

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE PATENT TRIAL AND APPEAL BOARD

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ERICSSON INC. AND NOKIA OF AMERICA  
CORPORATION,

Petitioners,

v.

COLLISION COMMUNICATIONS, INC.,

Patent Owner.

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Case IPR2022-01233

Patent 9,814,071

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**PATENT OWNER'S PRELIMINARY RESPONSE  
UNDER 37 C.F.R. § 42.107**

**TABLE OF CONTENTS**

|                                                                                                                                                                                                                                                                  |     |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|
| LIST OF EXHIBITS .....                                                                                                                                                                                                                                           | v   |
| LIST OF ABBREVIATIONS .....                                                                                                                                                                                                                                      | vii |
| I. INTRODUCTION .....                                                                                                                                                                                                                                            | 1   |
| II. THE CLAIMED INVENTION OF THE '071 PATENT .....                                                                                                                                                                                                               | 2   |
| III. THE '071 PROSECUTION HISTORY .....                                                                                                                                                                                                                          | 4   |
| IV. CLAIM CONSTRUCTION .....                                                                                                                                                                                                                                     | 8   |
| V. PERSON OF ORDINARY SKILL IN THE ART .....                                                                                                                                                                                                                     | 9   |
| VI. THE ASSERTED REFERENCES .....                                                                                                                                                                                                                                | 10  |
| A. <i>Kim</i> .....                                                                                                                                                                                                                                              | 10  |
| B. <i>Tong</i> .....                                                                                                                                                                                                                                             | 11  |
| C. <i>Jia</i> .....                                                                                                                                                                                                                                              | 13  |
| D. <i>Baum</i> .....                                                                                                                                                                                                                                             | 14  |
| VII. PETITIONERS FAIL TO ESTABLISH A REASONABLE<br>LIKELIHOOD THAT THEY WOULD PREVAIL WITH RESPECT<br>TO ANY CHALLENGED CLAIM .....                                                                                                                              | 16  |
| A. Petitioners Fail to Show that <i>Kim</i> Discloses or Renders Obvious<br>Claims 1-3, 5-7, 13, 14, 16, and 21 (Ground 1A) .....                                                                                                                                | 18  |
| 1. Petitioners Fail to Show that <i>Kim</i> Discloses or Renders Obvious<br>Estimating “at Least One Unique Signal Parameter for Each of<br>the Transmitting Nodes” (Elements [1.3] and [21.1]-[21.2]) .....                                                     | 18  |
| 2. Petitioners Fail to Show that <i>Kim</i> Discloses or Renders Obvious<br>Distinguishing Information Simultaneously Received From<br>Each of the Transmitting Nodes According to Their Unique<br>Estimated Signal Parameters (Elements [1.4] and [21.3]) ..... | 21  |
| B. Petitioners Fail to Show that the <i>Tong</i> and <i>Jia</i> Grounds Disclose or<br>Render Obvious Claims 1-7, 10, 13, 14, 16, and 21 (Grounds 2A,<br>2B, and 2C) .....                                                                                       | 26  |
| 1. Petitioners Fail to Show that <i>Tong</i> Alone or in Combination<br>With <i>Jia</i> Discloses or Renders Obvious Estimating at Least One<br>Unique Signal Parameter for Each of the Transmitting Nodes<br>(Elements [1.3] and [21.1]-[21.2]) .....           | 26  |

|       |                                                                                                                                                                                                              |    |
|-------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|
| 2.    | Petitioners Fail to Show that <i>Tong</i> Alone or in Combination With <i>Jia</i> Discloses or Renders Obvious “Distinguishing” in a Multi-UE System (Elements [1.4] and [21.3]).....                        | 32 |
| C.    | Petitioners Fail to Show that <i>Baum</i> Discloses or Renders Obvious Claims 1, 4, and 8-10 (Ground 3A) .....                                                                                               | 35 |
| 1.    | Petitioners Fail to Show that <i>Baum</i> Discloses or Renders Obvious “Requiring” Each Transmitting Node to Transmit the Alleged Parameter-Estimating Signal (Element [1.2]) .....                          | 36 |
| 2.    | Petitioners Fail to Show that <i>Baum</i> Discloses or Renders Obvious Estimating a Unique Signal Parameter for Baum’s “Desired Signal,” and Thus “for Each of the Transmitting Nodes” (Element [1.3]) ..... | 38 |
| 3.    | Petitioners Fail to Show that <i>Baum</i> Discloses or Renders Obvious Detecting and Distinguishing Information Simultaneously Received From Each of the Transmitting Nodes (Element [1.4]) .....            | 41 |
| VIII. | THE BOARD SHOULD EXERCISE ITS DISCRETION UNDER SECTION 314(A) TO DENY INSTITUTION .....                                                                                                                      | 43 |
| A.    | Factor 1: The Court Will Not Stay the Co-Pending Litigations When Trial Is Scheduled Prior to the Institution Deadline.....                                                                                  | 44 |
| B.    | Factor 2: The District Court’s Trial Date Is More Than a Year Before the Expected Date of Any Final Written Decision .....                                                                                   | 45 |
| C.    | Factor 3: Significant Investment in the Parallel Proceeding Has Occurred and Will Occur Before Institution.....                                                                                              | 46 |
| D.    | Factor 4: Petitioners Have Not Offered a <i>Sotera</i> Stipulation .....                                                                                                                                     | 47 |
| E.    | Factor 5: Petitioners and the Defendants in the Parallel Proceedings Are the Same Parties .....                                                                                                              | 49 |
| F.    | Factor 6: Petitioners’ Proposed Grounds Have Significant Defects and Petitioners Waited Nearly a Year to File .....                                                                                          | 49 |
| IX.   | CONCLUSION.....                                                                                                                                                                                              | 50 |

**TABLE OF AUTHORITIES**

|                                                                                                                                   | <b>Page(s)</b> |
|-----------------------------------------------------------------------------------------------------------------------------------|----------------|
| <b>Cases</b>                                                                                                                      |                |
| <i>Apple Inc. v. Fintiv, Inc.</i> ,<br>IPR2020-00019, Paper 11 (P.T.A.B. March 20, 2020) .....                                    | <i>passim</i>  |
| <i>Cisco Sys., Inc. v. Ramot at Tel Aviv Univ. Ltd.</i> ,<br>IPR2020-00484, Paper 10 (P.T.A.B. Oct. 29, 2020) .....               | 45, 46, 49     |
| <i>DISH Network LLC v. Broadband iTV, Inc.</i> ,<br>IPR2020-01268, Paper 15 (P.T.A.B. Jan. 21, 2021) .....                        | 24, 30         |
| <i>Google LLC v. Ikorongo Tech. LLC</i> ,<br>IPR2021-00205, Paper 13 (P.T.A.B. June 7, 2021) .....                                | 48             |
| <i>Hewlett Packard Enterprise Co. v. Intellectual Ventures II LLC</i> ,<br>IPR2022-00115, Paper 9 (P.T.A.B. March 29, 2022) ..... | 34             |
| <i>InTouch Techs., Inc. v. VGO Commc'ns, Inc.</i> ,<br>751 F.3d 1327 (Fed. Cir. 2014) .....                                       | 34             |
| <i>Juniper Networks, Inc. v. Packet Intelligence LLC</i> ,<br>IPR2020-00335, Paper 19 (P.T.A.B. Aug. 27, 2020) .....              | 21             |
| <i>Kranos Corp. v. Apalone, Inc.</i> ,<br>IPR2020-00501, Paper 13 (P.T.A.B. July 16, 2020) .....                                  | 50             |
| <i>Lego Systems, Inc. v. MQ Gaming LLC</i> ,<br>IPR2020-01446, Paper 14 (P.T.A.B. Feb. 16, 2021) .....                            | 24, 30         |
| <i>Micro-Tech (Nanjing) Co., Ltd. v. Boston Scientific Scimed, Inc.</i> ,<br>IPR2020-00185, Paper 11 (P.T.A.B. May 4, 2020) ..... | 21             |
| <i>NHK Spring Co. v. Intri-Plex Techs., Inc.</i> ,<br>IPR2018-00752, Paper 8 (P.T.A.B. Sept. 12, 2018) .....                      | 45, 46         |
| <i>One World Techs., Inc. v. Chervon (HK) Limited</i> ,<br>IPR2020-00883, Paper 20 (P.T.A.B. Nov. 6, 2020) .....                  | 31             |

|                                                                                                                                                                            |               |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|
| <i>Oyster Optics, LLC v. Infinera Corp.</i> ,<br>No. 2:19-CV-00257-JRG, slip op. (E.D. Tex. July 17, 2020), ECF<br>No. 87 (Ex. 2004) .....                                 | 44            |
| <i>Phillips v. AWH Corp.</i> ,<br>415 F.3d 1303 (Fed. Cir. 2005) ( <i>en banc</i> ) .....                                                                                  | 8             |
| <i>Samsung Elecs. Co. v. Ancora Techs., Inc.</i> ,<br>IPR2020-01184, Paper 13 (P.T.A.B. June 7, 2021) .....                                                                | 48            |
| <i>Sand Revolution</i> ,<br>IPR2019-01393, Paper 24 (P.T.A.B. June 16, 2020) .....                                                                                         | 48            |
| <i>Solas OLED Ltd. v. Samsung Display Co.</i> ,<br>No. 19-cv-00152-JRG, slip op. (E.D. Tex. July 17, 2020), ECF No.<br>133 (Ex. 2003) .....                                | 44            |
| <i>Sotera Wireless, Inc. v. Masimo Corp.</i> ,<br>IPR2020-01019, Paper 12 (P.T.A.B. Dec. 1, 2020) .....                                                                    | 47, 48        |
| <i>Uniloc USA, Inc. v. Motorola Mobility LLC</i> ,<br>No. 16-cv-992-JRG, slip op. (E.D. Tex. Apr. 5, 2017), ECF No.<br>125 (Ex. 2005) .....                                | 45            |
| <b>Statutes</b>                                                                                                                                                            |               |
| 35 U.S.C. § 102(b) .....                                                                                                                                                   | 5             |
| 35 U.S.C. § 103(a) .....                                                                                                                                                   | 5             |
| 35 U.S.C. § 314(a) .....                                                                                                                                                   | <i>passim</i> |
| <b>Other Authorities</b>                                                                                                                                                   |               |
| 37 C.F.R. §42.100(b) .....                                                                                                                                                 | 8             |
| Memorandum from USPTO on Interim Procedure for Discretionary<br>Denials in AIA Post-Grant Proceedings with Parallel District Court<br>Litigation 7-8 (June 21, 2022) ..... | 48, 49        |

**LIST OF EXHIBITS**

| <b>Exhibit</b> | <b>Description</b>                                                                                                                                                               |
|----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Ex. 2001       | Claim Construction Order, <i>Collision Communications, Inc. v. Nokia Networks and Solutions Oy</i> , No. 2:21-cv-308-JRG (lead) (E.D. Tex. Aug. 31, 2022), ECF No. 125           |
| Ex. 2002       | Sixth Amended Docket Control Order, <i>Collision Communications, Inc. v. Nokia Networks and Solutions Oy</i> , No. 2:21-cv-308-JRG (lead) (E.D. Tex. Oct. 14, 2022), ECF No. 162 |
| Ex. 2003       | <i>Solas OLED Ltd. v. Samsung Display Co.</i> , No. 2:19-cv-00152-JRG (E.D. Tex. July 17, 2020), ECF No. 133                                                                     |
| Ex. 2004       | <i>Oyster Optics, LLC v. Infinera Corp.</i> , No. 2:19-cv-00257-JRG (E.D. Tex. July 17, 2020), ECF No. 87                                                                        |
| Ex. 2005       | <i>Uniloc USA, Inc. v. Motorola Mobility LLC</i> , No. 2:16-cv-992-JRG (E.D. Tex. Apr. 5, 2017), ECF No. 125                                                                     |
| Ex. 2006       | Complaint, <i>Collision Communications, Inc. v. Nokia Networks and Solutions Oy</i> , No. 2:21-cv-308-JRG (E.D. Tex. Aug. 10, 2021), ECF No. 1                                   |
| Ex. 2007       | Complaint, <i>Collision Communications, Inc. v. Telefonaktiebolaget LM Ericsson</i> , No. 2:21-cv-327-JRG (E.D. Tex. Aug. 27, 2021), ECF No. 1                                   |
| Ex. 2008       | U.S. District Court, Eastern District of Texas, Calendar Events Set for 1/6/2023-1/6/2023, Judge Rodney Gilstrap (as of Oct. 25, 2022)                                           |
| Ex. 2009       | <i>District Court James Rodney Gilstrap</i> , Lex Machina (last accessed Aug. 2, 2022)                                                                                           |
| Ex. 2010       | Defendants' Preliminary Invalidity Contentions, <i>Collision Communications, Inc. v. Nokia Networks and Solutions Oy</i> , No. 2:21-cv-308-JRG (lead) (E.D. Tex. Jan. 13, 2022)  |
| Ex. 2011       | Declaration of Jonathan Bradford ISO Patent Owner's Preliminary                                                                                                                  |

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|  | Response, Dated Oct. 26, 2022 |
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## LIST OF ABBREVIATIONS

| Abbreviation      | Term                                                                           |
|-------------------|--------------------------------------------------------------------------------|
| '071              | U.S. Patent No. 9,814,071 (Ex. 1001)                                           |
| Challenged Claims | '071 patent, claims 1-10, 13, 14, 16, and 21                                   |
| Petition or Pet.  | Petition for <i>Inter Partes</i> Review of U.S. Patent No. 9,814,071 (Paper 3) |
| Patent Owner      | Collision Communications, Inc.                                                 |
| Petitioners       | Ericsson Inc., Nokia of America Corporation                                    |
| Kim               | U.S. Patent App. Publication No. 2008/0032630 (Ex. 1010)                       |
| Tong              | U.S. Patent App. Publication No. 2004/0114618 (Ex. 1011)                       |
| Jia               | U.S. Patent App. Publication No. 2004/0066866 (Ex. 1020)                       |
| Baum              | U.S. Patent No. 5,867,478 (Ex. 1005)                                           |

## I. INTRODUCTION

Each of the Grounds presented in the Petition has multiple significant gaps in both the cited disclosures and Petitioners' analysis thereof.<sup>1</sup> In particular, the Petition repeatedly fails to address key aspects of the Challenged Claims, including the requirements of estimating at least one unique signal parameter *for each of the transmitting nodes*, and *distinguishing* the information simultaneously received from each of the transmitting nodes *according to their respective said unique estimated signal parameters*. Moreover, the Petition relies on impermissible claim mappings, including improperly combining the teachings of separate embodiments without support for doing so, and internally inconsistent mappings across different elements of the same claim. As a result, Petitioners have failed to show a reasonable likelihood of success as to multiple, independent elements of the Challenged Claims.

In addition, and particularly in view of Petitioners' failure to present a compelling case of unpatentability, discretionary denial is warranted in view of the imminent trial in the parallel district court cases. Trial in the co-pending district court cases is scheduled for **January 6, 2023, before** the institution deadline and more than a year before the Final Written Decision (FWD) deadline. The parties

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<sup>1</sup> All emphasis herein is added, and all statutory and regulatory citations are to either 35 U.S.C. or 37 C.F.R., as the context indicates, unless otherwise stated.

and court have already made significant investments in the cases. By the institution deadline in late January, the trial date will have passed, all substantive motions will have been filed, and expert and fact discovery will have long concluded. Moreover, Petitioners have not provided a stipulation regarding grounds they reasonably could have raised. All of the *Fintiv* factors favor discretionary denial, and the Board should exercise its discretion under §314(a) to deny institution.

## II. THE CLAIMED INVENTION OF THE '071 PATENT

The '071 patent generally relates to multiuser digital communication systems. '071, 1:22-24. The patent recognizes that, while a shared multiuser environment in which multiple users may communicate with a single device allows users to use a common communication medium (*id.*, 1:37-40), such systems have limited traffic capacity due to a need to allocate a common resource (*id.*, 1:40-45). In particular, different users cannot share the same time, frequency and/or code for transmission, and thus, the amount of data that can be transmitted by multiple users is limited by the number of such resources that are available. *Id.* The '071 patent is directed toward increasing the capacity in wireless networks by allowing a plurality of devices, or nodes, to transmit overlapping signals over a shared channel, such that the overlapping signals are allowed to interfere, and employing a multiuser detector (“MUD”) to distinguish the interfering signals. *Id.*, 3:18-29.

The MUD can distinguish multiple interfering signals on the shared channel when the signal parameters for the interfering signals are known or accurately estimated. *Id.*, 3:36-39. The '071 patent uses estimates of separately transmitted parameter-estimating signals. Each node transmits a parameter-estimating symbol pattern using an unshared channel, and transmits packets, simultaneously with other nodes, on the shared channel. *Id.*, 3:40-59. The MUD uses the signal parameters estimated using the separately transmitted parameter-estimating signals to demodulate the packets. *Id.*, 4:12-16. Because the parameter-estimating symbols are transmitted on an unshared channel, the invention of the '071 patent does not require the use of anti-collision protocols and packets can be transmitted simultaneously. *Id.*, 8:20-26.

Figure 3 of the '071 patent, copied below, illustrates an embodiment of the invention using Frequency Division Multiple Access (FDMA), which is a type of channel-spreading technology. A main communication channel 300 is a high rate channel used for the shared communication channel. *Id.*, 8:27-32. A plurality of parameter channels 302 is created by channel-spreading technology to form “slots.” *Id.*, 8:27-43.

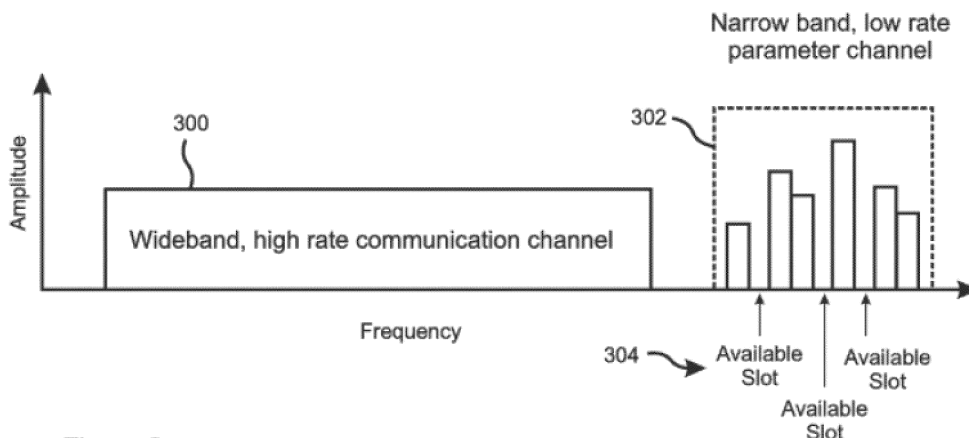


Figure 3

*Id.*, Fig. 3. Each signal from a node has signal parameters (*e.g.*, relative time delay, signal amplitude, signal phase). *Id.*, 3:18-29. The signal parameters can be estimated from the parameter-estimating symbol patterns transmitted on the parameter channels. *Id.*, 8:59-65. Further, the node can transmit other information on the parameter channel such as the frequency offset and identifying information, such as the node ID. *Id.*, 8:63-65; 7:36-40. An MUD uses the parameter-estimating symbol patterns to estimate signal parameters for the received signals and use them to demodulate the received packets. *Id.*, 7:56-62. The MUD can distinguish multiple overlapping received signals. *Id.*, 7:22-25. The receiving node acquires and detects the traffic on the parameter channels and estimates the signal parameters based on the parameter-estimating symbol. *Id.*, 8:54-63, Fig. 5.

### III. THE '071 PROSECUTION HISTORY

The prosecution of the '071 patent thoroughly considered numerous references, and included an appeal of the Examiner's rejections to the PTAB,

resulting in reversal of the Examiner's decision and a ruling in favor of Applicant on the merits. Moreover, the limitations that led to allowance during prosecution include the limitations missing from each of the grounds raised by Petitioners in this IPR.

The application leading to the '071 patent (Application No. 12/742,686) was filed on September 25, 2009 and claims priority to provisional application 61/100,461, filed on September 26, 2008.

On May 29, 2013, the Examiner issued a Non-Final Office Action rejecting pending claims 1-11, 13, 14, and 16-20 under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent Publication No. 2006/0114826 ("Brommer"), claim 12 under 35 U.S.C. § 103(a) as obvious over Brommer in view of U.S. Patent Publication No. 2006/10140259 ("Dunyak"), and claim 15 under 35 U.S.C. § 103(a) as obvious over Brommer in view of U.S. Patent Publication No. 2007/0087756 ("Hoffberg"). Ex. 1002 at 217-226. According to the Examiner, Brommer disclosed "providing a plurality of parameter channels on the network in addition to the shared communication channel" because Brommer disclosed using channel-spreading technologies and these schemes "provide multiple channels for communication." *Id.* at 217 (citing Brommer at [0007], [0092]). The Examiner further concluded that Brommer disclosed "requiring each transmitting node to transmit a parameter-estimating signal on an unshared parameter channel" because Brommer disclosed "a

polling signal correspond[ing] to a particular terminal out of a first set of terminals included in the network, where the model receives two or more simultaneous responses from a first set of polled terminals.” *Id.* at 217-18 (citing Brommer at [0011]).

On August 27, 2013, Applicant responded to the Non-Final Office Action. Specifically, regarding the parameter estimating signals, Applicant explained that “parameter-estimating signals and polling signals are very different” because “[a] polling signal simply polls communication nodes to initiate a response.” Ex. 1002 at 250. Further, Applicant explained that parameter estimation is not performed on the polling signal in Brommer, nor do Brommer’s polling signals have anything to do with parameter estimation, and thus Brommer’s polling signals cannot be the parameter-estimating signal of pending claim 1. *Id.* at 252.

On December 16, 2013, the Examiner issued a Final Office Action repeating the same rejections. *Id.* at 261-271. In response to Applicant’s arguments, the Examiner stated that “Brommer’s teachings of polling...are not directly utilized in the rejection.” *Id.* at 273. In addition, the Examiner asserted specific disclosures that teach “estimating” parameters that are unique to a transmitting terminal. *Id.* at 275 (citing Brommer at [0084], [0089]).

Applicant appealed the Final Office Action on June 12, 2014. Applicant again explained that parameter-estimating signals and polling signals are different: “As

described in Applicants' specification, parameter-estimating signals carry parameter-estimating symbol patterns. A polling signal simply polls communication nodes to initiate a response." Ex. 1002 at 302. To support its argument, Applicant further stated that a POSITA "would, reading the specification, interpret a parameter-estimating signal to include a set of parameter-estimating symbol patterns, since that interpretation is consistent with the specification. At a minimum, a parameter-estimating signal by definition must be usable to estimate parameters, which a polling signal clearly is not." *Id.* at 303. The Examiner filed a reply brief on October 9, 2014, largely repeating the same arguments described above in the Final Office Action. *Id.* at 317-321.

On April 21, 2017, the PTAB issued a decision reversing the Examiner. *Id.* at 344. On July 6, 2017, the USPTO issued a notice of allowance. In the notice of allowance, the Examiner stated that the prior art does not disclose the parameter-estimating signal limitations:

However, the prior art does not, either by anticipation or reasonable combination, disclose the following for claim 1 and similarly 17, 19, and 21: "requiring each transmitting node to transmit a parameter-estimating signal on an unshared said parameter channel; detecting the parameter-estimating signals on the unshared parameter channels and estimating therefrom at least one unique signal parameter for each of the transmitting nodes; and detecting and distinguishing the

information simultaneously received from each of the transmitting nodes according to their respective unique estimated signal parameters.”

Ex. 1002 at 354-55 (emphasis in original). These limitations that led to allowance during prosecution include the limitations missing from each of the grounds raised by Petitioners in this IPR. *See infra* §VII.

#### IV. CLAIM CONSTRUCTION

The Board construes claim terms “using the same claim construction standard that would be used to construe the claim in a civil action.” §42.100(b). Under this standard, claim terms are “generally given their ordinary and customary meaning” to a POSITA. *Phillips v. AWH Corp.*, 415 F.3d 1303, 1312 (Fed. Cir. 2005) (*en banc*) (citations omitted). A POSITA ascertains the meaning of the claims based on the claim language, specification, prosecution history, and relevant extrinsic evidence, although the claims and patent specification are the primary sources for construing claims. *Id.* at 1314-16.

In the parallel district court litigation, the parties have agreed that the underlined portion of the preamble of claim 21 of the '071 patent is limiting: “A method for enabling a receiving node to distinguish information concurrently received from a plurality of transmitting nodes on a shared communication channel of a wireless digital network, the method comprising.” Ex. 2001 at 7.

Patent Owner agrees with Petitioners that no construction is necessary at this stage of the IPR. Patent Owner further reserves the right to raise any issues for construction at a later stage in this proceeding or district court.

**V. PERSON OF ORDINARY SKILL IN THE ART**

Patent Owner submits a person of ordinary skill in the art (“POSITA”) related to the ’071 Patent would have had a bachelor’s degree in electrical engineering, computer science, or a related field, and two to three years of experience in the design or development of wireless telecommunication systems or the equivalent. Additional graduate education could substitute for professional experience, or significant experience in the field could substitute for formal education.

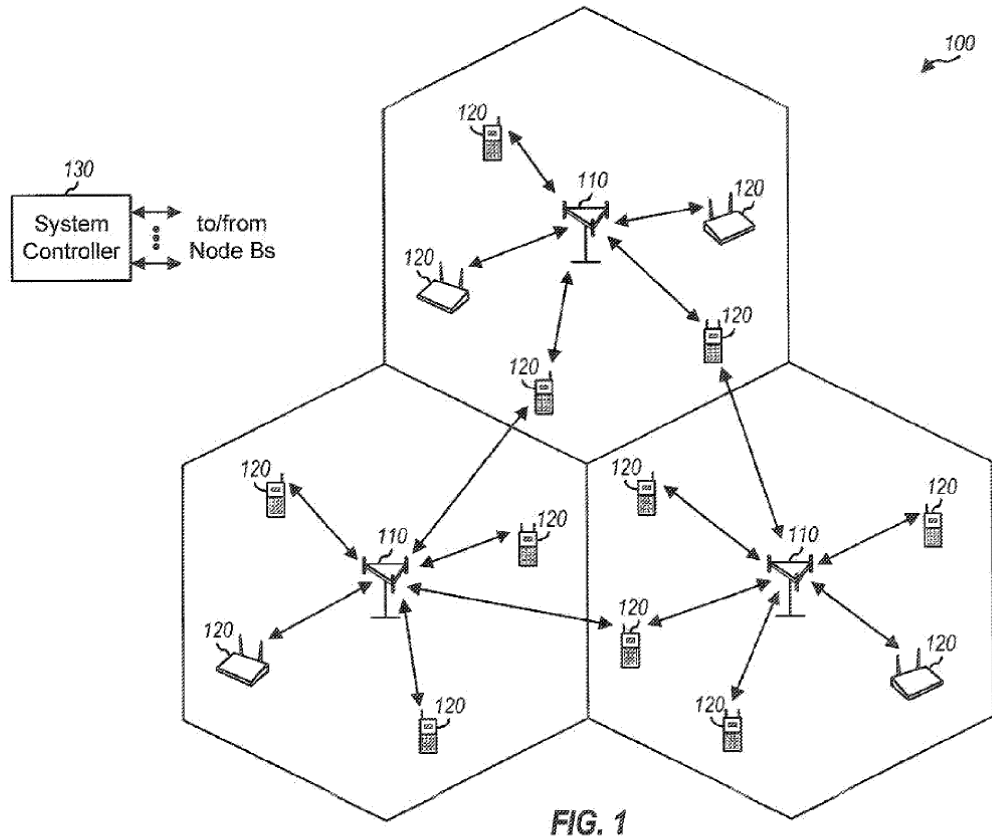
Petitioners submit that a POSITA “at the time of the earliest claimed priority date of September 26, 2008 is someone who had an undergraduate degree in electrical engineering, computer engineering, computer science, or a related field, and two to three years of experience in the design, research, development, operations, and/or testing of radio communications networks, or equivalent combination of education and experience” and that “[s]omeone with more technical education, but less experience could have also met this standard, and vice versa.” Pet. 7.

Regardless of whether the level of skill proposed by Petitioners and Patent Owner is selected, the Challenged Claims are not disclosed or rendered obvious under either proposed level of skill.

## VI. THE ASSERTED REFERENCES

### A. *Kim*

Kim (Ex. 1010) generally relates to techniques for performing channel estimation. Kim, [0003]. Figure 1 shows a wireless communication system with UEs 120 (user equipment) in communication with Node Bs 110 (base stations):



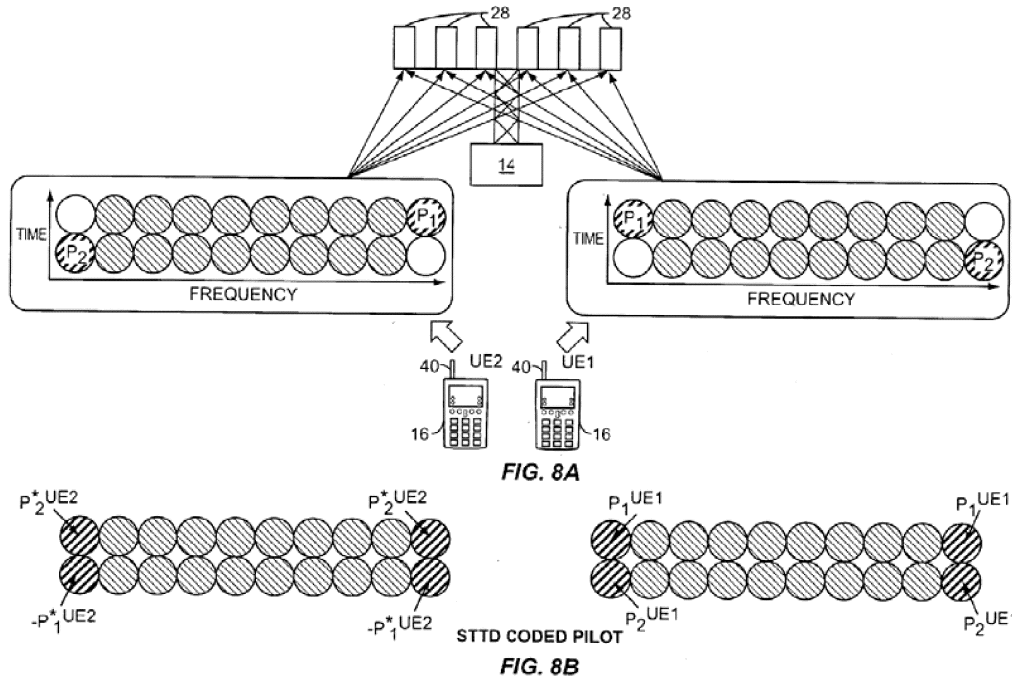
Kim, Fig. 1. A Node B may support single-user MIMO, which “refers to MIMO transmission from a single UE on a given time frequency block,” or multi-user MIMO, which “refers to MIMO transmissions from multiple UEs on the same time frequency block.” Kim, [0035]. “[A] time frequency block may be assigned to any

number of UEs for MU-MIMO or to a single UE with any number of transmit antennas for SU-MIMO.” Kim, [0038].

Channel gain estimates are used to demodulate data subcarriers for each UE. Kim, [0052]. A channel estimation process “derive[s] channel gain estimates for the pilot subcarriers based on the received pilot symbols.” Kim, [0080]. A subcarrier may carry pilot signals for multiple UEs. Kim, [0033]. Thus, channel gain is estimated for subcarriers, rather than specific UEs.

***B. Tong***

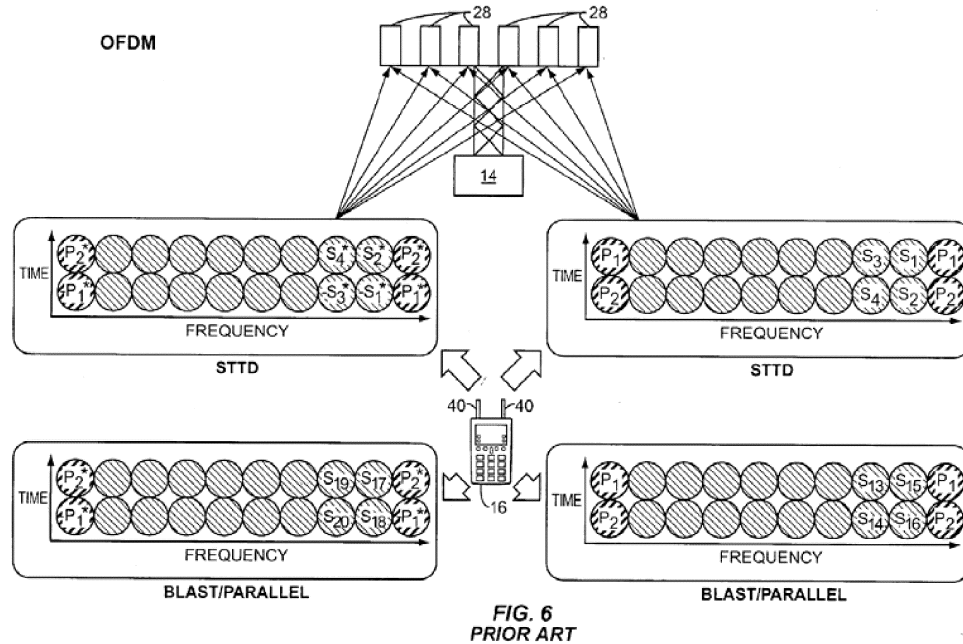
Tong (Ex. 1011) discloses “a virtual multiple input multiple output communication environment using mobile terminals having only a single transmission path and antenna.” Tong, [0001]. Figure 8 shows a virtual MIMO embodiment in which each of the mobile terminals (*e.g.*, UEs) transmits information via the same subcarrier group at the same time (this embodiment can be referred to as the “multiple-UE embodiment”):



Tong, Fig. 8, [0046]. “The base station 14 will receive the transmitted signals from the mobile terminals 16 ... and extract the pilot signals for each of the mobile terminals 16 to help identify the mobile terminals 16 transmitting information, as well as estimate the channel conditions for the MIMO channel (block 210).” Tong, [0045]. Tong does not disclose all of the details of the process for estimating the channel conditions, such as whether the process estimates unique signal parameters for each mobile terminal. Tong also does not disclose a decoding or demodulation process for distinguishing the signals transmitted from the different UEs in this embodiment.

Tong also discloses a separate embodiment that, while also a MIMO communication scheme, utilizes two transmissions paths to two antennas on the

same mobile terminal 16 (this embodiment can be referred to as the “single-UE embodiment”). Tong, [0040]. Figure 6 illustrates this single-UE embodiment:



Tong, Fig. 6. The single-UE embodiment does not receive transmissions from multiple UEs on a shared communicational channel. In this embodiment, channel responses are used by diversity decoder 88 “to decode the symbols according to the transmission and/or encoding used by the mobile terminal 16.” Tong, [0037]. However, the single-UE embodiment does not distinguish information transmitted from multiple UEs.

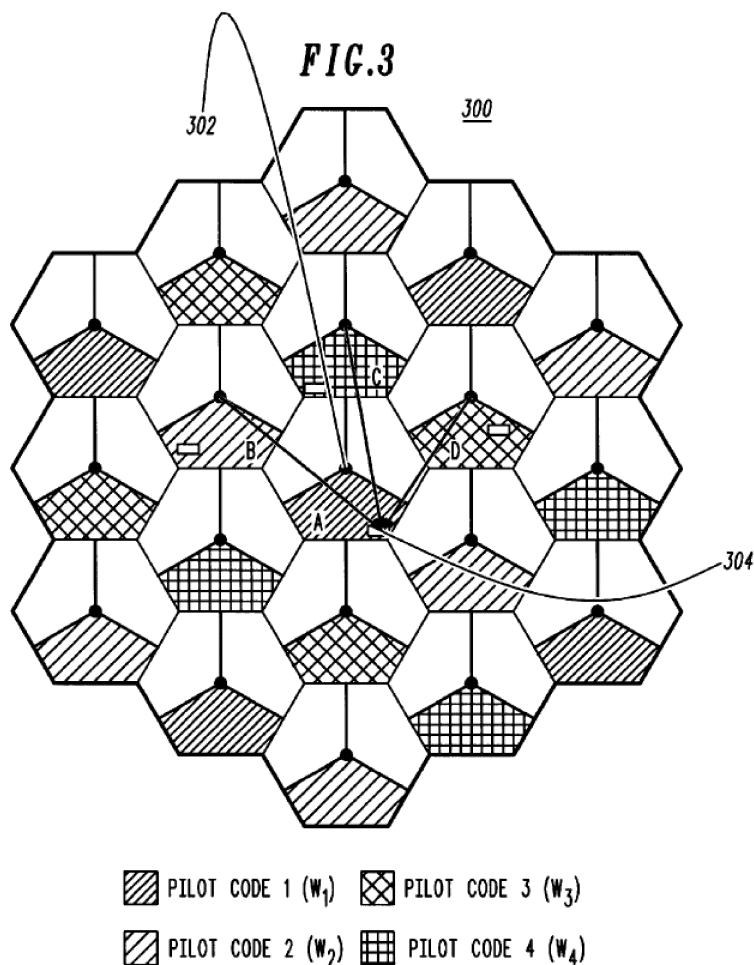
### C. Jia

Jia (Ex. 1020), which is incorporated by reference in Tong, is directed to adaptively controlling coding and modulation techniques in a wireless communication system incorporating space-time coding. Jia generally discloses

coding and modulation techniques in MIMO communication for receiving signals from a single UE with multiple antennas. *See* Jia, [0003] (referring to MIMO systems with multiple transmit and receive antennas), [0035] (describing a mobile terminal with “multiple antennas”), [0049] (describing “the overall functionality of the present invention” with reference to “the transmitter” and “the receiver”). Jia does not disclose any multi-user MIMO process for receiving and distinguishing signals from multiple UEs.

***D. Baum***

Baum (Ex. 1005) is directed to “reducing the impact of interference” in orthogonal frequency division multiplexing (OFDM) wireless communication systems. Baum, 1:7-10. Baum uses a Synchronous Coherent OFDM (SC-OFDM) system “for the suppression of co-channel interference in the measurement of the channel response of the desired signal in a receiver.” Baum, 3:15-26. Figure 3 of Baum shows that a “subscriber unit receives a signal from the base unit transmitting in sector A, which is referred to as the desired signal,” and “also receives a co-channel interfering signal from each of the base units transmitting in sectors B, C, and D”:



Baum, 6:1-38, Fig. 3.

The receiver may measure relative propagation delay and phase change per subcarrier on the interfering signals, which are then used in a detection algorithm. Baum, 9:27-36. However, this information is disclosed as being measured for the “interfering signals,” not the “desired signal.” *Id.* The measurements can be based on a received signal containing known data such as the broadcast synchronization signal. Baum, 19:54-59. However, the synchronization signal is an optional transmission that is **not required** to be transmitted by the base units. For example,

Baum discloses that “[t]he SC-OFDM transmitter may, where selected, transmit at least one of: synchronization signals and identification signals.” Baum, 24:39-50.

In a separate embodiment, “joint detection” is used. Baum, 18:1-48. In this separate embodiment, “the sum of the desired and interfering signal components can be treated as a new desired signal called the joint desired signal.” Baum, 18:9-17. However, Baum does not disclose a process to separate or demodulate each component of the joint desired signal.

## **VII. PETITIONERS FAIL TO ESTABLISH A REASONABLE LIKELIHOOD THAT THEY WOULD PREVAIL WITH RESPECT TO ANY CHALLENGED CLAIM**

Petitioners fail to establish a reasonable likelihood that they would prevail with respect to any of the Challenged Claims at least because Petitioners have failed to show any of the asserted Grounds discloses or renders obvious every element of the Challenged Claims.

First, none of the presented grounds discloses or renders obvious estimating “at least one unique signal parameter for each of the transmitting nodes” in claim 1 or estimating “at least one unique signal parameter for each of the received plurality of parameter-estimating signals” that are “receiv[ed] ... from a corresponding transmitting node” (claim 21). For example, although this was one of the elements that led to allowance during prosecution, Petitioners do not address key aspects of the claim element (Kim), present inconsistent claim mappings and rely upon one

possible implementation without providing a motivation (Tong and Jia), or do not address one of the signals that was mapped to an earlier claim element (Baum).

Second, none of the presented grounds discloses or renders obvious “distinguishing the information simultaneously received from each of the transmitting nodes according to their respective said unique estimated signal parameters” in claim 1 or “distinguishing information concurrently received from the transmitting nodes according to their corresponding estimated unique signal parameter” in claim 21. A key portion of this limitation—“according to their respective said unique estimated signal parameters”/“according to their corresponding estimated unique signal parameter”—was cited by the Examiner in the reasons for allowance. Yet, in analyzing this limitation, Petitioners, among other deficiencies, repeatedly and improperly combine separate embodiments of the prior art without providing a basis for doing so.

Finally, Petitioners additionally have failed to show that Baum discloses or renders obvious “requiring” each transmitting node to transmit a parameter-estimating signal on an unshared said parameter channel. In fact, the “requiring” aspect of the claims is never discussed by Petitioners for the Baum grounds.

For each of these reasons, institution should be denied.

**A. Petitioners Fail to Show that *Kim* Discloses or Renders Obvious Claims 1-3, 5-7, 13, 14, 16, and 21 (Ground 1A)**

The Petition fails to show that Kim discloses or renders obvious claims 1-3, 5-7, 13, 14, 16, and 21 of the '071 patent for at least two independent reasons: (1) Petitioners have not shown that Kim's channel estimation process estimates "at least one unique signal parameter for each of the transmitting nodes" (Elements [1.3] and [21.1]-[21.2]); and (2) Petitioners have not shown that Kim discloses or renders obvious "distinguishing the information simultaneously received from each of the transmitting nodes according to their respective said unique estimated signal parameters" (Elements [1.4] and [21.3]).

**1. Petitioners Fail to Show that *Kim* Discloses or Renders Obvious Estimating "at Least One Unique Signal Parameter for Each of the Transmitting Nodes" (Elements [1.3] and [21.1]-[21.2])<sup>2</sup>**

Petitioners have not shown that Kim's channel estimation process estimates "at least one unique signal parameter for each of the *transmitting nodes*" as required

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<sup>2</sup> Like claim 1, claim 21 also requires estimating at least one unique signal parameter for each of the transmitting nodes because claim 21 recites "estimating at least one unique signal parameter for each of the received plurality of parameter-estimating signals" (Element [21.2]), where the "plurality of parameter-estimating

by the Challenged Claims. Instead, Petitioners' evidence shows that the channel estimation process is performed for each *subcarrier*—as opposed to each transmitting node. Moreover, the Petition and Dr. Roy's declaration are devoid of any explanation on this issue. Pet. 17; Roy ¶¶72-75. Thus, Petitioners have failed to show that Kim discloses or renders obvious this element.

Element [1.3] recites “detecting the parameter-estimating signals on the unshared parameter channels and estimating therefrom at least one unique signal parameter for each of the transmitting nodes.” By its plain language, this element contains two steps: “detecting” and “estimating.” Although the detecting step is performed on “the unshared parameter channels” (which the Petition maps to Kim's pilot subcarriers), the estimating step must result in a unique signal parameter “for each of the transmitting nodes.” Similarly, the estimating step in claim 21 must result in a unique signal parameter “for each of the received plurality of parameter-estimating signals” [21.2], which are each “receiv[ed] ... from a corresponding transmitting node” [21.1]. The Petition for these elements points to Kim's disclosure of estimating “channel gains.” Pet. 17, 27-28. Specifically, Kim states that “[c]hannel estimator 1212 may derive channel gain estimates for the pilot subcarriers

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signals” are “*each ... from a corresponding transmitting node*” (Element [21.1]).

Thus, the same deficiency applies for claim 21.

based on the received pilot symbols.” Pet. 17 (quoting Kim, [0080]). According to Petitioners, “each channel gain estimate is ‘unique.’” Pet. 17.

The Petition fails to show that the alleged estimating step in Kim results in a unique signal parameter “for each of the transmitting nodes”/“for each of the ... parameter-estimating signals” “receiv[ed] ... from a corresponding transmitting node.” In the same evidence quoted by Petitioners for this element (Pet. 17, 27-28), Kim explains that channel estimation “derive[s] channel gain estimates *for the pilot subcarriers* based on the received pilot symbols” (Kim, [0080]). The Petition and Dr. Roy do not explain how calculating channel gain estimates for each pilot *subcarrier* would result in a unique estimate for each *transmitting node*. It would not. For example, Kim teaches transmitting *multiple* pilot signals simultaneously on the same subcarrier. Kim, [0033] (“Pilots may be transmitted simultaneously from one or more antennas on the same pilot subcarriers...”). Given that there are multiple pilot signals on the same subcarrier, but Kim teaches calculating only a single channel gain estimate for the subcarrier, Kim does not meet the claims’ requirement of calculating a unique channel gain estimate for each transmitting node. Thus, to the extent Petitioners are assuming a one-to-one correspondence between subcarriers and pilot signals, the Petition does not state this, and in fact Kim teaches the opposite. In view of Petitioners’ failure to address the “for each transmitting node” requirement in the claim, the Kim ground does not support institution. *See*

*Juniper Networks, Inc. v. Packet Intelligence LLC*, IPR2020-00335, Paper 19 at 21-22 (P.T.A.B. Aug. 27, 2020) (denying institution where “Petitioner fails to tether clearly [its] argument to the claim language”); *Micro-Tech (Nanjing) Co., Ltd. v. Boston Scientific Scimed, Inc.*, IPR2020-00185, Paper 11 at 32-33 (P.T.A.B. May 4, 2020) (determining that Petitioner has not shown a reasonable likelihood of prevailing for a claim limitation when the Petition “fails to address the pertinent claim language”).

Accordingly, Petitioners have not shown that Kim’s channel estimation process estimates “at least one unique signal parameter for each of the transmitting nodes” (claim 1) or estimates “at least one unique signal parameter for each of the received plurality of parameter-estimating signals” that are “receiv[ed] ... from a corresponding transmitting node” (claim 21).

**2. Petitioners Fail to Show that *Kim* Discloses or Renders Obvious Distinguishing Information Simultaneously Received From Each of the Transmitting Nodes According to Their Unique Estimated Signal Parameters (Elements [1.4] and [21.3])**

Petitioners have not shown that Kim discloses or renders obvious “distinguishing the information simultaneously received from each of the transmitting nodes according to their respective said unique estimated signal parameters” in claim 1 or “distinguishing information concurrently received from the transmitting nodes according to their corresponding estimated unique signal

parameter” in claim 21 because the disclosures cited by the Petition and Dr. Roy relate to either (1) REQCH transmissions that use a channel gain estimate for each cluster, not for each UE (*i.e.*, the channel gain estimates and the reliance on REQCH transmissions are inconsistent with Petitioners’ mappings for the previous claim elements), or (2) a demodulation step that Kim never discloses uses channel gain estimates (*i.e.*, the purported “unique estimated signal parameter”/“estimated unique signal parameter” is not used). Thus, Petitioners have failed to show that Kim discloses or renders obvious this element.

After discussing the claimed “detecting,” the Petition asserts that “Kim also discloses that the ‘channel gain estimate[s] may be ... used for coherent demodulation of the data subcarriers,’ *i.e.*, distinguishing the simultaneously received information.” Pet. 18, 28; *see also* Roy ¶78. Petitioners thus map coherent demodulation of the data subcarriers to the claimed “distinguishing” step. The Petition and Dr. Roy cite three disclosures in Kim to support their mapping of coherent demodulation of the data subcarriers to the claimed “distinguishing” step (Pet. 18 (citing Kim [0049], [0069], [0081]); Roy ¶78 (same)), but none of these three disclosures satisfies the claims.

As an initial matter, Kim contains separate disclosures relating to data transmissions on a request channel (REQCH) (*e.g.*, Kim, [0009]) and transmission of traffic data (*e.g.*, Kim, [0074] separately discussing traffic data and REQCH data).

The REQCH is used to transmit REQCH data and REQCH pilots, and Kim even discloses different data and pilot patterns for REQCH transmissions. *E.g.*, Kim, [0044]-[0048], Figs 5A to 5C. Moreover, the signaling processor in the Node B (base station) includes separate processors for REQCH data (RX REQCH processor 1240) and traffic data (RX data processor 1242). Kim, [0081], Fig. 12. This context, though ignored in the Petition, is important for understanding the three disclosures in Kim cited by Petitioners to support their mapping of demodulation of data subcarriers to the claimed “distinguishing” step.

First, Paragraphs [0049] and [0069] of Kim, which the Petition cites in support of the “distinguishing” step (Pet. 18, 28), pertain to REQCH transmissions rather than traffic transmissions, which is inconsistent with Petitioners’ mapping of Elements [1.0], [1.1], [1.2], and [1.3]. Paragraph [0049] addresses “data subcarriers to use for the **REQCH**” and Paragraph [0069] addresses “subcarriers for the signaling channel,” which is the **REQCH** (Kim, [0068]). But for Elements [1.0], [1.1], and [1.2] (and Elements [21.0], [21.1], and [21.]), the Petition relies upon the data and pilot structures for **traffic data** (Pet. 14 (citing Fig. 3A for Element [1.0]), 16 (citing Fig 3A for Element [1.1] and [1.2]), 27-28), not the data and pilot structures for the **REQCH** (Kim, [0044]-[0048], Figs 5A to 5C). In addition, Kim repeatedly explains that demodulation of data on the REQCH uses channel gain estimates for each **cluster**, not each **subcarrier**. For example, Kim discloses that

“[f]or the REQSCH, MIMO/SIMO detector 1220 may perform detection on the received data symbols in each cluster of subcarriers with *a channel gain estimate for that cluster*.” Kim, [0080]. This is different from Petitioners’ mapping of Element [1.3] (and Element [21.2]), where Petitioners relied upon “channel gain estimates *for the pilot subcarriers*” for the “unique signal parameter” term. Pet. 17, 27-28. Thus, the Petition’s claim mappings are “internally inconsistent,” and cannot meet Petitioners’ burden. *See Lego Systems, Inc. v. MQ Gaming LLC*, IPR2020-01446, Paper 14 at 13-14 (P.T.A.B. Feb. 16, 2021) (concluding that Petitioner has not established a reasonable likelihood of prevailing when Petitioner’s theory is “internally inconsistent” in identifying a claim element); *DISH Network LLC v. Broadband iTV, Inc.*, IPR2020-01268, Paper 15 at 21, 23-24 (P.T.A.B. Jan. 21, 2021) (concluding that Petitioner has not established a reasonable likelihood of prevailing where “Petitioner has not provided a consistent explanation as to how [the reference] teaches the two limitations”).

Second, Paragraph [0081] of Kim, which the Petition also cites in support of the “distinguishing” step (Pet. 18, 28), relates to a demodulation step that Kim never discloses uses channel gain estimates. Channel gain estimates are the information that Petitioners map to the “said unique estimated signal parameters” (claim 1) and “estimated unique signal parameter” (claim 21). Pet. 18, 28. Thus, to show that Element [1.4] is met, Petitioners must show “distinguishing the information

simultaneously received from each of the transmitting nodes according to their respective [channel gain estimates],” and to show that Element [21.3] is met, Petitioners must show “distinguishing information concurrently received from the transmitting nodes according to their corresponding [channel gain estimate].” They have not done so. Dr. Roy asserts that Kim discloses “[a]n RX data processor 1242 may demodulate and decode the data symbol estimates for traffic and provide decoded traffic data sink 1072.” Roy ¶78 (citing Kim, [0081]). But the only discussion of RX data processor 1242 in Kim never refers to channel gain estimates, and more particularly, does not state that the channel gain estimates from pilot-based channel estimator 1212 are used in the processing performed by RX data processor 1242. This is confirmed by Figure 12 of Kim, which shows that the outputs of pilot-based channel estimator 1212 are not fed to RX data processor 1242. Thus, Petitioners have not shown that Paragraph [0081] of Kim teaches or renders obvious distinguishing according to respective unique estimated signal parameters.

Accordingly, Petitioners have not shown that Kim discloses or renders obvious “distinguishing the information simultaneously received from each of the transmitting nodes according to their respective said unique estimated signal parameters” in claim 1 or “distinguishing information concurrently received from the transmitting nodes according to their corresponding estimated unique signal parameter” in claim 21.

**B. Petitioners Fail to Show that the *Tong* and *Jia* Grounds Disclose or Render Obvious Claims 1-7, 10, 13, 14, 16, and 21 (Grounds 2A, 2B, and 2C)**

The Petition fails to show that the Tong and Jia grounds disclose or render obvious claims 1-7, 10, 13, 14, 16, and 21 of the '071 patent for at least two independent reason: (1) Petitioners have not shown that Tong discloses or renders obvious detecting/receiving parameter-estimating signals on unshared parameter channels and estimating therefrom at least one unique signal parameter for each of the transmitting nodes (Elements [1.3] and [21.1]-[21.2]); and (2) Petitioners have not shown that Tong alone or in combination with Jia discloses or renders obvious distinguishing information simultaneously received from each of the transmitting nodes according to their respective said unique estimated signal parameters (Elements [1.4] and [21.3]).

**1. Petitioners Fail to Show that *Tong* Alone or in Combination With *Jia* Discloses or Renders Obvious Estimating at Least One Unique Signal Parameter for Each of the Transmitting Nodes (Elements [1.3] and [21.1]-[21.2])**

Petitioners have not shown that Tong—the only reference that Petitioners cite for this Element (Pet. 37-38)—discloses or renders obvious “detecting the parameter-estimating signals on the unshared parameter channels and estimating therefrom at least one unique signal parameter for each of the transmitting nodes” in

claim 1.<sup>3</sup> While Tong discloses “extract[ing] the pilot signals for each of the mobile terminals 16 to ... estimate the channel conditions for the MIMO channel” (Pet. 37 (quoting Tong, [0045]), 50), Petitioners have not shown that this disclosure teaches that the estimation process estimates unique signal parameters for each of the transmitting nodes. The Petition’s deficiencies are two-fold: (1) Petitioners are internally inconsistent as to their mapping of the “channel” limitations across claim elements for Tong, and (2) Petitioners’ expert attempts to fill in details regarding the operation of Tong’s channel estimation with citations to a textbook, but the textbook acknowledges that there are multiple ways to implement channel estimation—and Petitioners have made no attempt to show that a POSITA would have been motivated to use the particular claimed method.

First, Petitioners are internally inconsistent as to their mapping of the “channel” limitations for Tong, thus failing to meet the claim. For Element [1.3], which

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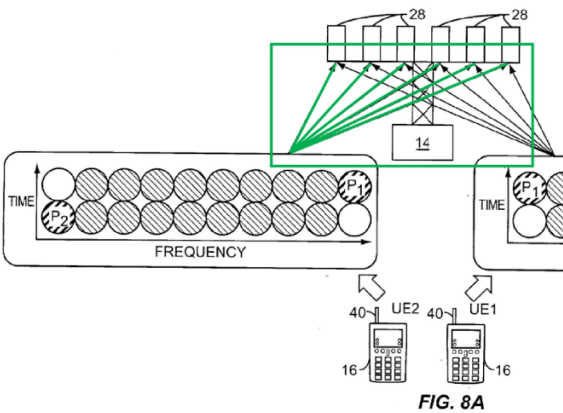
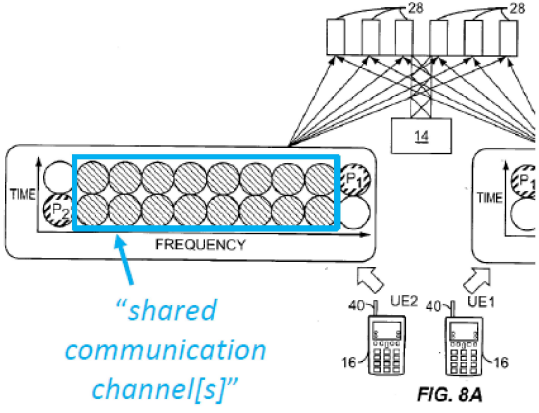
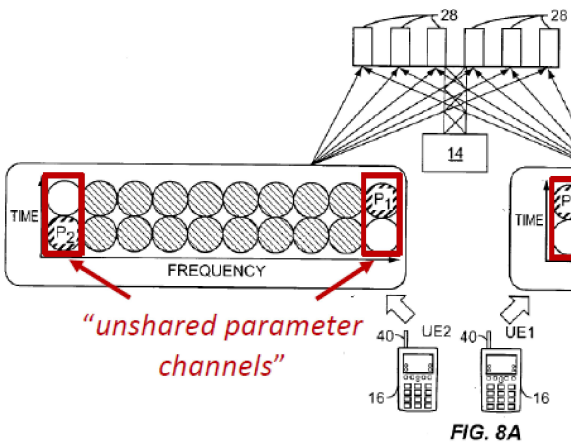
<sup>3</sup> Like claim 1, claim 21 also requires estimating at least one unique signal parameter for each of the transmitting nodes because claim 21 recites “estimating at least one unique signal parameter for each of the received plurality of parameter-estimating signals” (Element [21.2]), where the “plurality of parameter-estimating signals” are “*each ... from a corresponding transmitting node*” (Element [21.1]). Thus, the same deficiency applies for claim 21.

requires “detecting the parameter-estimating signals on the unshared parameter channels and estimating therefrom at least one unique signal parameter for each of the transmitting nodes,” the Petition relies on a disclosure from Tong that the base station “estimate[s] the channel conditions for the MIMO channel.” Pet. 37 (quoting Tong, [0045]).<sup>4</sup> Petitioners assert that “[t]he ‘MIMO channel’ refers to *the channels [plural] that exist between each mobile terminal’s antenna and each receiver antenna at a base station*,” i.e. “*six paths* from each UE antenna to six corresponding base station antennas.” Pet. 37. This usage is inconsistent with Petitioners’ earlier mappings for both the “shared communication channel” and “unshared said parameter channel,” which, in connection with Elements [1.1] and [1.2] (and Elements [21.0] and [21.1]), Petitioners mapped to *resources* in the sub-carrier block, *not* individual *paths* to the transmitting nodes. Specifically, Petitioners mapped “a ‘common sub-carrier block’ in OFDM” to the “shared communication channel” in the claims (Pet. 31), and mapped the “user-specific pilot

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<sup>4</sup> Similarly, for claim 21, which requires “estimating at least one unique signal parameter for each of the received plurality of parameter-estimating signals” (Element [21.2]), Petitioners refer back to their discussion of Element [1.3]. Pet. 50.

subcarriers” to the “unshared said parameter channel” in the claims (Pet. 35). *See also* Pet. 49-50. The table below shows Petitioners’ mappings for these elements:

| Petition’s Discussion of Element [1.3]                                                                                                                                                                                                                                                                                                                                                                  | Petition’s Discussion of Elements [1.1] (“shared communication channel”) and Element [1.2] (“unshared ... parameter channel”)                                                                                                                                                                                                                                                                        |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>“The ‘MIMO channel’ refers to <i>the channels that exist between each mobile terminal’s antenna and each receiver antenna at a base station,</i>” i.e. “<i>six paths</i> from each UE antenna to six corresponding base station antennas.” Pet. 37.</p>  <p>FIG. 8A</p> <p>Fig. 8A (annotated by Patent Owner)</p> | <p>“a ‘<i>common sub-carrier block</i>’ in OFDM (‘shared communication channel’)” Pet. 31.</p>  <p>FIG. 8A</p> <p>“‘<i>user-specific</i>’ pilot subcarriers (‘unshared said parameter channel’)” Pet. 35.</p>  <p>FIG. 8A</p> |

Thus, the Petition is internally inconsistent with its mapping of the claimed “channels” (switching between portions of Tong’s sub-carrier block and individual paths from the UE to different antennas), which fails to meet the claims. In light of this “internally inconsistent” mapping, institution should be denied. *See Lego Systems*, IPR2020-01446, Paper 14 at 13-14; *DISH Network LLC*, IPR2020-01268, Paper 15 at 21, 23-24.

Second, apart from the inconsistent mapping to the “channel” limitations, Petitioners’ expert attempts to fill in the details regarding how Tong’s channel estimation process would work without showing that a POSITA would have been motivated to use the particular claimed method. Tong itself never states that its channel estimation process estimates “at least one unique signal parameter for each of the transmitting nodes.” The Petition instead relies on Dr. Roy for the assertions that the process yields six channel coefficients per OFDM subcarrier, that the coefficients are represented using amplitude and phase, and that each channel estimate is unique. Pet. 37-38 (citing Roy ¶¶148-151). According to Dr. Roy, channel estimation in the context of OFDM was well understood and a POSITA would have known how to perform estimation of the complex channel coefficient. Roy ¶150. Dr. Roy cites an OFDM textbook (Van Nee) and other patents (Zhu; Ex. 1016) to support his assertion. But even assuming, *arguendo*, that the details of channel estimation described in those references would meet this claim element, Dr.

Roy does not explain why a POSITA would have been motivated to use that particular method of channel estimation in implementing the channel estimation of Tong (which again, is silent regarding whether it estimates at least one unique signal parameter for each of the transmitting nodes). Indeed, the cited portion of the OFDM textbook merely describes “[o]ne way to do” channel estimation. Van Nee, 96. Thus, at most, Petitioners “merely support[] a finding [of] one way to achieve” the desired result,” and were therefore required to “explain why a person having ordinary skill in the art would have been motivated to modify” the reference to use that particular way. *See One World Techs., Inc. v. Chervon (HK) Limited*, IPR2020-00883, Paper 20 at 20-21 (P.T.A.B. Nov. 6, 2020). Because Petitioners have “fail[ed] to explain why a person having ordinary skill in the art would have been motivated to modify” the reference in that way, they cannot prevail on this ground. *Id.*

Accordingly, Petitioners have not shown that Tong discloses or renders obvious “detecting the parameter-estimating signals on the unshared parameter channels and estimating therefrom at least one unique signal parameter for each of the transmitting nodes” (claim 1) or “estimating at least one unique signal parameter for each of the received plurality of parameter-estimating signals” that are “receiv[ed] ... from a corresponding transmitting node” (claim 21).

**2. Petitioners Fail to Show that *Tong* Alone or in Combination With *Jia* Discloses or Renders Obvious “Distinguishing” in a Multi-UE System (Elements [1.4] and [21.3])**

Petitioners have not shown that *Tong* alone or in combination with *Jia* discloses or renders obvious the “distinguishing” element in claims 1 and 21 because the cited decoding disclosures in *Tong* and *Jia* are from embodiments that use two antennas on the same mobile terminal 16 (the single-UE embodiments), and Petitioners have identified no teaching of whether or how such decoding could be adapted for the multi-UE “virtual MIMO environment” (the multiple-UE embodiment) that Petitioners map to the Challenged Claims.

The “distinguishing” step in claims 1 and 21 requires recovering or demodulating the information simultaneously received from the transmitting nodes. Element [1.4] recites “detecting and distinguishing the information simultaneously *received from each of the transmitting nodes* according to their respective said unique estimated signal parameters.”<sup>5</sup> As the ’071 patent specification explains, “distinguishing” involves recovering or demodulating the transmitting signals. ’071,

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<sup>5</sup> Similarly, Element [21.3] in claim 21 recites “distinguishing information concurrently *received from the transmitting nodes* according to their corresponding estimated unique signal parameter.”

3:26-28 (“Fundamentally, MUD technology distinguishes, or ‘demodulates,’ overlapping digital signals...”).

For its analysis based on Tong alone, Petitioners rely on a disclosure of diversity decoder 88 as evidence of “detecting and distinguishing” the simultaneously received information (Pet. 38-39 (citing Tong, [0037]), 51), but by Petitioners’ admission, this disclosure is presented for a mobile terminal with multiple antennas (Pet. 39)—*i.e.*, the single-UE embodiment. As also discussed in §VI.B, the single-UE embodiment does not distinguish information from multiple transmitting nodes because signals are transmitting from just a single UE. Tong, Fig. 6, [0037] (describing decoding of symbols from “the mobile terminal 16”).

Petitioners argue that “the description was understood to apply to a ‘virtual MIMO environment’ involving simultaneous transmissions from multiple mobile terminals that have only a single antenna” (Pet. 39, 51), but the cited evidence does not support this assertion. The Petition and Dr. Roy merely cite a general statement in Tong that the “present invention provides a way for mobile terminals 16 with a single transmission path to cooperate with one another under the control of the base station 14 to provide a virtual MIMO environment.” Roy ¶153 (citing Tong, [0042]); Pet. 39 (same). But this statement is entirely about the “present invention” in Tong, which uses mobile terminals “with a single transmission path” (Tong, [0042]), and is not referring to the single-UE embodiment using multiple antennas that is

described in Figure 6 as “prior art” to Tong. The statement also does not refer to decoding, or provide any indication that any “prior art” single-UE disclosures are applicable to Tong’s multiple-UE embodiment. Tellingly, Dr. Roy does not even attempt to explain how the statement supports his conclusion. Petitioners’ application of Tong’s single-UE decoding disclosure to its virtual MIMO environment is based on nothing more than impermissible hindsight. Just as in *Hewlett Packard Enterprise Co. v. Intellectual Ventures II LLC*, “but for hindsight, neither Petitioner nor its expert explains sufficiently, let alone with particularity, why the skilled artisan would have considered combining such distinct embodiments as claimed or had an expectation of success in doing so.” IPR2022-00115, Paper 9 at 16 (P.T.A.B. March 29, 2022) (citing *InTouch Techs., Inc. v. VGO Commc’ns, Inc.*, 751 F.3d 1327, 1351 (Fed. Cir. 2014)).

The combination of Tong and Jia suffers from the same deficiency with respect to the “detecting and distinguishing” step in the Challenged Claims. To support this limitation, Petitioners argue that it would have been obvious to implement the diversity decoder 88 of Tong “using the specific receiver techniques described in Jia” such as “zero-forcing, MMSSE, or MLD decoding techniques.” Pet. 43, 51. Jia in its entirety is directed to single-UE detection, however, and thus does not cure the deficiencies of Tong’s single-UE decoder. Specifically, Jia is directed to regular MIMO for receiving signals from a mobile terminal with multiple

antennas, not multi-user MIMO for receiving signals from multiple UEs. *See* Jia, [0003] (referring to MIMO systems with multiple transmit and receive antennas), [0035] (describing a mobile terminal with “multiple antennas”), [0049] (describing “the overall functionality of the present invention” with reference to “the transmitter” and “the receiver”). Neither the Petition nor Dr. Roy contends that Jia relates to multi-user MIMO or multiple-UE detection. Importantly, Petitioners provide no analysis or teaching of whether or how Jia’s single-UE decoding techniques could be adapted for a multi-user MIMO system to decode signals simultaneously transmitted by multiple users on a shared communication channel.

Accordingly, Petitioners have not shown that Tong discloses or renders obvious the “distinguishing” limitations in claims 1 and 21.

**C. Petitioners Fail to Show that *Baum* Discloses or Renders Obvious Claims 1, 4, and 8-10 (Ground 3A)**

The Petition fails to show that Baum discloses or renders obvious claims 1, 4, and 8-10 of the ’071 patent for at least three independent reason: (1) Petitioners have not shown that Baum discloses or renders obvious “requiring” each transmitting node to transmit a parameter-estimating signal on an unshared parameter channel (Element [1.2]); (2) Petitioners have not shown that the measurements of propagation delay and subcarrier phase difference (the alleged unique signal parameters) in Baum are performed “for each of the transmitting nodes” (Element [1.3]); and (3) Petitioners have not shown that Baum teaches recovering or

demodulating the individual signal components of the “joint desired signal,” and thus have not shown that Baum teaches “detecting and distinguishing the information simultaneously received from each of the transmitting nodes” (Element [1.4]).

**1. Petitioners Fail to Show that *Baum* Discloses or Renders Obvious “Requiring” Each Transmitting Node to Transmit the Alleged Parameter-Estimating Signal (Element [1.2])**

Petitioners have not shown that Baum discloses or renders obvious “requiring” each transmitting node to transmit a parameter-estimating signal on an unshared parameter channel. Indeed, neither the Petition nor Dr. Roy even attempts to address the “requiring” aspect of this claim element. That is because the “synchronization signal” that Petitioners rely upon in Baum is not required to be transmitted.

Despite the “requiring” term in the claim, Petitioners never address it. Element [1.2] recites “***requiring*** each transmitting node to transmit a parameter-estimating signal on an unshared said parameter channel.” Yet in the nearly two pages of analysis of Element [1.2] in the Petition (Pet. 73-74), the “requiring” term is never mentioned or analyzed, not even in a conclusory fashion. Likewise, Dr. Roy does not analyze the “requiring” term. Roy ¶¶264-270.

In Baum, there is no “requiring” that each transmitting node transmit a parameter-estimating signal on an unshared parameter channel. Petitioners rely upon a synchronization signal as the alleged parameter-estimating signal on an

unshared parameter channel. Pet. 74 (quoting Baum, 24:39-50). However, the cited portion of Baum states:

The SC-OFDM transmitter *may, where selected*, transmit *at least one of: synchronization signals and identification signals. At least one of: the synchronization signals and the identification signals* may typically be one of: A) non-interfering with a synchronization/identification signal from another SC-OFDM transmitter; and B) separable from a synchronization/identification signal from another SC-OFDM transmitter. *Where selected*, the SC-OFDM transmitter *may* transmit *at least one of the synchronization signal and the identification signal* at a different time/frequency/code than the synchronization/identification signal transmitted by the other SC-OFDM transmitter.

Baum, 24:39-50. As Baum describes, the SC-OFDM transmitter that Petitioners rely upon need only transmit “*at least one of* the synchronization signal and the identification signal” at a different time and frequency as the signal transmitted by the other transmitter. Thus, there is no “requiring” each transmitting node to transmit the synchronization signal on the alleged unshared parameter channel. The SC-OFDM transmitter can transmit an identification signal instead. Moreover, the disclosures are filled with permissive wording such as “may” and “where selected” that is inconsistent with the “requiring” element of the claim.

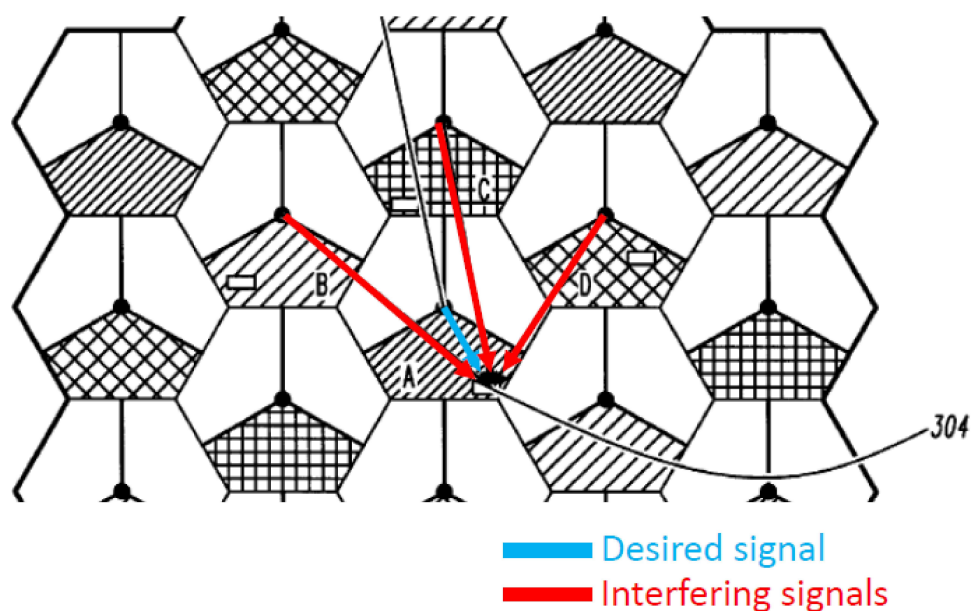
Accordingly, Petitioners have not shown that Baum discloses or renders obvious “requiring” each transmitting node to transmit a parameter-estimating signal on an unshared parameter channel.

**2. Petitioners Fail to Show that *Baum* Discloses or Renders Obvious Estimating a Unique Signal Parameter for Baum’s “Desired Signal,” and Thus “for Each of the Transmitting Nodes” (Element [1.3])**

Petitioners have not shown that the measurements of propagation delay and subcarrier phase difference (the alleged unique signal parameters) in Baum are performed “for each of the transmitting nodes.” While the measurements are performed for the so-called “interfering signals,” Petitioners identify no evidence that the measurements are performed for the “desired signal”—*i.e.*, the signal transmitted from one of the transmitting nodes that Petitioners mapped to the plurality of transmitting nodes in Element [1.0]. Pet. 67-68. Thus, Petitioners have failed to show that Baum discloses or renders obvious this element.

The Challenged Claims require estimating unique signal parameters “for each of the transmitting nodes.” Specifically, Element [1.3] requires “detecting the parameter-estimating signals on the unshared parameter channels and estimating therefrom at least one unique signal parameter for each of the transmitting nodes.” “[E]ach of the transmitting nodes” also appears in Element [1.2], and is first introduced in Element [1.0] as a “plurality of transmitting nodes.”

In Petitioners' mapping of Baum to the Challenged Claims, the "plurality of transmitting nodes" includes the nodes that transmit "interfering signals" *and* the node that transmits the "desired signal." Pet. 68. For example, the Petition explains that the four base units in sectors A, B, C, and D are the "plurality of transmitting nodes" (Pet. 67), where the base unit in sector A transmits a "desired signal":



Pet. 68 (annotating Baum, Fig. 3). Indeed, the device that transmits the "desired signal" must be included as one of the "plurality of transmitting nodes" because Petitioners map the desired signal to "detecting and distinguishing the information simultaneously received from each of the transmitting nodes..." in Element [1.4]. Pet. 75.

Petitioners rely on measurements of propagation delay and subcarrier phase difference information as the alleged estimation of at least one unique signal

parameter for each of the transmitting nodes (Pet. 74-75), but those measurements are performed for only the *interfering signals* (transmitted by the base units in sectors B, C, and D), not the *desired signal* (transmitted by the base unit in sector A) as demonstrated by the Baum passage that Petitioners cite:

As a result of this scheme, a subscriber unit is able to measure the synchronization signal from the base unit in its own cell without the detrimental effects of strong co-channel interference. In addition, the subscriber unit is able to measure/monitor the synchronization signal from the dominant co-channel interfering sectors of the surrounding cells. This capability enables the subscriber unit to *measure the relative propagation delay of the interfering signals*, which directly affects the amount of *phase change per subcarrier on the interfering signals* after demodulation. The *subcarrier phase difference information for an interfering signal* can be accounted for in the detection algorithms in the receiver, as will be described later.

Baum, 9:24-36. Tellingly, Petitioners do not quote the passage they cite, and instead purport to paraphrase its disclosure with a vague, misleading reference to “various signals.” Pet. 74. Nowhere do Petitioners identify measuring a different, unique propagation delay or phase difference for the “desired signal.”

Accordingly, Petitioners have not shown that Baum discloses or renders obvious estimating unique signal parameters “for each of the transmitting nodes.”

**3. Petitioners Fail to Show that *Baum* Discloses or Renders Obvious Detecting and Distinguishing Information Simultaneously Received From Each of the Transmitting Nodes (Element [1.4])**

Petitioners rely on Baum’s so-called “joint detection” embodiment in which co-channel interfering signal components are treated as “joint desired signals” (Pet. 75), but Petitioners have not shown for this embodiment that Baum teaches “detecting and distinguishing the information simultaneously received *from each of the transmitting nodes* according to their respective said unique estimated signal parameters” as required by Element [1.4], and have made no attempt to show that combining the teachings of various different embodiments is disclosed or obvious.

First, the Petition combines multiple embodiments from Baum, but without any explanation of why the teachings relating to the *non-joint detection* embodiment would apply to the *joint detection* embodiment so as to teach distinguishing the individual signal components of the “joint desired signal.” The Petition cites the “joint detection” embodiment for multiple elements of the claim, including Element [1.4]. Pet. 68, 69, 75. However, none of the evidence cited by Petitioners for the alleged detecting and distinguishing process (Pet. 75-76 (citing Baum, 9:11-36, 19:50-62, 21:3-21, 20:10-14)) is part of the “joint detection” embodiment of Baum

(Baum, 18:1-61).<sup>6</sup> Baum never teaches that the alleged detecting and distinguishing disclosures cited by Petitioners, such as the equation for generation of interpolation filtering coefficients cited in the Petition at 36 (citing Baum, 20:10-14), are applicable to the joint detection embodiment. Moreover, Petitioners have failed to present any basis for applying the teachings of one embodiment in Baum to the other.

Second, even if this showing had been attempted by Petitioners, applying the teachings of the non-joint detection mechanism to the joint detection embodiment would not have worked because the Petition does not show that the cited non-joint detection process distinguishes the individual signal components of the “joint desired signal.” As Baum states, the sum of the interfering signals are treated as “a new desired signal called the joint desired signal” in the detection process (Baum, 18:15-17), which teaches treating the individual signals as one joint signal instead of distinguishing them. The disclosures cited by Petitioners (Pet. 75-76), which pertain to the non-joint detection embodiment, do not explain how to detect and

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<sup>6</sup> With respect to the joint detection embodiment (Baum, 18:1-61), the Petition for Element [1.4] merely cites evidence that “co-channel interfering signal components can be treated as joint desired signals in the detection process.” Pet. 75 (quoting Baum, 18:1-15). The joint detection embodiment is not cited to show “distinguishing” the information in that combined signal.

distinguish the information when everything is combined as a single joint signal. Some additional process specific to joint detection would be needed to distinguish each component of the joint desired signal in Baum, but the Petition does not identify any such process in Baum—nor does Baum disclose one. Finally, the Petition does not attempt to show whether it would have been obvious to somehow modify the teachings of the non-joint detection mechanism to apply to the joint detection embodiment.

Thus, Petitioners have not shown that Baum teaches discloses or renders obvious detecting and distinguishing the information simultaneously received from each of the transmitting nodes.

#### **VIII. THE BOARD SHOULD EXERCISE ITS DISCRETION UNDER SECTION 314(A) TO DENY INSTITUTION**

It is rare that the Board would move forward with institution in view of imminent trial in the parallel district court cases that is scheduled *prior to the institution deadline*, particularly in light of the above deficiencies. This is especially the case where, as here, Petitioners have not provided a stipulation as to the grounds they could have raised in the petition. The Board should exercise its discretion under §314(a), denying institution in view of the January 6, 2023, trial date in the parallel district court litigations—nearly a month prior to the institution deadline and more than a year before any final written decision would issue. Each of the *Fintiv* factors supports discretionary denial.

**A. Factor 1: The Court Will Not Stay the Co-Pending Litigations When Trial Is Scheduled Prior to the Institution Deadline**

Factor 1 favors discretionary denial. The district court will not stay the cases when trial is scheduled prior to the deadline for the Board’s institution decision. *See* Ex. 2002, 2. Petitioners do not even assert that they will file a motion to stay (Pet. 84), and any such motion would be irrelevant because the institution deadline will be *after* the January 6, 2023, trial date.

Even if an IPR is instituted, and in the unlikely event that trial has not yet occurred as scheduled, Judge Gilstrap routinely denies motions to stay pending IPRs when, as here, a party files an opposed motion for such relief during an advanced stage of litigation. *See, e.g., Solas OLED Ltd. v. Samsung Display Co.*, No. 19-cv-00152-JRG, slip op. at 5 (E.D. Tex. July 17, 2020), ECF No. 133 (Ex. 2003) (denying motion for stay after institution of all asserted patents “due to the extremely advanced stage of this case” because the court issued a claim construction order and fact and expert discovery had closed); *Oyster Optics, LLC v. Infinera Corp.*, No. 2:19-CV-00257-JRG, slip op. at 5 (E.D. Tex. July 17, 2020), ECF No. 87 (Ex. 2004) (“While fact discovery is almost but not yet completed, the case is clearly at an advanced stage. ... [T]he [c]ourt finds that the late stage of this case weighs against granting a stay.”).

Petitioners also neglect to mention that they have challenged fewer than all of the asserted patents in the co-pending litigations. Judge Gilstrap has repeatedly

denied motions to stay in similar circumstances. *See, e.g., Uniloc USA, Inc. v. Motorola Mobility LLC*, No. 16-cv-992-JRG, slip op. at 3 (E.D. Tex. Apr. 5, 2017), ECF No. 125 (Ex. 2005) (finding it “especially” “not warranted” to stay the case “given that the pending IPR petitions do not challenge every patent asserted in this case”). For example, U.S. Patent No. 7,724,851 has been asserted against Petitioners in the co-pending litigations, but has not been challenged in an IPR. *See* Ex. 2006, 1; Ex. 2007, 1.

**B. Factor 2: The District Court’s Trial Date Is More Than a Year Before the Expected Date of Any Final Written Decision**

Factor 2 favors discretionary denial because the trial date of January 6, 2023 is more than a year before the expected date of any final written decision, which strongly weighs “in favor of exercising authority to deny institution under *NHK*.” *Apple Inc. v. Fintiv, Inc.*, IPR2020-00019, Pap. 11 at 9 (P.T.A.B. Mar. 20, 2020); *Cisco Sys., Inc. v. Ramot at Tel Aviv Univ. Ltd.*, IPR2020-00484, Pap. 10 at 7-8 (P.T.A.B. Oct. 29, 2020).

While Petitioners contend that there are six other cases proposed for trial during the same week, the most recent calendar shows that two of those cases are no longer scheduled for that week. *See* Ex. 2008. Moreover, the median time to trial in EDTX before Judge Gilstrap is 633 days. *See* Ex. 2009, 1. Thus, even under that rubric, trial would take place by May 2023 (complaints filed on August 10, 2021 (Nokia) and August 27, 2001 (Ericsson)), which further confirms that trial will take

place more than seven months before any final written decision. Even using Petitioners' suggested trial date estimate of August 2023 (Pet. 84-85), trial will take place more than four months before any final written decision.

**C. Factor 3: Significant Investment in the Parallel Proceeding Has Occurred and Will Occur Before Institution**

Factor 3 strongly favors discretionary denial in view of the significant investment in the parallel proceeding by the parties and the court that has already occurred and will occur by the deadline for institution.

As of the expected date of the Board's institution decision on January 26, 2023, the January 6 trial date will have passed; all substantive motions (including dispositive motions, *Daubert* motions, and motions *in limine*) have been filed (October 14 or 17, 2022 for dispositive motions and *Daubert*) or will have been filed (November 9, 2022 for motions *in limine*); pre-trial disclosures were served on October 19, 2022; and expert discovery has already concluded (October 13, 2022). *See* Ex. 2002, 1-4. The magistrate judge issued a *Markman* Order on August 31, 2022. Ex. 2001. Thus, the present cases are significantly advanced.

The present cases are even more advanced than in *NHK*, where the Board exercised its §314(a) discretion when expert discovery was scheduled to close in less than two months and a jury trial was scheduled to begin in six months. *NHK Spring Co. v. Intri-Plex Techs., Inc.*, IPR2018-00752, Pap. 8 at 20 (P.T.A.B. Sept. 12, 2018); *see also Cisco*, IPR2020-00484, Pap. 10 at 8-9 (finding investment in parallel

litigation weighs in favor of discretionary denial where expert discovery was closing soon after the Board’s institution decision and trial was scheduled to begin in less than four months); *Apple Inc. v. Fintiv, Inc.*, IPR2020-00019, Pap. 15 at 13-14 (P.T.A.B. May 13, 2020) (determining that, even though “further effort remains to be expended in this [co-pending district court] case before trial,” this factor weighs somewhat in favor of discretionary denial). The advanced stage of the co-pending litigations will lead to proceedings in two fora addressing common issues, weighing against the cost-saving alternative envisioned by Congress for IPRs.

Petitioners’ suggestion that they “promptly” filed this Petition almost nine months after receiving Patent Owner’s infringement contentions on November 4, 2021, is disingenuous. Pet. 85. First, Petitioners neglect to mention that they were put on notice of Patent Owner’s infringement allegations for the ’071 patent much earlier—by at least August 10, 2021 (Nokia) and August 27, 2001 (Ericsson) when the Complaints were filed. *See* Ex. 2006, 34-36; Ex. 2007, 33-35. Second, Petitioners also neglect to mention that this Petition was filed more than six months *after* Petitioners served their invalidity contentions on January 13, 2022, which asserted the *same* *Baum* reference. *See* Ex. 2010, 12.

**D. Factor 4: Petitioners Have Not Offered a *Sotera* Stipulation**

Factor 4 favors denial because Petitioners have not offered to withdraw *all* grounds that it reasonably could have raised—i.e., the full scope of estoppel if this

IPR proceeds to final written decision. §315(e)(2); *Sand Revolution*, IPR2019-01393, Pap. 24 at 12 n.5. Anything less than a *Sotera* stipulation, where “a petitioner stipulates not to pursue in a parallel district court proceeding the same grounds as in the petition ***or any grounds that could have reasonably been raised in the petition,***” would not “mitigate[] concerns of potentially conflicting decisions and duplicative efforts between the district court and the PTAB.” See Memorandum from USPTO on Interim Procedure for Discretionary Denials in AIA Post-Grant Proceedings with Parallel District Court Litigation 7-8 (June 21, 2022) (“Interim Procedure”) (*citing Sotera Wireless, Inc. v. Masimo Corp.*, IPR2020-01019, Pap. 12 at 18-19 (P.T.A.B. Dec. 1, 2020) (precedential)).

Thus, the Board should exercise its discretion to deny institution here where Petitioners have not proposed a stipulation as to any ground that reasonably could have been raised. See, e.g., *Google LLC v. Ikorongo Tech. LLC*, IPR2021-00205, Pap. 13 at 7-13 (P.T.A.B. June 7, 2021) (rejecting stipulation and denying institution where petitioner had not presently entered a stipulation in the district court, and the stipulation did not cover *all potential* grounds that reasonably could have been raised, only those grounds cited in the petition); *Samsung Elecs. Co. v. Ancora Techs., Inc.*, IPR2020-01184, Pap. 11 at 18-22, 27-28 (P.T.A.B. Jan. 5, 2021) (rejecting stipulation and denying institution where petitioner’s stipulation did not cover *all potential* grounds that reasonably could have been raised); cf. *Sotera Wireless*, Pap.

12 at 18-19 (finding stipulation sufficient where petitioner stipulated that it “[would] not pursue in [district court] the specific grounds [in] the instituted *inter parties* [sic] review petition, *or on any other ground...that was raised or could have been reasonably raised in an IPR*”) (emphasis in original).

**E. Factor 5: Petitioners and the Defendants in the Parallel Proceedings Are the Same Parties**

Factor 5 favors denial of institution because “petitioner[s] and the defendant[s] in the parallel proceeding are the same.” *Cisco*, IPR2020-00484, Pap. 10 at 10 (*citing Fintiv*, Pap. 15 at 15); Pet. 85; Ex. 2006, 1; Ex. 2007, 1.

**F. Factor 6: Petitioners’ Proposed Grounds Have Significant Defects and Petitioners Waited Nearly a Year to File**

Factor 6 favors denial of institution in view of the defects in Petitioners’ proposed obviousness grounds and Petitioners’ significant delay before filing the Petition.

For the reasons discussed above (§VII), Petitioners have not established a reasonable likelihood that they would prevail with respect to at least one of the Challenged Claims, let alone “a compelling unpatentability challenge” to avoid discretionary denial. §314; *Fintiv*, Pap. 11 at 14-15; *Cisco*, IPR2020-00484, Pap. 10 at 10-11; Interim Procedure, at 4-5 (“Where information presented at the institution stage is merely sufficient to meet the statutory institution threshold, the PTAB has the authority ... to exercise discretion to deny institution in view of the other *Fintiv*

factors.”). The Board has denied institution under §314(a) where, as here, Patent Owner raises an “argument [that] appears credible” that the alleged prior art did not disclose a limitation of the challenged claims. *Kranos Corp. v. Apalone, Inc.*, IPR2020-00501, Pap. 13 at 14 (P.T.A.B. July 16, 2020). As further discussed in §VII, Petitioners’ arguments completely fail to address key limitations of the claims and Patent Owner’s arguments compel a denial of institution.

Furthermore, as noted above, Patent Owner notified Petitioners of infringement no later than August 10, 2021 (Nokia) and August 27, 2001 (Ericsson) when complaints asserting infringement of the ’071 patent were filed. *See* Ex. 2006, 38-41; Ex. 2007, 44-47. Petitioners thus waited *nearly a year* from the time it received notice of its infringement before filing this Petition. Petitioners’ suggestion that it filed “promptly” (Pet. 85) is belied by Petitioners’ significant delay after receiving notices of infringement, which further supports discretionary denial.

## **IX. CONCLUSION**

For the above reasons, institution should be denied.

Dated: October 26, 2022

Respectfully submitted,

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**CERTIFICATE OF WORD COUNT**

The undersigned certifies that the foregoing PATENT OWNER'S PRELIMINARY RESPONSE UNDER 37 C.F.R. § 42.107 complies with the type-volume limitation in 37 C.F.R. § 42.24(c)(1). According to the word-processing system's word count, the brief contains 9,957 words, excluding the parts of the brief exempted by 37 C.F.R. § 42.24(c).

Dated: October 26, 2022

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**CERTIFICATE OF SERVICE**

The undersigned certifies that the foregoing PATENT OWNER'S PRELIMINARY RESPONSE UNDER 37 C.F.R. § 42.107 was served in its entirety by filing through the Patent Trial and Appeal Case Tracking System (PTACTS), as well as providing a courtesy copy via e-mail to the following attorneys of record for Petitioners listed below:

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