

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

COMMSCOPE TECHNOLOGIES LLC,
Petitioner,

v.

DALI WIRELESS, INC,
Patent Owner.

IPR2022-01293
Patent 10,334,499 B2

Before KARL D. EASTHOM, BARBARA A. BENOIT, and
SHARON FENICK, *Administrative Patent Judges*.

FENICK, *Administrative Patent Judge*.

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

I. INTRODUCTION

A. *Background and Summary*

CommScope Technologies LLC (“CommScope” or “Petitioner”) and Corning Optical Communications LLC (“Corning”) filed a Petition (Paper 1, “Pet.”) requesting institution of inter partes review of claims 1–19 (“the challenged claims”) of U.S. Patent No. 10,334,499 B2 (Ex. 1001, “the ’499 patent”). Dali Wireless Inc. (“Patent Owner”) filed a Preliminary Response (Paper 7, “Prelim. Resp.”). With our prior authorization, Petitioner filed a Preliminary Reply (Paper 11, “Prelim. Reply”), limited to new events related to discretionary denial, and Patent Owner filed a Preliminary Sur-reply (Paper 13, “Prelim. Sur-reply”).

As discussed, CommScope and Corning initially filed the Petition in this proceeding. After a joint request of Patent Owner and Corning, we terminated the proceeding as to Corning. Papers 9, 10, 14.

An *inter partes* review may be instituted only if “the information presented in the petition . . . and any [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(a) (2018). For the reasons below, Petitioner has established a reasonable likelihood that it would prevail in showing the unpatentability of at least one of the challenged claims. As discussed below, we have considered our whether to exercise our discretion to deny pursuant to 35 U.S.C. § 314(a) and determined not to exercise this discretion. Accordingly, we institute an *inter partes* review of the challenged claims on all grounds raised in the Petition.

B. Real Parties in Interest

The Petition identifies CommScope Technologies LLC, CommScope, Inc. of North Carolina, CommScope, Inc, CommScope Holding Company, Inc., and Corning as real parties in interest. Pet. 1. As noted, the proceeding has been terminated as to Corning. Paper 14.

Patent Owner identifies only itself as real party in interest. Paper 4 (Patent Owner’s Mandatory Notices), 1.

C. Related Matters

Petitioner and Patent Owner each identify as related *Dali Wireless, Inc. v. Cellco Partnership*, No. 6:22-cv-104 (W.D. Tex.) and *Dali Wireless, Inc. v. AT&T Corp.*, No. 2:22-cv-12 (E.D. Tex.). Pet. 2; Paper 4, 1; Prelim. Reply 1. The latter case has been severed into multiple cases, and we refer to these as “the AT&T cases.” Prelim. Reply 2; Prelim. Sur-reply 2.

Petitioner additionally identifies *Dali Wireless, Inc. v. T-Mobile US, Inc.*, No. 2:22-cv-414 (E.D. Tex.) (“T-Mobile case”) as a related case and notes that the identified *Cellco Partnership* case that had been pending in the Western District of Texas has been closed, with Petitioner transferred to the Eastern District of Texas in *Dali Wireless, Inc. v. Cellco Partnership D/B/A Verizon Wireless*, No. 2:23-cv-2-RWS-RSP (E.D. Tex.) (“Verizon case”) and other defendants severed, with one resulting remaining severed case in the Western District, *Dali Wireless, Inc. v. Ericsson Inc. et al.*, 6:22-cv-1313-ADA (W.D. Tex.) (“Ericsson case”). Paper 12, (Petitioner’s Updated Mandatory Notices), 1–2.

Petitioner and Patent Owner each identify *inter partes* proceeding IPR2020-01430 (“’01430 IPR”), challenging claims of the ’499 patent, as a related matter. Pet. 1–2; Paper 4, 1. Petitioner additionally identifies

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IPR2020-01473, challenging claims of related U.S. Pat. No. 10,080,178 B2 (“the ’178 patent”) as a related matter. Pet. 1–2.

Petitioner additionally identifies a petition filed by a different petitioner against the ’499 patent, IPR2022-01419, as related. Paper 12, 2.

D. The ’499 Patent

The ’499 patent is titled “Distributed Antenna System” and relates to a Distributed Antenna System (DAS) that “enables a high degree of flexibility to manage, control, enhance, [and] facilitate the usage and performance of a distributed wireless network.” Ex. 1001, codes (54), (57). According to one embodiment of the invention, a distributed antenna system includes a digital access unit (DAU), which connects to associated base stations. *Id.* at 4:40–44. The distributed antenna system receives downlink data via radio frequency (RF) signals from a base station. *Id.* at 4:63–65. The DAUs provide the received signals to multiple digital remote units (DRUs). *Id.* at 4:41–44, 5:4–9.

Figure 1 of the ’499 patent, reproduced below, is a block diagram showing the basic structure and an example of a downlink (base station to DRU) transport scenario.

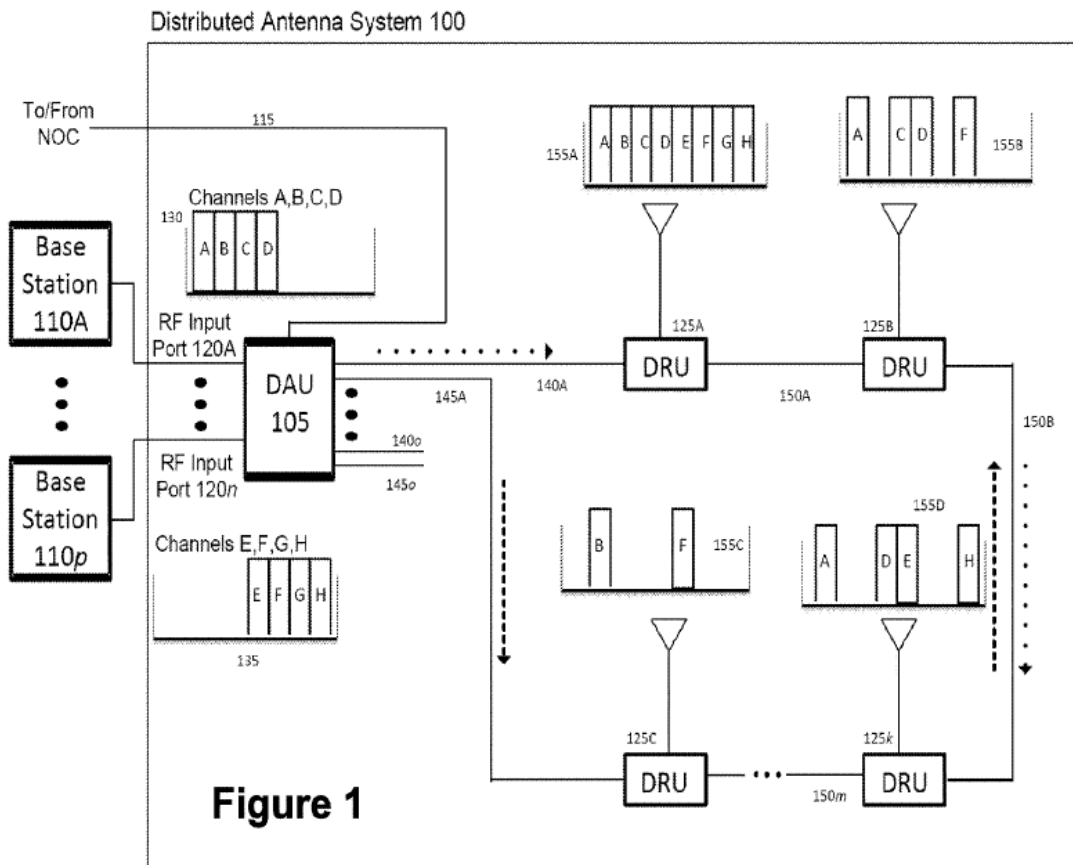


Figure 1 depicts DAU 105, which provides signals to DRUs 125A, 125B, 125C, through 125k. *Id.* at 4:41–44, 4:62–5:6. DAU 105 receives composite downlink input signal 130, containing carriers¹ A–D, from base

¹ Elements A–H are alternatively referred to as “carriers” and as “channels” in the ’499 patent. *Compare* Ex. 1001 at 5:20–28, 7:61–65, 8:46–49, Fig. 1 (describing A–H as channels), *with id.* at 5:65–6:2, 6:18–26, 6:34–38, 6:45–49, 7:23–25, 7:47–50, (describing A–H as carriers); *see also id.* at 5:34–36, 5:45–52, 7:63–8:2. The ’499 patent additionally specifies that “a wireless operator may have more than one RF carrier per channel allocated to a single base station” and describes Figure 1 and the related disclosure as explaining the situation where composite downlink signal 130 from a first base station comprises carriers A–D. *Id.* at 5:53–66. We use “carriers” in this section to refer to A–H.

station 110a. *Id.* at 5:62–66. DAU 105 receives second composite downlink input signal 135, containing carriers E–H, from base station 110p. *Id.* at 5:66–6:2. DRUs 125A, 125B, 125C, through 125k. DRUs 125A–k are connected in a ring configuration via bidirectional optical cables, and the downlinked carriers are propagated around the ring, or alternatively, in a daisy chain configuration, to provide all carriers to all DRUs 125A–k. *Id.* at 4:35–39, 5:4–9, 5:20–31, 6:9–20, 6:63–7:2. While the exemplary embodiment of Figure 1 shows all carriers arriving at each DRU, “the number of channels received at each DRU is assigned by the DAU and need not be equal, adjacent or sequential, but instead will typically be any configuration that optimizes network utilization.” *Id.* at 5:28–31.

Generally, software settings within a DRU are configured either manually or automatically to determine which of the carriers received at the DRU are present in the downlink output signal at the antenna port of the DRU. *Id.* at 6:21–27. In one embodiment, the DAU monitors which carriers and corresponding time slots are active for each DRU. *Id.* at 12:15–17. The DAU communicates with a software module in the DRU to enable or disable the transmission of specific radio resources by the DRU. *Id.* at 12:17–37.

E. Illustrative Claim

Claims 1, 8, and 14 of the challenged claims of the ’499 patent are independent. Claim 1 illustrates the claimed subject matter, and is reproduced with annotations used in the Petition in brackets:

1. [1A] A system for transporting wireless communications, comprising:
 - [1B] a baseband unit;
 - [1C] a plurality of signal sources, including at least a first signal source and a second signal source;

- [1D] a plurality of remote units, including at least a first remote unit and a second remote unit;
- [1E] wherein the baseband unit comprises a plurality of interfaces to communicatively couple the baseband unit to the plurality of signal sources;
- [1F] wherein the baseband unit is configured to receive a plurality of radio resources from the first signal source and the second signal source;
- [1G] wherein the baseband unit is configured to send a digital representation of a first set of radio resources to the first remote unit at a first point in time, the first set of radio resources for transmission at an antenna of the first remote unit;
- [1H] wherein the baseband unit is configured to send a digital representation of a second set of radio resources to the first remote unit at a second point in time, the second set of radio resources for transmission at the antenna of the first remote unit;
- [1I] wherein a number of radio resources in the first set of radio resources is different from a number of radio resources in the second set of radio resources; [1J] and wherein the baseband unit is configured to receive digital signals from each of the plurality of remote units.

Ex. 1001, 14:2–29.

F. Evidence

Petitioner relies on the following patent evidence.

Name	Patent Document	Exhibit
Sabat-522	US 6,963,552 B2	Ex. 1011
Hettstedt	US 2008/0119198 A1	Ex. 1006
Sabat-426	US 2009/0180426 A1	Ex. 1010
Wu	US 2010/0128676 A1	Ex. 1005

Petitioner relies on the following non-patent literature evidence.

Name	Non-Patent Literature Title	Author	Exhibit
OBSAI standard	OBSAI Reference Point 3 Specification Version 3.1	Open Base Station Architecture Initiative	Ex. 1008

G. Prior Art and Asserted Grounds

Petitioner asserts that claims 1–19 would have been unpatentable on the following grounds:

Claim(s) Challenged	35 U.S.C. § ²	Reference(s)/Basis
1–5, 8–11, 13–16, 18, 19	102	Wu
1–5, 8–11, 13–16, 18, 19	103	Wu or Wu, Sabat-426
6, 7, 12, 17	103	Wu, Sabat-552
1–19	103	Any preceding ground and OBSAI standard
1–5, 8–11, 13–16, 18, 19	102	Hettstedt
1–5, 8–11, 13–16, 18, 19	103	Hettstedt, Wu
6, 7, 12, 17	103	Hettstedt, Sabat-552

Pet. 4.

II. ANALYSIS

A. Discretionary Denial

Patent Owner argues that we should exercise discretion to deny institution under 35 U.S.C. § 314(a) because the factors identified in *Apple*,

² The Leahy-Smith America Invents Act (“AIA”), Pub. L. No. 112-29, 125 Stat. 284, 287–88 (2011), amended 35 U.S.C. §§ 102, 103. Because the ’499 patent claims priority to an application filed before the effective date of the applicable AIA amendment, we refer to the pre-AIA version of 35 U.S.C. § 102 and § 103. See Ex. 1001, code (63).

Inc. v. Fintiv, Inc., IPR2020-00019, Paper 11 (PTAB Mar. 20, 2020) (precedential) (“*Fintiv*”), weigh in favor of denying institution. Prelim. Resp. 54–46; PO Sur-reply. Petitioner argues we should not discretionarily deny institution under *Fintiv*. Pet. 25; Pet. Reply.

I. Initial Fintiv Analysis

The Board’s decision in *Apple Inc. v. Fintiv Inc.*, IPR2020-00019, Paper 11 (PTAB Mar. 20, 2020) (precedential) (“*Fintiv*”), identifies a non-exclusive list of factors parties may consider addressing where there is a related, parallel district court action to determine whether such action provides any basis for discretionary denial. *Fintiv*, Paper 11 at 5–16. Those factors include:

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. at 5–6.

In evaluating the factors, we take a holistic view of whether efficiency and integrity of the system are best served by denying or instituting review. *Id.* at 6. The Director has issued additional guidance on the application of *Fintiv*. See Katherine K. Vidal, *Interim Procedure for Discretionary Denials in AIA Post-Grant Proceedings with Parallel District Court*

Litigation (June 21, 2022)³ (“*Fintiv* Memo”). Additionally, we are guided by the precedential decisions of the Director in *OpenSky Indus., LLC v. VLSI Tech. LLC*, IPR2021-01064, Paper 102, 49–50 (Oct. 4, 2022) (precedential) (“*OpenSky*”) and *CommScope Techs. LLC v. Dali Wireless, Inc.*, IPR2022-01242, Paper 23 (Feb. 27, 2023) (precedential) (“*CommScope-01242*”). The *Fintiv* Memo indicates that if we “determine[] that the information presented at the institution stage presents a compelling unpatentability challenge, that determination alone demonstrates that the PTAB should not discretionarily deny institution under *Fintiv*.” *Fintiv* Memo, 4–5. *OpenSky* and *CommScope-01242* make clear that the compelling merits standard is a higher standard than the institution standard, requiring that it be “highly likely that the petitioner would prevail with respect to at least one challenged claim.” *OpenSky*, 49; *CommScope-01242*, 3–4. We are further instructed that we consider compelling merits only after a determination that the first five *Fintiv* factors favor discretionary denial. *CommScope-01242*, 4–5.

With this in mind, we first determine whether the *Fintiv* factors favor a discretionary denial.

a) *Factor 1 - Whether the court granted a stay or evidence exists that one may be granted if a proceeding is instituted*

“A district court stay of the litigation pending resolution of the PTAB trial allays concerns about inefficiency and duplication of efforts.” *Fintiv*, 6. *Fintiv* indicated that, in previous Board decisions, the existence of a district court stay pending Board resolution of an *inter partes* review has weighed

³ Available at https://www.uspto.gov/sites/default/files/documents/interim_proc_discretionary_denials_aia_parallel_district_court_litigation_memo_20220621_.pdf

strongly against discretionary denial, while a denial of such a stay request sometimes weighs in favor of discretionary denial. *Id.* at 6–8.

Patent Owner argues that a stay has not been requested in any of the related district court cases. Prelim. Resp. 57. Petitioner does not discuss this factor or contradict this assertion. *See generally* Prelim. Reply.

Because neither party has requested a stay of the related district court cases, we determine that Factor 1 is neutral. *See Apple Inc. v. Fintiv, Inc.*, IPR2020-00019, Paper 15 at 12 (PTAB May 13, 2020) (informative) (Institution Decision) (holding that “[t]his factor does not weigh for or against discretionary denial” when neither party requested a stay).

b) Factor 2 - Proximity of the court’s trial date to the Board’s projected statutory deadline for a final written decision

The proximity factor in *Fintiv* asks us to evaluate our discretion in light of a trial date that has been set in a parallel litigation. *See Fintiv*, 3, 5 (“*NHK* applies to the situation where the district court has set a trial date to occur earlier than the Board’s deadline to issue a final written decision in an instituted proceeding.”; “When the patent owner raises an argument for discretionary denial under *NHK* due to an earlier trial date, the Board’s decisions have balanced the following factors”) (citing *NHK Spring Co. v. Intri-Plex Techs., Inc.*, IPR2018-00752, Paper 8 at 20 (PTAB Sept. 12, 2018) (precedential)(“*NHK*”)). As noted above in the discussion of the first factor, *Fintiv* cites concern regarding “inefficiency and duplication of efforts.” *Id.* at 6. In its analysis of the proximity factor, *Fintiv* echoes that concern in its guidance that “[i]f the court’s trial date is at or around the same time as the projected statutory deadline or even significantly after the projected statutory deadline, the decision whether to institute will likely implicate other factors discussed herein, such as the resources that have been

invested in the parallel proceeding.” *Id.* at 9. Similarly, in *NHK*, the Board expressed the concern that a trial before the deadline for a final written decision addressing the same prior art and arguments would have undermined the Board’s objectives of providing an effective and efficient alternative to district court litigation. *See NHK*, 20 (citing *General Plastic Indus. Co., Ltd. v. Cannon Kabushiki Kaisha*, IPR2016-01357, Paper 19 at 16–17 (PTAB Sept. 6, 2017 (precedential))).

We are instructed that

when analyzing the proximity of the court’s trial date under factor two of *Fintiv*, when other relevant factors weigh against exercising discretion to deny institution or are neutral, the proximity to trial should not alone outweigh all of those other factors. Parties may present evidence regarding the most recent statistics on median time-to-trial for civil actions in the district court in which the parallel litigation resides for the PTAB’s consideration. Where the parties rely on time-to-trial statistics, the PTAB will also consider additional supporting factors such as the number of cases before the judge in the parallel litigation and the speed and availability of other case dispositions.

Fintiv Memo, 8–9 (internal citations and footnote deleted).

For the AT&T cases, Patent Owner initially argued that, given the median time to trial in the Eastern District of Texas, the trial would occur in January of 2024. Prelim. Resp. 57–58. Even after severance into separate cases in the Eastern District of Texas, Patent Owner argues that, because the cases are consolidated for pretrial purposes, the pretrial schedules have been preserved. Prelim. Sur-reply 1 (citing Ex. 1054). Thus, Patent Owner argues, the original trial date of October 23, 2023 will remain for one of the two AT&T cases, and the other trial will “follow shortly thereafter.” *Id.* In citing a trial date of October 2023, Patent Owner apparently refers to the date in Exhibit 2008; either this date or the Preliminary Response’s January

2024 date (based on time-to-trial statistics) is several months before an expected final written decision before us. For its part, Petitioner contends that the court has not set trial dates for the severed AT&T cases, and because of an order requiring the parties to confer regarding to consolidation with the Verizon case, a new schedule will be required. Prelim. Reply 2.

For the Verizon case (transferred to the Eastern District of Texas), Petitioner argues no applicable date is currently in force. Prelim Reply 1–2. Patent Owner does not appear to dispute this. Prelim. Sur-reply 1.

With respect to the T-Mobile case, Petitioner and Patent Owner each appear to agree that no trial will take place before an anticipated final decision if we institute here. Prelim. Reply 1; Prelim. Sur-reply 1.

Petitioner argues that the trial date for the “old” Verizon case (the Ericsson case) in the Western District of Texas is not relevant, as Petitioner is not a party to that case and the trial date listed (in December of 2023) is merely a default entry. Prelim. Reply 2 (citing Ex. 2011, 5). Petitioner estimates that that, given median time-to-trial statistics in the Western District of Texas, the estimated trial date for the Ericsson case should be June 2024. *Id.* Patent Owner disagrees with using this estimate, and contends that “there is no reason” for the listed trial date to move later. Prelim. Sur-reply 2.

Thus it appears that the cases in which a trial in district court might take place before a final decision here are the AT&T cases, if the original trial date is preserved despite possible consolidation with the Verizon case, and the Ericsson case, to which Petitioner is not a party.

In summary, at least one of the AT&T cases has a currently in force trial date several months before a final written decision would be due, and that date is consistent with the time-to-trial statistics for the district. With no

additional supporting factors cited by Petitioner, we agree with Patent Owner that this factor weighs somewhat in favor of exercising our discretion to deny the Petition.

c) Factor 3 - Investment in the parallel proceeding by the court and the parties

If, at the time of the institution decision, the district court has issued substantive orders related to the challenged patent, such as a claim construction order, this fact weighs in favor of denial. *See Fintiv*, 9–10. On the other hand, if the district court has not issued such orders, this fact weighs against discretionary denial. *Id.* at 10.

In the Ericsson case, a claim construction order has issued after briefing, and was filed as an exhibit in this proceeding pursuant to our authorization. Ex. 1059; Ex. 3001.

With respect to the AT&T and Verizon cases, in response to Petitioner’s argument that the court will not have entered any orders before an institution decision (Prelim. Reply 3), Patent Owner appears to concede this is the case; however, Patent Owner argues that “despite the yet-to-be-scheduled aspects” of these cases, “the parties have already made significant investments” including in the Verizon case before transfer to the Eastern District. Prelim. Sur-reply 2–3.

The record shows that the parties’ and the District Courts’ investment in the related cases has been extensive. This factor weighs heavily in favor of exercising our discretion to deny the Petition.

d) Factor 4 - Overlap between issues raised in the petition and in the parallel proceeding

“[I]f the petition includes the same or substantially the same claims, grounds, arguments, and evidence as presented in the parallel proceeding,

this fact has favored denial.” *Fintiv*, 12. “Conversely, if the petition includes materially different grounds, arguments, and/or evidence than those presented in the district court, this fact has tended to weigh against exercising discretion to deny institution under *NHK*.” *Id.* at 12–13. A stipulation as in *Sotera Wireless, Inc. v. Masimo Corp.*, IPR2020-01019, Paper 12 at 18–19 (PTAB Dec. 1, 2020) (precedential as to § II.A), if one is entered, would be highly relevant. “Consistent with *Sotera Wireless, Inc.*, the PTAB will not discretionarily deny institution in view of parallel district court litigation where a petitioner presents a stipulation not to pursue in a parallel proceeding the same grounds or any grounds that could have reasonably been raised before the PTAB.” *Fintiv* Memo 3 (footnote omitted).

Patent Owner argues that, as no *Sotera* stipulation has been filed and the same art and overlapping claims are at issue in the related cases, this factor weighs in favor of denial. Prelim. Resp. 60–61. Petitioner does not present any argument with respect to this factor.

This factor weighs in favor of exercising our discretion to deny the Petition.

e) Factor 5 - Whether the petitioner and the defendant in the parallel proceeding are the same party

If the petitioner is unrelated to the defendant in the parallel proceeding, that might weigh against discretionary denial. *See Fintiv*, 13–14.

Patent Owner argues that Petitioner is the defendant in several of the parallel proceedings. Prelim. Resp. 61. Petitioner does not dispute this. Prelim. Reply 3.

This factor weighs in favor of exercising our discretion to deny the Petition.

f) Conclusion – Initial Fintiv Analysis

We have considered the circumstances and facts before us in view of the first five *Fintiv* factors. Because our analysis is fact driven, no single factor is determinative of our conclusion. Considering these five *Fintiv* factors, we determine that they favor a discretionary denial.

2. Assessment of the Compelling Merits

As we have found that the first five *Fintiv* factors favor discretionary denial, we proceed to assess whether the record shows that Petitioner has presented a compelling unpatentability challenge.

In circumstances where . . . the Board’s analysis of *Fintiv* factors 1–5 favors denial of institution, the Board shall then assess compelling merits. In doing so, the Board must provide reasoning sufficient to allow the parties to challenge that finding and sufficient to allow for review of the Board’s decision.

CommScope-01242, 5.

“[I]f the merits of a ground raised in the petition seem particularly strong on the preliminary record, this fact has favored institution.” *Fintiv*, 14–15. “[C]ompelling, meritorious challenges will be allowed to proceed at the PTAB even where district court litigation is proceeding in parallel. Compelling, meritorious challenges are those in which the evidence, if un rebutted in trial, would plainly lead to a conclusion that one or more claims are unpatentable by a preponderance of the evidence.” *Fintiv* Memo

4. As the Director has stated:

To be clear, a compelling-merits challenge is a higher standard than the reasonable likelihood required for the institution of an IPR under 35 U.S.C. § 314(a). A challenge can only “plainly lead to a conclusion that one or more claims are unpatentable” if

it is highly likely that the petitioner would prevail with respect to at least one challenged claim. I recognize that all relevant evidence likely will not have been adduced at the point of institution; trial should produce additional evidence that may support a determination in the Final Written Decision that unpatentability has not been adequately proven. Thus, a determination of “compelling” merits should not be taken as a signal to the ultimate conclusion after trial. The Board shall provide its reasoning in determining whether the merits are compelling.

OpenSky, 49–50 (internal citation omitted) (quoting *Fintiv* Memo 4).

We find the merits of this case to be compelling. First, the anticipation and single-reference obviousness grounds set forth by Petitioner using the Wu reference, on the present record, are clear and persuasive. The single-reference obvious ground buttresses the anticipation ground. In addition, the single-reference obviousness ground does not rely on a combination of references, which simplifies the showing needed for obviousness. As discussed below, Wu discloses a system for wireless communications including a baseband unit coupled to signal sources and multiple remote units for transmission, where the baseband unit routes channels to the remote units via a matrix switch that can combine or split the individual channels and a host unit. Ex. 1005, code ¶¶ 34–39, Figs. 1, 2. The combination or splitting of channels can change based on conditions that may change over time. *Id.* at ¶ 46. On the present record, the system in the ’499 patent disclosure is similar to the one disclosed by the Wu reference. Claim 1 does not appear to encompass a high level of detail, and each element of the claimed system is persuasively shown to be present in Wu. And so, on the present record, Petitioner’s showing is highly persuasive that the Wu reference discloses or teaches the system of claim 1 as Petitioner asserts.

Second, although Petitioner did not request in its Petition any claim terms be expressly construed, Petitioner's arguments applying Wu's disclosures to claim 1 reflect the construction of claim terms we decide here for purposes of institution. *See Section II.D.* As noted below, our partial construction of "radio resources" encompasses RF carriers, CDMA codes, and TDMA time slots, including those in which underlying data is transmitted. As discussed with regard to "radio resources" recited in claim 1, Petitioner relies on Wu's description of converting to analog channel signals and transmitting these RF channel signals as disclosing the use of radio resources for transmission at the RTUs. *See* Pet. 35 (citing Ex. 1005 ¶¶ 4, 30; Ex. 1003 ¶ 113). As such, Petitioner's arguments of Wu's disclosure of RF channels as "radio resources" meets our partial construction.

Third, on the record at this point, with respect to the anticipation and single-reference obviousness grounds using the Wu reference, the arguments presented by Patent Owner in the current record rely on Patent Owner's claim construction argument with respect to "radio resources." *See* Prelim. Resp. 30–45. However, Patent Owner relies on its (flawed) interpretation of a prior Board construction of "radio resources," and not on any intrinsic evidence, in putting forth this construction, which additionally is contradicted by a claim construction issued in the Ericsson case. *See infra* § II.D; Ex. 1059.

For these reasons, while our analysis of *Fintiv* factors 1–5 favors denial of institution, we determine that it is highly likely that Petitioner would prevail with respect to at least one challenged claim, and, therefore, presents a compelling, meritorious challenge that plainly leads to a conclusion that at least one challenged claim is unpatentable. Accordingly,

we decline to exercise discretion to deny institution under 35 U.S.C. § 314(a). We note, however, that this determination of compelling merits “should not be taken as a signal to the ultimate conclusion after trial.” *OpenSky*, 50.

B. Legal Standards

“In an [*inter partes* review], 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) (citing 35 U.S.C. § 312(a)(3) (requiring [*inter partes*] review petitions to identify “with particularity . . . the evidence that supports the grounds for the challenge to each claim”)). This burden never shifts to Patent Owner. *See Dynamic Drinkware, LLC v. Nat’l Graphics, Inc.*, 800 F.3d 1375, 1378 (Fed. Cir. 2015) (citing *Tech. Licensing Corp. v. Videotek, Inc.*, 545 F.3d 1316, 1326–27 (Fed. Cir. 2008)) (discussing the burden of proof in *inter partes* review). Furthermore, Petitioner must explain with particularity how the prior art would have rendered the challenged claims unpatentable. 35 U.S.C. § 312(a)(3); 37 C.F.R. § 42.104(b)(4) (“The petition must specify where each element of the claim is found in the prior art patents or printed publications relied upon.”).

To establish anticipation, each and every element in a claim, arranged as recited in the claim, must be found in a single prior art reference. *See Net MoneyIN, Inc. v. VeriSign, Inc.*, 545 F.3d 1359, 1369 (Fed. Cir. 2008); *Karsten Mfg. Corp. v. Cleveland Golf Co.*, 242 F.3d 1376, 1383 (Fed. Cir. 2001). Although the elements must be arranged or combined in the same way as in the claim, “the reference need not satisfy an *ipsissimis verbis* test,” i.e., identity of terminology is not required. *In re Gleave*, 560 F.3d

1331, 1334 (Fed. Cir. 2009); *accord In re Bond*, 910 F.2d 831, 832 (Fed. Cir. 1990).

A claim is unpatentable under 35 U.S.C. § 103 if the differences between the subject matter sought to be patented 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 skill in the art; and (4) objective evidence of nonobviousness, i.e., secondary considerations. *See Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966).

C. Level of Ordinary Skill in the Art

Petitioner asserts that “[a] person of ordinary skill in the art (POSITA) would have a bachelor’s degree in electrical engineering (or equivalent field) with 2–3 years of work experience in wireless communications.” Pet. 21 (citing Ex. 1003 (Declaration of Dr. Anthony Acampora) ¶¶ 20–22).

Patent Owner argues that one of ordinary skill in the art “would have an educational background in electrical engineering and experience in the design of wireless communication systems,” and “[m]ore particularly, a POSA would be a person with a bachelor’s degree in electrical engineering (or a similar technical degree or equivalent work experience) and at least 3 years of experience working with wireless communication systems.” Prelim. Resp. 12.

Patent Owner’s definition appears generally consistent with Petitioner’s definition, with the exception of requiring 3 years or more (as

opposed to 2–3 years) of work experience in wireless communication systems. For the purpose of institution, we adopt Petitioner’s provided definition for the level of skill of a person of ordinary skill in the art as reasonable and consistent with the prior art, which does not encompass an open-ended (“at least 3 years”) amount of experience, and which is supported by the testimony of Dr. Acampora. We would reach the same conclusions if we were to remove the open-ended terminology from Patent Owner’s definition and adopt that.

D. Claim Construction

Petitioner does not request that we construe any claim term. Pet. 21. Patent Owner requests that we construe “radio resource(s),” recited in claims 1–4, 8–11, and 13–19. Prelim. Resp. 12–19.

Patent Owner proposes that we construe “radio resources” as “RF carriers, CDMA codes, TDMA time slots, and other information defining or describing the way data is being transmitted by a remote unit but do not include the user payload data that is transmitted.” Prelim. Resp. 12. Patent Owner argues that this proposed construction is consistent with the construction provided by the Board in the Decision Denying Institution of *Inter Partes Review*⁴ (“’01430 IPR DI”) in the ’01430 IPR. Prelim. Resp. 12–15.

In Patent Owner’s proposed construction, radio resources (i) encompass RF carriers, CDMA codes, and TDMA time slots and (ii) encompass other information defining or describing the way data is being transmitted by a wireless access point, (iii) as long as the RF carriers,

⁴ *John Mezzalingua Associates, LLC v. Dali Wireless Inc.*, IPR2020-01430, Paper 15 (PTAB Feb. 9, 2021) (Ex. 2002).

CDMA codes, and TDMA time slots or other information defining and describing the way data is being transmitted does include the user payload data that is transmitted. Prelim. Resp. 12. We address each of these three aspects of Patent Owner’s proposed construction below.

1. RF Carriers, CDMA Codes, and TDMA Time Slots

We agree with Patent Owner that “radio resources” encompass RF carriers, CDMA codes, and TDMA time slots. Prelim. Resp. 12. The specification identifies RF carriers, CDMA codes and TDMA time slots as exemplary radio resources. For instance, the ’499 patent describes a key function of the DAU Management Control Module as “determining and/or setting the appropriate amount of radio resources (such as RF carriers, CDMA codes or TDMA time slots) assigned to a particular DRU or group of DRUs to meet desired capacity and throughput objectives.” Ex. 1001, 12:3–9. When describing the deployment of additional radio resources, the ’499 specification identifies RF carriers, CDMA codes and TDMA time slots as radio resources that can be deployed: “the DAU Management Control module can adaptively modify the system configuration to begin to deploy . . . additional radio resources (such as RF carriers, CDMA codes or TDMA time slots).” Ex. 1001, 12:58–64; *see also id.* at 12:65–13:2.

While not arguing that a construction is required, Petitioner’s arguments are consistent with this conclusion. For example, Petitioner argues that “[p]er the ’499 patent specification, analog carrier channels are examples of radio resources.” Pet. 34 (citing Ex. 1001, 12:6–7; Ex. 1003 ¶¶ 109–110). The teaching from the specification that Petitioner relies on to support this argument identifies CDMA codes and TDMA time slots as additional radio resources. *Id.* (quoting Ex. 1001, 12:6–7). We also note that, in the ’01430 IPR DI, “radio resources” was partially construed as

encompassing RF carriers, CDMA codes and TDMA time slots. Ex. 2002, 11–12.

Thus, we agree with Patent Owner that “radio resources” encompass RF carriers, CDMA codes and TDMA time slots.

2. *Other Information Defining or Describing the Way Data Is Being Transmitted by a Wireless Access Point*

We do not need to determine whether “radio resources” encompass other information defining or describing the way data is being transmitted by a wireless access point because Petitioner only maps “radio resources” to analog downlink RF carriers. Pet. 29, 33–34, 65–66. Thus, whether “radio resources” encompass other information defining or describing the way data is being transmitted by a wireless access point is not at issue here. *Nidec Motor Corp. v. Zhongshan Broad Ocean Motor Co.*, 868 F.3d 1013, 1017 (Fed. Cir. 2017).

3. *Not Including the User Payload Data that Is Transmitted*

Patent Owner’s proposed construction for “radio resources” requires that RF carriers, CDMA codes, TDMA time slots or other information defining and describing the way data is being transmitted do not include the user payload data that is transmitted. In isolation, the phrase “not includ[ing] the user payload data that is transmitted” could be subject to different interpretations. It could simply mean that data being transmitted by itself is not a radio resource, but the RF carrier transmitting the data could be a radio resource. Patent Owner makes clear, however, that this interpretation is not the intent of its construction by arguing that, under its construction, Wu’s carriers are not radio resources because they have payload data modulated onto them. Prelim. Resp. 32–36. Additionally,

Patent Owner argues that Hettstedt's RF carriers are not radio resources because payload data is "packaged in the carriers." Prelim. Resp. 46–51.

Patent Owner, however, cites nothing from the specification of the '499 patent that indicates RF carriers, CDMA codes, or TDMA time slots cease to be radio resources merely because payload data is modulated or encapsulated on them. Prelim. Resp. 12–16. Further, we see no such teaching in the specification. Rather, in examining the intrinsic evidence, we note that the independent claims each specify that "the first set of radio resources" and "the second set of radio resources" are "for transmission at an antenna of the first remote unit." Ex. 1001, 14:17–19, 14:22–24, 15:3–5, 15:8–10, 16:6–8, 16:11–13; *see DePuy Spine, Inc. v. Medtronic Sofamor Danek, Inc.*, 469 F.3d 1005, 1014 (Fed. Cir. 2006) ("In determining the meaning of the disputed claim limitation, we look principally to the intrinsic evidence of record, examining the claim language itself, the written description, and the prosecution history, if in evidence."). If no payload data is included in the radio resources, it is unclear what is provided for transmission at an antenna of a remote unit; a more natural reading is that radio resources incorporate data for transmission, e.g., via the RF carriers, CDMA codes, or TDMA time slots. *See, e.g.*, Ex. 1001, 10:17–23 ("As an example, the Digital Up Converters present in DRU 125A and DRU 125B can be dynamically software reconfigured as described previously so that the signals present at the antenna port of DRU 125A would correspond to the *spectral profile* shown in FIG. 1 as 155A and also that the signal present at the antenna port of DRU 125B would correspond to the spectral profile shown in FIG. 1 as 155B" (emphasis added)).

Patent Owner relies on the partial construction in the '01430 IPR DI to exclude RF carriers, CDMA codes, or TDMA time slots including data,

e.g., data modulated on the RF carrier. Prelim. Resp. 14, 30, 35–36. The ’01430 IPR DI’s partial construction, however, does not provide such an exclusion. Ex. 2002, 9–12. The pertinent issue in the ’01430 IPR DI was whether data to be carried wirelessly using RF carriers, CDMA codes, and TDMA time slots was *by itself* a radio resource. *Id.* at 10. The ’01430 IPR panel determined that RF carriers, CDMA codes, and TDMA time slots are radio resources, but data that does not incorporate information used in the transmission of the radio resource from an antenna of the remote unit, that is, payload data on its own, is not. *Id.* at 12. The ’01430 IPR panel did not hold that RF carriers, CDMA codes, and TDMA time slots are not radio resources when they have data modulated or encapsulated on them. *Id.* at 10–12. In the ’01430 IPR DI’s partial construction, mere *data*, even if modulated or encapsulated on the RF carriers, CDMA codes, and TDMA time slots, are not radio resources, but RF carriers, CDMA codes, and TDMA time slots upon which data is modulated or encapsulated are radio resources.

Further, the issue of whether RF carriers, CDMA codes, and TDMA time slots with modulated or encapsulated data would be radio resources was not before the ’01430 IPR panel. Ex. 2002, 17–19 (describing the prior art in that case as disclosing “only underlying data that arrived in” a radio resource being sent to DAS antenna units). The unpatentability argument being addressed involved an assertion regarding prior art teaching the transmission of payload data that was not modulated or encapsulated on RF carriers, CDMA codes, and TDMA time slots, and the conclusion related to whether the transmission of this payload data disclosed “digital representations of radio resources [being] sent to a DAS antenna unit.” *Id.* In other words, in the ’01430 IPR DI, the disclosure being mapped to “radio

resources” was user payload data alone, and the finding there was that user payload alone did not constitute “radio resources” according to the preliminary claim construction in that decision. *Id.*

Thus, the record does not support Patent Owner’s proposed construction of “radio resources,” that requires the RF carriers, CDMA codes, TDMA time slots or other information defining and describing the way data is being transmitted cannot include the user payload data that is transmitted.

4. *Our Partial Construction*

For our present purposes, we do not need to completely construe the term “radio resources.” *Nidec Motor Corp.*, 868 F.3d at 1017. However, a partial construction is required, and for the reasons discussed above, for this Decision, we construe “radio resources” to encompass RF carriers, CDMA codes, and TDMA time slots, including those in which underlying data is transmitted.

We note that this is consistent with the construction of the same term in the same patent in *Dali Wireless, Inc. v. Cellco Partnership et al.*, 6:22-cv-01313-ADA (W.D. Tex.). *See* Ex. 1059, 2–3. In that case, the preliminary construction given was “[p]lain and ordinary meaning where the plain and ordinary meaning includes RF carriers, CDMA codes, and TDMA time slots, but does not include the underlying data that is transmitted” with an additional “Note” indicating that “*when data is modulated on an RF carrier, the RF carrier is a radio resource, but the data modulated on the RF carrier is not a radio resource.*” *Id.* (emphasis added).

E. *Estoppel*

Petitioner argues that Patent Owner should be estopped due to issue preclusion from arguing “whether to institute” based on anticipation by Wu

over claims 1–5, 8–10, 14, 15, and 19, based on the '01473 DI. Pet. 37–40, 42, 43, 45, 47 (citing Ex. 1013). Patent Owner argues that collateral estoppel does not apply. Prelim. Resp. 23–27.

Because we decide there are compelling merits and decide to institute based on anticipation by Wu, it is not necessary to reach this issue.

F. Ground 1 – Anticipation by Wu

Petitioner argues that claims 1–5, 8–11, 13–16, 18, and 19 are anticipated by Wu. Pet. 25–50. Patent Owner disagrees. Prelim. Resp. 30–42.

1. Wu

Wu is titled “Carrier Channel Distribution System” and describes a system where signals are communicated between base transceiver stations (BTSs) and remote transceiver units (RTUs), providing fine-grained control for this communication, splitting carrier channels and routing only some channels to RTUs according to a routing policy. Ex. 1005, codes (54), (57), ¶¶ 9, 11, 38–44. A BTS receives signals within a plurality of frequency bands, each of which may comprise multiple channels. *Id.* ¶¶ 11, 35, 37, 38. Figure 2 of Wu, reproduced below, is a schematic of a base transceiver station and associated host units.

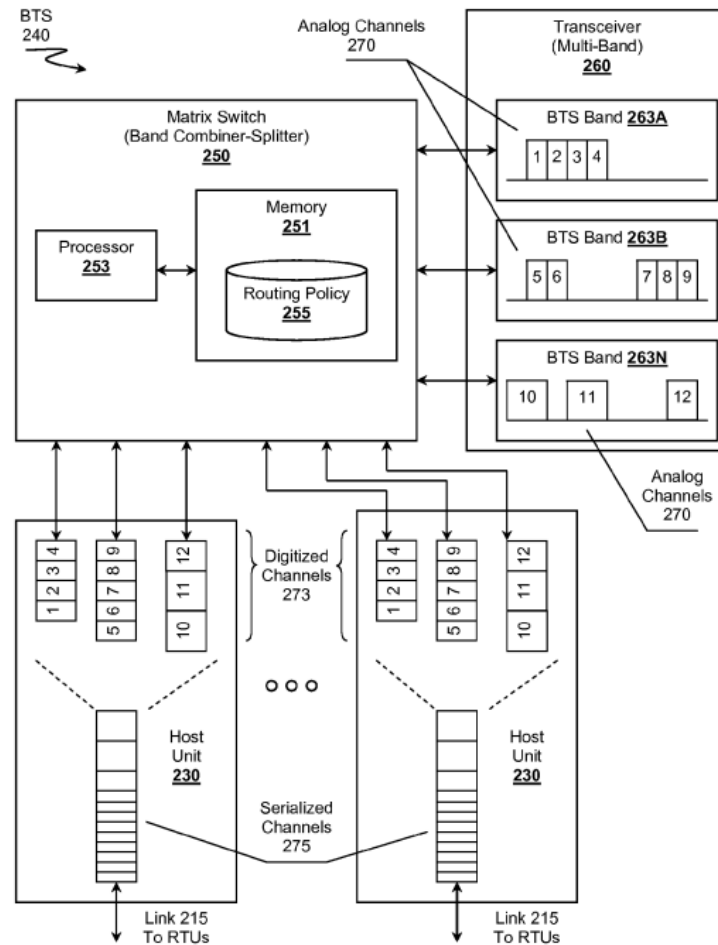


Figure 2

Figure 2 shows base transceiver station (BTS) 240 including transceiver 260, matrix switch 250, and host units 230. *Id.* ¶¶ 15, 34–36. Transceiver 260 receives signals on BTS bands 263A through 263N, and each may include multiple channels 270, e.g., channels 270 labelled 5 through 9 in BTS band 263B. *Id.* ¶¶ 35, 37. Transceiver 260 forwards the received channels 270 to matrix switch 250 that routes them according to Routing Policy 255 to host unit 230, which further distributes them to RTUs over links 215. *Id.* ¶ 38. The system is bi-directional, and carrier channel signals are received by host units 230 from RTUs and forwarded to transceiver 260 for transmission within bands 263. *Id.* ¶¶ 36, 49. Wu also discloses that some signals may be

received at an RTU with another RTU acting as intermediary. *Id.* at Figs. 1, 4, ¶¶ 33, 51.

Routing policy can be reconfigured in order to change the routing of channels to the various RTUs. *Id.* ¶¶ 48, 49. Channels may be routed, allocated, or distributed, for example, based on anticipated requirements of areas at a certain time of day, or on current traffic load. *Id.* ¶¶ 43, 44. Transmissions between host units and RTUs are disclosed as preferably occurring according to the CPRI Standard. *Id.* ¶¶ 31, 49.

2. Analysis of Claim 1

a) Preamble (limitation 1A)

According to Petitioner, Wu discloses a system for wireless communications, as recited in the preamble of claim 1, denoted limitation 1A by Petitioner. Pet. 28 (citing Ex. 1005 ¶¶ 2, 9; Ex. 1003 ¶ 101).

Patent Owner does not address Petitioner's showing with respect to this limitation. *See generally* Prelim. Resp.

On the present record, to the extent the preamble is limiting, we find that Petitioner's showing with respect to the preamble is persuasive.

b) Limitation 1B

Petitioner asserts that Wu discloses the baseband unit in the combination of the matrix switch 250 and host units (130, 230, 430), which are described as being within Wu's BTS and "make up a system that manages baseband communications to and from the plurality of RTUs on behalf of the operator's signal source." Pet. 28–29 (citing Ex. 1005 ¶¶ 31, 49–50; Ex. 1003 ¶¶ 102–104). Petitioner presents an annotated version of Wu's Figure 2 to illustrate its argument.

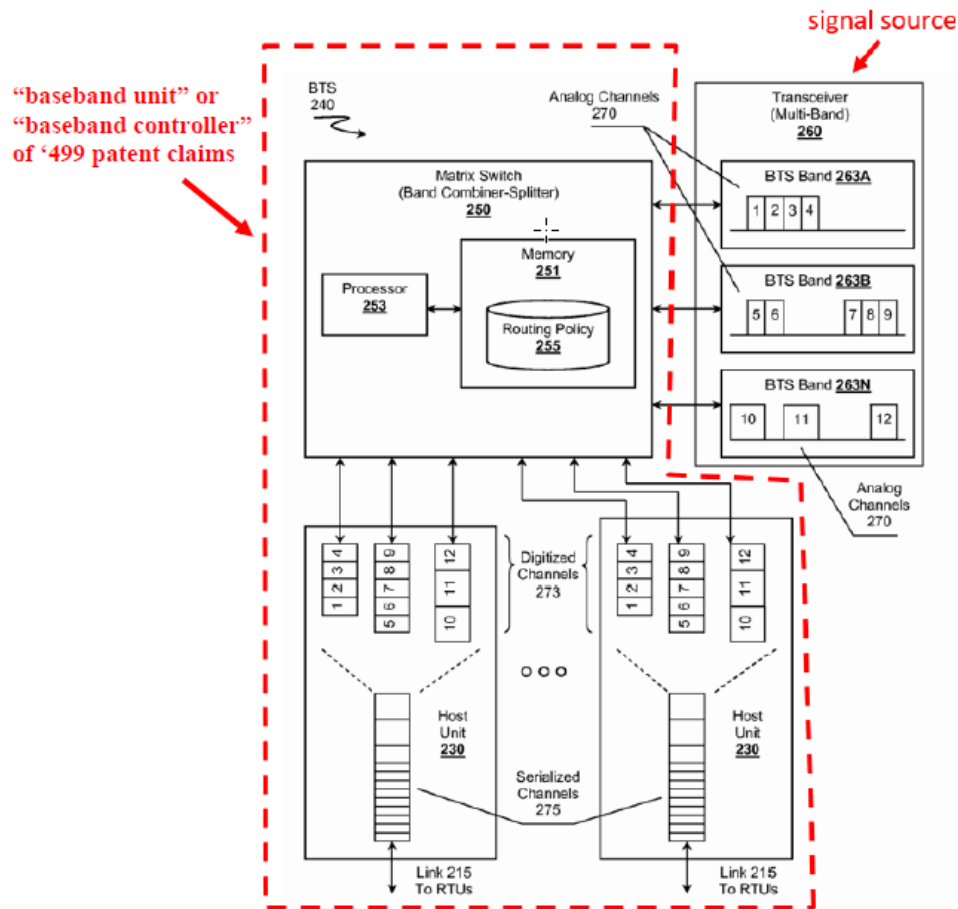


Figure 2

Id. at 27. Petitioner’s annotated version of Wu’s Figure 2 shows a dotted line around matrix switch 250 and host units 230, labelled “‘baseband unit’ or ‘baseband controller’ of ‘499 patent claims.’” *Id.* Petitioner cites Wu’s disclosure that the host units include downconverters and analog-to-digital converters for converting downlink RF signals into digital baseband data for transport to Wu’s RTUs. *Id.* at 29 (citing Ex. 1005 ¶¶ 49, 54–55; Ex. 1003 ¶ 103). Petitioner argues that the inclusion of the Wu host units and matrix switch within one element (the BTS) and the functional placement of the matrix switch support the combination of these elements teaching a baseband “unit” as in limitation 1B. *Id.* (citing Ex. 1005, Figs. 2, 4; Ex. 1003 ¶ 105).

Referring to annotated Figure 2, Patent Owner argues that Petitioner “draws an arbitrary box around Wu’s Matrix Switch 250 and multiple Host Units 230s as meeting the claimed baseband unit.” Prelim. Resp. 39–42. Patent Owner argues “in the ’499 patent, the signal source (e.g., base station) is separate from the baseband unit (e.g., Digital Access Unit or DAU).” *Id.* at 42 (citing Ex. 1001, 4:41–44 (“The DAU 105 serves as an interface between associated base stations (BTS) 110A-B and a plurality of digital remote units (DRU) 125A-n, although only four DRUs are shown in FIG. 1.”)). Patent Owner contends that “Petitioner’s rearrangement of Wu’s components makes the transceiver 260 the ‘operator hub,’ and then makes the Matrix Switch 250, which is already inside the base station 240, part of the Host Unit 230’s functionality.” *Id.* (citing Pet. 30) (emphasis omitted). Patent Owner summarizes that “[i]nterpreting Wu in this way requires *rearranging* the components in a way that is contrary to the ’499 patent’s claimed architecture where the base station is separate from the central node.” *Id.* (emphasis added).

These arguments do not undermine Petitioner’s showing. Petitioner does not “rearrange” any components in Wu. On the present record, it does not appear that the ’499 patent requires separation of the signal source from the baseband unit or that Wu’s transceiver is in host unit 230. The ’499 patent describes a DAU serving as an interface between base stations and DRUs. *See* Ex. 1001, 2:33, 4:41–44. But this does not require separation of the DAU and the base station – for example, claim 5 depends from claim 1 and recites that “the baseband unit and at least one of the plurality of signal sources are part of a baseband controller.” *Id.* at 14:43–45. For its part, Wu does not necessarily require that the transceiver be in base station 240, but

indicates that the transceiver 260 could be “remotely coupled” to base station 240. Ex. 1005 ¶ 34.

On the present record, we find that Petitioner’s showing with respect to limitation 1B is persuasive.

c) Limitations 1C, 1D, 1E, and 1F

Petitioner argues that Wu discloses the subject matter of limitation 1C, requiring that the system comprise “a plurality of signal sources, including at least a first signal source and a second signal source” in Wu’s disclosure that multiple frequency bands are provided by Wu’s multiband transceiver 260, and that the system may be coupled to more than one multiband transceiver 260. Pet. 31 (citing Ex. 1005 ¶¶ 34–39, Fig. 2; Ex. 1003 ¶ 106).

Petitioner argues that Wu discloses limitation 1D, requiring a plurality of remote transceiver units, in the disclosure of remote transceiver units, such as RTUs 110, 310, and 410. *Id.* at 31 (citing Ex. 1005 ¶¶ 11, 30, 31; Ex. 1003 ¶ 107).

Petitioner cites Wu’s description of analog interfaces coupling the matrix switch 250 and transceiver 260 as disclosing the “plurality of interfaces to communicatively couple the baseband unit to the plurality of signal sources” of limitation 1E. *Id.* at 32–33 (citing Ex. 1005 ¶ 34, Fig. 2 (element 270), Fig. 5-2; Ex. 1003 ¶ 108).

With respect to element 1F, “wherein the baseband unit is configured to receive a plurality of radio resources from the first signal source and the second signal source,” Petitioner cites Wu’s disclosure of the matrix switch 250 receiving downlink analog carrier channels in multiple bands from multi-band transceiver(s) 260. *Id.* at 33–34 (citing Ex. 1005 ¶¶ 34–39; Ex. 1003 ¶¶ 109–110).

Patent Owner does not address Petitioner's showing as to these limitations. *See generally* Prelim. Resp.

On the present record, we find that Petitioner's showing with respect to limitations 1C, 1D, 1E, and 1F is persuasive.

d) Limitations 1G and 1H

Limitations 1G and 1H require that “the baseband unit is configured to send a digital representation of a first set of radio resources to the first remote unit at a first point in time” and similarly configured “to send a digital representation of a second set of radio resources to the first remote unit at a second point in time” with each of the first and second set of radio resources being “for transmission at the antenna of the first remote unit.” Ex. 1001, 14:15–24.

Petitioner argues that these limitations are taught in the ability of matrix switch and host units to send digital representations of the downlink channel signals individually or in arbitrary groups to the Wu RTUs. Pet. 34–36 (citing Ex. 1005 ¶¶ 4, 9, 11, 30, 38–47, 49; Ex. 1003 ¶¶ 111–115). Wu describes host units containing analog-to-digital converters (“ADCs”) for creating digitized representations of the carrier signals for transport to the RTUs. Ex. 1005 ¶ 30 (“Host units 130 relay digitized signals between BTS 140 and [RTUs] 110.”), 54 (“[A] matrix switch operating as a band combiner/splitter routes channels to one or more RTUs The channels can be digitized using an ADC individually or as a group within an envelope.”). Petitioner cites, for the first and second set of radio resources of limitations 1G and 1H the routing policy in Wu that may change the channels or number of channels routed to a given RTU (“first remote unit”) when a given condition occurs. Pet. 35–36 (citing Ex. 1005 ¶¶ 38–47).

Patent Owner argues that Wu’s channels are not “radio resources” because Wu’s baseband unit sends “payload data that has been modulated onto RF carriers” to its remote units. Prelim. Resp. 31–35. But this argument relies on a claim construction that we do not adopt. Under our adopted claim construction, “radio resources” do not exclude carriers with payload data. *See supra* § II.D. Patent Owner additionally argues that the RTUs do not use received downlink channel carriers as radio resources, because they do not “obtain . . . any information defining or describing the way data is being transmitted” from them but “merely” deserialize them and then “convert[] these digitized signals back into analog channel signals for RF transmission.” Prelim. Resp. 36–38. In part, this again relies upon Patent Owner’s argued claim construction, which we do not adopt. Rather, on the present record, Petitioner sufficiently shows that in converting to analog channel signals and transmitting these RF channel signals, Wu discloses the use of the radio resources for transmission at the RTUs. *See* Pet. 35 (citing Ex. 1005 ¶¶ 4, 30; Ex. 1003 ¶ 113).

Patent Owner additionally argues that “Wu does not disclose the ability to send specific downlink signals to specific remote units or assign specific radio resources to specific RTUs.” Prelim. Resp. 40–42 (citing Ex. 1005 ¶¶ 36, 38, Fig. 1; Ex. 2001 ¶¶ 80–81). Patent Owner admits that Wu discloses an embodiment with multiple host units, each with multiple RTUs, but argues that “each Host Unit is only capable of sending carrier channel signals provided by the matrix switch to *all* remote units connected to it” and that “Wu does not provide any selectivity to target specific RTUs or which radio resources get assigned to which specific RTU connected to each host unit.” *Id.* at 42 (citing Ex. 2001 ¶¶ 80–81). Dr. Chrissan’s declaration does not address or support this argument at the cited portion or

otherwise. Additionally, the argument does not appear to be commensurate with the scope of the claim, which requires that one remote unit receive a first set of radio resources for transmission at a first point in time and a second set of radio resources at a second point in time, and on the present record, does not appear to require “selectivity to target specific RTUs” or exclude sending identical radio resources to a second remote unit.

For these reasons, on the present record, we find that Petitioner’s showing with respect to limitations 1G and 1H is persuasive.

e) Limitation 1I

Limitation 1I requires that “a number of radio resources in the first set of radio resources is different from a number of radio resources in the second set of radio resources.” Ex. 1001, 14:25–27.

Petitioner argues that Wu discloses the allocation of more channels to a region to increase “bandwidth available” in that condition, which discloses providing an increased number of channels (radio resources) in a second set of assigned channels. Pet. 36 (citing Ex. 1005 ¶ 46; Ex. 1003 ¶ 116).

Patent Owner does not address Petitioner’s showing as to these limitations. *See generally* Prelim. Resp.

On the present record, we find that Petitioner’s showing with respect to limitation 1I is persuasive.

f) Limitation 1J

Limitation 1J requires that “the baseband unit is configured to receive digital signals from each of the plurality of remote units.” Ex. 1001, 14:28–29.

Petitioner argues that Wu discloses a bi-directional system, and that RTUs include ADCs that allow uplink traffic to be sent to the host units. Pet. 36 (citing Ex. 1005 ¶¶ 36, 49; Ex. 1003 ¶¶ 117–119).

Patent Owner does not address Petitioner's showing as to these limitations. *See generally* Prelim. Resp.

On the present record, we find that Petitioner's showing with respect to limitation 1J is persuasive.

g) *Summary – Claim 1*

For purposes of institution, the preliminary record supports Petitioner's showing with respect anticipation of claim 1 by Wu. Accordingly, we determine that Petitioner persuasively shows that it would prevail with respect to its contention that claim 1 is anticipated by Wu.

3. *Analysis of Claims 2–5, 8–11, 13–16, 18, and 19*

Claims 8 and 14 are independent and argued on substantially the same basis as claim 1. Pet. 41–43. Patent Owner does not present separate arguments for claims 8 and 14. *See generally* Prelim. Resp.

Petitioner also presents a sufficient showing supported by the record with respect to anticipation by Wu of dependent claims 2–5, 9–11, 13, 15, 16, 18, and 19. *See* Pet. 27–34, 39–41. Petitioner sufficiently shows Wu discloses the added limitations of claims 2–5, 9–11, 13, 15, 16, 18, and 19 for the purposes of institution. Patent Owner does not present separate arguments for these claims. *See generally* Prelim. Resp.

For the reasons described with reference to claim 1, on this record and taking into account Patent Owner's prior arguments, Petitioner has shown a reasonable likelihood of demonstrating that claims 8 and 14 are anticipated by Wu. Additionally, on this record, Petitioner has shown a reasonable likelihood of demonstrating that claims 2–5, 9–11, 13, 15, 16, 18, and 19 are anticipated by Wu.

G. Ground 2 – Obviousness over Wu or over Wu and Sabat–426

Petitioner argues that claims 1–5, 8–11, 13–16, 18, and 19 would have been obvious over Wu or over Wu and Sabat–426. Pet. 50–53. Patent Owner argues against this conclusion. Prelim. Resp. 43–45.

1. Sabat-426

Sabat-426 describes a base station system and method of simulcasting a digital multiplexed signal to and from multiple digital radio heads. Ex. 1010, ¶ 29.

2. Analysis

Petitioner argues that, if Wu does not anticipate the “baseband unit” of claim 1, it is obvious in view of Wu, because aggregating or combining the matrix switch and host units of Wu would not change their operations, would yield a predictable result, and could reduce system complexity, installation costs, and errors in installing separate components. Pet. 50–51 (citing Ex. 1003 ¶ 166). Petitioner asserts that there would have been a reasonable expectation of success. *Id.* Alternatively, Petitioner argues that Sabat–426 teaches “a single hub unit” including “both (a) a programmable switch for dynamic capacity allocation to remote antenna units and (b) digital interfaces to the remote antenna units,” which would have been obvious to use for the same reasons. *Id.* at 51 (citing Ex. 1010 ¶¶ 31–32, 37, 45–47, Fig. 6; Ex. 1003 ¶¶ 167–168).

Patent Owner does not address obviousness over Wu alone, except with reference to its arguments relating to its proposed construction for “radio resources.” Prelim. Resp. 44–45. Patent Owner argues, with reference to the combination of Wu and Sabat-426 that Petitioner does not adequately explain why one of ordinary skill would have made the combination. Prelim. Resp. 43–44. However, Petitioner cites back to the

arguments made with respect to aggregating the matrix switch and host units of Wu into one unit, for motivation of the similar aggregation discussed in Sabat-426. Pet. 51 (citing Ex. 1003 ¶ 168).

Petitioner sufficiently shows that the combination of the matrix switch and host units of Wu would have been obvious to one of ordinary skill in the art, for predictability and decreased complexity. Pet. 50–51 (citing Ex. 1003 ¶ 166). Additionally, Petitioner has sufficiently provided motivation for combining the teaching of such an aggregation of substantially similar elements in Sabat-426 for the same reasons. Pet. 51 (citing Ex. 1003 ¶ 168).

For these reasons and the reasons discussed above with reference to anticipation by Wu, on this record and taking into account Patent Owner’s prior arguments, Petitioner has shown persuasively that claim 1 would have been obvious over Wu or over Wu and Sabat-426, and has shown a reasonable likelihood of demonstrating that claims 2–5, 8–11, 13–16, 18, and 19 would have been obvious over Wu or over Wu and Sabat-426.

H. Ground 3 – Obviousness over Wu and Sabat-552

Petitioner argues that claims 6, 7, 12, and 17 would have been obvious over Wu and Sabat-552. Pet. 50–53. Patent Owner argues against this conclusion. Prelim. Resp. 45.

1. Sabat-552

Sabat-552 describes an open access RF signal distribution system supporting wireless voice, data, and other services. Ex. 1011, code (57), 5:6–9. The system is comprised of base stations located at hub sites, with the hubs connected via high speed fiber links to distributed RF access nodes (RANs) distributed throughout a given community, which are used to distribute RF signals and provide wireless service to end customers. *Id.* at 5:6–58, 6:1–23. In one embodiment, hubs are connected via digital cross-

connects so a base station located at any hub site can transmit to any RAN.
Id. at 6:55–59.

2. *Analysis*

Petitioner argues that Wu does not disclose a baseband unit communicatively coupled to another baseband unit, or receiving radio resources from another baseband unit, as claimed in claims 6, 12, and 17, or the indirect connection to yet another baseband unit, as claimed in claim 7, but that this is disclosed by the hubs taught in Sabat-552. Pet. 53–56 (citing Ex. 1011, 6:55–61, Fig. 1, Fig. 3; Ex. 1003 ¶¶ 171–176). Petitioner argues that the combination would be motivated by Sabat-552’s teaching of easily sharing the system among service providers to reduce costs, and that one of ordinary skill in the art would have expected success. *Id.* at 54–55 (citing Ex. 1011, 2:48–58, 3:65–4:5; Ex. 1003 ¶¶ 173–175).

Patent Owner does not present any new arguments relating to this ground. Prelim. Resp. 45.

Petitioner sufficiently shows that the additional baseband unit and connections would have been obvious over the combination of Wu and Sabat-552 and the motivation for this combination. For these reasons discussed above and the reasons discussed previously with reference to anticipation by Wu, on this record and taking into account Patent Owner’s prior arguments, Petitioner has shown a reasonable likelihood of demonstrating that claims 6, 7, 12, and 17 would have been obvious over Wu and Sabat-552.

I. Ground 4 - Obviousness – Wu grounds, further in view of OBSAI standard

Petitioner provides additional arguments with reference to the combination of the previously discussed grounds with OBSAI standard. Pet.

57–58. Petitioner argues that OBSAI standard describes packetizing of messages, details regarding baseband signals, and the inclusion of destination addresses in baseband signals. *Id.* at 57. Patent Owner does not present any additional arguments relating to this ground, other than those discussed above. Prelim. Resp. 45–46.

Petitioner utilizes portions of OBSAI standard (Ex. 1008) and Exhibit 1009 (“Open Base Station Architecture Initiative - BTS System Reference Document - Version 2.0”) in prior grounds but does not provide any discussion or indication of which part of OBSAI standard or Exhibit 1009, each more than 100 pages long, it references in this ground. Petitioner has not explained with particularity how the prior art would have rendered the challenged claims unpatentable for this ground. Thus, on the present record, Petitioner has not sufficiently shown a reasonable likelihood of demonstrating obviousness using a combination with OBSAI standard.

However, we will institute an *inter partes* review based on other grounds, and institution is as to all claims and all grounds. *See SAS Inst. Inc. v. Iancu*, 138 S. Ct. 1348, 1359–60 (2018) (holding that a decision to institute under 35 U.S.C. § 314 may not institute on fewer than all claims challenged in the petition); Patent Trial and Appeal Board Consolidated Trial Practice Guide (Nov. 2019), 5–6, available at <https://www.uspto.gov/TrialPracticeGuideConsolidated> (“In instituting a trial, the Board will either (1) institute as to all claims challenged in the petition and on all grounds in the petition, or (2) institute on no claims and deny institution. The Board will not institute on fewer than all claims or all challenges in a petition.”).

J. Grounds 5-7 – Hettstedt Grounds

Petitioner provides additional grounds over Hettstedt. Pet. 58–91. Patent Owner does not address these grounds except in arguments based on

its interpretation of “radio resources,” which we do not adopt (Prelim. Resp. 28–30, 46–53) and relating to the motivation to combine Hettstedt and Sabat-552 (Prelim. Resp. 53–54).

We do not evaluate the additional grounds at this time, having determined that the grounds of anticipation by Wu, obviousness in view of Wu or Wu and Sabat-426, and obviousness in view of Wu and Sabat-552 justify institution. During trial, the parties may raise arguments regarding any ground in the Petition, and we will consider all grounds.

III. CONCLUSION

For the foregoing reasons, we determine that the information presented in the Petition at least establishes a reasonable likelihood that Petitioner would prevail in showing at least one of claims 1–19 of the ’499 patent is unpatentable under 35 U.S.C. § 103.

IV. ORDER

Accordingly, it is

ORDERED that pursuant to 35 U.S.C. § 314(a), an *inter partes* review is hereby instituted as to claims 1–19 of the ’499 patent on all the grounds set forth in the Petition; and,

FURTHER ORDERED that pursuant to 35 U.S.C. § 314(c) and 37 C.F.R. § 42.4, notice is hereby given of the institution of a trial; the trial will commence on the entry date of this decision.

IPR2022-01293
Patent 10,334,499 B2

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