

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

CISCO SYSTEMS, INC.,
Petitioner,

v.

XR COMMUNICATIONS, LLC d/b/a VIVATO TECHNOLOGIES,
Patent Owner.

Case IPR2018-00762
Patent 6,611,231 B2

Before BARBARA A. PARVIS, TERRENCE W. McMILLIN, and
JAMES J. MAYBERRY, *Administrative Patent Judges*.

McMILLIN, *Administrative Patent Judge*.

FINAL WRITTEN DECISION
Inter Partes Review
35 U.S.C. § 318(a) and 37 C.F.R. § 42.73

I. INTRODUCTION

Cisco Systems, Inc. (“Petitioner”) filed a Petition (Paper 2, “Pet.”) to institute an *inter partes* review of claims 1–9 and 12 of U.S. Patent No. 6,611,231 B2 (Ex. 1001, “the ’231 patent”). XR Communications LLC d/b/a Vivato Technologies (“Patent Owner”) filed a Preliminary Response (Paper 8, “Prelim. Resp.”). We instituted this review. Paper 10 (“Inst. Dec.”).

Subsequent to institution, Patent Owner filed a Patent Owner Response. Paper 17 (“Resp.”). Petitioner filed a Reply. Paper 25 (“Reply”). Patent Owner filed a Sur-Reply. Paper 32 (“Sur-Reply”). Petitioner filed a Sur-Sur-Reply. Paper 39 (“Sur-Sur-Reply”). An oral argument was held on June 18, 2019, and a transcript was entered. Paper 42 (“Tr.”).

Patent Owner has also filed a Motion to Strike directed against new arguments and evidence presented in the Reply. Paper 27 (“Motion to Strike”). Petitioner filed an opposition to the Motion to Strike. Paper 30. Patent Owner filed a Reply in Support of its Motion to Strike. Paper 31.

This Final Written Decision is entered pursuant to 35 U.S.C. § 318(a) and 37 C.F.R. § 42.73. For the reasons that follow, Petitioner has not established by a preponderance of the evidence that any of the challenged claims of the ’231 patent are unpatentable.

A. *Related Matters*

The parties indicate that the ’231 patent has been asserted in the following litigations:

XR Communications, LLC d/b/a Vivato Technologies v. ARRIS International plc, 8-18-cv-00192 (C.D. Cal.), filed February 2, 2018; *XR Communications, LLC d/b/a Vivato Technologies v. Aruba Networks, Inc.*, 2-17-cv-02945 (C.D. Cal.), filed April 19, 2017; *XR Communications, LLC d/b/a Vivato Technologies v. Newo Corp. d/b/a Amped Wireless*, 5-17-cv-00744 (C.D. Cal.), filed April 19, 2017; *XR Communications, LLC d/b/a Vivato Technologies v. ASUS Computer International*, 2-17-cv-02948 (C.D. Cal.), filed April 19, 2017; *XR Communications, LLC d/b/a Vivato Technologies v. Cisco Systems, Inc.*, 2-17-cv-02951 (C.D. Cal.), filed April 19, 2017; *XR Communications, LLC d/b/a Vivato Technologies v. Extreme Networks, Inc.*, 2-17-cv-02953 (C.D. Cal.), filed April 19, 2017; *XR Communications, LLC d/b/a Vivato Technologies v. NETGEAR, Inc.*, 2-17-cv-02959 (C.D. Cal.), filed April 19, 2017; *XR Communications, LLC d/b/a Vivato Technologies v. Ruckus Wireless, Inc.*, 2-17-cv-02961 (C.D. Cal.), filed April 19, 2017; *XR Communications, LLC d/b/a Vivato Technologies v. Ubiquiti Networks, Inc.*, 2-17-cv-02968 (C.D. Cal.), filed April 19, 2017; *XR Communications, LLC d/b/a Vivato Technologies v. Belkin International, Inc.*, 8-17-cv-00674 (C.D. Cal.), filed April 13, 2017; *XR Communications, LLC d/b/a Vivato Technologies v. D-Link Systems, Inc.*, 8-17-cv-00596 (C.D. Cal.), filed April 3, 2017; and *XR Communications, LLC d/b/a Vivato Technologies v. Xirrus, Inc.*, 3-17-cv-00675 (C.D. Cal.), filed April 3, 2017. Pet. 8–9; Paper 5, 2–4.

The '231 patent was also challenged in IPR2018-00701 and IPR2018-01016. A Decision Denying Institution of *Inter Partes* Review (Paper 10) was entered in IPR2018-00701 on August 27, 2018. A Decision Denying

Institution of *Inter Partes* Review (Paper 17) was entered in IPR2018-01016 on October 31, 2018.

B. The '231 Patent

The '231 patent is titled, “Wireless Packet Switched Communication Systems and Networks Using Adaptively Steered Antenna Arrays.” Ex. 1001, (54). The described apparatus “includes an adaptive antenna that is configurable to receive a transmission signal from a transmitter and in response transmit corresponding outgoing multi-beam electromagnetic signals exhibiting a plurality of selectively placed transmission peaks and transmission nulls within a far field region of a coverage area.” *Id.* at (57) (Abstract). Figure 2 of the '231 patent is reproduced below.

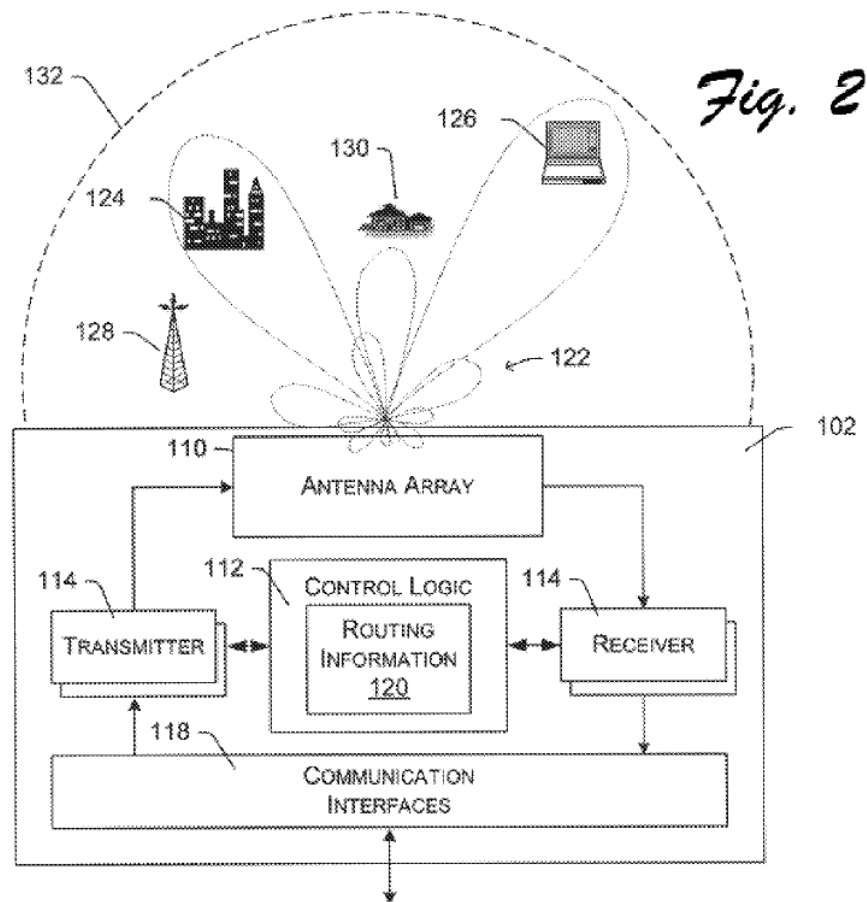


Figure 2 depicts a “wireless routing device 102 having an adaptive antenna comprising an antenna array 110 and control logic 112.” *Id.* at 7:1–3.

Control logic 112, which includes routing information 120 and the antenna array, is coupled to a receiver and transmitter. *Id.* at 7:3–7. The lobes of multibeam pattern 122 emanate from antenna array 110. *Id.* at 7:15–16.

Transmission peaks “illuminate buildings 124 and a mobile user 126 with transmitted energy” and transmission nulls “to not significantly illuminate an external transmitter 128 and a residence 130.” *Id.* at 7:16–20.

C. Illustrative Claim

Petitioner challenges claims 1–9 and 12 of the '231 patent. Pet. 7–8. Claim 1 is the only challenged independent claim. Claims 2–9 and 12 depend directly or indirectly from claim 1. Independent claim 1, reproduced below, is illustrative of the claimed subject matter:

1. An apparatus for use in a wireless routing network, the apparatus comprising:
 - an adaptive antennas;
 - at least one transmitter operatively coupled to said adaptive antenna;
 - at least one receiver operatively coupled to said adaptive antenna;
 - control logic operatively coupled to said transmitter and configured to cause said at least one transmitter to output at least one transmitter signal to said adaptive antenna to transmit corresponding outgoing multibeam electromagnetic signals exhibiting a plurality of selectively placed transmission peaks and transmission nulls within a far field region of a coverage area based on routing information; and
 - search receiver logic operatively coupled to said control logic and said at least one receiver and *configured to update said routing information based at least in part on cross-correlated*

signal information that is received by said receiver using said adaptive antenna.

Ex. 1001, 29:6–26 (disputed limitation emphasized).

D. Cited Art

Petitioner relies on the following prior art:

U.S. Patent No. 6,597,678 B1, filed July 30, 1999 (“Kuwahara”) (Ex. 1005);

U.S. Patent No. 7,031,266 B1, filed February 25, 2000 (“Patel”) (Ex. 1006);

Simon C. Swales et al., *The Performance Enhancement of Multibeam Adaptive Base-Station Antennas for Cellular Land Mobile Radio Systems*, 39 IEEE Transactions on Vehicular Technology 1 (1990) (“Swales”) (Ex. 1017);

U.S. Patent No. 6,169,759 B1, issued January 2, 2001 (“Kanterakis”) (Ex. 1009);

IEEE Standard 802.11-1997, *Wireless LAN Medium Access Control (MAC) and Physical Layer (PHY) Specifications*, Institute of Electrical and Electronics Engineers (1997) (“IEEE 802.11-1997”) (Ex. 1011); and

U.K. Patent Application GB 2,349,045 A, published October 18, 2000 (“Khalab”) (Ex. 1008).

The earliest priority date claimed for the ’231 patent is April 27, 2001. There is no dispute that the cited art qualifies as prior art.

E. Asserted Grounds of Unpatentability

Petitioner challenges claims 1–9 and 12 of the ’231 patent on the following grounds:

Claims 1, 3–6, 9, and 12 as obvious under 35 U.S.C. § 103¹ in view of Kuwahara, Patel, and Swales;

Claim 2 as obvious under 35 U.S.C. § 103 in view of Kuwahara, Patel, Swales, and Kanterakis;

Claim 2 as obvious under 35 U.S.C. § 103 in view of Kuwahara, Patel, Swales, and IEEE 802.11-1997; and

Claims 5–8 as obvious under 35 U.S.C. § 103 in view of Kuwahara, Patel, Swales, and Khalab. Pet. 22.

II. ANALYSIS

The dispute between the parties relates to the last limitation of independent claim 1, which is “configured to update said routing information based at least in part on cross-correlated signal information that is received by said receiver using said adaptive antenna” (the “cross-correlated limitation”). Reply 5 (“The only dispute is whether Kuwahara teaches [the cross-correlated limitation].”). The only limitation discussed in the Patent Owner Response is the cross-correlated limitation. *See generally* Resp. Our consideration of the issues relating to the cross-correlated limitation is dispositive. Thus, we limit our discussion to those issues and the cross-correlated limitation.

¹ The Leahy-Smith America Invents Act, Pub. L. No. 112-29, 125 Stat. 284 (2011) (“AIA”), amended 35 U.S.C. § 103. Because the ’231 patent has an effective filing date before the effective date of the applicable AIA amendment, we refer to the pre-AIA version of 35 U.S.C. § 103.

A. Legal Standards

A patent claim is unpatentable under 35 U.S.C. § 103 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 ordinary skill in the art; and (4) objective evidence of nonobviousness.² *Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966).

“In an [*inter partes* review], the petitioner has the burden from the onset to show with particularity why the patent it challenges is unpatentable.” *Harmonic Inc. v. Avid Tech., Inc.*, 815 F.3d 1356, 1363 (Fed. Cir. 2016) (citing 35 U.S.C. § 312(a)(3) (requiring *inter partes* review petitions to identify “with particularity . . . the evidence that supports the grounds for the challenge to each claim”)). This burden of persuasion never shifts to Patent Owner. See *Dynamic Drinkware, LLC v. Nat’l Graphics, Inc.*, 800 F.3d 1375, 1378 (Fed. Cir. 2015) (discussing the burden of proof in *inter partes* review). Furthermore, Petitioner cannot satisfy its burden of proving obviousness by employing “mere conclusory statements.” *In re Magnum Oil Tools Int’l, Ltd.*, 829 F.3d 1364, 1380 (Fed. Cir. 2016).

² Neither party presents any objective evidence of nonobviousness or any related arguments for us to consider.

B. Level of Skill in the Art

With regard to the level of ordinary skill in the art, Petitioner contends:

[A] Person of Ordinary Skill In The Art (“POSITA”) is someone knowledgeable concerning wireless communication systems employing beamforming techniques. Ex.1003, ¶18. That person would have (i) a master’s degree in electrical engineering, and (ii) two years of smart antenna design experience. *Id.* Lack of work experience can be remedied by additional education, and vice versa. *Id.*

Pet. 16. Petitioner’s witness, Dr. Winters, addresses level of ordinary skill in the art in paragraphs 16–19 of his Declaration (Ex. 1003) and his testimony supports Petitioner’s contention. Patent Owner does not address this issue. *See generally* Resp.; Sur-Reply. We find Petitioner’s contention to be reasonable and consistent with the prior art of record. We adopt the level of ordinary skill in the art as proposed by Petitioner.

C. Claim Construction

The claim construction standard to be employed in an *inter partes* review has changed. *See* Changes to the Claim Construction Standard for Interpreting Claims in Trial Proceedings Before the Patent Trial and Appeal Board, 83 Fed. Reg. 51,340 (Oct. 11, 2018) (amending 37 C.F.R. § 42.100(b) effective November 13, 2018). At the time of the filing of the Petition in this proceeding, however, the applicable claim construction standard was set forth in 37 C.F.R. § 42.100(b) (2017), which provides that “[a] claim in an unexpired patent . . . shall be given its broadest reasonable construction in light of the specification of the patent in which it appears.” 37 C.F.R. § 42.100(b) (2017); *see also* *Cuozzo Speed Techs., LLC v. Lee*,

136 S. Ct. 2131, 2142 (2016) (upholding the use of the broadest reasonable interpretation standard). Consistent with the broadest reasonable construction standard, the challenged claims are presumed to be given their ordinary and customary meaning as would be understood by one of ordinary skill in the art in the context of the entire disclosure. *In re Translogic Tech., Inc.*, 504 F.3d 1249, 1257 (Fed. Cir. 2007).

Petitioner contends that the phrase “cross-correlated signal information that is received by said receiver” should be construed as “including, ‘cross-correlated signal information based on information that is received by said receiver.’” Pet. 20–21; *see also* Tr. 8:19–24. The Petitioner argues that such a construction is proper because “the ’231 Patent only describes performing cross-correlation on received signals and information derived from received signals. The ’231 Patent does not describe any examples in which a receiver receives signal information that has already been cross-correlated.” Pet. 21; *see also* Tr. 9:11–10:14. We do not believe Petitioner’s position on construction of the cross-correlated limitation is well-taken.

Patent Owner contends that the cross-correlated limitation requires that the “signal information” that is “received” by the “adaptive antenna”

must be already “cross-correlated” at the time it is “received.” Resp. 1.³ Patent Owner relies on “[t]he plain and ordinary language of claim 1, the language of the other claims of the ’231 patent, the patent’s teachings, and a recent decision of the same panel of the Board as to the exact same issue.”⁴ *Id.* For the reasons that follow, we adopt the construction of the cross-correlated limitation proposed by Patent Owner.

We begin our analysis with the wording of claim 1. “[T]he claim construction inquiry . . . begins and ends in all cases with the actual words of the claim.” *Renishaw PLC v. Marposs Società per Azioni*, 158 F.3d 1243, 1248 (Fed. Cir. 1998) (citing *Abtox, Inc. v. Exitron Corp.*, 122 F.3d 1019, 1023 (Fed. Cir. 1997) (“[T]he language of the claim frames and ultimately

³ Patent Owner did not contest Petitioner’s proposed construction of the cross-correlated limitation in its Preliminary Response. Prelim. Resp. 9 (“Patent Owner disagrees with [Petitioner’s proposed construction of the cross-correlated limitation], but the disagreement is not material to the issues that this Preliminary Response presents, and thus the limitation should not be construed at this time.”). The Board did not construe the cross-correlated limitation in the Decision on Institution. Inst. Dec. 10 (“We agree with Patent Owner that we need not resolve this issue in order to make our determination regarding institution of trial.”).

⁴ The same claims of the ’231 patent were challenged in IPR2018-01016. Unlike in this proceeding, in the Preliminary Response in that case, Patent Owner challenged the construction of the cross-correlated limitation. IPR2018-01016 Paper 13, 21 n.1; see also IPR2018-01016 Paper 16 (Sur-Reply), 1 (“In order for an adaptive antenna to ‘**receive**’ ‘cross-correlated signal information,’ that ‘signal information’ must come to the adaptive antenna **in already cross-correlated form**. That is the limitation’s plain and **only** possible meaning.”). In our Decision Denying Institution, the Board “construe[d] claim 1 as requiring that the ‘signal information’ that is ‘received’ by the ‘adaptive antenna’ must be ‘cross-correlated’ at the time [it] is ‘received.’” IPR2018-01016 Paper 17, 19.

resolves all issues of claim interpretation.”)). Again, claim 1 recites, “search receiver logic . . . configured to update said routing information based at least in part on cross-correlated signal information that is received by said receiver using said adaptive antenna.” Ex. 1001, 29:22–26. The term “cross-correlated” is in the past tense and is used as a modifier or restrictor of “signal information.” “That” is a defining or restrictive pronoun. “Receive” means to come into possession of or acquire. *See, e.g., Receive Definition*, Merriam-Webster.com, <https://merriam-webster.com/dictionary/receive> (last visited August 26, 2019) (providing confirmation of our understanding of the definition of “receive”). Thus, the plain and ordinary meaning of the operative terms in this limitation provides that the “cross-correlated signal information” is acquired by the “receiver using the adaptive antenna.” Patent Owner’s proposed construction is in accord with the plain and ordinary meaning of the separate terms in the limitation and in accord with the terms as used together in the limitation.

Petitioner argues that the plain language of the cross-correlated limitation is ambiguous and supports the construction presented in the Petition. Reply 6–9. Specifically, Petitioner argues, “The claim recites that the claimed signal information is both ‘cross-correlated’ and ‘received’ but the claim does not specify whether cross-correlation or reception occurred first.” *Id.* at 7. We disagree. In the disputed cross-correlated limitation, “cross-correlated” modifies and limits “signal information,” and “that is received by said receiver using said adaptive antenna” modifies and further limits “cross-correlated signal information.” Thus, the plain language is not ambiguous.

We also look to other claims of the '231 patent for guidance as to the proper interpretation of claim 1. *Phillips v. AWH Corp.*, 415 F.3d 1303, 1314 (Fed. Cir. 2005) (en banc) (“Other claims of the patent in question, both asserted and unasserted, can also be valuable sources of enlightenment as to the meaning of a claim term.” (citing *Vitronics Corp. v. Conceptronic, Inc.*, 90 F.3d 1576, 1582 (Fed. Cir. 1996))). The differences between claim 1 and the other claims of the '231 patent support construing claim 1 as Patent Owner contends. *See id.* (“Differences among claims can also be a useful guide in understanding the meaning of particular claim terms.” (citing *Laitram Corp. v. Rexnord, Inc.*, 939 F.2d 1533, 1538 (Fed. Cir. 1991))). Independent claim 20, like claim 1, is directed to “[a]n apparatus for use in a wireless routing network” comprising an adaptive antenna, a transmitter, and a receiver. Ex. 1001, 30:58–31:12. In regard to the related limitation, claim 20 recites, “at least one adaptive antenna is further configured to cross-correlate data sequences in said at least one received signal and based thereon selectively adjust said outgoing multi-beam electromagnetic signals.” *Id.* at 31:8–12. Independent claim 52 is directed to “[a] wireless routing network system” comprising “at least one wireless routing device.” *Id.* at 33:46–47. Claim 52 recites “cross-correlate data sequences in said at least one received signal and based thereon selectively adjust said outgoing multi-beam electromagnetic signals.” *Id.* at 33:61–64. It is not necessary or appropriate for us to construe independent claims 20 and 52 as they are not challenged or otherwise at issue in this proceeding. Nonetheless, these claims show that the patentee used different language in the '231 patent when intending to convey that the cross-correlation was to be performed in

an apparatus rather than having that apparatus receive information that was already cross-correlated. *See Free Motion Fitness, Inc. v. Cybex Int'l, Inc.*, 423 F.3d 1343, 1351 (Fed. Cir. 2005) (“The doctrine of claim differentiation ‘create[s] a presumption that each claim in a patent has a different scope.’

The difference in meaning and scope between claims is presumed to be significant ‘[t]o the extent that the absence of such difference in meaning and scope would make a claim superfluous.’” (quoting *Comark Commc’ns, Inc. v. Harris Corp.*, 156 F.3d 1182, 1187 (Fed. Cir. 1998) and *Tandon Corp. v. ITC*, 831 F.2d 1017, 1023 (Fed. Cir. 1987))). The use of different language by the patentee in claims 20 and 52 strongly supports concluding that the patentee intended to convey a different meaning than the language in claim 1 and supports construing claim 1 as argued by Patent Owner.

Importantly, in contrast to the recitations in claims 20 and 52, the plain meaning of the disputed limitation in claim 1 is that the “cross-correlated signal information” is acquired by the “receiver using the adaptive antenna.”

Independent claim 63 also supports construing claim 1 as argued by Patent Owner. Claim 63 recites:

63. A reciprocal feedback method for use in a wireless routing network, the method comprising:

at a first wireless routing device, measuring an unwanted signal from a second wireless routing device and **updating routing information based at least in part on cross-correlated data sequences in received data packets;**

causing said first wireless device to provide information associated with said measured unwanted signal to said second wireless routing device; and

causing said second wireless routing device to adaptively apply a transmission null in a direction towards said first wireless routing device based on said information associated with said measured unwanted signal, such that subsequent transmissions by said second wireless routing device will be substantially reduced in said direction towards said first wireless routing device.

Id. at 35:29–36:7 (emphasis added). According to the first limitation of “reciprocal feedback method” claim 63, it is directed to “a first wireless routing device” that receives a “signal” from “a second wireless routing device” and updates “routing information based at least in part on cross-correlated data sequences in received data packets.” Thus, method claim 63 is directed to an apparatus receiving “cross-correlated signal information” that is used to update routing information, in accordance with Patent Owner’s proposed construction of claim 1. Accordingly, we determine that Patent Owner’s proposed construction is consistent with a reasonable claiming scheme in which the patentee uses different terms and limitations to claim its invention with varying scope.

Patent Owner cites Figure 15 and the related disclosure (22:1–40) in the ’231 patent Specification as describing “reciprocal and feedback methods” “in which cross-correlated signal information arrives, in already cross-correlated form, at a wireless routing device, which then uses the received correlated signal information to update routing information.” Resp. 4. Figure 15 of the ’231 patent is reproduced below.

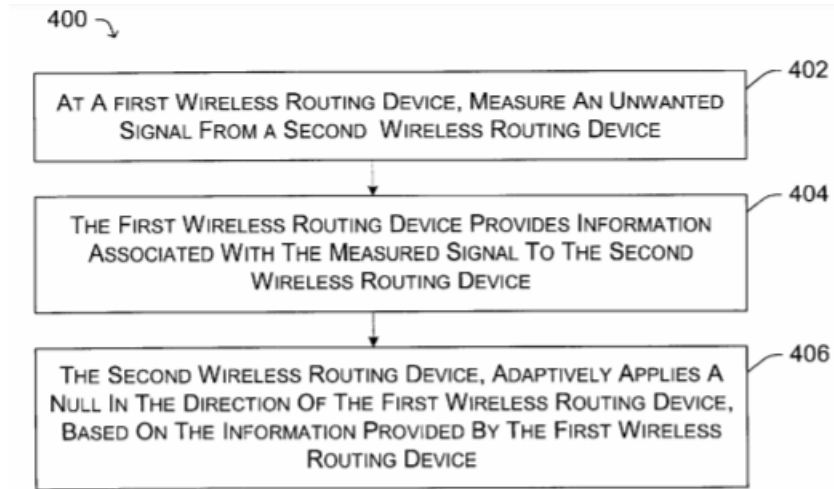


Fig. 15

Figure 15 depicts “an *exemplary* reciprocal and feedback process, in accordance with certain implementations of the present invention.”

Ex. 1001, 4:24–26 (emphasis added). Figure 15 of the ’231 patent explicitly depicts first and second wireless routing devices and sending information associated with the measured signal from the first to the second device. *Id.* at Fig. 15. Additionally, as discussed above, claim 63, which is the only claim in the ’231 patent directed to a “reciprocal feedback method,” does recite “updating routing information based at least in part on *cross-correlated* data sequences in received data packets.” *Id.* at 35:28–36:7.

Accordingly, taking Figure 15 and claim 63 together, we determine that they support Patent Owner’s proposed construction of claim 1.

Figure 22 of the ’231 patent is reproduced below.

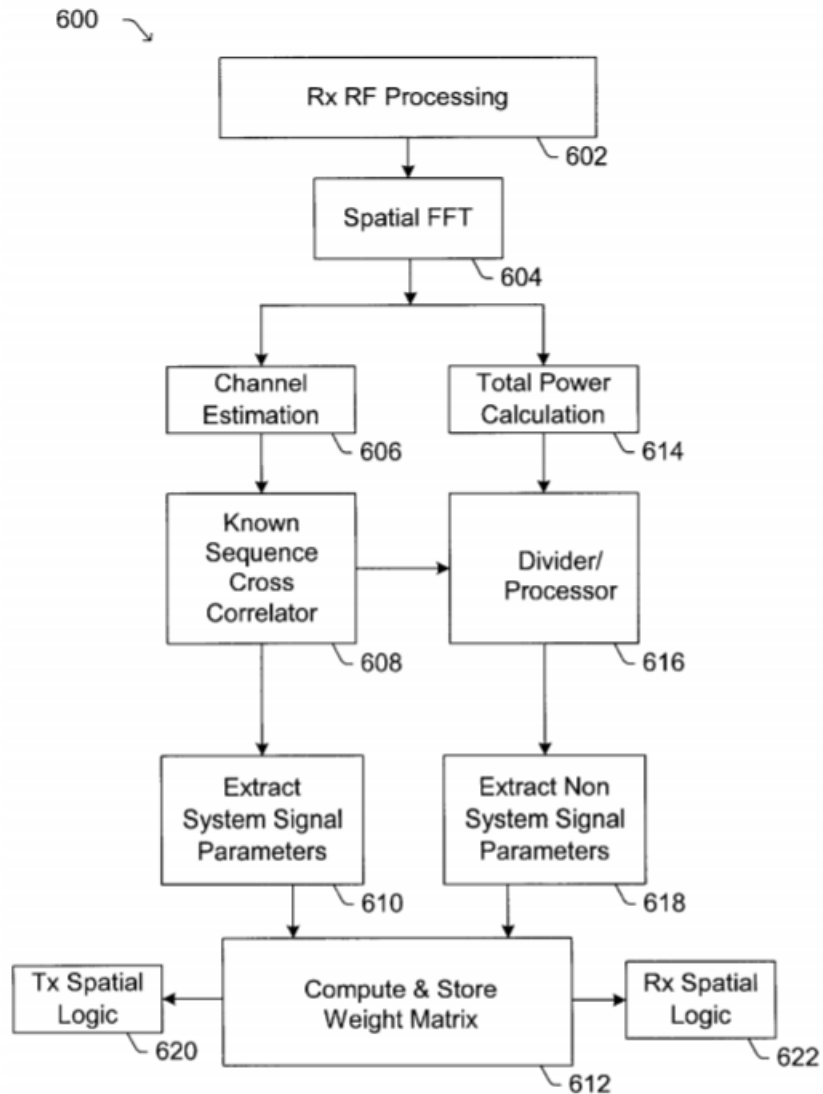


Fig. 22

Figure 22 depicts “a functional flow diagram depicting various processing associated with an **exemplary** search receiver process, in accordance with certain **exemplary** implementations of the present invention.” Ex. 1001, 5:1–4 (emphases added). The related detailed description of Figure 22 states:

FIG. 22 is a functional flow diagram depicting processing associated with an exemplary search receiver process 600. Here, in step 602, a receiver processes the RF signal received with an antenna array. The resulting element domain values are provided to step 604, wherein a special [fast Fourier transform (“FFT”)] process converts them into corresponding pattern domain values. The pattern domain values are then provided to step 606, wherein a FFT process or other process, such as, e.g., a pilot **cross-correlation** process, is employed to estimate the channel. The resulting estimated channel data is then provided to step 608, wherein a known sequence **cross correlation** process, such as, e.g., a [physical layer convergence procedure (“PLCP”)] header preamble or other like information **cross-correlation** process, is conducted. The resultant data from the **cross-correlation** process is then provided to step 610 in which system signal parameters are extracted. These parameters may then be included or otherwise incorporated in constraints 504 (FIG. 18). The data is then provided to step 612, wherein the weighting values are computed and stored, for example, in a weighting matrix. . . . In this manner, the search receiver essentially acts as an adaptive filter to optimize/**update** the weighting values so as to detect the signal indicated by knowledge of the PLCP header or other like information that is **cross-correlated**.

Ex. 1001, 25:65–26:31 (emphases added). We determine that this example, which explains how cross-correlation that takes place after the signal information is received can be used to update routing information, does not compel reading this temporal requirement into claim 1, which contains plain and ordinary language to the contrary. *E-Pass Techs., Inc. v. 3Com Corp.*, 343 F.3d 1364, 1369 (Fed. Cir. 2003) (stating that limitations from the specification should not be imported into a claim even if found in the description of a preferred embodiment). Taking the Specification, including

the claims, as a whole, we determine that it supports interpreting claim 1 in accordance with Patent Owner's argument.

Petitioner argues that Patent Owner's proposed construction of the cross-correlated limitation does not have written description support in the original application for the '231 patent. Reply 12–20. As shown by plain language of claims 1 and 63 discussed above, the '231 patent issued with claims reciting that the information received was already cross-correlated. It is beyond the scope of this *inter partes* review to consider whether the '231 patent complies with 35 U.S.C. § 112, including considering compliance with the written description requirement. 35 U.S.C. § 311(a) (“A petitioner in an inter partes review may request to cancel as unpatentable 1 or more claims of a patent only on a ground that could be raised under section 102 or 103 and only on the basis of prior art consisting of patents or printed publications.”).

Petitioner argues that statements made by Patent Owner and its expert in District Court proceedings contradict the position Patent Owner has taken in this proceeding concerning the construction of the last limitation of claim 1. Reply 8–9. We have reviewed the arguments and evidence presented by Petitioner and determine that they do not directly relate to or contradict Patent Owner's position in litigation. Moreover, we analyze the language of claim 1, the entire set of claims in the '231 patent, and the related disclosure of the '231 patent, and conclude that Patent Owner's proposed construction is proper. The language of claim 1 and the '231 patent is more pertinent and persuasive as to the proper construction of the last limitation of claim 1 than the evidence from the District Court litigation cited by Petitioner.

The plain and ordinary meaning of the disputed language in claim 1 supports construing the claim as Patent Owner argues. Our consideration of the other evidence discussed above and argued by the parties supports this construction.⁵ Taking all the evidence into consideration, but particularly relying on the plain language of claim 1, we construe claim 1 as requiring that the “signal information” that is “received” by the “adaptive antenna” must be “cross-correlated” at the time it is “received.”⁶

⁵ In addition to the evidence cited by the parties, we also reviewed the file history of the '231 patent (Ex. 1002). *Markman v. Westview Instruments, Inc.*, 52 F.3d 967, 980 (Fed. Cir. 1995) (en banc), *aff'd*, 517 U.S. 370 (1996) (in construing the claims, the file history should be considered if it is in evidence). We did not discern any evidence contained in the file history that is relevant to interpretation of the disputed limitation in claim 1. The claims as originally filed did not contain the limitations relating to cross-correlation discussed in this decision. *See* Ex. 1002, 109–132. After being rejected, the limitations relating to cross-correlation were added and the claims were allowed, but neither the applicants nor the examiner made any specific reference to the cross-correlation limitations. *See id.* at 279–323 (Amendment); 333–335 (Notice of Allowability (without any statement of the reasons for allowance)).

⁶ Petitioner recognized as early as December 10, 2018, that the Patent Owner might argue this construction in this proceeding and that the Board might adopt this construction in its final written decision. Ex. 1021, 5:9–6:10. The Petitioner addressed this construction and the issues raised by this construction in its Reply filed March 20, 2019, and in its Sur-Sur-Reply filed May 31, 2019. *See generally* Reply; Sur-Sur-Reply.

D. Analysis of Kuwahara Relative to the Cross-Correlated Limitation

Petitioner challenges claims 1, 3–6, 9, and 12 as obvious⁷ in view of Kuwahara, Patel, and Swales. Pet. 22, 24–71. However, Petitioner cites only Kuwahara against the cross-correlated limitation. See Pet. 55–57, Reply 20–32; Sur-Sur-Reply 13–18. Therefore, we limit our discussion of the cited art to Kuwahara.

1. Summary of Kuwahara (Ex. 1005)

Kuwahara is titled “Radio Communication System Using Adaptive Array Antenna.” Ex. 1005, (54). “An AAA [adaptive antenna array] form[s] a beam directed toward a desired mobile station in a[n] optional direction or a beam having null in a direction of an optional interference source to increase the capacity of the system.” *Id.* at 3:1–5. Figure 2 of Kuwahara is reproduced below.

⁷ Petitioner’s other asserted obviousness grounds are directed against dependent claims 2 and 5–8 and, for these other grounds, Petitioner relies on its showing for independent claim 1. See Pet. 71–90. Thus, the same issues are presented for the other asserted grounds.

Fig.2

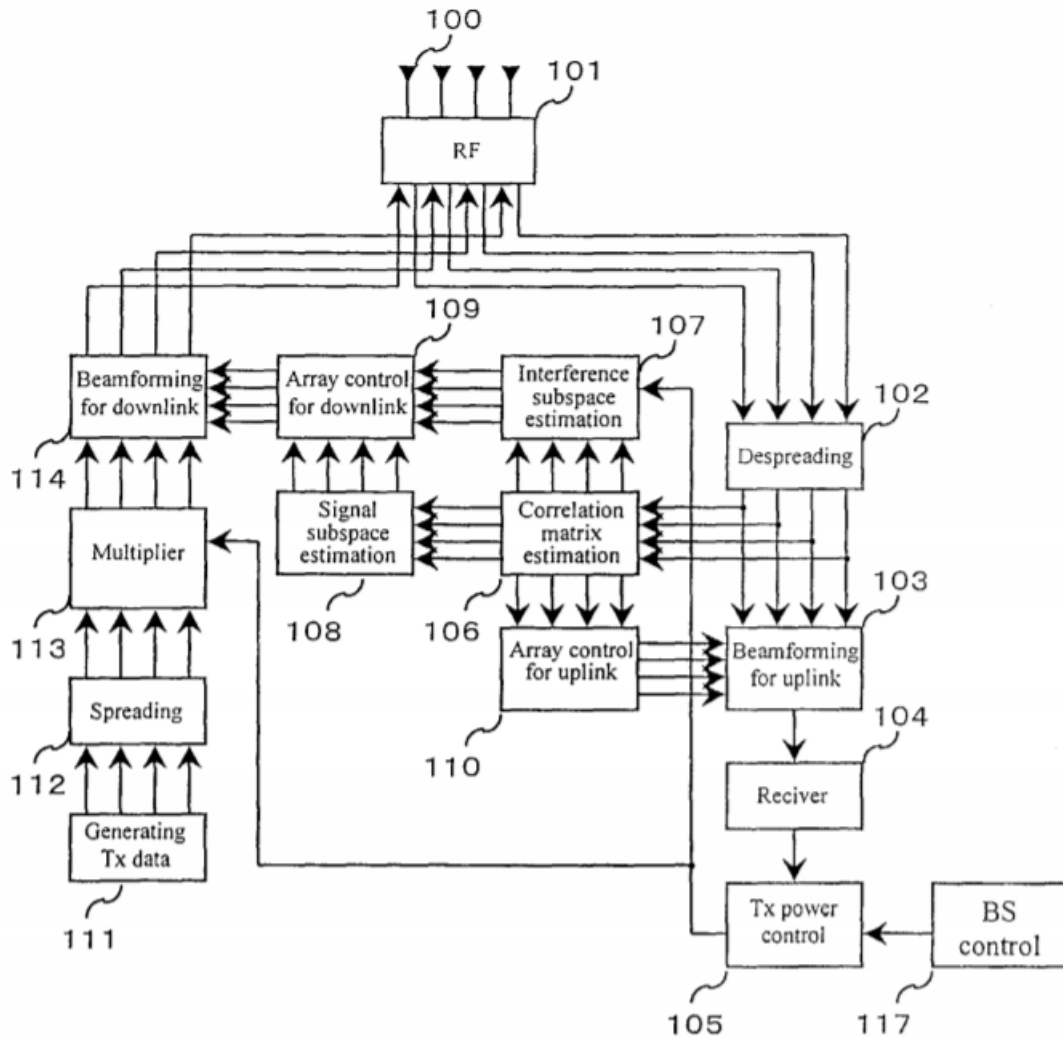


Figure 2 depicts a preferred embodiment of the invention disclosed in Kuwahara. *Id.* at 2:57–58. Kuwahara discloses a base station “provided with a plurality of antennas 100 constituting an AAA [adaptive antenna array].” *Id.* at 3:34–35. “[I]nformation received by the antennas 100 is down-converted by an RF circuit 101, and a despreading system 102 multiplies the down-converted information by an appropriate code sequence of an appropriate phase.” *Id.* at 3:66–4:2. The embodiment in Figure 2

includes receiver 104, which is operatively linked to the adaptive antenna array. It also includes transmitter elements 111, 112, 113, 114 operatively linked to the adaptive antenna array. *Id.* at 8:39–9:11. The apparatus disclosed in Figure 3 also includes control components 105, 109, 110, and 117.

2. Analysis of Petitioner’s Cross-Correlated Limitation Presentation

In the Petition, Petitioner relies on passages in Kuwahara relating to calculations performed on signal information after it is received and output from the antennas as rendering obvious the cross-correlated limitation. Pet. 55–57. Accordingly, in the Petition, Petitioner fails to show that Kuwahara teaches or suggests the cross-correlated limitation as construed to require the signal information to be cross-correlated at the time it is received. See Resp. 13 (“[T]he Petition’s theory . . . is that Kuwahara’s adaptive antenna meets claim 1’s last limitation by receiving signal information that is allegedly ‘cross-correlated’ **by the adaptive antenna, after receipt**, at correlation matrix estimator 106.”).

In the Reply, Petitioner presents a new argument⁸ in an attempt to show that Kuwahara discloses the receipt of signal information that has been cross-correlated. Reply 20–32. Petitioner argues that because “Kuwahara’s mobile station performs a known sequence cross-correlation process when measuring the quality of the base station’s signal, the transmission power control ‘request[] to increase or decrease the transmission power’ (Ex. 1005, 6:13-19) is already cross-correlated when received at the base station.” Reply 24–25. We do not find this new argument to be well-supported or persuasive.

In support of this argument, Petitioner contends that “Kuwahara . . . teaches that the mobile station despreads the base station’s signal by **‘multiplying the received signal by a despreading code sequence.’**” Reply 21 (citing Ex. 1005, 3:55–57). However, the cited passage relates to actions by the base station, not the mobile station. The cited passage is part of the detailed description of “FIG. 2 showing the radio communication base station.” See Ex. 1005, 3:33–34. This description also makes clear that it is

⁸ In the Reply, Petitioner contends that “the Petition also relied on the already cross-correlated transmission power control signal from the mobile station” to show that the cross-correlated limitation was disclosed in Kuwahara. See, e.g., Reply 25. This is inaccurate. There is no mention of the transmission power control signal from the mobile station in Petitioner’s presentation with regard to the cross-correlated limitation in the Petition. See Pet. 55–57. At oral argument, Petitioner’s counsel acknowledged that the argument relating to the transmission power control signal from the mobile station was a new argument not in the Petition. Tr. 38: 7–9 (“[T]he argument that transmission power control information is the cross-correlated signal information of claim 1, that position was not articulated in the petition.”).

referring to information received by the antenna array of the base station. *Id.* at 3:66–4:2 (“Referring to FIG. 2, information received by the antennas 100 is down-converted by an RF circuit 101, and a despreading system 102 multiplies the down-converted information by an appropriate code sequence of an appropriate phase.”).⁹

Petitioner also contends, “In the CDMA context, Kuwahara’s mobile station ‘executes **transmission power control** for the downlink.” Reply 21 (citing Ex. 1005, 6:13–26). This contention misinterprets Kuwahara’s teachings. The cited passage relates to actions performed by the base station, not the mobile station. Kuwahara actually states, “It is assumed that the radio communication base station shown in FIG. 2 executes transmission power control for the downlink.” Ex. 1005, 6:13–15. The cited portions of Kuwahara that Petitioner relies on to establish that the mobile station sends cross-correlated signal information to the base station do not support this conclusion.

Petitioner attempts to bolster the teachings in these passages of Kuwahara with additional declaration testimony of its witness Dr. Winters. Reply 21–22 (citing Ex. 1025 (Second Declaration of Jack Winters Ph.D.) ¶¶ 20–24). However, the cited paragraphs in this Declaration consist only of quotations of the same two passages from Kuwahara cited in the Reply and Dr. Winters’s unexplained conclusions as to what would have been obvious based on these passages. *Id.* We give little weight to this conclusory

⁹ In the Petition, Petitioner cites this same passage in Kuwahara in support of its showing that the base station performs the cross-correlation on signal information received by the adaptive antenna. *See* Pet. 56.

testimony of Petitioner's witness and, instead, rely on the cited passages of Kuwahara. *See* 37 C.F.R. § 42.65(a) ("Expert testimony that does not disclose the underlying facts or data on which the opinion is based is entitled to little or no weight.").

The passages in Kuwahara cited by Petitioner relate to cross-correlation by the base station after the signal information has been received. Thus, the new argument in the Reply that Kuwahara teaches the cross-correlated limitation is not supported by the cited portions of Kuwahara.

E. Patent Owner's Motion to Strike

As indicated above in the Introduction, Patent Owner filed a "Motion to Strike Petitioner's Untimely New Reply Arguments and Evidence." The Motion to Strike is directed against the new arguments and evidence in the Reply in support of Petitioner's contention that Kuwahara teaches the mobile station sends already cross-correlated signal information to the base station. *See generally* Motion to Strike. The Motion to Strike states:

In Section III of its Reply, Cisco argues for the first time that the prior art would meet limitation 1.5.3 [the cross-correlated limitation] under the *alternative* construction of "cross-correlated signal information that is received by said receiver." Reply at 20-32.

Specifically, Cisco argues that limitation 1.5.3 is met when the base station receives a "transmission power control 'request to increase or decrease transmission power'" from the mobile station, which "transmission power control request" is allegedly "already cross-correlated when received at the base station." Reply at 24-25. In support, Cisco relies on new expert testimony (Ex. 1025), new art (Exs. 1023 and 1029), and new portions of Kuwahara. *See* Reply Section III.

Id. at 5. As indicated above, we have considered the new argument in the Reply and found it unsupported by the cited passages in Kuwahara. With regard to the other challenged evidence (Exs. 1023, 1025, 1029), these exhibits do not change the cited passages of Kuwahara or cure the deficiencies of Kuwahara. Thus, even considering the challenged arguments and evidence, we determine that Kuwahara does not teach or suggest the cross-correlated limitation. But in order to provide a complete record for appeal and other purposes, we do not believe it is necessary or appropriate for us to strike the challenged materials from the record. Therefore, we deny the Motion to Strike.

III. CONCLUSION

For the foregoing reasons, we conclude that Petitioner has failed to establish that any of the challenged claims of the '231 patent are unpatentable.

IV. ORDER

Accordingly, it is:

ORDERED that claims 1–9 and 12 of U.S. Patent No. 6,611,231 B2 have not been shown to be unpatentable; and

FURTHER ORDERED that because this is a Final Written Decision, parties to the proceeding seeking judicial review of the decision must comply with the notice and service requirements of 37 C.F.R. § 90.2.

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