

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

QUALCOMM INCORPORATED,
Petitioner,

v.

COBBLESTONE WIRELESS, LLC,
Patent Owner.

Case No. IPR2024-01336
U.S. Patent No. 7,924,802

PETITIONER'S REPLY TO PATENT OWNER'S RESPONSE

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PETITIONER'S EXHIBIT LIST

Ex.	Description
1001	U.S. Patent No. 7,924,802 (“’802 Patent”)
1002	Prosecution History for 7,924,802
1003	Declaration of Dr. Kevin Almeroth
1004	U.S. Patent Pub. No. 2006/0276146A1 (“Suzuki”)
1005	U.S. Patent Pub. No. 2009/0052556A1 (“Fernandez”)
1006	U.S. Patent Pub. No. 2005/0135312A1 (“Montejo”)
1007	U.S. Patent Pub. No. 2005/0249266A1 (“Brown”)
1008	U.S. Patent No. 6,952,454 (“Jalali”)
1009	U.S. Patent No. 6,359,868 (“Chen”)
1010	U.S. Patent No. 7,136,430 (“Morris”)
1011	U.S. Patent No. 7,460,615 (“Kunysz”)
1012	U.S. Patent No. 7,133,697 (“Judd”)
1013	<i>Cobblestone Wireless, LLC v. Samsung Electronics America, Inc. et al.</i> , 2:23-cv-00285-JRG-RSP (E.D. Tex.), Plaintiff Cobblestone Wireless, LLC’s Preliminary Disclosure of Asserted Claims and Infringement Contentions, Exhibit A (served September 28, 2023)
1014	U.S. Patent No. 8,036,702 (“Etemad”)
1015	John A. C. Bingham, Multicarrier Modulation for Data Transmission: An Idea Whose Time Has Come, IEEE Comms. Magazine (1990)
1016	Mischa Schwartz et al., Origins of Carrier Multiplexing - Major George Owen Squeir and AT&T (June 2008)
1017	U.S. Patent No. 980,357

1018	U.S. Patent No. 980,359
1019	U.S. Patent No. 980,356
1020	Nickolas LaSorte et al., The History of Orthogonal Frequency Division Multiplexing (Jan. 2008)
1021	U.S. Patent No. 8,693,525 (“Rick”)
1022	<i>Curriculum Vitae</i> of Dr. Kevin Almeroth
1023	Lathi, Modern Digital and Analog Communication Systems, Third Edition, Oxford University Press (1998)
1024	U.S. Patent No. 6,154,661
1025	Cassan, Gola, “A 3.5 GHz 25 W Silicon LDMOS RFIC power amplifier for WiMAX applications,” 2007 IEEE Radio Frequency Integrated Circuits Symposium
1026	Zyren, “Overview of the 3GPP Long Term Evolution Physical Layer,” July 2007 (available at https://web.archive.org/web/20081122142941/http://www.freescale.com/files/wireless_comm/doc/white_paper/3GPPEVOLUTIONWP.pdf)
1027	U.S. Patent Pub. No. 20070280098
1028	<i>Cobblestone Wireless, LLC v. Samsung Electronics America, Inc. et al.</i> , 2:23-cv-00285-JRG-RSP (E.D. Tex.), Joint Motion to Amend Docket Control Order (filed August 7, 2024)
1029	Declaration of Archibald Cruz in Support of Motion for Pro Hac Vice Admission
1030	Supplemental Declaration of Dr. Kevin Almeroth

PATENT OWNER'S EXHIBIT LIST

Ex.	Description
2001	Samsung Elecs. Am, Inc. et al. v. Cobblestone Wireless, LLC, IPR2024-00606, Institution Decision, Paper 13 (PTAB Sept. 10, 2024)
2002	Cellco P'ship d/b/a Verizon Wireless et al. v. Cobblestone Wireless, LLC, IPR2024-00946, Petition, Paper 1 (PTAB June 28, 2024)
2003	Hewlett Packard Enter. Co. et al. v. Cobblestone Wireless, LLC, IPR2024-00707, Institution Decision, Paper 17 (PTAB Sept. 24, 2024)
2004	Cellco P'ship d/b/a Verizon Wireless et al. v. Cobblestone Wireless, LLC, IPR2024-00946, Termination Decision, Paper 12 (PTAB Nov. 15, 2024)
2005	Samsung Elecs. Am, Inc. et al. v. Cobblestone Wireless, LLC, IPR2024-00606, Motion to Terminate, Paper 19 (PTAB Nov. 1, 2024)
2006	Email correspondence between PTAB and counsel regarding conference call addressing Petitioner's motion for joinder in this IPR, dated November 13-18, 2024
2007	Samsung Elecs. Am, Inc. et al. v. Cobblestone Wireless, LLC, IPR2024-00606, Scheduling Order, Paper 14 (PTAB Sept. 12, 2024)
2008	Hewlett Packard Enter. Co. et al. v. Cobblestone Wireless, LLC, IPR2024-00707, Patent Owner Preliminary Response, Paper 7 (PTAB June 27, 2024)
2009	Samsung Elecs. Am, Inc. et al. v. Cobblestone Wireless, LLC, IPR2024-00606, Petition, Paper 3 (PTAB Feb. 26, 2024)
2010	Hewlett Packard Enter. Co. et al. v. Cobblestone Wireless, LLC, IPR2024-00707, Petition, Paper 3 (PTAB Mar. 19, 2024)
2011	Samsung Elecs. Am, Inc. et al. v. Cobblestone Wireless, LLC, IPR2024-00606, Patent Owner Preliminary Response, Paper 8 (PTAB June 14, 2024)
2012	Samsung Elecs. Am, Inc. et al. v. Cobblestone Wireless, LLC, IPR2024-00606, Termination Order, Paper 20 (PTAB Jan. 2, 2025)
2013	Declaration of Dr. Todor v. Cooklev
2014	Curriculum Vitae of Dr. Cooklev

I. INTRODUCTION

The Board instituted *inter partes* review of all challenged claims (Claims 1–4, 6–10, 13, 14, 17, and 21–25) of U.S. Patent No. 7,924,802 (Ex. 1001, the “’802 Patent”). Paper 15. Petitioner Qualcomm Incorporated files this reply to Patent Owner Cobblestone Wireless, LLC’s Response.¹ See Paper 22 (hereinafter “POR”). As discussed herein, Patent Owner’s arguments are flawed for several reasons. Throughout Patent Owner’s Response, Patent Owner improperly relies on claim constructions without undertaking the proper analysis and without adequate support for those constructions. Moreover, Patent Owner mischaracterizes the cited art in an ineffective attempt to distinguish them from the ’802 Patent. Further still, Patent Owner at times disregards or misrepresents the Petition’s analyses. Based on at least these defects, Patent Owner’s arguments fail to overcome the references.

II. ARGUMENT

A. Patent Owner fails to overcome Rick under Ground 1.

1. Patent Owner improperly seeks to backdoor claim constructions without adequate support.

Patent Owner asserts that “the claim terms should be given their pla[i]n and ordinary meaning” unless otherwise indicated. POR 1. However, even though Patent

¹ Petitioner maintains and incorporates by reference the arguments made in the Petition. Paper 4 (hereinafter “Pet.”).

Owner refuses to *explicitly* offer any constructions, Patent Owner’s arguments rely on interpretations of claim terms that go well beyond their plain and ordinary meaning. In doing so, Patent Owner seeks to backdoor its own constructions into the claims without undergoing proper claim construction analysis. This is ostensibly because, if its proposed interpretations were subjected to claim construction, they would fail for lack of any support in the intrinsic evidence.

For example, Patent Owner seeks exceedingly narrow readings of the terms “first information” and “second information” as recited in Claim 1 of the ’802 Patent. *See* POR 2–6. Specifically, Patent Owner asserts that “the first and second information are related to one another and part of a greater information package that is transmitted.” *Id.* 3 (citing Ex. 1001, 2:39–41).

Patent Owner’s argument fails at least because it relies on an interpretation of “information” that departs from its plain and ordinary meaning without adequate justification, and Patent Owner did not identify the term for construction. It is well-settled that claims are generally given their plain and ordinary meaning as understood by a POSITA at the time of the alleged invention. *Phillips v. AWH Corp.*, 415 F.3d 1303, 1312–13 (Fed. Cir. 2005). A patentee may act as “his own lexicographer and use terms in a manner other than their ordinary meaning, ***as long as the special definition of the term is clearly stated in the patent specification or file history.***” *Vitronics Corp. v. Conceptronic*, 90 F.3d 1576, 1582 (Fed. Cir. 1996)

(emphasis added). Here, a POSITA would understand that the term “information” simply means data. Ex. 1030 ¶ 10. Yet, Patent Owner improperly seeks to import into the claims that the information be “related to one another and part of a greater information package that is transmitted.” POR 3.

However, there is no support for such a narrow reading. Patent Owner relies on merely two embodiments in the Specification where the “transmitted information comprises a plurality of OFDM symbols” and “the information transmitted is wireless protocols.” *Id.* (citing Ex. 1001, 2:16–20, 2:36–38). Patent Owner’s reasoning is flawed for several reasons. The Federal Circuit has made clear that “although the specification often describes very specific embodiments of the invention, we have repeatedly warned against confining the claims to those embodiments.” *Phillips*, 415 F.3d at 1323 (collecting cases); *Thorner v. Sony Comput. Entm’t Am. LLC*, 669 F.3d 1362, 1366 (Fed. Cir. 2012) (“We do not read limitations from the specification into claims; we do not redefine words. Only the patentee can do that.”). Rather, to deviate from the plain and ordinary meaning, there must be a “clear and explicit statement by the patentee” such that a POSITA “would have to read the specification and conclude that the applicant has clearly disavowed claim scope or has acted as its own lexicographer.” *Thorner*, 669 F.3d at 1368. There is no such statement here.

Patent Owner offers no reason for importing these two specific embodiments into Claim 1. Indeed, other claims of the '802 Patent seem to reflect these particular embodiments. Ex. 1001, 14:25–27 (reciting wireless protocols in Claim 6), 14:33–41 (reciting OFDM in Claim 9). This suggests that Claim 1 is not so limited. *See Phillips*, 415 F.3d at 1324 (noting that the inclusion of a specific limitation in a dependent claim makes it likely that it was not already contained in the independent claim); *Dow Chem. Co. v. United States*, 226 F.3d 1334, 1341–42 (Fed. Cir. 2000) (concluding that an independent claim should be given broader scope than a dependent claim to avoid rendering the dependent claim redundant).

Moreover, to the extent that the Specification offers any insight, the '802 Patent explicitly defines “information” as data. Ex. 1001, 5:60–62 (“**Information (i.e., data)** to be transmitted may be received in a baseband digital system 250, such as a wireless digital baseband processor.” (emphasis added)), 11:30–32 (“In this example, the signals 911 and 912 carry **the same information (data)**.” (emphasis added)); *see Edwards Lifesciences LLC v. Cook Inc.*, 582 F.3d 1322, 1334 (Fed. Cir. 2009) (“As the court correctly reasoned, the specification’s use of ‘i.e.’ signals an intent to define the word to which it refers . . . and that definition was not limited to the embodiment being discussed.”). In fact, the Specification directly contradicts Patent Owner’s proposed reading that the “first information” and “second information” be related. Ex. 1001, 6:7–9 (“The data of the first digital signal and the

data of the second digital [signal] may be *unrelated* data streams or may be data from the same data stream, for example.” (emphasis added)), 9:15–16 (“In one embodiment, the first data may be *unrelated* to the second data.” (emphasis added)). In light of the unambiguous language in the intrinsic evidence, Patent Owner’s attempt to backdoor claim construction for the term “information” fails. Accordingly, “information” should be given its plain and ordinary meaning—that is, data. Ex. 1030 ¶ 10.

This is not the only instance Patent Owner impermissibly seeks to backdoor claim construction. Other such occurrences are addressed with respect to the corresponding arguments. *See infra* Sections II.B.1, II.B.2, II.B.4, II.C.2.

2. Patent Owner’s reliance on a narrower, unsupported construction of “information” fails to overcome Rick under Ground 1.

Based on the plain and ordinary meaning of “information” (*i.e.*, data), Rick discloses every limitation of Claim 1. As to Ground 1, Patent Owner’s only argument for distinguishing Rick is that “merely transmitting on multiple frequencies is not the same as transmitting a related set of information.” POR 4. However, as discussed above, there is no support for reading “information” to require “a related set of information.” *See supra* Section II.A.1. And as explained in the Petition, Rick discloses the “transmission of N CDMA signals,” each of which “may carry *any*

type of data for any service.” Pet. 13–15 (quoting Ex. 1021, 3:19, 3:35–36; Fig. 1) (emphasis added).

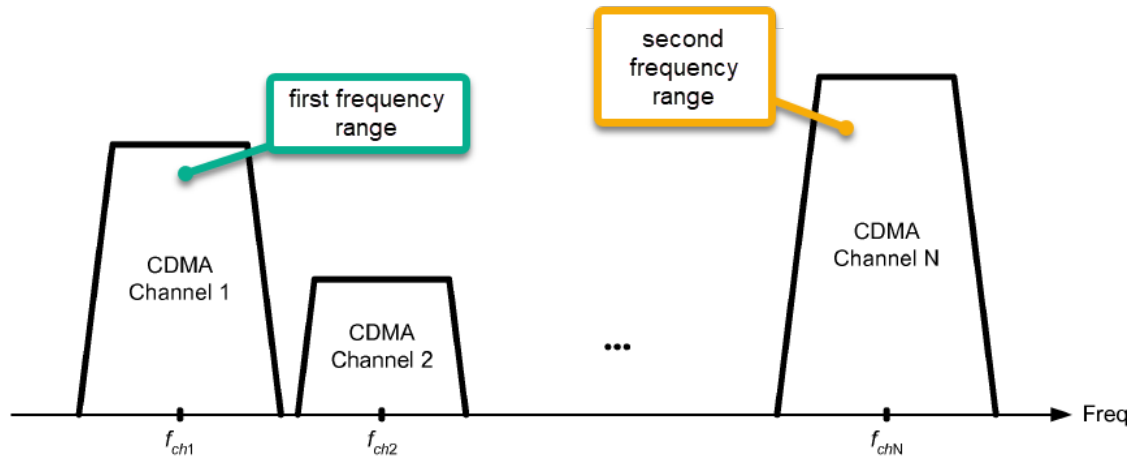


FIG. 1

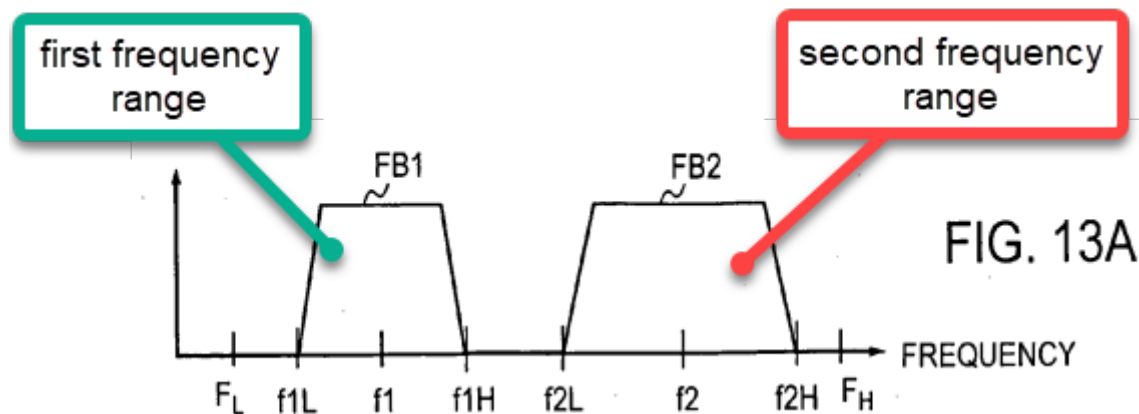
Thus, Rick discloses the steps “transmitting first information” and “simultaneously transmitting second information” in Claim 1 of the ’802 Patent. *Id.* (citing Ex. 1003 ¶¶ 83–84, 88–89). Patent Owner does not dispute any other limitation under Ground 1. Therefore, Claim 1 is rendered obvious by Rick.

B. Patent Owner fails to overcome Suzuki under Grounds 2–5.

1. Suzuki discloses “information.”

For similar reasons, Patent Owner’s related arguments with respect to Ground 2 (Suzuki) also fail. As to Claim 1, Patent Owner states, “But two different businesses with two different wireless systems that send two completely different and unrelated data streams coincidentally at the same time is not the claimed method of transmitting information where that information is sent as a first information and a second information simultaneously.” POR 5. However, Suzuki *does* disclose the

claimed method of transmitting information. The Petition explains that in Suzuki, “[t]he predistorter output combines two predistorted signals from adders 13-1 and 13-2, one of which is the first information and the other is the second information.” Pet. 21 (citing Ex. 1004 ¶ 45).

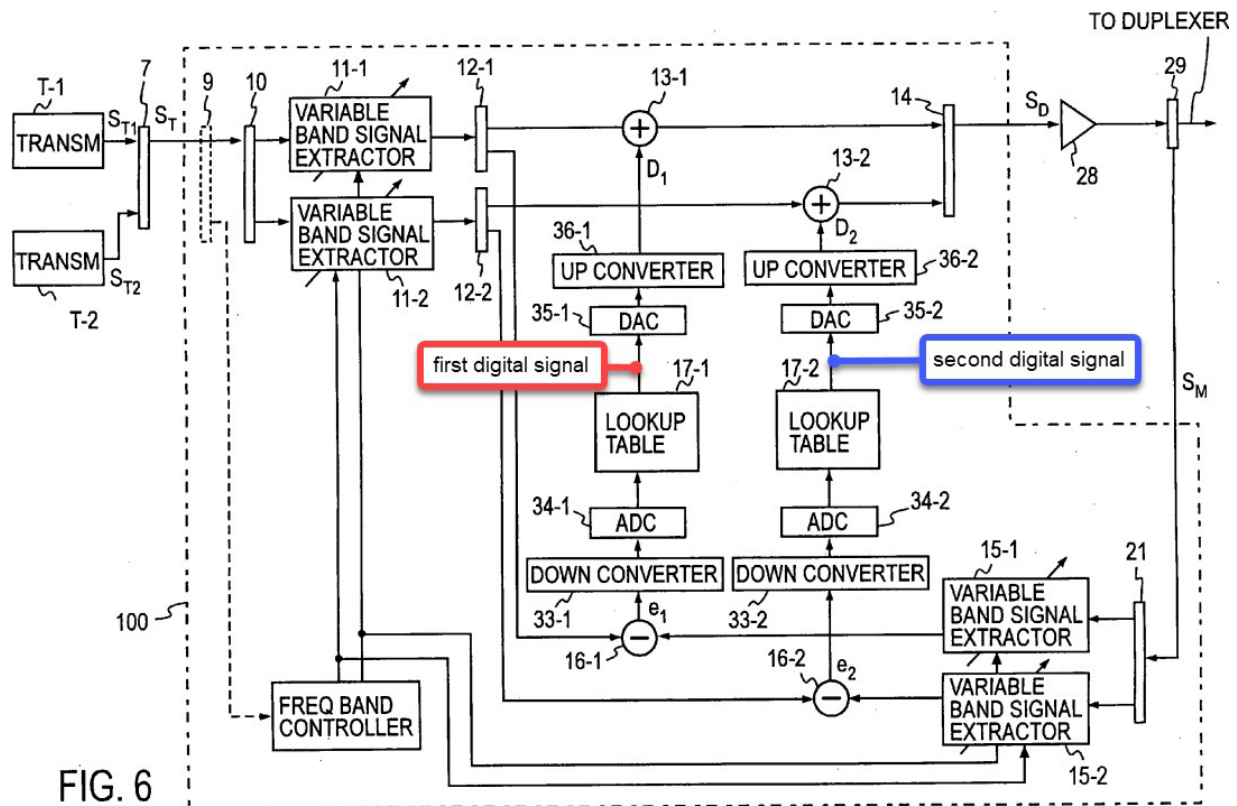


Whether or not Suzuki involves “two completely different and unrelated data streams” is irrelevant to the analysis because, as discussed above, there is no requirement that “information” be limited to “related information.” *See supra* Section II.A.1. Therefore, Suzuki renders obvious Claim 1.

2. Suzuki discloses the “first digital signal comprising first data to be transmitted” and the “second digital signal comprising second data to be transmitted.”

Patent Owner further argues that Suzuki does not disclose “first and second digital signals that contain data ‘to be transmitted,’” referring to limitations in Claims 10 and 17. POR 7. Patent Owner does not dispute that the output of the lookup tables 17-1 and 17-2 are signals. POR 10. Rather, Patent Owner’s dispute is whether the predistorted signals are “digital signals that are either transmitted by the

transmitter or contain ‘data to be transmitted.’” *Id.* As to the former, Patent Owner seems to import into Claims 10 and 17 a requirement that the claims be “transmitted *by the transmitter.*” *Id.* (emphasis added). However, neither Claim 10 nor 17 recites a “transmitter” structure. Ex. 1030 ¶ 11. And as to the latter, Suzuki clearly refers to “distortion compensation *data* D_1 and D_2 .” Ex. 1004 ¶ [0063] (emphasis added). These data are then added to the respective frequency band from signal S_T in order to predistort the output signal, which is then transmitted. *Id.*; Ex. 1003 ¶ 131.



Patent Owner argues that these data are not “transmitted” because “they are cancelled by the distortion caused by the power amplifier when the signal is amplified before transmission.” POR 10. But even if the *effect* is distortion

compensation, Suzuki makes clear that the compensation data is *added* to the respective frequency band via adders 13-1 and 13-2 (*i.e.*, “addition of predistortion”). Ex. 1030 ¶ 12; Ex. 1004 ¶¶ [0047], [0063]. As such, the compensation data, which become part of the output signal, are transmitted. Ex. 1030 ¶ 12. Therefore, Suzuki discloses the “first digital signal comprising first data to be transmitted” and the “second digital signal comprising second data to be transmitted” as recited in Claims 10 and 17.

3. Suzuki discloses the “first up-converted analog signal” and the “second up-converted analog signal.”

Similarly, with respect to Claims 10 and 17, Patent Owner argues that Suzuki does not disclose “two distinct up-converted signals.” POR 11. Notably, Petitioner presented two alternative theories for this limitation: one based on Figure 6 of Suzuki, and one based on Figure 8. Pet. 36–37. Patent Owner does not dispute that Figure 6 discloses this limitation. Rather, Patent Owner focuses on arguing that Figure 8 does not disclose the limitation.

Patent Owner contends that “Suzuki never discloses that its Figure 13A frequency profile applies to the output signal of Figure 8’s predistorter and, in fact, states that Figure 8’s output signal contains a single frequency band, not two frequency bands as shown in Figure 13A.” POR 16. However, Suzuki explains that “it is also possible to arrange such that the power amplifier output monitor signal SM is divided by a divider 20 to the frequency band controller 8 as shown by a

broken line in **FIG. 8** and frequency bands of signals in the frequency bands **FB1** and **FB2** are detected from the monitor signal SM.” Ex. 1004 ¶ [0094] (emphasis added). FB1 and FB2 are elements of Figure 13A. Ex. 1030 ¶ 14. Thus, even using the configuration in Figure 8, the two frequency bands depicted in Figure 13A still apply. *Id.* Furthermore, as previously mentioned, Patent Owner does not dispute that Figure 6 discloses the two up-converted signals. Therefore, under either theory, Suzuki *does* disclose “a first up-converted analog signal” and “a second up-converted analog signal” as recited in Claims 10 and 17.

Accordingly, Claims 10 and 17 are rendered obvious by Suzuki.

4. Suzuki-Chen teaches “the filter receives the first and second down-converted signals.”

As to Claim 24, Patent Owner contends that Suzuki and Chen do not teach “the filter receives the first and second down-converted signals.” POR 23. Patent Owner discusses at length how “the analog outputs of Chen’s down-converters 306 and 310 are *not* received by Chen’s filter.” *Id.* 23–29. Patent Owner’s reasoning is fundamentally flawed.

Patent Owner tries to import into Claim 24 a limitation that the down-conversion must occur before converting to digital signals. POR 25–26. But Claim 24 is silent as to whether the signals are digital or analog, let alone any conversion from analog to digital. Ex. 1030 ¶ 15. Reading in a completely new step—that is, conversion from analog to digital—goes beyond merely construing terms to

ascertain the claim’s meaning. Rather, it would impermissibly import a limitation wholesale from the Specification into the claims. *Id.*; see *Vitronics*, 90 F.3d at 1582 (“[W]e look to the words of the claims themselves, both asserted and nonasserted, to define the scope of the patented invention.”); *Phillips*, 415 F.3d at 1323 (“[T]here is sometimes a fine line between reading a claim in light of the specification, and read a limitation into the claim from the specification.” (quoting *Comark Communs., Inc. v. Harris Corp.*, 156 F.3d 1182, 1186 (Fed. Cir. 1998))); *Deere & Co. v. Bush Hog, LLC*, 703 F.3d 1349, 1354 (Fed. Cir. 2012) (“While claim terms are understood in light of the specification, a claim construction must not import limitations from the specification into the claims.”). Indeed, even if the Specification provides one embodiment describing the invention, the claims of the patent are not necessarily construed as being limited to that embodiment. *Phillips*, 415 F.3d at 1323; *Thorner*, 669 F.3d at 1366 (“It is likewise not enough that the only embodiments, or all of the embodiments, contain a particular limitation. We do not read limitations from the specification into the claims”). Therefore, there is no requirement in Claim 24 that the signals be converted from analog to digital, let alone that that it must happen after down-conversion. Ex. 1030 ¶ 15. Accordingly, as explained in the Petition, Chen teaches that “the filter receives the first and second down-converted signals” as recited in Claim 24. Pet. 71 (citing Ex. 1009, 14:13–15; Ex. 1003 ¶ 220).

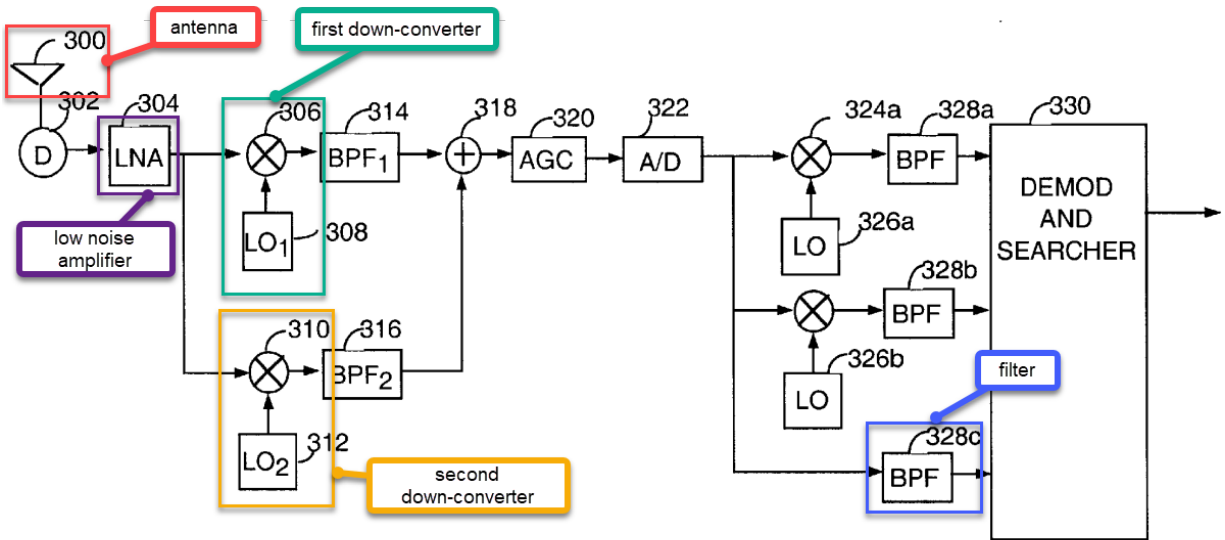


FIG. 6

With respect to Claim 25, which depends from Claim 24, Patent Owner asserts that Petitioner “presents no argument or evidence that the combination of Suzuki and Chen renders that claim obvious.” POR 29. Not so. For Claim 25, the Petition refers to the analysis for Claim 2. Pet. 57. This is because the analysis for Claim 25 would be the same as for Ground 2, Claim 2 by virtue of the claims’ identical language. Ex. 1030 ¶ 16; Pet. 24–25. For ease of reference, Claims 2 and 25 are reproduced side-by-side in the table below (with identical language emphasized).

Claim 2	Claim 25
The method of claim 1 <i>wherein frequency difference between the first center frequency and the second center frequency is greater than the sum of one-half the first frequency range and one-half the second frequency range.</i>	The communication system of claim 24 wherein first signal has a first frequency range and the second signal has a second frequency range, and <i>wherein the frequency difference between the first RF frequency and the second RF frequency is greater than the sum of one-half the first frequency range and one-half the second frequency range.</i>

To the extent Patent Owner complains that Claim 2 does not recite “wherein first signal has a first frequency range and the second signal has a second frequency range,” the “first frequency range” and “second frequency range” limitations are discussed with respect to Ground 2, Claim 1, from which Claim 2 depends. Ex. 1030 ¶ 17; Pet. 18–20. Thus, the analysis for Ground 2, Claim 2 applies to Claim 25, and Patent Owner’s contention that the requirements of Claim 25 were not addressed is demonstrably false. Other than suggesting the analysis was missing, Patent Owner offers no further defense of Claim 25.

Accordingly, Claims 24 and 25 are obvious over Suzuki in view of Chen.

C. Patent Owner fails to overcome the Fernandez-Montojo combinations under Grounds 6–9.

1. A POSITA would be motivated to combine Fernandez and Montojo.

As set forth in the Petition, a POSITA would have been motivated to combine Fernandez’s parallel system for generating a multi-carrier signal with Montojo’s single amplifier that amplifies a multi-carrier signal and single antenna for transmitting the amplified signal. Pet. 75 (citing Ex. 1003 ¶¶ 223–34). Patent Owner’s deficient arguments do not change this conclusion.

Patent Owner disputes whether a POSITA would have been motivated to combine Fernandez and Montojo. POR 36. Specifically, Patent Owner complains

that “Petitioner does not perform any balancing of benefits and drawbacks” and that “Petitioner has not shown Montojo’s priority-based power amplifier would be desirable or even functional in a system such as Fernandez.” *Id.* 37–39. However, Patent Owner’s argument is flawed for several reasons. First, Patent Owner applies the wrong analysis for motivation to combine. Second, Patent Owner’s assertion that Petitioner has not shown Montojo’s amplifier to be “functional” with Fernandez is plainly incorrect. Third, the Petition explains why a POSITA would look beyond the four corners of Fernandez and rely on the solution provided by Montojo.

(i) Motivation to Combine Test

Patent Owner’s vague requirement that a combination be “desirable” confuses the analysis. The Federal Circuit has explained that “[t]here is a motivation to combine when a known technique ‘has been used to improve one device, and a person of ordinary skill in the art would recognize that it would improve similar devices in the same way,’ using the ‘prior art elements according to their established functions.’” *Intel Corp. v. PACT XPP Schweiz AG*, 61 F.4th 1373, 1380–81 (Fed. Cir. 2023) (first quoting *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 417 (2007); and then quoting *Intel Corp. v. Qualcomm Inc.*, 21 F.4th 784, 799–800 (Fed. Cir. 2021)). “[A] patent challenger need only ‘show that there was a known problem’ in the art, that the prior art at issue ‘helped address that issue,’ and that combining the teachings of the prior art references at issue was not beyond the skill of an ordinary

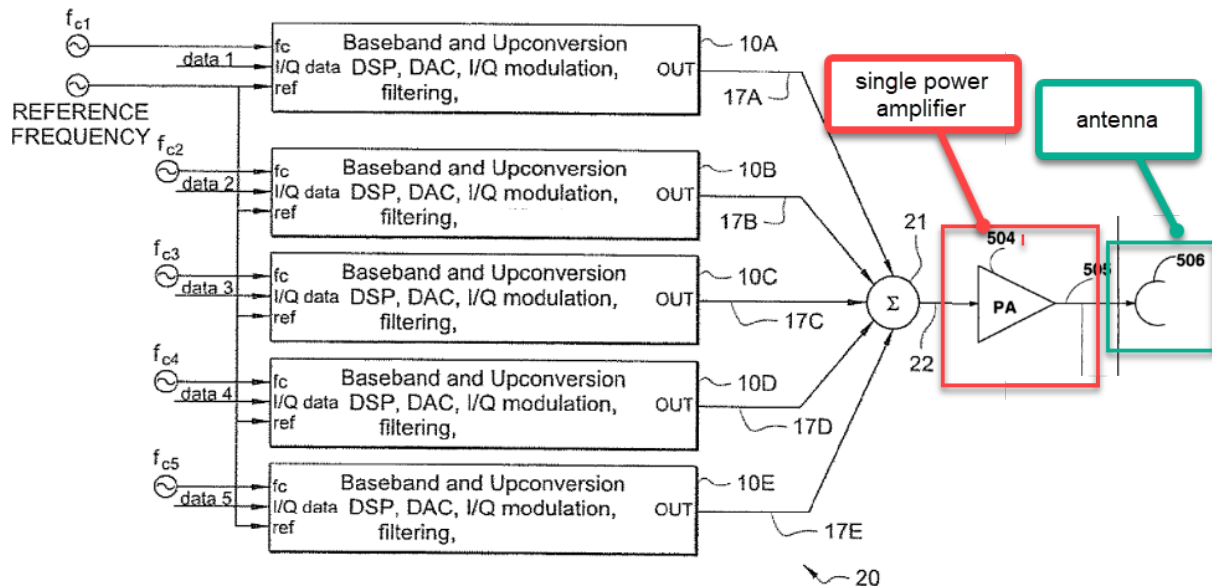
artisan.” *Everstar Merch. Co. Ltd. v. Willis Elec. Co., Ltd.*, No. 2023-1686, 2025 U.S. App. LEXIS 12734, at *8–9 (Fed. Cir. May 27, 2025) (quoting *Intel*, 61 F.4th at 1381).

Following the Federal Circuit’s test, a POSITA would have been motivated to combine Fernandez and Montojo. Montojo addresses a “known problem” in the art that “limitations on space, manufacturing cost, power consumption and other factors dictate the need to share resources among the carriers, including power amplification circuitry.” Ex. 1003 ¶ 236; Ex. 1006 ¶ [0005]. To help address this issue, Montojo teaches a single amplifier that amplifies a multi-carrier signal and single antenna for transmitting the amplified signal. Ex. 1003 ¶ 234; Ex. 1006 ¶ [0042]. Thus, Montojo’s amplifier improves wireless communication systems because it provides well-known benefits by using a single amplifier to amplify a multi-carrier wireless signal, including lower complexity, a single (vs. multiple) potential point of failure, and lower cost. Ex. 1003 ¶¶ 235–236; Ex. 1006 ¶ [0005] (“[I]t would be advantageous to utilize a single power amplifier for transmission of a plurality of carriers transmitted by a multi-carrier terminal.”). Accordingly, a POSITA would recognize that using Montojo’s single amplifier would improve similar devices in the same field (*i.e.*, multi-carrier transmissions), such as those discussed in Fernandez, in the same way. Ex. 1003 ¶¶ 235, 238. Therefore, a POSITA would have been motivated to combine Fernandez and Montojo.

(ii) Reasonable Expectation of Success

Furthermore, contrary to Patent Owner's assertions (POR 37–39), Petitioner *did* explain how the combination is “functional.” As discussed in the Petition, a POSITA would have had a reasonable likelihood of success combining Fernandez and Montojo. Pet. 78–79 (citing Ex. 1003 ¶ 237). For example, the Petition provides a revised version of Figure 2A of Fernandez, which shows one way to modify Fernandez in view of Montojo by removing amplification from each of Fernandez's signal generators and using Montojo's single amplifier and antenna. *Id.*

FIG. 2A



Effectively, Montojo simplifies the multi-carrier system in Fernandez by providing a single line that feeds the signals into a standard amplifier and antenna. Ex. 1030 ¶ 20. Such a solution is straightforward, off-the-shelf technology. *Id.* Thus, combining the references was within the skill of a POSITA.

(iii) *Suitable Option*

Patent Owner also argues that there is no motivation to combine because “Montejo teaches a person of ordinary skill in the art that using a single amplifier has substantial, and potentially impractical, drawbacks.” POR 39. As an initial matter, Patent Owner mischaracterizes the references. The quoted passage from Montejo on which Patent Owner relies discusses how “[i]f a multi-carrier terminal has a single amplifier for simultaneous transmission of *different types* of carrier signals, the power amplifier may be subject to power constraints.” Ex. 1006 ¶ [0007] (emphasis added). Specifically, Montejo explains that if one carrier has priority over another carrier, “it would be desirable to allocate to the [lower priority carrier] only some portion of transmitter power not used by the [higher priority carrier].” *Id.* In other words, the full context of this paragraph—from which Patent Owner cherry-picks a mere sentence fragment—describes a problem involving different priority carriers. Ex. 1030 ¶ 21. Fernandez does not implicate these concerns. *Id.* ¶ 22. For example, Fernandez does not address different priority carriers or different “types” of signals. *Id.* Thus, Patent Owner has not shown there are drawbacks to the combination.

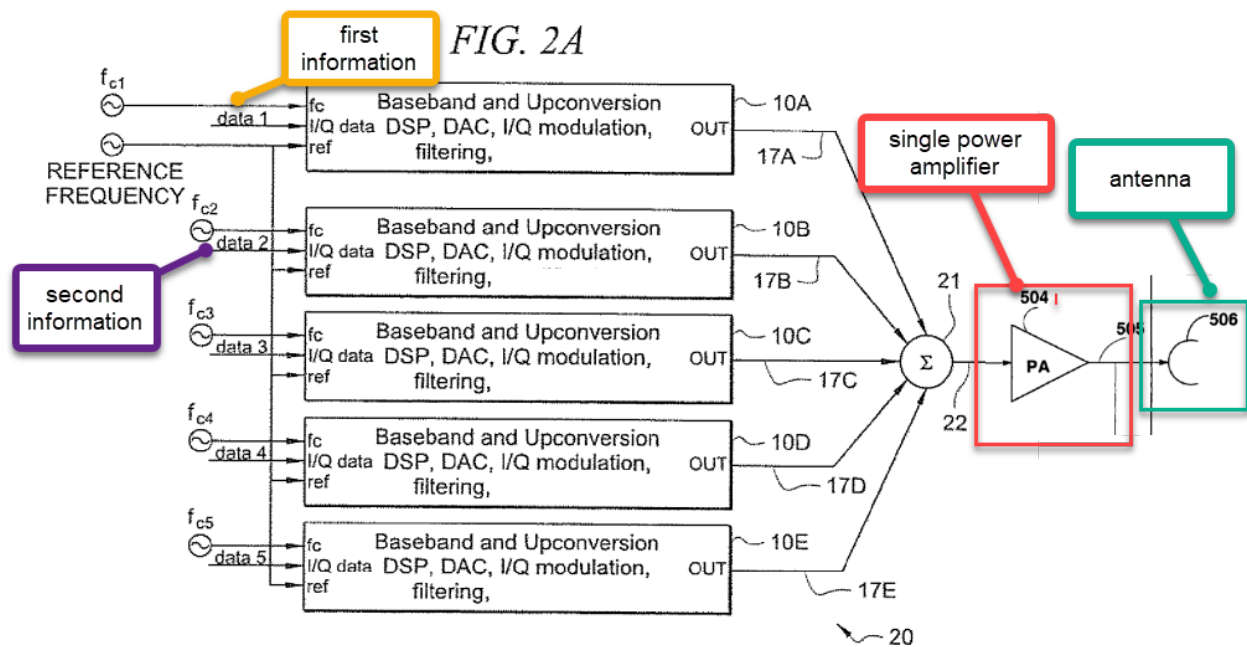
Moreover, even if there were some potential drawback, the mere presence of a drawback does not change the analysis. The Federal Circuit has made it clear that an improvement need not be “categorical” in order to combine references. *Intel*, 61

F.4th at 1381. Rather, Petitioner merely needs to show that Montojo’s amplifier is a “suitable option” to combine with Fernandez’s teachings. *Id.* (quoting *Intel*, 21 F.4th at 800). As discussed above, there are known problems (*e.g.*, space limitations, power consumption) in the art, Montojo’s single amplifier helps address those issues, and combining Fernandez and Montojo is not beyond the skill of a POSITA. “Nothing more is required to show a motivation to combine” *Id.*

Therefore, a POSITA would have been motivated to combine Fernandez and Montojo to teach the limitations of the ’802 Patent under Grounds 6–9.

2. Fernandez-Montojo teaches “information.”

Similar to its flawed arguments for Grounds 1 and 2, Patent Owner argues as to Claim 1, “But there is no disclosure in Fernandez that data 1 and data 2 are related or part of an organized transmission of information.” POR 6. Again, there is no requirement in the ’802 Patent that the information be “related or part of an organized transmission of information.” *See supra* Section II.A.1. Rather, as explained in the Petition, Fernandez discloses transmitting data 1 and data 2 (the recited “first information” and “second information”). Pet. 80–81 (citing Ex. 1005 ¶ 8; Fig. 2A).

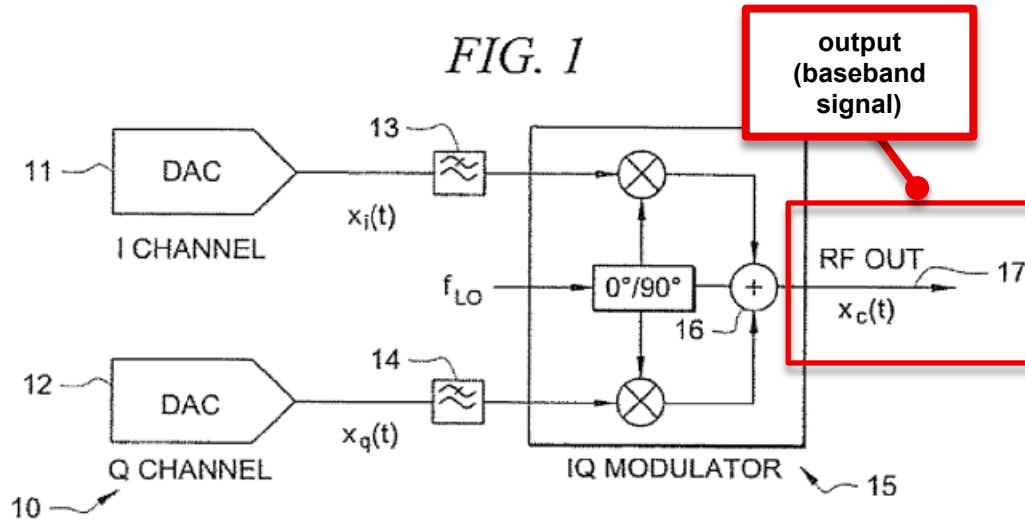


Patent Owner reiterates that there is insufficient motivation to combine Fernandez and Montojo. POR 6, 36. However, as discussed above, a POSITA would have been motivated to combine Fernandez and Montojo. Accordingly, Fernandez-Montojo renders obvious Claim 1.

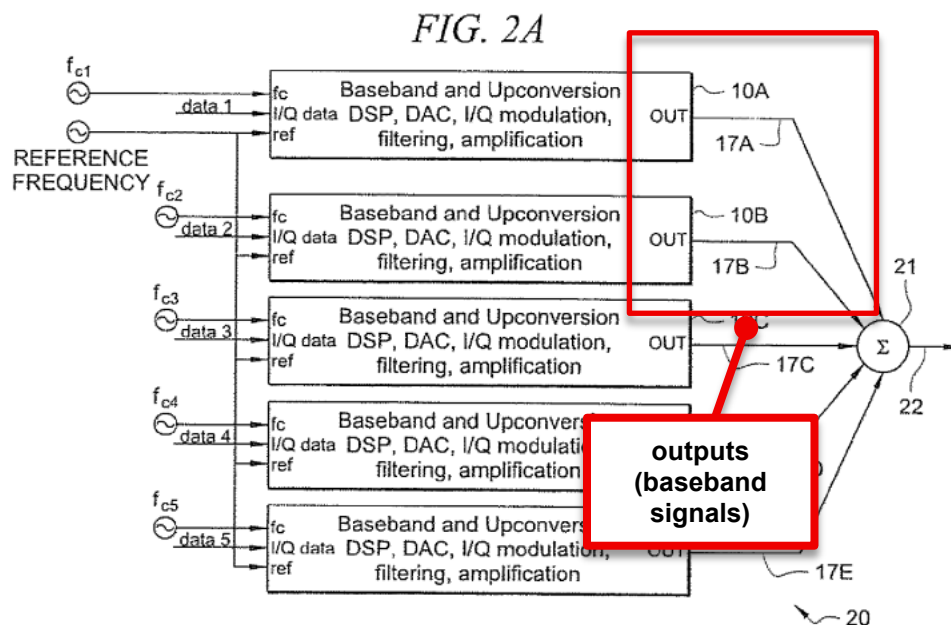
3. Fernandez-Montojo teaches “a baseband digital system for providing a first/second digital signal.”

In the Petition, Petitioner explained that Fernandez discloses the baseband digital system recited in Claim 17. Pet. 97 (citing Ex. 1005 ¶¶ [0006], [0011]). Fernandez provides “a general method . . . to increase a digitally synthesized signal’s bandwidth by frequency interleaving *multiple (i.e., at least 2) digitally synthesized signal sources of narrower bandwidth.*” Ex. 1005 ¶ [0011] (emphasis added). These “signal sources of narrower bandwidth” can be baseband signals. Ex. 1030 ¶ 24; Ex. 1005 ¶ [0006]. Specifically, Fernandez provides that $x_c(t)$ is the

baseband signal. Ex. 1005 ¶ [0006]. The baseband signal is depicted in Fernandez as the output of Figure 1, element 17. Ex. 1030 ¶ 24.

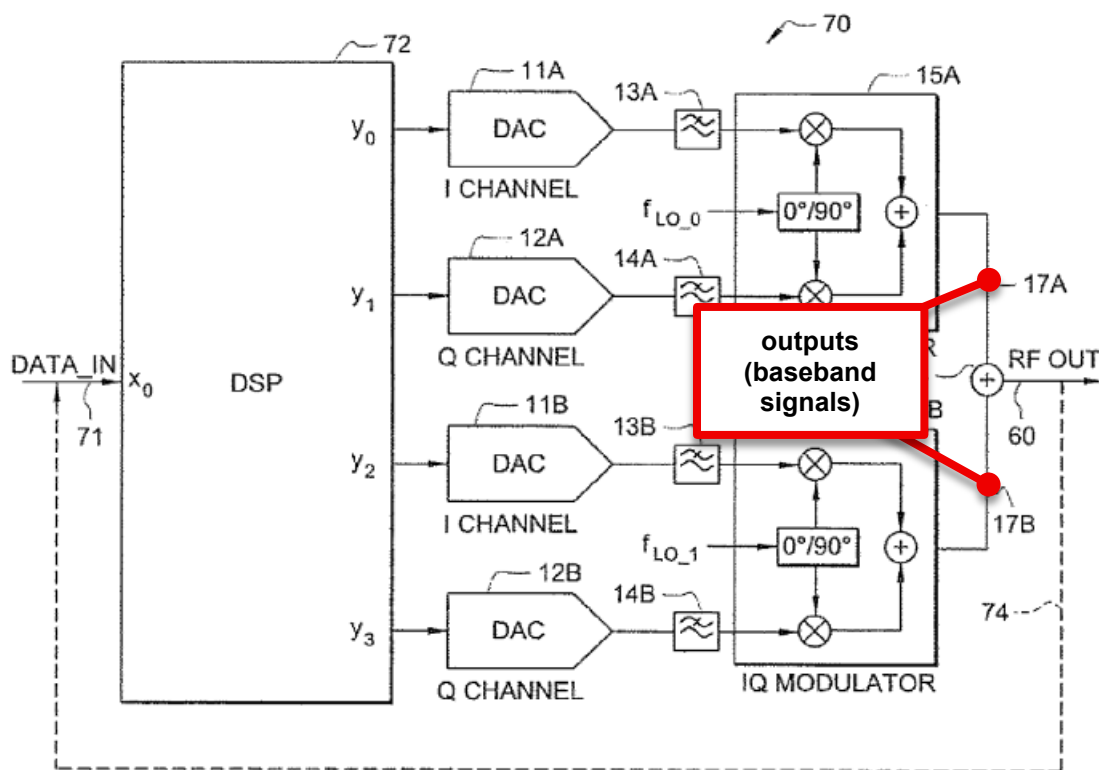


Output 17 of Figure 1 corresponds to similarly numbered elements found in other figures of Fernandez. For example, in Figure 2A, the outputs 17A and 17B are combined by summing circuit 21. Ex. 1030 ¶ 25.



And as Fernandez explains, these outputs (baseband signals) can be *digitally* synthesized for frequency interleaving. Ex. 1030 ¶ 26; Ex. 1005 ¶ [0011]. This is further evidenced with the same outputs 17A and 17B in Figure 7, which expressly uses frequency interleaving. Ex. 1030 ¶ 26; Ex. 1005 ¶ [0079].

FIG. 7



Therefore, as explained in the Petition, Fernandez discloses “a baseband digital system for providing a first/second digital signal” as recited in Claim 17 of the ’802 Patent.

Patent Owner takes issue with these citations. But instead of addressing the argument as a whole, Patent Owner targets each citation individually and out of

context. In doing so, Patent Owner once again mischaracterizes the reference. For example, Patent Owner discredits paragraph [0006] of Fernandez because “it discloses the mathematical formula for representing the baseband signal.” POR 32. However, as explained above, paragraph [0006] links the “baseband signal” output 17 with the corresponding “digitally synthesized signal sources of narrower bandwidth” discussed in paragraph [0011]. Ex. 1030 ¶¶ 24–26, 28.

Next, Patent Owner seems to argue that paragraph [0011] of Fernandez should not be considered simply because Petitioner also cites paragraphs from the background of Fernandez. POR 34. Patent Owner complains that Petitioner “relies exclusively upon Fernandez’s discussion of admitted prior art for all other claim limitations” and that this means “Petitioner does not rely on Fernandez’s present invention.” *Id.* This argument is illogical for several reasons. First, Petitioner *does* rely on Fernandez’s present invention, at least because the Petition *cites* it. *See, e.g.*, Pet. 97 (citing Ex. 1005 ¶ [0011]). That Petitioner also cites the background of Fernandez should not bar it from also citing the invention itself. Under Patent Owner’s absurd rule, anyone reading the prior art would have to divorce the teachings in the background section from anything taught in the rest of the disclosure. But the background is intimately linked to the invention itself. Ex. 1030 ¶ 30; *see also* Manual of Patent Examining Procedure § 608.01(c) (8th ed. Rev. 6, 2007) (providing that the “Background of the Invention” should include the

“problems involved in the prior art which are solved by the applicant’s invention”). Indeed, in the present case, a POSITA reading Fernandez would understand that Fernandez sets out what existed in its prior art and then develops a system to improve on the same. Ex. 1030 ¶ 30. Thus, a POSITA can consider both what Fernandez represents as the prior art and how Fernandez’s invention innovated over the prior art.

Patent Owner’s restrictive rule not only defies common sense but also has no basis in law. Patent Owner cites no legal authority in support of its strange requirement. On the contrary, case law expressly allows the Board to consider any “claimed and unclaimed materials disclosed in a patent” and “prior art publications” because they are “presumptively enabled.” *Uniqure Biopharma B.V. v. Pfizer Inc.*, No. 2023-1404, 2025 U.S. App. LEXIS 12420, at *19–20 (Fed. Cir. May 22, 2025) (quoting *In re Antor Media Corp*, 689 F.3d 1282, 1288 (Fed. Cir. 2012)). This is the case “even if only the background section provides the enabling disclosure.” *Callicrate v. Wadsworth Mfg.*, 427 F.3d 1361,1374 (Fed. Cir. 2005).

Therefore, Fernandez (and by extension, Fernandez-Montojo) renders obvious Claim 17.

4. Fernandez-Montojo in view of Chen teaches “the filter receives the first and second down-converted signals.”

As explained above, Chen *does* disclose “the filter receives the first and second down-converted signals” as recited in Claim 24. *See supra* Section II.B.4.

Patent Owner does not provide any other substantive arguments for why Chen does not disclose this feature. Instead, Patent Owner’s attack for Ground 8, Claim 24 is about the combination of Fernandez, Montojo, and Chen. POR 42.

As set forth in the Petition, it would have been obvious to combine the Fernandez-Montojo transmitter with Chen’s receiver for the same reasons discussed in Ground 4. Pet. 101 (citing Ex. 1003 ¶ 299). In Ground 4, the Petition explains that a POSITA would have been motivated to combine Suzuki and Chen so that Chen’s receiver receives the multi-carrier signal from Suzuki’s transmitter. *Id.* 57. Specifically, wireless communications receivers provide well-known benefits and features (*e.g.*, low noise amplifier, down-converter, filter) that would have motivated a POSITA to incorporate Chen’s receiver into Suzuki. *Id.* 57–58 (citing Ex. 1003 ¶ 188). Turning to Ground 8, the Petition cross-references this discussion from Ground 4 because it explains the benefits of combining a receiver with a transmitter, and Fernandez-Montojo’s transmitter does not change the analysis. Ex. 1030 ¶ 32.

Patent Owner argues that the Petitioner relies on hindsight, focusing heavily on the language “*including the benefits* (and necessity) of the convention[al] low noise amplifier, downconverters, and filter *claimed in claims 14 and 24.*” POR 42 (emphasis in original). However, Patent Owner misreads the Petition’s analysis. Notably, Patent Owner does not challenge the motivation to combine Chen and Suzuki. Thus, Patent Owner does not dispute that Chen’s receiver provides the

benefits described under Ground 4. As discussed above, the benefits that a receiver (like that described in Chen) provides to a transmitter (like that described in Suzuki) include a low noise amplifier, a down-converter, and a filter. These are specific features recited in Claims 14 and 24 and, thus, provide the same benefits. Pet. 57; Ex. 1030 ¶ 34. The above quote from the Petition reflects the connection between the benefits of Chen and the corresponding language in the claims. Therefore, Petitioner did not rely on hindsight to combine Chen with Fernandez-Montojo. Rather, as explained in the Petition, a POSITA would have been motivated to combine Fernandez, Montojo, and Chen to achieve the benefits of Chen's receiver with Fernandez-Montojo's transmitter.

Accordingly, Fernandez-Montojo-Chen renders obvious Claim 24.

III. CONCLUSION

For the foregoing reasons, Petitioner respectfully requests that the Board hold that Claims 1–4, 6–10, 13, 14, 17, and 21–25 of the '802 Patent are invalid.

Date: September 5, 2025

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CERTIFICATE OF SERVICE

The undersigned hereby certifies that the above document was served on September 5, 2025, by filing this document through the Patent Trial and Appeal Case Tracking System (P-TACTS) as well as delivering a copy via electronic mail upon the following attorneys of record for the Patent Owner:

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CERTIFICATE OF COMPLIANCE

Pursuant to 37 C.F.R the undersigned hereby certifies that this reply complies with the type-volume limitation of 37 C.F.R. § 42.24 because this reply contains 5,048 words, excluding the parts of the brief exempted by 37 CFR § 42.24(a).

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