

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

ERICSSON, INC.,
Petitioner,

v.

DALI WIRELESS, INC.,
Patent Owner.

IPR2022-01419
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*

Ericsson, Inc. (“Petitioner”) filed a Petition (Paper 2, “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 7,¹ “Prelim. Resp.”). With our prior authorization, Petitioner filed a Preliminary Reply (Paper 9, “Prelim. Reply”), limited to addressing a claim construction issue, and Patent Owner filed a Preliminary Sur-reply on this issue (Paper 10, “Prelim. Sur-reply”).

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.

¹ Paper 7 is a corrected Patent Owner’s Preliminary Response, filed with authorization. The original version of the Preliminary Response is Paper 6 and a redline indicating the differences from the original version was filed as Paper 8.

B. Real Parties in Interest

The Petition identifies Ericsson, Inc. and corporate parent Telefonaktiebolaget LM Ericsson as real parties in interest. Pet. 63.

Patent Owner identifies only itself as real party in interest. Paper 3 (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. 63; Paper 3, 1; *see* Prelim. Reply 34 n.5.

Petitioner and Patent Owner each identify *inter partes* proceedings IPR2020-01430 (“’01430 IPR”) and IPR2022-01293, challenging claims of the ’499 patent, as a related matter. Pet. 63; Paper 3, 1.

Petitioner identifies U.S. Patent No. 8,737,300, PCT/US11/47995, PCT/US11/47999, U.S. Patent No. 9,137,078, U.S. Patent 10,080,178, U.S. Patent No. 9,148,324, U.S. Patent No. 9,419,837, U.S. Patent Application No. 17/313,658, PCT/US11/48004, and U.S. Patent No. 11,006,343 as related patents or applications. Pet. 63; Ex. 1021.

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.

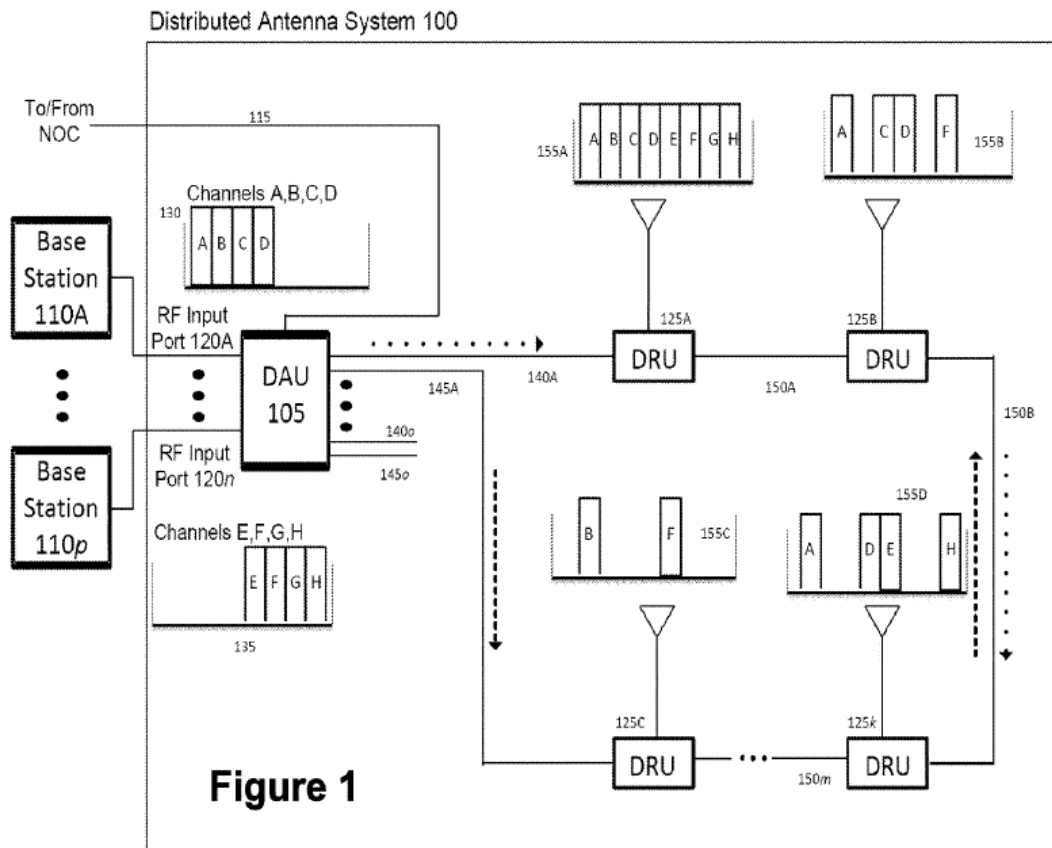


Figure 1 depicts DAU 105, which provides signals to DRUs 125A, 125B, 125C, through 125k. *Id.* at 4:41–44, 4:62–5:6. DAU 105 receives composite downlink input signal 130, containing carriers² A–D, from base

² 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–

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 change 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.

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.

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. [1.pre] A system for transporting wireless communications, comprising:
 - [1.a] a baseband unit;
 - [1.b] a plurality of signal sources, including at least a first signal source and a second signal source;
 - [1.c] a plurality of remote units, including at least a first remote unit and a second remote unit;
 - [1.d] wherein the baseband unit comprises a plurality of interfaces to communicatively couple the baseband unit to the plurality of signal sources;
 - [1.e] wherein the baseband unit is configured to receive a plurality of radio resources from the first signal source and the second signal source;
 - [1.f] 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;
 - [1.g] 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;
 - [1.h] 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; and
 - [1.i] 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. 1008
Wu	US 2010/0128676 A1	Ex. 1007

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. § ³	Reference(s)/Basis
1–5, 8–11, 13–16, 18, 19	103	Wu
6, 7, 12, 17	103	Wu, Sabat-552

Pet. 10.

II. ANALYSIS

A. 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*,

³ 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., 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.”).

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).

B. Level of Ordinary Skill in the Art

Petitioner asserts that “[a] person of ordinary skill in the art (POSA) . . . would have at least a bachelor’s degree in electrical engineering or an equivalent field with two to three years of work experience in wireless communications networks.” Pet. 21 (citing Ex. 1012 (Declaration of Henry Houh, Ph.D.) ¶ 40).

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. 9.

Patent Owner’s definition appears generally consistent with Petitioner’s definition, with the exception of requiring three years or more (as opposed to at least “two to three years”) of work experience in wireless communication systems. For the purpose of institution, we adopt Petitioner’s provided definition, modified to remove the open-ended “at least” from the description of educational attainment, for the level of skill of a person of ordinary skill in the art. We view this definition as reasonable and consistent with the prior art, and is supported by the testimony of Dr. Houh. We would reach the same conclusions if we were to remove the open-ended terminology from Patent Owner’s definition and adopt that.

C. Claim Construction

Petitioner does not request that we construe any claim term. Pet. 20. Patent Owner requests that we construe “radio resource(s),” recited in claims 1–4, 8–11, and 13–19. Prelim. Resp. 12–19; Prelim. Sur-reply. Petitioner argues that Patent Owner’s proposed construction is incorrect. Prelim. Reply.

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. 9. Patent Owner argues that this proposed construction is consistent with the construction provided by the Board in the Decision Denying Institution of

Inter Partes Review⁴ (“’01430 IPR DI”) in the ’01430 IPR. Prelim. Resp. 9–12.

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, 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. 9. 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. 9. 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

⁴ *John Mezzalingua Associates, LLC v. Dali Wireless Inc.*, IPR2020-01430, Paper 15 (PTAB Feb. 9, 2021) (Ex. 1019).

. . . 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 the analog channels in Wu are radio resources, as understood by one of ordinary skill. Pet. 37 (citing Ex. 1012 ¶ 69). 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. 1019, 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. 37–40. 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. 21–28.

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. 17–20; Prelim. Sur-reply 1–2 (citing the specification's description that information related to resource monitoring and control is exchanged between a DAU and a DRU). 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. 9–12, 17, 23, 25; Prelim. Sur-reply 1–2. The ’01430 IPR DI’s partial construction, however, does not provide such an exclusion. Ex. 1019, 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. 1019, 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.

D. *Ground 1 – Obviousness Over Wu*

Petitioner argues that claims 1–5, 8–11, 13–16, 18, and 19 would have been obvious over Wu. Pet. 28–50. Patent Owner disagrees. Prelim. Resp. 21–31.

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. 1007, 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.

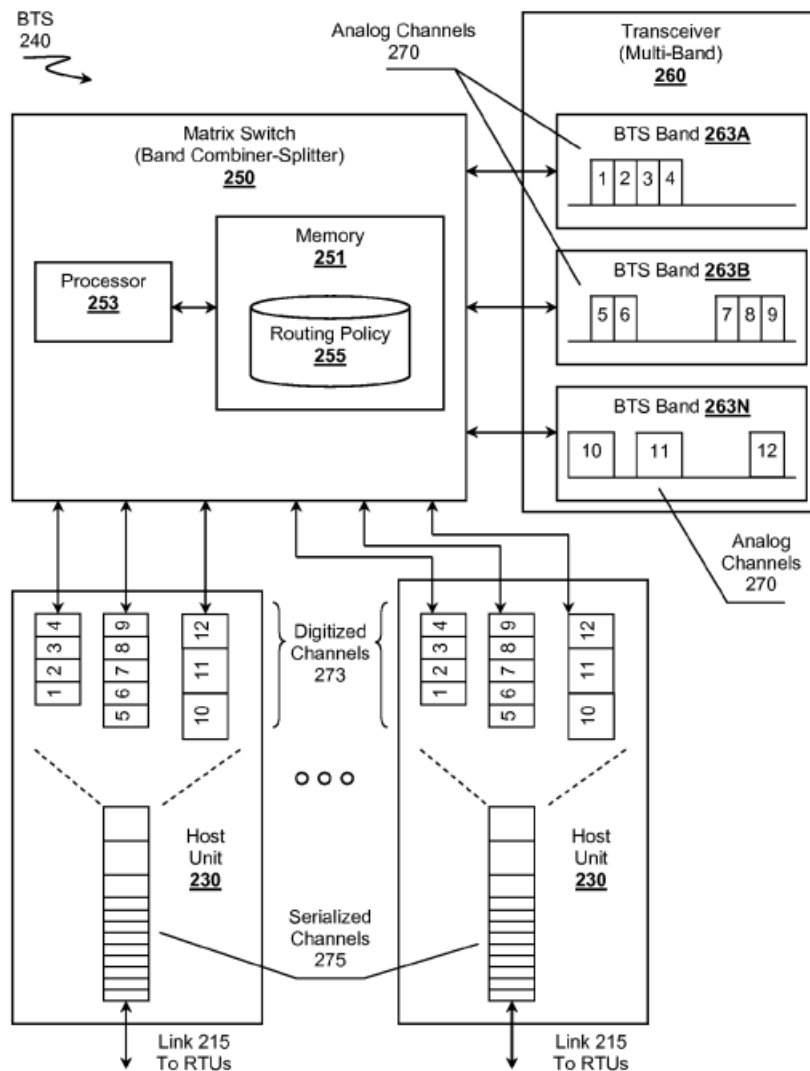


Figure 2

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 255 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*

According to Petitioner, Wu teaches a system for wireless communications, as recited in the preamble of claim 1, denoted limitation 1A by Petitioner. Pet. 31–32 (citing Ex. 1007 ¶¶ 2, 11, Fig. 1; Ex. 1012 ¶ 61).

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 sufficient for institution.

b) Limitation 1.a

Petitioner asserts that Wu teaches the baseband unit in the combination of the matrix switch 250 and host units 230, which are described as being within Wu’s BTS and “form a system . . . that manages two-way communications between the RTUs . . . and the transceiver.” Pet. 33–34 (citing Ex. 1007 ¶¶ 15, 35–38, Fig. 2; Ex. 1012 ¶¶ 62–64). Petitioner presents an annotated version of Wu’s Figure 2 to illustrate its argument.

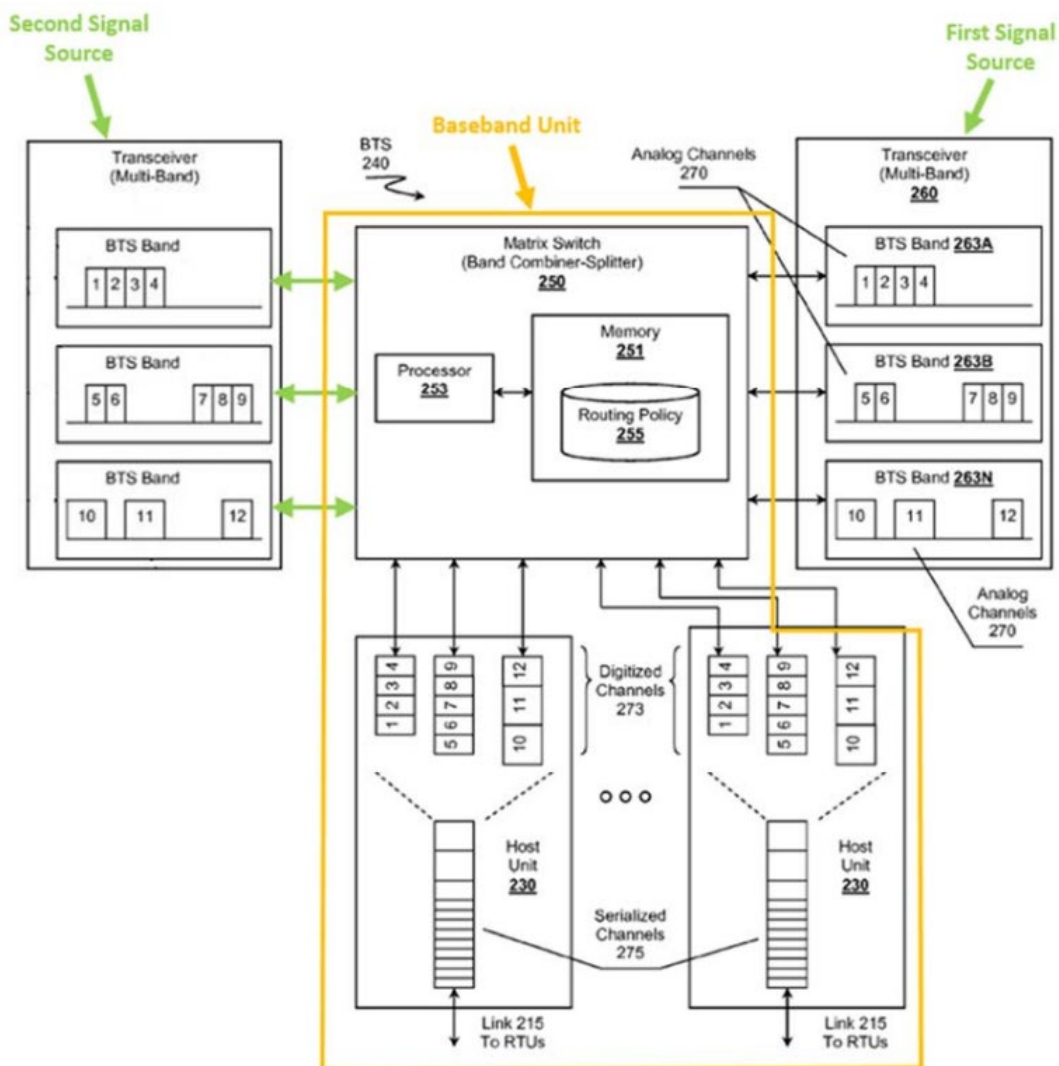


Figure 2

Id. at 33. Petitioner’s annotated version of Wu’s Figure 2 shows a yellow line around matrix switch 250 and host units 230, labelled “Baseband Unit.”

Id. Petitioner argues that the combination of matrix switch 250 and host units 230 manage two-way communications between RTUs 110 and transceiver 260, and disclose the baseband unit.

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 central baseband unit.” Prelim. Resp. 28–

31 (citing Ex. 2001 ¶ 66). 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 30 (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 ‘signal source,’ and then makes the Matrix Switch 250, which is already inside the base station 240, part of the Host Unit 230’s functionality.” *Id.* at 30–31 (citing Pet. 32–33) (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 baseband unit.” *Id.* at 31 (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. 1007 ¶ 34.

On the present record, we find that Petitioner’s showing with respect to limitation 1.a is sufficient for institution.

c) Limitations 1.b, 1.c, 1.d, and 1.e

Petitioner argues that Wu teaches the subject matter of limitation 1.b, 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. 34–35 (citing Ex. 1007 ¶¶ 34–35; Ex. 1012 ¶ 66).

Petitioner argues that Wu discloses limitation 1.c, requiring a plurality of remote transceiver units, in the disclosure of remote transceiver units, such as RTUs 110 and 410. *Id.* at 36 (citing Ex. 1007 ¶¶ 31–33, Figs. 1, 4; Ex. 1012 ¶ 67).

Petitioner cites Wu’s description of 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 1.d. *Id.* at 36–37 (citing Ex. 1007 ¶ 42, Fig. 2; Ex. 1012 ¶ 68).

With respect to element 1.e, “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 matrix switch 250 receiving downlink analog carrier channels in multiple bands from multiband transceiver(s) 260. *Id.* at 37 (citing Ex. 1007 ¶¶ 35–38, Fig. 2; Ex. 1012 ¶ 69).

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 1.b, 1.c, 1.d, and 1.e is sufficient for institution.

d) Limitations 1.f and 1.g

Limitations 1.f and 1.g 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. 38–39 (citing Ex. 1007 ¶¶ 4, 30, 38–47, 49; Ex. 1012 ¶¶ 70–74). Wu describes host units containing analog-to-digital converters (“ADCs”) for creating digitized representations of the carrier signals for transport to the RTUs. Ex. 1007 ¶ 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 1.f and 1.g 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. 38–39 (citing Ex. 1007 ¶¶ 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. 20–27. 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.C. Patent Owner additionally argues that the RTUs do not use received downlink channel carriers as radio resources, because they “do not need and would not know what to do with bare ‘radio resources’ as they are only designed to receive and pass along carrier channel signals inclusive of user payload data.” Prelim. Resp. 26–27. 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. 39 (citing Ex. 1007 ¶¶ 4, 30; Ex. 1012 ¶ 73).

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. 28–30 (citing Ex. 1007 ¶¶ 36, 38, Fig. 1; Ex. 2001 ¶ 66). Patent Owner admits that Wu discloses an embodiment with multiple host units, each with multiple RTUs, but argues that since “each Host Unit is only capable of sending carrier channel signals provided by the matrix switch to *all* remote units connected to it [so] 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 30. This 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 1.f and 1.g is sufficient for institution.

e) Limitation 1.h

Limitation 1.h 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 teaches the allocation of more channels to a region to increase “bandwidth available” in response to a changed condition, which discloses providing an increased number of channels (radio resources) in a second set of assigned channels. Pet. 40 (citing Ex. 1007 ¶ 46; Ex. 1012 ¶ 75).

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 1.h is sufficient for institution.

f) Limitation 1.i

Limitation 1.i 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 teaches a bi-directional system, and that RTUs include ADCs that allow uplink traffic to be sent to the host units. Pet. 40 (citing Ex. 1007 ¶¶ 36, 49; Ex. 1012 ¶ 76).

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 1.i is sufficient for institution.

g) Summary – Claim 1

For purposes of institution, the preliminary record supports Petitioner’s showing with respect to the obviousness of claim 1 in view of

Wu. Accordingly, we determine that Petitioner shows a reasonable likelihood that it would prevail with respect to its contention that claim 1 is obvious in view of 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. 44–45, 47–48. 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 the obviousness over Wu of dependent claims 2–5, 9–11, 13, 15, 16, 18, and 19. See Pet. 41–50. Petitioner sufficiently shows Wu teaches 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 would have been obvious over 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 would have been obvious over Wu.

E. *Ground 2 – 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. 51–56. Patent Owner does not present separate arguments regarding this ground. *See* Prelim. Resp. 31.

1. *Sabat-552*

Sabat-552 describes an open access RF signal distribution system supporting wireless voice, data, and other services. Ex. 1008, 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 Sabat-552 teaches 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. Pet. 52–56 (citing Ex. 1008, 6:55–61, Fig. 1; Ex. 1012 ¶¶ 107, 109, 110, 113). 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. 1008, 2:48–58, 3:65–4:5; Ex. 1012 ¶ 110).

Patent Owner does not present any new arguments relating to this ground. Prelim. Resp. 31.

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 obviousness over 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.

III. 37 C.F.R. § 42.73(d)(3)

Petitioner asserts that estoppel applies under 37 C.F.R. § 42.73(d)(3) as follows:

Under 37 C.F.R. § 42.73(d)(3), [Patent Owner] is precluded from taking action inconsistent with the adverse judgment, including arguing the patentability before the Board of any claim that is not patentably distinct from a finally canceled claim.

Pet. 57; *see also id.* at 4–10 (similar assertions). Petitioner argues that, in each of the two grounds at issue, the claims are not patentably distinct from claims of the '178 patent that were cancelled after the Board granted institution over substantially the same disclosures of Wu and a combination of Wu and Sabat-552 in IPR2020-01473. *Id.* at 57; *see* Ex. 1004 (*CommScope Techs. LLC v. Dali Wireless Inc.*, IPR2020-01473 (PTAB March 12, 2021) (Institution Decision)) (“the '01473 DI”); Ex. 1005 (*CommScope Techs. LLC v. Dali Wireless Inc.*, IPR2020-01473 (PTAB June 30, 2021) (Granting Request for Adverse Judgment)). Petitioner presents charts comparing claims 10 and 11 of the '178 patent with challenged claim 1 of the '499 patent and comparing claims 26 and 28 of the '178 patent with challenged claims 6 and 7 of the '499 patent. Pet. 4–9.

Patent Owner responds that “it is well settled law . . . that 37 C.F.R. § 42.73(d)(3) does not apply to a patent owner defending the validity of *issued* claims in IPR proceedings because the patent owner is not ‘*obtaining*’ a patent in this post-issuance proceeding as required by the language of § 42.73(d)(3).” Prelim. Resp. 2–3. Patent Owner also asserts that “the claims of the '499 patent are also materially different from the claims of the '178 patent such that Patent Owner is not taking any positions inconsistent with the prior IPR proceeding.” *Id.* at 3, 17–20.

Based on Petitioner’s sufficient showing of obviousness for purposes of institution as discussed above, we do not reach alleged estoppel under 37 C.F.R. § 42.73(d)(3).

IV. DISCRETIONARY INSTITUTION, 35 U.S.C. § 314(a)

Institution of *inter partes* review is discretionary. *See Harmonic Inc. v. Avid Tech., Inc.*, 815 F.3d 1356, 1367 (Fed. Cir. 2016) (“[T]he [U.S. Patent and Trademark Office] is permitted, but never compelled, to institute an IPR proceeding.”). Patent Owner urges the Board to exercise discretion to deny institution of *inter partes* review under § 314(a) based on the factors established in *Apple Inc. v. Fintiv, Inc.*, IPR2020-00019, 2020 WL 2126495, at 2–3 (PTAB Mar. 20, 2020) (precedential). Prelim. Resp. 31–37.

On June 21, 2022, the Director of the USPTO issued an Interim Procedure for Discretionary Denials in AIA Post Grant Proceedings with Parallel District Court Litigation, *available at* https://www.uspto.gov/sites/default/files/documents/interim_proc_discretionary_denials_aia_parallel_district_court_litigation_memo_20220621_.pdf (the “Interim Procedure”). The Interim Procedure explains that “[c]onsistent 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.” Interim Procedure 3 (internal footnote omitted) (citing *Sotera Wireless, Inc. v. Masimo Corp.*, IPR2020-01019, Paper 12 (PTAB Dec. 1, 2020) (precedential as to § II.A)). The Interim Procedure explains that such a *Sotera* stipulation “mitigates concerns of potentially conflicting decisions and duplicative efforts between the district court and the PTAB . . . [and] allows the PTAB to review grounds that the parallel district court litigation will not resolve.” *Id.* at 7–8.

Petitioner “adopts the identical stipulation from *Sotera*, namely, that if the IPR is instituted, Petitioner will not pursue in the District Court Litigation any ground raised or that could have been reasonably raised in an IPR for the challenged patent.” Pet. 59–60.

Patent Owner “acknowledges that the recent Interim Guidance notes that a petition should not ordinarily be denied in accordance with the *Fintiv* factors where (as here) Petitioner has stipulated” according to *Sotera*. Prelim. Resp. 31–32. Nevertheless, Patent Owner contends that the Petition “merits denial under a holistic analysis of the *Fintiv* factors due to the advanced stage of the parallel district court proceedings and the duplication of the invalidity grounds asserted therein.” *Id.* at 32.

Each party presents arguments and evidence regarding the *Fintiv* factors. Pet. 59–62; Prelim. Resp. 31–37. Given the *Sotera* stipulation and the guidance under the Interim Procedure, we decline to exercise discretion to deny institution. Notwithstanding Patent Owner’s contention that the Petition merely “should not ordinarily be denied” in view of the *Sotera* stipulation (Prelim. Resp. 31), the Interim Procedure provides that the Board “will not discretionarily deny institution . . . where a petitioner presents a [*Sotera*] stipulation” (Interim Procedure 3).

V. CONCLUSION

For the foregoing reasons, we determine that the information presented in the Petition 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.

VI. 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.

IPR2022-01419
Patent 10,334,499 B2

FOR PETITIONER:

Patrick D. McPherson
Patrick Muldoon
D. Joseph English
DUANE MORRIS LLP
pdmcperson@duanemorris.com
pcmuldoon@duanemorris.com
djenglish@duanemorris.com

FOR PATENT OWNER:

David D. Schumann
Palani P. Rathinasamy
Moses Xie
Timothy Dewberry
FOLIO LAW GROUP PLLC
david.schumann@foliolaw.com
palani@foliolaw.com
moses.xie@foliolaw.com
timothy.dewberry@foliolaw.com