Petitioner assumes that any WLAN link in Ho between CAP and non-CAP must necessarily be a backhaul. That is wrong, however, because Ho's non-CAP hybrid devices can be client devices and thus connect to the CAP using a wireless front haul as discussed for element [1.1]/[12.1].

Importantly, Ho discloses that the non-CAP determines its second-level personality on different bands independently. Ho, 18:28-35. That is, a non-CAP can be an AP on one band and a sink on another, or vice versa. Ex.2006 ¶63. Consequently, Ho does not disclose that a non-CAP would move its connection with the CAP from 5GHz to 2.4GHz. To the contrary, as discussed above for claim element [1.1]/[12.1], if the link to the CAP is poor, the non-CAP simply disables its WLAN STA module and operates as an AP in that band. Ho, 17:25-29; Ex.2006 ¶80.

There is no disclosure in Ho of attempting to transition to a different band.

Ex.2006 ¶80. Although Ho discloses an embodiment where a non-CAP can choose to connect to the CAP via whichever band has “better connectivity” (Ho, 18:38-46), that embodiment does meet the claim limitations at least because one of the connections (either 5GHz or 2.4GHz) would be front-haul only and could not be a backhaul. Specifically, in the relied-upon embodiment, the non-CAP only operates the WLAN AP interface on *one* band—either 2.4GHz or 5GHz. Ho, 18:38-46.

Specifically, the non-CAP device “can switch ON the WLAN AP device to transmit on the 2.4 GHz WLAN communication band, 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.*” *Id.* Thus, if the hybrid device has its 2.4GHz WLAN AP enabled, then in the initial 5GHz band the non-CAP operates as a *sink* with its 5GHz WLAN AP turned off. *See, e.g., id.*, 8:11-23. This scenario does not satisfy the claims because this initial 5GHz link is not a backhaul, but rather *only* a front haul providing client communication to the non-CAP operating as a sink. Ex.2006 ¶81. Conversely, if the 5GHz WLAN AP is enabled, then a 2.4GHz link to the CAP is a front-haul only and cannot be a backhaul—i.e., the 2.4GHz WLAN STA is disabled in that band. Ex.2006 ¶81.

C. The Petition fails to show Ho discloses or renders obvious dependent claims 2-11 and 13-22.

Each of dependent claims 2-11 and 13-22 are valid for at least the reasons of independent claims 1 and 12 above. Furthermore, Petitioner independently fails to show that the additional requirements of at least claims 2 and 13, 4 and 15, 6 and 17, 7 and 18, or 8 and 19 are disclosed or rendered obvious by Ho.

1. Ho does not disclose or render obvious “performing an attempt to establish the backhaul with the second node utilizing a different radio” (claims 2 and 13).

Claims 2 and 13 depend from claims 1 and 12, respectively, and recite “wherein said attempts are performed on a first radio, the [method/operations] further comprising: upon failure of all said attempts, performing an attempt to establish the backhaul with the second node utilizing a different radio.”

Petitioner relies on the dual-band dual-concurrent radio embodiment of Ho, where, according to Petitioner, a non-CAP would switch its connection to a CAP from a 5GHz band to a 2.4GHz band. Pet. 58-59. But for the reasons describe above for claim element [1.2]/[12.2], Ho does not disclose switching its connection in this manner, or that a subsequent connection would be switching from a backhaul to a backup backhaul. Ex.2006 ¶84. Specifically, in the relied-upon embodiment, the AP of the non-CAP is disabled in one of the two bands, meaning the non-CAP acts as a sink and the link to the CAP is for front-haul only. Ho,

18:38-46; Ex.2006 ¶84. Accordingly, Petitioner failed to meet its burden and claims 2 and 13 are not obvious.

2. Ho does not disclose or render obvious measuring signal strengths using “probes” or for “all nodes” (claims 4 and 15)

The Petition also fails to show that Ho discloses or renders obvious the additional requirements of claims 4 and 15, which depend from claims 1 and 12 respectively, and recite “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.”

Petitioner relies on only a single passage from Ho as allegedly disclosing or rendering claims 4 and 15. Pet. 60 (citing Ho, 14:11-27). That passage, however, merely refers to the non-CAP hybrid device measuring RSSI from the CAP. Ho, 14:11-14 (“WLAN connection quality *to the CAP*”), 14:14-27 (“WLAN connection quality *to the CAP*”); Ex.2006 ¶86. That is not what claims 4 and 15 require, including specifically the use of “probes” to measure signal strengths, and using such probes to measure from “all nodes within a communication range.” Ex.2006 ¶86.

As a backstop, Petitioner argues that a “POSITA would understand and find obvious that the signals received at a non-CAP hybrid device include probe requests that are broadcasted by every mesh point of a wireless mesh network ...

as part of the mesh discovery and backhaul peer link management process, as described in the IEEE mesh networking standards.” Pet. 60-61 (citing Ex.1020, 109) (draft 802.11s amendment). The Petition’s conclusory reliance on 802.11s for anticipation and obviousness by Ho alone fails both legally and factually.

Legally, Petitioner is wrong that the draft 802.11s amendment can be used as part of any anticipation analysis, because Ho does not incorporate any part of 802.11 by reference, let alone the specific portion of the draft 802.11s Petitioner relies on. *Apple Inc. v. Int’l Trade Comm’n*, 725 F.3d 1356, 1362 (Fed. Cir. 2013) (explaining that incorporation by reference requires a “host document must ***identify with detailed particularity what specific material it incorporates and clearly indicate where that material is found in the various documents***”).

Petitioner’s alternative argument based on obviousness similarly fails because it is conclusory, unsupported, and thus cannot satisfy Petitioner’s burden to prove obviousness. Petitioner has not provided any basis why a POSA would have and could have been motivated to utilize any “mesh discovery” portion of the 802.11s standard—a standard that is not mentioned anywhere in Ho. Ex.2006 ¶¶87-88. Moreover, even if one were to assume a POSA would have considered 802.11s with Ho, the Petition does not provide any basis to conclude a POSA would have chosen specifically to implement “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” as recited by claims 4 and 15. To the contrary, even the specific section from 802.11s Petitioner relies on has two distinct options for “neighbor discovery,” one that includes “beacons” and another that includes “probes.” *See* Ex.1020, 109 (“This process requires detection of potential mesh neighbors through Beacons or through active scanning using Probe Requests.”). Petitioner does not explain why a POSA would have and could have implemented using probes in Ho as required by claims 4 and 15, instead of beacons, or identify why a POSA would have considered beacons (or any other potentially available option) as satisfying the claims. *Belden Inc. v. Berk-Tek LLC*, 805 F.3d 1064, 1073 (Fed. Cir. 2015) (“[O]bviousness concerns whether a skilled artisan not only *could have made* but *would have been motivated to make* the combinations or modifications of prior art to arrive at the claimed invention.”) (original emphasis). Nor is there any factual basis to assume that a POSA would have found it obvious to implement every requirement of every 802.11 standard, which describe different WiFi generations, or specifically the “mesh” protocol. Ex.2006 ¶¶87-88. They would not because Ho describes an ad-hoc hybrid network using a mix of wired and wireless connections between devices, rather than a mesh wireless network. *Id.*

In sum, Petitioner did not provide any motivation to combine, or reason why a POSA both would have and could have implemented Ho in a manner that

satisfies the additional requirements of claims 4 and 15. For these reasons, the ITC found also found that Ho did not disclose or render obvious claims 15. Ex.2008, 144-146.

3. Ho does not disclose or render obvious causing a number of nodes to form a “daisy chain topology” (claims 6, 8, 17, and 19)

Claims 6 and 17 depend from claims 1 and 12, respectively, and recite “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.” Claims 8 and 19 depend directly from claims 6 and 17, respectively, and indirectly from claims 1 and 12, and recite “wherein the formed connection topology is a daisy chain topology if the link quality does not exceed a predetermined threshold.” The Petition fails to show that the additional “daisy chain” requirements of claims 6/8 and 17/19 are disclosed or rendered obvious by Ho.

The Petition contends the additional requirement of claims 8 and 19 is disclosed or rendered obvious by Ho's description that a “non-CAP hybrid device” may associate with another “non-CAP ... that provides the best performance,” instead of associating directly with the CAP, which Ho refers to as “mode B.” Pet. 68-69. Petitioner asserts that “Ho refers” to mode B as the “daisy-chain mode.” *Id.* That is false. Ho never uses the phrase “daisy chain,” and Ho's devices operating

in mode B do not disclose the additional requirements of claims 8 and 19. Ex.2006 ¶¶90-91. That is because Ho's mode B refers to a hybrid device that is acting exclusively as a *client/sink*, meaning it is neither a "node in the network" nor part of a daisy chain topology of nodes. Ex.2006 ¶91.

To explain, a non-CAP hybrid device in Mode B expressly switches OFF its WLAN AP module and switches ON its WLAN STA module. Ho, 19:35-43 ("WLAN AP module of the non-CAP hybrid device is switched OFF[]" in mode B). Thus, a mode-B non-CAP device is a *client/sink*. *Id.*, 19:35-43, 20:18-24, 8:13-23; Ex.2006 ¶91. Ho also teaches that a mode B non-CAP device will be "associated with an *access point*" that is not the CAP" (Ho, 19:35-43), where Ho's "access point[s]" have *wired* connections to the CAP as discussed above. *See supra* Section IV.B.1.c. Connecting a non-CAP hybrid *client* indirectly to the CAP does not disclose or render obvious the "formed connection topology is a daisy chain" in claims 8 or 19. Ex.2006 ¶¶91-92. That is because the "formed connection topology" takes its antecedent from claims 6 and 17, which specifies that what must form the claimed "topology" are a "number of nodes in the network." Ex.1001, cls.6, 17; Ex.2006 ¶91. Those nodes cannot be client devices (i.e., Ho's mode B devices) because claims 6/17 and 8/19, through their dependence on claims 1/12, expressly differentiate "nodes in the network" from "clients in the network," and further require the nodes to connect *wirelessly*. Ex.1001, cls.1, 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*”).

Thus, Ho's indirect connections of non-CAP **client** devices (i.e., non-CAP devices operating in mode B) to Ho's access point non-CAP devices with wired connections to the CAP does not disclose or render obvious a daisy chain topology of nodes in the network as required by claims 8 and 19. For these reasons, the ITC found also found that Ho did not disclose or render obvious claim 19. Ex.2008, 147-149.

4. Ho does not disclose or render obvious claims 3, 5, 7, 9-11 and 14, 16, 18, 20-22.

The remaining dependent claims 3, 5, 7, 9-11, 14, 16, 18 and 20-22 are valid for at least the reasons of the claims they depend from above. Specifically, claims 3 and 14 depend from claims 2 and 13, respectively; claims 5 and 16 depend from claims 1 and 12, respectively; claims 7 and 18 depend from claims 6 and 17, respectively, and indirectly to claims 1 and 12; claims 9 and 20 depend from claims 8 and 19, respectively; claims 10 and 21 depend from claims 1 and 12, respectively; and claims 11 and 22 depend from claims 10 and 21, respectively. The Petition's arguments for each of these dependent claims fail to remedy the deficiencies identified above, and thus the Petition fails to show that they are invalid for at least the same reasons.

V. Ground III: Claims 9 and 20 are patentable over the combination of Ho and Farid.

Claims 9 and 20 depend from independent claims 1 and 12, respectively. As shown above for Ground II, Petitioner failed to show that Ho renders obvious claims 1 and 12. Ground III relies on the deficient Ground II, and Petitioner does not rely on Farid to cure Ho's deficiencies with respect to the independent claims. *See* Pet. 72-74. Accordingly, claims 9 and 20 are patentable over Ground III for at least the same reasons as claims 1 and 12 in Ground II.

VI. Ground I: Claims 1-6 and 12-17 are patentable over Gatewood alone or in combination with Ho.

In Ground I, Petitioner applies Gatewood alone or in combination with Ho. As discussed below, there are a number of differences between Gatewood and independent claims 1 and 12. Petitioner attempts to fix these differences with a POSITA's supposed understanding of various aspects of the references. But, Petitioner's fixes are based on hindsight and unsupported attorney argument and contradict the references themselves. For the reasons discussed below, Petitioner failed to meet its burden to show that any claim would have been obvious to a POSITA in view of Gatewood alone or in combination with Ho.

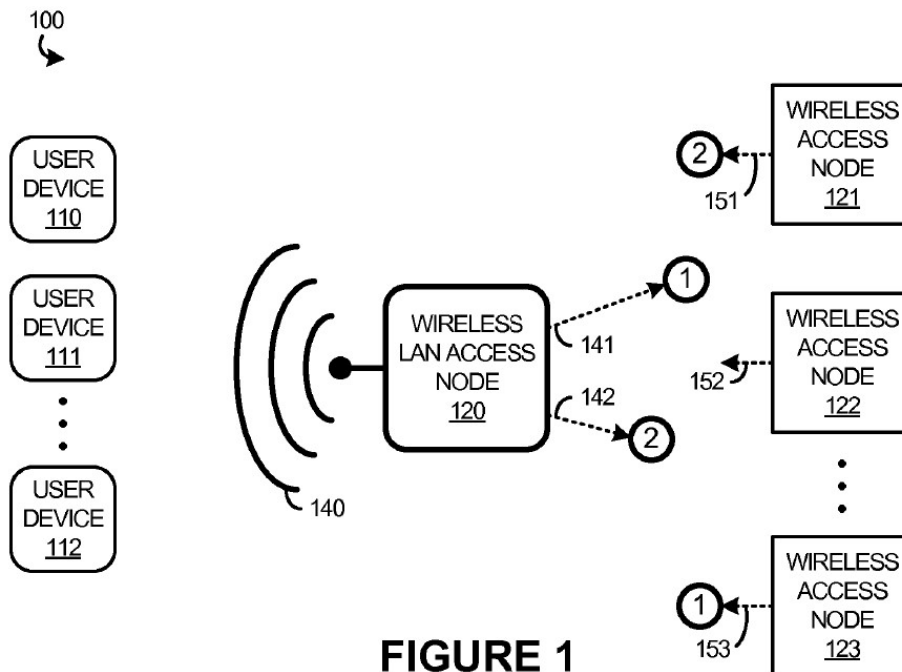
A. Overview of Gatewood

Gatewood is generally directed to “[s]ystems, methods, and software for providing a wireless local area network [WLAN] to user devices using a wireless access node,” including the “selection of wireless backhaul links for wireless

access nodes.” Ex.1005 (Gatewood), Abstract, 1:6-9. More particularly, Gatewood teaches a system where a first wireless access node can form a backhaul link with any of a plurality of access nodes, each of which has a connection to an external network. *Id.*, 3:58-62.

In Gatewood's system, unlike the '698 patent, the “backhaul links” to different nodes all comprise “the same or similar first wireless frequency spectrum” (*id.*, 6:52-56, 7:1-8, 9:55-10:5), and the “first wireless backhaul link” and “second wireless backhaul link as a backup” are always to entirely different nodes. Ex.2006 ¶¶98, 102; Gatewood, Figs. 1-4.

In Figure 1, for example, the “WLAN access node 120” can form a “backhaul link[]” by “way of ones of wireless access nodes 121-123.” Gatewood, 2:39-42, 2:61-63.

**FIGURE 1****Gatewood, Fig. 1**

Gatewood explains that in this example the “first wireless backhaul link” is with access node 123 as indicated by the “1” indicator, and the “backup” backhaul link is with a different access node 121 as shown by the “2” indicator. Gatewood, 3:17-44. The two backhaul links are associated with different nodes by design. Gatewood explains that after a node is selected as the first wireless backhaul link, a different node must be selected for the backup backhaul link. *Id.*, 3:35-38 (“Since wireless link 153 has already been selected as the first wireless backhaul link in operation 202, WLAN access node 120 selects from among wireless links 151-152 for the second wireless backhaul link.”).

Gatewood's Figure 3 embodiment is the same. The wireless LAN access node 330 can form a backhaul with any of "WLAN access nodes 331-334" to provide connections to "other networks." *Id.*, 3:58-62.

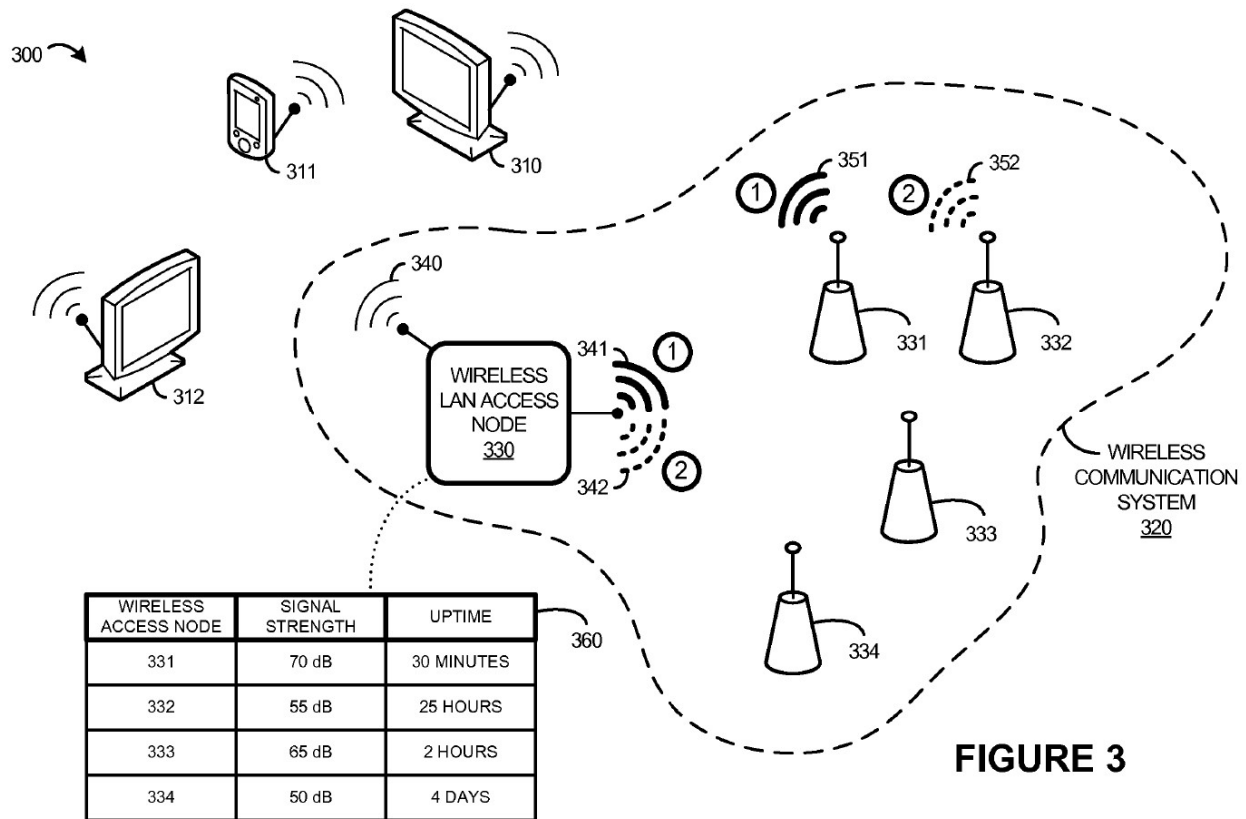


FIGURE 3

Gatewood, Fig. 3

Based on signal strength and uptime, the WLAN access node 330 "selects WLAN access node 331 for the first wireless backhaul link, as indicated by wireless link 341 and the '1' indicator in FIG. 3." Gatewood, 4:49-53. For the backup backhaul link, "WLAN access node 331 has already been selected for first wireless backhaul link 341, and only WLAN access nodes 332-334 remain for

selection for the second backhaul wireless link.” *Id.*, 5:31-35. Thus, the “first” and “second” backhaul links in Gatewood must be to different nodes.

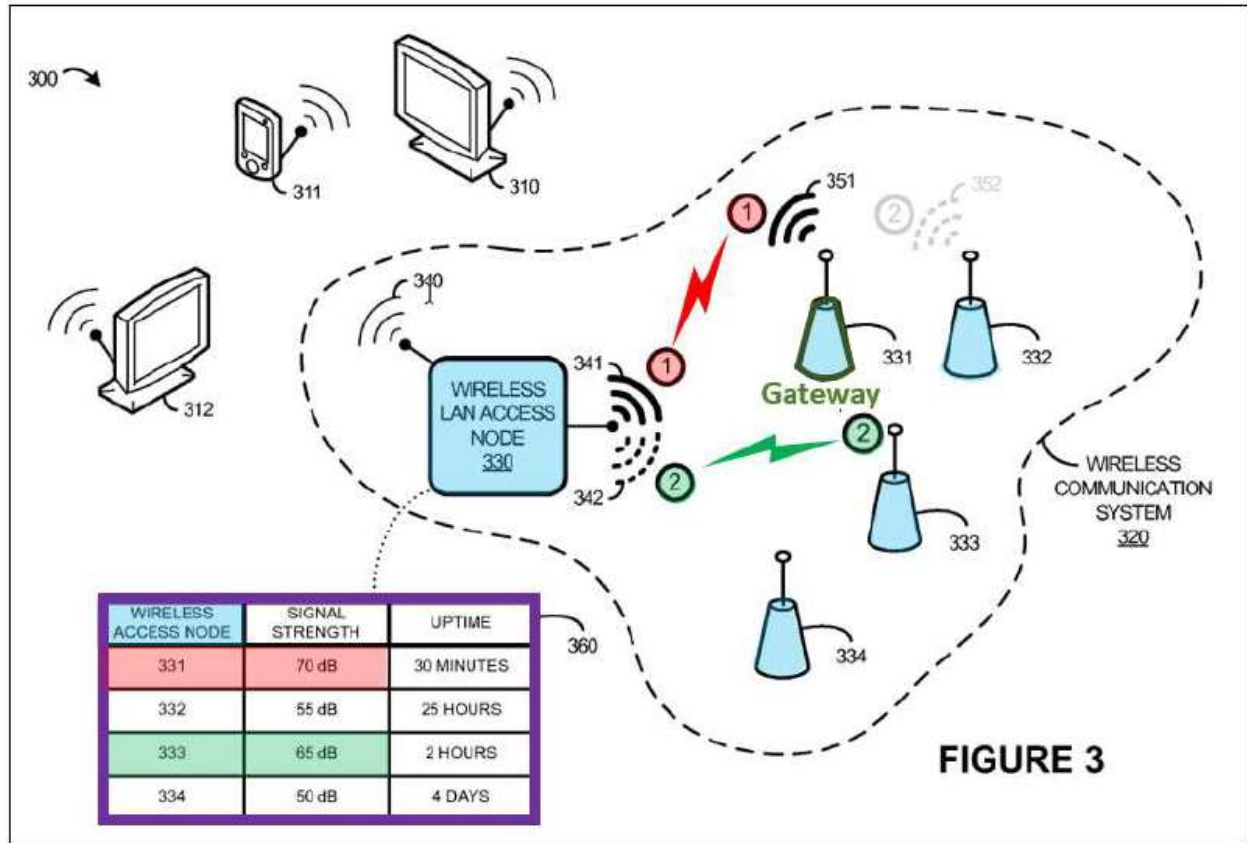
B. The Petition does not show Gatewood, alone or in combination with Ho, renders claims 1 or 12 obvious.

1. Gatewood, alone or in combination with Ho, does not disclose or render obvious two attempts to establish a backhaul between a first node and a second node (claim elements [1.1]/[12.1] and [1.2]/[12.2]).

Claims 1 and 12 recite “*performing an attempt to utilize a first channel* in a default frequency band as a *backhaul with second node* in the network[.]” and “*performing an attempt to utilize a different channel* in the default frequency band and/or a channel in a different frequency band that has a lower frequency range than the default frequency band, *to establish the backhaul with the second node*[.]” Petitioner concedes these two claim elements require attempts to establish a backhaul with the same “*second node*.” Pet. 29.

Petitioner does not show Gatewood taught making multiple attempts to establish a backhaul with a single “second node.” Petitioner maps the “attempt to utilize a first channel” to a “first wireless backhaul link 341” in Gatewood’s Figure 3, reproduced below, and maps the second attempt—“an attempt to utilize a different channel in the default frequency band”—to the “second wireless backhaul link 342.” Pet. 23, 30.

But these two mapped links 341 and 342 are with different access nodes—notably nodes 331 and 333, respectively. *Id.* 26-27, 29 (“[T]he first wireless backhaul link and second wireless backhaul link connect MAP.330 to MAP.331 and MAP.333, respectively.”); Ex.2006 ¶101. The different destinations of these links are expressly shown by Petitioner’s annotation of Figure 3, reproduced below, which shows that the first and second attempts to establish backhaul are to different access nodes 331 and 333. Specifically, the first attempted backhaul to access node 331 (the purported attempt in the “default frequency band”) is shaded red, while the second attempted backhaul to access node 333 (the purported “attempt to utilize a different channel ... and/or ... band”) is shaded green.



Pet. 27 (Petitioner's annotation of Gatewood, Figure 3)

Petitioner attempts to overcome this obvious deficiency with three different hindsight-based obviousness arguments. Each fails.

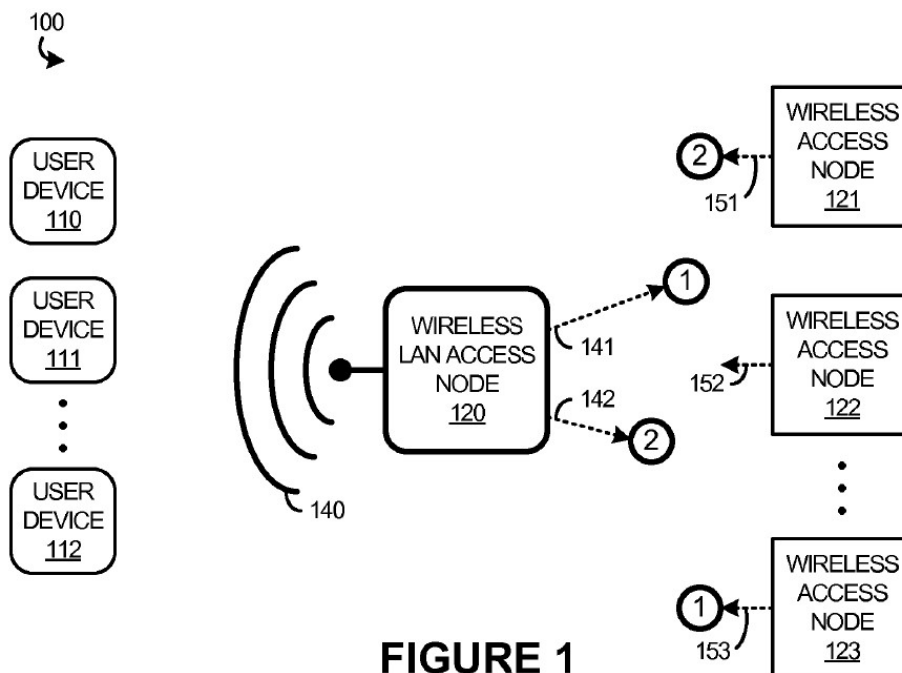
First, Petitioner asserts that “[t]he second wireless backhaul link is part of a multi-hop backhaul path (*e.g.*, MAP.330-to-MAP.333-to-MAP.331) to the same gateway[]” (MAP.331). Pet. 29. This multi-hop scenario is fabricated by Petitioner with no support in Gatewood itself. Gatewood does not designate node 331 as being different than the other nodes, nor does it disclose selecting a multi-hop route to node 331 instead of a one-hop route. Ex.2006 ¶¶98, 102. To the contrary, Gatewood taught selecting links to two different wireless access nodes 331 as the

first and second backhaul links. Further, Gatewood specifically discloses that *all* of the WLAN nodes 331-334 are coupled to other networks, not just a subset (let alone node 331). Gatewood, 3:58-62. Put simply, Gatewood has no multi-hop paths. Ex.2006 ¶¶98, 102. Petitioner's assertion otherwise is based on nothing more than hindsight using the '698 patent claims as a blueprint to modify Gatewood.

Second, Petitioner argues as a backup that “Gatewood teaches forming multiple parallel wireless links (channels) between any two MAPs—such as between MAP.330 (first node) and MAP.331 (second node).” Pet. 30 (citing Gatewood, 10:23-31). Under this interpretation of Gatewood, according to Petitioner, the node 330 “can establish first wireless backhaul link (over claimed ‘first channel’) and second wireless backhaul link (over claimed ‘different channel’) that both terminate at *the same* MAP, such as MAP.331 (second node/gateway).” Pet. 30-31 (original emphasis). In other words, Petitioner asserts that Gatewood explicitly discloses two channels between access nodes, and in that case a node “can” select one channel for its first attempt to establish backhaul to a second node and the other channel for its second attempt to establish a backhaul with the same second node.

This second argument fares no better than Petitioner's first because, once again, it is made out of whole cloth and entirely unsupported by Gatewood and

improperly mixes and matches Gatewood's embodiments without a motivation to combine. The cited passage of Gatewood does not disclose "multiple parallel wireless links (channels) between any two MAPs." *Id.* 30. Nor does it disclose making two attempts to establish backhaul on two different channels between the same two nodes. Rather, the passage refers to "wireless links 140-142 and 151-153" of Figure 1 (Gatewood, 10:23-25), reproduced below. Gatewood states that "one main wireless link for each of wireless links 140-142 and 151-153 is shown in FIG. 1[.]" *Id.* These wireless links "are merely illustrative to show communication modes or wireless access pathways for user devices 110-112 and associated backhaul." *Id.*, 10:23-27.



Gatewood, Fig. 1

According to Gatewood, “further wireless links can be shown, with portions of the further wireless links shared and used for different communication sessions or different content types, among other configurations.” Gatewood, 10:28-31.

Nowhere in this passage does Gatewood describe multiple links (let alone channels) between access nodes, let alone multiple links (or channels) for redundancy between the same two nodes. Ex.2006 ¶¶104-105. For example, even if this passage did disclose multiple links between access nodes, there is no reason that these links would have different link quality (e.g., signal strength and uptime) such that one could serve as a serviceable backup to the other. *Id.* ¶105. Nor has Petitioner provided any motivation for a POSITA to combine descriptions of Gatewood's Figure 1 embodiment with Gatewood's Figure 3 embodiment. *See SIBIA Neurosciences, Inc. v. Cadus Pharm. Corp.*, 225 F.3d 1349, 1356 (Fed. Cir. 2000) (“In appropriate circumstances, a single prior art reference can render a claim obvious. ... ***However, there must be a showing of a suggestion or motivation to modify the teachings of that reference to the claimed invention in order to support the obviousness conclusion.***”). A POSITA would not have because Gatewood indicates that in the Figure 3 embodiment, if “WLAN access node 331 has already been selected for first wireless backhaul link,” “***only*** WLAN access nodes 332-334 remain for selection for the second backhaul wireless link.” Gatewood, 5:31-35. Thus, Gatewood teaches against the second backhaul link

being a parallel link with the same node. Again, Petitioner's only support for this interpretation comes from Dr. Ding, who merely recites the Petition's conclusions verbatim, and his opinions should not be given any weight. *Compare* Pet. 29-31, *with* Ex.1002 ¶¶99-104.

Third, Petitioner attempts to fix Gatewood by reaching outside of its disclosures into one or more of Ho, Sinha, or Handforth. Those arguments fail too. Petitioner asserts "Ho also teaches forming multiple parallel backhaul connections ('upstream links') between a non-CAP hybrid device and a CAP using different frequency channels and, thus, Ho further confirms Gatewood's teachings." Pet. 31 (citing Ho, 21:7-12). Even if Petitioner's characterization of Ho were correct (it is not), Petitioner has not proposed any kind of modification of Gatewood based on Ho, offered any motivation for why a POSITA could have or would have combined the references, nor has Petitioner argued that Ho's teaching would have influenced a POSITA's understanding of Gatewood. DI 26 (agreeing at institution that the Petition did not present any motivations to combine). That is fatal to Petitioner's argument. *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006) (requiring "articulated reasoning with some rational underpinning to support the legal conclusion of obviousness"); *Ruiz v. A.B. Chance Co.*, 357 F.3d 1270, 1275 (Fed. Cir. 2004) (improper under the "as a whole" requirement of § 103 to "break an invention into its component parts (A+B+C), then find a prior art reference

containing A, another containing B, and another containing C, and on that basis alone declare the invention obvious”).

Nevertheless, Petitioner mischaracterizes Ho. Ho's “establish[ing] redundant upstream links” in this example does not teach or suggest multiple WLAN channels between a non-CAP and a CAP in the same frequency band. Ex.2006 ¶106. Rather, the cited passage of Ho refers to the usage of non-WLAN interfaces to determine a non-CAP device's second-level personality. Ho states “determining the personality of the non-CAP hybrid device can also take into consideration whether the non-CAP hybrid device is connected an end-device.” Ho, 21:3-7. In Ho's example, a non-CAP hybrid device may choose *not* to be an access point (which would “improv[e] WLAN coverage”) if it is connected to an end-device via an Ethernet interface. *Id.*, 21:7-12; Ex.2006 ¶106. But the non-CAP includes multiple interfaces capable of connecting to the CAP (e.g., PLC interface and WLAN STA interface) for the redundant upstream links.

Because Ho fails to support Petitioner's arguments, Petitioner tries again with Sinha and Handforth, contending based on those references that “[f]orming multiple redundant parallel backhaul links (over different frequency channels) between two nodes of a mesh network was in fact well-known and described in many other prior art references, and thus within the knowledge of a person of ordinary skill.” Pet. 31. This argument is insufficient for similar reasons to Ho.

Petitioner does not rely on any modification of Gatewood based on Sinha or Handforth (or the knowledge of a POSITA) for this limitation. *See* Pet. 29-31. Nor does Petitioner provide any motivation to combine those references. Once again, that is fatal to Petitioner's arguments. *Kahn*, 441 F.3d at 988; *see also* DI 26.

Even if the Board were to consider Sinha and Handforth, they do not support Petitioner's mischaracterizations of Gatewood. Sinha discloses multiple *paths* to a controller, not multiple redundant backhaul links over different frequency channels. Ex.2006 ¶108. Not only is that inapplicable, but as discussed above there is no reason for multiple paths to a single MAP in Gatewood because each of nodes 331-334 is coupled to further networks. Gatewood, 3:58-62. Nor has Petitioner identified any reason to modify Gatewood in view of Handforth's "multiple parallel wireless channels" (Pet. 31) (citing Ex.1006 (Handforth), 4:54-63), when Gatewood already has redundancy in its backhauls built into the network. Ex.2006 ¶¶98, 109.

Petitioner's hindsight driven interpretations of Gatewood should be rejected for the same reasons as at institution, and the Board should find Petitioner failed to meet its burden to show that Gatewood alone or in combination with Ho discloses or renders obvious claim elements [1.1]/[12.1] and [1.2]/[12.2].

2. Gatewood alone or in combination with Ho does not disclose or render obvious claim element [1.1]/[12.1].

Claims 1 and 12 both recite “performing an attempt to utilize a first channel in a default frequency band as a backhaul with second node in the network, 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[.]” Petitioner labels this claim element [1.1]/[12.1]. Pet. 17.

Petitioner relies on a POSITA's knowledge of “backhaul communication” to argue disclosure of the requirement that “the backhaul is to provide communication of management functions between the nodes in the network.” *Id.* 21-22. In other words, Petitioner asserts based on a POSITA's understanding that *any* backhaul meets the claim limitation. *Id.* (“[A] backhaul communication provides MAP-to-MAP communication and is not a front-haul client-facing communication A backhaul also carries control and management information that communicate management functions such as MAP coordination functions, which Gatewood refers to as ‘overhead communications,’ between the nodes in the network.”). That is wrong as a matter of law because it improperly renders superfluous the limitations requiring that 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.” *See Intel*

Corp. v. Qualcomm Inc., 21 F.4th 801, 809-10 (Fed. Cir. 2021) (“It is highly disfavored to construe terms in a way that renders them void, meaningless, or superfluous.”). Petitioner also misrepresents Gatewood, which does not disclose that overhead communication constitutes “MAP coordination functions” carried by a backhaul. *Cf.* Pet. 22; Ex.2006 ¶¶110-111.

Petitioner also cites to Ho, stating “as also described in Ho, APs communicate with one another over the backhaul to identify themselves, to exchange capability and configuration information, and to coordinate their operations.” Pet. 22 (citing Ho, 13:39-41, 14:4-6, 4:46-55). These passages all relate to *broadcasts* of AP information that occur *before* the alleged backhaul links are established.⁷ Thus, they cannot satisfy this limitation that requires “the *backhaul* ... to provide communication of management functions between the nodes in the network[.]”

Finally, Petitioner cites to Dr. Ding’s Declaration (Ex.1002 ¶¶86-88), but Dr. Ding mimics Petitioner *verbatim* (Pet. 21-22), and his opinions are not entitled

⁷ Petitioner also mentions IEEE 802.11s in passing (Pet. 22). That standard cannot save Petitioner’s arguments. Neither Gatewood nor Ho disclose use of IEEE 802.11s; IEEE 802.11s is not part of Ground 1; and Petitioner does not assert any reason to modify Gatewood or Ho based on IEEE 802.11s. Ex.2006 ¶112.

to any weight. *Xerox Corp. v. Bytemark, Inc.*, IPR2022-00624, Paper 9 at 15 (Aug. 24, 2022) (precedential) (“conclusory and unsupported” declaration testimony “adds little to the conclusory assertion[s] for which it is offered to support, and is entitled to little weight”).

Accordingly, Petitioner failed to meet its burden to show that Gatewood alone or in combination with Ho discloses or renders obvious claim element [1.1]/[12.1].

3. Petitioner fails to show that Gatewood alone or in combination with Ho discloses or renders obvious claim element [1.2]/[12.2].

Claim 1 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 channel in a different frequency band that has a lower frequency range than the default frequency band, to establish the backhaul with the second node.”

Petitioner asserts that “Gatewood teaches that the second wireless backhaul link is established using a different channel of the default 5 GHz band, Gatewood satisfies” this claim element. Pet. 28. Not so. Gatewood does not disclose using different channels for different links, and Petitioner makes no attempt to cite to Gatewood for such disclosure. *See id.* 28-29. Instead, Petitioner seems to assume that the second wireless backhaul link will operate on “a different channel of

the ... 5 GHz band” than the first wireless backhaul link, merely because they are different links. *Id.*

Petitioner further asserts that “[t]he second wireless backhaul link can be established using a different, better, channel of the same default 5 GHz band used to establish the first wireless backhaul link.” *Id.* 28. Gatewood makes no such disclosure or suggestion. Nevertheless, even if true, Petitioner’s statement goes to the mere possibility of performing the claim element, not obviousness of the claim. *See Belden*, 805 F.3d at 1073 (“[O]bviousness concerns whether a skilled artisan not only *could have made* but *would have been motivated to make* the combinations or modifications of prior art to arrive at the claimed invention.”) (original emphasis).

Accordingly, Petitioner failed to meet its burden to show that Gatewood alone or in combination with Ho discloses or renders obvious claim element [1.2]/[12.2].

C. Gatewood alone or in view of Ho does not render obvious performing an attempt to establish the backhaul with the second node utilizing a different radio (claims 2 and 13).

Claims 2 and 13 depend from claims 1 and 12, respectively, and recite “wherein said attempts are performed on a first radio, the [method/operations] further comprising: upon failure of all said attempts, performing an attempt to establish the backhaul with the second node utilizing a different radio.”

As discussed above for claims 1 and 12, Gatewood does not attempt to establish another backhaul “with the second node” upon failure of a previous attempt. To the contrary, Gatewood uses a backhaul with a *different node* when one backhaul fails. Gatewood therefore cannot meet the claim 2/13 limitation, which requires a further attempt to establish the backhaul with the second node utilizing a different radio. *See* Pet. 35-37. Petitioner does not propose any modification of Gatewood based on Ho for claims 1 and 12. *See* DI 26-27. Further, for claims 2/13 Petitioner only asserts that a MAP in Gatewood “*can be implemented*” with Ho’s “dual-band dual concurrent [(DBDC)] radio” for claims 2/13, but does not explain why a POSITA could have or would have done so. Pet. 36-37. Petitioner’s expert admitted that even if a device is “able to operate on two different frequency bands, it’s not necessarily obvious the device is going to have two separate radios[.]” Ex.2007, 109:19-110:12. The Petition does not explain why a POSA would have implemented the DBDC device of Ho using separate radios. Accordingly, Petitioner failed to meet its burden and claims 2 and 13 are not obvious.

D. Gatewood alone or in view of Ho does not render obvious Claims 4 and 15.

Claims 4 and 15 depend from claims 1 and 12, respectively, and recite “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.” These claims are patentable at least for their dependence on patentable claims 1 and 12. Further, similar to its analysis for claims 4 and 15 in Ground 2, Petitioner does not explain why a POSA would have and could have implemented using probes in Gatewood as required by claims 4 and 15, instead of beacons, or identify why a POSA would have considered beacons (or any other potentially available option) as satisfying the claim. *Belden*, 805 F.3d at 1073 (“[O]bviousness concerns whether a skilled artisan not only *could have made* but *would have been motivated to make* the combinations or modifications of prior art to arrive at the claimed invention.”) (original emphasis). Petitioner thus fails to meet its burden to show obviousness of these claims.

E. Gatewood alone or in view of Ho does not render obvious Claims 6 and 17.

Claims 6 and 17 depend from claims 1 and 12, respectively, and recite “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.”

These claims are patentable over Gatewood, alone or in combination with Ho, at least for their dependence on claims 1 and 12. In addition, Petitioner relies on its doomed two-hop backhaul theory for the independent claims as the “particular connection topology.” Pet. 43-44. But as discussed above and agreed by the Board, Gatewood alone or in combination with Ho does not disclose a two-hop

backhaul. DI 25-26. Alternatively, Petitioner argues that a single hop direct link between two devices constitutes a particular connection topology. Pet. 43-44. But Petitioner's argument would render a "particular connection topology" meaningless in the claim, as any link between any two nodes would satisfy claims 6 and 17 under Petitioner's faulty logic. *Bicon, Inc. v. Straumann Co.*, 441 F.3d 945, 951 (Fed. Cir. 2006) (discussing "principle that claim language should not be treated as meaningless[']"). Petitioner failed to meet its burden to show that these claims are obvious over Gatewood alone or in combination with Ho.

F. Gatewood alone or in view of Ho does not render obvious claims 3, 5, 14, and 16.

Claims 3 and 14 depend from claims 2 and 13, respectively, and are patentable at least for their reliance on those claims.

Claims 5 and 16 depend from claims 1 and 12, respectively, and recite "utilizing a spanning tree based protocol to avoid loops in said attempts." These claims are patentable at least for their dependence on patentable claims 1 and 12, and Petitioner failed to meet its burden to show obviousness of these claims.

VII. Conclusion

For the reasons set forth above, the Board should find the challenged claims patentable over the instituted grounds.

Respectfully submitted,

Dated: July 9, 2024

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CERTIFICATE OF COMPLIANCE WITH 37 C.F.R. § 42.24

I hereby certify that this Patent Owner's Response complies with the word count limitation of 37 C.F.R. § 42.24(b)(2) because the Patent Owner's Response contains 13,996 words using Microsoft Word's counting feature, excluding the cover page, signature block, and the parts of the Patent Owner's Response exempted by 37 C.F.R. § 42.24(b)(2).

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CERTIFICATE OF SERVICE

Pursuant to 37 C.F.R. § 42.6(e), I certify that on this 9th day of July, 2024, a true and correct copy of the foregoing **Patent Owner's Response and all Exhibits** were served by electronic mail on Petitioner's lead and backup counsel at the following email addresses:

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