

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

ZYXEL COMMUNICATIONS CORPORATION AND
ZYXEL NETWORKS CORPORATION,
Petitioner,

v.

ATLAS GLOBAL TECHNOLOGIES LLC,
Patent Owner

Case IPR2023-00877
Patent 9,917,679

**PATENT OWNER'S PRELIMINARY RESPONSE UNDER 37
C.F.R. § 42.107 TO PETITION FOR *INTER PARTES* REVIEW
OF U.S. PATENT NO. 9,917,679**

Mail Stop "PATENT BOARD"
Patent Trial and Appeal Board
U.S. Patent and Trademark Office
P.O. Box 1450
Alexandria, VA 22313-1450

EXHIBIT LIST

Exhibit	Description
2001	Affidavit in Support of Motion for <i>Pro Hac Vice</i> Admission of Eric J. Enger
2002	Declaration of Dr. Konstantinos Psounis in Support of Patent Owner's Preliminary Response to Petition for <i>Inter Partes</i> Review of U.S. Patent No. 9,917,679
2003	Dr. Konstantinos Psounis Curriculum Vitae
2004	Evgeny Khorov <i>et al.</i> , A Tutorial on IEEE 802.11ax High Efficiency WLANs, IEEE Communications Surveys & Tutorials, Vol. 21, No. 1, First Quarter 2019
2005	Joint Claim Construction Statement, <i>Atlas Global Technologies LLC v. Zyxel Networks Corp., Zyxel Communications Corp.</i> , Dkt. No. 47, Case No. 6:22-cv-00355-ADA (W.D. Tex.)
2006	Claim Construction Memorandum and Order, <i>Atlas Global Technologies LLC v. Zyxel Networks Corp., Zyxel Communications Corp.</i> , Dkt. No. 53, Case No. 6:22-cv-00355-ADA (W.D. Tex.)
2007	Proof of Service, <i>Atlas Global Technologies LLC v. Zyxel Networks Corp., Zyxel Communications Corp.</i> , Dkt. No. 19, Case No. 6:22-cv-00355-ADA (W.D. Tex.)
2008	Defendants' Preliminary Invalidity Contentions, <i>Atlas Global Technologies LLC v. Zyxel Networks Corp., Zyxel Communications Corp.</i> , October 20, 2022, Case No. 6:22-cv-00355-ADA (W.D. Tex.)
2009	Richard Lloyd, Interview with Judge Alan D. Albright, "The last thing anyone should think about WDTX is that it is patent plaintiff friendly," says Albright," IAM, https://www.iam-media.com/law-policy/albright-the-last-thing-anyone-should-think-about-venue-it-plaintiff-friendly , accessed on September 17, 2020
2010	Ryan Davis, "Albright Says He'll Very Rarely Put Cases on Hold for PTAB", Law360, https://www.law360.com/articles/1381597/print?section-ip , accessed on July 25, 2022
2011	Scheduling Order, <i>Atlas Global Technologies LLC v. Zyxel Networks Corp., Zyxel Communications Corp.</i> , Dkt. No. 27, Case No. 6:22-cv-00355-ADA (W.D. Tex.)
2012	United States District Courts-National Judicial Caseload Profile, available at https://www.uscourts.gov/sites/default/files/data_tables/fcms_na_distprofile0331.2023.pdf

Exhibit	Description
2013	Defendants' Final Invalidity Contentions, <i>Atlas Global Technologies LLC v. Zyxel Networks Corp., Zyxel Communications Corp.</i> , June 15, 2023, Case No. 6:22-cv-00355-ADA (W.D. Tex.)

TABLE OF CONTENTS

I.	Introduction	1
II.	Background	3
A.	The '679 Patent Invention	3
B.	Level of Ordinary Skill in the Art	10
C.	Petitioner's references	11
1.	Merlin [EX1004]	11
2.	Abraham466 [EX1005]	12
3.	Chu806 [EX1006]	13
4.	Ma [EX1007]	13
III.	Legal Standards	14
IV.	Claim Construction	15
V.	Argument	16
A.	All Grounds Fail to Present a Reasonable Likelihood of Success on the Merits	16
1.	Ground 1: Merlin	16
2.	Ground 2: Abraham466	29
3.	Ground 3: Merlin+Abraham466+Chu806+Ma	37
B.	The Board should exercise its discretion to deny the Petition under <i>Fintiv</i>	43
VI.	Conclusion	52

I. Introduction

Petitioners Zyxel Communications Corporation and Zyxel Networks Corporation (collectively “Zyxel” or “Petitioner”) have challenged Claims 1-10 (the “Challenged Claims”) of U.S. Patent No. 9,917,679 (the “’679 Patent”). Patent Owner Atlas Global Technologies LLC (“Atlas” or “Patent Owner”) respectfully requests that the Board decline to institute *inter partes* review of the Challenged Claims.

First, Petitioner’s proposed grounds fail to present a reasonable likelihood of success of invalidating any of the Challenged Claims. The Challenged Claims recite an access point sending a downlink frame to a station indicating that the station should send an acknowledgement frame in a specific format (single-user or multi-user). Those claims further recite how the format is indicated, the timing of the acknowledgement, and the station sending the acknowledgement frame in the specific requested format. However, *none* of the proposed grounds teach or render obvious indicating or using the specific claimed multi-user format.

Compounding that deficiency, Petitioner’s Ground 1 fails to render obvious the specific claimed timing, and Petitioner’s Ground 2 fails to render obvious the specific control field mechanism used to indicate the format of the uplink acknowledgement frame. Lastly, Petitioner’s “kitchen sink” Ground 3 proposes a conclusory combination of its first two grounds with two additional references. Yet,

Petitioner never properly explains why a POSITA would have made the combination it proposes, and instead its position amounts to an assertion that all of the elements were known separately in the art, so the claimed invention should be obvious. Even if such an assertion was proper under the law (it is not), Petitioner’s “kitchen sink” Ground 3 fails to address the claimed multi-user uplink acknowledgement frame format. Thus, each of Petitioner’s grounds fail on the merits.

Furthermore, this Petition should be discretionarily denied under *Fintiv* in light of the advanced stage of the parallel district court proceeding and Petitioner’s complete lack of diligence. Petitioner concedes the parallel district court trial is scheduled to occur **5-6 months** before any potential final written decision in this proceeding, thus making it highly unlikely that institution would simplify issues for trial. That gap between the district court trial date and a final written decision is wholly attributable to Petitioner’s lack of diligence—Petitioner identified and served largely the same invalidity grounds in the parallel district court litigation **six months** before it filed its Petition. Rather than promptly filing its IPR challenge, Petitioner delayed filing its Petition until April 21, 2023—a full year after the date the complaint was served, as shown on the Proof of Service filed with the District Court.

II. Background

A. The '679 Patent Invention

The '679 Patent is titled “Method and Apparatus for Transmitting Response Frame Based on Type in a High Efficiency Wireless LAN.” EX1001. It was invented by Yongho Seok while he was working on next generation improvements to Wi-Fi communications at Newracom. The patent was filed on November 3, 2015, issued on March 13, 2018, and claims priority to two provisional applications: (1) provisional application No. 62/080,026, filed on Nov. 14, 2014, and (2) provisional application No. 62/074,514, filed on Nov. 3, 2014. *See* EX2002 (Psounis Dec.) ¶29.

The '679 Patent “relates to a Wireless Local Area Network (WLAN)” in the context of “improving performance felt by users demanding high-capacity, high-rate services while supporting simultaneous access of numerous stations in an environment in which a plurality of APs is densely deployed and coverage areas of APs overlap.” EX1001 ('679 Patent) at 1:19-20, 1:57-64; *see also* EX2002 (Psounis Dec.) ¶30. The '679 Patent Invention proved so useful that it was adopted into the IEEE 802.11ax specification as part of the Wi-Fi 6 standard.

Devices communicating in a WLAN include stations (“STAs”) and access points (“APs”). *See* EX1001 ('679 Patent) Abstract. One or more STAs may access a network through an AP, and multiple APs may serve overlapping areas.

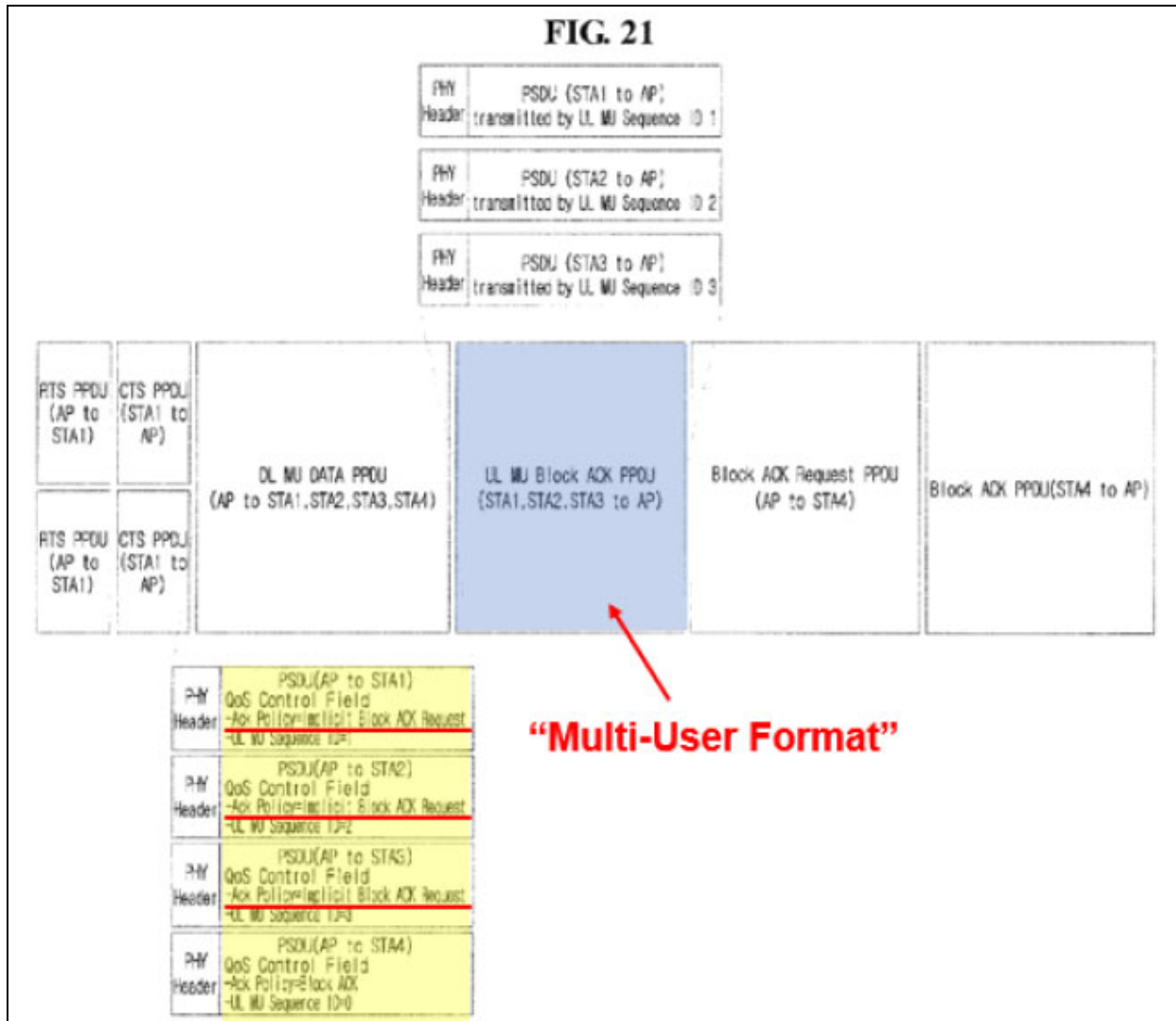
Improving network performance in Wi-Fi networks having large numbers of users is particularly difficult. In areas where there are multiple STAs (potentially being served by multiple overlapping APs), “the primary source of performance degradation is the massive interference.” EX2004 (802.11ax tutorial) at 198. Data must be transmitted both in the downlink (“DL”) direction from an AP to one or more STAs, as well as in the uplink (“UL”) direction from one or more STAs to an AP. To maximize throughput, it is necessary to coordinate which devices should be speaking or listening at a given time on a given channel. However, implementing such an approach has proved especially difficult in the context of providing simultaneous multi-user (“MU”) UL communications, where multiple STAs need to transmit data to an AP at the same time over different frequency ranges. This is further complicated by the prospect of having to accommodate (and coordinate) a mixture of single-user (“SU”) communications along with MU communications. *See* EX2002 (Psounis Dec.) ¶¶30, 32.

These difficulties are illustrated by the history of IEEE 802.11 development. While certain aspects of MU transmission had been disclosed previously for DL transmissions from APs to STAs in 802.11ac (the prior generation of Wi-Fi), the same approaches could not be used for UL transmissions from STAs to APs because “such a technique requires tight synchronization going well beyond what has been so far standardized in previous 802.11 amendments.” EX2004 (802.11ax tutorial) at

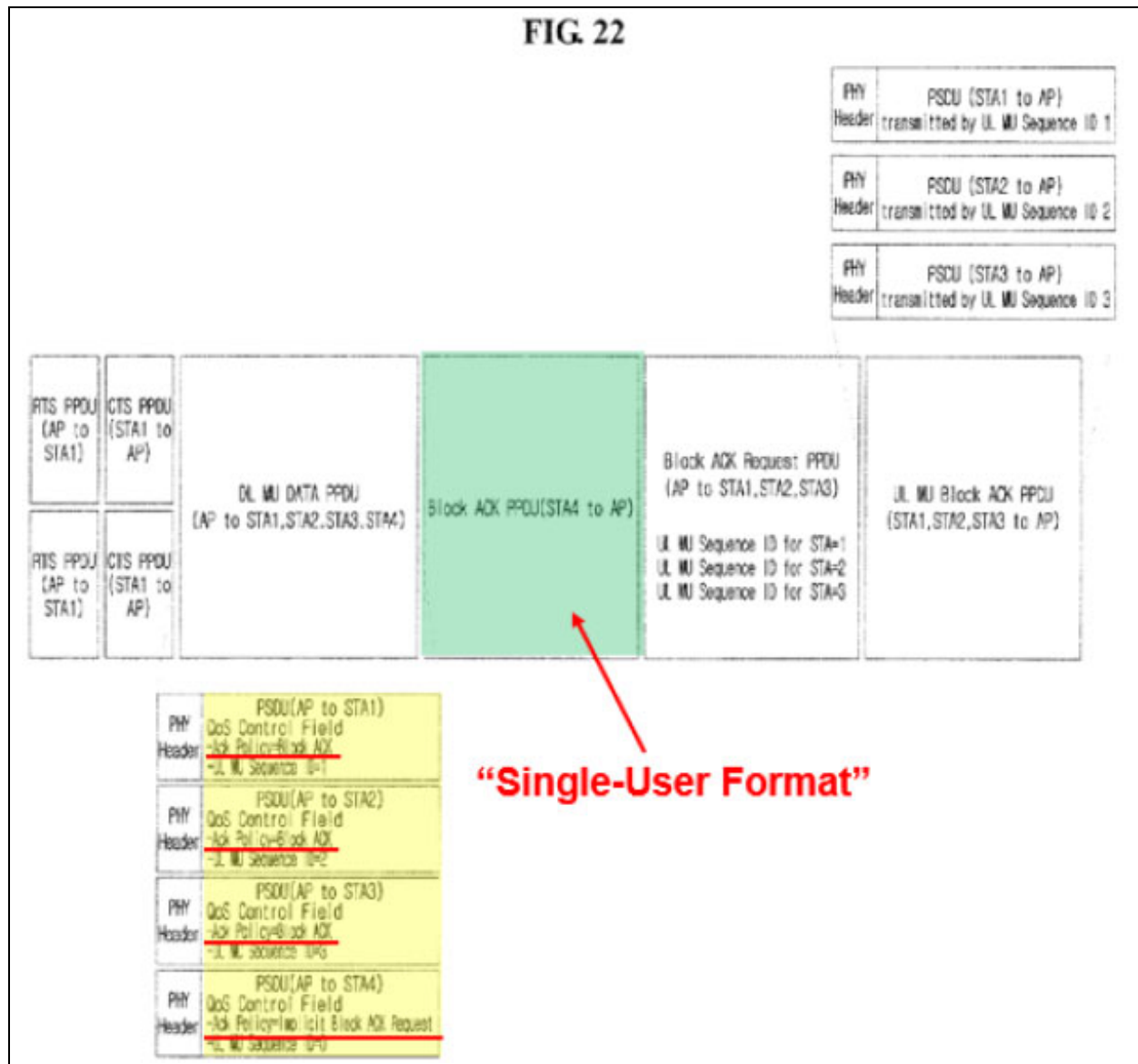
198. Development of UL MU transmission ultimately proved so difficult that plans to include it in 802.11ac (Wi-Fi 5) had to be abandoned until future inventions (such as those taught and claimed by the '679 Patent) made such synchronization possible. *Id.* at 200 (“[T]he UL MU transmission was postponed to subsequent standards owing to the tight synchronization requirements which would have required a significant re-design.”).

The '679 Patent inventor created solutions that addressed challenges including the timing and format of particular exchanges between an AP and a STA to support simultaneous multi-user uplink transmissions. More specifically, the '679 Patent relates to UL acknowledgement frame transmissions from a STA to AP in response to acknowledgement information sent from the AP to the STA in a downlink frame.

“FIGS. 21 and 22 depict various types of UL responses to DL MU transmission.” EX1001 ('679 Patent) at 4:27-28. As Dr. Psounis explains, “Figure 21 shows that when the ACK Policy subfield for STAs 1-3 is set to ‘Implicit Block ACK Request,’ each of those STAs 1-3 will simultaneously transmit a UL MU Block ACK PPDU acknowledgment frame in multi-user format (colored blue in the below figure) one SIFS after receiving the DL MU PPDU. *Id.* at 37:3-13.”



EX2002 (Psounis Dec.) ¶31. He further explains: “Figure 22 shows that when the ACK Policy for STAs 1-3 is set to ‘Block ACK’ and the ACK Policy for STA 4 is set to ‘Implicit Block ACK Request,’ then STA 4 will transmit a UL SU Block ACK PPDU acknowledgment frame in single-user format (colored green in the below figure) one SIFS after receiving the DL MU PPDU. *Id.* at 37:36-46.”



EX2002 (Psounis Dec.) ¶31. Based on this, “the PPDU type of an immediate response to a DL MU PPDU (i.e., a UL response transmitted a predetermined IFS (e.g., an SIFS) after reception of a DL MU PPDU) may be of the UL SU transmission type (e.g., a legacy PPDU type) or the UL MU transmission type (e.g., a UL MU PPDU type), and the type of the immediate response to the DL MU PPDU may be

determined based on information (e.g., information triggering UL transmission) included in the DL MU PPDU.” EX1001 at 37:59-67.

Thus, the '679 Patent teaches and claims, *inter alia*, the content and arrangement of the downlink frame necessary to indicate the specific format (e.g., SU or MU) and timing of the response. *See, e.g.*, EX1001 ('679 Patent) at 2:11-17, 34:51-35:19, 35:30-40, 35:50-59; *see also* EX2002 (Psounis Dec.) ¶¶29-32. This can be seen in the independent claims of the '679 Patent, reproduced below.

Claim 1

[1pre] A method for transmitting an acknowledgement frame for notifying successful data reception by a station (STA) to an access point (AP) in a wireless local area network, the method comprising:
[1a] receiving, from the AP, a downlink frame including a quality of service (QoS) control field including acknowledgement information representing whether the STA is requested to transmit the acknowledgement frame in a single-user (SU) format or in a multiple-user (MU) format at a Short Inter-Frame Space (SIFS) time after the downlink frame; and
[1b] transmitting, to the AP, the acknowledgement frame based on the acknowledgement information at the SIFS time after the downlink frame,
[1c] wherein transmitting the acknowledgment frame comprises: when the acknowledgment information represents that the STA is requested to transmit the

acknowledgement frame in the MU format and the STA is allocated a resource, transmitting the acknowledgement frame in the MU format on the allocated resource simultaneously with transmission of at least one acknowledgement frame from at least one other STA, and

[1d] [wherein transmitting the acknowledgment frame comprises:] when the acknowledgment information represents that the STA is requested to transmit the acknowledgement frame in the SU format, transmitting the acknowledgement frame in SU format.

Claim 6

[6pre] A method for receiving an acknowledgement frame for notifying successful data reception by an access point (AP) from a station (STA) in a wireless local area network, the method comprising:

[6a] transmitting, to the STA, a downlink frame including a quality of service (QoS) control field including acknowledgement information representing whether the STA is requested to transmit the acknowledgement frame in a single-user (SU) format or in a multiple-user (MU) format at a Short Inter-Frame Space (SIFS) time after the downlink frame; and

[6b] receiving, from the STA, the acknowledgement frame based on the acknowledgement information at the SIFS time after the downlink frame,

[6c] wherein receiving the acknowledgment frame comprises: when the acknowledgment information represents that the STA is requested to transmit the acknowledgement frame in the MU format, receiving the acknowledgement frame in the MU format on an allocated resource simultaneously with transmission of at least one acknowledgement frame from at least one other STA, and

[6d] [wherein receiving the acknowledgment frame comprises:] when the acknowledgment information represents that the STA is requested to transmit the acknowledgement frame in the SU format, receiving the acknowledgement frame in SU format.

B. Level of Ordinary Skill in the Art

Petitioner suggests a POSITA had “(1) a bachelor’s degree in electrical engineering or a closely related field, and (2) a minimum of 2-3 years of industry or academic experience with wireless communication physical layer protocols. However, an individual with an advanced degree in a relevant field, such as electrical engineering, would require less industry or academic experience (e.g., 1-2 years).” Pet. at 14. Patent Owner does not propose a different definition at this stage because,

even under Petitioner’s proposed definition, the proposed grounds fail to present a reasonable likelihood of rendering the Challenged Claims obvious.¹

C. Petitioner’s references

Petitioner’s invalidity grounds are based on U.S. Patent No. 10,230,497 (“Merlin”), U.S. Patent App. Pub. No. 2016/0065466 (“Abraham466”), U.S. Patent No. 10,257,806 (“Chu806”), and U.S. Patent No. 9,462,607 (“Ma”):

Ground	Claims	References	Statutory Basis
1	1-10	Merlin	§103
2	1-10	Abraham466	§103
3	1-10	Merlin+Abraham466+Chu806+Ma	§103

Pet. at 3.

1. Merlin [EX1004]

Merlin is a U.S. Patent titled “Protocols For Multiple User Frame Exchanges.” EX1004. It was filed Oct. 30, 2014, issued Mar. 12, 2019, and claims priority to a provisional application filed Nov. 1, 2013. Merlin “relate[s] to wireless communications and, more particularly, to frame structures and protocols for uplink multiple user (MU) frame exchanges.” *Id.* at 1:14-17. Merlin provides general

¹ Patent Owner reserves the right to propose a different POSITA definition if the Petition is instituted.

disclosures related to a STA acknowledging a DL frame from an AP, but fails to provide specific implementation details needed to actually achieve the UL MU communications claimed by the '679 Patent, such as (1) the spacing between a downlink frame and an acknowledgement frame needed to provide the necessary synchronization, and (2) the frame format for MU UL acknowledgements (or even the necessary structure to indicate such a format in the downlink frame). *See also* EX2002 (Psounis Dec.) ¶¶38-39 (citing Merlin).

2. Abraham466 [EX1005]

Abraham466 is a U.S. Patent Application Publication titled “System and Methods for Signaling Multi-Destination Aggregated Multi-User Media Access Control Protocol Data Units in a Wireless Network.” EX1005. It was filed Aug. 26, 2015, published Mar. 3, 2016, and claims priority to a provisional application filed Aug. 28, 2014. *Id.* Abraham466 “relates generally to wireless communications, and more specifically to...signaling aggregated multi-user media access control protocol data units (“A-MPDUs”) in a wireless network.” *Id.* ¶3. Abraham466 proposes a format for a DL frame which includes an optional acknowledgement control field (separate from the QoS control field) and suggests general information such a field might include—a different approach than that taught by the '679 Patent, which instead utilizes a QoS control field including acknowledgement information. *See id.* Fig. 7, ¶¶63-65. Additionally—like Merlin—Abraham466 fails to disclose the

necessary details to indicate an MU format in the DL frame or respond with an MU format in the UL frame. *See also* EX2002 (Psounis Dec.) ¶¶40-46 (citing Abraham466).

3. Chu806 [EX1006]

Chu806 is titled “Medium Access Control for Multi-Channel OFDM in a Wireless Local Area Network.” EX1006. It was filed Nov. 11, 2014, issued Apr. 9, 2019, and claims priority to two U.S. Provisional Applications dated Nov. 11, 2013 and Mar. 4, 2014. *Id.* Chu806 describes the disclosure as being related to “wireless local area networks that utilize orthogonal frequency division multiplexing (OFDM).” *Id.* at 1:16-19. The Chu806 disclosure provides general descriptions of OFDM communication between communication devices, but lacks any disclosure of the specific implementation details missing from Merlin and Abraham466 (such as those relating to the MU format limitations of the challenged claims). *See* EX2002 (Psounis Dec.) ¶¶47-48 (citing Chu806).

4. Ma [EX1007]

Ma is titled “Apparatus, Method and System of Multi-User Uplink Transmission.” EX1007. It was filed Aug. 28, 2014 and issued Oct. 4, 2016. Ma describes its disclosure as “generally relat[ing] to Multi-User (MU) uplink transmission.” *Id.* at 1:6-7. Ma proposes certain aspects for a “multi-user (MU) communication scheme,” but much like Chu806, none of those disclosures provide

the implementation details missing from Merlin and Abraham466. *See id.* at 1:11-16; *see also* EX2002 (Psounis Dec.) ¶¶49-51 (citing Ma).

III. Legal Standards

An IPR should not be instituted unless Petitioner has shown a likelihood of success on the invalidity grounds presented *in the petition*. *See In re Magnum Oil Tools Int’l, Ltd.*, 829 F.3d 1364, 1381 (Fed. Cir. 2016) (“[T]he Board must base its decision on arguments that were advanced by a party, and to which the opposing party was given a chance to respond.”). “In an IPR, the petitioner has the burden from the onset to show with particularity why the patent it challenges is unpatentable.” *Harmonic Inc. v. Avid Tech., Inc.*, 815 F.3d 1356, 1363 (Fed. Cir. 2016). This burden of persuasion never shifts to the patent owner. *See Dynamic Drinkware, LLC v. Nat’l Graphics, Inc.*, 800 F.3d 1375, 1378 (Fed. Cir. 2015).

“To satisfy its burden of proving obviousness, a petitioner cannot employ mere conclusory statements. The petitioner must instead articulate specific reasoning, based on evidence of record, to support the legal conclusion of obviousness.” *In re Magnum Oil Tools Int’l*, 829 F.3d at 1380. The obviousness inquiry requires considering whether one of skill in the art “would have been motivated to combine the prior art to achieve the claimed invention.” *In re NuVasive, Inc.*, 842 F.3d 1376, 1381 (Fed. Cir. 2016) (quoting *In re Warsaw Orthopedic, Inc.*,

832 F.3d 1327, 1333 (Fed. Cir. 2016)). “[T]he factual inquiry whether to combine references must be thorough and searching...” *Id.*

IV. Claim Construction

Claims are construed according to *Phillips v. AWH Corp.*, 415 F.3d 1303 (Fed. Cir. 2005) (en banc). *See* 37 C.F.R. § 42.100(b). “Any prior claim construction determination concerning a term of the claim in a civil action...will be considered.” *Id.*

Petitioner’s only claim construction argument is that the preambles of ’679 Patent Claims 1 and 6 should be treated as limiting. Pet. at 15. For the purposes of this Preliminary Response and evaluating whether the Petition should be instituted, Patent Owner agrees. At this stage, no further claim construction is needed beyond the plain and ordinary meaning of the relevant claim terms in order to evaluate the Parties’ arguments as discussed further below.² Patent Owner has included the parties’ Joint Claim Construction Statement and the District Court’s Markman Order from the parallel proceeding as Exhibits 2005 and 2006 respectively.

² Patent Owner reserves the right to propose additional claim constructions in its Response if the Petition is instituted.

V. Argument

The Board should decline to institute review because (A) the proposed grounds fail to present a reasonable likelihood of success on the merits, and (B) the Petition should be discretionarily denied under *Fintiv* because of the advanced stage of the parallel proceeding and Petitioner's lack of diligence.

A. All Grounds Fail to Present a Reasonable Likelihood of Success on the Merits

1. Ground 1: Merlin

Under Ground 1, Petitioner asserts that “Merlin renders Claims 1-10 obvious.” Pet. at 19. However, Merlin fails to render obvious the Challenged Claims.

First, all Challenged Claims require a particular timing be indicated by the AP (and used by the STA) for the claimed acknowledgement frame. Specifically, the claims require (1) a downlink frame from the AP including acknowledgement information representing whether the STA is requested to transmit the acknowledgement frame at a “Short Inter-Frame Space (SIFS) time after the downlink frame,” and (2) the station transmitting (or the AP receiving) the acknowledgement frame based on that acknowledgment information a SIFS after the downlink frame. *See* EX1001 Claims 1 and 6 at 41:41-50, 42:24-33 (hereinafter “the SIFS Limitations”). Merlin fails to teach (or render obvious) the specific timing between the downlink frame and the acknowledgement frame claimed by the SIFS Limitations.

Second, the Challenged Claims require an AP sending a downlink frame to a station indicating that the station should send an acknowledgement frame in a specific format (single-user or multi-user). The claims further specify how the format is indicated (acknowledgement information included in a QoS control field), and the station sending (or the AP receiving) the acknowledgement frame in the specific requested format. *See* EX1001 Claims 1 and 6 at 41:41-46, 41:53-60, 42:24-29, 42:35-41 (hereinafter “the MU Format Limitations”). Merlin never teaches or renders obvious this claimed multi-user frame format (much less the downlink frame including information indicating that a specific multi-user frame format should be used) claimed by the MU Format Limitations.

*i. Merlin fails to render obvious the SIFS limitations
[Claims 1 and 6]*

Petitioner’s Ground 1 fails because Petitioner has failed to address the specific language of the limitations related to inter-frame spacing, and has instead pointed to the use of a type of spacing (a “SIFS”) in a different context in Merlin.

’679 Patent Claim 1 recites a STA receiving a downlink frame including acknowledgement information representing whether the STA should transmit an acknowledgement frame *a SIFS after the downlink frame*, and then transmitting the acknowledgement frame at the *SIFS after the downlink frame*:

receiving, from the AP, a downlink frame including a quality of service (QoS) control field **including acknowledgement information**

representing whether the STA is requested to transmit the acknowledgement frame in a single-user (SU) format or in a multiple-user (MU) format at a Short Inter-Frame Space (SIFS) time after the downlink frame; and
transmitting, to the AP, the acknowledgement frame based on the acknowledgement information at the SIFS time after the downlink frame,

EX1001 Claim 1 at 41:41-50 (emphasis added).

Similarly, '679 Patent Claim 6 recites an AP:

transmitting, to the STA, a downlink frame including a quality of service (QoS) control field including acknowledgement information representing whether the STA is requested to transmit the acknowledgement frame in a single-user (SU) format or in a multiple-user (MU) format at a Short Inter-Frame Space (SIFS) time after the downlink frame; and
receiving, from the STA, the acknowledgement frame based on the acknowledgement information at the SIFS time after the downlink frame,

EX1001 Claim 6 at 42:24-33 (emphasis added); *see also* EX2002 ¶¶52-53.

Petitioner was unable to identify this claimed arrangement where the acknowledgment information represents the format of the acknowledgment frame transmitted at a Short Inter-Frame Space (SIFS) time *after the downlink frame* in the prior art, and has instead pointed to the inter-frame spacing between *consecutive acknowledgement transmissions*. However, it has long been recognized that different

interframe spacing types are not interchangeable, and an interframe space that was sufficient to separate two frames of one type could cause significant unexpected issues if used between frames of other types. *See* EX2002 (Psounis Dec.) ¶¶57-58.

An interframe space (“IFS”) is a waiting period between when transmission of one frame ends and another frame begins. These waiting periods are needed to reduce interference, but achieving the high throughput needed for high efficiency WLANs requires balancing a variety of interframe space types and considerations. *See, e.g.,* EX1001 (‘679 Patent) at 7:27-8:15, Fig. 4 (discussing a variety of interframe spaces). These different spaces are not interchangeable, and identifying when to use certain types (and how to coordinate that usage) has been recognized as a difficult problem to overcome. *See* EX2002 (Psounis Dec.) ¶¶57-58.

“The most notable 802.11ax[] design driver is the recognition that, today, WLAN devices are deployed in very diverse environments, characterized by the presence of a massive number of terminals concentrated in localized geographic areas.” EX2004 (802.11ax tutorial) at 197. “Obviously, in such environments, the primary source of performance degradation is the massive interference.” *Id.* at 198. The authors of the IEEE Article “A Tutorial on IEEE 802.11ax High Efficiency WLANs” provided several examples of the types of difficulties and unexpected problems that have historically arisen when addressing this coordination of wireless communication in the context of interframe spaces.

For example, in a previous iteration of the 802.11 standard, the selection of a shorter PCF InterFrame Space over a Distributed Coordination Function InterFrame Space caused collisions when several APs operated in the same area, resulting in “very marginal deployment” of the related contention-free channel access. EX2004 at 200 (“Indeed, if several APs use PIFS, their transmissions will start simultaneously and collide.”). So a subsequent 802.11 iteration was forced to include a new “[n]egotiation mechanism” to try to overcome the issue. *Id.* But that mechanism was still unable to overcome collisions in all scenarios. *Id.* This demonstrates how selection of the wrong IFS can have a significant impact on the overall function of the network, as well as how difficult it can be to select an IFS that does not create additional problems.

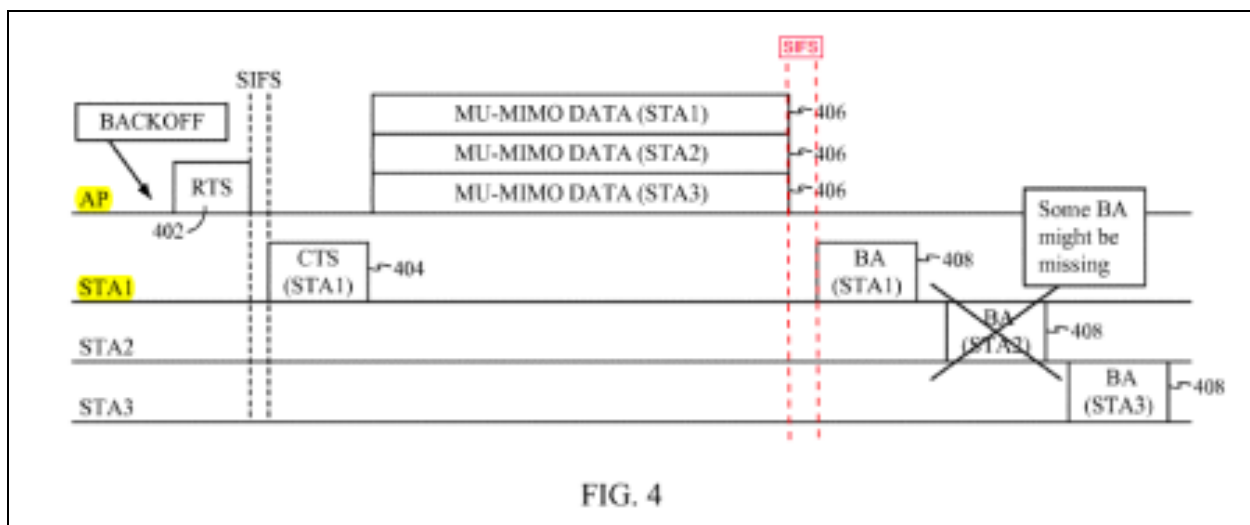
The authors of the IEEE Tutorial article also observed other scenarios in which an interframe space was found to have an unexpected impact on device functionality and efficiency. For example, it was found that low-cost devices could not generate an acknowledgement within a SIFS in some proposed scenarios, and increasing SIFS to try to accommodate such scenarios would prevent backwards compatibility and decrease channel usage efficiency. EX2004 at 203. Again, this demonstrates the definition and selection of an IFS is not straightforward, nor is a SIFS the right choice for all scenarios.

These difficulties are further highlighted by the history of 802.11ax development. While certain aspects of multi-user (“MU”) transmission had been disclosed previously for downlink (“DL”) transmission from APs to STAs in 802.11ac, the same approaches could not be used for uplink (“UL”) transmission from STAs to APs because “such a technique requires tight synchronization going well beyond what has been so far standardized in previous 802.11 amendments.” EX2004 at 198. Development of UL MU transmission ultimately proved so difficult that plans to include it in 802.11ac had to be abandoned, and it was instead pushed off until the next generation of Wi-Fi. *Id.* at 200 (“[T]he UL MU transmission was postponed to subsequent standards owing to the tight synchronization requirements which would have required a significant re-design.”).

The authors of the IEEE article even highlighted the design, coordination, and timing of uplink acknowledgements (including IFS and implementation) as one of the “Main Features of 802.11ax.” EX2004 at 200-201 (noting the header of a Trigger frame containing scheduling information “is especially useful for acknowledging DL MU transmissions. An UL MU transmission starts exactly one SIFS after the DL frame containing a schedule. This permits to synchronize the STAs participating in the UL MU transmission, whatever techniques the STAs use: OFDMA, MU-MIMO, or both.”).

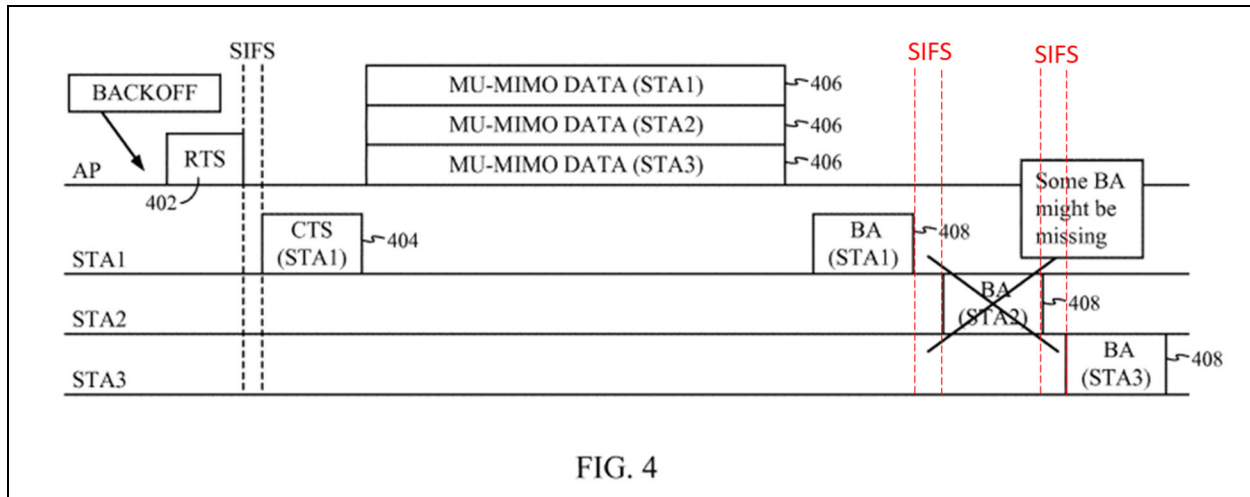
All of this demonstrates the difficulty in coordinating timing of contention features such as acknowledgements, and the need to customize safeguards such as interframe spacing for the specific series of frames—in the case of '679 Patent Claims 1 and 6, the space between a downlink frame including the acknowledgement information sent from an AP to a STA, and the acknowledgement frame that is provided based on that acknowledgement information. *See* EX1001 Claim 1 at 41:41-50; *see also id.* Claim 6 at 42:23-33. Nothing Petitioner cites teaches that arrangement. Instead, Petitioner points to the interframe space Merlin indicates for use by successive block acknowledgements sent by separate STAs, ignoring the language of the claim that requires that the space be between the downlink frame from the AP and the acknowledgement frame (rather than successive uplink frames).

Petitioner relies primarily on an annotated version of Merlin Fig. 4, 11:32-34, 12:57-65, and 14:26-32 for its challenge to these limitations. Pet. at 20-21. Petitioner added a red SIFS label to Figure 4 that is not found in the figure itself:



Pet. at 21.

In addition to not being indicated in the figure itself, nothing Petitioner cites teaches the use of a SIFS between the DL MU-MIMO DATA frames sent from the AP and the initial block acknowledgement from STA1. Instead, the cited portions teach the successive block acknowledgements may be separated by a SIFS—not that a SIFS should be used between the MU-MIMO frames and the block acknowledgements. EX1004 (Merlin) at 11:29-34 (“The STAs receiving the MU - MIMO data 406 may transmit BAs 408 in the uplink (UL) in series, **starting with the BA for STA1 and ending with the BA for STA3** as shown in FIG 4. **The STA BA transmissions may be separated by SIFS.**” (emphasis added)). Thus, the Merlin figure Petitioner relies on would be correctly annotated as follows:



EX1004 Fig. 4 (annotated to match disclosure); see EX2002 ¶¶54-56, 59.³

Nor does Petitioner cite anything in Merlin which suggests “a downlink frame...including acknowledgement information representing whether the STA is requested to transmit the acknowledgement frame...at a Short Inter-Frame Space (SIFS) time after the downlink frame...” EX1001 Claim 1 at 41:41-47. Petitioner relies on Merlin disclosures that “[t]he order and timing for the STA BA transmissions may be sent in DL-MU-MIMO data 406.” Pet. at 20-21 (quoting EX1004 at 11:32-34) (emphasis omitted). However, nothing in the disclosure gives the specifics of such timing. As explained above, coordinating such timing was difficult—so much so that attempts to do so for MU UL had to be abandoned in

³ The SIFS noted between the RTS and CTS in Figure 4 is part of Merlin Figure 4; however, once again this has no bearing on what sort of IFS would be used between the DL frame and an acknowledgement. See EX1004 at 11:20-28.

802.11 ac and put off until further inventions (such as those disclosed by the '679 Patent) made it possible in 802.11 ax. *See* EX2004 (802.11 ax tutorial) at 200 (“[T]he UL MU transmission was postponed to subsequent standards owing to the tight synchronization requirements which would have required a significant re-design.”).

At best, the portions of Merlin that Petitioner relies on merely suggest that timing and order information should be sent. But Merlin provides no disclosure as to what timing and order information would work. As discussed above, the use of improper spacing in past implementations had resulted in unexpected failures, and the absence of such a disclosure from Merlin demonstrates that the implementation claimed in the '679 Patent was not known in the art at the time of invention.

Petitioner also cites (without explanation) Merlin at 4:26-28, 18:11-33, 18:67-19:5, FIG. 9, FIG. 12. Pet. at 20-21. However, none of those passages provide any further support for its theory, as none of them address interframe spacing at all. Petitioner also cites its declarant (EX1003) at ¶¶126-139. Pet. at 20-21. Petitioner's declarant provides no actual analysis of Merlin that would support its theory; instead, he merely parrots Petitioner's conclusions. *Compare, e.g.,* EX1003 ¶¶133, 139 with Pet. at 21. Thus, Petitioner's Ground 1 fails to render obvious the Challenged Claims.

- ii. *Merlin fails to render obvious the MU format limitations included in the downlink transmission [Claims 1 and 6]*

Next, Petitioner's Ground 1 fails because Merlin fails to teach the claimed MU format limitations. '679 Patent Claim 1 requires:

receiving, from the AP, a downlink frame including a quality of service (QoS) control field **including acknowledgement information representing whether the STA is requested to transmit the acknowledgement frame in a single-user (SU) format or in a multiple-user (MU) format** at a Short Inter-Frame Space (SIFS) time after the downlink frame; and

transmitting, to the AP, the acknowledgement frame based on the acknowledgement information at the SIFS time after the downlink frame,

wherein transmitting the acknowledgment frame comprises:

when the acknowledgment information represents that the STA is requested to transmit the acknowledgement frame in the MU format and the STA is allocated a resource, transmitting the acknowledgement frame in the MU format on the allocated resource simultaneously with transmission of at least one acknowledgement frame from at least one other STA, and

when the acknowledgment information represents that the STA is requested to transmit the acknowledgement frame in the SU format, transmitting the acknowledgement frame in SU format.

EX1001 Claim 1 at 41:41-42:2 (emphasis added). As shown in the highlighted language above, a key requirement of the Claim is transmission of the uplink acknowledgement frame in a specific format (MU or SU) as indicated by the downlink frame received from the AP. '679 Patent Claim 6 includes similar requirements, requiring an AP transmitting a downlink frame including acknowledgement information representing whether the STA is requested to transmit the acknowledgement frame in SU or MU format, as well as receiving an acknowledgement frame in the requested format. EX1001 Claim 6 at 42:19-44. Merlin fails to even address the concept of MU specific acknowledgment frame formats (much less teach indicating and sending/receiving a frame in such a format). See EX2002 ¶¶60-63.

As discussed above, UL MU transmissions were not included with the prior Wi-Fi version (802.11 ac) due to the unanticipated complexity of coordinating such transmissions. The '679 Patent teaches the formatting for a UL MU specific acknowledgement frame, for example:

FIG. 13													
L-STF	L-LTF	L-SIG	HE-SIG-A	HE-STF	HE-LTF	HE-SIG-B	HE-LTF	HE-LTF	HE-LTF	HE-LTF	HE-SIG-C	PSDU(STA4 to AP)	
				HE-STF	HE-LTF	HE-SIG-B	HE-LTF	HE-LTF	HE-LTF	HE-LTF	HE-SIG-C	PSDU(STA3 to AP)	
				HE-STF	HE-LTF	HE-SIG-B	HE-LTF	HE-LTF	HE-LTF	HE-LTF	HE-SIG-C	PSDU(STA2 to AP)	
				HE-STF	HE-LTF	HE-SIG-B	HE-LTF	HE-LTF	HE-LTF	HE-LTF	HE-SIG-C	PSDU(STA1 to AP)	

'679 Patent Fig. 13; see also *id.* at 24:61-26:2 (describing the use of the UL MU frame of Fig. 13 for MU transmission); EX2002 ¶¶63.

While Merlin suggests using UL MU transmission at times, Merlin does not teach (and Petitioner does not even address) the use of a separate UL MU specific format for an acknowledgement frame, as taught by the '679 Patent and claimed in Claims 1 and 6. *See* Pet. at 22-24. Similarly, Merlin never addresses a downlink frame including acknowledgement information representing what specific format should be used for the acknowledgement frame. *See* EX2002 ¶¶64-65.

For support, Petitioner relies on, *e.g.*, Merlin at 14:12-18 and 14:26-32 as teaching these limitations. Pet. at 20-21. However, none of those sections address the format of the UL MU acknowledgement frame. For example, Merlin 14:12-18 states that “each recipient STA that is requested to send an immediate response may know—or be indicated—how the immediate reply (*e.g.*, ACK/BA) should be sent.” The portions of Merlin that Petitioner relies on are rife with such tautologies: of course the recipient STA *should* either know how to respond or be indicated how to respond—this does nothing to teach a POSITA what format should be used for such a response, nor does it even suggest that separate formats might be necessary. Petitioner’s reliance on 14:26-32 fares no better—it suggests that a “response type indication may be added in each MPDU or PSDU.” Again, this does not address the format of the response.

Petitioner also cites to Merlin’s discussion indicating which “mode of response” should be used for a reply. Pet. at 20-21, 30. However, the cited discussion

does not address the specific format of an acknowledgement frame, or even indicate that different formats may be needed for different modes. Nor does it even discuss what differences (if any) the use of a MU format for an acknowledgement frame might entail. Thus, Merlin amounts to no more than a suggestion that it might be possible to indicate that a UL MU frame should be sent. Petitioner has not shown that Merlin teaches using (or indicating) any specific UL MU format, and thus the asserted grounds fail to render obvious the limitations of the Claim 1.⁴

2. Ground 2: Abraham466

Under Ground 2, Petitioner asserts that “Abraham466 renders Claims 1-10 obvious.” Pet. at 34. However, Abraham466 fails to render obvious the Challenged Claims. *See* EX2002 (Psounis Dec.) ¶66.

First, all Challenged Claims require that acknowledgement information in the downlink frame be included in the “quality of service (QoS) control field.” EX1001 Claims 1 and 6 at 41:41-43, 42:23-26 (collectively, the “QoS Control Field

⁴ Petitioner references Merlin Fig. 12 in its Ground 1 analysis, but never asserts that it teaches the claimed UL MU format. *See* Pet. at 22-23. Nor could Petitioner support such an assertion—as Merlin explains, Fig. 12 shows transmissions in the DL direction (rather than a UL direction acknowledgement frame).” *See, e.g.*, EX1005 at 19:43-19:49 (noting the BAR frame “may be sent in a separate DL PPDU”).

Limitations”). However, Abraham466 does not teach the claimed arrangement. At best, Abraham466 teaches a separate optional field containing the purported acknowledgement information—rather than it being included in the QoS control field, as claimed.

Second, as discussed above, the Challenged Claims require an AP sending a downlink frame to a station indicating the station should send an acknowledgement frame in a specific format (single-user or multi-user). The claims further specify how the format is indicated (acknowledgement information included in a QoS control field), and the station sends/AP receives the acknowledgement frame in the specific requested format. Abraham466 never teaches or renders obvious these claimed Multi-User Format Limitations—much less that the downlink frame includes acknowledgement information indicating that a specific multi-user frame format should be used.

i. Abraham466 does not render obvious the QoS control field limitations [Claims 1 and 6]

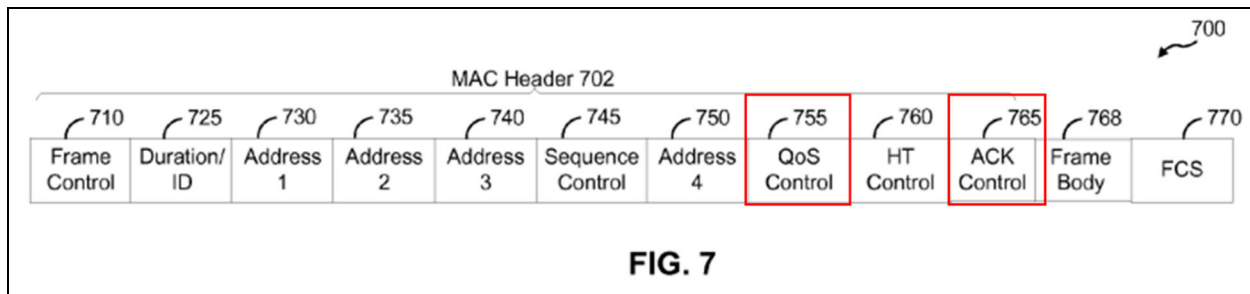
Abraham466 fails to render obvious the '679 Patent's QoS control field limitations. '679 Patent Claim 1 requires a STA:

receiving, from the AP, a downlink frame including a **quality of service (QoS) control field including acknowledgement information** representing whether the STA is requested to transmit the acknowledgement frame in a single-user (SU) format or in a multiple-

user (MU) format at a Short Inter-Frame Space (SIFS) time after the
downlink frame;

'679 Patent Claim 1 at 41:40-47. '679 Patent Claim 6 similarly claims transmitting a downlink frame including a QoS control field including acknowledgement information. EX1001 Claim 6 at 42:23-26. Ground 2 fails to render these QoS Control Field limitations obvious, at least because Abraham466 does not teach an AP sending/STA receiving a downlink frame with a QoS control field including the claimed acknowledgement information, as claimed. *See* EX2002 ¶66.

Petitioner suggests Abraham466 teaches the QoS Control Field Limitations because it “discusses that ‘[i]n some embodiments, the presence of the ACK control field 765 may be indicated using a reserved bit/bit combination in the frame control field 710, QoS control field 755 or the HT/VHT control field 760.’” Pet. at 36 (quoting EX1005 ¶64). However, even the portion of Abraham466 cited by Petitioner makes clear the ACK control field includes the purported acknowledgement information, not the QoS control field. Abraham466 teaches the use of a QoS control field separate from the ACK control field, as shown in Figure 7:



Abraham466 Figure 7 (annotated to show separate QoS Control and ACK Control fields).

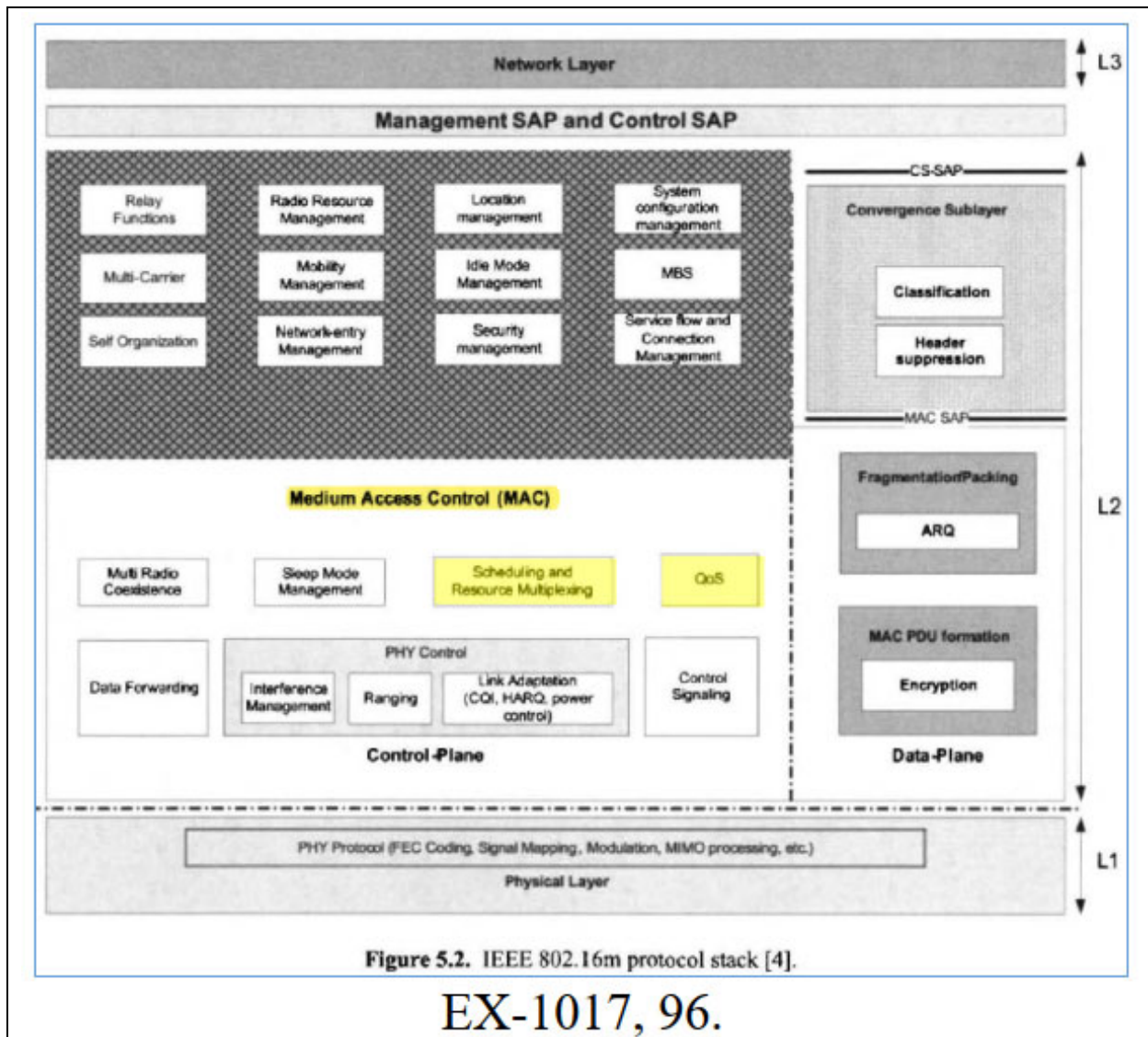
Abraham466 teaches “[t]he ACK control field 765 may indicate to a station receiving the MPDU frame 700 when and how a BA is sent and a time gap.” Abraham466 ¶64 (emphasis added). At best, Abraham466 teaches the QoS Control Field 755 (along with the Frame Control Field 710 or the HT/VT Control Field 760) might indicate that an Ack Control field is “present.” *Id.* The QoS Control Field indicating that another control field is present does not mean that the QoS Control Field itself **includes** the acknowledgement information, as claimed. *See* EX2002 ¶67.

Recognizing this shortcoming in Ground 2, Petitioner nonetheless asserts it should be overlooked because “[i]t has been known to use QoS control field bits to indicate ACK policy directly.” Pet. at 36. Petition cites to its declarant for support on this point, but its declarant merely parrots the same conclusion in *the exact same words* without providing any sort of analysis or evidence which would support the conclusion:

Pet. at 36	EX1003 ¶193
It has been known to use QoS control field bits to indicate ACK policy directly. <i>See</i> EX-1003 ¶ 193. Particularly in view of the known techniques to utilize bits of a DL MU frame to convey transmission management by an AP, a POSITA would have understood that Abraham466’s disclosed “indication of the presence of ACK policy” in the QoS control field can represent the ACK policy directly. For example, a POSITA would understand that as long as both the AP and the receiving STAs agree on what the bits in QoS control field can represent whether the information of the existence of ACK policy or a specific ACK request, the bits in QoS control field can either represent the existence of ACK policy or an explicit ACK instruction.	193. As discussed above regarding the State of the Art, it has been known to use QoS control field bits to indicate ACK policy directly. <i>See</i> Section VI.B above. Particularly in view of the known techniques to utilize bits of a DL MU frame to convey transmission management by an AP, a POSITA would have understood that Abraham466’s disclosed “indication of the presence of ACK policy” in the QoS control field can represent the ACK policy directly. For example, a POSITA would understand that as long as both the AP and the receiving STAs agree on what the bits in QoS control field can represent whether the information of the existence of ACK policy or a specific ACK request, the bits in QoS control field can either represent the existence of ACK policy or an explicit ACK instruction.

See Xerox Corp. et al. v. Bytemark, Inc., IPR2022-00624, Paper 9 at 15 (granting little weight to an expert declaration which “merely repeats, *verbatim*, the conclusory assertion for which it is offered to support”) (precedential).

Petitioner’s Declarant also refers to Section VI.B of his declaration, but none of the four sentences in that section supports (or even addresses) the point either. Even assuming the declarant’s intention was to refer to Section VI.C of his declaration, that section does nothing more than establish both (1) QoS and (2) Scheduling and Resource Multiplexing were separate parts of the Medium Access Control (MAC) layer—a far cry from supporting the conclusion that “it has been known to use QoS control field bits to indicate ACK policy directly.” *See* EX1003 ¶¶54-56, 193.



EX1003 at 22 (Petitioner's declarant's annotated figure showing QoS to be separate from Scheduling and Resource Multiplexing in the MAC).

Petitioner then argues "a POSITA would understand that as long as both the AP and the receiving STAs agree on what the bits in QoS control field can represent whether the information of the existence of ACK policy or a specific ACK request, the bits in QoS control field can either represent the existence of ACK policy or an explicit ACK instruction." Pet. at 36. However, this ignores the text of the claim language, which requires that the QoS control field **include** the acknowledgement

information, not that it represent the “existence” of an ACK policy or ACK instruction.

Petitioner then suggests “[i]t also has been known that additional bits/frames may be considered as ‘overhead’ to the systems,” and therefore “a POSITA would understand that QoS control field can be utilized to represent either the existence of ACK policy or the specific ACK instruction as a design choice.” Pet. at 37. However, this argument is irrelevant. It does not matter if it would have been obvious to use the QoS control field to represent the existence of ACK policy in another field, **because that is not what the ’679 Patent recites**. The ’679 Patent recites that the QoS control field includes the acknowledgement information—Petitioner’s suggestion that it would have been obvious to do something other than what the Challenged Claims recites is immaterial.

ii. Abraham466 does not render obvious the claimed MU format limitations [Claims 1 and 6]

Much like Merlin, Abraham466 does not even address the claimed MU acknowledgement frame format. As discussed above in Section V.A.1.ii (incorporated here by reference), Claim 1 requires the STA to receive a downlink frame from the AP with acknowledgement information representing whether the STA is requested to transmit in SU or MU format, and that the STA transmit to the AP in either SU or MU format. EX1001 Claim 1 at 41:37-42:2. Claim 6 similarly requires the AP to send a downlink frame to the STA with acknowledgement

information representing whether the STA is requested to transmit in SU or MU format, and that the AP receives such a frame from the STA in the respective format. EX1001 Claim 6 at 42:19-45. Abraham466 never even addresses UL MU format, much less in the specific context of the AP identifying the desired acknowledgement frame format in the downlink frame and the STA responding with the particular MU format frame if MU is indicated. *See* EX2002 ¶¶68-73.

Petitioner relies on Abraham466’s general discussion of an AP setting and STA receiving acknowledgement policy, noting (for example) that (1) “the STA 106a a may receive a message containing ACK information,” (2) “the acknowledgement policy may indicate... the type of acknowledgement that should be transmitted (e.g., whether an acknowledgement or block acknowledgement should be transmitted),” and (3) “the STA 106a may then determine when and how to send its ACK message transmission based on the ACK information.” Pet. at 34-37, 39-40 (quoting EX1005 ¶¶62, 74). Similar to Merlin, all of Abraham466’s discussion relates to generalities, noting that the AP will send information that the STA might use to respond, but failing to differentiate SU from MU format or get into the actual details of the specific format used for such a response. Petitioner cannot rely on Abraham466’s discussion of general “acknowledgement policy” to render obvious specific requirements as to what is contained within the

acknowledgment information sent by the AP and what specific format is used by the STA when transmitting an acknowledgement frame.

3. Ground 3: Merlin+Abraham466+Chu806+Ma

As discussed above in Sections V.A.1-2, Merlin and Abraham466 fail to render obvious the Challenged Claims, and Petitioner's proposed combination of the two references does nothing to remedy those failures. For example, neither Merlin nor Abraham466 would have rendered obvious the MU acknowledgement format related limitations, thus a combination of the two would have the same deficiencies. *See* Sections V.A.1.ii, V.A.2.ii. Nor would the proposed combination with Chu806 or Ma remedy those failures, at least because (1) Petitioner has not provided sufficient reason why a POSITA would even make the specific proposed combination, and (2) even Petitioner's "kitchen sink" combination of the four references still fails to render obvious the claimed MU acknowledgement frame format limitations.

i. A POSITA would not have been motivated to make the proposed combination

Petitioner's Ground 3 fails, at least because a POSITA would not have made the specific proposed combination of Merlin, Abraham466, Chu806, and Ma.

In arguing that a POSITA would have made such a combination, Petitioner first lists off a number of surface similarities between the references, largely centered around its assertion that the references all mention "acknowledgement information"

in some capacity. *See* Pet. at 48. However, “[t]hese surface similarities do not control the obviousness analysis,” and Petitioner has failed to tie these “surface similarities” to the specific challenged claimed elements, such as the specific frame formatting, timing, and control field usage. *See In re Magnum Oil Tools Int’l, Ltd.*, 829 F.3d 1364, 1379 (Fed. Cir. 2016); *see also* EX2002 ¶¶74-77.

Next, Petitioner relies on several general goal and/or purpose statements from the references that are untethered from Petitioner’s proposed modifications. *See* EX2002 ¶¶78-79. For example, Petitioner asserts “a POSITA would have been motivated to combine Merlin’s DL MU frame with a portion of the DL MU frame of Abraham466 in light of the ‘need to more efficiently transmit messages and frames across various communication schemes,’” citing Abraham466 ¶6. Pet. at 49. However, the cited portion of Abraham466 comes from the Background section and makes absolutely no mention of DL MU frames. Petitioner takes a statement of a high-level goal and makes the completely unsupported claim that it supports a specific modification to functionality not even addressed by the cited statement. Nor does Petitioner explain how combining the DL MU frames of Merlin and Abraham466 would even provide the purported benefit it states. Petitioner uses this exact same approach with citations to Chu806 at 1:36-38, pointing to a general high-level statement regarding “provid[ing] even greater throughputs” without explaining how the proposed combination would even provide that benefit. *See* Pet. at 49.

Even more tellingly, Petitioner’s motivation to combine Merlin with Ma is based on Ma’s boilerplate disclosure that some of Ma’s embodiments could be combined with other of Ma’s embodiments. *See* Pet. at 49 (citing EX1007 at 27:32-37). Just as a matter of common sense, if such common boilerplate language could provide a motivation to combine a reference with *other* references, then the motivation to combine inquiry’s usefulness as a check against hindsight would be wholly negated. *See, e.g., Ecolochem, Inc. v. S. Cal. Edison Co.*, 227 F.3d 1361, 1371 (Fed. Cir. 2000) (“[T]he best defense against hindsight-based obviousness analysis is the rigorous application of the requirement for a showing of a teaching or motivation to combine the prior art references”). Furthermore, “[t]he mere fact that the prior art could be so modified would not have made the modification obvious unless the prior art suggested the desirability of the modification.” *In re Mills*, 916 F.2d 680, 682 (Fed. Cir. 1990) (quoting *In re Gordon*, 733 F.2d 900, 902 (Fed. Cir. 1984)) (emphasis added). Thus, even if the cited Ma disclosure was not just generic boilerplate, the mere fact that certain elements of its embodiments could be combined would provide no motivation to make the specific proposed combination with Merlin. *See* EX2002 ¶80.

Petitioner’s remaining analysis just repeatedly concludes that “Merlin in view of Abraham466, Chu806, or Ma renders [the limitation] obvious” for each limitation without explaining why a POSITA would have made the specific proposed

modifications to Merlin that Petitioner asserts. *See, e.g.*, Pet. at 50-51, 53, 56. Petitioner ignores the fact that “[t]he determination of obviousness is made with respect to the subject matter as a whole, not separate pieces of the claim.” *Sanofi-Synthelabo v. Apotex, Inc.*, 550 F.3d 1075, 1086 (Fed. Cir. 2008) (citing *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 127 S. Ct. 1727, 1734, 167 L. Ed. 2d 705 (2007)).

As the Supreme Court explained in *KSR*:

[A] patent composed of several elements is not proved obvious merely by demonstrating that each of its elements was, independently, known in the prior art. Although common sense directs one to look with care at a patent application that claims as innovation the combination of two known devices according to their established functions, **it can be important to identify a reason that would have prompted a person of ordinary skill in the relevant field to combine the elements in the way the claimed new invention does.** This is so because inventions in most, if not all, instances rely upon building blocks long since uncovered, and claimed discoveries almost of necessity will be combinations of what, in some sense, is already known.

KSR, 550 U.S. at 418-19 (emphasis added). However, Petitioner here has made no effort to explain why a POSITA would have combined the elements *in the way the claimed invention does*. Instead, Petitioner relies on surface similarities and

unrelated mentions of general benefits in the references without regard to the actual claimed improvements. *See* Pet. at 48-50. Petitioner’s reasoning is completely untethered from the components of the challenged claims. Under Petitioner’s logic, any permutation of the elements of Merlin, Abraham466, Chu806, and Ma would be unpatentable without regard to whether it actually would have been obvious to a POSITA to have made such a combination.

Ultimately, Petitioner has nothing but hindsight as a guide, and is thus relegated to relying on general statements untethered from the actual Challenged Claims in an attempt to cobble together a reason to combine disparate aspects of various disclosures that simply could not have motivated a POSITA to create the specific ’520 Patent invention. *See Polaris Industries, Inc. v. Arctic Cat, Inc.*, 882 F.3d 1056, 1068 (Fed. Cir. 2018) (“We have observed that the prejudice of hindsight bias often overlooks that the genius of invention is often a combination of known elements which in hindsight seems preordained.”).

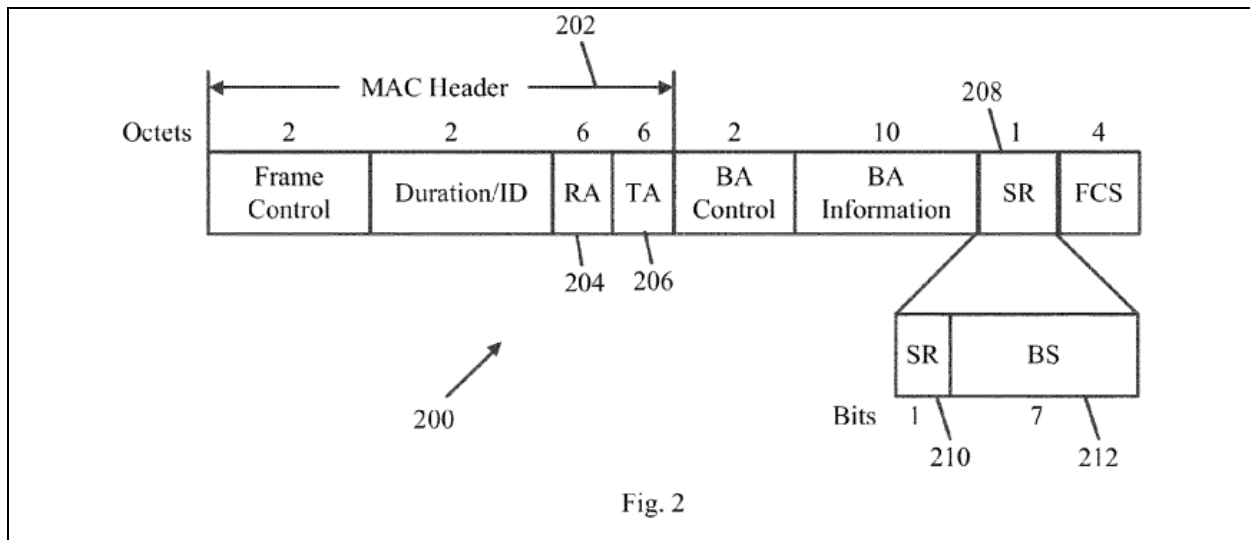
ii. The proposed combination fails to render obvious the MU format limitations

Even if a POSITA would have made the proposed combination of Merlin+Abraham466+Chu806+Ma as Petitioner proposes, the proposed combination would still fail to remedy the shortcomings of Merlin and Abraham466 as described above. As discussed previously, both Merlin and Abraham466 fail to render obvious the MU format related limitations. *See* Sections V.A.1.ii, V.A.2.ii

(incorporated here by reference); *see also* EX2002 ¶81. Furthermore, Petitioner does not cite Chu806 as teaching any of the MU Format specific limitations. *See* Pet. at 35-37, 39-41. Because Ma also fails to render obvious the limitations, Petitioner's Ground 3 necessarily fails.

Petitioner cites several Ma disclosures generally relating to MU transmissions. *See* Pet. at 18-19, 50-55 (citing, *e.g.*, EX1007 at 10:1-4, 13:65-14:1, 14:6-9, 15:50-56, 17:54-57). However, nothing Petitioner cites discusses (1) indicating whether an acknowledgement frame should be sent in a SU or MU format, (2) the use of different formats for SU and MU, or (3) the MU format itself. *See* EX2002 ¶¶82-83.

At best, Ma only discloses a single frame format as shown in Fig. 2:



EX1007 Fig. 2

Far from teaching the claimed SU or MU format related limitations, Ma fails to even contemplate indicating or using a different frame format for MU or SU

acknowledgement frames. Its apparent reliance on a single frame format for both ultimately teaches away from the methods claimed in the '679 Patent.

Petitioner identified no support from Chu806 for its Ground 3 challenge to the MU acknowledgement frame format portions of the limitations. Nor could it, because Chu806 provides no disclosure of the claimed MU acknowledgement frame format. Chu806 mentions “format” only in the context of (1) Fig. 10C [4:3-5, 22:27-34] and (2) “OFDMA data unit 302-4 formatted according to a legacy communication protocol” [9:10-16]. Fig. 10C describes an ACK frame sent in the DL—not UL—direction from an AP to STA and makes no mention of SU or MU. Nor would such a distinction be directly relevant given the opposite direction. And the discussion at 9:10-16 just notes that the described frame is “formatted according to a legacy communication protocol...e.g., the IEEE 802.11ac standard.” But as discussed previously, 802.11ac did not even have MU UL frames, so this discussion of legacy frames is not relevant.

B. The Board should exercise its discretion to deny the Petition under *Fintiv*

The Board should exercise its discretion to deny the Petition under *Fintiv*. Petitioner delayed filing its IPR challenge for a full year after service of the district

court complaint,⁵ despite having prepared and served largely the same invalidity theories in its invalidity contentions as part of the parallel district court litigation **six months earlier**.⁶ Petitioner concedes that the district court trial is scheduled to occur **five to six months** prior to any potential final written decision in this proceeding—a gap wholly attributable to Petitioner’s delay in filing its challenge. Pet. at 7. In light of the advanced stage of the district court litigation, Petitioner’s lack of diligence in filing its Petition demonstrates that its actions are purely meant to “increase, rather than limit, litigation costs,” and thus the Petition should be denied under *Fintiv*. See Director’ *Fintiv* Guidance at 1 (June 21, 2022), available at https://www.uspto.gov/sites/default/files/documents/interim_proc_discretionary_denials_aia_parallel_district_court_litigation_memo_20220621_.pdf.

The Director has discretion to deny institution under 35 U.S.C. § 314(a). *Cuozzo Speed Techs., LLC v. Lee*, 136 S. Ct. 2131, 2140 (2016). The Board should

⁵ Patent Owner contends Zyxel Networks Corporation was served with the district court complaint at least as of April 21, 2022 (as shown on the Proof of Service filed with the district court), yet did not file its Petition until April 21, 2023. See EX2007 at 4; Pet. at 69; *see also* 35 U.S.C. §315(b).

⁶ Compare Exhibit 2008 at 103 (Petitioner’s invalidity contentions based on Merlin and Abraham466, served October 20, 2022) with Pet. at 69 (filed April 21, 2023).

exercise such discretion here and deny the Petition because the same invalidity arguments will be addressed, and resolved, in the co-pending district court proceedings before the Board would issue a final written decision.

Patent Owner has asserted the '679 Patent against Petitioner Zyxel in the Western District of Texas in *Atlas Global Technologies LLC v. Zyxel Networks Corporation and Zyxel Communications Corporation*, Case No. 6:22-cv-00355, filed April 4, 2022 (W.D. Tex.) (“District Court Proceeding”). The Board considers the presence and status of parallel district court litigation in determining whether to deny institution. *See NHK Spring Co. Ltd. v. Intri-Plex Techs. Inc.*, IPR2018-00752, Paper 8, at 20 (P.T.A.B. Sept. 12, 2018) (precedential); *Apple Inc. v. Fintiv, Inc.*, IPR2020-00019, Paper 15, at 17 (P.T.A.B. May 13, 2020) (informative) [hereinafter “*Fintiv*”]; *see also Gen. Plastic Indus. Co., Ltd. v. Canon Kabushiki Kaisha*, IPR2016-01357, Paper 19, at 16-17 (P.T.A.B. Sept. 6, 2017) (“[W]e recognize that an objective of the AIA is to provide an effective and efficient alternative to district court litigation . . .”). *Fintiv* “sets forth factors that balance considerations of system efficiency, fairness, and patent quality when a patent owner raises an argument for discretionary denial due to the advanced state of a parallel proceeding.” *Fintiv*, Paper 15, at 7-8 (citing *Apple Inc. v. Fintiv, Inc.*, IPR2020-00019, Paper 11, at 5-6 (P.T.A.B. Mar. 20, 2020) (precedential)).

The factors are:

1. whether the court granted a stay or evidence exists that one may be granted if a proceeding is instituted;
2. proximity of the court's trial date to the Board's projected statutory deadline for a final written decision;
3. investment in the parallel proceeding by the court and the parties;
4. overlap between issues raised in the petition and in the parallel proceeding;
5. whether the petitioner and the defendant in the parallel proceeding are the same party; and
6. other circumstances that impact the Board's exercise of discretion, including the merits.

Id. “[T]he Board examines these factors, which relate to whether efficiency, fairness, and the merits support the exercise of authority to deny institution. In evaluating the factors, the Board takes a holistic view of whether efficiency and integrity of the system are best served by denying or instituting review.” *Id.* (internal citations omitted). Additionally, on June 21, 2022, USPTO Director Vidal issued interim guidance for discretionary denial analysis (hereinafter the “Director’s Guidance”).⁷ As detailed below, these factors favor discretionary denial under §314(a).

⁷ Available at https://www.uspto.gov/sites/default/files/documents/interim_proc_discretionary_denials_aia_parallel_district_court_litigation_memo_20220621_.pdf.

Factor 1: The District Court Proceeding is ongoing in front of Judge Albright in the Western District of Texas. Zyxel has not moved to stay the District Court Proceeding pending the resolution of this IPR, nor is there evidence that such a stay would be granted. In fact, Judge Albright has been outspoken on his preference not to stay cases pending PTAB decision. *See, e.g.,* EX2009 (IAM Article) at 1 (“[Question to Judge Albright]: You’re one of the judges who hears a lot of patent cases who has tended not to stay cases pending a PTAB decision – why is that? [Answer from Judge Albright]: You know, I have done that because I think that people have a constitutional right to assert their patent. I mean, patents are in the Constitution, the right to a jury trial is in the Constitution. I am not taking away anyone’s right to go to the PTAB, but I think people ought to have a jury trial.”); EX2010 (Law360 Article) (“Albright Says He’ll Very Rarely Put Cases On Hold For PTAB”). Thus, this factor favors denial of institution because evidence exists that the Judge in the District Court Proceeding would not grant a stay even if institution were to occur. *See Fintiv*, Paper 11 at 6 (noting the analysis is based on whether “evidence exists that [a stay] may be granted if a proceeding is instituted”).

Factor 2: Trial in the District Court Proceeding is scheduled for May 16, 2024. EX2011 at (Scheduling Order) at 4. In addition to the district court’s schedule, the Director’s Guidance has suggested that parties refer to the median time to trial for a district as well as judge specific disposition data when evaluating the *Fintiv*

factors. Director's Guidance at 8-9. The District Court Proceeding was filed April 4, 2022. EX1008 (Complaint) at 60. The most recent statistics for WDTX show a median time to trial of 28.2 months, which would suggest a trial around the beginning of August 2024. EX2012 at 37 (March 2023 WDTX Judicial Caseload Profile).

If the Board reaches its institution decision within three months of receiving the preliminary response, 35 U.S.C. §314(b), and issues a final written decision within 1 year of institution, 35 U.S.C. §316(a)(11), a final written decision would likely not issue until around November 2024. Thus, both the scheduled trial date (May 16, 2024) as well as the projected trial date (August 2024) fall several months before any final written decision would be likely to issue. Further, as noted above, the fact that the trial will occur so many months before any final written decision in this proceeding is wholly attributable to Petitioner's lack of diligence in filing its Petition. Thus, this factor weighs in favor of denial.

Factor 3: The investment in the parallel proceeding is significant. In the District Court Proceeding, the parties conducted a *Markman* hearing and received a Claim Construction Order. EX2006 (Claim Construction Order). Both preliminary and final invalidity contentions have already been served. EX2011 at 1-2 (Scheduling Order); EX2008 (Preliminary Invalidity Contentions); EX2013 (Final Invalidity Contentions). Furthermore, opening expert reports are due November 2,

2023, which means that Petitioner will likely have already served (or will be about to serve) its expert report on validity before an institution decision issues in this proceeding. EX2011 at 3. Given the completion of the *Markman* process and the advanced stage of discovery in the District Court Proceeding, this factor favors denial.

Petitioner suggests this factor is “firmly neutral given Petitioner’s [] diligence.” Pet. at 9. However, as discussed above, nothing could be further from the truth—Petitioner did not file its Petition until six months after first identifying its invalidity theories, and a full year after the service date shown in the Proof of Service filed with the District Court. EX2007 at 4. Had Petitioner been diligent, it would have filed its Petition six months earlier, shortly after it first identified its invalidity theories (as shown in its invalidity contentions, EX2008). As it stands, Petitioner delayed so long that the parties will be in the middle of serving expert reports on validity before an institution decision is likely to issue, and a final written decision in this proceeding has very little chance of simplifying issues prior to trial in the District Court.

Factor 4: Petitioner’s asserted grounds in this proceeding were expressly incorporated into its invalidity contentions in the District Court Proceeding. *See, e.g.*, EX2013 at 105 (incorporating its full IPR grounds into its final invalidity contentions); EX2008 (Preliminary Invalidity Contentions) at 103-104 (identifying

both primary references: Merlin [listed as F-2] and Abraham406 [listed as F-4]); *see also id.* (Preliminary Invalidity Contentions) at 17-18 (identifying Chu806 [A-6] and Ma [A-4]).⁸ Thus, instituting this proceeding would lead to duplicative efforts here and in the District Court Proceeding.

Petitioner suggests this factor weighs against denial because it states: “if *inter partes* review is instituted on Grounds 1-3 in this proceeding, Petitioners will not pursue Grounds 1-3 in the Texas Litigation.” Pet. at 9. However, this stipulation is far narrower than in *Sotera Wireless, Inc. v. Masimo Corporation*, IPR2020-01019, Paper 12 (PTAB Dec. 1, 2020), where the “Petitioner broadly stipulates to not pursue ‘any ground raised ***or that could have been reasonably raised.***’” *Id.* at 19 (emphasis in original); *see also* Director’s Guidance at 7-8.

Petitioner’s offer to conditionally litigate one set of invalidity theories in the PTAB and a separate set of invalidity theories in the district court proceeding (*i.e.*,

⁸ While Chu806 and Ma were not explicitly applied to the ’679 Patent in Petitioner’s *Preliminary Invalidity Contentions*, Petitioner was aware of both references as well as their purported teachings at least as of service of its preliminary invalidity contentions, and in this proceeding it relies on them solely as purportedly duplicative secondary references (as demonstrated by its assertion that Merlin and Abraham466 invalidate the Challenged Claims without relying on Chu806 or Ma). *See* Pet. at 3.

those that are not *exactly* the same as the PTAB grounds, but nonetheless reasonably could have been raised in the Petition) does little to provide an “inexpensive resolution of every proceeding.” *See* 37 CFR §42.1(b). In fact, Petitioner’s approach simply increases the costs for all parties, creating a duplication of litigation rather than the desired “cost-effective alternative to litigation.” *See* 77 Fed. Reg. 48680-01 (Aug. 14, 2012). Petitioner’s limited stipulation effectively amounts to an empty promise that is unlikely to significantly prevent duplication of work, especially given that its opening validity expert report will potentially have been served before an institution decision issues. *See Ericsson Inc. and Nokia of America Corp. v. Godo Kaisha IP Bridge 1*, IPR2022-00725, Paper 10 (PTAB Nov. 2, 2022) at 11; EX2011 at 3.

Factor 5: Petitioner Zyxel and Patent Owner Atlas are both parties in the co-pending District Court Proceeding. Under the Board’s precedential *Sotera* opinion, when the parties are the same this factor supports denying institution. *Sotera*, IPR2020-01019, Paper 12 at 19.

Petitioner makes the baffling statement that this factor supports institution because “institution offers a unique opportunity to adjudicate the grounds of this Petition exclusively at the PTAB.” Pet. at 10. If Petitioner actually believed that to be true, then it would not have delayed filing its Petition for six months after identifying its invalidity theories. Nor would it have declined to make a *Sotera*

stipulation, which would have disposed of the *Fintiv* inquiry and put the matter exclusively in front of the PTAB as Petitioner ostensibly suggests it is seeking. *See* Director’s Guidance at 3.

Factor 6: As discussed above, the merits of this Petition are weak. None of Petitioner’s grounds even attempts to identify the specific claimed UL MU acknowledgement frame format. Even Petitioner’s “kitchen sink” Ground 3 simply glosses over the claimed format, in addition to failing to explain why a POSITA would have combined the four references into the specific proposed combination.

On balance, the *Fintiv* factors favor discretionary denial.

VI. Conclusion

Patent Owner respectfully requests that the Board refuse to institute *inter partes* review for the reasons stated herein.

Dated: August 11, 2023

Respectfully submitted,

By: /Michael F. Heim/
Michael F. Heim (Reg. No. 32,702)
Attorney for Patent Owner
Atlas Global Technologies LLC

CERTIFICATE OF SERVICE

The undersigned certifies that pursuant to 37 C.F.R. § 42.6(e), a copy of the foregoing was served via email to counsel of record for Petitioners as follows:

Victoria Hao, Reg. No. 47,630 Martha Hopkins, Reg. No. 46,277 Law Offices of S.J. Christine Yang 17220 Newhope Street, Suites 101-102 Fountain Valley, CA 92708 Telephone: (714) 641-4022 Facsimile: (714) 641-2082	Benn Wilson, Reg. No. 78,224 Bradley, Arant Boult Cummings LLP 1819 5th Avenue N Birmingham, AL 35203 Telephone: (205) 521-8000 Facsimile: (205) 521-8800
---	--

Service Email: ZyXEL_AGT679_IPR@sjclawpc.com

Dated: August 11, 2023

Respectfully submitted,
By: /Michael F. Heim/
Michael F. Heim (Reg. No. 32,702)
Attorney for Patent Owner
Atlas Global Technologies LLC

CERTIFICATE OF COMPLIANCE

Pursuant to 37 C.F.R. § 42.24(d), the undersigned hereby certifies that this brief complies with the type-volume limitation of 37 C.F.R. § 42.24 because this brief contains 10,382 words as calculated by Microsoft Word, excluding the items exempted under 37 C.F.R. § 42.24.

Dated: August 11, 2023

Respectfully submitted,
By: /Michael F. Heim/
Michael F. Heim (Reg. No. 32,702)
Attorney for Patent Owner
Atlas Global Technologies LLC