

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Qualcomm Incorporated,
Petitioner,

v.

Cobblestone Wireless LLC,
Patent Owner.

Case IPR2024-01336
Patent 7,924,802

**SUPPLEMENTAL DECLARATION OF KEVIN C. ALMEROTH, PH.D.
IN SUPPORT OF
PETITION FOR INTER PARTES REVIEW OF
UNITED STATES PATENT NO. 7,924,802**

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I. INTRODUCTION

1. As set forth in my initial Declaration (Ex. 1003), I have been retained by Qualcomm Incorporated (“Petitioner”) as an independent expert consultant in this proceeding before the United States Patent and Trademark Office (“PTO”) against Cobblestone Wireless, LLC (“Patent Owner”) regarding U.S. Patent No. 7,924,802 (“the ’802 patent”) (Ex. 1001). I have been asked to review Patent Owner’s Response, as well as the exhibits thereto, and submit this Supplemental Declaration on behalf of Petitioner.

2. I incorporate by reference my opening declaration (Ex. 1003, “Opening Decl.”) in its entirety.

3. All of my opinions stated in this Supplemental Declaration are based on my own personal knowledge and professional judgment. I am over 18 years of age and, if I am called upon to do so, I would be competent to testify as to the matters set forth in this Supplemental Declaration.

II. MATERIALS REVIEWED

4. The opinions contained in this Supplemental Declaration are based on the documents I reviewed, my professional judgment, as well as my education, experience, and knowledge.

5. In forming my opinions expressed in this Supplemental Declaration, I also reviewed the following materials and information:

Exhibit No.	Description
1001	U.S. Patent No. 7,924,802
1002	Prosecution History of the '802 patent
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)

Exhibit No.	Description
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

Exhibit No.	Description
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
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)

Exhibit No.	Description
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

6. I also reviewed other materials I refer to in this Supplemental Declaration in support of my opinions.

7. My opinions contained in this Supplemental Declaration are based on the documents I reviewed and my knowledge and professional judgment. My opinions have also been guided by my appreciation of how a person of ordinary skill in the art would have understood the state of the art, the prior art, and the claims and the specification of the '802 patent at the time of the alleged invention.

III. RESPONSE TO DR. COOKLEV'S DECLARATION AND PATENT OWNER'S RESPONSE

A. The plain and ordinary meaning of "information" is data.

8. Based on my review of Dr. Cooklev's declaration and Patent Owner's Response, while Patent Owner does not explicitly offer constructions, Patent Owner's arguments rely on interpretations of claim terms that go well beyond their plain and ordinary meaning. Further, Patent Owner's proposed interpretations lack support in the intrinsic evidence.

9. Patent Owner relies on 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).

10. However, Patent Owner's interpretation of "information" departs from the plain and ordinary meaning of the term. At the time of the alleged invention, a POSITA would understand that the term "information" means data. This understanding is further supported in the intrinsic evidence, for example, in passages from the Specification that explicitly define "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)). Thus, contrary to Patent Owner’s assertions, I disagree that information must be “related to one another and part of a greater information package that is transmitted.” POR 3. Rather, “information” should be given its plain and ordinary meaning—that is, data.

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

11. I understand that Patent Owner 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. Specifically, Patent Owner disputes whether the predistorted signals are “digital signals that are either transmitted by the transmitter or contain ‘data to be transmitted.’” *Id.* 10. 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. Thus, a POSITA at the time of the alleged invention would not read in that the first and second data be “transmitted by the transmitter” when there is no recitation of a transmitter.

12. Furthermore, Patent Owner argues that the distortion compensation data in Suzuki 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. 1004 ¶¶ [0047], [0063]. As such, the compensation data, which become part of the output signal, are transmitted. Therefore, I maintain that 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. *See, e.g.*, Ex. 1003 ¶ 131.

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

13. Similarly, with respect to Claims 10 and 17, Patent Owner argues that Suzuki does not disclose “two distinct up-converted signals.” POR 11. I note that I presented two alternative theories for this limitation: one based on Figure 6 of Suzuki, and one based on Figure 8. Ex. 1003 ¶¶ 138–39. 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.

14. 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. Thus, a POSITA would understand that even using the configuration in Figure 8, the two frequency bands depicted in Figure 13A still apply. 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.

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

15. 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. However, this argument relies on importing 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. Thus, contrary to Patent Owner’s assertions, a POSITA would not read Claim 24 to require a conversion from analog to digital or that it must happen after down-conversion.

16. 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. I disagree. For Claim 25, the Petition refers to the analysis for Claim 2. Pet. 57. Based on the identical language, the analysis for Claim 25 would be the same as for Ground 2, Claim 2. Pet. 24–25. For ease of reference, Claims 2 and 25 are reproduced side-by-side in the table below (with identical language emphasized).

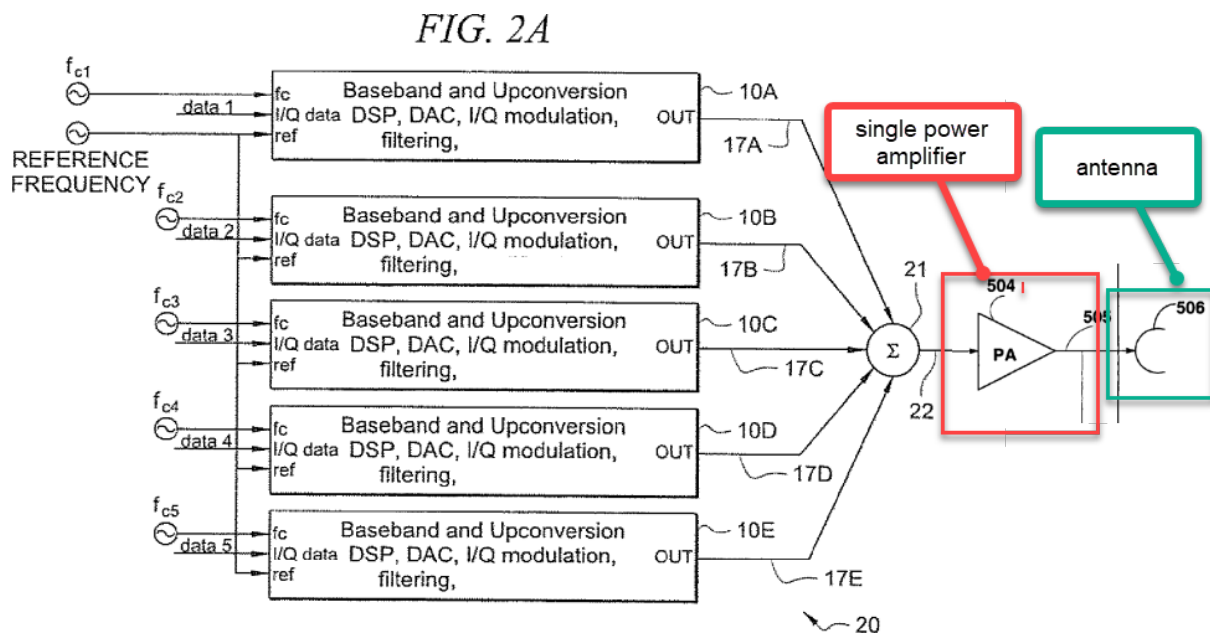
Claim 2	Claim 25
The method of claim 1 <i>wherein frequency difference between the first center frequency and the second center frequency is greater than the sum of one-half the first frequency range and one-half the second frequency range.</i>	The communication system of claim 24 wherein first signal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

17. To the extent Patent Owner argues 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. Thus, the analysis for Ground 2, Claim 2 applies to Claim 25.

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

18. Patent Owner disputes whether a POSITA would have been motivated to combine Fernandez and Montojo. POR 36. I disagree. As set forth in my Original Declaration, 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.

19. Furthermore, I explained how the combination is “functional.” As discussed in my Original Declaration, a POSITA would have had a reasonable likelihood of success combining Fernandez and Montojo. Ex. 1003 ¶ 237. For example, I provided 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.*



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

21. Patent Owner also argues that there is no motivation to combine because “Montojo teaches a person of ordinary skill in the art that using a single

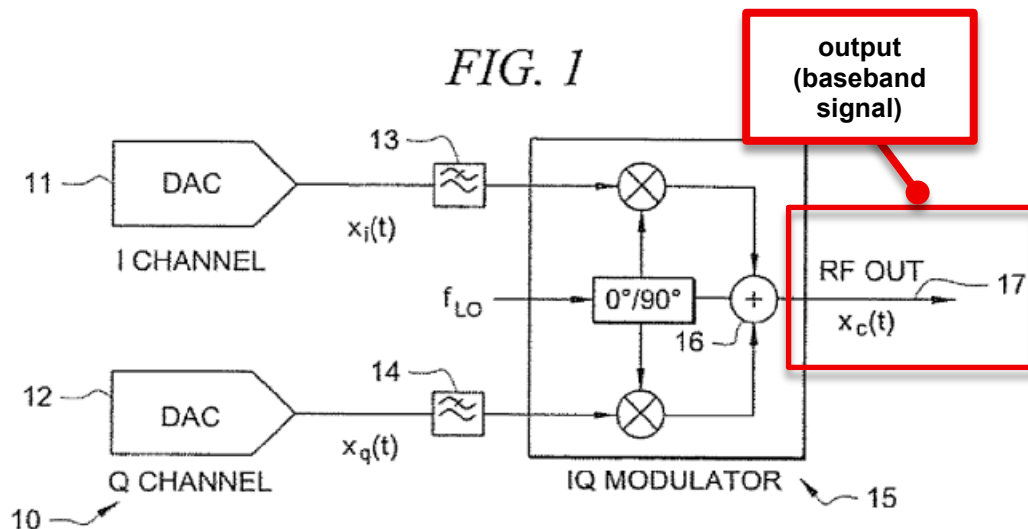
amplifier has substantial, and potentially impractical, drawbacks.” POR 39. I disagree with Patent Owner’s characterization of the references. The quoted passage from Montojo on which Patent Owner relies discusses how “[i]f a multi-carrier terminal has a single amplifier for simultaneous transmission of *different types* of carrier signals, the power amplifier may be subject to power constraints.” Ex. 1006 ¶ [0007] (emphasis added). Specifically, Montojo 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 Montojo describes a problem involving different priority carriers.

22. Fernandez does not implicate these concerns from Montojo. For example, Fernandez does not address different priority carriers or different “types” of signals. *Id.* Thus, in my opinion, Patent Owner has not shown there are drawbacks to the combination.

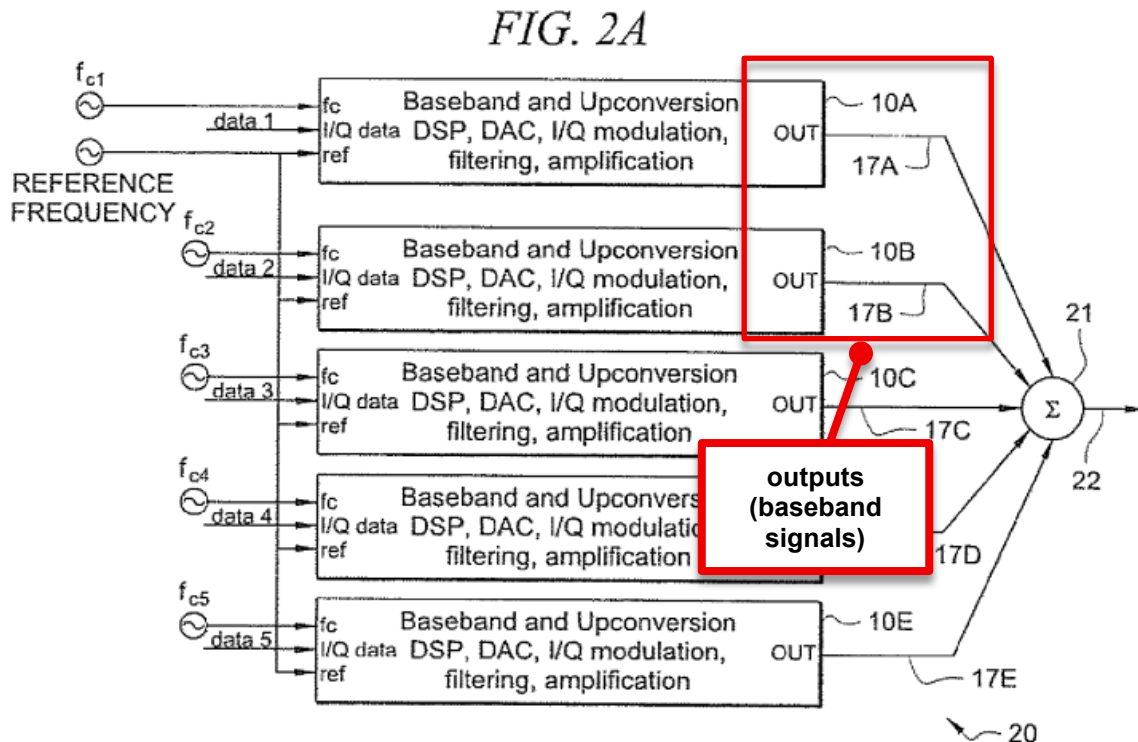
23. Therefore, I maintain that Montojo’s amplifier is a “suitable option” to combine with Fernandez’s teachings and that a POSITA would have been motivated to combine Fernandez and Montojo.

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

24. In my Original Declaration, I explained that Fernandez discloses the baseband digital system recited in Claim 17. Ex. 1003 ¶ 280 (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). A POSITA would understand that the “signal sources of narrower bandwidth” discussed in the above passage from Fernandez can be baseband signals. 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.

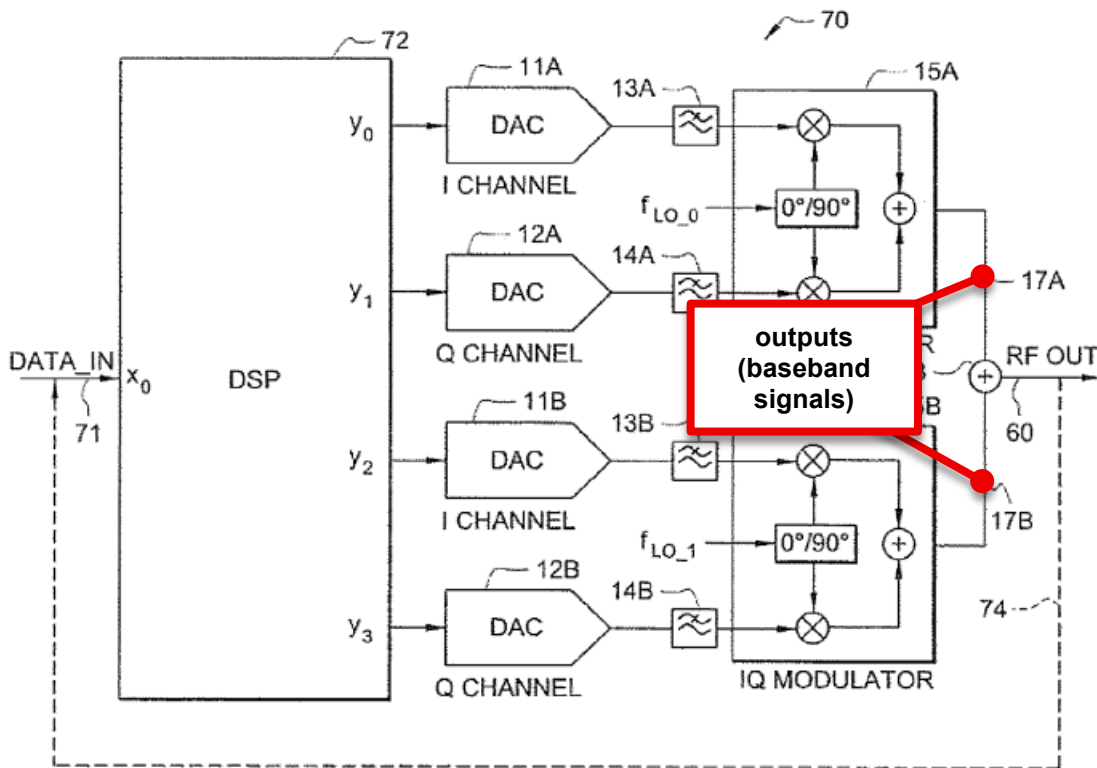


25. Output 17 of Figure 1 corresponds to similarly numbered elements found in other figures of Fernandez. For example, in Figure 2A, the outputs 17A and 17B are combined by summing circuit 21.



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

FIG. 7



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

28. Patent Owner discredits paragraph [0006] of Fernandez because “it discloses the mathematical formula for representing the baseband signal.” POR 32.I disagree with Patent Owner’s characterization of the reference. 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].

29. Patent Owner next 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 argues that because 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.” POR 34. I disagree. Petitioner *does* rely on Fernandez’s present invention, at least because the Petition *cites* to it. *See, e.g.*, Pet. 97 (citing Ex. 1005 ¶ [0011]); *see also* Ex. 1003 ¶ 280 (citing the same).

30. Furthermore, the background of the invention is intimately linked to the invention itself. 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”). 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. Thus, a POSITA can consider both what Fernandez represents as the prior art and how Fernandez’s invention innovated over the prior art.

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

31. As I previously explained, Chen *does* disclose “the filter receives the first and second down-converted signals” as recited in Claim 24. *See supra* ¶ 15; *see also* Ex. 1003 ¶ 220. Patent Owner now disputes the combination of Fernandez, Montojo, and Chen. POR 42.

32. As set forth in my Original Declaration, it would have been obvious to combine the Fernandez-Montojo transmitter with Chen’s receiver for the same reasons discussed in Ground 4. Ex. 1003 ¶ 299. In Ground 4, I explain 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.* ¶ 188. 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.* Turning to Ground 8, I cross-reference this discussion from Ground 4 because I had already explained the benefits of combining a receiver with a transmitter. It is the same analysis for using Fernandez-Montojo’s transmitter with Chen’s receiver.

33. Patent Owner argues that I relied 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). In my opinion, Patent Owner is misreading my analysis. I note that 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.

34. 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. The above quote from my Original Declaration reflects the connection between the benefits of Chen and the corresponding language in the claims.

35. Therefore, I did not rely on hindsight to combine Chen with Fernandez-Montojo. Rather, as explained in my Original Declaration, 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. Ex. 1003 ¶ 299.

36. Accordingly, I maintain that Fernandez-Montojo-Chen teaches "the filter receives the first and second down-converted signals."

IV. CONCLUSION

37. I hereby declare that all statements made of my own knowledge are true and that all statements made on information and belief are believed to be true. I further declare that these statements were made with the knowledge that willful false

statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of the Title 18 of the United States Code and that such willful false statements may jeopardize the validity of this proceeding.

Executed on this September 5, 2025 by:



Kevin C. Almeroth, Ph. D.