

IN THE UNITED STATES DISTRICT COURT  
FOR THE EASTERN DISTRICT OF TEXAS  
MARSHALL DIVISION

WILUS INSTITUTE OF STANDARDS AND  
TECHNOLOGY INC.,

Plaintiff,

v.

HP INC.

Defendant.

Civil Case No. 2:25-cv-00069-JRG

**JURY TRIAL DEMANDED**

WILUS INSTITUTE OF STANDARDS AND  
TECHNOLOGY INC.,

Plaintiff,

v.

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

Defendants.

Civil Case No. 2:25-cv-00070-JRG

**JURY TRIAL DEMANDED**

**DEFENDANTS' P.R. 3-3 AND 3-4 INVALIDITY CONTENTIONS  
AND SUBJECT MATTER ELIGIBILITY CONTENTIONS**

Pursuant to Docket Control Order (Dkt. No. 45) and Local Patent Rule 3-3, Defendants Samsung Electronics Co., Ltd. and, Samsung Electronics America, Inc., and HP, Inc. (collectively, "Defendants") hereby provide their Invalidity Contentions, which include the accompanying claim charts concerning U.S. Patent Nos. 10,911,186 ("186 patent"), 11,716,171 ("171 patent"), 11,664,926 ("926 patent"), and 12,004,262 ("262 patent") (collectively, "Asserted Patents") to Wilus Institute of Standards and Technology Inc. ("Plaintiff" or "Wilus"). Defendants also respectfully submit their subject matter eligibility contentions for the Asserted Claims of the

Asserted Patent in accordance with the July 25, 2019 Standing Order Regarding Subject Matter Eligibility Contentions Applicable to All Patent Infringement Cases Assigned to Chief District Judge Rodney Gilstrap (“Standing Order”).

The citation of prior art herein and the accompanying exhibits are not intended to reflect Defendants’ claim construction contentions, which will be disclosed in due course in accordance with the Docket Control Order and may instead reflect Plaintiff’s apparent (and potentially erroneous) claim constructions based on its Infringement Contentions.

## **I. Introduction**

As disclosed in its P.R. 3-1 Infringement Contentions served on Defendants, Plaintiff asserts the following patents and claims:

| <b>Patent</b>              | <b>Claims</b>      |
|----------------------------|--------------------|
| U.S. Patent No. 10,911,186 | <b>1-10, 11-18</b> |
| U.S. Patent No. 11,716,171 | <b>1-8, 9-16</b>   |
| U.S. Patent No. 11,664,926 | <b>1-7, 8-14</b>   |
| U.S. Patent No. 12,004,262 | <b>1-3, 4</b>      |

The claims identified above are referenced to as “the Asserted Claims” unless reference is made specifically with respect to particularly identified one or more of the Asserted Patents and/or one or more of the Asserted Claims.

As further detailed in and supported by these Invalidity Contentions, Defendants contend that each of the Asserted Claims is invalid under at least 35 U.S.C. §§ 101, 102, 103, and/or 112. Defendants reserve the right to prove the invalidity of the Asserted Claims on bases other than those required to be disclosed in these disclosures pursuant to P.R. 3-3.

## **II. Amendment/Supplementation**

Defendants’ Invalidity Contentions pertain to the Asserted Claims as identified in Plaintiff’s Infringement Contentions. To the extent the Court later allows Plaintiff to amend its

Consequently, Defendants reserve the right to amend, modify, or supplement these Invalidity Contentions should additional information become available to them through discovery.

**E. U.S. Patent No. 12,004,262**

Invalidity claim charts identifying disclosures in the references identified in Tables 1-D, 2-D, and 3-D as to the Asserted Claims of the '262 patent are provided in attached Exhibits D1-D16<sup>23</sup> and Appendix D.

**Table 1-D: Prior Art Patents and Printed Publications for the '262 patent**

| <b>No.</b> | <b>Patent No. or Title<br/>(Primary Inventor/Author)</b>                                                  | <b>Date of Issue/<br/>Publication</b> | <b>Filing<br/>Date</b> |
|------------|-----------------------------------------------------------------------------------------------------------|---------------------------------------|------------------------|
| RD-1       | IEEE P802.11ax/D1.0                                                                                       | Dec. 1, 2016                          | N/A                    |
| RD-2       | IEEE 802.11-17/0250r2, "Proposed Resolution for Comments Related to Various CIDs in 27.5.2" ("Patil 250") | Mar. 9, 2017                          | N/A                    |
| RD-3       | IEEE 802.11-16/1415r0, "Proposed Resolution for CID 72 (BSS Color Change Procedure)" ("Patil 1415")       | Nov. 6, 2016                          | N/A                    |
| RD-4       | IEEE 802.11-16/0929r3, "Comment Resolutions on UL MU Operation" ("Merlin 929")                            | Sept. 14, 2016                        | N/A                    |
| RD-5       | IEEE 802.11-17/0230r1, "Proposed Resolution for Comments Related to Multiple BSSID Set" ("Patil 230")     | Mar. 6, 2017                          | N/A                    |
| RD-6       | IEEE 802.11-2016 <sup>24</sup>                                                                            | 2016                                  | N/A                    |
| RD-7       | U.S. Patent No. 10,136,349 ("Yang 349")                                                                   | Nov. 20, 2018                         | June 20, 2016          |
| RD-8       | U.S. Patent Appl. Pub. No. 2016/0249397 ("Seok 397")                                                      | Aug. 25, 2016                         | Feb. 23, 2016          |

<sup>23</sup> Defendants reserve their right to rely on patents or patent application publications that are in the same family as the charted references as well as other revisions of the charted IEEE documents.

<sup>24</sup> IEEE 802.11-2016 is an amendment to IEEE 802.11-2012 & 802.11-2013ac, as such IEEE 802.11-2016 incorporates IEEE 802.11-2012 & 802.11-2013ac. Therefore, any reference in the instant document to IEEE 802.11-2016 should be interpreted to include IEEE 802.11-2012 & 802.11-2013ac.

| No.   | Patent No. or Title<br>(Primary Inventor/Author)                                                           | Date of Issue/<br>Publication | Filing<br>Date |
|-------|------------------------------------------------------------------------------------------------------------|-------------------------------|----------------|
| RD-9  | IEEE 802.11-2012 (“802.11-2012”) <sup>25</sup>                                                             | Dec. 18, 2013                 | N/A            |
| RD-10 | IEEE 802.11-16/0024r1, “Proposed TGax Draft Specification” (“Stacey 0024”)                                 | Mar. 2, 2016                  | N/A            |
| RD-11 | IEEE 802.11-17/0238r2, “Comment Resolutions for HT Control Field (9.2.4.6.X and 10.1)” (“Asterjhadhi 238”) | Mar. 11, 2017                 | N/A            |
| RD-12 | IEEE 802.11-17/0138r1, “Proposed Resolution for Comments Related to Section 27.16.2” (“Patil 138”)         | Mar. 9, 2017                  | N/A            |
| RD-13 | IEEE 802.11-17/0389r0, “Proposed Resolution for CIDs for 27-2-1” (“Lv 389”)                                | Mar. 10, 2017                 | N/A            |
| RD-14 | U.S. Patent No. 9,942,193 (“Chu 193”)                                                                      | Apr. 10, 2018                 | Dec. 7, 2015   |
| RD-15 | U.S. Patent No. 10,321,485 (“Noh 485”)                                                                     | Jun. 11, 2019                 | Dec. 14, 2016  |
| RD-16 | IEEE 802.11ac-2013 (“802.11ac”) <sup>26</sup>                                                              | Dec. 18, 2013                 | N/A            |

Moreover, Defendants incorporate by reference the petition for *inter partes* review of the ’262 patent (PTAB-IPR2025-01164) filed on June 30, 2025, including the accompanying exhibits and expert declaration, which contains Defendant’s additional invalidity contentions based on references RD-1, RD-2, RD-3, RD-5, and RD-6.<sup>27</sup>

Further, Defendants are actively searching for information regarding at least the following devices and inventions:

<sup>25</sup> IEEE 802.11ac is an amendment to IEEE 802.11-2012, as such IEEE 802.11ac incorporates IEEE 802.11-2012. Therefore, any reference in the instant document to IEEE 802.11ac should be interpreted to include IEEE 802.11-2012.

<sup>26</sup> IEEE 802.11ac is an amendment to IEEE 802.11-2012, as such IEEE 802.11ac incorporates IEEE 802.11-2012. Therefore, any reference in the instant document to IEEE 802.11ac should be interpreted to include IEEE 802.11-2012.

<sup>27</sup> Defendants also incorporate by reference the invalidity contentions served by Askey Computer Corporation et al., in the 2:24-cv-00753 and 2:24-cv-00766 actions and by Samsung and HP in Civil Case No. 2:24-cv-00752-JRG, 2:24-cv-00746-JRG, 2:24-cv-00764-JRG, 2:24-cv-00765-JRG.

**Table 2-D: Prior Art Systems and Inventions for the '262 patent<sup>28</sup>**

| <b>No.</b> | <b>Name of System or Invention</b>                           | <b>Date of Sale / Offer for Sale / Public Use</b> |
|------------|--------------------------------------------------------------|---------------------------------------------------|
| RD-17      | Systems implementing IEEE 802.11ac (“Wi-Fi 5”) <sup>29</sup> | 2013                                              |
| RD-18      | HP Spectre 13 (2013 Model)                                   | October 2013                                      |
| RD-19      | HP Envy 17 (2014 Model)                                      | February 2014                                     |
| RD-20      | Samsung Galaxy S4 Smartphone                                 | April 2013                                        |
| RD-21      | Samsung Galaxy Note 3 Smartphone                             | October 2013                                      |
| RD-22      | Samsung Galaxy Tab Pro                                       | February 2014                                     |
| RD-23      | Samsung Galaxy Tab S                                         | July 2014                                         |
| RD-24      | Samsung ATIV Book 9 (2014 Edition)                           | May 2014                                          |
| RD-25      | Samsung ATIV Book 9 (2015 Edition)                           | December 2015                                     |
| RD-26      | Samsung Galaxy S7 Smartphone                                 | March 2016                                        |
| RD-27      | Samsung Galaxy S8 Smartphone                                 | April 2017                                        |
| RD-28      | Samsung Galaxy Note7                                         | August 2016                                       |

For each of the prior art devices identified above, Defendants have listed and produced one or more documents as evidence of the relevant features and functionality. Defendants have obtained or are in the process of obtaining the identified devices and will make them available for inspection. To the extent that one or more documents (*e.g.*, user manual) may be used to describe aspects of a particular device, that device is a single reference for prior art purposes under 35 U.S.C. § 102. Some or all of the corroborating references may also separately qualify

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<sup>28</sup> All of the systems listed in this table are Wi-Fi 5 (802.11ac) enabled and capable, and thus invalidate the asserted claims of the '262 patent, alone or in combination with other art. Furthermore, some of those systems may be Wi-Fi 6 enabled and capable. Wilus's May 14, 2025 Infringement Contentions are based entirely on the Wi-Fi 6 standard. Thus, while we disagree that Wilus's Infringement Contentions demonstrate infringement, to the extent the Court finds otherwise, the Wi-Fi 6 systems listed above also invalidate the asserted claims of the '262 patent.

<sup>29</sup> The attached invalidity chart over IEEE 802.11ac (D-16), as well as the invalidity chart over IEEE 802.11-2012 (D-9), which IEEE 802.11ac amends, demonstrate how the systems implementing IEEE 802.11ac, listed in Table 2-D, disclose each element of each asserted claim.

as prior art publications under 35 U.S.C. § 102 and may be used as invalidating references under 35 U.S.C. §§ 102 and/or 103.

Discovery is ongoing, and Defendants may serve third parties with document subpoenas. One or more of these devices, along with related documentation, may be invalidating, and Defendants reserve the right to supplement these contentions accordingly.

In addition, Defendants identify, responsive to Plaintiff's infringement contentions, the following patents, publications, and systems as evidence of the state of the art as it relates BSS color operations, BSS color change functionality, and/or inter-/intra-BSS PPDU classification:<sup>30</sup>

- US20190357256 (relying on Provisional Application No. 62/445247)
- US20190373634 (relying on Provisional Application No. 62/434423)
- US20180220368 (relying on Provisional Application No. 62/453768)
- US20170181129
- US20170295560
- Hongyuan Zhang et al., *(LB200) TGah D1.0 PHY Comment Resolutions on Clause 24.2.2*, IEEE 802.11-14/0597r3 (2014)
- Abhishek Patil et al., *Proposed Resolution for CID 193 (BSS Color Disable Indication)*, IEEE 802.11-16/1413r8 (2016)
- US20170188368
- US20170289987 (relying on Provisional Application No. 62/181142)
- Chao-Chun Wang, *11ax D1.0 MAC Comment Resolution*, IEEE 802.11-17/0421r0 (2017)

Each of these references (and other references in the same family) show (1) setting BSS color of a PPDU (including a trigger-based PPDU) based on the BSS color of a PPDU carrying a trigger frame, (2) setting BSS color of a PPDU (including a trigger-based PPDU) based on the BSS color received in an HE Operation element, (3) changing BSS color in response to an announcement from an AP, and (4) classifying PPDUs as inter-/intra-BSS PPDUs based on

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<sup>30</sup> Defendants reserve their right to rely on any unlisted patents, patent application publications, provisional applications that are related to the listed reference.

partial BSS color is not novel, and was well-known in the art for many years. In light of the references discussed herein, the Asserted Claims of the '262 patent cannot be valid.

Defendants' reference to a particular product, device, or software program in these contentions should be interpreted as a reference to the system itself and any corresponding patents, publications, or product literature relating to the cited system. Upon information and belief, the systems were publicly disclosed, used, sold, or offered for sale in the United States before the alleged priority date of the Asserted Claims of the '262 patent. Defendants' investigation of such prior art systems is still ongoing and discovery has not yet been received from third parties who may have information concerning such prior art systems. Accordingly, subsequent discovery may reveal information that affects the disclosures and contentions herein. For example, subsequent discovery may provide additional information regarding whether or not any of the third party prior art systems anticipate or render obvious the Asserted Claims of the '262 patent. As such, Defendants reserve all rights to supplement their invalidity contentions.

Many of the inventive, research, design, and development activities concerning these systems and technologies occurred in the United States before the alleged priority date of the Asserted Claims of the '262 patent. Defendants have obtained, and are in the process of obtaining, additional information regarding the dates by which the cited products and services were publicly disclosed, used, sold, or offered for sale, the circumstances under which the research, design, and development activities were conducted, and the identities of the particular individuals involved in such activities through publicly available patents, publications, and product literature. The actual dates, circumstances, and identities of individuals will be the subject of third party discovery during this lawsuit, which Defendants reserve the right to rely

upon to corroborate the prior art status of the prior art identified herein. Defendants reserve the right to modify, amend, or supplement these contentions if additional information becomes available during the course of this lawsuit. Furthermore, Defendants will make all such devices, software programs, or other products in Defendants' possession, custody, or control available for inspection by Plaintiff.

Consequently, Defendants reserve the right to amend, modify, or supplement these Invalidity Contentions should additional information become available to them through discovery.

#### **IV. P.R. 3-3(b) – Invalidity Grounds**

Pursuant to P.R. 3-3(b), Defendants contend that certain prior art references below anticipate one or more Asserted Claims and that to the extent the identified prior art references do not anticipate the Asserted Claims, those claims are invalid as obvious under 35 U.S.C. §103. Each anticipatory prior art reference, either alone or in combination with other prior art, also renders the Asserted Claims invalid as obvious. In particular, each anticipatory prior art reference may be combined with (1) information generally known to persons skilled in the art at the time of the alleged invention, and/or (2) any of the other anticipatory prior art references. To the extent that Plaintiff contends that any of the anticipatory prior art fails to disclose one or more limitations of the Asserted Claims, Defendants contend that any difference between the reference and the corresponding patent claims would have been obvious to one of ordinary skill in the art. Thus, all anticipation charts should be interpreted as both reflecting anticipation by the reference as well as invalidity due to single reference obviousness, to the extent that Plaintiff contends that any limitation is missing.

##### **A. Anticipation**

certain cited references. To the extent any limitation is deemed not to be exactly met by an item of prior art, then any purported differences are such that the claimed subject matter as a whole would have been obvious to one skilled in the art at the time of the alleged invention, in view of the state of the art and knowledge of those skilled in the art. To the extent that an element of an Asserted Claim is not anticipated, the claim is rendered obvious by combination with one or more other prior art references identified in Appendix C.

#### **4. U.S. Patent No. 12,004,262**

The Asserted Claims of the '262 patent are anticipated and/or rendered obvious by prior art. Pursuant to P.R. 3-3(a), Defendants identify the prior art references that anticipate or render obvious the '262 patent Asserted Claims in the claim charts of Exhibits D1 through D16 which are hereby incorporated by reference as if fully set forth herein. The claim charts and Appendix D provide an explanation showing how these prior art references teach or suggest each and every element of the '262 patent Asserted Claims. For each reference or combination of references suggested by each chart, Defendants indicate whether the prior art renders the claim anticipated and/or obvious pursuant to P.R. 3-3(b).

In addition to contending that the '262 patent Asserted Claims are invalid in view of the prior art references cited in the claim charts and Appendix D, Defendants further contend that the '262 patent Asserted Claims are invalid as anticipated and/or obvious under U.S.C. §§ 102 and/or 103 in view of public knowledge and uses and/or offers for sale of products and services related to the subject matter of the cited references. As discovery is ongoing, Defendants continue to investigate these items and to reserve the right to amend or supplement these contentions to include additional information or documents regarding such products and/or systems.

Defendants' reference to a particular communications device, modem, circuit, software program, device or product in the claim charts and Appendix D should be interpreted as a reference to the product itself and any corresponding patents, publications, or product literature cited in Appendix D that relates to the cited memory module, circuit, software program, device, or product. In addition, Defendants may rely on other documents or things that have not yet been located to support its contentions regarding such prior art communications device(s), modem(s), circuit(s), software program(s), device(s) or product(s) that are referenced in the charts. Furthermore, Defendants' reference to a wireless communications standard, such as for example IEEE 802.11ac, in the claim charts and Appendix D should be interpreted as a reference to the products implementing and/or complying with such standard.

Defendants incorporate by reference, as if set forth fully herein, all prior art cited during the prosecution of the '262 patent, all prior art as described in any *inter partes* review proceedings of the '262 patent, and all prior art disclosed during previous litigation proceedings involving the '262 patent.

Defendants further identify and hereby incorporate by reference as if set forth fully herein the prior art references and invalidity contentions as described in any Other Wilus Proceedings wherein invalidity contentions have been, or will be, provided regarding the '262 patent, its foreign counterparts, or any parent or child patent of the '262 patent. Defendants reserve the right to use any and all portions of the publication, related publications, commercial embodiments of the publication, and other evidence that is discovered in these lawsuits to demonstrate and/or evidence the components, functionality, and capabilities of the devices and systems disclosed in the references charted.

Where Defendants identify a particular figure in a prior art reference, the identification should be understood to encompass the caption and description of the figure, as well as any text relating to the figure in addition to the figure itself. Similarly, where an identified portion of text refers to a figure or other material, the identification should be understood to include the referenced figure or other material as well. It should be recognized that a person of ordinary skill in the art would generally read a prior art reference as a whole and in the context of other publications, literature, and general knowledge in the field. To understand and interpret any specific statement or disclosure in a prior art reference, a person of ordinary skill in the art would rely upon other information including other publications and general scientific or engineering knowledge. Defendants therefore reserve the right to rely upon other unidentified portions of the prior art references and on other publications and expert testimony to provide context and to aid understanding and interpretation of the identified portions.

Defendants also reserve the right to rely upon other portions of the prior art references, other publications, and the testimony of experts to establish that the alleged inventions would have been obvious to a person of ordinary skill in the art, including the basis of modifying or combining certain cited references. To the extent any limitation is deemed not to be exactly met by an item of prior art, then any purported differences are such that the claimed subject matter as a whole would have been obvious to one skilled in the art at the time of the alleged invention, in view of the state of the art and knowledge of those skilled in the art. To the extent that an element of an Asserted Claim is not anticipated, the claim is rendered obvious by combination with one or more other prior art references identified in Appendix D.

## **B. Obviousness**

As stated above, Defendants incorporate by reference all other invalidity contentions

| Patent No. or Title<br>(Primary Inventor/Author) | In Combination with One or More of:<br>(Patent No. or Title<br>(Primary Inventor/Author))                                                                                                                                                                                                                                                              |
|--------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                  | <ul style="list-style-type: none"> <li>• Chu 951</li> <li>• Asterjadhi 813</li> <li>• Kim 678</li> <li>• Cherian 0024</li> <li>• Stacey 0024</li> <li>• 802.11ac-2013</li> <li>• 802.11-2016</li> <li>• Merlin 0366</li> <li>• Draft D1.0</li> <li>• Chu 1185</li> <li>• Asterjadhi 0616</li> <li>• Knowledge of a person of ordinary skill</li> </ul> |

#### 4. U.S. Patent No. 12,004,262

A Pursuant to P.R. 3-3(a) and (b), Defendants identify in Appendix D the prior art references that render obvious the Asserted Claims of the '262 patent and include below exemplary combinations showing the obviousness of the '262 patent Asserted Claims in view of the prior art. To the extent Plaintiff contends that an element is not disclosed in any one of the anticipatory references described in Appendix D, the limitation would have been obvious in light of the disclosures within the reference and the knowledge of one of skill in the art at the time of the '262 patent. Moreover, to the extent Plaintiff contends that an element is not disclosed in any one of the anticipatory references described in Appendix D, such reference may be combined with any other references listed in Appendix D for such element, thereby rendering the claims invalid for obviousness.

To the extent a finder of fact determines that a limitation of any of the '262 patent Asserted Claims is not disclosed by one of the references identified above pursuant to P.R. 3-3(a), the claim is nevertheless unpatentable as obvious because they contain nothing that constitutes a patentable innovation. To the extent a finder of fact determines that a limitation of the '262 patent Asserted

Claims is not anticipated, it does not go beyond combining familiar elements according to known methods to achieve predictable results or does more than choose between clear alternatives known to those of ordinary skill in the art.

**(a) Obviousness Rationale**

For at least the reasons described in these contentions, it would have been obvious to one of ordinary skill in the art to combine any of a number of prior art references, including any combination of those prior art references identified in Appendix D along with the knowledge of one of ordinary skill in the art to meet the limitations of the '262 patent Asserted Claims. Moreover, as mentioned above, Defendants have not yet completed their search or discovery concerning additional prior art. As such, Defendants' inclusion of exemplary combinations does not preclude them from identifying other invalidating combinations as appropriate, and Defendants reserve the right to identify additional specific combinations as well as to detail and explain such combinations.

To the extent not anticipated, the '262 patent Asserted Claims represent no more than the result of ordinary variations of the prior art. Defendants further believe that no showing of a specific motivation to combine prior art is required to combine the references disclosed above and in the attached charts, as each combination of art would have no unexpected results, and at most would simply represent a known alternative to one of skill in the art. *See KSR Int'l Co. v. Teleflex, Inc.*, 550 U.S. 398, 415-16 (2007) (rejecting the Federal Circuit's "rigid" application of the teaching, suggestion, or motivation to combine test, instead espousing an "expansive and flexible" approach). Indeed, the Supreme Court held that a person of ordinary skill in the art is "a person of ordinary creativity, not an automaton" and "in many cases a person of ordinary skill in the art will be able to fit the teachings of multiple patents together like pieces of a puzzle." *Id.* at 420-21. Nevertheless, in addition to the information contained elsewhere in these contentions, Defendants

identify motivation and reason to combine the cited art.

One or more combinations of the prior art references identified in Appendix D would have been obvious because these references would have been combined using: known methods to yield predictable results; known techniques in the same way; a simple substitution of one known, equivalent element for another to obtain predictable results; and/or a teaching, suggestion, or motivation in the prior art generally. In addition, it would have been obvious to try combining the prior art references identified above because there were only a finite number of predictable solutions and/or because known work in one field of endeavor prompted variations based on predictable design incentives and/or market forces either in the same field or a different one. Further, the combinations of the prior art references identified in Appendix D would have been obvious because the combinations represent known potential options with a reasonable expectation of success.

Additional evidence that there would have been a motivation to combine the prior art references identified above includes the interrelated teachings of multiple prior art references; common authorship; the effects of demands known to the design community or present in the marketplace; the existence of a known problem for which there was an obvious solution encompassed by the '262 patent Asserted Claims; the existence of a known need or problem in the field of the endeavor at the time of the alleged invention(s); and the background knowledge that would have been possessed by a person having ordinary skill in the art.

Thus, the motivation to combine the teachings of the prior art references disclosed in Appendix D is found in the references themselves and also in: (1) the nature of the problem being solved; (2) the express, implied and inherent teachings of the prior art; (3) the knowledge of persons of ordinary skill in the art; (4) the predictable results obtained in combining the different

elements of the prior art; (5) the predictable results obtained in simple substitution of one known element for another; (6) the use of a known technique to improve similar devices, methods, or products in the same way; (7) the predictable results obtained in applying a known technique to a known device, method, or product ready for improvement; (8) the finite number of identified predictable solutions that had a reasonable expectation of success; and (9) known work in various technological fields that could be applied to the same or different technological fields based on design incentives or other market forces.

Additionally, it would have been obvious to one of skill in the art to consult and/or combine any of the prior art listed in Appendix D because all of these references relate to the same area of technology and/or are from analogous art. The '262 patent Asserted Claims are directed to BSS color functionality in Wi-Fi communication, including the specific concepts of (1) setting BSS color values for a trigger-based PPDU, (2) receiving a BSS color change announcement and, in response, changing the BSS color, and (3) classifying PPDUs as inter-/intra-BSS PPDUs based on partial BSS color. '262 patent at 1:24-26, cls. 1, 3. Moreover, the references, like the '262 patent, are also reasonably pertinent to wireless communications issues in the MAC layer or issues related to coordination among different BSSs operating in the same area, requiring mechanisms such as BSS color. The '262 patent Asserted Claims merely united old elements, well known in the field, with no change in their respective function or result. Given the interrelated teachings of the prior art, the effects of demands known to the design community or present in the marketplace, and the background knowledge possessed by a person having ordinary skill in the art, it would have been obvious for one of ordinary skill in the art to combine these familiar elements, disclosed and/or embodied in the prior art listed above to practice the '262 patent Asserted Claims.

Similarly, it would be obvious to one of skill in the art to consult and/or combine any of

the prior art listed in Appendix D with reasonable expectation of success because all of these references are works by people in the same technical field. For example, many of the authors of the prior art references are members of the same IEEE 802.11ax High Efficiency (HE) working group. *See e.g.*, IEEE 802.11-16/0024r1 (“Stacey 0024”) (identifying authors of prior art references as authors of draft specification). Moreover, one of ordinary skill in the art would have recognized that members of an IEEE working group frequently collaborate with, and build on, each other’s work. In fact, some of the prior art references are comments regarding other members’ submissions or proposed additions to the IEEE standard. Thus, one of ordinary skill in the art would have recognized that the works of the same IEEE working group are likely compatible or otherwise work harmoniously when combined.

All of the ’262 patent Asserted Claims are directed to (1) setting BSS color values for a trigger-based PPDU, (2) receiving a BSS color change announcement and, in response, changing the BSS color, and/or (3) classifying PPDUs as inter-/intra-BSS PPDUs based on partial BSS color. Implementing such technology, at least partially based on, but not limited by, the claim constructions implicit in Plaintiff’s infringement contentions, was a common problem with a well-known solution before the alleged priority date of the ’262 patent, as evidenced by the references in Appendix D. *See generally* Appendix D, cls. 1-3.

One of ordinary skill in the art would have been motivated to combine any of the references in Appendix D because, at the time of the alleged invention, a wireless communication terminal wirelessly communicating with base wireless communication terminals was a well-known concept/technique. *See, e.g.*, Appendix D at 1[pre].

One of ordinary skill in the art would have been motivated to combine any of the references in Appendix D because, at the time of the alleged invention, a transceiver configured to transmit

and receive wireless signals was a well-known concept/technique. *See, e.g.*, Appendix D at 1[a].

One of ordinary skill in the art would have been motivated to combine any of the references in Appendix D because, at the time of the alleged invention, a processor configured to process wireless signals was a well-known concept/technique. *See, e.g.*, Appendix D at 1[b].

One of ordinary skill in the art would have been motivated to combine any of the references in Appendix D because, at the time of the alleged invention, receiving a PPDU including a trigger frame, where the trigger frame indicates a resource unit (RU) which is allocated to the wireless communication terminal, was a well-known concept/technique. *See, e.g.*, Appendix D at 1[c].

One of ordinary skill in the art would have been motivated to combine any of the references in Appendix D because, at the time of the alleged invention, setting the BSS color of a trigger-based PPDU (or other PPDU types) based on the BSS color of a received PPDU (including a PPDU carrying a trigger frame) was a well-known concept/technique. *See, e.g.*, Appendix D at 1[d].

One of ordinary skill in the art would have been motivated to combine any of the references in Appendix D because, at the time of the alleged invention, setting the BSS color of a trigger-based PPDU (or other PPDU types) based on the terminal's/station's active BSS color (*i.e.*, one received in a recent HE Operation element) was a well-known concept/technique. *See, e.g.*, Appendix D at 1[e]. A POSITA would have been motivated to add this feature or combine with another prior art disclosing this feature (and have a reasonable expectation of success in doing so) so as to enable population of a trigger-based PPDU's BSS color when the PPDU carrying the trigger frame is of a format that does not include BSS color.

One of ordinary skill in the art would have been motivated to combine any of the references in Appendix D because, at the time of the alleged invention, transmitting a trigger-based PPDU based on a trigger frame was a well-known concept/technique. *See, e.g.*, Appendix D at 1[f].

One of ordinary skill in the art would have been motivated to combine any of the references in Appendix D because, at the time of the alleged invention, terminals/stations maintaining and using an active BSS color set by an Operation element was a well-known concept/technique. *See, e.g.,* Appendix D at 1[g]. A POSITA would have been motivated to add this feature or combine with another prior art disclosing this feature (and have a reasonable expectation of success in doing so) so as to enable population of a trigger-based PPDU's BSS color (*i.e.*, with the BSS color received in the Operation element) when the PPDU carrying the trigger frame is of a format that does not include BSS color.

One of ordinary skill in the art would have been motivated to combine any of the references in Appendix D because, at the time of the alleged invention, terminals/stations receiving information on a BSS color change from a base wireless communication terminal and, when a BSS color change time point indicated by the information on the BSS color change is reached, setting the active BSS color to a value of a BSS color indicated by the information on the BSS color change was a well-known concept/technique. *See, e.g.,* Appendix D at 1[h].

One of ordinary skill in the art would have been motivated to combine any of the references in Appendix D because, at the time of the alleged invention, BSS color being one of the identifiers identifying a BSS was a well-known concept/technique. *See, e.g.,* Appendix D at 1[i].

One of ordinary skill in the art would have been motivated to combine any of the references in Appendix D because, at the time of the alleged invention, the BSS color change time point being set based on a target beacon transmission time transmitted by the base wireless communication terminal was a well-known concept/technique. *See, e.g.,* Appendix D, cl. 2.

One of ordinary skill in the art would have been motivated to combine any of the references in Appendix D because, at the time of the alleged invention, it was a well-known concept/technique

that if the PPDU indicates a partial Basic Service Set (BSS) color using a Partial Association ID (AID) field, the processor determines whether the PPDU is an Intra-BSS PPDU or an Inter-BSS PPDU based on the partial BSS color when the value of the partial AID field is non-zero. *See, e.g., Appendix D at 3[a].*

One of ordinary skill in the art would have been motivated to combine any of the references in Appendix D because, at the time of the alleged invention, it was a well-known concept/technique that the partial AID field is a signaling field used to indicate a value obtained based on an AID value. *See, e.g., Appendix D at 3[b].*

In addition, the prior art also provided sets of finite, identified, predictable solutions for known problems that would have been obvious to those of ordinary skill to try with a reasonable expectation of success. For example, it would have been obvious to one of skill in the art at the time to combine references disclosing copying BSS color from a received PPDU (including PPDUs containing trigger frames) with references disclosing using the BSS color received in an HE Operation element. *See, e.g., Appendix D at 1[e]-[f].* At the time of the alleged invention, it was well-known to both (1) copy the BSS color of the PPDU carrying a trigger frame when constructing a trigger-based PPDU and (2) use the BSS color received in an HE Operation element when constructing PPDUs (including non-trigger based PPDUs). A POSITA would have recognized that a trigger frame may be received in a PPDU format that does not include a BSS color field. In such a scenario, a POSITA would have found it obvious to use another well-known technique for setting BSS color of an outgoing PPDU—use the BSS color received in an HE operation element. When these solutions are combined, a device can set the BSS color of a trigger-based PPDU by copying the BSS color of the PPDU carrying the trigger frame when said PPDU is of a format including BSS color, and when the PPDU carrying the trigger frame is of a format

such that it does not include BSS color, the device can set the BSS color based on the value received in an HE Operation element. Such a combination would have been obvious to try in light of the finite number of identified, predictable solutions for setting BSS color of an outgoing PPDU. Such a combination would also have amounted to the combination of prior art elements according to known methods to yield predictable results. This combination is also the simple substitution of one known element (*i.e.*, using a BSS color received in an HE Operation element to set BSS color for a trigger-based PPDU when the PPDU carrying the trigger frame is of a format that does not include BSS color) for another (*i.e.*, setting the BSS color for a trigger-based PPDU by copying the BSS color from the PPDU carrying the trigger frame) to obtain predictable results. Further, this combination amounts to applying a known technique (setting BSS color of an outgoing PPDU based on the BSS color received in an HE Operation element) to a known device ready for improvement (a device that sets the BSS color for a trigger-based PPDU solely by copying the BSS color of the PPDU carrying the trigger frame) to yield predictable results. A POSITA would thus have been motivated to combine such references and would have had a reasonable expectation of success in combining such references.

Further, it would have been obvious to one of skill in the art at the time to combine references disclosing BSS color change techniques with references disclosing setting the BSS color for an outgoing PPDU (including by (1) copying the BSS color from a trigger frame and/or (2) using the BSS color received in an HE Operation element). *See, e.g.*, Appendix D at 1[e], 1[f], 1[i], 2. These references are in the same field of endeavor and/or are analogous art, namely, Wi-Fi communications technology. Moreover, it would have been obvious to a POSITA that in certain circumstances—for example, a BSS color collision—devices may need to update/change their BSS color, which would impact all BSS color operations, including setting the BSS color of an

outgoing PPDU. Such a combination would have amounted to combining known prior art elements (*i.e.*, (1) setting BSS color for an outgoing PPDU and (2) BSS color change techniques) to achieve predictable results. Further, this combination amounts to applying a known technique (changing BSS color) to a known device ready for improvement (a device that sets the BSS color for outgoing PPDU, including trigger-based PPDU) to yield predictable results. A POSITA would thus have been motivated to combine such references and would have had a reasonable expectation of success in combining such references.

Moreover, it would have been obvious to one of skill in the art at the time to combine references disclosing BSS color operations (including setting BSS color for outgoing PPDU and changing BSS color) with references relating to inter-/intra-BSS PPDU classification. *See, e.g.*, Appendix D at 1[e], 1[f], 1[i], [2], 3[a], 3[b]. Such a combination would have amounted to the combination of known prior art elements to achieve predictable results. Further, this combination amounts to applying a known technique to a known device ready for improvement to yield predictable results. A POSITA would thus have been motivated to combine such references and would have had a reasonable expectation of success in combining such references.

The prior art references provide motivations to combine because they describe the field of the '262 patent, teach improvements, explain desired features, and even expressly state that one of skill in the art would be able to apply their teachings to related systems or methods. *See, e.g.*, RD-2 (Patil 250) (addressing comments to RD-1 (Draft D1.0)); RD-3 (Patil 1415) (addressing comments to RD-1 (Draft D1.0)); RD-4 (Merlin 929) (addressing comments to RD-1 (Draft D1.0)); RD-5 (Patil 230) (addressing comments to RD-1 (Draft D1.0)); RD-11 (Asterjadhi 238) (addressing comments to RD-1 (Draft D1.0)); RD-12 (Patil 138) (addressing comments to RD-1 (Draft D1.0)); RD-13 (Lv389) (addressing comments to RD-1 (Draft D1.0)).

Further, the prior art references provide motivations to combine because they explicitly suggest utilizing the teachings and disclosures of other references.

In accordance with these advances, the prior art could have been combined according to methods known to those of ordinary skill within the field of the '262 patent to yield predictable results. A POSITA would have understood that certain PPDU formats would not include a BSS color field such that a trigger-based PPDU cannot be constructed by simply copying the BSS color value of the PPDU carrying the trigger frame. The substitution of one element of a BSS color function (*i.e.*, using the BSS color received in an HE Operation element when the PPDU carrying the trigger frame is of a format without BSS color) could have been predictably achieved by one of ordinary skill at the time of the alleged invention. One of ordinary skill in the art would have been aware of these various applications, and would have been able to select appropriate attributes of one for inclusion in another. Those of ordinary skill in the art could have employed known techniques to improve similar prior art devices in the same way as claimed in the '262 patent.

In addition, one of ordinary skill in the art would be motivated to combine the prior art references because the elements found in the Asserted Claims of the '262 patent were well known in the art. Indeed, the listed inventors of the '262 patent admitted as much in the specification of the '262 patent. *See, e.g.*, '262 patent at 1:30-2:54.

Moreover, it would have been obvious to one of ordinary skill in the art at the time to combine the teachings of a document submitted as part of the IEEE 802.11ax standard development process (*e.g.*, working group documents, draft specifications, technical submissions, working group meeting presentations) with a system implementing an older IEEE standard such as IEEE 802.11ac or a draft standard. For example, one of ordinary skill in the art would have been motivated to combine the teachings of a document submitted as part of the IEEE 802.11ax

standard development process, or patents/publications describing improved Wi-Fi devices, with a real wireless communications hardware/device to yield a working wireless communication system with the improvements and benefits offered by the new standard. In another example, one of ordinary skill in the art would have been motivated to simply substitute an older version of a wireless module implemented on a wireless device/hardware with one implementing a newer version of the standard that addresses the shortcomings of the older standard. In yet another example, one of ordinary skill in the art would have been motivated to apply the known techniques disclosed in the documents submitted as part of the IEEE 802.11ax standard development process to an older wireless communications system implementing IEEE 802.11ac to yield the predictable results of improved wireless communication performance. Further, one of ordinary skill in the art would have been prompted by the teachings in the documents submitted as part of the IEEE 802.11ax standard development process to modify the wireless communications hardware/device to meet market demands for improved wireless performance.

It would have been obvious to one of ordinary skill in the art at the time to combine teachings of a document submitted as part of IEEE 802.11ax standard development process (e.g., working group documents, draft specification, technical submissions, working group meeting presentations) with teachings of a reference pertaining to hardware/devices (e.g., non-access-point stations) for wireless communications (e.g., wireless local area network (WLAN)). For instance, a person of ordinary skill would have been motivated to combine the teachings of a document submitted as part of the IEEE 802.11ax standard development process—which generally address narrow technical issues and solutions—with references disclosing WLAN devices and hardware more broadly (e.g., devices with transceivers and configurable processors) to yield a blueprint for a working device that addresses the technical problem disclosed in the IEEE 802.11ax standard

development document. Such a combination amounts to combining known prior art elements according to known methods to yield predictable results. Further, to the extent any prior art WLAN devices/hardware documents disclose deficiencies or technical issues with the state of the art, one of ordinary skill in the art would have been prompted to combine these references with the teachings in documents submitted as part of the IEEE 802.11ax standard development process to meet market demands for improved wireless performance. This disclosure of deficiencies and/or technical issues would provide a teaching, suggestion, or motivation for a person of ordinary skill to modify the prior art reference based on the IEEE 802.11ax standard working documents.

It would have been obvious to one of ordinary skill in the art at the time to combine teachings of a document submitted as part of IEEE 802.11ax standard development process (*e.g.*, working group documents, draft specification, technical submissions, working group meeting presentations) with teachings of another document submitted as part of IEEE 802.11ax standard development process. For instance, considering the common underlying technical subject matter of the IEEE 802.11ax standard development documents, it would be obvious to one of ordinary skill to try combining the teachings of multiple documents. In doing so, a person of ordinary skill would have a reasonable expectation of success. Moreover, given the common goals and design incentives among authors of IEEE 802.11ax standard development documents (*e.g.*, improving WLAN device performance), a person of ordinary skill would find it obvious to combine the technical solutions disclosed in multiple IEEE 802.11ax standard development documents. Further, given the additive nature of the IEEE standard development process, a person of ordinary skill would have understood that various IEEE 802.11ax standard development documents could be combined to create a cohesive solution. Thus, a person of ordinary skill would have a reasonable expectation of success in combining the teachings in these documents.

Any reference or combination of references that anticipates or makes obvious an asserted independent claim also makes obvious any asserted claim dependent on that independent claim, as the element of each dependent '262 patent Asserted Claim was known by a person of ordinary skill at the time of the alleged invention, at least partially based on, but not limited by, the claim constructions implicit in Plaintiff's infringement contentions, and it would have been obvious to combine those known elements with the independent claims at least as a matter of common sense and routine innovation. Accordingly, Defendants contend that each Asserted Claim would have been obvious not only by the combinations described in these contentions, but also by any combination of references that renders obvious an Asserted Claim.

In addition to the specific examples of motivation provided above, Defendants reserve the right to rely on the disclosures of the references listed in Appendix D for additional motivation to combine. The above-identified examples of combinations are given merely to illustrate various motivations to combine and are not intended to provide an exhaustive list of every possible combination to which the motivation may apply. Defendants reserve the right to contend that the above-described motivations to combine apply to other combinations at the appropriate time, i.e., in expert reports regarding invalidity.

**Combination of RD-1 (IEEE P802.11/D1.0), RD-7 (Yang 349), and RD-6 (IEEE 802.11-2016)**

***Integration of Yang 349***

802.11ax/D1.0 proposes, among other features, enhancements relating to basic service set (BSS) color, including (i) configuring a trigger frame to include a field signaling the BSS color of a first STA, which allows a second STA to synchronize its communications with the first STA), and (ii) allowing STAs to dynamically change BSS colors during operation (e.g., by configuring an AP STA to “announce” a BSS color change to one or more non-AP STAs). *See, e.g.*, RD-1 at

163-70, 206.

A POSITA would have understood that a STA as described in 802.11ax/D1.0 would be equipped with certain conventional components such as a transceiver configured to transmit and receive wireless signals and a processor configured to process the wireless signals, which would allow the STA to carry out the capabilities described in 802.11ax/D1.0. Such features are thus rendered obvious by 802.11ax/D1.0 alone. Nonetheless, to the extent details of these components are not expressly disclosed in 802.11ax/D1.0, these features also would have been obvious in view of Yang 349.

Like 802.11ax/D1.0, Yang 349 describes techniques “for changing an identifier of a basic service set (BSS).” RD-7 at Abstract. Further, Yang 349 discloses specific components for performing these techniques, including (i) a “processing system” including a “processor” (RD-7 at 21:30-56, FIG. 12), and (ii) “a transceiver” that “may be installed in a host device” (RD-7 at 22:20-52, FIG. 13).

In view of Yang 349, a POSITA would have found it obvious to implement the techniques described by 802.11ax/D1.0 using conventional components like those described in Yang 349 (*e.g.*, a “processing system” and a “transceiver”). A POSITA would have sought to implement 802.11ax/D1.0’s STAs with such components as described in Yang 349 to enhance and facilitate the processing and communication capabilities of the STAs. Indeed, such components were commonly used to perform operations such as processing data in connection with wireless transmissions and/or transmitting and receiving wireless signals, and the components would have been beneficial to enable the STAs to implement the functions and capabilities described in 802.11ax/D1.0. A POSITA would have reasonably expected success since these components were well known and commonly implemented in such STAs by the Critical Date.

### ***Integration of 802.11-2016***

802.11ax/D1.0 is a draft specification representing a proposed amendment to the P802.11REVmc/D8.0 draft standard, which was later finalized as 802.11-2016. RD-1 at 1-2. The proposed amendment at least in part “defines modifications to both the 802.11 physical layer (PHY) and the medium access control (MAC) sublayer for high efficiency operation in frequency bands between 1 GHz and 6 GHz.” RD-1 at 2.

In view of 802.11ax/D1.0 and 802.11-2016, a POSITA would have understood that 802.11ax/D1.0 was specifically intended to modify certain features described in 802.11-2016 and/or include additional features beyond those described in 802.11-2016 (*e.g.*, in order to provide “high efficiency operation in frequency bands between 1 GHz and 6 GHz,” as described by 802.11-2016). RD-1 at 2. Accordingly, a POSITA would have found it obvious to look to 802.11-2016 for details regarding pre-existing features not explicitly described in 802.11ax/D1.0 (*e.g.*, by using 802.11-2016 as a starting point, and modifying and/or adding certain features as specified by 802.11ax/D1.0). The disclosures of 802.11ax/D1.0 and 802.11-2016 are complementary to each other, and it would have been obvious to combine their teachings to implement a more complete system. A POSITA would have reasonably expected success combining 802.11ax/D1.0 and 802.11-2016, along with Yang 349, because the teachings of the references were well known and directed to a common WLAN system.

### **Combination of RD-7 (Yang 349), RD-2 (Patil 250), and RD-3 (Patil 1415)**

#### ***Integration of Patil 250***

As discussed above, Yang 349 discloses techniques for changing the BSS color that is used by an AP and a STA during communications (*e.g.*, to avoid BSS color collisions with an “overlapping” BSS (OBSS)). *See, e.g.*, RD-7 at 6:6-30. To the extent that Yang 349 does not

expressly describe how a BSS color is initially selected by an AP and communicated to a STA, Yang 349 nevertheless indicates that, in at least some circumstances, the BSS color indicated in the “Trigger frame” would be used in the responsive trigger-based PPDU transmitted by the STA to the AP. *See* RD-7 at 13:43-14:6.

In view of Yang 349, a POSITA would have looked to other references for specific guidance regarding how an initial BSS color can be signaled by an AP to a STA. One such reference is Patil 250, which discloses specific techniques for signaling BSS color between an AP and a STA in the context of trigger-based PPDU transmissions. *See* RD-2 at 17-20.

For example, as discussed above, Patil 250 discloses that “[a] non-AP HE STA transmitting an HE trigger-based PPDU in response to a Trigger frame sets a TXVECTOR parameter” differently, depending on whether the PPDU includes a “BSS\_COLOR parameter.” RD-2 at 17.

In view of Patil 250, a POSITA would have configured Yang 349’s system to perform initial BSS color signaling in accordance with Patil 250 technique (*e.g.*, based on BSS color signaling in a PPDU having a trigger frame soliciting a trigger-based PPDU), in order to facilitate the coordination of BSS color between an AP and a STA.

For example, in view of Patil 250, a POSITA would have found it obvious to configure the STA such that, “[i]f the preceding Trigger frame was received in an HE PPDU,” the “BSS\_COLOR” parameter of the TXVECTOR for the trigger-based PPDU is “set to the value of the RXVECTOR parameter BSS\_COLOR of the HE PPDU” (representing the BSS color identified in the BSS Color subfield of the HE-SIG-A field of the received PPDU). RD-2 at 17.

Further, view of Patil 250, a POSITA would have found it obvious to configure the STA such that, “[i]f the Trigger frame was received in a non-HE PPDU” (*i.e.*, in which the “HE-SIG-A field” with “a BSS Color subfield” is not present), the “BSS\_COLOR” parameter of the

TXVECTOR for the trigger-based PPDU is “set to the value of the BSS Color subfield of the most recently received HE Operation element for that BSS.” RD-2 at 17.

A POSITA would have recognized that employing such a technique in Yang 349’s system would be beneficial, as it allows an AP and STA to synchronize the use of BSS color between them under a wide variety of circumstances (*e.g.*, in both situations in which the triggering PPDU explicitly indicates BSS color and situations in which the trigger PDDU does not explicitly indicate BSS color). Accordingly, the communications between the AP and STA can be maintained in a more reliable manner. A POSITA would have reasonably expected success implementing the combination because the techniques were well known and directed to a common WLAN system.

Similar motivations to combine would apply to other references that disclose solutions for populating BSS color of an outgoing PPDU, including a trigger-based PPDU. *See, e.g.*, RD1 (IEEE P802.11ax/D1.0), RD4 (Merlin 929), RD7 (Yang), RD8 (Seok 397), RD10 (Stacey 0024), RD11 (Asterjadhi 238).

### ***Integration of Patil 1415***

Yang 349 discloses techniques that “allow an AP to change a BSS Color value used in the BSS that the AP serves, *e.g.*, when a BSS Color collision occurs.” RD-7 at 9:11-18. As an example, Yang 349 discloses that “an AP initiates a BSS Color Change procedure when there is a need to change the current BSS Color value of the BSS that the AP serves,” which an example of which includes two “stages.” RD-7 at 9:19-10:42.

During the first stage, “the AP uses a pre-specified Transitory BSS Color value to set the BSS Color subfield in the HE-SIG-A field of the DL HE PPDUs transmitted by the AP as soon as the AP determines to change the BSS Color value, *e.g.*, after the detection of a collision with the

current BSS Color value.” RD-7 at 9:30-57.

During the second stage, “the AP uses the new BSS Color value to set the BSS Color subfield in the HE-SIG-A field of the DL HE PPDU that the AP transmits after the one or more conditions, as mentioned above, are met.” RD-7 at 10:18-22. Yang 349 discloses that one such condition can include the expiration of “a time T.” RD-7 at 9:58-10:17.

In view of Yang 349, a POSITA would have recognized that allowing an AP to switch BSS color is beneficial, as it allows the BSS to avoid collisions (*e.g.*, with other BSSs having the same BSS color). However, a POSITA would have recognized several deficiencies in Yang 349’s BSS change color technique, including (i) requiring the use of a “Transitory BSS Color” (thereby increasing the number of BSS colors that are in use, which may be undesirable for a dense networking environment with many other BSSs in close proximity and many BSS colors may already be in use), and (ii) an inability for the AP to select a specific time at which the STAs switch to the new BSS.

To address these deficiencies, a POSITA would have looked to other references regarding alternative techniques for coordinating a BSS color switch between an AP and a STA. One such reference is Patil 1415, which discloses a “BSS Color Change Procedure” that allows an AP to cause a new BSS color to be used at a specific time by each device of the BSS, and without requiring the use of an additional “Transitory BSS Color.” *See generally* RD-3.

In view of Patil 1415, a POSITA would have found it obvious to modify Yang 349’s system to perform Patil 1415’s “BSS Color Change Procedure” instead, in order to (i) avoid the use of “Transitory BSS Colors” (thereby reducing the number of BSS that are in use), and (ii) allow an AP to select specific time at which the STAs switch to a new BSS (thereby allowing the AP and STAs to remain synchronized in time with respect to BSS color changes). A POSITA would

have reasonably expected success implementing the combination because the techniques were well known and directed to a common WLAN system.

Similar motivations to combine would apply to other references that disclose BSS color change operations. *See, e.g.*, RD1 (IEEE P802.11ax/D1.0), RD7 (Yang 349), RD12 (Patil 138), RD14 (Chu 193).

**Combination of RD-7 (Yang 349), RD-2 (Patil 250), RD-3 (Patil 1415), RD-1 (IEEE P802.11ax/D1.0), RD-6 (IEEE 802.11-2016), and RD-5 (Patil 230)**

Yang 349 discloses several different “high efficiency (HE) physical (PHY) protocol data unit (PPDU) formats.” RF-7 at 4:5-7, FIGS. 2A-2D. However, Yang 349 does not expressly address certain legacy non-HE PPDU formats, such as Very High Throughput (VHT) formats.

In view of Yang 349, a POSITA would have looked to other references for specific guidance regarding how to perform operations pertaining to signaling and synchronizing BSS color between devices in the context of non-HE PPDU formats, such that wireless devices can reliably signal and synchronize BSS color between them in a variety of network environments (*e.g.*, legacy network environments that do not utilize HE PPDUUs).

Three such references are 802.11ax/D1.0, 802.11-2016, and Patil 230. Each of these references includes specific teaching regarding the signaling and synchronization of BSS color between wireless devices using legacy PPDU formats, such as VHT PPDU formats. In view of these references, a POSITA would have found it obvious to modify the Yang 349-Patil 250-Patil 1415 system to additionally incorporate the VHT PPDU-based techniques in these references, such that the resulting system maintains communications compatibility with both HE-based systems and legacy VHT-based systems. A POSITA would have reasonably expected success implementing the combination because the techniques were well known and directed to a common WLAN system.

For at least the reasons described above, it would have been obvious to one of ordinary skill in the art to combine each prior art reference listed in Appendix D with any other reference or references listed in Appendix D along with the knowledge of one of ordinary skill in the art to arrive at the inventions claims in the '262 patent. For example, and without limitation, the Asserted Claims of the '262 patent would have been obvious to one of ordinary skill in the art in view of the following combinations:

| <b>Patent No. or Title<br/>(Primary Inventor/Author)</b> | <b>In Combination with One or More of:<br/>(Patent No. or Title<br/>(Primary Inventor/Author))</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|----------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| IEEE P802.11ax/D1.0                                      | <ul style="list-style-type: none"> <li>• Asserted Patents Admitted Prior Art (APA)</li> <li>• IEEE 802.11-17/0250r2, “Proposed Resolution for Comments Related to Various CIDs in 27.5.2” (“Patil 250”)</li> <li>• IEEE 802.11-16/1415r0, “Proposed Resolution for CID 72 (BSS Color Change Procedure)” (“Patil 1415”)</li> <li>• IEEE 802.11-16/0929r3, “Comment Resolutions on UL MU Operation” (“Merlin 929”)</li> <li>• IEEE 802.11-17/0230r1, “Proposed Resolution for Comments Related to Multiple BSSID Set” (“Patil 230”)</li> <li>• IEEE 802.11-2016</li> <li>• U.S. Patent No. 10,136,349 (“Yang 349”)</li> <li>• U.S. Patent Appl. Pub. No. 2016/0249397 (“Seok 397”)</li> <li>• IEEE 802.11-2012 (“802.11-2012”)</li> <li>• IEEE 802.11-16/0024r1, “Proposed TGax Draft Specification” (“Stacey 0024”)</li> <li>• IEEE 802.11-17/0238r2m “Comment Resolutions for HT Control Field (9.2.4.6.X and 10.1)” (“Asterjhadi 238”)</li> <li>• IEEE 802.11-17/0138r1, “Proposed Resolution for Comments Related to Section 27.16.2” (“Patil 138”)</li> <li>• IEEE 802.11-17/0389r0, “Proposed Resolution for CIDs for 27-2-1” (“Lv 389”)</li> <li>• U.S. Patent No. 9,942,193 (“Chu 193”)</li> <li>• U.S. Patent No. 10,321,485 (“Noh 485”)</li> </ul> |

| Patent No. or Title<br>(Primary Inventor/Author)                                                          | In Combination with One or More of:<br>(Patent No. or Title<br>(Primary Inventor/Author))                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|-----------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                                                           | <ul style="list-style-type: none"> <li>• IEEE 802.11ac-2013 (“802.11ac”)</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| IEEE 802.11-17/0250r2, “Proposed Resolution for Comments Related to Various CIDs in 27.5.2” (“Patil 250”) | <ul style="list-style-type: none"> <li>• Asserted Patents Admitted Prior Art (APA)</li> <li>• IEEE P802.11ax/D1.0</li> <li>• IEEE 802.11-16/1415r0, “Proposed Resolution for CID 72 (BSS Color Change Procedure)” (“Patil 1415”)</li> <li>• IEEE 802.11-16/0929r3, “Comment Resolutions on UL MU Operation” (“Merlin 929”)</li> <li>• IEEE 802.11-17/0230r1, “Proposed Resolution for Comments Related to Multiple BSSID Set” (“Patil 230”)</li> <li>• IEEE 802.11-2016</li> <li>• U.S. Patent No. 10,136,349 (“Yang 349”)</li> <li>• U.S. Patent Appl. Pub. No. 2016/0249397 (“Seok 397”)</li> <li>• IEEE 802.11-2012 (“802.11-2012”)</li> <li>• IEEE 802.11-16/0024r1, “Proposed TGax Draft Specification” (“Stacey 0024”)</li> <li>• IEEE 802.11-17/0238r2m “Comment Resolutions for HT Control Field (9.2.4.6.X and 10.1)” (“Asterjhadhi 238”)</li> <li>• IEEE 802.11-17/0138r1, “Proposed Resolution for Comments Related to Section 27.16.2” (“Patil 138”)</li> <li>• IEEE 802.11-17/0389r0, “Proposed Resolution for CIDs for 27-2-1” (“Lv 389”)</li> <li>• U.S. Patent No. 9,942,193 (“Chu 193”)</li> <li>• U.S. Patent No. 10,321,485 (“Noh 485”)</li> <li>• IEEE 802.11ac-2013 (“802.11ac”)</li> </ul> |
| IEEE 802.11-16/1415r0, “Proposed Resolution for CID 72 (BSS Color Change Procedure)” (“Patil 1415”)       | <ul style="list-style-type: none"> <li>• Asserted Patents Admitted Prior Art (APA)</li> <li>• IEEE P802.11ax/D1.0</li> <li>• IEEE 802.11-17/0250r2, “Proposed Resolution for Comments Related to Various CIDs in 27.5.2” (“Patil 250”)</li> <li>• IEEE 802.11-16/0929r3, “Comment Resolutions on UL MU Operation” (“Merlin 929”)</li> <li>• IEEE 802.11-17/0230r1, “Proposed Resolution for Comments Related to Multiple BSSID Set” (“Patil 230”)</li> <li>• IEEE 802.11-2016</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |

| Patent No. or Title<br>(Primary Inventor/Author)                               | In Combination with One or More of:<br>(Patent No. or Title<br>(Primary Inventor/Author))                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|--------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                                | <ul style="list-style-type: none"> <li>• U.S. Patent No. 10,136,349 (“Yang 349”)</li> <li>• U.S. Patent Appl. Pub. No. 2016/0249397 (“Seok 397”)</li> <li>• IEEE 802.11-2012 (“802.11-2012”)</li> <li>• IEEE 802.11-16/0024r1, “Proposed TGax Draft Specification” (“Stacey 0024”)</li> <li>• IEEE 802.11-17/0238r2m “Comment Resolutions for HT Control Field (9.2.4.6.X and 10.1)” (“Asterjhadhi 238”)</li> <li>• IEEE 802.11-17/0138r1, “Proposed Resolution for Comments Related to Section 27.16.2” (“Patil 138”)</li> <li>• IEEE 802.11-17/0389r0, “Proposed Resolution for CIDs for 27-2-1” (“Lv 389”)</li> <li>• U.S. Patent No. 9,942,193 (“Chu 193”)</li> <li>• U.S. Patent No. 10,321,485 (“Noh 485”)</li> <li>• IEEE 802.11ac-2013 (“802.11ac”)</li> </ul>                                                                                                                                                                                                                                 |
| IEEE 802.11-16/0929r3, “Comment Resolutions on UL MU Operation” (“Merlin 929”) | <ul style="list-style-type: none"> <li>• Asserted Patents Admitted Prior Art (APA)</li> <li>• IEEE P802.11ax/D1.0</li> <li>• IEEE 802.11-17/0250r2, “Proposed Resolution for Comments Related to Various CIDs in 27.5.2” (“Patil 250”)</li> <li>• IEEE 802.11-16/1415r0, “Proposed Resolution for CID 72 (BSS Color Change Procedure)” (“Patil 1415”)</li> <li>• IEEE 802.11-17/0230r1, “Proposed Resolution for Comments Related to Multiple BSSID Set” (“Patil 230”)</li> <li>• IEEE 802.11-2016</li> <li>• U.S. Patent No. 10,136,349 (“Yang 349”)</li> <li>• U.S. Patent Appl. Pub. No. 2016/0249397 (“Seok 397”)</li> <li>• IEEE 802.11-2012 (“802.11-2012”)</li> <li>• IEEE 802.11-16/0024r1, “Proposed TGax Draft Specification” (“Stacey 0024”)</li> <li>• IEEE 802.11-17/0238r2m “Comment Resolutions for HT Control Field (9.2.4.6.X and 10.1)” (“Asterjhadhi 238”)</li> <li>• IEEE 802.11-17/0138r1, “Proposed Resolution for Comments Related to Section 27.16.2” (“Patil 138”)</li> </ul> |

| Patent No. or Title<br>(Primary Inventor/Author)                                                      | In Combination with One or More of:<br>(Patent No. or Title<br>(Primary Inventor/Author))                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|-------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                                                       | <ul style="list-style-type: none"> <li>• IEEE 802.11-17/0389r0, “Proposed Resolution for CIDs for 27-2-1” (“Lv 389”)</li> <li>• U.S. Patent No. 9,942,193 (“Chu 193”)</li> <li>• U.S. Patent No. 10,321,485 (“Noh 485”)</li> <li>• IEEE 802.11ac-2013 (“802.11ac”)</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| IEEE 802.11-17/0230r1, “Proposed Resolution for Comments Related to Multiple BSSID Set” (“Patil 230”) | <ul style="list-style-type: none"> <li>• Asserted Patents Admitted Prior Art (APA)</li> <li>• IEEE P802.11ax/D1.0</li> <li>• IEEE 802.11-17/0250r2, “Proposed Resolution for Comments Related to Various CIDs in 27.5.2” (“Patil 250”)</li> <li>• IEEE 802.11-16/1415r0, “Proposed Resolution for CID 72 (BSS Color Change Procedure)” (“Patil 1415”)</li> <li>• IEEE 802.11-16/0929r3, “Comment Resolutions on UL MU Operation” (“Merlin 929”)</li> <li>• IEEE 802.11-2016</li> <li>• U.S. Patent No. 10,136,349 (“Yang 349”)</li> <li>• U.S. Patent Appl. Pub. No. 2016/0249397 (“Seok 397”)</li> <li>• IEEE 802.11-2012 (“802.11-2012”)</li> <li>• IEEE 802.11-16/0024r1, “Proposed TGax Draft Specification” (“Stacey 0024”)</li> <li>• IEEE 802.11-17/0238r2m “Comment Resolutions for HT Control Field (9.2.4.6.X and 10.1)” (“Asterjhadi 238”)</li> <li>• IEEE 802.11-17/0138r1, “Proposed Resolution for Comments Related to Section 27.16.2” (“Patil 138”)</li> <li>• IEEE 802.11-17/0389r0, “Proposed Resolution for CIDs for 27-2-1” (“Lv 389”)</li> <li>• U.S. Patent No. 9,942,193 (“Chu 193”)</li> <li>• U.S. Patent No. 10,321,485 (“Noh 485”)</li> <li>• IEEE 802.11ac-2013 (“802.11ac”)</li> </ul> |
| IEEE 802.11-2016                                                                                      | <ul style="list-style-type: none"> <li>• Asserted Patents Admitted Prior Art (APA)</li> <li>• IEEE P802.11ax/D1.0</li> <li>• IEEE 802.11-17/0250r2, “Proposed Resolution for Comments Related to Various CIDs in 27.5.2” (“Patil 250”)</li> <li>• IEEE 802.11-16/1415r0, “Proposed Resolution for CID 72 (BSS Color Change Procedure)”</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |

| Patent No. or Title<br>(Primary Inventor/Author) | In Combination with One or More of:<br>(Patent No. or Title<br>(Primary Inventor/Author))                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|--------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                  | <p>(“Patil 1415”)</p> <ul style="list-style-type: none"> <li>• IEEE 802.11-16/0929r3, “Comment Resolutions on UL MU Operation” (“Merlin 929”)</li> <li>• IEEE 802.11-17/0230r1, “Proposed Resolution for Comments Related to Multiple BSSID Set” (“Patil 230”)</li> <li>• U.S. Patent No. 10,136,349 (“Yang 349”)</li> <li>• U.S. Patent Appl. Pub. No. 2016/0249397 (“Seok 397”)</li> <li>• IEEE 802.11-2012 (“802.11-2012”)</li> <li>• IEEE 802.11-16/0024r1, “Proposed TGax Draft Specification” (“Stacey 0024”)</li> <li>• IEEE 802.11-17/0238r2, “Comment Resolutions for HT Control Field (9.2.4.6.X and 10.1)” (“Asterjhadhi 238”)</li> <li>• IEEE 802.11-17/0138r1, “Proposed Resolution for Comments Related to Section 27.16.2” (“Patil 138”)</li> <li>• IEEE 802.11-17/0389r0, “Proposed Resolution for CIDs for 27-2-1” (“Lv 389”)</li> <li>• U.S. Patent No. 9,942,193 (“Chu 193”)</li> <li>• U.S. Patent No. 10,321,485 (“Noh 485”)</li> <li>• IEEE 802.11ac-2013 (“802.11ac”)</li> </ul> |
| U.S. Patent No. 10,136,349 (“Yang 349”)          | <ul style="list-style-type: none"> <li>• Asserted Patents Admitted Prior Art (APA)</li> <li>• IEEE P802.11ax/D1.0</li> <li>• IEEE 802.11-17/0250r2, “Proposed Resolution for Comments Related to Various CIDs in 27.5.2” (“Patil 250”)</li> <li>• IEEE 802.11-16/1415r0, “Proposed Resolution for CID 72 (BSS Color Change Procedure)” (“Patil 1415”)</li> <li>• IEEE 802.11-16/0929r3, “Comment Resolutions on UL MU Operation” (“Merlin 929”)</li> <li>• IEEE 802.11-17/0230r1, “Proposed Resolution for Comments Related to Multiple BSSID Set” (“Patil 230”)</li> <li>• IEEE 802.11-2016</li> <li>• U.S. Patent Appl. Pub. No. 2016/0249397 (“Seok 397”)</li> <li>• IEEE 802.11-2012 (“802.11-2012”)</li> <li>• Asserted Patents Admitted Prior Art (APA)</li> </ul>                                                                                                                                                                                                                                |

| Patent No. or Title<br>(Primary Inventor/Author)     | In Combination with One or More of:<br>(Patent No. or Title<br>(Primary Inventor/Author))                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                      | <ul style="list-style-type: none"> <li>• IEEE 802.11-16/0024r1, “Proposed TGax Draft Specification” (“Stacey 0024”)</li> <li>• IEEE 802.11-17/0238r2m “Comment Resolutions for HT Control Field (9.2.4.6.X and 10.1)” (“Asterjhadi 238”)</li> <li>• IEEE 802.11-17/0138r1, “Proposed Resolution for Comments Related to Section 27.16.2” (“Patil 138”)</li> <li>• IEEE 802.11-17/0389r0, “Proposed Resolution for CIDs for 27-2-1” (“Lv 389”)</li> <li>• U.S. Patent No. 9,942,193 (“Chu 193”)</li> <li>• U.S. Patent No. 10,321,485 (“Noh 485”)</li> <li>• IEEE 802.11ac-2013 (“802.11ac”)</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| U.S. Patent Appl. Pub. No. 2016/0249397 (“Seok 397”) | <ul style="list-style-type: none"> <li>• Asserted Patents Admitted Prior Art (APA)</li> <li>• IEEE P802.11ax/D1.0</li> <li>• IEEE 802.11-17/0250r2, “Proposed Resolution for Comments Related to Various CIDs in 27.5.2” (“Patil 250”)</li> <li>• IEEE 802.11-16/1415r0, “Proposed Resolution for CID 72 (BSS Color Change Procedure)” (“Patil 1415”)</li> <li>• IEEE 802.11-16/0929r3, “Comment Resolutions on UL MU Operation” (“Merlin 929”)</li> <li>• IEEE 802.11-17/0230r1, “Proposed Resolution for Comments Related to Multiple BSSID Set” (“Patil 230”)</li> <li>• IEEE 802.11-2016</li> <li>• U.S. Patent No. 10,136,349 (“Yang 349”)</li> <li>• IEEE 802.11-2012 (“802.11-2012”)</li> <li>• IEEE 802.11-16/0024r1, “Proposed TGax Draft Specification” (“Stacey 0024”)</li> <li>• IEEE 802.11-17/0238r2m “Comment Resolutions for HT Control Field (9.2.4.6.X and 10.1)” (“Asterjhadi 238”)</li> <li>• IEEE 802.11-17/0138r1, “Proposed Resolution for Comments Related to Section 27.16.2” (“Patil 138”)</li> <li>• IEEE 802.11-17/0389r0, “Proposed Resolution for CIDs for 27-2-1” (“Lv 389”)</li> <li>• U.S. Patent No. 9,942,193 (“Chu 193”)</li> <li>• U.S. Patent No. 10,321,485 (“Noh 485”)</li> </ul> |

| Patent No. or Title<br>(Primary Inventor/Author)                           | In Combination with One or More of:<br>(Patent No. or Title<br>(Primary Inventor/Author))                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|----------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                            | <ul style="list-style-type: none"> <li>• IEEE 802.11ac-2013 (“802.11ac”)</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| IEEE 802.11-2012 (“802.11-2012”)                                           | <ul style="list-style-type: none"> <li>• Asserted Patents Admitted Prior Art (APA)</li> <li>• IEEE P802.11ax/D1.0</li> <li>• IEEE 802.11-17/0250r2, “Proposed Resolution for Comments Related to Various CIDs in 27.5.2” (“Patil 250”)</li> <li>• IEEE 802.11-16/1415r0, “Proposed Resolution for CID 72 (BSS Color Change Procedure)” (“Patil 1415”)</li> <li>• IEEE 802.11-16/0929r3, “Comment Resolutions on UL MU Operation” (“Merlin 929”)</li> <li>• IEEE 802.11-17/0230r1, “Proposed Resolution for Comments Related to Multiple BSSID Set” (“Patil 230”)</li> <li>• IEEE 802.11-2016</li> <li>• U.S. Patent No. 10,136,349 (“Yang 349”)</li> <li>• U.S. Patent Appl. Pub. No. 2016/0249397 (“Seok 397”)</li> <li>• IEEE 802.11-16/0024r1, “Proposed TGax Draft Specification” (“Stacey 0024”)</li> <li>• IEEE 802.11-17/0238r2m “Comment Resolutions for HT Control Field (9.2.4.6.X and 10.1)” (“Asterjhadhi 238”)</li> <li>• IEEE 802.11-17/0138r1, “Proposed Resolution for Comments Related to Section 27.16.2” (“Patil 138”)</li> <li>• IEEE 802.11-17/0389r0, “Proposed Resolution for CIDs for 27-2-1” (“Lv 389”)</li> <li>• U.S. Patent No. 9,942,193 (“Chu 193”)</li> <li>• U.S. Patent No. 10,321,485 (“Noh 485”)</li> <li>• IEEE 802.11ac-2013 (“802.11ac”)</li> </ul> |
| IEEE 802.11-16/0024r1, “Proposed TGax Draft Specification” (“Stacey 0024”) | <ul style="list-style-type: none"> <li>• Asserted Patents Admitted Prior Art (APA)</li> <li>• IEEE P802.11ax/D1.0</li> <li>• IEEE 802.11-17/0250r2, “Proposed Resolution for Comments Related to Various CIDs in 27.5.2” (“Patil 250”)</li> <li>• IEEE 802.11-16/1415r0, “Proposed Resolution for CID 72 (BSS Color Change Procedure)” (“Patil 1415”)</li> <li>• IEEE 802.11-16/0929r3, “Comment Resolutions</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |

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|-----------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                                                           | <p>on UL MU Operation” (“Merlin 929”)</p> <ul style="list-style-type: none"> <li>• IEEE 802.11-17/0230r1, “Proposed Resolution for Comments Related to Multiple BSSID Set” (“Patil 230”)</li> <li>• IEEE 802.11-2016</li> <li>• U.S. Patent No. 10,136,349 (“Yang 349”)</li> <li>• U.S. Patent Appl. Pub. No. 2016/0249397 (“Seok 397”)</li> <li>• IEEE 802.11-2012 (“802.11-2012”)</li> <li>• IEEE 802.11-17/0238r2m “Comment Resolutions for HT Control Field (9.2.4.6.X and 10.1)” (“Asterjhadi 238”)</li> <li>• IEEE 802.11-17/0138r1, “Proposed Resolution for Comments Related to Section 27.16.2” (“Patil 138”)</li> <li>• IEEE 802.11-17/0389r0, “Proposed Resolution for CIDs for 27-2-1” (“Lv 389”)</li> <li>• U.S. Patent No. 9,942,193 (“Chu 193”)</li> <li>• U.S. Patent No. 10,321,485 (“Noh 485”)</li> <li>• IEEE 802.11ac-2013 (“802.11ac”)</li> </ul>                                              |
| IEEE 802.11-17/0238r2m “Comment Resolutions for HT Control Field (9.2.4.6.X and 10.1)” (“Asterjhadi 238”) | <ul style="list-style-type: none"> <li>• Asserted Patents Admitted Prior Art (APA)</li> <li>• IEEE P802.11ax/D1.0</li> <li>• IEEE 802.11-17/0250r2, “Proposed Resolution for Comments Related to Various CIDs in 27.5.2” (“Patil 250”)</li> <li>• IEEE 802.11-16/1415r0, “Proposed Resolution for CID 72 (BSS Color Change Procedure)” (“Patil 1415”)</li> <li>• IEEE 802.11-16/0929r3, “Comment Resolutions on UL MU Operation” (“Merlin 929”)</li> <li>• IEEE 802.11-17/0230r1, “Proposed Resolution for Comments Related to Multiple BSSID Set” (“Patil 230”)</li> <li>• IEEE 802.11-2016</li> <li>• U.S. Patent No. 10,136,349 (“Yang 349”)</li> <li>• U.S. Patent Appl. Pub. No. 2016/0249397 (“Seok 397”)</li> <li>• IEEE 802.11-2012 (“802.11-2012”)</li> <li>• IEEE 802.11-16/0024r1, “Proposed TGax Draft Specification” (“Stacey 0024”)</li> <li>• IEEE 802.11-17/0138r1, “Proposed Resolution</li> </ul> |

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|----------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                                                    | for Comments Related to Section 27.16.2”<br>(“Patil 138”) <ul style="list-style-type: none"> <li>• IEEE 802.11-17/0389r0, “Proposed Resolution for CIDs for 27-2-1” (“Lv 389”)</li> <li>• U.S. Patent No. 9,942,193 (“Chu 193”)</li> <li>• U.S. Patent No. 10,321,485 (“Noh 485”)</li> <li>• IEEE 802.11ac-2013 (“802.11ac”)</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| IEEE 802.11-17/0138r1, “Proposed Resolution for Comments Related to Section 27.16.2” (“Patil 138”) | <ul style="list-style-type: none"> <li>• Asserted Patents Admitted Prior Art (APA)</li> <li>• IEEE P802.11ax/D1.0</li> <li>• IEEE 802.11-17/0250r2, “Proposed Resolution for Comments Related to Various CIDs in 27.5.2” (“Patil 250”)</li> <li>• IEEE 802.11-16/1415r0, “Proposed Resolution for CID 72 (BSS Color Change Procedure)” (“Patil 1415”)</li> <li>• IEEE 802.11-16/0929r3, “Comment Resolutions on UL MU Operation” (“Merlin 929”)</li> <li>• IEEE 802.11-17/0230r1, “Proposed Resolution for Comments Related to Multiple BSSID Set” (“Patil 230”)</li> <li>• IEEE 802.11-2016</li> <li>• U.S. Patent No. 10,136,349 (“Yang 349”)</li> <li>• U.S. Patent Appl. Pub. No. 2016/0249397 (“Seok 397”)</li> <li>• IEEE 802.11-2012 (“802.11-2012”)</li> <li>• IEEE 802.11-16/0024r1, “Proposed TGax Draft Specification” (“Stacey 0024”)</li> <li>• IEEE 802.11-17/0238r2m “Comment Resolutions for HT Control Field (9.2.4.6.X and 10.1)” (“Asterjhadi 238”)</li> <li>• IEEE 802.11-17/0389r0, “Proposed Resolution for CIDs for 27-2-1” (“Lv 389”)</li> <li>• U.S. Patent No. 9,942,193 (“Chu 193”)</li> <li>• U.S. Patent No. 10,321,485 (“Noh 485”)</li> <li>• IEEE 802.11ac-2013 (“802.11ac”)</li> </ul> |
| IEEE 802.11-17/0389r0, “Proposed Resolution for CIDs for 27-2-1” (“Lv 389”)                        | <ul style="list-style-type: none"> <li>• Asserted Patents Admitted Prior Art (APA)</li> <li>• IEEE P802.11ax/D1.0</li> <li>• IEEE 802.11-17/0250r2, “Proposed Resolution for Comments Related to Various CIDs in 27.5.2” (“Patil 250”)</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |

| Patent No. or Title<br>(Primary Inventor/Author) | In Combination with One or More of:<br>(Patent No. or Title<br>(Primary Inventor/Author))                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|--------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                  | <ul style="list-style-type: none"> <li>• IEEE 802.11-16/1415r0, “Proposed Resolution for CID 72 (BSS Color Change Procedure)” (“Patil 1415”)</li> <li>• IEEE 802.11-16/0929r3, “Comment Resolutions on UL MU Operation” (“Merlin 929”)</li> <li>• IEEE 802.11-17/0230r1, “Proposed Resolution for Comments Related to Multiple BSSID Set” (“Patil 230”)</li> <li>• IEEE 802.11-2016</li> <li>• U.S. Patent No. 10,136,349 (“Yang 349”)</li> <li>• U.S. Patent Appl. Pub. No. 2016/0249397 (“Seok 397”)</li> <li>• IEEE 802.11-2012 (“802.11-2012”)</li> <li>• IEEE 802.11-16/0024r1, “Proposed TGax Draft Specification” (“Stacey 0024”)</li> <li>• IEEE 802.11-17/0238r2m “Comment Resolutions for HT Control Field (9.2.4.6.X and 10.1)” (“Asterjhadi 238”)</li> <li>• IEEE 802.11-17/0138r1, “Proposed Resolution for Comments Related to Section 27.16.2” (“Patil 138”)</li> <li>• U.S. Patent No. 9,942,193 (“Chu 193”)</li> <li>• U.S. Patent No. 10,321,485 (“Noh 485”)</li> <li>• IEEE 802.11ac-2013 (“802.11ac”)</li> </ul> |
| U.S. Patent No. 9,942,193 (“Chu 193”)            | <ul style="list-style-type: none"> <li>• Asserted Patents Admitted Prior Art (APA)</li> <li>• IEEE P802.11ax/D1.0</li> <li>• IEEE 802.11-17/0250r2, “Proposed Resolution for Comments Related to Various CIDs in 27.5.2” (“Patil 250”)</li> <li>• IEEE 802.11-16/1415r0, “Proposed Resolution for CID 72 (BSS Color Change Procedure)” (“Patil 1415”)</li> <li>• IEEE 802.11-16/0929r3, “Comment Resolutions on UL MU Operation” (“Merlin 929”)</li> <li>• IEEE 802.11-17/0230r1, “Proposed Resolution for Comments Related to Multiple BSSID Set” (“Patil 230”)</li> <li>• IEEE 802.11-2016</li> <li>• U.S. Patent No. 10,136,349 (“Yang 349”)</li> <li>• U.S. Patent Appl. Pub. No. 2016/0249397 (“Seok 397”)</li> </ul>                                                                                                                                                                                                                                                                                                           |

| Patent No. or Title<br>(Primary Inventor/Author) | In Combination with One or More of:<br>(Patent No. or Title<br>(Primary Inventor/Author))                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|--------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                  | <ul style="list-style-type: none"> <li>• IEEE 802.11-2012 (“802.11-2012”)</li> <li>• IEEE 802.11-16/0024r1, “Proposed TGax Draft Specification” (“Stacey 0024”)</li> <li>• IEEE 802.11-17/0238r2m “Comment Resolutions for HT Control Field (9.2.4.6.X and 10.1)” (“Asterjhadi 238”)</li> <li>• IEEE 802.11-17/0138r1, “Proposed Resolution for Comments Related to Section 27.16.2” (“Patil 138”)</li> <li>• IEEE 802.11-17/0389r0, “Proposed Resolution for CIDs for 27-2-1” (“Lv 389”)</li> <li>• U.S. Patent No. 10,321,485 (“Noh 485”)</li> <li>• IEEE 802.11ac-2013 (“802.11ac”)</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| U.S. Patent No. 10,321,485 (“Noh 485”)           | <ul style="list-style-type: none"> <li>• Asserted Patents Admitted Prior Art (APA)</li> <li>• IEEE P802.11ax/D1.0</li> <li>• IEEE 802.11-17/0250r2, “Proposed Resolution for Comments Related to Various CIDs in 27.5.2” (“Patil 250”)</li> <li>• IEEE 802.11-16/1415r0, “Proposed Resolution for CID 72 (BSS Color Change Procedure)” (“Patil 1415”)</li> <li>• IEEE 802.11-16/0929r3, “Comment Resolutions on UL MU Operation” (“Merlin 929”)</li> <li>• IEEE 802.11-17/0230r1, “Proposed Resolution for Comments Related to Multiple BSSID Set” (“Patil 230”)</li> <li>• IEEE 802.11-2016</li> <li>• U.S. Patent No. 10,136,349 (“Yang 349”)</li> <li>• U.S. Patent Appl. Pub. No. 2016/0249397 (“Seok 397”)</li> <li>• IEEE 802.11-2012 (“802.11-2012”)</li> <li>• IEEE 802.11-16/0024r1, “Proposed TGax Draft Specification” (“Stacey 0024”)</li> <li>• IEEE 802.11-17/0238r2m “Comment Resolutions for HT Control Field (9.2.4.6.X and 10.1)” (“Asterjhadi 238”)</li> <li>• IEEE 802.11-17/0138r1, “Proposed Resolution for Comments Related to Section 27.16.2” (“Patil 138”)</li> <li>• IEEE 802.11-17/0389r0, “Proposed Resolution for CIDs for 27-2-1” (“Lv 389”)</li> </ul> |

| Patent No. or Title<br>(Primary Inventor/Author) | In Combination with One or More of:<br>(Patent No. or Title<br>(Primary Inventor/Author))                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|--------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                  | <ul style="list-style-type: none"> <li>• U.S. Patent No. 9,942,193 (“Chu 193”)</li> <li>• IEEE 802.11ac-2013 (“802.11ac”)</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| IEEE 802.11ac-2013 (“802.11ac”) <sup>34</sup>    | <ul style="list-style-type: none"> <li>• Asserted Patents Admitted Prior Art (APA)</li> <li>• IEEE P802.11ax/D1.0</li> <li>• IEEE 802.11-17/0250r2, “Proposed Resolution for Comments Related to Various CIDs in 27.5.2” (“Patil 250”)</li> <li>• IEEE 802.11-16/1415r0, “Proposed Resolution for CID 72 (BSS Color Change Procedure)” (“Patil 1415”)</li> <li>• IEEE 802.11-16/0929r3, “Comment Resolutions on UL MU Operation” (“Merlin 929”)</li> <li>• IEEE 802.11-17/0230r1, “Proposed Resolution for Comments Related to Multiple BSSID Set” (“Patil 230”)</li> <li>• IEEE 802.11-2016</li> <li>• U.S. Patent No. 10,136,349 (“Yang 349”)</li> <li>• U.S. Patent Appl. Pub. No. 2016/0249397 (“Seok 397”)</li> <li>• IEEE 802.11-2012 (“802.11-2012”)</li> <li>• IEEE 802.11-16/0024r1, “Proposed TGax Draft Specification” (“Stacey 0024”)</li> <li>• IEEE 802.11-17/0238r2m “Comment Resolutions for HT Control Field (9.2.4.6.X and 10.1)” (“Asterjhadhi 238”)</li> <li>• IEEE 802.11-17/0138r1, “Proposed Resolution for Comments Related to Section 27.16.2” (“Patil 138”)</li> <li>• IEEE 802.11-17/0389r0, “Proposed Resolution for CIDs for 27-2-1” (“Lv 389”)</li> <li>• U.S. Patent No. 9,942,193 (“Chu 193”)</li> <li>• U.S. Patent No. 10,321,485 (“Noh 485”)</li> </ul> |

As mentioned above, Defendants have not yet completed their search or discovery concerning additional prior art. Moreover, the exemplary combinations are provided based on

<sup>34</sup> This combination of references further means that any prior art systems listed in Table 2-D that are Wi-Fi 5 (802.11ac) enabled and capable can further be combined with one or more prior art references noted in the second column in this row.

Defendants' current understanding of the Asserted Claims and Plaintiff's apparent view of the scope of those claims as shown, for example, in Plaintiff's Infringement Contentions. Further, a *Markman* Order has not yet been issued in this case. As such, Defendants' inclusion of exemplary combinations does not preclude them from identifying other invalidating combinations as appropriate, and Defendants reserve the right to identify additional specific combinations as well as to detail and explain such combinations.

### **C. Improper Inventorship**

The Asserted Patents, including all Asserted Claims, are invalid for failure to comply with 35 U.S.C. §§ 101, 115, 282, on the grounds that the purported inventors did not themselves invent the subject matter sought to be patented, resulting in improper inventorship. Specifically, the inventors of Asserted Patents derived their purported inventions from others, and/or one or more joint inventors who conceived significant parts of the purported inventions were not named as inventors on the Asserted Patents.

#### **1. U.S. Patent No. 10,911,186**

The '186 patent, including all asserted claims therein, are invalid on the grounds that the inventors of the '186 patent derived their purported inventions from others. Table 3-A provides an identification, by the name of the person(s), from whom the purported invention was derived, and the circumstances of derivation are explained below. The same person(s) are considered to be one or more joint inventors who conceived parts of the purported invention of the '186 patent, but were not named as the '186 patent inventors.

Date: July 9, 2025

Respectfully submitted,

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