

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

NOKIA OF AMERICA CORPORATION, ERICSSON INC.,
AND T-MOBILE USA, INC.,
Petitioner,

v.

GENERAL ACCESS SOLUTIONS, LTD.,
Patent Owner.

IPR2023-01416
Patent 6,947,477 B2

Before KEN B. BARRETT, BARBARA A. PARVIS, and
TERRENCE W. McMILLIN, *Administrative Patent Judges*.

BARRETT, *Administrative Patent Judge*.

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

I. INTRODUCTION

A. *Background and Summary*

Nokia of America Corporation, Ericsson Inc., and T-Mobile USA, Inc. (collectively, “Petitioner”)¹ filed a Petition requesting *inter partes* review of U.S. Patent No. 6,947,477 B2 (“the ’477 patent,” Ex. 1001). Paper 1 (“Pet.”). The Petition challenges the patentability of claims 1–20 of the ’477 patent. General Access Solutions, Ltd. (“Patent Owner”)² filed a Preliminary Response to the Petition. Paper 8 (“Prelim. Resp.”). With our authorization, Petitioner filed a Reply to the Preliminary Response (Paper 10, “Pet. Prelim. Reply”) and Patent Owner filed a Sur-reply (Paper 11, “PO Prelim. Sur-reply”).

An *inter partes* review may not be instituted “unless . . . the information presented in the petition . . . 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). Having considered the arguments and evidence presented by Petitioner and Patent Owner, we determine that Petitioner has demonstrated a reasonable likelihood of prevailing on at least one of the challenged claims of the ’477 patent. Accordingly, we institute an *inter partes* review as to all the challenged claims of the ’477 patent on all the grounds of unpatentability set forth in the Petition.

¹ Petitioner identifies Nokia of America Corporation, Ericsson Inc., and T-Mobile USA, Inc. as real parties-in-interest. Pet. 72.

² Patent Owner identifies General Access Solutions, Ltd. as the real party-in-interest. Paper 6, 1.

B. Related Proceedings

Both parties identify, as a matter involving or related to the '477 patent, *General Access Solutions, Ltd. v. T-Mobile USA, Inc. et al.*, No. 2:23-cv-00158-JRG (E.D. Tex.). Pet. 72; Paper 6, 1.

C. The '477 Patent

The '477 patent is titled “Apparatus and Method for Creating Signal and Profiles at a Receiving Station.” Ex. 1001, code (54). The '477 patent “relates generally to a manner by which to operate upon burst data signals received at a receiving station, such as a base station of a fixed wireless access (FWA) communication system.” *Id.* at 3:20–23. An apparatus and an associated method of the '477 patent relate to creating a profile representative of expected signal characteristics of a burst data signal and of expected characteristics of the channel upon which the burst data signal is communicated, in which the profile “is used at the receiving station to facilitate processing of the burst data signals received at the receiving station.” *Id.* at 3:23–30.

The '477 patent explains that base stations of a fixed wireless broadband system transmit forward channel (downstream) signals in directed beams to fixed location antennas attached to the residences or offices of subscribers and also receive reverse channel (upstream) signals transmitted by the broadband access equipment of the subscriber. *Id.* at 5:24–30. According to the '477 patent, there was a need for broadband access equipment that could be readily and inexpensively deployed in the large domestic and international markets and a need “for an apparatus to compensate for distortion introduced upon data signals transmitted on a wireless communication channel.” *Id.* at 5:44–50. Also, according to

the '477 patent, “the base stations of a FWA system must be able to quickly and accurately to operate upon data bursts received from a potentially large number of subscribers,” and “[a]ny manner by which to facilitate an increase in speed and accuracy by which the data bursts can be operated upon by the base stations, or other infrastructure, would therefore be advantageous.” *Id.* at 5:44–56.

The '477 patent states that it provides an apparatus and an associated method to operate upon bursts data signals received at a receiving station, in which “[c]haracteristics of data bursts and the channels by which the data bursts are received are stored in memory as signal and channel profiles at the receiving station.” *Id.* at 5:60–6:3. A burst of data is provided to a demodulator and a profile is associated with the channel upon which the burst is communicated to the base station and utilized in the demodulation of the burst of data. *Id.* at 6:19–22. “As the burst of data is demodulated, the values of the profile associated with the channel upon which the data burst is communicated are updated as appropriate.” *Id.* at 6:22–29. According to the '477 patent, uplink capacity of data signals sent by the subscriber stations to the base station is improved and “better compensation is made to counteract the effects of distortion of the data signals communicated during operation of a communication system.” *Id.* at 6:35–40. The '477 patent states that “[e]lements of the profile created and stored during operation . . . are selected, e.g., to be values pertinent to the implementation of the communication system.” *Id.* at 6:42–45.

Figure 1 is reproduced below.

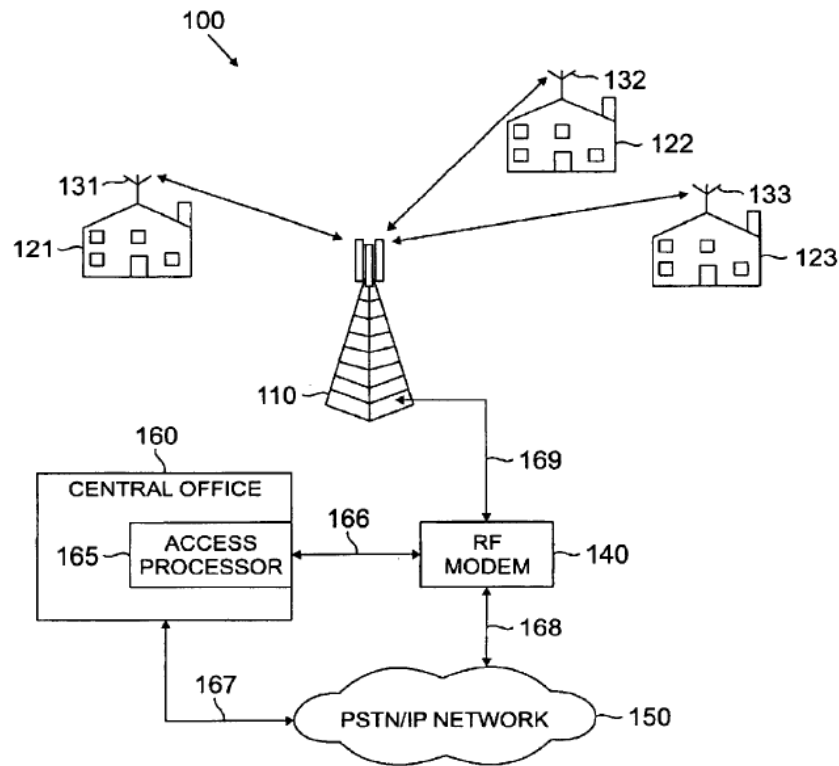


FIG. 1

Figure 1 illustrates “a functional representation [of] an exemplary fixed wireless access network.” *Id.* at 7:28–30. Fixed wireless access network 100 includes transceiver base station 110 that transmits forward channel (downstream) broadband signals to subscriber premises 121–123 via respective antennas 131–133, and receives reverse channel (upstream) broadband signals from the subscriber premises. *Id.* at 7:58–8:2. The ’477 patent discloses that, for the downlink, “each subscriber receives only the base station signal,” but for the uplink, the base station receives a burst of data on a demand basis from the subscribers and the base station has to process each channel.” *Id.* at 9:47–50.

Figure 3 is reproduced below.

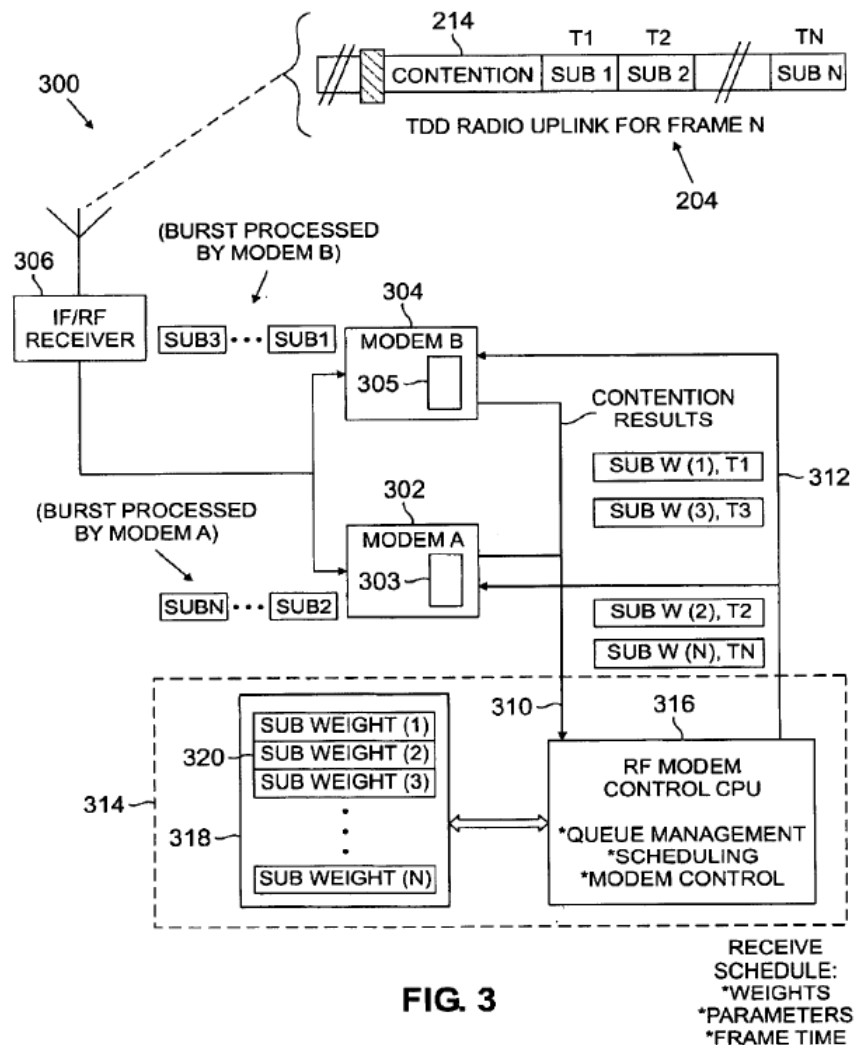


Figure 3 illustrates “a functional block diagram of a portion of an embodiment [of the ’477 patent] comprising two modems and a controller.” *Id.* at 7:34–36. Shown, at the top of Figure 3, is uplink portion 204 of a time division duplex (TDD) data frame, with bursts of data sub1, sub2 . . . subN. *See id.* at 9:26–31, 10:7–9. Also, shown is a system having modem 302 and modem 304 that are “selectively coupled to receive uplink signals sent by different ones of subscriber stations to the base station.” *Id.* at 9:64–10:2. IF/RF (intermediate frequency/radio frequency) receive circuitry 306 of the base station passes the uplink signals to the modems and “is operable to

down-convert in frequency uplink signals received from receive circuitry 304.” *Id.* at 10:2–7. “Thereafter, the down-converted signals, bursts sub3 . . . sub1 and bursts subN . . . sub2 are operated upon by modems 304 and 302[,] respectively.” *Id.* at 10:5–9. Modems 302 and 304 are coupled to controller 316 “via lines 310, for receiving contention results, and 312 for passing parameters, frame times and weight values for the modems to apply to the received signals.” *Id.* at 10:9–13. “Controller 314 includes control CPU 316 and memory device 318.” *Id.* at 10:13–14. Profiles are created and maintained by controller 314 in memory device 318. *Id.* at 10:17–18. “[T]he control CPU is operable to form a profile parameter determiner and updater, and the memory . . . forms a profile storage device.” *Id.* at 11:10–13

Modems 302 and 304 include equalizers 303 and 305, respectively, which perform equalization functions. *Id.* at 10:25–27. The’477 patent discloses:

The profiles associated with the various communication channels stored at memory device 318 include weighting values 320 by which to weight equalizers 303 and 305. Values 320 are utilized to weight equalizers 303 or 305, as appropriate, when data signals sent to the base station on the corresponding channel are to be operated upon by the selected modem. As channel conditions change, changes to values 318 are calculated and stored. Other values of the profiles, while not separately shown, are analogously stored at memory device 318.

Because changes in the channel condition typically vary at a rate much slower than the rate of data transmission of the uplink data signals, the update rates at which the values of the

profiles need to be applied to the modems are a mere fraction of the data transmission rates.

Id. at 10:27–42. “Updates are made to the profile as appropriate . . . and the updated profile is stored at the memory device of the controller.” *Id.*

at 11:14–16. “When subsequent bursts generated by the same subscriber station are received at the base station and applied to the modem, the updated profile is retrieved and utilized when the subsequent burst of data is to be operated upon by the modem.” *Id.* at 11:16–20. “Compensation for distortion introduced on the uplink data signal is improved because the profile was updated as the data signal’s channel conditions changed.” *Id.* at 11:20–23.

In an exemplary method, a subscriber station transmits a burst of a burst data signal to the base station and the burst is applied to an RF modem located at the base station. *Id.* at 11:37–50. If the burst is an initial burst communicated during a contention period, “operations are performed upon the burst to determine the parameters associated with the burst as well as determinations of the channel characteristics of the channel upon which the burst was transmitted.” *Id.* at 11:51–56. The parameters can include signal-related parameters such as “the amount of forward error correction (FEC) of the burst, change in frequency of the burst, changes in time of the burst, changes in power levels of the burst, etc.” and channel-related parameters such as “values of equalization weighting, antenna parameters, either at the subscriber station or at the base station, etc.” *Id.* at 11:56–64.

D. Illustrative Claims

Of the challenged claims of the ’477 patent, claims 1 and 16 are independent claims. The remaining challenged claims depend directly or

indirectly from claim 1 or claim 16. Claims 1 and 16, reproduced below with bracketed annotations³ inserted, are illustrative.

1. [Pre] Profile-creating apparatus for creating at least a first profile associated with transmission upon at least a first channel of at least a first burst-data signal transmitted in bursts to a receiving station, said profile-creating apparatus comprising:

[1.A] a profile parameter determiner coupled to receive an indication of an initial burst of the first burst data signal transmitted upon the first channel to the receiving station, [1.B] said profile parameter determiner for determining a value of at least one signal-related parameter and at least one channel-related parameter, wherein the signal-related and channel-related parameters are collectively representative of communication of the first burst data signal over the first channel to the receiving station; and

[1.C] a profile parameter storage device coupled to said profile parameter determiner, said profile parameter storage device for storing values representative of the at least one signal-related parameter and the at least one channel-related parameter determined [sic] by said profile parameter determiner, [1.D] the values stored at said profile parameter storage device to be used to facilitate receive operations performed at the receiving station on subsequent bursts of the first burst data signal.

16. [Pre] A method for creating at least a first profile associated with transmission upon at least a first channel of at least a first burst data signal in bursts to a receiving station, said method comprising:

[16.A] responsive to reception at the receiving station of an initial burst of the first burst data signal transmitted upon the first channel, determining a value of at least one signal-related parameter and at least one channel-related parameter, wherein the signal-related and channel-related parameters are

³ We utilize Petitioner's annotations for claims 1 and 16 but have retained the paragraph formatting from the issued patent.

collectively representative of communication of the first burst data signal over the first channel to the receiving station;

[16.B] storing values representative of the at least one signal-related parameter and the at least one channel-related parameter determined during said operation of determining; and [16.C] using the values stored during said operation of storing to facilitate receive operations performed at the receiving station upon at least one subsequent burst of the first burst data signal.

Ex. 1001, 12:63–13:18, 14:22–42.

E. Evidence

Petitioner relies on the following references:

Name	Reference	Exhibit No.
Genossar	US 6,643,321 B1, filed Sept. 30, 1998, issued Nov. 4, 2003	1005
WiMAX	<i>Air Interface for Fixed Broadband Wireless Access Systems</i> , “IEEE 802.16.1-00/01r4, September 2000” ⁴	1006
Barratt ’470	US 5,909,470; issued June 1, 1999	1007
Barratt ’490	US 5,592,490; issued Jan. 7, 1997	1008
PHS	Personal Handy Phone System ARIB Standard Version 2, Association of Radio Industries and Businesses (ARIB), December 26, 1995	1009

Petitioner also relies on the declaration of Daniel van der Weide, Ph.D. (Ex. 1003) in support of its arguments. The parties also rely on other exhibits as discussed below.

⁴ We quote here, for identification purposes only, the information in the header of the first page of the WiMAX exhibit. Whether and when the document was publicly accessible are disputed issues. *See* Prelim. Resp. 21–26.

F. Asserted Grounds of Unpatentability

Petitioner asserts that the challenged claims are unpatentable on the following grounds:

Claim(s) Challenged	35 U.S.C. §⁵	Reference(s)/Basis
1, 3–5, 8, 9, 13, 15–17, 19, 20	102	Genossar
2, 10–12, 14, 18	103	Genossar, WiMAX
1, 3–6, 8–10, 13, 15–17, 19, 20	102	Barratt ’470
7, 11, 12	103	Barratt ’470, Barratt ’490
2, 14, 18	103	Barratt ’470, PHS

II. DISCRETIONARY DENIAL UNDER 35 U.S.C. § 314(A)—*FINTIV*

Patent Owner argues that, in view of the parallel litigation in Texas, the Board should discretionarily deny institution of an *inter partes* review under 35 U.S.C. § 314(a) pursuant to *Fintiv*. Prelim. Resp. 34–36; *see Apple Inc. v. Fintiv, Inc.*, IPR2020-00019, Paper 11 (PTAB Mar. 20, 2020) (precedential) (setting out six nonexclusive factors that the Board may consider in determining whether to deny institution because of a parallel district-court proceeding).

Petitioner filed, in this *inter partes* review, a stipulation under *Sotera Wireless, Inc. v. Masimo Corp.*, IPR2020 01019, Paper 12 at 19 (PTAB Dec. 1, 2020) (precedential as to § II.A). Pet. Prelim. Reply 4 (“Petitioners . . . present a *Sotera* stipulation.”). Specifically,

⁵ The application that issued as the ’477 patent was filed before the effective date of the Leahy Smith America Invents Act, Pub. L. No. 112-29, 125 Stat. 284 (2011) (“AIA”), and we apply the pre-AIA versions of 35 U.S.C. §§ 102 and 103.

Petitioners hereby stipulate that if the PTAB institutes an IPR in response to Petitioners' Petition against General Access Solutions' U.S. Patent No. 6,947,477 (IPR2023-01416), then T-Mobile, Ericsson, and Nokia will not pursue in the related district court litigation, *General Access Solutions Ltd. v. T-Mobile US, Inc. et al.*, Case No. 2:23-cv-00158-JRG-RSP, the grounds raised in this Petition for IPR or any other grounds that could have reasonably been raised before the PTAB in this proceeding.

Id.

Our analysis under *Fintiv* is guided by the USPTO Director's Memorandum issued on June 21, 2022, titled "Interim Procedure for Discretionary Denials in AIA Post Grant Proceedings with Parallel District Court Litigation" ("Director's Memorandum"), *available at* https://www.uspto.gov/sites/default/files/documents/interim_proc_discretionary_denials_aia_parallel_district_court_litigation_memo_20220621_.pdf. The Director's Memorandum explains that, when a petitioner makes a *Sotera*-type stipulation, "it mitigates concerns of potentially conflicting decisions and duplicative efforts between the district court and the PTAB" and "[w]ith such a stipulation, if an IPR or PGR is instituted, the grounds the PTAB resolves will differ from those present in the parallel district court litigation." Director's Memorandum 7 (citing *Sotera*, Paper 12 at 18–19). Pursuant to the Director's Memorandum, we "will not discretionarily deny institution of an IPR or PGR in view of parallel district court litigation where a petitioner stipulates not to pursue in a parallel district court proceeding the same grounds as in the petition or any grounds that could have reasonably been raised in the petition." *Id.*

Accordingly, because Petitioner has offered a stipulation like that in *Sotera*, we do not discretionarily deny institution under *Fintiv*.

III. ANALYSIS

A. Principles of Law

Petitioner bears the burden of persuasion to prove unpatentability of the claims challenged in the Petition, and that burden never shifts to Patent Owner. *Dynamic Drinkware, LLC v. Nat’l Graphics, Inc.*, 800 F.3d 1375, 1378 (Fed. Cir. 2015).

“A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference.” *Verdegaal Bros., Inc. v. Union Oil Co. of Cal.*, 814 F.2d 628, 631 (Fed. Cir. 1987); *see also Finisar Corp. v. DirecTV Group, Inc.*, 523 F.3d 1323, 1334 (Fed. Cir. 2008) (to anticipate a patent claim under 35 U.S.C. § 102, “a single prior art reference must expressly or inherently disclose each claim limitation”). Moreover, “[b]ecause the hallmark of anticipation is prior invention, the prior art reference—in order to anticipate under 35 U.S.C. § 102—must not only disclose all elements of the claim within the four corners of the document, but must also disclose those elements ‘arranged as in the claim.’” *Net MoneyIN, Inc. v. VeriSign, Inc.*, 545 F.3d 1359, 1369 (Fed. Cir. 2008) (quoting *Connell v. Sears, Roebuck & Co.*, 722 F.2d 1542, 1548 (Fed. Cir. 1983)). Whether a reference anticipates is assessed from the perspective of one of ordinary skill in the art. *See Dayco Prods., Inc. v. Total Containment, Inc.*, 329 F.3d 1358, 1368–69 (Fed. Cir. 2003) (“[T]he dispositive question regarding anticipation [i]s whether *one skilled in the art* would reasonably understand or infer from the [prior art reference’s] teaching’ that every claim element was disclosed in that single reference.” (second and third alterations in original) (quoting *In re Baxter Travenol Labs.*, 952 F.2d 388, 390 (Fed. Cir. 1991))).

Additionally, “[u]nder the principles of inherency, if the prior art necessarily functions in accordance with, or includes, the claimed limitations, it anticipates.” *MEHL/Biophile Int’l Corp. v. Milgraum*, 192 F.3d 1362, 1365 (Fed. Cir. 1999); see *In re Cruciferous Sprout Litig.*, 301 F.3d 1343, 1349–50 (Fed. Cir. 2002).

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

B. The Level of Ordinary Skill in the Art

In determining the level of ordinary skill in the art, various factors may be considered, including the “type of problems encountered in the art; prior art solutions to those problems; rapidity with which innovations are made; sophistication of the technology; and educational level of active workers in the field.” *In re GPAC Inc.*, 57 F.3d 1573, 1579 (Fed. Cir. 1995) (quoting *Custom Accessories, Inc. v. Jeffrey–Allan Indus., Inc.*, 807 F.2d 955, 962 (Fed. Cir. 1986)).

Petitioner contends that:

A POSITA [(person of ordinary skill in the art)] at the time of the alleged invention of the ’477 Patent would have had

at least a bachelor's degree in computer science, electrical or computer engineering, or a related field, and at least two years of work or research experience in digital communications systems, such as wireless communications systems and networks, or equivalent, or a master's degree in electrical engineering, computer engineering, computer science, or a similar field. Ex. 1003, ¶34. Relevant working experience would include experience with telecommunications and networking, radio-access networking, and/or service provisioning in wireless networks. *Id.* More education can supplement practical experience and vice-versa. *Id.*

Pet. 5. Patent Owner states that, “[f]or purposes of this preliminary Response only, Patent Owner does not dispute the Petitioners’ definition of a person of ordinary skill in the art.” Prelim. Resp. 4 (citing Pet. 5).

Petitioner’s definition is consistent with the level of ordinary skill reflected in the prior art references of record. *See Okajima v. Bourdeau*, 261 F.3d 1350, 1355 (Fed. Cir. 2001) (recognizing that the prior art itself may reflect an appropriate level of skill in the art). For purposes of this decision, we apply Petitioner’s definition of the person of ordinary skill in the art.

C. Claim Construction

We apply the same claim construction standard used in district court actions under 35 U.S.C. § 282(b), namely that articulated in *Phillips v. AWH Corp.*, 415 F.3d 1303 (Fed. Cir. 2005) (en banc). *See* 37 C.F.R. § 42.100(b). In applying that standard, claim terms generally are given their ordinary and customary meaning as would have been understood by a person of ordinary skill in the art at the time of the invention and in the context of the entire patent disclosure. *Phillips*, 415 F.3d at 1312–13. “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.” *DePuy Spine, Inc.*

v. Medtronic Sofamor Danek, Inc., 469 F.3d 1005, 1014 (Fed. Cir. 2006) (citing *Phillips*, 415 F.3d at 1312–17). “[W]hile extrinsic evidence can shed useful light on the relevant art, . . . it is less significant than the intrinsic record in determining the legally operative meaning of claim language.” *Phillips*, 415 F.3d at 1317 (internal quotation marks omitted).

Petitioner does not propose an explicit claim construction for any term, asserting that, “[u]nless otherwise specified, for purposes of this Petition, the terms should receive their respective plain and ordinary meaning as understood by a [person of ordinary skill in the art].” Pet. 6. Patent Owner asserts that “[n]o claim construction is necessary to deny institution because [Patent Owner] General Access’s arguments for denial do not hinge on any disputed issues of claim interpretation.” Prelim. Resp. 10.

For the reasons set forth below, we determine that, as to the independent apparatus claim, Petitioner has not met its burden on its challenges as articulated by Petitioner, but we determine that Petitioner has met its burden for the independent method claim. We need not reach any claim construction issues to make those determinations. Accordingly, on this record and for purposes of this decision, we determine that no claim terms require express construction. However, the parties’ respective positions regarding the anticipation grounds suggest that there may be claim construction disputes regarding terms in independent apparatus claim 1.

Apparatus claim 1 recites, “a profile parameter storage device coupled to said profile parameter determiner.” Ex. 1001, 13:11–12. Patent Owner impliedly construes this phrase as requiring that the “profile parameter storage device” and the “profile parameter determiner” be two different and distinct components. See Prelim. Resp. 19 (citing *Kyocera Senco Indus.*

Tools Inc. v. Int’l Trade Comm’n, 22 F.4th 1369, 1382 (Fed. Cir. 2022)); *id.* at 31 (citing *Becton, Dickinson & Co. v. Tyco Healthcare Grp., LP*, 616 F.3d 1249, 1254 (Fed. Cir. 2010)). Petitioner’s position on this issue is not clear. *See, e.g.*, Pet. 20 (Petitioner’s contentions for the subject limitation lacking any explicit allegation using the phrase “coupled to.”).

Apparatus claim 1 also recites, “said profile parameter storage device for storing values representative of the at least one signal-related parameter and the at least one channel-related parameter.” Ex. 1001, 13:12–15. Patent Owner impliedly argues that the signal-related parameter and the channel-related parameter must be stored in the same storage device. *See* Prelim. Resp. 19–20; *id.* at 2 (“Genossar teaches that the alleged signal-related parameter and channel-related parameter are stored in separate devices, such that there is not a single ‘profile parameter storage device’ that stores both alleged parameters as claim [1.C] . . . recites.”); *id.* at 28 (referring to a “profile parameter storage device arranged in the same manner recited in claim [1.C]: . . . storing both the alleged signal-related parameter and channel-related parameter”). Petitioner’s position on this issue also is unclear but Petitioner appears to disagree with the proposition that “the ‘profile parameter storage device’ must be a singular component.” Pet. Prelim. Reply 2–3.

The parties are encouraged to meet and confer, prior to any further briefing, to discuss these claim construction matters and to narrow the disputed issues. If these or any other claim construction issues remain in dispute, each party, in the respective brief(s) authorized in the Scheduling Order, should identify the areas of agreement and should fully discuss the remaining disputed issues. The parties’ analyses should focus primarily on

the intrinsic evidence rather than, for example, on infringement contentions made in the District Court. *See, e.g.*, Pet. Prelim. Reply 2–3 (Petitioner impliedly contending that the recited “profile parameter storage device” need not be a singular component based on the purported configuration of the accused devices).⁶

D. The Alleged Anticipation of Claims 1, 3–5, 8, 9, 13, 15–17, 19, and 20 by Genossar (Ground 1)

Petitioner alleges that claims 1, 3–5, 8, 9, 13, 15–17, 19, and 20 of the ’477 patent are anticipated by Genossar. *See* Pet. 15–20 (addressing claim 1). For reasons discussed below, Petitioner has *not* shown a reasonable likelihood that it would prevail in establishing unpatentability of independent apparatus claim 1 as anticipated by Genossar, but has shown a reasonable likelihood of prevailing in its challenge to independent method claim 16 as anticipated by Genossar.

1. Genossar (Ex. 1005)

Genossar is titled, “Method for Rapid Synchronization of a Point to Multipoint Communication System.” Ex. 1005, code (54). Genossar discloses “a method for increasing the efficiency of processing of a received signal by storing the carrier frequency offset and equalizer taps between

⁶ Petitioner does not explain how Patent Owner’s purported subjective belief as to the meaning of a claim term and purportedly expressed through infringement contentions is relevant to any recognized canon of claim construction. *See* Pet. Prelim. Reply 3 (Petitioner arguing that “[i]t is evident from these admissions that Patent Owner doesn’t believe that the ‘profile parameter storage device’ must be a singular component as it represents to the Board.”). “[C]laims are construed as they would be understood by a hypothetical person of skill in the art.” *Phillips*, 415 F.3d at 1318.

processing of burst transmissions.” *Id.* at 1:10–13. Genossar explains that in fixed systems having a base station and terminal stations that are stationary, various values calculated during the signal processing change relatively slowly between consecutive bursts and “the equalizer coefficients typically do not change significantly between bursts.” *Id.* at 2:17–23. Thus, by “using the values obtained from the calculation of equalizer coefficients for a previous burst transmission as the basis for the calculation for a subsequent consecutive burst from the same terminal station,” the efficiency of the equalizer coefficient adaptation could significantly improve. *Id.* at 2:23–30. However, according to Genossar, then-current systems did not take advantage of receiver parameters that change slowly. *Id.* at 2:30–32. Genossar, therefore, provides “a system and a method for storing certain relatively slowly changing receiver parameters between transmissions for signal processing, such as the equalizer coefficients and the carrier frequency offset.” *Id.* at 2:33–40.

Genossar discloses a system for communication between a base station and a terminal station, in which the base station receives a plurality of sequentially transmitted bursts from the terminal station according to a TDMA (time division multiple access) protocol. *Id.* at 2:43–47. Each burst features a synchronization portion, each of the plurality of sequentially transmitted bursts are denoted S_i , wherein i is an integer, and the plurality of sequentially transmitted bursts include a burst S_m and a burst S_n that are sent from one terminal station. *Id.* at 2:48–54. The base station transceiver comprises “an equalizer controller for determining each set of coefficients by processing a portion of an equalized signal corresponding to the

synchronization portion of a burst S_i , according to an initialized coefficient adjustment procedure.” *Id.* at 2:54–3:3.

Figure 1 of Genossar is reproduced below.

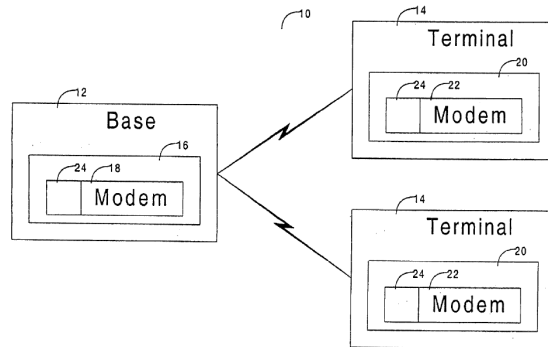


Figure 1

Figure 1 “shows a schematic block diagram of an exemplary system of base and terminal stations according to the background art.” *Id.* at 8:25–27.

Shown is system 10 including base station 12 which controls the transmissions of a plurality of terminal stations 14. *Id.* at 8:56–60. Base station 12 includes base station transceiver 16, which includes base station modem 18, and each of terminal stations 14 includes terminal station transceiver 20, which includes terminal station modem 22. *Id.* at 8:60–64. Radio-frequency signals are exchanged between base station 12 and terminal stations 14. *Id.* at 8:64–65. Each of base station transceiver 16 and terminal station transceiver 20 includes radio-frequency receiver unit 24 which receives an analog signal and then downconverts and demodulates the signal. *Id.* at 9:28–32.

Figure 2 of Genossar is reproduced below.

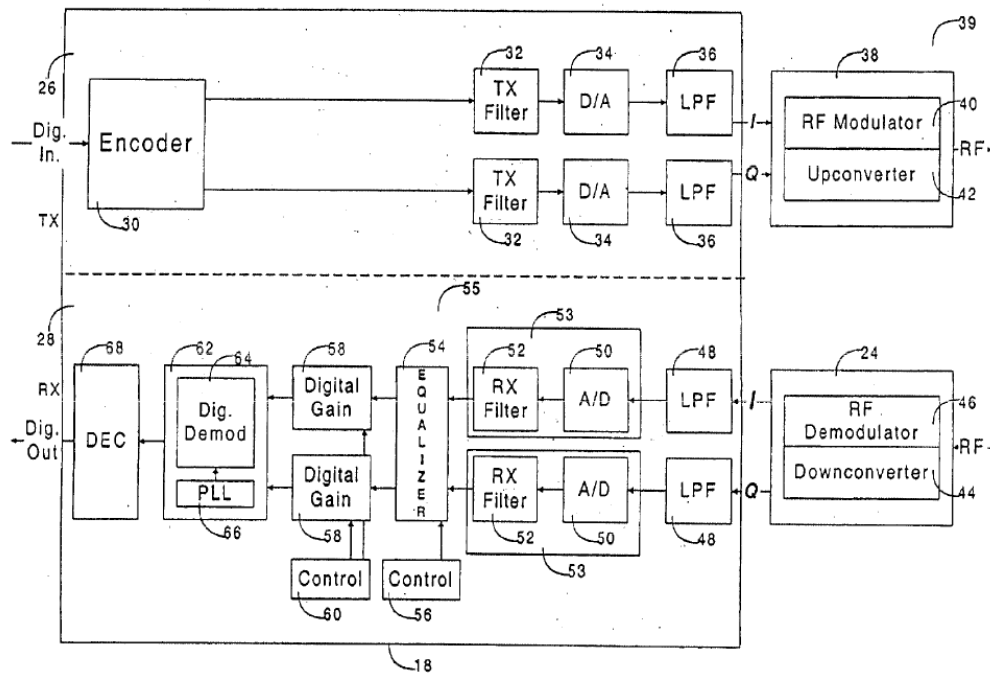


Figure 2

Figure 2 illustrates an exemplary base station transceiver of Genossar's system. *Id.* at 8:28–29. Figure 2 shows base station transceiver 16 having base station modem 18 with transmit portion 26 and receive portion 28. *Id.* at 9:59–67. Receive portion 28 includes radio-frequency receiver unit 24 that receives an analog radio-frequency signal. *Id.* at 10:33–35. Radio-frequency receiver unit 24 includes radio-frequency downconverter 44 and a demodulator 46. *Id.* at 10:35–36. Radio-frequency downconverter 44 converts the frequency of the transmitted radio-frequency signal to an intermediate frequency signal, the intermediate frequency signal then passes to demodulator 46, which splits the signal into the two components of “I” and “Q.” *Id.* at 10:36–42. The two signal components are then processed separately by analog low pass filters 48. *Id.* at 10:43–44. The low pass filtered signals are converted to digital signals by analog-to-digital converters 50, the digital signals are then passed to digital receive filters 52,

and the digital signals are then passed to equalizer 54, which is controlled by equalizer controller 56. *Id.* at 10:45–65. Equalizer controller 56 stores values for equalizer coefficients and then reuses these values as an initial estimate when a new signal is received. *Id.* at 11:28–31. The equalizer coefficients “can be stored for each terminal station 14 separately, and then reused when that terminal station 14 is transmitting again.” *Id.* at 11:37–39.

Later in the process, “[t]he digital signal is . . . passed to an automatic carrier frequency control 62, designated as ‘AFC’, which features a digital demodulator 64 and a PLL (phase locked loop) 66.” *Id.* at 11:51–53.

Genossar explains that “according to the background art, phase locked loops do not reuse previous values at the beginning of a burst, such that the process of convergence cannot take advantage of slowly changing values to converge on the optimum value more quickly.” *Id.* at 11:57–61. “By contrast, . . . PLL 66 at base station modem 18 does store and reuse the values for carrier frequency offset, such that the process of convergence at the beginning of a burst is able to occur much more quickly.” *Id.* at 11:61–65.

*2. The Alleged Anticipation of Apparatus Claim 1 and Its
Dependent Claims by Genossar*

Independent claim 1 recites a “profile-creating apparatus comprising” two components: “a profile parameter determiner” (element 1.A) and “a profile parameter storage device coupled to said profile parameter determiner” (element 1.C). Ex. 1001, 12:63–67, 13:1, 13:11–12.

Patent Owner’s arguments pertain, *inter alia*, to the recited structural relationship of the storage device being “coupled to” the determiner. *See, e.g.,* Prelim. Resp. 11–15. Specifically, Patent Owner argues that the Petition fails to even allege that Genossar discloses a storage device coupled

to the components collectively identified by Petitioner as the recited profile parameter determiner. *See id.* at 12–14.

For the determiner element 1.A, Petitioner contends that “Genossar discloses a base station 12 (i.e., ‘receiving station’) that includes a receive portion 28 (i.e., ‘profile parameter determiner’).” Pet. 17 (citing Ex. 1003 ¶ 71). Petitioner additionally contends:

In addition, Genossar further discloses that *the receive portion 28 (i.e., “profile parameter determiner”) determines and stores certain parameter values (e.g., equalizer coefficients) for the signals received from each terminal station.* Ex. 1005, 11:27-43. For example, Genossar teaches that *equalizer controller 56, forming part of the receive portion 28 (as shown in Figure 2), “stores the values for the equalizer coefficients and then reuses these values as an initial estimate when a new signal is received” from the same terminal station.* *Id.*

Id. at 17–18 (emphasis added). Thus, Petitioner maps receive portion 28 to the recited “profile parameter determiner,” and contends the receive portion 28 both determines and stores profile parameters. *See id.*

For the storage device element 1.C, Petitioner contends that the determined parameter values, including the equalizer coefficients, “can be stored,” and that “Genossar expressly teaches that these determined parameter values can be stored in the ‘stored memory’ (i.e., profile parameter storage device) of the base station.” *Id.* at 20 (citing, *inter alia*, Ex. 1005, 11:22–65, 13:37–45, 18:41–67; Ex. 1003 ¶ 77).

Patent Owner argues that “Petitioners do not even identify where within the base station—other than generally in its ‘stored memory’ (not pictured in Genossar’s Figure 2 . . .)—they allege the claimed ‘profile parameter storage device’ is located,” that “the word ‘couple’ does not appear at all in Petitioners’ scant discussion of claim element [1.C], much

less with respect to the alleged ‘profile parameter storage device’ and the alleged ‘profile parameter determiner’—which Petitioners allege to be the receive portion 28,” and that “Petitioners do not provide any discussion at all regarding the relationship between Genossar’s alleged ‘profile parameter determiner’ and Genossar’s alleged ‘profile parameter storage device.’”

Prelim. Resp. 13 (bracketed element numbers in original). We find Patent Owner’s arguments to be persuasive.

It is not enough for Petitioner to allege that the overall base station has a profile parameter storage device. Petitioner needed to, but did not, explain adequately how Genossar discloses such a storage device coupled to the component identified by Petitioner as the determiner. As mentioned, Petitioner maps Genossar’s receive portion 28 to the recited “profile parameter determiner” and contends that the receive portion both determines and stores parameter values and also contends that “equalizer controller 56, forming part of the receive portion 28,” stores certain parameter values. *See* Pet. 17–18. However, if, as Petitioner contends, the parameter storing is occurring within the determiner, Petitioner has not explained adequately how there also is a structure in the form of “a profile parameter storage device” that is coupled to that determiner. *See* Prelim. Resp. 19 (Patent Owner arguing that, “[b]ecause Genossar teaches that its equalizer controller 56—which ‘stores the values for the equalizer coefficients’—form[s] part of the receive portion 28, this equalizer controller 56 cannot be ‘coupled’ to the receive portion 28, as it is already ‘part of the receive portion 28.’”).

Petitioner asserts in its Preliminary Reply that, “like the ’477 Patent, Genossar teaches the general process of determining and storing parameters

for use in processing subsequently received signals,” and that “Petitioners have shown that Genossar, like the ’477 Patent, discloses determining parameters and using a stored memory to store the parameters for reuse in subsequent bursts.” Pet. Prelim. Reply 2 (citing Ex. 1005, Abstr., 11:27–30, 11:62–64; Ex. 1003 ¶¶ 48–53, 77). Even if correct, the disclosure of a general *process* is inadequate in this case to satisfy Petitioner’s burden regarding the claimed *apparatus* having the “coupled to” structural relationship.

Petitioner, also in the Preliminary Reply, asserts that “because Genossar discloses *storing* the parameters after *determining* the parameters, the component that determines the parameters is coupled to the component that stores the parameters for later use, otherwise such storage would not/could not occur.” *Id.* at 3 (citing Pet. 20; Ex. 1003 ¶¶ 71, 77, 85, 91). Petitioner impliedly argues that a person of ordinary skill in the art would have the “understanding that the determining components would inherently be coupled to the storing components of a base station because the determined parameters are stored.” *Id.* at 3–4 (citing Ex. 1011, 20 (Patent Owner’s infringement contentions); *cf.* PO Prelim. Sur-reply 1–2 (Patent Owner asserting that Petitioner’s inherency-related contentions are improper new arguments not found in the Petition). The issue, however, is not whether some unspecified “component” is inherently coupled to some other unspecified “component” located somewhere in a base station. Rather, the issue is whether Petitioner has shown adequately how the reference discloses the recited “profile parameter determiner” and the recited “profile parameter storage device coupled to said profile parameter determiner.” Petitioner has not done so. Without a clearly articulated contention as to what component

purportedly corresponds to the recited “profile parameter storage device,” we cannot evaluate whether the two specific components recited in independent claim 1 are “coupled to” each other.

We determine that Petitioner has not demonstrated a reasonable likelihood of proving that Genossar discloses “a profile parameter storage device coupled to said profile parameter determiner,” as recited in claim 1. Accordingly, having considered the parties’ arguments and evidence, we determine that Petitioner has not demonstrated a reasonable likelihood of prevailing in its challenge to independent apparatus claim 1 or its dependent claims 3–5, 8, 9, 13, and 15 as anticipated by Genossar.⁷

3. The Alleged Anticipation of Method Claim 16 and Its Dependent Claims by Genossar

For each element of independent method claim 16, Petitioner relies on its contentions made for the corresponding element of independent apparatus claim 1. *See* Pet. 26–27.

- a. [16.Pre] A method for creating at least a first profile associated with transmission upon at least a first channel of at least a first burst data signal in bursts to a receiving station, said method comprising:*

Petitioner contends that Genossar discloses the preamble. *See* Pet. 26 (“To the extent the preamble is limiting, Genossar discloses Claim [16.pre] for the reasons discussed for Claim [1.pre].” (citing Pet. § VII.A, 1.pre; Ex. 1003 ¶¶ 88–89) (bracketed element numbers in original); *id.* at 15–16 (contentions for 1.Pre).

⁷ Because of the Petition’s flaw regarding the “coupled to” arrangement, we do not reach, at this time, Patent Owner’s argument that, in Genossar, “the alleged signal-related parameter and channel-related parameter are not stored in the same storage device.” Prelim. Resp. 20.

According to Petitioner, “Genossar discloses “a system for communication between a base station and at least one terminal station, [where] the base station receiv[es] a plurality of sequentially transmitted *bursts from the at least one terminal station according to a TDMA (time division multiple access) protocol.*” *Id.* at 15 (citing Ex. 1005, 2:43–50). Petitioner contends that this is a disclosure of the recited “transmission upon at least a first channel of at least a first burst data signal in bursts to a receiving station [mapped to Genossar’s base station].” *See id.*

Petitioner additionally contends that “Genossar discloses ‘storing certain . . . parameters between transmissions . . . such as the equalizer coefficients’” and that “[t]his process is carried out by a base station modem 18 (i.e., profile-creating apparatus) . . . that ‘determin[es] each set of coefficients by processing’ the signal.” *Id.* at 15 (citing Ex. 1005, 2:32–39, 2:66–3:9, 11:28–42, Fig. 1–2; Ex. 1003 ¶¶ 68–69) (first two alterations in original). Petitioner asserts that “Genossar thus discloses a ‘profile-creating apparatus’ that creates at least a ‘first profile’ (e.g., stored parameter values)” as recited in the preamble of claim 1. *Id.* at 16.

Patent Owner does not raise any arguments regarding these contentions.

- b. [16.A] responsive to reception at the receiving station of an initial burst of the first burst data signal transmitted upon the first channel, determining a value of at least one signal-related parameter and at least one channel-related parameter, wherein the signal-related and channel-related parameters are collectively representative of communication of the first burst data signal over the first channel to the receiving station;*

Petitioner contends that Genossar’s receive portion 28 of base station modem 18 is a “profile parameter determiner” as recited in independent

apparatus claim 1, and that it “determines and stores certain parameters for each terminal station.” Pet. 18 (addressing element 1.B and citing Ex. 1005, 2:43–3:9, 10:33–54); *see id.* 16–18 (addressing “profile parameter determiner” element 1A); *id.* at 26 (“Genossar discloses Claim [16.A] for the reasons discussed for Claim [1.A] and [1.B].”). According to Petitioner, “[t]his includes, for instance, ‘*the carrier frequency offset*’ parameter, which reflects a change in frequency of the burst as received at the base station.” *Id.* at 18 (citing Ex. 1005, 2:17–39, 11:22–65; Ex. 1003 ¶ 74). Petitioner contends that Genossar’s carrier frequency offset is the recited “signal-related parameter.” *Id.* at 19 (citing Ex. 1003 ¶ 76).

Petitioner further contends that “[t]he ’477 Patent . . . states that ‘*channel-related parameters*’ can include, for instance, ‘values of *equalization weighting*,’” and that Genossar “discloses determining ‘*equalizer coefficients*,’ which comprise complex weighting values to be used by the equalizer during equalization operations.” *Id.* at 18–19 (citing Ex. 1001, 11:56–63; Ex. 1005, 12:19–33, Fig. 3A; Ex. 1003 ¶ 75). Thus, according to Petitioner, Genossar’s equalizer coefficients correspond to the recited “channel-related parameter.” *Id.* at 19 (citing Ex. 1003 ¶ 76).

Patent Owner does not raise any arguments regarding these contentions.

- c. [16.B] storing values representative of the at least one signal-related parameter and the at least one channel-related parameter determined during said operation of determining; and*
- [16.C] using the values stored during said operation of storing to facilitate receive operations performed at the receiving station upon at least one subsequent burst of the first burst data signal.*

Petitioner contends that Genossar disclose the “storing” element 16.B and the “using the values” element 16.C for the reasons discussed, respectively, for the “profile parameter storage device” and “values stored” of apparatus claim 1 (elements 1.C. and 1.D). Pet. 26–27. In that regard, Petitioner asserts that “Genossar teaches that the determined parameter values including ‘the equalizer coefficients can be stored for each terminal station 14 separately, and then reused when that terminal station 14 is transmitting again.’” *Id.* at 20 (citing Ex. 1005, 11:22–65; Ex. 1003 ¶ 77); *see also id.* at 20 (Petitioner’s “values . . . used” contentions and citing, *inter alia*, Ex. 1003 ¶ 78).

Patent Owner does not dispute, at this stage, Petitioner’s contentions regarding the mapping of the recited parameters and regarding Genossar’s disclosure of the acts of storing and reuse of those parameters. *See, e.g.*, Prelim. Resp. 20 (“[T]he Petition’s alleged signal-related parameter is both stored and reused in Genossar’s PLL 66, and the Petition’s alleged channel-related parameter is both stored and reused in Genossar’s equalizer controller 56.”). Rather, as discussed above, Patent Owner argues that Petitioner has not met its burden regarding certain structural recitations of apparatus claim 1—namely, the “coupled to” structural relationship between the “profile parameter storage device” and the “profile parameter determiner,” and the structure that is the “profile parameter storage device

for storing values representative of [two types of parameters].” *See supra* Section III.D.2; *see also* Prelim. Resp. 1–2. However, the purported structural distinctions are not applicable to the subject elements of independent method claim 16, which merely call for storing and using the parameter values without regard to where they are stored. We do not agree with Patent Owner’s argument that, “because Petitioners rely only on their claim [1.C] analysis for claim [16.B] and its dependent claims—without providing any additional analysis whatsoever—Petitioners incorporate the failings of its claim 1 challenge into claim 16,” and that, “[f]or this reason, Petitioners’ Ground 1 challenge must fail as to claim 16 and its dependent claims as well.” Prelim. Resp. 15 (bracketed element numbers in original).

Regarding the equalizer coefficients—mapped by Petitioner to the recited “channel-related parameter”—Genossar discloses: “equalizer controller 56 of the present invention stores the values for the equalizer coefficients and then reuses these values as an initial estimate when a new signal is received.” Ex. 1005, 11:28–31. Regarding the carrier frequency offset—mapped by Petitioner to the recited “signal-related parameter”—Genossar discloses: “PLL [(phase locked loop) 66 at base station modem 18 does store and reuse the values for carrier frequency offset, such that the process of convergence at the beginning of a burst is able to occur much more quickly.” *Id.* at 11:62–65; *see id.* at 11:53. Genossar also discloses, for example, that “[t]he method . . . uses previously obtained values for the equalizer coefficients and for the frequency offset in order to more rapidly process the signal, by starting the process of estimation with values which are taken from known values rather than arbitrarily chosen values.” Ex. 1005, 8:47–52.

We determine that Petitioner has demonstrated a reasonable likelihood of proving that Genossar discloses the steps of “storing values” and “using the values,” as recited in elements 16.B and 16.C of independent method claim 16.

d. Conclusion as to Independent Method Claim 16

Having considered the parties’ arguments and evidence, we determine that Petitioner has demonstrated a reasonable likelihood of prevailing in its challenge to method claim 16 as anticipated by Genossar.

e. Dependent Method Claims 17, 19, and 20

The remaining claims subject to this ground, claims 17, 19, and 20, each depends directly from independent method claim 16. Petitioner contends that each of those dependent claims is anticipated by Genossar. *See* Pet. 27; *id.* at 18–20, 24–25. Patent Owner does not raise any arguments regarding Petitioner’s contentions beyond those addressed above. *See* Prelim. Resp. 15 (arguing that Petitioner’s failings as to claim 1 extend to independent claim 16 and its dependent claims). Having considered the arguments and evidence, we determine that Petitioner has demonstrated a reasonable likelihood of prevailing in its challenge to dependent method claims 17, 19, and 20 as anticipated by Genossar.

*E. The Alleged Obviousness of Claims 2, 10–12, 14, and 18
Over Genossar and WiMAX (Ground 2)*

Petitioner alleges that dependent claims 2, 10–12, 14, and 18 of the ’477 patent would have been obvious over Genossar and WiMAX. *See* Pet. 28–40. Patent Owner argues that Petitioner’s articulation of this ground 2 fails to cure the problems with the challenge to the independent claims. Prelim. Resp. 16. Patent Owner also argues that Petitioner has failed to establish that WiMAX is prior art. *See id.* at 21–26.

1. WiMAX (Ex. 1006)

WiMAX is titled, “Air Interface for Fixed Broadband Wireless Access Systems” and indicates that it is a document of the Institute of Electrical and Electronics Engineers (IEEE). Ex. 1006, 1.⁸ WiMAX states:

[t]his document is FOR COMMENT as a potential DRAFT standard for medium-access and physical layer components that meet the functional requirements of a point-to-multipoint Broadband Wireless Access (BWA) system as defined by the IEEE 802.16 Working Group. Detailed logical, electrical, and signal processing specifications are presented that enable the production of interoperable equipment.

Id.

2. The Status of WiMAX as a Prior Art Printed Publication

Petitioner states that, “[f]or purposes of this proceeding only, Petitioners have assumed that the earliest alleged priority date of the ’477 Patent is not earlier than January 19, 2001,” and contends that:

WiMAX was published in September 2000 and qualifies as prior art under at least pre-AIA U.S.C. §102(a). Ex. 1006. First, WiMAX includes a 2000 Copyright stamp. *Id.*, 1. Second, IEEE draft standards such as WiMAX were and are available to the public and are easily searchable through libraries and other IEEE resources. Ex. 1003, ¶54. These indicia establish WiMAX was publicly available as of its 2000 publication date. *See Ericsson Inc. v. Intellectual Ventures I LLC*, IPR2014-00527, Paper 41 at 10-12 (PTAB May 18, 2015).

Furthermore, any POSITA interested in the subject matter of fixed access wireless network systems in the early 2000’s would have likely been a member of the IEEE or, at the very least, followed its publications and discussions, because of the IEEE’s notoriety in the industry as a source of innovation

⁸ We cite here to the page numbers of the exhibit rather than the page numbers of the underlying document.

and important standards. Ex. 1003, ¶55. Those skilled in the art and interested members of the public, such as those working to develop standards for telecommunications and those working to implement the standards, would have had access to relevant documents at the IEEE, including draft standards such as WiMAX. *Id.*

Pet. 10–11 (footnote omitted).

Patent Owner argues that Petitioner has failed to establish that WiMAX is prior art. Prelim. Resp. 21. Specifically, Patent Owner argues that Petitioner has not demonstrated adequately the public accessibility of WiMAX prior to the critical date. *Id.* at 21–26.

Patent Owner asserts that “any copyright date printed on the WiMAX potential draft standard document cannot be relied on to establish its purported publication date.” *Id.* at 23. Although both parties refer to a copyright stamp or date, we fail to see anything in WiMAX identified as such. We do, however, note that the header on the first page of the document states “IEEE 802.16.1-00/01r4, September 2000” and, at the bottom of that same page, states “Published August 2000.” Ex. 1006, 1. The listing of two different dates calls into question whether either is correct.

Patent Owner also argues that “Petitioners have failed to meet their burden to show that members of the interested public outside of the IEEE 802.16 Working Group would have known about, and known how to request the WiMAX potential draft standard.” Prelim. Resp. 26. As mentioned above, Petitioner contends that draft IEEE standards like WiMAX would have been available to the public. Pet. 10. However, Patent Owner (Prelim. Resp. 24) correctly points out that the Abstract states that “[t]his document is FOR COMMENT as a potential DRAFT standard.” Ex. 1006, 1. WiMAX also states, in a footer repeated on almost every page,

that “[t]his is an unapproved Task Group document being circulated for comment.” *See, e.g., id.* Thus, the document not only is not an issued standard, it indicates that it is not even a draft standard.

We determine that Petitioner has not established adequately that WiMAX is prior art and, accordingly, that Petitioner has not demonstrated a reasonable likelihood of prevailing in its challenge to claims 2, 10–12, 14, and 18 as obvious over Genossar and WiMAX.

F. The Alleged Anticipation of Claims 1, 3–6, 8–10, 13, 15–17, 19, and 20 by Barratt ’470 (Ground 3)

Petitioner alleges that claims 1, 3–6, 8–10, 13, 15–17, 19, and 20 of the ’477 patent are anticipated by Barratt ’470. *See* Pet. 40–49 (addressing claim 1). Patent Owner argues that, “[a]s in Grounds 1–2, in Ground 3, Petitioner once again fails to allege that the prior art—Barratt ’470 on this occasion—discloses ‘a profile parameter storage device *coupled* to said profile parameter determiner,’ and that this alleged ‘profile parameter storage device’ is ‘for storing values representative of the at least one signal-related parameter *and* the at least one channel-related parameter.’” Prelim. Resp. 27. For reasons discussed below, Petitioner has *not* shown a reasonable likelihood that it would prevail in establishing unpatentability of independent apparatus claim 1 as anticipated by Barratt ’470, but has shown a reasonable likelihood of prevailing in its challenge to independent method claim 16 as anticipated by Barratt ’470.

1. Barratt ’470 (Ex. 1007)

Barratt ’470 pertains to wireless (radio) communications, and, in particular, “using antenna arrays and spatial signal processing in wireless communications systems to perform demodulation, including correction for

frequency offset and alignment, in the presence of co-channel interference.”

Ex. 1007, 1:19–24. Barratt ’470 discloses:

[a] method and apparatus for generating a reference signal for use in an alternating projection loop which is part of demodulation in a base station of a wireless communication system, the reference signal relaxed to minimize the effects of frequency offset and amplitude variations, the base station including an array of antennas. The alternating projection loop demodulates in the presence of co-channel interference and includes correction for time alignment and/or frequency offset.

Id., code (57).

Barratt ’470 states that its method and apparatus “are for incorporation in a cellular system using the ‘Personal Handyphone System’ (PHS), ARIB Standard, Version 2 (RCR STD-28),” in which “[t]he PHS system is an 8 slot time division multiple access (TDMA) system with true time division duplex (TDD).” *Id.* at 7:58–66. Barratt ’470 explains that “the 8 timeslots are divided into 4 transmit (TX) timeslots and 4 receive (RX) timeslots.” *Id.* at 7:67–8:1. According to Barratt ’470, in PHS, “a burst is defined as the finite duration RF [(radio frequency)] signal that is transmitted or received over the air during a single timeslot.” *Id.* at 8:11–13. Barratt ’470 further explains that “any particular remote terminal and a base station communicate in bursts in timeslots that are a frame apart.” *Id.* at 8:33–35.

Figure 1 of Barratt '470 is reproduced below.

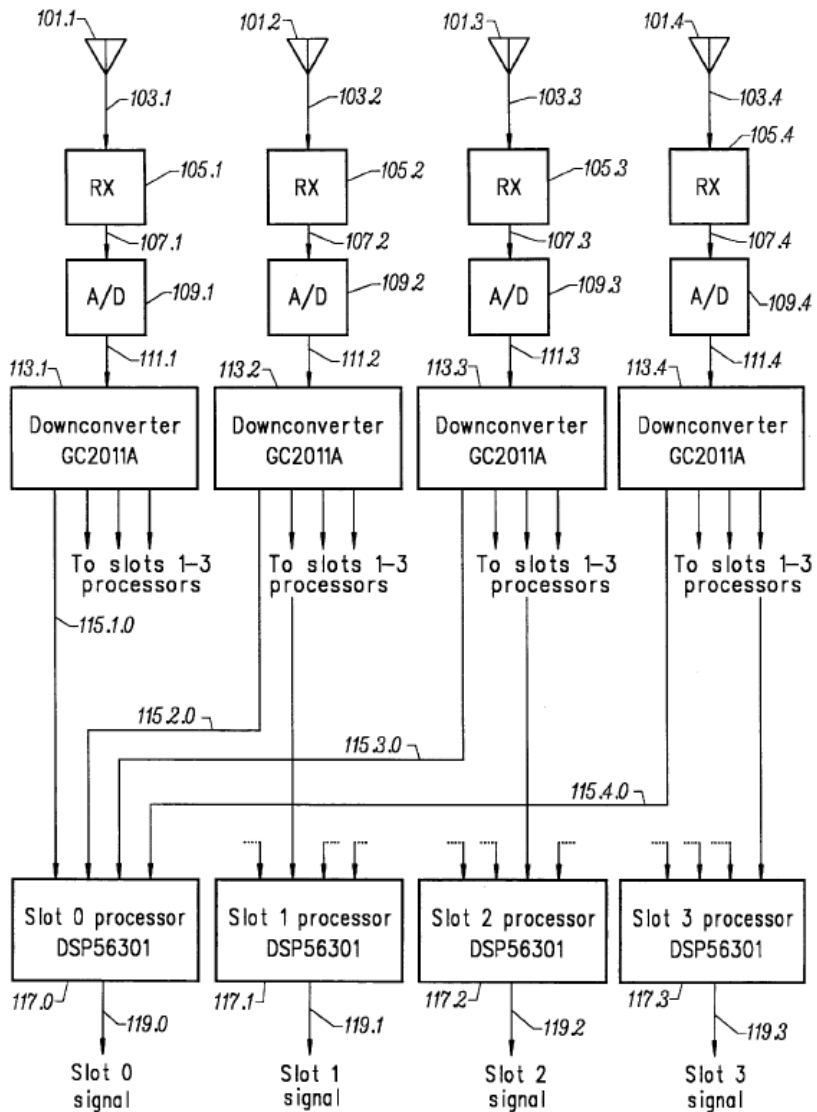


FIG. 1

Figure 1 depicts the architecture of the preferred embodiment of the apparatus of Barratt '470. *Id.* at 9:31–32. Figure 1 shows an apparatus having antennas 101.1–101.4, with outputs mixed down in analog by RX blocks 105.1–105.4, respectively. *Id.* at 9:31–37. The signals are then digitized by converters 109.1–109.4, and filtered by digital filters 113.1–113.4, respectively. *Id.* at 9:37–59. “There are four downconverted outputs from each antenna’s GC2011A digital filter device 113, one per time slot,”

and, “[f]or each of the four timeslots, the four downconverted outputs from the four antennas are fed to a digital signal processor (DSP) device 117 for further processing according to this invention.” *Id.* at 9:60–65.

Barratt ’470 further discloses that:

For any timeslot, SYNCH mode processing to determine the initial weight matrix, frequency offset and time alignment parameters, and normal mode processing to provide frequency offset and alignment determination, frequency offset and alignment correction, signal copy operations, weight vector determination, decimation, filtering, and demodulation is carried out by a DSP, one for each timeslot.

Id. at 24:31–37; *see also id.* at 16:17–20 (“[T]he initial frequency offset and initial weight vector are determined. Thus, in a single SYNCH burst, all three parameters are estimated: the initial alignment, frequency offset and weight vector w_r .”). “The quantities determined in SYNCH mode are used as initial conditions for normal mode, during which the method and apparatus of this invention continues to compensate for frequency offset and alignment,” and “[t]he values for offset and alignment are updated during normal mode.” *Id.* at 16:25–30.

“[T]he method involves a recursive loop repeated every frame.” *Id.* at 16:36–37. “The first time one enters normal mode, one starts the recursive loop with an initial estimate of w_r and of the alignment and frequency offset obtained from SYNCH mode.” *Id.* at 16:37–40. “On an ongoing basis, one starts the loop with starting estimate of w_r and of the alignment and frequency offset obtained from the processing of the same signal on the previous frame.” *Id.* at 16:40–43.

Figure 6 of Barratt '470 is reproduced below.

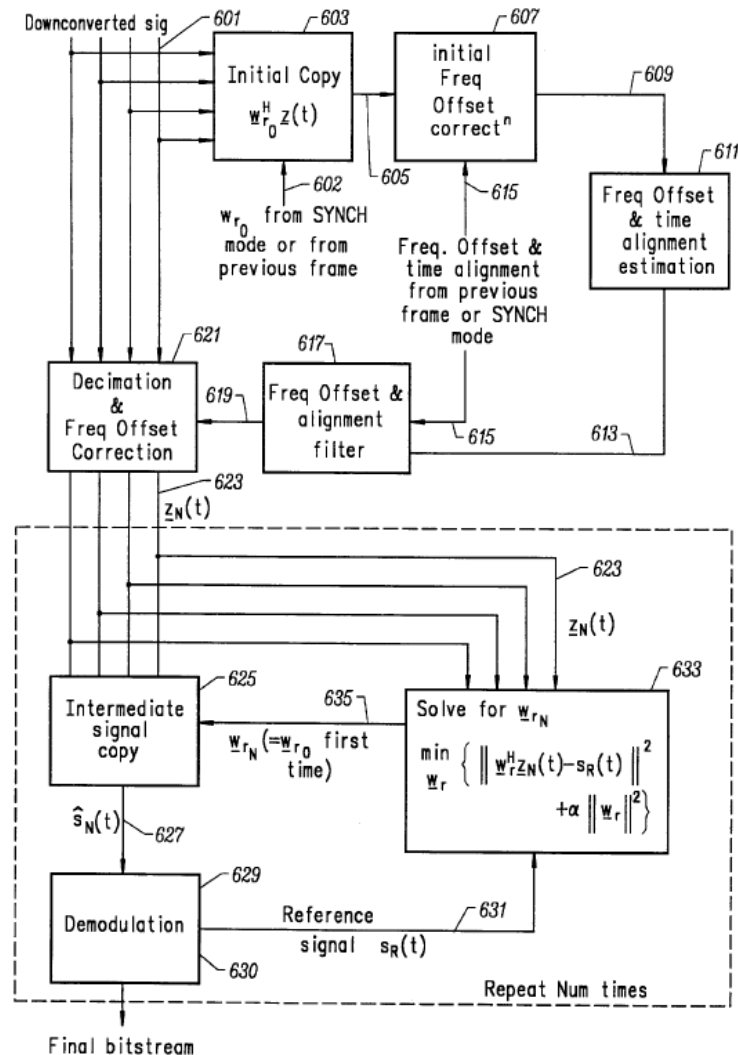


FIG. 6

Figure 6 is a flow chart showing the normal mode. *See id.* at 16:44–45. The normal mode starts at 602 with the value of w_r either from the previous frame or, at the start, from the SYNCH mode estimate. *Id.* at 16:52–54.

Given a starting value of w_r , denoted by w_{r0} , one produces an estimate of the signal of interest by an initial signal copy operation 603 using this w_{r0} , together with the downconverted

received signal vector $z(t)$ (labeled 601) to produce an estimate 605 of the signal expressed as initial copy signal

$$\hat{s}_0(t) = w_{r0}^H z(t)$$

Step 607 corrects initial copy signal 605 for frequency offset using the frequency offset from the last frame, or from the SYNCH mode if this is the first frame. The frequency corrected initial copy signal 609 is now used in step 611 to compute a new frequency offset difference estimate and an alignment estimate. The result frequency offset difference and alignment estimates 613 are combined in an estimate filter 617 with estimates 615 from previous frames, or with the SYNCH mode estimate if this is the first frame, to produce the updated frequency offset and alignment estimates 619.

Id. at 16:54–17:5

2. *The Alleged Anticipation of the Apparatus Claims by Barratt '470*

Petitioner's contentions for this Barratt '470 ground and Patent Owner's arguments against it are somewhat similar to that of the Genossar ground discussed above. The issue here is whether Petitioner, for the apparatus claims, has demonstrated adequately that Barratt '470 discloses "a profile parameter storage device coupled to said profile parameter determiner," as recited in independent claim 1.

Petitioner maps the DSP of Barratt '470 to the recited "profile parameter determiner" (element 1.A). *See* Pet. 42–43. Petitioner contends that "[e]ach DSP 117 *maintains values associated with the signals* received during that timeslot, including: an initial weight matrix, frequency offset, and time alignment parameters." *Id.* at 42 (emphasis added) (citing Ex. 1007, 8:36–61, 16:17–17:7, 24:24–48). Thus, it appears that Petitioner contends that, in Barratt '470, it is the profile parameter determiner that stores values representative of the values of the parameters. As such,

Petitioner has not explained adequately how there is, as recited in element 1.C, “a profile parameter storage device coupled to said profile parameter determiner” where it is that storage device that is “for storing values representative [of the parameters].” Ex. 1001, 13:10–15.

For element 1.C, the “profile parameter storage device,” Petitioner contends that “Barratt ’470 teaches that *the base station maintains various parameter values (e.g., antenna weights, frequency offset, time alignment, etc.)* for each subscriber station.” Pet. 47 (emphasis added) (citing Ex. 1003 ¶ 145; Ex. 1007, 8:48–62, 16:17–43, 16:44–17:7, 18:8–20, 18:39–45). Petitioner further contends that the method of Barratt ’470 involves the use of parameter values in a recursive loop repeated every frame and, “[t]hus, Barratt ’470 discloses that the base station necessarily includes a ‘profile parameter storage device’ for *storing* these parameter values *from one frame to next* for each signal of interest, as required by Claim [1.C].” *Id.* at 48 (citing Ex. 1003 ¶ 145; Ex. 1011, 20–21 (infringement contentions)) (emphasis and bracketed element number in original). The contentions in the Petition regarding element 1.C do not include any explicit assertion using the claim phrase “coupled to.” *See id.* at 47–48.

In the Preliminary Reply, Petitioner contends that “Barratt ’470 discloses *maintaining* (i.e., storing) and using values *obtained* (i.e., determined) from processing on a signal from a *previous frame*.” Pet. Prelim. Reply 3 (citing Pet. 47–48). Petitioner further contends that “[t]he components that obtain the values must be coupled to the components that maintain the values; to imply otherwise would be nonsensical and contrary to the teachings of the prior art.” *Id.*; *see also id.* at 3–4 (“the determining

components would inherently be coupled to the storing components of a base station because the determined parameters are stored”); *cf.* PO Prelim. Sur-reply 1–2 (Patent Owner asserting that Petitioner’s inherency-related contentions are improper new arguments not found in the Petition).

As with the Genossar anticipation ground, it is not enough for Petitioner to allege that there is a storage device somewhere in the base station or that some unidentified storage component necessarily must be connected to some component that obtains the values. See Prelim. Resp. 28 (Patent Owner arguing that, “[e]ven if Barratt ’470 necessarily includes a ‘profile parameter storage device’ as the Petition alleges, it is *not* the case that Barratt ’470 *necessarily* includes a ‘profile parameter storage device[’] *arranged in the same manner* recited in claim [1.C]: (1) ‘coupled’ to a profile parameter determiner, and (2) storing both the alleged signal-related parameter and channel-related parameter.”). Petitioner does not identify adequately the component in Barratt ’470 that Petitioner contends is the recited profile parameter storage device and does not address adequately the required structural relationship of a profile parameter storage device “coupled to” the structure mapped by Petitioner to the profile parameter determiner (the DSP). Accordingly, we determine that Petitioner has not demonstrated a reasonable likelihood of prevailing in its challenge to independent apparatus claim 1 or its dependent claims 3–6, 8–10, 13, and 15 as anticipated by Barratt ’470.⁹

⁹ As with the Genossar anticipation ground, we do not reach, at this time, Patent Owner’s argument that Petitioner has failed to show that, in Barratt ’470, both types of parameters are stored in the same “profile parameter storage device.” See, e.g., Prelim. Resp. 27–28; *id.* at 29 (“Figure 6 provides no disclosure regarding whether the [purported

3. *The Alleged Anticipation of the Method Claims by Barratt '470*

For independent method claim 16, Petitioner relies on its contentions made for independent apparatus claim 1. Pet. 58.

Petitioner contends that “Barratt ’470 discloses a TDMA wireless communication system where ‘any particular remote terminal and a base station communicate in bursts in timeslots that are a frame apart’” and that Barratt ’470 “discloses a profile-creating apparatus (*e.g.*, base station).” *Id.* at 41 (citing Ex. 1003 ¶¶ 130–133; Ex. 1007, 8:11–35, 8:36–61, 16:17–17:7).

Element 16.A recites, in part, the step of “determining a value of at least one signal-related parameter and at least one channel-related parameter.” Ex. 1001, 14:28–30. Petitioner contends that the DSP is a “profile parameter determiner” (as recited in apparatus claim 1) and that “[e]ach DSP 117 maintains values associated with the signals received during that timeslot, including: an initial weight matrix, frequency offset, and time alignment parameters.” Pet. 42–43 (citing Ex. 1007, 8:36–61, 16:17–17:7, 24:24–48, Fig. 1). Petitioner further contends that Barratt ’470 discloses “determining at least one signal-related parameter (*e.g.*, *frequency offset, time alignment, etc.*)” and “determining a value of at least one channel-related parameter (*e.g.*, *antenna weights*), where together these parameters are representative of communication of the first burst data signal over the transmission channel.” *Id.* at 46 (citing Ex. 1003 ¶ 143); *see also*

parameter values] . . . are stored separately, or in a single ‘profile parameter storage device for storing values representative of the at least one signal-related parameter *and* the at least one channel-related parameter’ as claim [1.C] recites.”).

id. at 44–46 (Petitioner’s contentions as to why the identified parameters in Barratt ’470 correspond to the two recited types of parameters).

Elements 16.B and 16.C recite, in part, the steps of “storing values representative of the [two types of parameters]” and “using the values stored during said operation of storing to facilitate receive operations performed at the receiving station upon at least one subsequent burst of the first burst data signal.” Ex. 1001, 14:35–42. Petitioner contends that

Barratt ’470 teaches that the base station maintains various parameter values (*e.g.*, antenna weights, frequency offset, time alignment, etc.) for each subscriber station. [Ex. 1003 ¶ 145]; *See also* Ex. 1007, 8:48–62, 16:17–43, 16:44–17:7, 18:8–20, 18:39–45. For example, Barratt ’470 discloses that for each signal of interest “the method involves a recursive loop repeated every frame . . . On an ongoing basis, one starts the loop [*for the current frame*] with starting estimate of w_r and of the alignment and frequency offset obtained from the processing of the same signal *on the previous frame*.” Ex. 1006 [sic, 1007], 16:32–17:7. Thus, Barratt ’470 discloses that the base station necessarily includes a “profile parameter storage device” for *storing* these parameter values *from one frame to next* for each signal of interest” Ex. 1003, ¶145; *see also* Ex. 1011, 20–21.

Pet. 47–48 (second alteration in original). Petitioner also contends that, “[l]ike the ’477 Patent, Barratt ’470 too discloses a system where base stations create and store various parameter values (*e.g.*, ‘frequency offset’) for each remote terminal communicating with the base station.” *Id.* at 41 (citing Ex. 1007, 8:36–61, 16:17–17:7). Petitioner additionally contends that Figure 6 of Barratt ’470 “shows that certain values obtained in a previous frame (‘frequency offset’) are being used in receive operations performed on the current frame,” and, “[t]hus, Barratt ’470 discloses storing values to facilitate receive operations performed on subsequent bursts of the same

burst data signal.” *Id.* at 48 (citing Ex. 1003 ¶¶ 146–147; Ex. 1007, 8:48–61, 16:17–18:45). Petitioner relies on the testimony of Dr. van der Weide as support for its contentions, and, at this point, that testimony is un rebutted.

Patent Owner does not dispute, at this stage, Petitioner’s contentions regarding the mapping of the recited parameters and regarding disclosure in Barratt ’470 of the acts of storing and use of those parameters. *See, e.g.*, Prelim. Resp. 29 (Patent Owner stating that Figure 6 of Barratt ’470 “illustrates utilizing ‘ w_{r0} from SYNCH mode or from previous frame,’ and subsequently correcting this initial copy signal using the ‘[f]req. offset & time alignment from previous frame or SYNCH mode.’” (alterations in original)). Rather, Patent Owner argues that Petitioner has not met its burden regarding certain structural recitations of apparatus claim 1—namely, the “coupled to” structural relationship between the “profile parameter storage device” and the “profile parameter determiner,” and the structure that is the “profile parameter storage device for storing values representative of [two types of parameters].” *See, e.g.*, Prelim. Resp. 27. However, the purported structural distinctions are not applicable to the subject elements of independent method claim 16, which merely call for storing and using the parameter values without regard to where they are stored. We do not agree with Patent Owner’s argument that, “because Petitioners rely only on their claim [1.C] analysis for claim [16.B] and its dependent claims, Petitioners’ Ground 3 challenge must fail as to [those method] claims.” Prelim. Resp. 33 (bracketed element numbers in original).

We determine that Petitioner has demonstrated a reasonable likelihood of proving that Barratt ’470 discloses the steps of “storing values” and

“using the values,” as recited in elements 16.B and 16.C of independent method claim 16.

Having considered the parties’ arguments and evidence, we determine that Petitioner has demonstrated a reasonable likelihood of prevailing in its challenge to method claim 16 as anticipated by Barratt ’470.

The remaining claims subject to this ground, claims 17, 19, and 20, each depends directly from independent method claim 16. Petitioner contends that each of those dependent claims is anticipated by Barratt ’470. *See* Pet. 58–59; *id.* at 45–56. Patent Owner does not raise any arguments regarding Petitioner’s contentions beyond those addressed above. *See* Prelim. Resp. 33 (arguing that Petitioner’s failings as to claim 1 extend to independent claim 16 and its dependent claims). Having considered the arguments and evidence, we determine that Petitioner has demonstrated a reasonable likelihood of prevailing in its challenge to method claims 17, 19, and 20 as anticipated by Barratt ’470.

*G. The Alleged Obviousness of Claims 7, 11, and 12
Over Barratt ’470 and Barratt ’490 (Ground 4)*

Petitioner alleges that claims 7, 11, and 12 of the ’477 patent would have been obvious over Barratt ’470 and Barratt ’490. *See* Pet. 59–65. This ground challenges only dependent apparatus claims. *See id.* Petitioner’s challenge to those dependent claims does not cure the flaw in the underlying ground alleging anticipation of independent apparatus claim 1. *See id.* Accordingly, Petitioner has not demonstrated a reasonable likelihood of prevailing in its challenge to apparatus claims 7, 11, and 12 as being obvious over Barratt ’470 and Barratt ’490.

*H. The Alleged Obviousness of Claims 2, 14, and 18 Over
Barratt '470 and PHS (Ground 5)*

Petitioner alleges that claims 2, 14, and 18 of the '477 patent would have been obvious over Barratt '470 and PHS. *See* Pet. 65–68.

In this ground, challenged claims 2 and 14 are dependent apparatus claims. Petitioner's challenge to those dependent claims does not cure the flaw in the underlying ground alleging anticipation of independent apparatus claim 1. *See id.* Accordingly, Petitioner has not demonstrated a reasonable likelihood of prevailing in its challenge to apparatus claims 2 and 14 as being obvious over Barratt '470 and PHS.

Dependent method claim 18 recites:

The method of claim 16 wherein the receiving station is operable in a communication system in which communication protocols include a contention period and wherein the initial burst of the first burst data signal responsive to which *the at least one signal-related parameter and the at least one channel-related parameter* are determined is transmitted to the receiving station during the contention period.

Ex. 1001, 14:51–57 (emphasis added). Thus, dependent claim 18 refers to the same signal-related and channel-related parameters recited in independent method claim 16. In its mapping of those parameters for the independent claims, Petitioner contends that “Barratt '470 discloses “determining at least one signal-related parameter (*e.g., frequency offset, time alignment, etc.*)” and “determining a value of at least one channel-related parameter (*e.g., antenna weights*).” Pet. 46. For dependent claim 18, Petitioner does not refer explicitly to those same parameters. *See id.* at 68 (relying on the contentions made for claim 2); *id.* at 67 (Petitioner contending, for claim 2, that “the initial burst is used by the base station to determine the at least one parameter for the first burst data signal, including

the ‘*frequency*’ and ‘*timeslot*’ of the SCH channel and other parameters described in the PHS standard.”). Petitioner has not explained adequately how it consistently maps the same parameters in both independent claim 16 and its dependent claim 18. Accordingly, Petitioner has not demonstrated a reasonable likelihood of prevailing in its challenge to method claim 18 as being obvious over Barratt ’470 and PHS.

IV. CONCLUSION

Petitioner has demonstrated a reasonable likelihood of prevailing in showing the unpatentability of at least one of the challenged claims of the ’477 patent. Accordingly, we institute an *inter partes* review on all challenged claims on all asserted grounds. *See SAS Inst. Inc. v. Iancu*, 138 S. Ct. 1348, 1354, 1359–60 (2018); 37 C.F.R. § 42.108(a) (“When instituting *inter partes* review, the Board will authorize the review to proceed on all of the challenged claims and on all grounds of unpatentability asserted for each claim.”). At this stage of the proceeding, we have not made a final determination with respect to the patentability of any of the challenged claims.

V. ORDER

For the foregoing reasons, it is

ORDERED that, pursuant to 35 U.S.C. § 314(a), an *inter partes* review of claims 1–20 of the ’477 patent is instituted with respect to all grounds of unpatentability set forth in the Petition; and

FURTHER ORDERED that, pursuant to 35 U.S.C. § 314(c) and 37 C.F.R. § 42.4(b), *inter partes* review of the ’477 patent shall commence on the entry date of this Order, and notice is hereby given of the institution of a trial.

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