

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE PATENT TRIAL AND APPEAL BOARD

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SAMSUNG ELECTRONICS CO., LTD. AND  
SAMSUNG ELECTRONICS AMERICA, INC.,

Petitioners,

v.

APEX BEAM TECHNOLOGIES LLC,

Patent Owner.

Patent No. 10,912,081  
Filing Date: May 6, 2018  
Issue Date: February 2, 2021

Inventor: Xiaobo Zhang  
Title: METHOD AND DEVICE USED FOR WIRELESS  
COMMUNICATION IN UE AND BASE STATION

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**PATENT OWNER'S SUR-REPLY**

Case No. IPR2023-00599

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| <b>Exhibit No.</b> | <b>Description of Document</b>                                                                                                                                                                                                |
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| 2001               | Defendants' Patent L.R. 3-3 Invalidity Contentions and Subject Matter Ineligibility Contentions, <i>Apex Beam Technologies LLC v. Samsung Electronics Co., Ltd. et al.</i> , Case No. 2:22-cv-00188-JRG, served March 2, 2023 |
| 2002               | Order Denying Motion to Stay Pending <i>Inter Partes</i> Review, Dkt. 55, <i>Apex Beam Technologies LLC v. Samsung Electronics Co., Ltd., et al.</i> , Case No. 2:22-cv-00188-JRG (E.D. Tex. June 14, 2023)                   |
| 2003               | Redline Comparison of the Declaration of Apostolos Kakaes, Ph.D. (Ex. 1003) to the Petition                                                                                                                                   |
| 2004               | Declaration of Miguel Gomez ("Gomez Decl."), dated January 12, 2024 and Exhibit A, Curriculum Vitae of Miguel Gomez                                                                                                           |
| 2005               | Deposition of Apostolos Kakaes, taken in <i>Samsung Elecs. Co., Ltd. and Samsung Elecs. America, Inc. v. Apex Beam Techs. LLC</i> , IPR2023-00599, on December 22, 2023 ("Kakaes Depo.")                                      |

**I. THE BOARD MUST RESOLVE THE CLAIM CONSTRUCTION DISPUTES BECAUSE THEY ARE RELEVANT TO THE OUTCOME**

**A. “radio signal”**

Petitioner’s Reply (Paper 14, “Reply”) confirms the existence of a genuine controversy regarding how to construe “radio signal.” There is no question that the parties dispute the meaning of this term, which will affect the Board’s findings on whether Lee teaches numerous limitations.

The Petition maps “radio signal” to two distinct signals without proposing a construction, and the Board invited the parties to develop the record on this construction in the absence of agreement. Paper 9, “Inst.” at 18, 20.

Patent Owner proposes that the Board construe “radio signal” to be a “signal that transmits particular radio information.” Ex. 2004, ¶ 27. This construction addresses at least two critical disputes: (1) the signal must be one, single signal, and (2) the one signal must include and carry particular (rather than different contents or types) of radio information. In addition to the POR evidence supporting this construction, Petitioner took sworn testimony from Patent Owner’s expert regarding this construction. *See, e.g.*, Ex. 1024 at 11:17-12:12.

Petitioner’s Reply confirms their strategy of construing the term “broadly” to map the Challenged Claims to Lee, a reference requiring the mapping of multiple signals to meet the requirements of a single signal. Indeed, in furtherance of

Petitioner's violation of Rule 37 C.F.R. § 42.104(b)(3) requiring an identification of "[h]ow the challenged claim is to be construed," Petitioner maintains their attempt to construe "radio signal" as capable of each comprising two separate radio signals with different content and transmitted at different times. *Id.*

Petitioner's Reply fails to articulate a valid reason to forego claim construction or to otherwise construe a single signal as multiple signals with different information. Instead, Petitioner advances new contentions not previously raised in the Petition.

First, Petitioner's new contention that "[b]ecause the '081 patent allows for the third information and the second radio signal to be sent together, they are not necessarily 'different signals'" is irrelevant and lacks merit. Reply at 5. The "third information" of the '081 Patent is not itself a *radio* signal. Indeed, Mr. Gomez consistently testified that the only two radio signals in FIG. 5 of the '081 Patent are the first radio signal and the second radio signal. Ex. 1024 at 16:7-17, 31:8-18. Petitioner's belated attempt to combine different teachings from multiple distinct embodiments to show how different content from different signals can be carried in different ways does not change the fact that, in each distinct embodiment, each radio signal is carrying particular information. That is, the single second radio signal must have one signal that carries its own particular information distinct from a first radio signal. Accordingly, Petitioner's new contention that the signal does not need to be

tied to the “particular radio information” being transmitted lacks merit.

Second, Petitioner’s contention that additional third information can be sent “together” with the second radio signal is immaterial to the construction and is irrelevant to the contents and structure of the “second radio signal” itself. As discussed in the Patent Owner Response and as confirmed during the deposition of Patent Owner expert, Mr. Gomez, Figure 5 of the ’081 Patent discloses five *different* signals: second information (from UE to Base Station), first information (from Base Station to UE), third information (from Base Station to UE), second radio signal (from Base Station to UE), and first radio signal (from Base Station to UE):

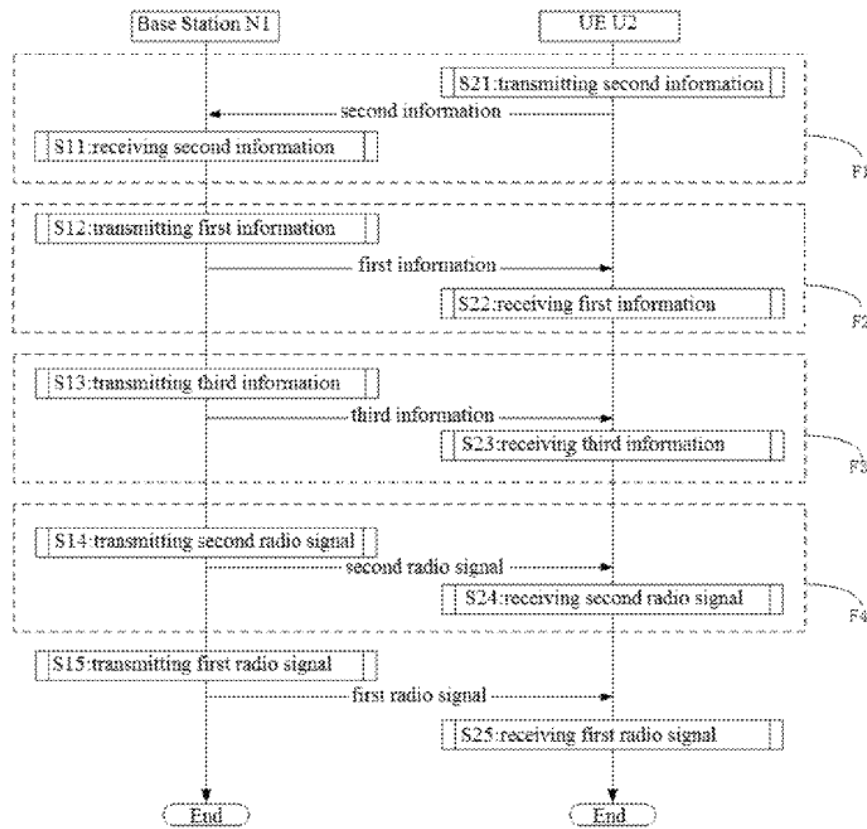
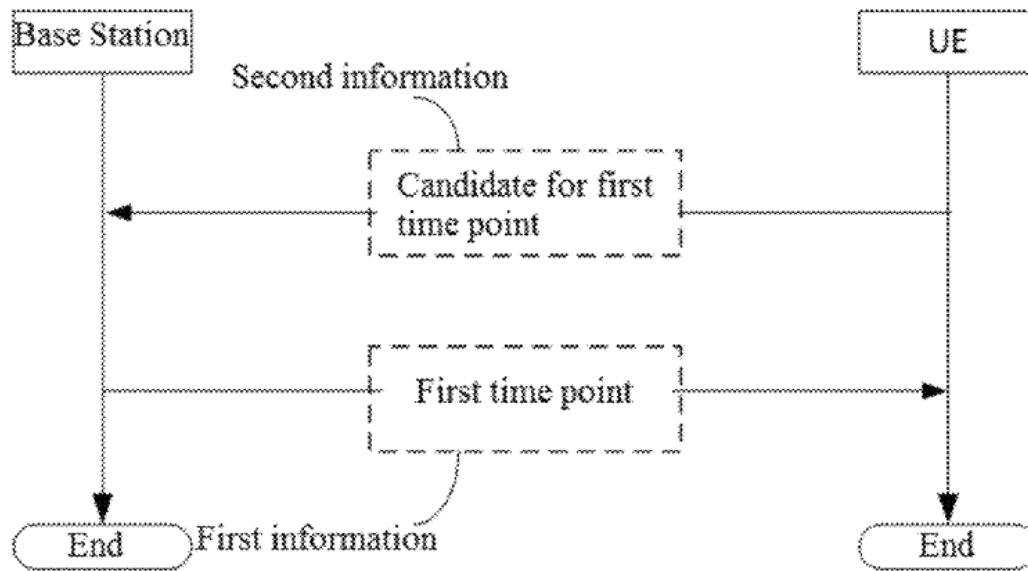


FIG. 5

*Id.* (citing '081 Patent, FIG. 5). A person of ordinary skill would understand that each of the five signals correspond to different pieces of particular information and that the '081 Patent describes the information or content that is particular to each signal. Ex. 2004, ¶ 28. For example, the content for the first information signal is a “first time point,” the content for the second information is the “candidate [scheme] for the first time point,” and the content for the third information signal is the “candidate scheme for the multi-antenna related receiving corresponding to the G multicarrier symbols [of the first radio signal]”:



'081 Patent, FIG. 8).

The third information is used for determining a candidate scheme for the multi-antenna related receiving corresponding to the G multicarrier symbols.

'081 Patent, at 6:4-6. Because each of the content of the first, second, and third information signals is different, a person of ordinary skill in the art would not consider the first, second, and third information to be part or portions of the same signal. Ex. 2004, ¶ 28. Petitioner's new contentions do not address these distinctions.

Third, Petitioner's new contention that the proposed construction for "radio signal" is vague and lacks merit. Petitioner mischaracterizes Mr. Gomez's deposition testimony to accuse him of not being able to explain the meaning of "particular radio information." When asked what he meant by "particular radio

information,” Mr. Gomez answered the question directly by providing the example that the radio information was content-dependent. Ex. 1024, 12:7:22 (“Well, it depends on the content. If the content is changing, the information itself is changing. Then it’s a different radio signal.”). This is consistent with Patent Owner’s stated position that the ’081 Patent is clear that each of the first and second radio signals correspond to particular content:

In one subembodiment, the second radio signal is a DCI that is used for indicating downlink assignment, and the first radio signal is a PDSCH transmitted on the downlink resource indicated by the second radio signal.

Ex. 2004, ¶ 29 (citing ’081 Patent, at 6:4-6). Because each of the content of the first and second signals is different, a person of ordinary skill in the art would not consider the first and second radio signals to be part, or portions of, the same signal, despite the fact that they may be transmitted back-to-back. *Id.* Mr. Gomez’s deposition testimony is also consistent with Petitioner’s expert’s admission that, when signals are sent at different times (*e.g.*, each of the signals is sent on a physical downlink shared channel but five hours apart), a person of ordinary skill in the art would also understand that those are two separate signals with different information:

Q. So using any of those signals that you just described, if two of those types of signals have different content, would a person of ordinary skill in the art consider the signals to be different signals?

...

A. If one of those signals is a physical downlink shared channel that takes place now and the other radio signal is a physical downlink shared channel that takes place five hours from now, the person would consider them to be different.

*Id.* (citing Ex. 2005, 22:11-17).

Ultimately, as explained below, Petitioner does not disagree that Lee teaches multiple signals and that the Petition maps multiple signals with different information to each of the “second radio signal” and “first radio signal.” Thus, the Board must resolve this controversy in favor of construing “radio signal” in a manner that is not overbroad and does not include multiple signals.

**B. “the second radio signal is used for determining a time-domain resource occupied by the G multicarrier symbols”**

Similarly, Petitioner’s Reply confirms the existence of a genuine controversy regarding how to construe “the second radio signal is used for determining a time-domain resource occupied by the G multicarrier symbols.” There is no question that the parties dispute the meaning of this term, which will affect the Board’s findings on whether Lee teaches numerous limitations.

Petitioner’s implied construction of Claim 1’s limitation that “the second radio signal is used for determining a time-domain resource occupied by the G multicarrier symbols” is that the second radio signal is used for determining a time-domain resource occupied by the G multicarrier symbols collectively. Ex. 2004,

¶ 32.

Patent Owner has shown that this term should be construed as “the second radio signal is used for determining a time-domain resource occupied by *each of* the G multicarrier symbols.” Resolution of this controversy is necessary and relevant to the outcome of this proceeding because it would not be possible to determine, in the subsequent limitations, whether the time domain resource occupied by each one of the G multicarrier symbols is before or behind the first time point. *Id.*

Petitioner’s reasons to forego claim construction in favor of their implicit meaning lack merit. Petitioner engages in assumption and speculation about self-serving methods for determining the time domain resource occupied by each symbol. But Petitioner misses the point. Petitioner’s examples (which are applied in the mapping of the authorized grounds) circumvent the claimed requirements of determining resources for multiple symbols, thereby raising the need to resolve the dispute. While Petitioner does not disagree that multiple time-domain symbols cannot occupy a single resource, Petitioner identifies various methods for determining a one single resource for one G multicarrier symbol rather than all of the required G multicarrier symbols.

The Board must resolve this controversy in favor of construing this term in a manner that does not read out the resource determination as to each of the G multicarrier symbols and that does not facilitate modifying the claims to meet the

insufficient prior art teachings.

## **II. THE AUTHORIZED GROUNDS DO NOT RENDER THE CLAIMS UNPATENTABLE**

### **A. Claims 1-12 Are Not Anticipated by Lee**

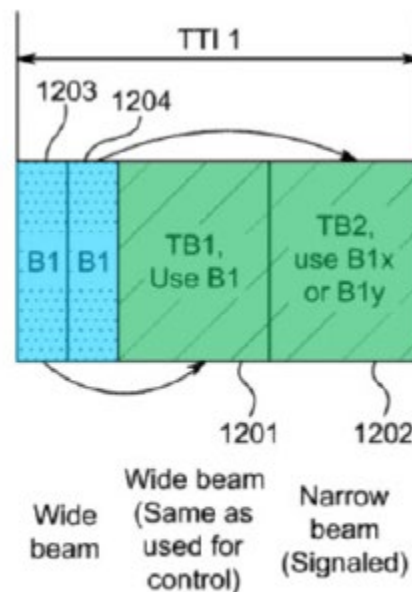
#### **1. Lee Does Not Disclose “*receiving a second radio signal*,” as Required by Claim 1**

Petitioner’s Reply confirms that Lee fails to disclose a single second radio signal (*i.e., receiving a second radio signal*). This point is supported by Petitioner’s attempt to map the teachings of multiple separate signals carrying different sets of information to meet the requirements of a single radio signal.

Petitioner’s Reply does not address the fact that the evidence of record overwhelmingly supports that the portion of the disclosure of Lee mapped to the “second radio signal” is, in fact, two different control signals (B1 1203 and B1 1204). Without specifying a single signal to meet the claimed limitations requiring one “second radio signal,” Petitioner is unable to show that Lee discloses “receiving a second radio signal” because B1 1203 and B1 1204 are two separate control signals (*i.e., each contain different particular information*). Ex. 2004, ¶ 37. Petitioner’s attempt to sidestep the evidence by raising the possibility that certain features of Lee “can be” mapped to the claims underscores the ambiguity of the Lee reference and fails to prove unpatentability by a preponderance of the evidence.

**2. Lee Does Not Disclose “receiving a first radio signal,” as Required by Claim 1**

Petitioner’s Reply confirms that Lee fails to disclose “receiving a first radio signal.” Petitioner does not identify a single radio signal with particular information as the one incoming “first radio signal.” *Id.*, ¶ 41. Petitioner argues that two different transport block signals (TB1 1201 and TB1 1202) are collectively the claimed first radio signal:



*Lee*, FIG. 12 (annotated).

*Id.* (citing Pet. at 17).

But Mr. Gomez’s deposition confirms that the mapped elements are separate signals *i.e.*, each contain different particular information. Ex. 1024, 8:1-5.

Petitioner fails to address the disclosure related to FIG. 12 which shows Lee teaches that TB1 and TB2 are “individual” signals in a “dual TB transmission” with different particular information carried, and different modulation and coding schemes:

FIG. 12 shows a diagram for a *dual TB transmission scheme*. *Two or more transport blocks* may be transmitted with a same beam as the control channel, or may be transmitted with different beams. For example, FIG. 12 illustrates two transport blocks 1201 and 1202 transmitted (multiplexed) in a TDM fashion within a single TTI (e.g., TTI1). The transmission of the *individual transport blocks* may use the same beam as the control channel (e.g., transport block 1201 which uses a wide beam), or may use a different beam (e.g., transport block 1202 which uses a narrow beam).

Ex. 2004, ¶ 42 (citing Ex. 1004, [0167]). Each transport block is also respectively associated with each of the different control Tx beams:

For example, *transport block 1201 may be associated with control Tx beam 1203 and transport block 1202 may be associated with control Tx beam 1204*. The first transport block may be mapped on to a first codeword provided in the control Tx beam 1203 and the second transport block may be mapped on to a second codeword provided in control Tx beam 1204. The codeword may be associated with: a specific beam or beam ID, a BRS, and/or a time/frequency location. As used herein, a codeword represents user data before it is formatted for transmission.

*Id.* (citing Ex. 1004, [0169]). Each transport block in a dual TB transmission scheme is associated with separate codewords in separate control Tx beams. Each transport

block comprises separate particular information. *Id.* Petitioner’s expert confirms the understanding that each of Lee’s TB 1201 and TB 1202 contains different particular information, for example, “different places on the time frequency resources” and “using different beams”:

Q. Would a person of ordinary skill in the art expect the code words associated with each of TB1 and TB2 to be different?

A. TB1 is being transmitted using a wide beam, as he explains in the figure 12, and TB2 is transmitted using a narrow beam and the specific aspects needed to receive those respective portions of the data block, for example, beam IDs time and frequency resource locations used for each of them, those specific values will be different in 1203 and 1204 because ***TB1 and TB2 are located at different places on the time frequency resources and they’re using different beams*** and that information would have -- would be conveyed in 1203 and in 1204 for the respective portions of the signal representing the data in TB1 and TB2.

*Id.* (citing Ex. 2005, 25:2-24).

In an attempt to misrepresent the claimed requirements, as for the claimed “second radio signal,” Petitioner contends that “[t]he ’081 patent does not preclude the ‘first radio signal’ from having multiple portions.” Pet. at 18; Ex. 2004, ¶ 43. But having different particular information corresponds to different signals in the context of the ’081 Patent, not portions of the same signal. *Id.*

**3. Lee Does Not Disclose “*first bit block is used for generating the first radio signal,*” as Required by Claim 1**

Petitioner’s Reply does not address that Lee’s MAC PDU (which Petitioner alleges corresponds to the first bit block) does not generate a first radio signal.

**4. Lee Does Not Disclose “*the second radio signal is used for determining a time-domain resource occupied by the G multicarrier symbols,*” as Required by Claim 1**

Petitioner’s Reply confirms that Lee fails to disclose “the second radio signal is used for determining a time-domain resource occupied by the G multicarrier symbols.” Patent Owner’s proposed construction makes clear that the determination must occur for the “G multicarrier symbols” as required by the Challenged Claims, *i.e.*, “the second radio signal is used for determining a time-domain resource occupied by *each of* the G multicarrier symbols.”

However, Petitioner and Lee are silent regarding the determination of occupied time domain resources for each of the G multicarrier symbols in the first radio signal. Petitioner applies an implicit construction to demonstrate that “*Lee* discloses that the control channel may carry scheduling information for the data channel.” Ex. 2004, ¶ 52; Pet. at 25 (citing Ex. 1004, [0110]). Petitioner’s Reply additionally engages in speculation about self-serving methods for determining the time domain resource occupied by each symbol. But Petitioner misses the point. Petitioner’s examples (which are applied in the mapping of the authorized grounds)

circumvent the claimed requirements of determining resources for the claimed “G multicarrier symbols.” While Petitioner does not disagree that multiple time-domain symbols cannot occupy a single resource, Petitioner identifies various methods for determining a one single resource for one G multicarrier symbol rather than the required G multicarrier symbols.

Lee is limited to disclosing a codeword that “may be associated with: . . . a time/frequency location” of the respective entire transport block mapped to that codeword. Ex. 2004, ¶ 52 (citing Ex. 1004, [0169]). Thus, Lee fails to support a finding, by a preponderance of the evidence, of a determination of occupied time domain resources made for each of G multicarrier symbols because Lee’s teaching is limited to a transport block basis. *Id.*

5. **Lee Does Not Disclose** *“as for any one given multicarrier symbol of the G multicarrier symbols, the multi-antenna related receiving for the given multicarrier symbol is related to the relative position of a time-domain resource occupied by the given multicarrier symbol with respect to a first time point in time domain,” “when the time-domain resource occupied by the given multicarrier symbol is behind the first time point, the second radio signal is used for determining the multi-antenna related receiving for the given multicarrier symbol,” and “when the time-domain resource occupied by the given multicarrier symbol is before the first time point, the multi-antenna related receiving for the given multicarrier symbol is related to the multi-antenna related receiving for the second radio signal,” as Required by Claim 1*

Regarding the limitations “as for any one given multicarrier symbol of the G multicarrier symbols, the multi-antenna related receiving for the given multicarrier symbol is related to the relative position of a time-domain resource occupied by the given multicarrier symbol with respect to a first time point in time domain,” “when the time-domain resource occupied by the given multicarrier symbol is behind the first time point, the second radio signal is used for determining the multi-antenna related receiving for the given multicarrier symbol,” and “when the time-domain resource occupied by the given multicarrier symbol is before the first time point, the multi-antenna related receiving for the given multicarrier symbol is related to the multi-antenna related receiving for the second radio signal,” Petitioner’s Reply fails to address that Lee’s disclosure (1) does not enable a person of ordinary skill in the

art to ascertain whether each multicarrier symbol occupies a time domain resource before or after the first time point, (2) does not show the claimed limitations because the mere facts of a wide beam and narrow beam and associated IDs is inapposite to determining an occupied time domain resource for a specific multicarrier symbol and its relation to a first time point, and (3) pertains only to the occupied time domain resource of each transport block as a whole, not on a multi-carrier symbol basis, as required by these claim limitations.

**B. Claims 1-12 Are Not Obvious Over the Combination of Chen and Lee**

**1. The Combination of Chen and Lee Does Not Render Obvious “*first bit block is used for generating the first radio signal*”**

The proposed combination of Chen and Lee does not render obvious the “first bit block is used for generating the first radio signal.” Contrary to Petitioner’s assertion that Patent Owner addresses the references individually, Patent Owner’s Response acknowledges that Petitioner alleges Lee’s teachings of a data message generated by a bit block (MAC PDU) could be implemented into Chen’s method. Directly addressing this proposed combination, Patent Owner argues that the combination is deficient because Lee’s MAC PDU does not generate a first radio signal as required by the claims. Ex. 2004, ¶ 63. Lee’s alleged first bit block (MAC PDU) generates two different signals (*i.e.*, TB1 and TB2) associated with two

different code words (CW), instead of generating one radio signal. *Id.* Petitioner cannot change the operation of Lee's MAC PDU in proposing to combine the references. Petitioner relies on improper hindsight and fails to address this shortcoming.

**2. The Combination of Chen and Lee Does Not Render Obvious “*the second radio signal is used for determining a time-domain resource occupied by the G multicarrier symbols*”**

The proposed combination of Chen and Lee does not render obvious “the second radio signal is used for determining a time-domain resource occupied by the G multicarrier symbols.” Because Chen does not even mention multicarrier symbols, Chen is unable to address Lee's deficiencies in failing to disclose determining time-domain resource occupation on an individual multicarrier symbol basis, as the claim requires. Ex. 2004, ¶ 66 (citing Pet. at 60 (“[A] POSITA would have understood that *Chen*'s control message and/or scheduling message includes information indicating a time-domain resource occupied by *Chen*'s data message (“first message”).”). *Id.* Petitioner's scant disclosure of symbol-level processing is irrelevant to this limitation and there is no relevant incorporation by reference to any materials describing base stations to supply missing features to the disclosure of Chen.

**III. MR. GOMEZ IS QUALIFIED TO OFFER EXPERT TESTIMONY FROM THE PERSPECTIVE OF AN ORDINARILY SKILLED ARTISAN**

Although the parties agree that “[a]dditional relevant work experience can compensate for less education,” Petitioner does not clarify what the metes and bounds of that “additional work experience” might be in its Reply. Even after the Board noted that “Petitioner’s last sentence regarding additional relevant work experience compensating for less education and *vice versa*, [] is vague,” Petitioner’s Reply provides no further clarification or rebuttal of Patent Owner’s proposed “additional relevant work experience,” outside of stating that the technological experience should be limited to MIMO instead of telecommunications even though MIMO is a small subset of telecommunications. Reply at 27-28. Since Patent Owner provided the only definition of a person of skill in the art with a clear scope, Patent Owner’s definition should be adopted. Mr. Gomez satisfies Patent Owner’s proposed definition (as well as Petitioner’s proposed definition, despite its lack of clarity). In addition to a Bachelor of Science Degree from Yale University in Electrical Engineering, Mr. Gomez has over “thirty five years of experience in the design and development of hardware and software technology used in telecommunications, data communications, wireless transmission and related protocols.” See Ex. 2004, Exhibit A, at 1, 3. Mr. Gomez has considerable experience designing products that utilize the underlining technologies of Spread

Spectrum (802.11a,b,g,n), LTE, OFDM, RF Transmission and reception, which are in turn utilized by LTE and by 5G NR. *Id.* at 2. Specifically, the following work experiences listed in Mr. Gomez’s CV are highly pertinent to the field of “telecommunications systems,” which Petitioner agrees is the relevant field. Pet. at 13.

Mr. Gomez’s work experience began in 1983 at ROLM Corporation where he designed *transmission protocols for business telephone equipment*. Ex. 2004, Exhibit A, at 6. Later, in 1985, Mr. Gomez was a founding member of Stratacom, Inc. where he designed long haul voice and *data routing equipment*, and developed compression algorithms for *voice communications*. *Id.* Mr. Gomez’s work at Stratacom also included designing methods to include data on the *voice transmission paths that later became known as Frame Relay*. *Id.* In 1990, as a consultant, Mr. Gomez worked on circuit design in “*computing, telephony and data systems*.” *Id.* at 5 (emphasis added). At ActSolar, from August 2006 to March 2009, Mr. Gomez was Vice President and tasked with implementing both power conversion circuitry, as well as *a radio system*, to convey the health status of the solar array to a web server. *Id.* at 3. Petitioner’s allegations that Mr. Gomez is not a POSITA in the field of wireless communications are therefore meritless and should be rejected.

Moreover, Petitioner’s arguments attacking Mr. Gomez’s qualifications are based on an incorrect heightened standard that “[t]he Board should give no weight to the testimony of Mr. Gomez because he does not qualify as a POSITA.” Reply at 27. In fact, the Board explicitly states that “[a] person *may not need to be a person of ordinary skill in the art* in order to testify as an expert under Rule 702, but rather must be ‘qualified in the pertinent art’” and that there is “no requirement of a perfect match between the expert’s experience and the relevant field.” Patent and Appeal Board Consolidated Trial Practice Guide (“Trial Practice Guide”) (Nov. 2019), at 34 (citing *Sundance, Inc. v. DeMonte Fabricating Ltd.*, 550 F.3d 1356, 1363–64 (Fed. Cir. 2008) and *SEB S.A. v. Montgomery Ward & Co.*, 594 F.3d 1360, 1373 (Fed. Cir. 2010)) (emphasis added).

As described above, Mr. Gomez not only provides sufficient qualifications in the field of wireless networking but also meets the parties’ agreed upon definition of a POSITA. And, Mr. Gomez has previously been recognized as having sufficient qualifications in the field of wireless networking. For example, as an expert, Mr. Gomez has been engaged in several cases relating to OFDM. Between September 2012 and August 2013, in the case of *WiLAN Inc. v. HTC Corp.* (2:11-CV-68-JRG), Mr. Gomez supported WiLAN investigating VHDL, Verilog, C, and C++ source code that implemented *OFDM and SC-OFDMA*. Ex. 2004, Ex. A at 13-14 (emphasis added). Between May 2009 and March 2011, Mr. Gomez also

investigated OFDM implementations used in 802.11a,b,g,n in the case of *WiLAN v. Acer* (2:07-CV-473). *Id.* at 18-19. In this case, Mr. Gomez also supported WiLAN investigating Verilog, C, and C++ source code that implemented **OFDM**. *Id.* (emphasis added).

Therefore Mr. Gomez easily meets the level of requisite experience for a POSITA. Mr. Gomez also responded to every question posed by Petitioner’s counsel at his depositions, and Petitioner cannot point to an instance where Mr. Gomez could not respond for lack of relevant technical experience. *See generally* Ex. 1024.

The Board has broad discretion to assign weight to be accorded expert testimony. Trial Practice Guide at 35 (citing *Yorkey v. Diab*, 601 F.3d 1279, 1284 (Fed. Cir. 2010)). Such broad discretion certainly extends here, where an expert, like Mr. Gomez, provides “testimony that is helpful to the Board” and is qualified in the pertinent art of wireless networking. *Id.* at 34 (“[T]he absence of an advanced degree in a particular field may not preclude an expert from providing testimony that is helpful to the Board, so long as the expert’s experience provides sufficient qualification in the pertinent art.”).

#### IV. CONCLUSION

The Board should issue a Final Written Decision finding the Challenged Claims not unpatentable.

Respectfully submitted,

Dated: May 17, 2024

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**CERTIFICATE OF WORD COUNT**

The undersigned hereby certifies that the portions of the above-captioned PATENT OWNER'S SUR-REPLY specified in 37 C.F.R. § 42.24 has 4,298 words in compliance with the 5,600 word limit set forth in 37 C.F.R. § 42.24. This word count was prepared using Microsoft Word for Office 365.

Respectfully submitted,

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