

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

RUCKUS WIRELESS, INC., BELKIN INTERNATIONAL, INC.,
NETGEAR, INC., AND ROKU, INC.,
Petitioner,

v.

HERA WIRELESS S.A.,
Patent Owner.

Case IPR2018-01737
Patent 7,873,389 B2

Before THOMAS L. GIANNETTI, ROBERT L. KINDER, and
JACQUELINE T. HARLOW, *Administrative Patent Judges*.

HARLOW, *Administrative Patent Judge*.

DECISION
Denying Institution of *Inter Partes* Review
35 U.S.C. § 314

I. INTRODUCTION

Ruckus Wireless, Inc., Belkin International, Inc., Amazon.com, Inc.,¹ Netgear, Inc., and Roku, Inc. (collectively, “Petitioner”) filed a Petition requesting *inter partes* review of claims 1–3 of U.S. Patent No. 7,873,389 B2 (Ex. 1001, “the ’389 patent”). Paper 1 (“Pet.”). Patent Owner, Hera Wireless S.A., filed a Preliminary Response. Paper 12 (“Prelim. Resp.”). Pursuant to our authorization, Petitioner filed a Reply to Patent Owner’s Preliminary Response (Paper 15, “Reply”), and Patent Owner filed a Sur-Reply (Paper 19, “Sur-Reply”).

We have authority under 35 U.S.C. § 314, which provides that an *inter partes* review may be instituted if the information presented in the Petition and the Preliminary Response shows that “there is a reasonable likelihood that the petitioner would prevail with respect to at least 1 of the claims challenged in the petition.” 35 U.S.C. § 314; *see also* 37 C.F.R. § 42.4(a) (“The Board institutes the trial on behalf of the Director.”).

For the reasons that follow, we do not institute trial as to any challenged claim or ground stated in the Petition.

A. Related Matters

The parties identify several district court proceedings concerning the ’389 patent: *Hera Wireless S.A. v. Amazon.com, Inc.*, 1:17-cv-00947 (D. Del.); *Hera Wireless S.A. v. ARRIS Group, Inc.*, 1:17-cv-00948 (D. Del.); *Hera Wireless S.A. v. Belkin Int’l, Inc.*, 1:17-cv-00949 (D. Del.);

¹ A joint motion to terminate the proceeding as to Amazon.com, Inc. has been granted. Paper 13.

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Hera Wireless S.A. v. Buffalo Americas, Inc., 1:17-cv-00950 (D. Del.); *Hera Wireless S.A. v. Netgear, Inc.*, 1:17-cv-00951 (D. Del.); *Hera Wireless S.A. v. Roku, Inc.*, 1:17-cv-00952 (D. Del.); *Hera Wireless S.A. v. Lenovo Holding Co., Inc.*, 1:17-cv-01088 (D. Del.); and *Hera Wireless S.A. v. LG Electronics, Inc.*, 1:17-cv-01089 (D. Del.). Pet. 3; Paper 5, 2.

The '389 patent is also the subject of IPR2018-01702, filed by Intel Corporation. In addition, Petitioner has filed petitions seeking *inter partes* review of several other patents held by Patent Owner, including: IPR2018-01418 (challenging U.S. Patent No. 7,962,103); IPR2018-01419 (challenging U.S. Patent No. 8,412,115); IPR2018-01420 (challenging U.S. Patent No. 8,934,851); IPR2018-01421 (challenging U.S. Patent No. 8,934,851); IPR2018-01732 (challenging U.S. Patent No. 9,270,024); IPR2018-01736 (challenging U.S. Patent No. 7,454,234); IPR2018-01738 (challenging U.S. Patent No. 7,369,389); and IPR2018-01739 (challenging U.S. Patent No. 8,295,400).

B. The '389 Patent

The '389 patent is titled "Radio Base Station Apparatus, Radio Terminal Apparatus, Mobile Communication System, and Reception Operation Control Program." Ex. 1001, (54). The '389 patent describes a method for improving radio terminal performance by adapting a reception operation at the terminal to a transmission operation by a base station. *Id.*, Abstract. In particular, the patent teaches that, in response to a connection request from a terminal, a base station provides a signal to the terminal indicating a reception operation adapted to a transmission operation of the

base station. *Id.* Based on the signal from the base station, the terminal selects and performs the optimum reception operation. *Id.*

The '389 patent explains that prior art mobile communication systems, such as the Personal Handyphone System ("PHS"), use Path Division Multiple Access ("PDMA") schemes to permit the connection of several terminals to a single base station in a spatially multiplexed manner. Ex. 1001, 1:36–42. By spatially dividing a given time slot for a given frequency, such systems allow for the creation of different spatial paths, and, thus, efficient use of transmission bandwidth. *Id.* at 1:42–44.

In a PDMA scheme, a receiving terminal may employ either selective diversity reception ("diversity reception") or adaptive array reception. Ex. 1001, 1:45–51, 1:64–66. A terminal using diversity reception "operates to select one antenna with [a] higher reception level as a reception antenna from, for example, two [or more] antennas." *Id.* at 1:64–2:1. In adaptive array reception, a received signal is extracted with reception directivity through an adaptive array process. *Id.* at 1:45–51. Difficulties arise when a terminal using diversity reception receives a transmission from a base station using an adaptive array transmission technique, as the terminal may receive signals not intended for it. *Id.* at 4:3–6. When this occurs, the resultant reduction in the ratio of desired to undesired signal degrades reception performance, and reduces the minimum distance required between base stations in order for them to share the same frequency. *Id.* at 4:6–11

The '389 patent aims to overcome this problem by causing the terminal to perform a reception operation that is adapted to the transmission operation of the base station. *Id.* at 4:22–34. Specifically, an indicating

signal sent by the base station instructs the terminal to receive the frame in the manner prescribed by the base station—for instance, using diversity reception or adaptive array reception. *Id.* at 15:21–44. When the terminal receives this signal, it adapts its reception operation to the transmission operation of the base station and proceeds to receive a frame in an optimal manner. *Id.* at 15:64–16:3.

C. Challenged Claims

The '389 patent includes three claims, each of which is challenged in the Petition. Claim 1, reproduced below, is the sole independent claim of the '389 patent.

1. A communication method comprising:
receiving a connection request from a radio terminal apparatus; and
transmitting a multiple-field frame to the radio terminal apparatus which has sent the connection request, wherein (1) a single bit indicating a reception operation adapted to a transmission operation of a radio base station apparatus and (2) data are respectively contained in mutually different fields of the multiple-field frame.

Ex. 1001, 26:27–35. Claim 2 depends from claim 1 and further recites:
wherein the single bit has a first value specifying a first reception operation or a second value specifying a second reception operation, the single bit instructing the radio terminal apparatus to accept the multiple-field frame only in a prescribed manner determined by the first or second value and adapted to a corresponding transmission operation of the radio base station apparatus.

Ex. 1001, 26:36–43. Claim 3 likewise depends from claim 1, and adds a requirement that the receiving and transmitting steps be performed using a “plurality of antennas.” *Id.* at 26:44–48.

D. Evidence Relied Upon

Petitioner relies upon the following references (Pet. 26):

Hood US 6,778,844 B2 Aug. 17, 2004 (Ex. 1017)

Wireless LAN Medium Access Control (MAC) and Physical Layer (PHY) Specifications, ANSI/IEEE Std 802.11, 1999 Edition (Ex. 1007) (“802.11-1999”).

Wireless LAN Medium Access Control (MAC) and Physical Layer (PHY) Specifications: Higher-Speed Physical Layer Extension in the 2.4 GHz Band, IEEE Std 802.11b-1999 (Supplement to ANSI/IEEE Std 802.11, 1999 Edition) (Ex. 1008) (“802.11b”).

Petitioner also relies on the Declaration of Kevin Negus, Ph.D. (Ex. 1002). Patent Owner submits the Declaration of Jacob Sharony, Ph.D. (Ex. 2001) in support of its position.

E. Asserted Grounds of Unpatentability

Petitioner asserts the following grounds of unpatentability (Pet. 18):

Claim(s)	Basis	References
1, 2	§ 103	802.11-1999 as amended by 802.11b
3	§ 103	802.11-1999 as amended by 802.11b in view of Hood

II. ANALYSIS

A. Real Party-in-Interest

The Petition names Ruckus Wireless, Inc., Belkin International, Inc., Amazon.com, Inc., NETGEAR, Inc., Roku, Inc., and “[o]ut of an abundance

of caution,” ARRIS International plc, ARRIS Enterprises, LLC, and ARRIS Solutions, Inc., as real parties-in-interest. Pet. 2. Patent Owner does not contest these identifications in its Preliminary Response.

B. Level of Ordinary Skill in the Art

In determining the level of ordinary skill in the art, various factors may be considered, including the “type of problems encountered in the art; prior art solutions to those problems; rapidity with which innovations are made; sophistication of the technology; and educational level of active workers in the field.” *In re GPAC, Inc.*, 57 F.3d 1573, 1579 (Fed. Cir. 1995) (citation omitted). In that regard, Petitioner submits that a person with ordinary skill in the art at the time of the invention would have had a “Bachelor of Science in Electrical Engineering, or an equivalent field, as well as three to four years of experience in the field of wireless communications, or a Master’s degree in Electrical Engineering, or an equivalent field, as well as two years of experience in the field of wireless communications.” Pet 20 (citing Ex. 1002 ¶ 29).

Patent Owner’s formulation is similar, requiring somewhat less formal education but more work experience:

The level of ordinary skill in the art applicable to the ’389 patent as of around 2001 is a person with a working knowledge of advanced antenna techniques. The person would have gained this knowledge through an undergraduate Bachelor of Science degree in Electrical Engineering or an equivalent degree, and three to five years of experience working in the field of wireless communications. Additional education or experience may serve as a substitute for these requirements.

Prelim. Resp. 9 (citing Ex. 2001 ¶ 26).

We regard any differences in the parties' formulations as immaterial. Both require experience in wireless communications, and a similar number of years of combined educational and work experience. In addition, although Patent Owner's definition is more specific in requiring "a working knowledge of advanced antenna techniques" (Prelim. Resp. 9), we conclude that under either formulation, a person of ordinary skill in wireless communications at the time of invention of the '389 patent would have had at least a "working knowledge" of advanced antenna techniques, and thus, this requirement is subsumed by Petitioner's proposal. *See Okajima v. Bourdeau*, 261 F.3d 1350, 1355 (Fed. Cir. 2001) (prior art itself may reflect an appropriate level of skill). For the purpose of our decision, we adopt Petitioner's proposal. However, we would reach the same result with regard to this institution decision under either formulation.

C. Claim Construction

In this *inter partes* review, the Board interprets claim terms according to the broadest reasonable construction in light of the specification of the patent in which they appear. 37 C.F.R. § 42.100(b) (2018); *Cuozzo Speed Techs., LLC v. Lee*, 136 S. Ct. 2131, 2142 (2016).² Under that standard, and absent any special definitions, we give claim terms their ordinary and customary meaning, as would be understood by one of ordinary skill in the

² A recent amendment to this rule changing the claim construction standard does not apply here because the Petition was filed before the November 13, 2018, effective date. *See* Changes to the Claim Construction Standard for Interpreting Claims in Trial Proceedings Before the Patent Trial and Appeal Board, 83 Fed. Reg. 51,340 (Oct. 11, 2018).

art at the time of the invention. *In re Translogic Tech., Inc.*, 504 F.3d 1249, 1257 (Fed. Cir. 2007). Additionally, any special definitions for claim terms must be set forth with reasonable clarity, deliberateness, and precision. *In re Paulsen*, 30 F.3d 1475, 1480 (Fed. Cir. 1994).

Petitioner asserts the claims should be given “their ordinary and customary meaning read in view of the ’389 Patent’s specification and prosecution history” and does not request any constructions. Pet. 21. Patent Owner, on the other hand, requests construction of the term “reception operation adapted to a transmission operation,” which appears in the sole independent claim of the ’389 patent, claim 1. Prelim. Resp. 10. Patent Owner proposes that this term be construed as “an operation of the receiving radio terminal apparatus adapted in response to an indication signal having a single bit transmitted from the radio base station apparatus.” *Id.* Patent Owner offers the following examples of the claimed “reception operation”: “adaptive array reception and transmission . . . , diversity reception operation . . . , and performing a reception operation with a single, previously selected antenna.” *Id.* at 11.

Excluded from the construction proposed by Patent Owner would be antenna selection and demodulation. *Id.* at 11–14. Patent Owner argues: “While antenna selection or demodulation are steps in the overall operation of a receiver, neither alone is a ‘reception operation adapted to a transmission operation.’” *Id.* at 11. Patent Owner continues: “Based on the[] disclosures in the specification, a POSITA would understand that even the broadest reasonable interpretation of the claim terms ‘reception operation’ and ‘transmission operation’ requires more than the separate steps

of modulation and demodulation.” *Id.* at 14. Patent Owner concludes: “The proper construction of the term is, thus, ‘an operation of the receiving radio terminal apparatus adapted in response to an indication signal having a single bit transmitted from the radio base station apparatus.’” *Id.*

In its Reply, Petitioner contends that Patent Owner has presented a conflicting position from that in a related litigation, and that Patent Owner “arbitrarily excludes a demodulation scheme that is adapted to the modulation scheme selected by the transmitting radio base station.”

Reply 2. Petitioner asserts that demodulation at the receiver is a step in the overall operation of a receiver, as purportedly admitted by Patent Owner, and that the plain and ordinary meaning of the claim terms should not “exclude demodulation reception operations, which are clearly ‘operation[s] of the receiving radio terminal apparatus.’” *Id.* at 2–3. Petitioner also argues that Patent Owner’s proposed “construction also conflicts with the specification’s disclosure of *single* antenna receiver embodiments,” because the only reception operations disclosed for such a single, previously selected antenna are demodulation reception operations – meaning that certain embodiments would be excluded. *Id.* at 4.

We agree with Patent Owner’s construction. The specification of the ’389 patent distinguishes between adaptive array reception and antenna selection. As described in the specification, in adaptive array processing, “an uplink signal from each user’s terminal antenna is received by an array antenna of a base station and extracted with reception directivity through an adaptive array process.” Ex. 1001, 1:45–49. Similarly, we agree with Patent Owner’s assertion that demodulation is not disclosed in the ’389 patent as a

“reception operation adapted to a transmission operation.” Prelim. Resp. 13. The specification consistently indicates a separation between the Demodulator Circuit and the DSP (Digital Signal Processor) analyzing the reception operation indication signal. Ex. 1001, 19:12–17, 19:41–51, 20:40–51. For example, the ’389 specification teaches that demodulation at a receiver is separate from the claimed reception operation. *See, e.g.*, Ex. 1001, Fig. 10. As is explained by Patent Owner, “Figure 10 shows an already demodulated signal from demodulator 16 provided to DSP 12 (comprising apparatuses 12a and 12b), which extracts a terminal reception operation indicating signal (bit), receives the analyzed result, and **then** ‘performs the reception operation based on the indication.’” Sur-Reply 2–3 (quoting Ex. 1001, 19:41–51). Patent Owner provides a similar example based on Figure 11, and as shown in both figures a demodulated signal is first required by DSPs 12 and 14, respectively, to perform the subsequent claimed reception operation. *Id.* at 3.

We find Patent Owner’s contentions more persuasive and more in line with controlling authority. The Federal Circuit reached a similar conclusion in *Microsoft Corp. v. Proxyconn, Inc.*, 789 F.3d 1292 (Fed. Cir. 2015). There, the Federal Circuit decided that the Board erred in construing the terms “sender/computer” and “receiver/computer” as broad enough to include separate and distinct intermediary gateway and caching computers. Citing the specification, the Court explained:

The language of the specification consistently refers to the sender/computer, receiver/computer, gateway, and caching computers as separate and independent components of an overall system. The figures of the ’717 patent separately identify and

number each component of the system. And nowhere does the '717 patent indicate that the gateway and caching computer are the same as, or can be subsumed within, the sender/computer and receiver/computer.

789 F.3d at 1300. Patent Owner argues, and we agree, that “where the specification clearly distinguishes a reception operation from another type of ‘operation,’ it would be erroneous to characterize both operations as the ‘reception operation.’” Sur-Reply 4.

As to Petitioner’s argument that because a “single antenna receiver” contains no DSP, it cannot perform any “reception operation” other than demodulation (Reply 4), we find Patent Owner’s explanation more persuasive. Specifically, Patent Owner explains that “the specification clarifies that even a single antenna receiver, such as that in Figs. 9 or 18, performs a ‘reception operation’ after receiving a ‘reception operation indicating signal,’ and neither figure references demodulation as the reception operation.” Sur-Reply 4 (citing Ex. 1001, Figs. 14, 25, 18:63–64; 21:13–32; 25:18–27). Patent Owner notes that “a reception operation may be as simple as ‘fix[ing] [a] reception antenna’ and ‘perform[ing] [a] 1 antenna reception operation.’” *Id.* (alterations in original).

Based on the record before us, including the supplemental briefing, we agree with Patent Owner that “reception operation adapted to a transmission operation” means “an operation of the receiving radio terminal apparatus adapted in response to an indication signal having a single bit transmitted from the radio base station apparatus.” For the purposes of this decision, we do not need to construe any other term. Only terms which are in controversy need to be construed, and then only to the extent necessary to

resolve the controversy. *Vivid Techs., Inc. v. Am. Sci. & Eng’g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999).

D. References Relied Upon

1. 802.11-1999 and 802.11b

The 802.11-1999 specification is a wireless LAN standard intended to “develop a medium access control (MAC) and physical layer (PHY) specification for wireless connectivity for fixed, portable, and moving stations within a local area.” Ex. 1007, 1. The 802.11-1999 specification discloses that in order for a wireless terminal (“STA”) to communicate with another station, such as an access point (“AP”), the STA must first be authenticated by the AP and then become associated with the AP. Ex. 1007, 21–22. Once authenticated, the STA sends an Association Request to the AP, and receives an Association Response from the AP. *Id.* The frames used to exchange Authentication, Association Request, and Association Response messages are referred to as “Management frames.” *Id.* The 802.11-1999 standard further specifies that Association Response frames may include a “Capability Information” field, with a number of subfields that are used to indicate requested or advertised capabilities. *Id.* at 51.

The 802.11b standard is a “Supplement” to the 802.11-1999 standard, amending 802.11 to add certain features. Ex. 1008, 1. Among the added features are several that “allow the performance of the radio frequency LAN system to be improved,” including by enhanced data throughput. *Id.* at 11. The 802.11b standard teaches inserting certain additional fields into the “Capability Information” field of 802.11-1999. *Id.* at 3–4. For example, 802.11b describes adding a “Short Preamble” subfield and a “PBCC [Packet

Binary Convolutional Coding]” subfield to the Capability Information field.
Id. Figure 27 of 802.11b follows.

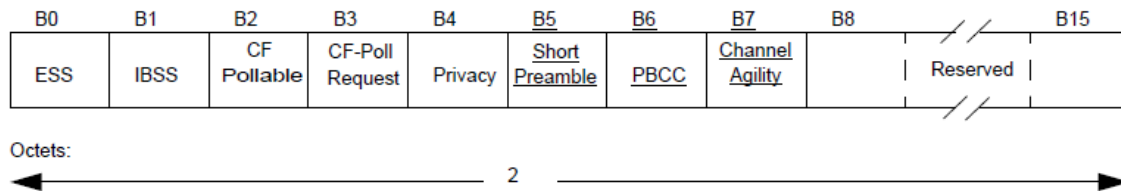


Figure 27—Capability Information fixed field

Figure 27 depicts the addition of the “Short Preamble” and “PBCC” subfields to the Capability Information field at bit 5 (“B5”). Ex. 1008, 3–4. With regard to the Short Preamble subfield, 802.11b explains that APs shall set that subfield to “1” to indicate use of the Short Preamble option, and to “0” to indicate that use of the Short Preamble option is not allowed. *Id.* at 4. Concerning the PBCC subfield, 802.11b provides that the PBCC subfield at bit 6 (“B6”) is set to “1” to indicate use of the PBCC Modulation option is allowed within the basic service set (“BSS”), and set to “0” to indicate that use of the PBCC Modulation option is not allowed. *Id.*

802.11b also discloses changes to the Physical Layer Convergence Procedure (“PLCP”) header to implement the CCK or PBCC modulation option. The PLCP header of the PLCP Protocol Data Unit (“PPDU”) includes a SERVICE field which, under 802.11-1999, was “reserved for future use.” Ex. 1007, 197. In order to support the High Rate extension, 802.11b discloses that the SERVICE field should instead have the format depicted in Table 97, reproduced below.

Table 97—SERVICE field definitions

b0	b1	b2	b3	b4	b5	b6	b7
Reserved	Reserved	Locked clocks bit 0 = not 1 = locked	Mod. selection bit 0 = CCK 1 = PBCC	Reserved	Reserved	Reserved	Length extension bit

As shown in Table 97, 802.11b uses bit 3 (“b3”) “to indicate whether the modulation method is CCK <0> or PBCC <1>.” Ex. 1008, 15.

2. Hood

Hood is a U.S. Patent titled “System for reducing Multipath Fade of RF Signals in a Wireless Data Application.” Ex. 1017 (54). Hood describes a technique in a wireless LAN for mitigating the effects of signal fading that results from multipath propagation. *Id.*, Abstract. The wireless LAN includes a number of portable clients that may be notebook computers. *Id.* An access point, or hub, couples the clients to a wired network and/or to each other. *Id.*

Hood describes mitigating multipath effects by continually varying the radiation pattern of a transmitting antenna system associated with the access point. Ex. 1017, 1:8–12. Hood provides numerous approaches to continually vary the radiation pattern of the respective antenna system, including, but not limited to, switching between two or more antennas in an array, adjusting the physical positioning of a single or multiple antennas, adjusting the effective length of the antenna, and adjusting the respective gain and/or phase of each of one or more of the signals coupled to antennas in an array. *Id.*

E. Principles of Law

A patent claim is unpatentable under 35 U.S.C. § 103(a) if the differences between the claimed subject matter and the prior art are such that the subject matter, as a whole, would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 406 (2007). The question of obviousness is resolved on the basis of underlying factual determinations including (1) the scope and content of the prior art; (2) any differences between the claimed subject matter and the prior art; (3) the level of ordinary skill in the art; and (4) objective evidence of nonobviousness.³ *Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966).

F. Obviousness Based on 802.11-1999 and 802.11b

Petitioner asserts that claims 1 and 2 of the ’389 patent are rendered obvious by the combination of 802.11-1999 and 802.11b. Pet. 33–62. Petitioner provides an element-by-element analysis of these claims in relation 802.11-1999 and 802.11b. *Id.* Patent Owner disagrees, and argues that the cited combination fails to teach or suggest a “single bit indicating a reception operation adapted to a transmission operation of a radio base station apparatus” (Ex. 1001, 26:32–34), as required by independent claim 1, from which each challenged claim depends. Prelim. Resp. 18–25. For the reasons stated below, we agree with Patent Owner.

³ Neither party presents arguments or evidence regarding objective evidence of nonobviousness here.

Each of the challenged claims requires, *inter alia*, “a single bit indicating a reception operation adapted to a transmission operation of a radio base station apparatus.” Ex. 1001, 26:32–34. Petitioner identifies two aspects of the cited combination as independently satisfying this claim element: (1) the modulation selection indicator in the SERVICE field for a data frame PPDU, and (2) the Short Preamble indicator in the Capacity Information field for a management frame PPDU. Pet. 44.

Turning first to Petitioner’s contention that modulation selection indicator bit b3 in the PPDU SERVICE field disclosed by 802.11b indicates a reception operation adapted to a transmission operation, Petitioner asserts this bit is used by an AP to “inform the STA whether PBCC or CCK modulation has been used to encode the Frame body so that the STA can adapt its demodulation setting accordingly.” Pet. 45. Petitioner reasons that an ordinarily skilled artisan would have understood that bit “‘b3,’ in identifying the modulation scheme that was used by the AP, is ‘indicating a reception operation adapted to a transmission operation’ because it informs the STA what demodulation scheme it must choose in order for the STA to receive and read the data sent by the AP.” *Id.* at 47.

Patent Owner responds that the modulation selection bit does not indicate a “reception operation.” Prelim. Resp. 24–25. Patent Owner relies on its construction of claim term “reception operation” discussed *supra*: “[T]he ’389 patent specification makes clear that modulation and demodulation operations are outside the scope of the claimed ‘transmission operation’ and ‘reception operation.’” *Id.* at 24. Therefore, reasons Patent

Owner, “the modulation selection bit is not indicative of a ‘reception operation adapted to a transmission operation.’” *Id.* at 25.

As discussed *supra*, we agree with Patent Owner that in light of the ’389 patent specification a “reception operation” does not include modulation or demodulation. For at least that reason, we are not persuaded by Petitioner’s argument based on the modulation selection bit.

Petitioner argues also that the Short Preamble indicator at bit B5 in the Capacity Information field for a management frame PPDU described by 802.11b indicates a reception operation adapted to a transmission operation. Pet. 47–50. Petitioner explains, “[i]n operation, this Short Preamble bit is sent by an AP to a STA to inform the STA that the Short Preamble (and its reduced preamble length) is available for subsequent frames transmitted from the AP to the STA.” Pet. 48. As a result, asserts Petitioner, “upon being informed that the Short Preamble Option is available (through receipt of the Short Preamble bit), the STA adapts its operation so that it can complete these functions (e.g., antenna selection) in the time allotted by the Short Preamble.” *Id.* In view of the foregoing, Petitioner contends that an ordinarily skilled artisan would have understood that “bit ‘B5,’ in identifying the Short Preamble option being used by the AP, is ‘indicating a reception operation adapted to a transmission operation’ because it informs the STA that the STA will need to adjust the speed at which it completes the selection of an antenna for diversity.” *Id.* at 49–50.

Patent Owner responds that “neither of 802.11-1999 nor 802.11b teaches any relationship between antenna selection (or antenna diversity) and the length of the preamble or the setting of the Short Preamble bit.”

Prelim. Resp. 20–21 (citing Ex. 2001 ¶ 52). According to Dr. Sharony, “While the execution time for an antenna selection operation may vary, it is entirely likely that a remote terminal will select the same antenna or set of antennas for reception with a long preamble as it would with a short preamble.” Ex. 2001 ¶ 52.

Patent Owner further asserts the short preamble bit does not “indicate” a reception operation to the terminal as is required by the claims. “The Short Preamble bit is an informational bit . . . that denotes a capability of the AP—it does not ‘indicate’ a reception operation.” Prelim. Resp. at 21.

We are not persuaded by Petitioner’s argument that the Short Preamble bit satisfies the claim 1 requirement for a “single bit indicating a reception operation adapted to a transmission operation of a radio base station apparatus” (Ex. 1001, 26:32–34). The 802.11-1999 and 802.11b standards themselves do not make a connection between preamble length and antenna selection, and Dr. Negus’s testimony on this issue is not persuasive. See Ex. 1002 ¶¶ 482–483. His testimony establishes only that the short preamble is intended to permit higher “throughput.” *Id.* at ¶ 482. He does not sufficiently connect the throughput increase with antenna selection or antenna diversity. He testifies: “A POSITA would understand, as known in the prior art at the time of the alleged invention of the ‘389 Patent, that this ‘Short Preamble option’ provides this ‘improved performance’ by ‘reducing the high overhead of the existing long (192μs) preamble’ such [that] this ‘short preamble will allow better throughput when the LAN does not need to contend with low rate PHYs. . . .” *Id.* (emphases omitted). We agree with Dr. Negus that a stated goal of providing short

preambles is to increase throughput. He provides insufficient support, however, for his conclusion that this meets the requirement of the claim that the preamble bit “indicat[e] a reception operation adapted to a transmission operation of a radio base station apparatus” (Ex. 1001, 26:32–34). His citation to paragraphs 330 and 338 of his declaration, quoting references other than 802.11-1999 and 802.11b, does not persuade us that this requirement is met. The citations relate generally to the advantages of using short preambles. Neither citation describes using 802.11b’s Short Preamble bit to indicate a reception operation adapted to a transmission operation of the base station.

For the foregoing reasons, we are not persuaded that Petitioner has demonstrated a likelihood of prevailing on this challenge to claims 1 and 2.

G. Obviousness Based on 802.11-1999, 802.11b, and Hood

Petitioner’s analysis of dependent claim 3 in this asserted ground of unpatentability relies on its analysis of independent claim 1 in the immediately preceding ground. Pet. 63. Dependent claim 3 adds a requirement that the receiving and transmitting steps respectively require receiving or transmitting by a “plurality of antennas.” Ex. 1001, 26:44–48. For this additional feature, Petitioner relies on 802.11-1999, 802.11b, and Hood’s disclosure of an antenna array. Pet. 62–71. Hood is not relied on for any of the other limitations in claim 3 carried over from claim 1. *Id.* Patent Owner does not separately argue dependent claim 3. Prelim. Resp. 25–26.

In our analysis of claim 1, *supra*, we determined Petitioner has not demonstrated that 802.11-1999 and 802.11b meet the claim requirements for “a single bit indicating a reception operation adapted to a transmission

operation of a radio base station apparatus” (Ex. 1001, 26:32–34).
Petitioner’s analysis of claim 3 does not rely on Hood for this feature.
Instead, it refers to the previous analysis that we found unconvincing. See
Pet. 62–72. For the reasons given for claim 1, therefore, we are persuaded
that Petitioner does not demonstrate a reasonable likelihood of prevailing on
its challenge to claim 3.

III. CONCLUSION

For the foregoing reasons, we have determined that Petitioner has not
demonstrated a reasonable likelihood of prevailing with respect to at least
one of the claims challenged in the Petition. We therefore do not institute
trial as to any challenged claim or ground stated in the Petition.

IV. ORDER

Upon consideration of the record before us, it is:

ORDERED that the Petition is *denied* and no trial is instituted.

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