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Filed on behalf of

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UNITED STATES PATENT AND TRADEMARK OFFICE

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**BEFORE THE PATENT TRIAL AND APPEAL BOARD**

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WILSON ELECTRONICS, LLC,  
Petitioner,

v.

CELLPHONE MATE, INC. d/b/a SURECALL  
Patent Owner

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Case No. IPR2018-01774  
U.S. Patent 9,402,190

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**PATENT OWNER PRELIMINARY RESPONSE**

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**EXHIBIT LIST**

<b>Exhibit No.</b>	<b>Description</b>
2001	Declaration of Dr. Todd Moon
2002	Dr. Todd Moon CV
2003	Declaration of Laine Matthews
2004	Declaration of Jonathan Bacon
2005	Declaration of Hongtao Zhan
2006	Claim Chart Mapping SureCall's Force5 Signal Booster to '190 Patent Claims
2007	Force5 Schematic
2008	Representative FCC Approval Documents for Product Code CM5000 (Force5)
2009	April 30, 2012 Cellphone-Mate press release, "Cellphone-Mate Announces the SureCall Force-5, the Wireless Industry's First Self-Contained 5-Band Amplifier for Increased Cellular Reception"
2010	Commercial Integrator's 2014 BEST Award
2011	May 8, 2012 press release, "Wilson Electronics Announces Five-Band 4G/3G Indoor Cellular Signal Booster"
2012	AG Pro Quint Signal Booster Installation Guide
2013	April 30, 2012 EVDOinfo article, "Cellphone-Mate Announces Five Band CM5000 Force-5 Wireless Amp for 3G and 4G Networks"
2014	December 12, 2012 EVDOinfo article, "Converting a 3G repeater setup into a 3G/4G setup"
2015	3gstore article, "Cellphone-Mate Force-5 (CM5000) Five-Band 3G/4G Wireless Amp Now Available"
2016	July 9, 2013 Gizmochat article, "SureCall CM5000 Force 5 Cell Phone Booster by Cellphone-Mate"
2017	June 30, 2014 EVDOinfo article, "SureCall's Force5 Wins Commercial Integrators BEST Award"
2018	Force5 external photos provided to FCC
2019	Force5 internal photos provided to FCC
2020	Force5 test report that was submitted to the FCC
2021	SureCall Sales 2012-2017
2022	RCR Wireless News webinar
2023	Gizmochat video: 4G Force5 and TriFlex signal boosters from SureCall

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<b>Exhibit No.</b>	<b>Description</b>
2024	Gizmochat video: Changes in the cellphone signal booster industry
2025	Video: CES Cellphone-Mate Product Demonstration

## **I. INTRODUCTION AND SUMMARY OF ARGUMENT**

Petitioner engages in improper hindsight analysis to raise five grounds of alleged obviousness. For certain grounds, Petitioner also presents combinations of prior art in its Petition that differ from those relied upon by its expert in his declaration. And this inconsistency is not limited to the Petitioner presenting different positions from its expert. Between the grounds, Petitioner contends that the same prior art references teach diametrically opposed features. When addressing dependent claims, Petitioner omits references from its grounds that would be necessary for the independent claims and provides no explanation of how any new combinations address the independent claim limitations. Based on these inconsistencies, the petition fails to identify with particularity the grounds for challenging the '190 Patent claims. Thus, the petition should be denied in its entirety for failing to comply with 35 U.S.C. § 312(a)(3).

Petitioner's grounds also fail to account for the fundamental differences in the prior art. Where the prior art fails to teach required claim elements, Petitioner relies on significant modifications as the basis for its grounds without support. Petitioner and its expert never explain why a person of ordinary skill would make significant modifications to the prior art to end up with the claimed inventions. Moreover, Petitioner and its expert fail to identify any reason to combine the references in the

specific way that the Petition alleges without improperly relying on the '190 Patent itself.

Further, where the expert declaration deviates from the Petition grounds, the expert actually presents different prior art combinations. The expert declaration therefore fails to support the combinations set forth for each ground. Worse yet, the expert had been a patent attorney for more than a decade at the time of the inventions, and Petitioner's counsel employed him as a patent agent and associate attorney for years. His declaration amounts to little more than another attorney from Petitioner's firm adding his name to the signature block of the declaration.

Petitioner's hindsight obviousness allegations are unsupportable. Petitioner itself tried and failed to solve the problem addressed by the '190 Patent. That failure continued for months after the filing of Petitioner's patent relied upon in this IPR. Despite having the same prior art and even after having seen Patent Owner's commercial embodiment, Petitioner took over a year to develop a product with the solution claimed by the '190 Patent. When weighed along with the other strong objective indicia of non-obviousness, Petitioner cannot prevail on any challenges raised in this Petition.

## **II. BACKGROUND**

### **A. Signal Boosters**

At a high level, cell phones work by receiving and transmitting radio frequency signals from/to a cell tower (also called base stations). Signals transmitted from the cell tower to the cell phone travel along downlink channels, while signals transmitted from the cell phone to the cell tower travel along uplink channels. Ex. 1001 at 1:29-32. Signal strength varies by location and can be weakened by large structures between the cell tower and the cell phone. *Id.* at 1:36-44. Radio frequency signal boosters amplify signals in the network, particularly in areas, such as inside of a building, where there is poor reception. *Id.* at 1:45-58. A typical signal booster boosts signals from the cell tower by having one antenna capture the signal outside of a building, where the reception is stronger, sending the signal to the booster for amplification, and then retransmitting the signal through a second antenna inside of the building. Signals being transmitted from the cell phone to the cell tower are also amplified in the reverse manner.

Each carrier such as AT&T, Verizon, T-Mobile, or Sprint, operates on its own frequency band. Thus, a signal booster that can boost AT&T signals may not be able to boost Verizon or Sprint signals, unless it has appropriate circuitry for those additional frequency bands. Additionally, different communications standards also operate on different frequency bands. For example, a signal booster that can only

boost AT&T 3G signals would not be able to boost AT&T 4G LTE signals. Multi-band signal boosters are signal boosters that amplify multiple frequency bands in order to accommodate various carriers and technologies.

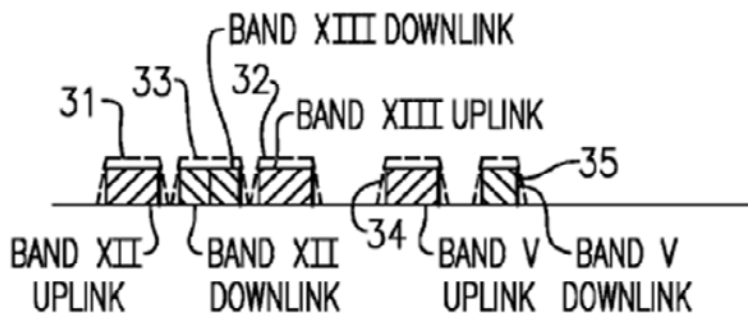
At the time of the '190 Patent, a number of cell phone signal boosters existed on the market that could boost one or more frequency bands such as the talk and text bands of the 2G and 3G networks. Ex. 2003 ¶ 16. However, those pre-existing signal boosters were unable to boost AT&T and Verizon 4G LTE frequency bands simultaneously—they could only boost one set of bands or the other. *Id.* ¶ 17. Those frequency bands correspond to Bands XII and XIII.

## **B. Overview of the '190 Patent**

The '190 Patent, titled “Apparatus and Methods for Radio Frequency Signal Boosters,” discloses a multi-band signal booster. Ex. 1001 at Title, Abstract. The '190 Patent claims priority through a series of continuations to application No. 13/872,877, which issued as U.S. Patent No. 8,867,572 (the subject of related IPRs IPR2018-01771 and IPR2018-01772). *Id.* at Front Page. According to the patent, “increased crowding of the radio frequency spectrum has constrained the design and development of signal boosters, particular [sic] multi-band signal boosters that provide boosting across multiple frequency bands, including, for example, adjacent frequency bands.” Ex. 1001 at 6:3-7. Before the '190 Patent’s earliest effective filing date, there were no signal boosters that could boost both Bands XII and XIII

at the same time due to interference between the two bands. The '190 Patent explains that “a band-pass filter used to select a particular uplink or downlink channel for boosting can have a non-ideal passband associated with roll-off near the passband’s edges. The filter’s roll-off can lead to an increase in undesired spurious and/or out-of-band emissions associated with amplification of signals outside of the particular channel’s frequency band.” *Id.* at 6:7-13. And while solutions existed, such as using “relatively sharp filter[s] such as a cavity filter,” those solutions were “prohibitive in cost and/or size.” *Id.* at 6:14-16.

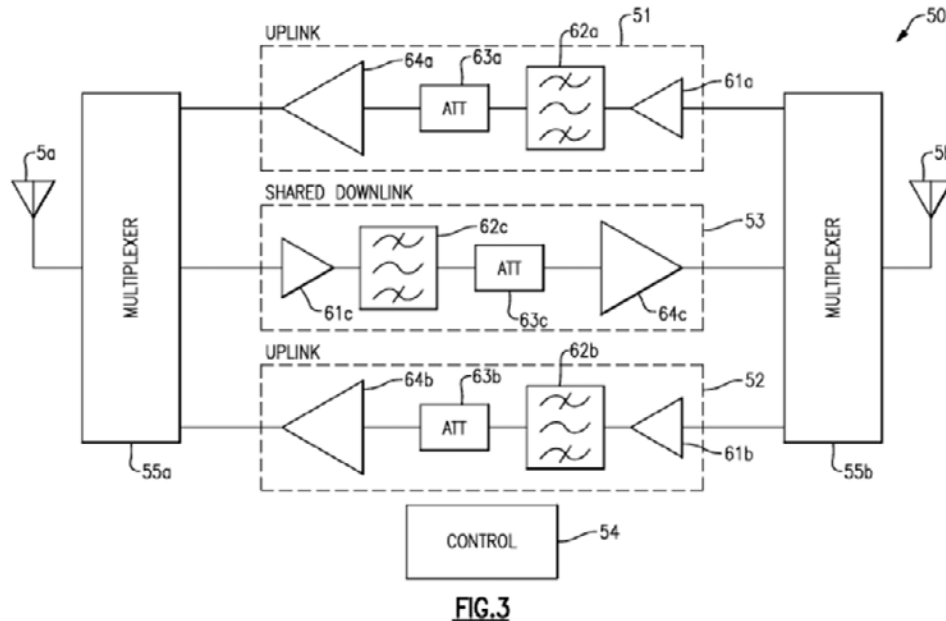
The '190 Patent solved the problem of being unable to boost Bands XII and XIII simultaneously by recognizing that the downlink bands for Bands XII and XIII are adjacent. *Id.* at 7:45-62; *see also id.* at Fig. 2B (relevant portion reproduced below).



As shown in Figure 3 of the '190 Patent, the patented solution takes advantage of the fact that these two downlink bands are adjacent to each other. By configuring a signal booster with a band-pass filter that passes both downlink signals, the '190



Patent avoids the need for sharp band-pass filters for separately filtering the two frequencies. *Id.* at 7:45-62; *see also id.* at Fig. 3 (below).



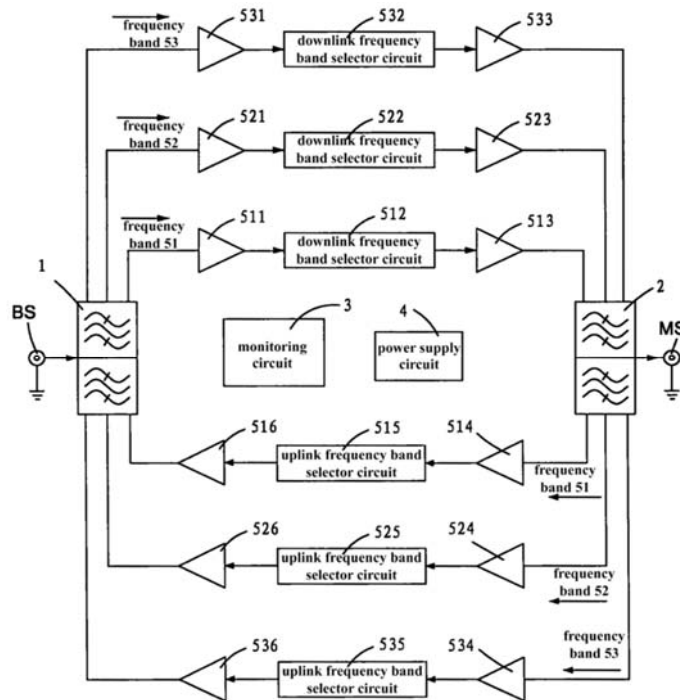
SureCall's Force5 signal booster, the first commercial embodiment of the '190 Patent, boosted both the AT&T and Verizon 4G LTE bands (Bands XII and XIII). After its initial public release in April 2012, the Force5 signal booster was met with industry praise, including garnering the BEST Award from Commercial Integrator, an industry publication covering cell phone signal boosters and other integrated-electronic products. Ex. 2003 ¶ 26.

### C. Overview of the Alleged Prior Art

#### 1. Zhuo

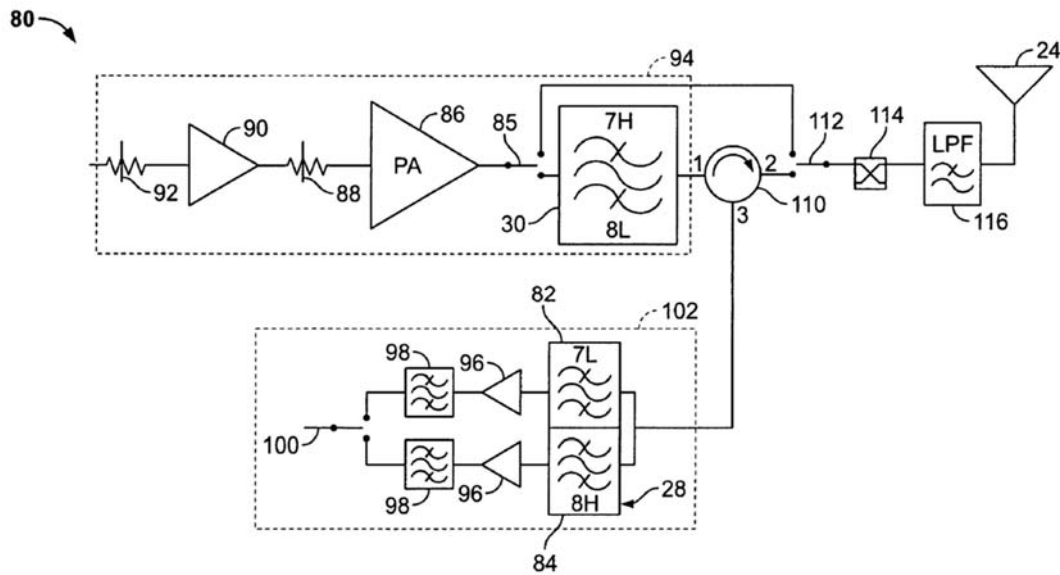
Chinese Patent CN 201699704 to Zhuo discloses a "Tri-band Wireless Repeater" comprised of "a donor-end multiplexer, a retransmission-end multiplexer,

a monitoring circuit, a power supply circuit, and a signal path of three frequency bands connecting the donor-end multiplexer and the retransmission-end multiplexer.” Ex. 1005 at Abstract. The general circuit disclosed in Zhuo shows six amplification paths, three uplink paths and three downlink paths for the three frequency bands. *Id.* at Fig. 2 (reproduced below).



## 2. Layne

U.S. Patent No. 7,250,830 to Layne is titled “Dual Band Full Duplex Mobile Radio.” Layne is directed to a mobile radio, not a signal booster. Ex. 2001 ¶¶ 34, 49. The patent explains that “[k]nown land mobile radio units do not provide combined dual band operation with full duplex transmissions.” Ex. 1011 at 1:20-21. Petitioner relies on the disclosure of Figure 3, reproduced below.



Ex. 1011 at Fig. 3. Layne discloses a “mobile radio having full duplex operation in both the 700 MHz and 800 MHz operating frequencies, and more particularly, the Public Safety Frequency Bands within these frequency ranges.” *Id.* at 2:24-28. The Layne radio is able to provide “communication in simplex, half duplex and full duplex transceiver modes.” *Id.* at 2:28-30.

### 3. DUO Repeater

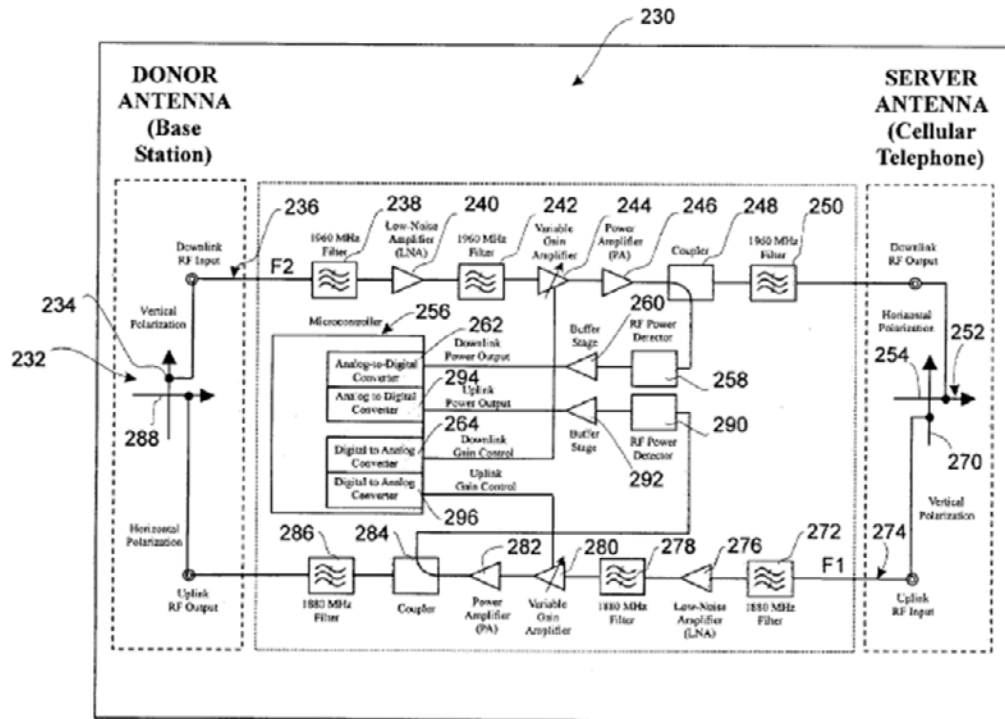
The DUO Repeater, titled Duo-i6525 USER MANUAL Version 1.2, appears to be a manual for a dual band radio frequency repeater that operates in the SMR (800 and 900 MHz) frequency bands. Ex. 1009 at 2, 6. For reasons explained below with respect to Ground 4, Petitioner has not shown that the DUO Repeater is a prior art printed publication. The DUO Repeater also describes a vastly different class of device using complex digital signal processing and configurable filters.

**4. Sahota**

U.S. Patent Application Publication 2012/0302188 A1 to Sahota et al. discloses a “Tunable Multi-Band Receiver” that supports operation on a plurality of frequency bands. Ex. 1008 at Title, Abstract. Sahota’s tunable multi-band receiver employs an antenna, a tunable notch filter, and at least one low noise amplifier. *Id.* at Abstract. Petitioner does not appear to rely on the technical teachings of Sahota, that is, the device disclosed in Sahota. Rather, Petitioner relies on Table 1 shown in paragraph 69 listing a number of frequency bands in the U.S. *Id.* ¶ 69.

**5. McKay**

U.S. 2004/0166802A1 to McKay discloses a “Cellular Signal Enhancer.” Ex. 1007 at Title. McKay discloses a bi-directional amplifier that receives a user signal, amplifies the signal power, and then retransmits the amplified signal to a base station. *Id.* ¶ 14. McKay teaches that its bi-direction amplifier may be used for a particular wireless communication service. *Id.* ¶ 15. Figure 19 shows a block diagram of McKay’s bi-directional amplifier.

**FIG 19**

*Id.* at Fig. 19.

## 6. TEKO Repeater

The TEKO Repeater appears to be a collection of documents, including a technical handbook, describing the Teko Telecom Modular Coverage and Capacity System. TEKO Repeater describes a system for distribution of wireless signal with a master unit and one or more remote units that “can be installed up to 20km (12.4miles) [sic] from the Master Unit site.” Ex. 1006 at 12. It explains that “A single Master Unit can drive up to 144 Remote Units.” *Id.* TEKO Repeater also involves conversion of signals from radio frequency to fiber optics and back to radio frequency for its operation. *Id.* at 12-13. For reasons explained below, Petitioner

has not met its burden of showing that the TEK0 Repeater is a prior art printed publication.

### **III. CLAIM CONSTRUCTION**

Petitioner offered definitions for the words “contiguous,” “abutting,” and “adjacent.” *See* Pet. at 4-5. But only the words “abutting” and “adjacent” actually appear in the challenged ’190 Patent claims. Specifically, “abutting” appears in Claims 6 and 24, and “adjacent” appears in Claims 1 and 19. The Board need not construe claim terms unnecessary to resolving the controversy. *Shenzhen Liown Elecs. Co. v. Disney Enterps., Inc.*, IPR2015-01656, Paper 7 at 10 (P.T.A.B. Feb. 8, 2016). Accordingly, the Board need not even consider Petitioner’s proffered definition for “contiguous.”

Petitioner’s proposed definition for “abutting” is also plainly contradicted by the ’190 Patent’s specification. Petitioner stated that “[b]ands that are directly next to each other (e.g., 910 MHz to 920 MHz and 921 MHz to 930 MHz) are ‘abutting.’” Pet. at 4. Petitioner’s proposed definition allows for a 1 MHz gap between two frequency bands. However, the ’190 Patent specifically states that there is *no* gap between abutting bands. Ex. 1001 at 11:7-11 (“[T]he adjacent uplink channels or the adjacent downlink channels of the first and second frequency bands are abutting, such that there is substantially no separation or gap (e.g., about 0 MHz) between the channel frequencies.” *See* M.P.E.P. § 2111.01 (“Where an explicit definition is

provided by the applicant for a term, that definition will control interpretation of the term as it is used in the claim.”) (citing *Toro Co. v. White Consolidated Indus. Inc.*, 199 F.3d 1295, 1301 (Fed. Cir. 1999)).

For purposes of this stage of the proceedings, Patent Owner does not contest Petitioner’s definition of the word “adjacent.” However, as explained below, Patent Owner notes that Petitioner’s definition contradicts its own arguments.

#### IV. ARGUMENT

##### A. Legal Standard

##### 1. Threshold for Institution

The statutory threshold that must be met to institute an IPR reads as follows:

(a) Threshold – The Director ***may not authorize*** an inter partes review to be instituted ***unless*** the Director determines that the ***information presented in the petition*** filed under section 311 and any response filed under section 313 ***shows*** that there is a reasonable likelihood that the petitioner would prevail with respect to at least 1 of the claims challenged in the petition.

35 U.S.C. § 314(a) (emphasis added). For the reasons explained below, Petitioner has not shown a reasonable likelihood of success with respect to *any* challenged claim of the ’190 Patent.

##### 2. All Grounds Rely on Obviousness

Petitioner argues that the challenged claims are obvious over five combinations of prior art. For any IPR ground to prevail based on obviousness, it is not enough to simply show that a combination of references disclose the claim

limitations; in addition, a reason to modify and combine the references must be provided. *See, e.g., KSR Int’l v. Teleflex, Inc.*, 550 U.S. 398, 418-419 (2007) (“[R]ejections on obviousness grounds cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness.”).

Moreover, an appropriate obviousness inquiry must be made without any “hint of hindsight.” *Star Scientific, Inc. v. R.J. Reynolds Tobacco Co.*, 655 F.3d 1364, 1375 (Fed. Cir. 2011). Petitioner may not “simply retrace[] the path of the inventor with hindsight, discount[] the number and complexity of the alternatives, and conclude[] that the invention . . . was obvious.” *Ortho-McNeil Pharm., Inc. v. Mylan Labs., Inc.*, 520 F.3d 1358, 1364 (Fed. Cir. 2008). Likewise, “[c]are must be taken to avoid hindsight reconstruction by using the patent in suit as a guide through the maze of prior art references, combining the right references in the right way so as to achieve the result of the claims in suit.” *In re NTP, Inc.*, 654 F.3d 1279, 1299 (Fed. Cir. 2011) (internal quotations omitted).

**B. Petitioner Disguises a Patent Attorney as a Technical Expert**

The Federal Circuit has held that “a witness not qualified in the pertinent art [may not] testify as an expert on obviousness, or any of the underlying technical questions.” *Sundance, Inc. v. DeMonte Fabricating Ltd.*, 550 F.3d 1356, 1364 (Fed. Cir. 2008) (footnote omitted). Petitioner’s expert, Dr. Ralston, had been a patent



attorney for over a decade at the time of the invention, and not a person of ordinary skill in the art. Accordingly, the Board should give little weight to his testimony on the teachings of the prior art or motivation to combine it.

The original application to which the '190 Patent claims priority was filed in April 2013. Ex. 1001 at Front Page. But as Dr. Ralston's CV explains, he graduated from law school in 2005, and stopped working as an engineer by 2002. Thus, he had not been a practicing engineer for at least a decade before the effective filing date of the '190 Patent. Ex. 1003 at 2-3; *see Sundance*, 550 F.3d at 1360-63 (holding district court abused discretion by permitting expert testimony by a patent law expert on issues of infringement and validity, where the patent law expert was not an expert in the pertinent art); *see also Medtronic Inc. v. Intermedics, Inc.*, 799 F.2d 734, 741 (Fed. Cir. 1986) (determining no abuse of discretion where trial court excluded patent law expert's testimony relating to the infringement of the asserted claims); *Endress + Hauser, Inc. v. Hawk Measurement Sys. Pty. Ltd.*, 122 F.3d 1040, 1042 (Fed. Cir. 1997) ("Indeed, this court has on numerous occasions noted the impropriety of patent lawyers testifying as expert witnesses and giving their opinion regarding the proper interpretation of a claim as a matter of law, the ultimate issue for the court to decide.").

To the extent that the Board finds that Dr. Ralston is even *technically qualified* to opine as to a person of ordinary skill in the art, the Board need not credit

Dr. Ralston's unsubstantiated and conclusory statements that merely parrot the Petition. *See Harmonic Inc. v. Avid Tech., Inc.*, 815 F.3d 1356, 1363 (Fed. Cir. 2016) (affirming Board's decision that claims were not obvious where Petitioner's expert testimony "add[ed] nothing beyond the conclusory statements in [Petitioner's] petition."); *Ashland Oil, Inc. v. Delta Resins & Refractories, Inc.*, 776 F.2d 281, 294 (Fed. Cir. 1985) ("Lack of factual support for expert opinion going to factual determinations" is sufficient to "render the testimony of little probative value in a validity determination."); *see also Initiative for Medicines, Access & Knowledge (I-MAK), Inc. v. Gilead Pharmasset LLC*, IPR2018-00122, Paper 10 at 21 (P.T.A.B. May 21, 2018) ("Dr. Fortunak's declaration essentially parrots the Petition without directing us to adequate objective proof for the bare assertions made therein, and, therefore, does not remedy the various deficiencies in Petitioner's ground of unpatentability.").

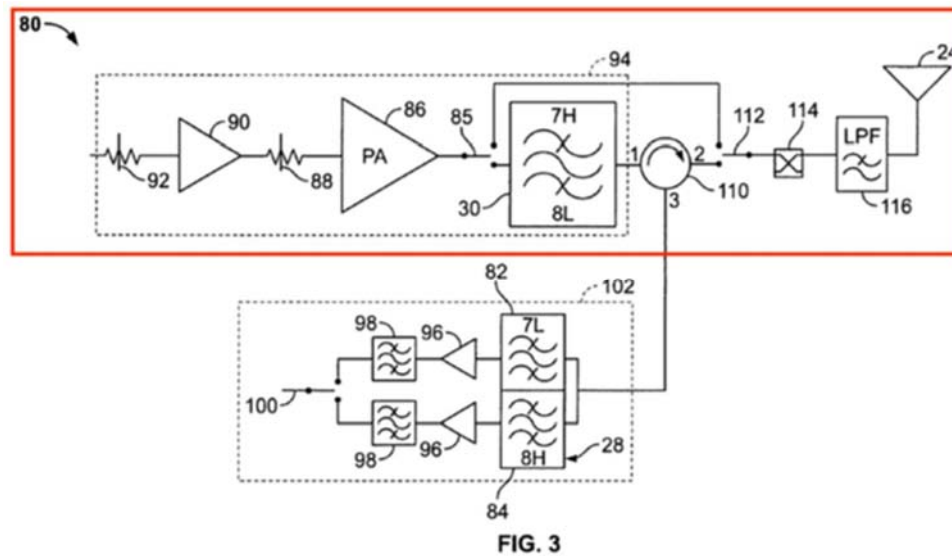
Though the Petition heavily cites Dr. Ralston's declaration, Dr. Ralston never explains why a person of ordinary skill in the art would have modified the prior art with the evidence and rational underpinning required to support the legal conclusion of obviousness. *KSR*, 550 U.S. at 418. Rather, his declaration merely repeats the same conclusory statements found in the petition almost verbatim. *Compare* Pet. at 24 *with* Ex. 1002 ¶¶ 50-51; *compare* Pet. at 27-28 *with* Ex. 1002 ¶ 44. Dr. Ralston's conclusory and unsupported statements are nothing more than attorney arguments.

**C. Petitioner Has Not Established a Likelihood of Success on Ground 1 (Claims 1-4, 6, 8, 19, 20, 24)**

**1. The Combination of Layne, Sahota, and McKay Does Not Teach a Shared Downlink Amplification Path**

Petitioner alleges with respect to the independent Claims 1 and 19 that Layne teaches “a shared amplification path configured to provide amplification to at least a portion of a first downlink channel of a first frequency band and to provide amplification to at least a portion of a second downlink channel of a second frequency band.” *See* Pet. at 23-24, 37-39 (Claim 19 does not contain the phrases “at least a portion of”). However, Layne does not teach a combined downlink amplification path—it teaches a combined *uplink* amplification path. Ex. 1011 at 3:57-59; 3:3-21 (explaining that the 7H and 8L frequency bands are transmit bands); Ex. 2001 ¶ 41-43. Petitioner, in fact, acknowledges that Layne does not teach a combined downlink amplification path. Pet. at 38 (“The combined frequency band 7H and frequency band 8L are uplink channels.”).

The Petition asserts that “the circuitry for amplifying an uplink channel is no different than the circuitry for amplifying a downlink channel.” Pet. at 24. Petitioner is incorrect. In fact, Layne discloses that its downlink amplification path is completely different from its uplink amplification path:



Ex. 1011 at Fig. 3 (with Petitioner’s annotations); Ex. 2001 ¶¶ 45. As shown, Layne’s combined **uplink** amplification path, highlighted by Petitioner in the red box, consists of attenuator 92 connected in series with amplifier 90, attenuator 88, power amplifier 86, switch 85, and then transmit filter 30. Ex. 1011 at Fig. 3, 3:65-4:1. On the other hand, the two downlink amplification paths shown in the bottom, dotted-line box 102, consists of receive filters 82 and 84 (in parallel), followed by amplifiers 96 (in parallel), filters 98 (in parallel), and switch 100. *Id.* at 3:44-52. Layne explains that switch 100 is used to select between the two filtered signals. *Id.* at 3:47-51. A POSITA would recognize that only one downlink signal is active in Layne at any given time due to the switch 100. Ex. 2001 ¶¶ 45-46. Accordingly, Layne discloses two downlink amplification paths that are structurally very different from Layne’s combined uplink amplification path. Furthermore, Layne’s two downlink amplification paths also do not meet the “shared amplification path”

limitation because neither has a band-pass filter that passes both of the 7L and 8H frequency bands. Layne uses two separate band-pass filters, one for each of the 7L and 8H frequency bands, in parallel amplification paths. Ex. 1101 at Fig. 3; *see also* Ex. 2001 ¶ 45. Therefore, Layne also does not disclose the “shared amplification path” limitation.

Further, Ground 1 does not even assert that McKay or Sahota disclose a “shared amplification path” for two downlink channels. In fact, McKay discloses a single amplification path for a single uplink channel and a single amplification path for a single downlink channel. McKay does not disclose *any* combined amplification path. *See* Ex. 1007 at Fig. 19 (showing amplification paths for a single uplink channel and single downlink channel); Ex. 2001 ¶ 47. And Petitioner makes no allegation that Sahota discloses a “shared amplification path” for two downlink channels. *See* Pet. at 23-25. Accordingly, none of the references teach the shared downlink amplification path claim limitation.

**2. A POSITA Would Not Have Been Motivated to Combine Layne with McKay or Sahota**

The Petition does not propose modifying Layne in any manner that would meet the “shared amplification path” limitation. At most, the Petition asserts that “the circuitry for amplifying an uplink channel is no different than the circuitry for amplifying a downlink channel.” Pet. at 24. This conclusory assertion is

contradicted by Layne itself and is not supported by adequate expert testimony. Petitioner's expert merely repeats the Petition verbatim, without providing any further explanation of the basis for the assertion. *Compare* Ex. 1002 ¶ 50 ("The combined frequency band 7H and frequency band 8L are uplink channels. However, the circuitry for amplifying an uplink frequency is no different than the circuitry for amplifying a downlink frequency.") *with* Pet. at 24 (containing nearly identical language). As shown above, Layne has entirely different circuitry for the amplifying the uplink and the downlink. Moreover, the Board need not credit Petitioner's conclusory statements that have been signed by Dr. Ralston. *See* 37 C.F.R. § 42.5(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."); *see also InfoBionic, Inc. v. Braemar Manufacturing, LLC*, IPR2015-01704, Paper 11 at 14-15 (P.T.A.B. Feb. 16, 2016) (denying institution where Petitioner's expert repeated the petition with the addition of "in my opinion").

Further, Petitioner has not established that a person of ordinary skill in the art would have had any motivation to replace Layne's downlink channels—which do not meet the "shared amplification path" claim limitation—with a combined downlink amplification path meeting the "shared amplification path" limitation. Indeed, as explained below, a person of ordinary skill in the art would not be motivated to modify Layne's downlink channels, for at least four reasons.

a. **Petitioner Does Not Adequately Explain How or Why to Modify Layne**

First, Layne discloses different structures for downlink and uplink amplification paths. Petitioner ignores Layne's express teachings. Neither Petitioner nor its expert identify any shortcoming with the separate amplification paths or any reason to replace Layne's downlink structure, which does not meet the claim limitation, with a different structure.

Moreover, Petitioner and its expert fail to explain how to modify Layne. As mentioned above, Layne's two downlink paths include switch 100, which Layne explains is used to select between the two filtered signals. Ex. 1011 at 3:47-51. Thus, Layne teaches two mutually exclusive downlink paths. Ex. 2001 ¶ 46.

Given the vastly different circuit structure between the uplink and downlink paths in Layne, Petitioner's simple statement that uplink and downlink circuitry are equivalent is insufficient to explain how a POSITA could modify Layne to have a combined downlink amplification path. Ex. 2001 ¶¶ 46, 48.

b. **It Is Legally Improper to Use the Teachings of the '190 Patent to Establish a Motivation to Combine**

Second, it is entirely inappropriate to use the teachings of the '190 Patent in an attempt to invalidate the '190 Patent's claims. The Federal Circuit has explained that "[t]o imbue one of ordinary skill in the art with knowledge of the invention in suit, when no prior art reference or references of record convey or suggest that

knowledge, is to fall victim to the insidious effect of a hindsight syndrome wherein *that which only the inventor taught is used against its teacher.*” *W.L. Gore & Assocs., Inc. v. Garlock, Inc.*, 721 F.2d 1540, 1553 (Fed. Cir. 1983) (emphasis added). Petitioner’s reliance on the ’190 Patent’s supposed teachings only shows that hindsight—not a motivation from the prior art itself—guides Petitioner’s analysis for why a POSITA would modify Layne’s circuit to have a combined downlink amplification path. *See* Pet. at 24 (citing ’190 Patent); *see also* Ex. 2001 ¶ 44.

**c. Modifying Layne Would Render It Unfit for Its Purpose as a Mobile Radio**

Third, even if Petitioner explained how to modify Layne, it would render Layne unfit for its purpose as a mobile radio. Ex. 2001 ¶¶ 49-50. A signal booster is an intermediary device between a mobile radio and a cell tower. *Id.* A signal booster, by definition, can no longer function as a mobile radio. *Id.* ¶ 49. Since any modification would render Layne unfit for its purpose as a mobile radio, a POSITA would not have been motivated to combine Layne with Sahota to somehow arrive at a signal booster. *See also In re Gordon*, 733 F.2d 900, 902 (Fed. Cir. 1984) (explaining that the proposed modification cannot render the prior art unsatisfactory for its intended purpose).



d. **Sahota's Notch Filter Is Incompatible with Layne's Band-Pass Filters.**

Fourth, a POSITA would not combine Layne with Sahota because the tunable notch filter taught by Sahota is the antithesis of the combined band-pass filter for multiple channels taught by Layne. *See, e.g.*, Ex. 1008 at Abstract (“The tunable notch filter is tunable to a transmit band in a plurality of transmit bands and attenuates signal components in the transmit band.”). As Dr. Moon explains, a tunable notch filter allows all frequencies except a certain range to pass through, while a band-pass filter blocks all frequencies except a certain range. Ex. 2001 ¶ 51. Because the function of a band-pass filter is diametrically opposed to that of a tunable notch filter, a POSITA would not have even considered Sahota. *Id.* ¶¶ 51-52. Indeed, Petitioner and its expert provide no reason to even look to Sahota.

D. **Petitioner Has Not Established a Likelihood of Success on Ground 2 (Claim 18)**

1. **The Petition Should Be Denied Because It Fails to Set Forth the Grounds with Particularity as Required by 35 U.S.C. § 312(a)(3)**

Section 312 of the AIA states that “[a] petition filed under section 311 may be considered *only if* . . . the petition identifies, in writing and with particularity, each claim challenged, the grounds on which the challenge to each claim is based, and the evidence that supports the grounds for the challenge to each claim . . . .” 35 U.S.C. § 312(a)(3) (emphasis added). Thus, if a petition fails to identify with particularity

the grounds of a challenge to a claim, the petition should be denied. Such is the case here.

Petitioner alleges in Ground 2 that dependent Claim 18 is obvious over Zhuo in view of Layne and Sahota. Claim 18 depends from Claim 1. But Petitioner failed to present any argument that Claim 1 is obvious over any combination of Zhuo, Layne, and Sahota. In Ground 1, Petitioner argued Claim 1 is obvious over the combination of Layne, McKay and Sahota. Ground 1 contains no argument including Zhuo or omitting McKay. Because the Petition fails to identify how the combination of Zhuo, Layne, and Sahota teaches all the elements of independent Claim 1, Ground 2 fails. *See* Ex. 2001 ¶ 53.

Dr. Ralston's declaration does not clarify Petitioner's argument, and in fact, it further muddies the waters by arguing yet a different combination. Dr. Ralston attempts to explain how claim 18 is obvious over "Zhuo in view of Layne and Sahota or the TEKO Repeater." Ex. 1002 ¶ 86. But the TEKO Repeater is not presented in *either* Ground 1 or 2 of the Petition. The combination of Zhuo and TEKO Repeater is *not* a combination presented in the Petition *at all*. Dr. Ralston also does not explain how the combination of Zhuo, Layne, and Sahota teaches the limitations of Claim 1. *Id.* Dr. Ralston's declaration simply does not support the Petition's argument and only creates more confusion as to the actual combination of prior art references that Petitioner is relying upon. *See* Ex. 1002 ¶¶ 81-86; Ex. 2001 ¶ 54.

Because it is completely unclear what references are actually relied upon to meet the limitations of Claim 1 and Claim 18, Petitioner has not specified with particularity the grounds upon which it is challenging Claim 18. *See Zetec, Inc. v. Westinghouse Elec. Co., LLC*, IPR2014-00384, Paper 10 at 14 (P.T.A.B. July 23, 2014) (denying institution where “numerous grounds [were] presented and argued together in the Petition, thereby obfuscating the arguments as to each ground.”). The Petition fails to satisfy § 312(a)(3) and should be denied in its entirety.

**2. The Combination of Zhuo, Layne, and Sahota Does Not Teach the Invention of Claim 18**

Petitioner apparently relies on Zhuo for its disclosure of a signal booster that amplifies three different frequency bands. Pet. at 45-46. However, other than identifying a signal booster for three frequency bands, Petitioner does not explain (a) how the combination teaches the independent claim limitations, (b) how a POSITA could have modified Zhuo with teachings from Layne and Sahota, and (c) why a POSITA would have chosen to amplify Bands II, IV, V, XII, and XIII.

**a. Petitioner Fails to Explain How the Combination Teaches the Independent Claim Limitations**

As explained above, Claim 18 depends from Claim 1. However, Petitioner presented no argument regarding Zhuo with respect to Claim 1. Petitioner also did not explain how Zhuo could be combined with Layne and Sahota to meet the

limitations of Claim 1. Thus, Petitioner has not made a *prima facie* showing that the combination teaches all of the limitation of Claim 18. *See* Ex. 2001 ¶ 53.

**b. Petitioner Fails to Explain How a POSITA Would Have Modified Zhuo with Layne and Sahota**

Petitioner simply identifies different aspects of each reference, contending that Zhuo teaches a multi-band signal booster, Layne amplifies two uplink frequency signals on a common pathway, and Sahota lists a number of frequency bands. *See* Pet. at 46. But Petitioner never explains *how* these references together disclose each and every limitation of Claim 18. *See* Ex. 2001 ¶ 55. As the Federal Circuit explained, “it is not enough for [the challenger] to merely demonstrate that elements of the claimed invention were independently known in the prior art. Often, every element of a claimed invention can be found in the prior art.” *Metalcraft of Mayville, Inc. v. The Toro Co.*, 848 F.3d 1358, 1367 (Fed. Cir. 2017).

**c. Petitioner Fails to Explain Why a POSITA Would Focus on Any Particular Bands in Sahota**

With respect to Sahota, Petitioner focuses on its disclosure of five particular bands: II, IV, V, XII, and XIII. Pet. at 44. But Sahota discloses *fourteen* different frequency bands in a table. Ex. 1008 ¶ 69. Petitioner does not explain how a table listing fourteen bands would motivate a POSITA to develop a signal booster specifically for only five of those bands. Petitioner merely states that a “POSITA would understand from *Sahota* that the downlink channels for Bands XII and XIII

are contiguous cellular frequency bands and that Band II, Band IV, Band V are cellular frequency bands.” Pet. at 46. But as Dr. Moon explains, there are 2002 possible combinations of five frequency bands given a list of fourteen frequency bands. Ex. 2001 ¶56. Petitioner only assumes *a priori* that a POSITA would want to amplify those specific bands without support. That is not a motivation to combine—that is hindsight analysis using Claim 18 as the reason for choosing those specific bands. See Pet. at 46 (“The POSITA wanting to amplify the bands recited in claim 18 would have been motivated . . .”).

**E. Petitioner Has Not Established a Likelihood of Success on Ground 3**

Petitioner asserts in Ground 3 that Claims 1, 2, 6, 8, and 19 are obvious over the DUO Repeater. However, Ground 3 fails at least because (1) Petitioner has not met its burden of proving that the DUO Repeater is a printed publication, and (2) the DUO Repeater does not disclose “a first band-pass filter configured to pass the at least a portion of the first downlink channel and the at least a portion of the second downlink channel” as required by Claim 1 (and the corresponding limitation in Claim 19).

**1. Petitioner Has Not Met Its Burden of Proving that the DUO Repeater Is a Printed Publication**

An IPR petition must include all “evidence the petitioner seeks to rely upon.” Office Patent Trial Practice Guide, 77 Fed. Reg. 48,756 (Aug. 14, 2012). It is the

Petitioner's burden to establish by a preponderance of the evidence that a particular document is a printed publication. *Medtronic, Inc. v. Barry*, 891 F.3d 1368, 1380 (Fed. Cir. 2018).

Whether a reference qualifies as a “printed publication” is a legal conclusion based on underlying factual findings. *Jazz Pharms. v. Amneal Pharms.*, 895 F.3d 1347, 1356 (Fed. Cir. 2018). The underlying factual findings include whether a reference was publicly accessible. *In re NTP, Inc.*, 654 F.3d 1279, 1296 (Fed. Cir. 2011); *In re Hall*, 781 F.2d 897, 899 (Fed. Cir. 1986). “[W]hether information is printed, handwritten, or on microfilm or a magnetic disc or tape, etc., the one who wishes to characterize the information, in whatever form it may be, as a ‘printed publication’ . . . should produce sufficient proof of its dissemination or that it has otherwise been available and accessible to persons concerned with the art to which the document relates and thus most likely to avail themselves of its contents.” *In re Wyer*, 655 F.2d 221, 227 (C.C.P.A. 1981).

Without support, Petitioner asserted that the DUO Repeater “was available at least from the public records of the Federal Communications Commission as of February 9, 2007.” Pet. at 12. But Petitioner has presented *no evidence* as to the DUO Repeater's availability to the public or to that date. The absence of evidence on public accessibility is fatal to this ground. *See Blue Calypso, LLC v. Groupon, Inc.*, 815 F.3d 1331, 1349 (Fed. Cir. 2016) (“Groupon has provided no evidence . . .

other than testimony from Dr. Joshi that it was ‘publicly available around November 2003.’”).

Here, Petitioner has not explained how it concluded that the DUO Repeater was available from the FCC. Generally, when a patent challenger wishes to rely on non-patent literature, the challenger needs to be able to explain how the document was publicly available. This includes whether the document was stored in physical form or online, whether the document was indexed and catalogued by a library, or whether the electronic document was indexed and catalogued such that a person could actually locate it on a website. *See id.* at 1348-51 (affirming Board decision that reference was not shown to be publicly accessible where petitioner failed to present evidence that reference was actually viewed or downloaded, or that the article was indexed and locatable by a search engine before the critical date); *Google Inc. v. IPA Techs. Inc.*, IPR2018-00475, Paper 7 at 8-15 (P.T.A.B. July 20, 2018) (public accessibility of paper stored on a website not proven, where petition did not present evidence that persons of ordinary skill in the art knew of a website, that anyone ever visited the website, that the document was ever accessed, or that the website was indexed, catalogued, or contained a search function). Petitioner and Dr. Ralston do not even attempt to show how the DUO Repeater was publicly

accessible.<sup>1</sup> Petitioner sidesteps this threshold matter entirely and expects the Board to accept their bare legal conclusion at face value.

Moreover, Petitioner presents no evidence establishing the particular date it relies on—February 9, 2007. *See* Pet. at 12-13. That date does not appear anywhere on or in the DUO Repeater document itself. The only reference to a date in the DUO Repeater is on page 3—“Version 1.2 (Released January 19, 2007).” Ex. 1009 at 4. But as Petitioner likely recognized due to its non-reliance on this date, the date on the face of a document is generally not sufficient to show public accessibility. *See, e.g., Google*, IPR2018-00475, Paper 7 at 10 (“[T]he date on the document, in and of itself, would not provide sufficient factual support for such a finding.”); *Microsoft Corp. v. Biscotti Inc.*, IPR2014-01459, Paper 24 at 9 (P.T.A.B. June 3, 2015) (“Regarding the recitation of ‘November 10, 2006’ on the face of the HDMI Specification, this may tend to demonstrate that the HDMI Specification existed as of that date, but we find it relatively unpersuasive on the issue of whether it was publicly accessible.”). There is no other evidence for another date. Accordingly,

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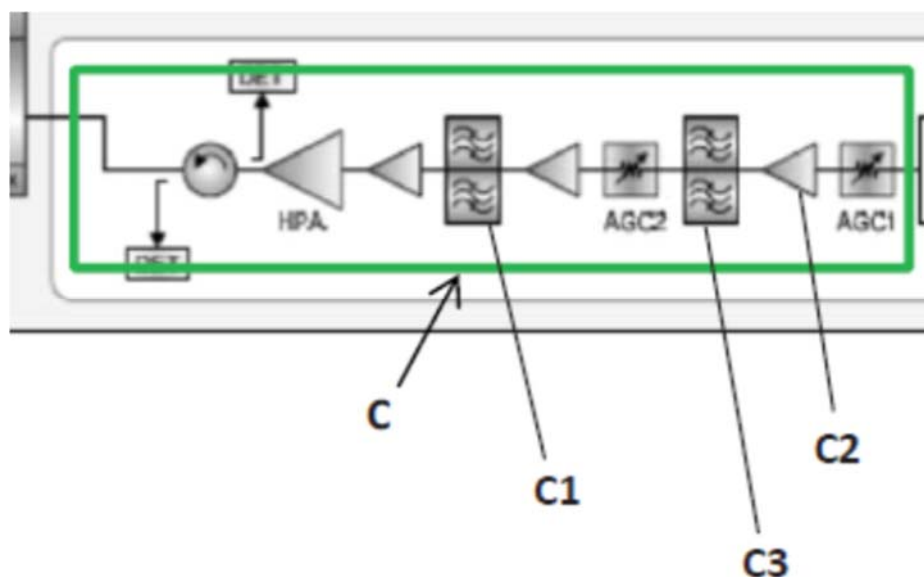
<sup>1</sup> Moreover, to the extent that Petitioner relies on the Ralston Declaration to prove public accessibility, the Dr. Ralston is not a percipient witness with actual knowledge of the document’s public accessibility on a relevant date to establish the prior art status of the document.



Petitioner has presented no evidence whatsoever to establish a date for public accessibility.

**2. The DUO Repeater Does Not Disclose a “First Band-Pass Filter” That Passes Two Downlink Channels**

Even if the Board accepts the DUO Repeater as a prior art reference, Ground 3 still fails because the DUO Repeater does not render Claims 1 or 19 obvious. Claim 1 requires a “shared amplification path” which “comprises a first band-pass filter configured to pass the at least a portion of the first downlink channel and the at least a portion of the second downlink channel.” Ex. 1001 at Claim 1. Claim 19 recites a similar limitation, but without the two phrases “at least a portion of.” *Id.* at Claim 19. Petitioner asserts that the band-pass filter labeled as C1 in the DUO Repeater is the “first band-pass filter.” Pet. at 49-50. However, as clearly shown in the DUO Repeater, the band-pass filter C1 is actually *two* band-pass filters.



Pet. at 48 (citing Ex. 1009 at Fig. 4); *see also* Ex. 2001 ¶¶ 57-60.

As Dr. Moon explains, a POSITA would recognize that the two stacked band-pass filters in C1 are in fact two band-pass filters because the remainder of the DUO Repeater's circuit filters and amplifies the two signals separately. Ex. 2001 ¶ 61. Petitioner and its expert fail to explain how the two band-pass filters in the DUO Repeater teaches the actual claim requirement.

Furthermore, the DUO Repeater explains that the SMR800 downlink frequency is 851-869 MHz and the SMR900 downlink frequency is 935-940 MHz. The two band-pass filters filter SMR800 downlink band and the SMR900 downlink band, respectively. Ex. 1009 at 31, Fig. 4; Ex. 2001 ¶ 62. The two signal bands of interest are 18 MHz and 5 MHz, respectively. The difference between the upper and lower bounds of these two frequency ranges is 89 MHz. Ex. 2001 ¶ 62. Contrary to Petitioner's argument, a POSITA would not have been motivated to amplify the 66 MHz gap between the two bands—a POSITA would not be interested in amplifying a frequency gap that is three times *larger* than the sum of the signals of interest. *Id.*

Another issue with Petitioner's positions is that *the SMR900 uplink frequency band is situated in between the SMR800 and SMR900 downlink frequency bands.*

**Electrical Specifications**

Parameters		Specifications	Comments
Frequency	SMR800 DL	851 ~ 869 MHz or 862 ~ 869 MHz	
	SMR800 UL	806 ~ 824 MHz or 817 ~ 824 MHz	
	SMR900 DL	935 ~ 940 MHz	
	SMR900 UL	896 ~ 901 MHz	

Ex. 1009 at 31 (listing SMR900 uplink as 896-901 MHz). A POSITA designing an amplification path for downlink signals would not try to amplify the uplink signal as well because that would cause interference with the amplification path specifically for the uplink signal. Ex. 2001 ¶ 63.

Petitioner accordingly has not shown that the DUO Repeater discloses a “first band-pass filter” that is configured to pass the downlink channels of two frequency bands. *See* Ex. 1001 at Claims 1, 19. Nor would a POSITA find that limitation obvious in view of the DUO Repeater, because the SMR900 uplink frequency band is situated between the two downlink bands. Ex. 2001 ¶¶ 60-63, 65.

**3. The DUO Repeater Does Not Show “wherein the first downlink channel and the second downlink channel are adjacent in frequency to one another”**

Petitioner argues that the DUO Repeater’s amplification of the 66 MHz gap between the SMR800 and SMR900 downlink frequency bands suggests that a POSITA would recognize that “amplification of the separation between the frequency bands is an acceptable trade-off.” Pet. at 50. But Petitioner’s argument fails because, (1) as explained above, the DUO Repeater does not amplify the 66

MHz gap, and (2) the SMR800 and SMR900 downlink frequency bands are not adjacent to each other.

Petitioner stated in its claim construction section that “[t]wo frequency bands that are not contiguous or abutting would be considered ‘adjacent’ if the bands are separated by a frequency range that *does not include another intervening, incompatible frequency band.*” Pet. at 4-5 (emphasis added). But as explained above, the SMR900 uplink frequency band, 896-901MHz, is *directly between* the SMR800 and SMR900 frequency bands. Ex. 1009 at 31; Ex. 2001 ¶ 64. Therefore, under Petitioner’s construction, the two downlink frequency bands used in the DUO Repeater are not adjacent.

Furthermore, the Petition does not identify any suggestion or motivation to modify the DUO Repeater to “accommodate Bands XII and XIII in the repeater.” Pet. at 50. The DUO Repeater does not mention Bands XII or XIII. Petitioner also cites no prior art reference or evidence that would motivate a POSITA to modify the DUO Repeater to work with those bands. Petitioner merely assumes that a POSITA would want to accommodate Bands XII and XIII in the DUO Repeater—but, again, that is hindsight analysis—using the ’190 Patent as a guide to modify the prior art.

Petitioner’s argument with respect to Claim 2 exposes the inconsistency in its position. That claim requires the “first band-pass filter is further configured to attenuate both a first uplink channel of the first frequency band and a second uplink

channel of the second frequency band.” Ex. 1001 at Claim 2. With respect to Claim 2, Petitioner argues that the band-pass filter C1 *attenuates* the uplink signals for the SMR800 and SMR900 frequency bands. Pet. at 52. In contrast, for Claim 1, Petitioner argues that the band-pass filter C1 *passes* the 66 MHz gap in between the SMR800 and SMR900 downlink bands, which also contains the SMR900 uplink frequency band. Pet. at 50-51. The band-pass filter C1 (which is not a single band-pass filter, for the reasons explained above) cannot *both* attenuate and pass the SMR900 uplink signal at the same time. Petitioner’s Ground 3 arguments are contradictory. Accordingly, Petitioner has not shown a reasonable likelihood of success on Ground 3.

**F. Petitioner Has Not Established a Likelihood of Success on Ground 4**

Petitioner alleges in Ground 4 that Claims 3, 4, 20, and 24 are obvious over DUO Repeater in view of Sahota. However, Ground 4 also fails for the same reasons that Ground 3 fails.

Additionally, Petitioner alleges that “*Sahota* further discloses a tunable filter that can be modified to accommodate multiple frequency bands.” Pet. at 58. But as explained above, a POSITA would not have been motivated to look to Sahota because Sahota teaches the use of a tunable notch filter—the antithesis of the band-pass filters used in the DUO Repeater. Ex. 1008 at Abstract; Ex. 2001 ¶¶ 66-67. Petitioner omits the fact that Sahota’s filters are *notch* filters, not shared band-pass

filters. A POSITA would have understood that Sahota's disclosure is not compatible with the band-pass filters disclosed in the DUO Repeater and therefore would not have been motivated to combine Sahota with the DUO Repeater. Ex. 2001 ¶ 67.

**G. Petitioner Has Not Established a Likelihood of Success on Ground 5**

Ground 5 relies on the same DUO Repeater reference and the additional TEKO Repeater reference. As explained above, Petitioner failed to demonstrate that the DUO Repeater is a prior art printed publication (among other errors). Petitioner makes similar fatal errors with respect to the TEKO Repeater.

**1. Petitioner Has Not Met Its Burden of Showing that the TEKO Repeater Is a Printed Publication**

As with the DUO Repeater, Petitioner presents *no argument* and *no evidence* to show that the TEKO Repeater is a prior art printed publication. The Petition is silent on whether the TEKO Repeater was publicly accessible and when it became publicly accessible. Petitioner does not explain (1) where the TEKO Repeater can be found, (2) what date the TEKO Repeater was supposedly publicly available, and (3) whether the portions presented in the TEKO Repeater are actually public. *See* Pet. at 17-19, 64-67.

As mentioned above, “whether information is printed, handwritten, or on microfilm or a magnetic disc or tape, etc., the one who wishes to characterize the information, in whatever form it may be, as a ‘printed publication’ . . . should

produce sufficient proof of its dissemination or that it has otherwise been available and accessible to persons concerned with the art to which the document relates and thus most likely to avail themselves of its contents.” *In re Wyer*, 655 F.2d 221, 227 (C.C.P.A. 1981). Petitioner does not explain where the TEKO Repeater comes from at all. The Petition contains ***no allegation*** of where a person concerned with the art could actually find the TEKO Repeater. *See* Pet. at 17-19, 64-67. The Petition does not even ***state a date*** for when the TEKO Repeater was supposedly publicly available. *See id.*

Dr. Ralston’s declaration attempts to supply this information, but Dr. Ralston is not a fact witness with personal knowledge of when the document was publicly available or where the document may be found. *See* Ex. 1002 ¶ 34; *see also Dell, Inc. v. Selene Commc’n Techs., LLC*, IPR2014-01411, Paper 23 at 22–23 (P.T.A.B. Feb. 26, 2015) (expert witness’ unsupported statement that document was publicly available is insufficient to show public accessibility). Moreover, the Petition itself must contain the arguments and evidence in support of a showing that the TEKO Repeater is available as prior art. *See Cisco Systems, Inc. v. C-Cation Techs., LLC*, IPR2014-00454, Paper 12 at 10 (P.T.A.B. Aug. 29, 2014) (designated as informative) (“[W]e will not consider arguments that are not made in the Petition, but are instead incorporated by reference to [the expert declaration].”). The Petition

contains no evidence or reason for the Board to accept the TEK0 Repeater as a prior art printed publication.

It is further unclear whether the portions relied upon by Petitioner in the TEK0 Repeater document are actually publicly available. The first page of the TEK0 Repeater consists of a Request for Confidentiality. *See* Ex. 1006 at 2. Specifically, the request for confidentiality encompasses schematic diagrams, block diagrams, and tune up information. *Id.* The Petition itself reproduces a block diagram from the TEK0 Repeater that supposedly would fall within that request for confidentiality. *See* Pet. at 18, 65 (citing “REMOTE UNIT BLOCK DIAGRAM”). Petitioner does not explain why it believes that the cited portions of the TEK0 Repeater are not confidential or if they were confidential at one point in time. *See Northern Telecom, Inc. v. Datapoint Corp.*, 908 F.2d 931, 936 (Fed. Cir. 1990) (documents containing security classification not found to be publicly accessible); *Cordis Corp. v. Boston Sci. Corp.*, 561 F.3d 1319, 1334 (Fed. Cir. 2009) (document was not a prior art printed publication where document was distributed under an expectation of confidentiality). Dr. Ralston’s declaration even acknowledges that portions of the TEK0 Repeater are not printed publications because they are confidential. Ex. 1002 ¶ 34. But he does not explain whether Ex. 1006 contains only non-confidential portions or if certain portions are still confidential.



Accordingly, Petitioner has not presented any evidence or argument as to why the Board should accept the TEK0 Repeater as a prior art printed publication. Dr. Ralston's declaration also should be given no weight on the issue because (1) it does not form part of the Petition, and (2) he is not a witness with personal knowledge of the TEK0 Repeater's public accessibility as of a relevant date.

**2. Even If the TEK0 Repeater Were a Printed Publication, It Does Not Resolve the Issues with the DUO Repeater**

As explained above with respect to Ground 3, the DUO Repeater does not disclose a "first band-pass filter" that filters two downlink bands. Even if the Board were to accept the TEK0 Repeater as a printed publication, Grounds 3-5 still fail because the TEK0 Repeater does not supply that missing limitation of a "first band-pass filter" that filters two downlink bands.

Petitioner points to a table in the TEK0 Repeater that lists a number of frequency bands. *See* Pet. at 66. However, that table is only a listing of frequency bands. It does not disclose a combined downlink amplification path or any band-pass filters that pass two downlink channels. *See* Ex. 2001 ¶¶ 68-69. Furthermore, TEK0 Repeater describes a different type of device that relies on converting radio frequency signals to fiber optic signals and back to radio frequency signals. Ex. 1006 at 12-13; *see also* Pet. at 65 (showing circuit diagram with fiber optic receiver).

It is an entirely different category of device. Accordingly, the combination of DUO Repeater and TEKO Repeater fail to meet the limitations of Claim 1.

**V. OBJECTIVE EVIDENCE CONFIRMS THE NONOBVIOUSNESS  
OF THE CHALLENGED CLAIMS**

Objective evidence strongly supports the nonobviousness of the '190 Patent claims, including satisfying a long-felt need, industry praise, commercial success, failure of others, and copying by others. *See generally* Exs. 2003, 2004, 2005. When present, objective evidence of nonobviousness must be considered. *Apple Inc. v. Samsung Elecs. Co.*, 839 F.3d 1034, 1048 (Fed. Cir. 2016), *cert. denied*, 138 S. Ct. 420 (2017).

**A. The Force5 Repeater Covered By the '190 Patent Met a Long-Felt But Unsolved Need for Boosting Bands Simultaneously**

The first commercial embodiment of the '190 Patent, SureCall's Force5, was a breakthrough in the signal booster industry. It provided, for the first time, a signal booster that could simultaneously amplify 4G LTE signals for AT&T and Verizon.

From 2008 through early 2011, commercially available cell phone signal boosters only amplified two bands, the talk and text bands of the 2G and 3G networks. Ex. 2003 ¶ 16; Ex. 2005 ¶ 12. As 4G LTE technology became more widespread around 2010, there became a need to create signal booster technology that could also boost the 4G LTE bands, in addition to the traditional 2G and 3G talk and text bands. Ex. 2003 ¶ 16; Ex. 2004 ¶ 12; Ex. 2005 ¶¶ 12, 17. Indeed, by 2010

when it was clear the entire cell phone industry was adopting 4G LTE, the industry, distributors, and consumers widely shared a desire for a technological advancement that would allow simultaneous boosting of multiple LTE bands. Ex. 2003 ¶ 19; Ex. 2004 ¶¶ 12-14; Ex. 2005 ¶ 17.

The technological hurdles proved difficult. In the summer of 2011, 4G LTE signal boosters started becoming commercially available. Ex. 2003 ¶ 17; Ex. 2005 ¶ 13. However, those products boosted the 4G LTE signal only, and not the 2G and 3G bands. *Id.* Not until the beginning of 2012, was there a device capable of boosting three bands simultaneously – the two bands of 2G/3G and a third band for 4G LTE for a single carrier’s network. Ex. 2003 ¶ 17; Ex. 2004 ¶ 13; Ex. 2005 ¶ 13. But despite the three-band technology, there was still tremendous room for improvement because those devices could only boost the 4G LTE signal of one particular carrier at a time. Ex. 2003 ¶ 17; Ex. 2004 ¶ 13; Ex. 2005 ¶ 14. Thus, a customer would have to buy and install a device specifically made to boost 4G LTE for Verizon, or for AT&T, or for T-Mobile. *Id.*

There also were interoperability problems among the three-band products. For example, even if a customer owned different boosters, one compatible with Verizon 4G LTE and another compatible with AT&T 4G LTE, the customer could not operate those boosters at the same time due to interference. Ex. 2003 ¶ 18; Ex. 2005 ¶ 15. That was because the AT&T and Verizon 4G LTE bands were extremely

close together. Ex. 2005 ¶ 15. Verizon operated on the 700 MHz “upper blocks” while AT&T operated on the 700 MHz “lower blocks.” Thus, a signal booster that filtered the AT&T 4G LTE signal would interfere with a signal booster for the Verizon 4G LTE signal, and vice versa. *Id.*

The lack of interoperability was a major problem particularly for the commercial market, such as large office buildings. Ex. 2003 ¶ 18; Ex. 2005 ¶ 16. Interoperability was important to those customers because people in the same office building, for example, were very unlikely to all use the same cell phone carrier. *Id.* But due to the interference, those customers could not offer an integrated solution to all of the individuals in need of a boosted 4G LTE signal. Ex. 2004 ¶ 14. The EVDOinfo blog, known in the industry for product reviews and the latest signal booster industry news, even recognized the need for a technology solving this long-known problem. Ex. 2004 ¶ 21; Ex. 2013. Coinciding with the announcement of the Force5, an EVDOinfo article stated that “Cellphone-Mate has announced the release of a product that has been *long-anticipated by users* wanting to boost the signal to multiple networks at the same time.” *Id.* (emphasis added).

SureCall was able to solve the long-known problem of simultaneously boosting 4G LTE signals for all major wireless carriers. Ex. 2005 ¶ 19. SureCall’s Force5 product covered by the ’190 Patent was the solution. This fact weighs strongly in favor of nonobviousness. *WBIP, LLC v. Kohler Co.*, 829 F.3d 1317,

1332 (Fed. Cir. 2016) (“Evidence of a long felt but unresolved need tends to show non-obviousness because it is reasonable to infer that the need would have not persisted had the solution been obvious.”).

**B. The Industry Praised Patent Owner’s First Commercial Embodiment of the ’190 Patent**

SureCall introduced the Force5 signal booster to the industry and public on April 30, 2012. Ex. 2003 ¶ 20; Ex. 2004 ¶ 15; Ex. 2005 ¶ 31; Ex. 2009. The industry responded with immediate praise. Indeed, that same day, the EVDOinfo blog published an article regarding SureCall’s release of the Force5. Ex. 2013. The article noted that the Force5 was “the first and ONLY amplifier currently available that supports ALL of those frequencies [for the major carriers].” (emphasis in original). *Id.*

Petitioner also responded with both surprise and reverence. In particular, James Wilson, the founder and then-CEO of Petitioner, appeared to be irritated by SureCall’s announcement. Ex. 2003 ¶ 24; Ex. 2004 ¶ 19. Former Wilson employees recall Mr. Wilson appearing to be in disbelief that another engineering group could make such advancements before Petitioner. *Id.* Similarly, Petitioner’s then-Director of Business Development, viewed the Force5 as a groundbreaking achievement. Ex. 2003 ¶ 22.

Patent Owner publicly displayed its Force5 device at the Cellular Telecommunications Industry Association (CTIA) trade show from May 7 to May 10, 2012. Ex. 2004 ¶¶ 16-17. CTIA, which at the time was one of the largest, if not the largest, trade shows for cellular telecommunications in the world, took place in New Orleans, Louisiana in 2012. Industry members at CTIA 2012, including Petitioner's own Director of Marketing at the time, immediately recognized the Force5 as a groundbreaking advancement. Ex. 2003 ¶ 22; Ex. 2004 ¶ 17. Indeed, the attending media recognized the Force5 as the most compelling booster device at CTIA 2012 because of its 5-band capability. Ex. 2004 ¶ 17.

The industry continued to praise Patent Owner's Force5 product for months and even years after its introduction. For instance, on December 12, 2012, the EVDOinfo blog published an article about boosting both 3G and 4G LTE signal. Ex. 2004 ¶ 22; Ex. 2014. That article noted that "[u]ntil now customers only had a few options to repeat both 3G and 4G LTE signal within a building. Option one was to shell out for a Cellphone-Mate Force-5, which is the only wireless amplifier on the market that currently supports 3G/4G AWS and LTE." Ex. 2014. The article also explains do-it-yourself type solutions for customers looking to boost 3G and 4G LTE signals without purchasing a Force5 by using multiple boosters together. *Id.* However, those proposed solutions would only allow a consumer to boost 4G LTE signal for a particular carrier, *i.e.* AT&T or Verizon, but not both. *Id.*

In July 2012, the 3gstore blog, another industry blog, published an article announcing that the Force5 was available for sale. Ex. 2004 ¶ 23; Ex. 2015 at 9-10. That article emphasized that “[t]he SureCall® Force-5 CM5000 Wireless Amplifier, the first amplifier that supports virtually every 2G, 3G, and 4G frequency in North America (except Nextel/iDen and Sprint/CLEAR 4G WiMAX), is now available!” Ex. 2015 at 9. The article further noted that “[t]his is the first and ONLY amplifier currently available that supports ALL of those frequencies. Prior to the availability of the Force5, customers who wanted to boost the signal to 3G and 4G devices from a variety of providers had to either install multiple systems or compromise their plans and settle for just boosting some of the networks.” *Id.* In addition, the article explained part of the reason for consumer demand of Force5 – “it is intended for use in large buildings where lots of users of various networks are in need of better signal (for example, an office building where the owner wants to make sure all of his employees and customers can make phone calls regardless of who their provider is).” *Id.* at 10.

In February 2013, RCR Wireless News, a respected industry publication, hosted a webinar discussing the technological advancements of the Force5. Ex. 2005 ¶ 41; Ex. 2022. Notably, RCR Wireless invited Hongtao Zhan, the inventor of the ’190 Patent, to give that presentation and to explain the unique ability of the Force5 to boost 4G LTE signals for all major cell phone carriers in the U.S. *Id.*

On July 9, 2013, GizmoChat, another industry blog, published a post about the Force5. Ex. 2004 ¶ 24; Ex. 2016. That post noted that “[u]p until Q4 of 2012, you had to mix and match multiple cellular amplifiers in order to cover the[] 5 major bands. This was a very expensive and complicated thing to do. Cellphone-Mate was the first cellular amplifier company to do this.” Ex. 2016. The article also noted that the Force5 was a major technological advancement and big news in the industry – in particular, the article stated “[n]ow one system with a single amplifier can take care of all the major carrier frequencies used in the US and Canada. **That’s a big deal.**” *Id.* (emphasis added).

GizmoChat also posts videos on YouTube highlighting the latest and best cell phone signal booster technology. Ex. 2005 ¶ 42. On two separate occasions GizmoChat invited Hongtao Zhan to participate in order to display and discuss the Force5 because of its renown in the industry and groundbreaking technological advancement to boost 5-bands simultaneously. Ex. 2005 ¶¶ 42-43; Exs. 2023, 2024.

In addition to industry blogs, “Commercial Integrator,” one of the most prominent and well-respected industry publications covering cell phone signal boosters, featured the Force5. Ex. 2003 ¶ 25; Ex. 2004 ¶ 25. Commercial Integrator publishes annual BEST (Best Electronics Systems Technologies) Awards. Ex. 2003 ¶ 26; Ex. 2004 ¶ 26. The BEST AWARDS recognize the most outstanding products and services impacting the commercial technology-integration industry. Ex. 2003 ¶



26; Ex. 2004 ¶ 26. An unbiased panel of a dozen industry leaders, along with the editors of Commercial Integrator, judges the selections. Ex. 2003 ¶ 26; Ex. 2004 ¶ 26. The judges give special consideration to innovation, functionality, competitive advantages and benefits to the installer. Ex. 2003 ¶ 26; Ex. 2004 ¶ 26.

In June 2014, Commercial Integrator published that the Force5 had won the 2014 BEST Award for cell booster technology. Ex. 2003 ¶ 27; Ex. 2004 ¶ 27; Ex. 2010. That article noted that “when [the Force5] was first released in 2012, it was the first self-contained cell booster on the market to support 2G, 3G and 4G service for every major carrier.” Ex. 2010.

Shortly thereafter, on June 30, 2014, the EVDOinfo blog published the fact that the Force5 had won the BEST Award. Ex. 2004 ¶ 28; Ex. 2017. That article further noted that “when it was first released in 2012, it was the first self-contained cell booster on the market to support 2G, 3G and 4G service for every major carrier. Due to this, the Force5 has become the leading choice of professional installers everywhere.” Ex. 2017.

The praise awarded to Force5 is due to SureCall’s patented 5-band technology. Ex. 2003 ¶ 28; Ex. 2004 ¶ 29. The technology allowed the Force5 to simultaneously boost signals for voice, text, and 4G LTE signal for all major North American cell carriers. Moreover, this praise strongly suggests the nonobviousness of the ’190 Patent’s claimed technology. *WBIP, LLC v. Kohler Co.*, 829 F.3d 1317,

1334 (Fed. Cir. 2016) (“Evidence that the industry praised a claimed invention or a product which embodies the patent claims weighs against an assertion that the same claim would have been obvious. Industry participants, especially competitors, are not likely to praise an obvious advance over the known art. Thus, if there is evidence of industry praise in the record, it weighs in favor of the nonobviousness of the claimed invention.”); *See also Institut Pasteur & Universite Pierre Et Marie Curie v. Focarino*, 738 F.3d 1337, 1347 (Fed. Cir. 2013) (“[I]ndustry praise ... provides probative and cogent evidence that one of ordinary skill in the art would not have reasonably expected [the claimed invention].”).

**C. The SureCall Force5 Embodies the Claimed Features**

A nexus between the objective evidence and a novel feature of the claimed invention is presumptively attributed to the patented invention where the product is coextensive with the claimed features. *Muniauction, Inc. v. Thomson Corp.*, 532 F.3d 1318, 1328 (Fed. Cir. 2008) (citation omitted). Such is the case here.

Dr. Moon has reviewed Patent Owner’s Force5 device, and the contemporaneous documents describing it, and compared the Force5 to each of the challenged claims of the ’190 Patent. Ex. 2001 ¶¶ 70-76; Ex. 2006. Dr. Moon explains that the Force5 practices and is coextensive with every challenged claim the ’190 Patent. Ex. 2001 ¶¶ 70-76. Thus, objective evidence of nonobviousness with respect to the Force5 is directly applicable to the claims of the ’190 Patent.

**D. Petitioner Tried and Failed to Produce a Competing Product**

As explained above, the industry recognized the need for a device capable of simultaneously boosting 4G LTE signals for multiple carriers since at least 2010. The industry, and Petitioner, expressed the sentiment that technological challenges made that unfeasible. The main challenge was that the existing technology that could boost 4G LTE for AT&T would interfere with the existing technology that could boost 4G LTE signals for Verizon. Ex. 2003 ¶ 18; Ex. 2005 ¶ 15. Thus, those two types of boosters could not be operated near each other, such as in the same building. Ex. 2003 ¶ 18; Ex. 2005 ¶ 15. For those same reasons, manufacturers were unable to figure out how to house a booster that could boost 4G LTE on Verizon and AT&T in the same unit.

When Patent Owner publicly disclosed its Force5 on April 30, 2012, Petitioner recognized that it needed a similar device to remain competitive. Ex. 2003 ¶ 23; Ex. 2004 ¶ 18. As a result, Petitioner announced the introduction of its AG Pro-Quint on May 8, 2012 – coinciding with one of the first days of the 2012 CTIA conference. Ex. 2003 ¶ 31; Ex. 2004 ¶ 31; Ex. 2011. Petitioner touted that the “AG Pro-Quint is the most technologically advanced signal booster Wilson has ever produced, with coverage enhancement for five frequency bands integrated in a single device. . . . Despite this sophistication, it’s by far the most compact, affordable and easiest-to-install booster in its class.” Ex. 2003 ¶ 31. However, Petitioner made that

announcement even though the design and manufacture of the device had not been completed. Ex. 2003 ¶ 31-32; Ex. 2004 ¶ 31.

Indeed, after Petitioner's announcement, it was unable to commercially release the device until six months later. And when the AG Pro-Quint device was finally released in January 2013, it *could not* simultaneously boost AT&T and Verizon 4G LTE signals. Ex. 2003 ¶ 32; Ex. 2004 ¶ 31; Ex. 2012. A user would have to specifically select on Petitioner's device *only one of* Verizon or AT&T to be boosted. Ex. 2003 ¶ 32; Ex. 2012. Thus, Petitioner failed to deliver the feature that made the Force5 desirable in the market – the simultaneous amplification of AT&T and Verizon 4G LTE signals. *Uniroyal, Inc. v. Rudkin-Wiley Corp.*, 837 F.2d 1044, 1054 (Fed. Cir. 1988) (“[F]ailure of others to provide a feasible solution to a long standing problem is probative of nonobviousness.”).

**E. Embodiments of the '190 Patent, Including the Force5, Have Been Commercially Successful**

SureCall first sold its Force5 on May 22, 2012. Ex. 2005 ¶ 33. Since that first sale, SureCall's Force5 has continued to be very successful. *Id.* ¶ 34. Despite being one of the more expensive products it sold at the time, the Force5 quickly became Patent Owner's best-selling product. *Id.*

After May 2012, Patent Owner continued to introduce additional 5-band products, such as the Fusion 5 and Force5 2.0. *Id.* ¶ 35. Today, Patent Owner's six

bestselling products are its Fusion 5s, Fusion5X, Flare, Fusion4Home, Fusion2Go 3.0, and Force5 2.0. All of those products boost signals for voice, text, and 4G LTE signal for all North American cell carriers, a capability that Patent Owner specifically touts on all of its 5-band capable products. *Id.* All of these products are covered by the '190 Patent. *Id.* Since the release of the Force5, SureCall has experienced dramatic increases in its sales volume and revenue directly attributable to the technology covered by the '190 Patent. *Id.* ¶¶ 36-37; Ex. 2021. That increase in sales is the result of SureCall's claimed 5-band technology.

Accordingly, the industry-wide commercial success of Patent Owner's Force5 device and its other devices embodying the technology claimed in the '190 Patent weighs heavily in favor of nonobviousness. *Merck & Co. v. Teva Pharms. USA, Inc.*, 395 F.3d 1364, 1376 (Fed. Cir. 2005) (When "a product attains a high degree of commercial success, there is a basis for inferring that such attempts [to a solution] have been made and have failed."); *see also WBIP*, 829 F.3d at 1337 ("Demonstrating that an invention has commercial value, that it is commercially successful, weighs in favor of its non-obviousness.").

**F. Petitioner Tried to Copy the Claimed Technology**

As explained above, once Patent Owner announced its Force5 product prior to CTIA 2012, Petitioner rushed to get a competing product out to the public. Ex. 2003 ¶ 31-32; Ex. 2004 ¶ 31. On May 8, 2012, during CTIA 2012, Petitioner

announced that it had created a 5-band product – the AG Pro-Quint. Ex. 2003 ¶ 31; Ex. 2004 ¶ 31. However, Petitioner merely created a sticker for the AG Pro-Quint and placed it on an existing booster that was *not* 5-band capable in order to give the appearance that Petitioner had also come up with 5-band technology. Ex. 2004 ¶ 31. Indeed, Petitioner had not created a functioning prototype capable of boosting 4G LTE signal for all major carriers until January, 2013. However, the AG Pro-Quint device was not capable of simultaneously boosting the AT&T and Verizon 4G LTE bands, and required a user to select one of the signals to be boosted. Ex. 2003 ¶ 32; Ex. 2004 ¶ 31.

Immediately after CTIA 2012, Petitioner’s engineering department requested that its sales team acquire a Force5 device so that it could test and evaluate it for competitive analysis. Ex. 2003 ¶ 34; Ex. 2004 ¶ 32. Shortly thereafter, Petitioner acquired a Force5 device. Ex. 2004 ¶ 32. Even then, Petitioner could not release a commercial booster capable of simultaneously amplifying the AT&T and Verizon 4G LTE signals until February 2014. Ex. 2003 ¶ 35.

Moreover, after Patent Owner’s release of its Force5, and Petitioner’s implicit acknowledgement of the device’s success, Petitioner’s marketing efforts heavily shifted to promoting 5-band, 4G technology. Ex. 2004 ¶ 33. Petitioner specifically directed advertisements of 5-band, 4G capable signal boosters to tout the products’

abilities to work with all phones & cellular devices including all major US carriers.

Ex. 2003 ¶ 36; Ex. 2004 ¶ 33.

Accordingly, Petitioner's attempts to copy the technology claimed in the '190 Patent weigh heavily in favor of nonobviousness. *Windsurfing Int'l, Inc. v. AMF, Inc.*, 782 F.2d 995, 1000 (Fed. Cir. 1986) (“[C]opying the claimed invention, rather than one within the public domain, is indicative of non-obviousness.”).

## **VI. CONCLUSION**

The five grounds presented fail to demonstrate the obviousness of any challenged claim of the '190 Patent. Petitioner engaged in hindsight reconstruction, presented contradicting arguments, and failed to establish that the references that it relies upon are printed publications. Furthermore, significant objective indicia establish that the claimed inventions were not obvious. Thus, Patent Owner respectfully requests that the Board deny institution in full.

Respectfully submitted,

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Dated: January 18, 2019

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**CERTIFICATE OF COMPLIANCE**

Pursuant to 37 C.F.R. § 42.24(d), the undersigned certifies that the foregoing **PATENT OWNER PRELIMINARY RESPONSE** complies with the type-volume limitation of 37 C.F.R. § 42.24(a)(1)(i). This document contains 11,595 words, excluding the parts exempted as provided in 37 C.F.R. § 42.24(b).

Respectfully submitted,

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**CERTIFICATE OF SERVICE**

I hereby certify that a true and correct copy of **PATENT OWNER PRELIMINARY RESPONSE and EXHIBITS 2001-2025** are being served on January 18, 2019, via EMAIL pursuant to 37 C.F.R. § 42.6(e), to counsel for Petitioners as addressed below:

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