

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

MEDIATEK INC. and
MEDIATEK USA, INC.,

Petitioners,

v.

NIPPON TELEGRAPH AND TELEPHONE CORPORATION,
Patent Owner.

Case IPR2020-01404
Patent 7,280,551

**DECLARATION OF JAMES T. GEIER IN SUPPORT OF
PATENT OWNER'S RESPONSE TO
PETITION FOR *INTER PARTES* REVIEW
OF U.S. PATENT NO. 7,280,551**

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I. INTRODUCTION

1. My name is James T. Geier. I have been retained by Nippon Telegraph and Telephone Corporation, which I may refer to as either the “Patent Owner” or “NTT,” for this *inter partes* review proceeding, which I may refer to as an “IPR.” I understand that this IPR proceeding involves U.S. Patent No. 7,280,551, which I may refer to as “the ’551 patent” for shorthand. I understand that the claims challenged in this IPR are Claims 1-8 of the ’551 patent.

2. I understand that the ’551 patent is assigned to NTT.

3. I understand that in this proceeding MediaTek Inc. and MediaTek USA, Inc., which I may also refer to collectively as the “Petitioner” or “MediaTek,” filed a Petition for review of Claims 1-8 of the ’551 patent.

4. I understand that the above claims are challenged on the following four grounds:

Claims Challenged	Basis	References
Claims 1, 3, 5, 7	Obviousness	Ground 1: Shpak, Ho
Claims 1, 3-5, 7-8	Obviousness	Ground 2: Shpak, Lundby
Claims 1-3, 5-7	Obviousness	Ground 3: Bugeja, Ho
Claims 4 and 8	Obviousness	Ground 4: Shpak-Ho-Thielecke, Bugeja-Ho-Thielecke

5. I have been asked to provide my objective, independent analysis of the '551 patent in view of the asserted prior art references cited in the Petition and to provide my opinion regarding the allegations in the Petition, as well as the supporting opinions of Dr. Tim A. Williams.

6. I am not currently, nor have I ever been, an employee of NTT. I received no compensation for this declaration beyond my normal hourly compensation based on my time actually spent analyzing the '551 patent, the asserted prior art references cited herein and in the Petition, and any related issues. I will not receive any added compensation based on the outcome of this IPR, any other IPR, or any other proceeding involving the '551 patent.

II. QUALIFICATIONS

7. My general qualifications can be found in my curriculum vitae attached as Appendix A. It includes my educational and professional background, published books, articles, publications, public lectures and conference proceedings. A section details my assignments testifying at depositions and trial as an expert witness.

8. I am a practicing engineer and have 40 years of experience in the field of communications systems analyzing, designing, and implementing wired and wireless networks, mobile devices, databases, and software.

9. I received a B.S. in Electrical Engineering (BSEE) from California State University in 1985, a M.S. in Electrical Engineering (MSEE) from the Air Force Institute of Technology in 1990, and an M.B.A. from the University of Phoenix in 2001. The focus of my studies when obtaining my MSEE was on communications systems.

10. From 1978 to 1983, I was a radar technician in the U.S. Air Force responsible for installing and testing automatic tracking radar systems. Part of my responsibilities included factory testing the first computerized automatic tracking radar system and providing feedback on how to re-design the system to better meet operational needs.

11. From 1986 to 1989, I was a communications test engineer, with the rank of Lieutenant in the U.S. Air Force, where I tested and evaluated data networks used by U.S. Department of Defense organizations worldwide. The majority of the network I tested supported secret voice and data communications and included interaction with operational support centers. Based on the results of my testing, I provided recommendations on how to refine and further develop the systems. As part of my work during this period of time, I developed and instructed a six-week training course on how to perform data network testing, which was used for training test engineers throughout all branches of the militaries.

12. From 1990 to 1992, I was a systems design engineer, with the rank of Captain in the U.S. Air Force, where I designed and implemented IEEE 802.3 (Ethernet) local area networks (LANs) at Wright-Patterson Air Force Base. This involved designing and overseeing the installation of corresponding networks throughout Wright-Patterson Air Force Base for supporting thousands of users. It also involved interconnecting / integrating the Ethernet networks with a base-wide wide area network (WAN) and communications links to other bases. During this timeframe, I also tested the first wireless LANs being sought for use on military bases.

13. From 1992 to 1994, I was a senior systems engineer at Adroit Systems, Inc., where I researched and analyzed emerging wireless network technologies as part of the Department of Defense Airborne Reconnaissance Data Link Architecture (ARDA) study, supporting communications for airborne systems. I also designed a software tool that aids network engineers in planning, upgrading and maintaining shipboard computer networks - based on a Small Business Innovative Research (SBIR) government grant obtained from the U.S. Navy.

14. From 1994 to 1996, I was employed as a senior systems engineer at TASC, Inc., where I worked primarily on the design and implementation of wireless communication systems for civilian and military applications. For

example, I designed a highly secure communications system for a U.S. Navy attack submarine. In addition, while at TASC, I designed computer networks for various organizations, such as Dayton Power and Light, and developed centralized databases, such as a training database used by the U.S. Department of Defense and a wireless parts tracking and inventory database/system for car dealerships.

15. From 1996 to 2000, I was an engineer and manager at Monarch Marking Systems, where I designed and developed wireless printers / scanners and corresponding networks for customers. Some of these systems, such as warehouse management systems, involved wireless bar code scanners to support voice-activated warehouse operations (*e.g.*, inventory control and picking) and communications between warehouse personnel. In addition, I developed wireless database / systems for tracking inventory and usage of narcotics in hospitals and people attending the World Economic Forum. Also, during this timeframe, I designed and implemented a wireless middleware system that interconnected various client devices (*e.g.*, bar code scanner / data collectors, personal digital assistants, and desktop computers) with multiple types of servers and databases.

16. Since 2000, I have worked as an independent consultant for my firm Wireless-Nets, Ltd., where I have been analyzing, designing, and integrating Wi-Fi, Bluetooth, and Ethernet transceivers into mobile devices such as smart phones, hospital patient monitors, and bar code scanners and designing corresponding

network infrastructures and systems for a multitude of customers. Many of these designs have included telephone applications. For example, I have analyzed, designed, and tested voice-over-Wi-Fi telephones for dozens of organizations and implemented and tested the corresponding network infrastructure and telephone switch systems. In addition, I have implemented IEEE 802.11 wireless transceivers for use in a variety of applications, such as monitoring status of concrete truck mixing operations, providing wireless connectivity for Wi-Fi phones, etc.

17. I am the author of over a dozen books on mobile and wireless topics and have served as an active participant within multiple IEEE standards organizations.

18. I have attached a true and correct copy of my curriculum vitae as Exhibit A, which further sets forth my qualifications.

19. I have no financial interest in either party or in the outcome of this proceeding. I am being paid for my work as an expert in these matters on an hourly basis. My compensation is not dependent on the outcome of these proceedings or the content of my opinions. My opinions, as explained below, are based on my education, experience, and background in the fields discussed above, and my review of the patents-in-suit and their file histories, the materials provided by Patent Owners, and the other materials discussed herein.

20. I understand that the purpose of claim construction is to determine the meaning and scope of the limitations of the claims, so that they may be properly understood and applied in considering issues such as infringement or validity.

21. I understand that the claims themselves define the scope of the patented invention. I understand that, unless there is a clear disclaimer of claim scope, terms in the claims of a patent will generally be given their ordinary and customary meaning, as understood by one of ordinary skill in the art at the time of the invention in light of the intrinsic record. I also understand that the claims themselves can provide substantial guidance for the meaning of particular claim terms.

22. I understand that it is generally improper to read limitations of the preferred embodiments from the specification into the terms of the claims. However, I also understand that the claims must be read in view of the specification, of which they are a part.

23. I understand that the claims are generally interpreted so that they cover what was actually invented and what the inventor intended them to cover, and, in particular, that the claims will generally not be construed as excluding the preferred embodiments described in the specification.

24. I understand that the specification is always highly relevant to the claim construction analysis, particularly where it: (i) contains an explicit disclaimer

of subject matter as being outside the scope of the invention, (ii) distinguishes prior art or cites particular advantages of the invention over the prior art, (iii) defines the terms contained in the claims, and/or (iv) repeatedly and consistently characterizes “the invention” as having a certain limitation.

25. I understand that the prosecution history is often considered less helpful evidence than the specification. I understand that this is because the prosecution history lacks the clarity provided in the specification as the prosecution history represents an ongoing negotiation between the applicant and the Patent Office. However, I understand that statements made in the prosecution history can control the construction of the claim language if they constitute a clear and unambiguous disclaimer of claim scope. I understand that, for the purposes of claim construction, the reexamination history of a patent can be consulted in the same manner as the original prosecution history.

26. I understand that evidence extrinsic to the patent may be consulted in performing claim construction, including dictionaries or treatises, the prior art, and the testimony of experts. I understand that dictionaries may help in understanding the underlying technology, the manner in which one skilled in the art might use claim terms, and whether there is an established ordinary meaning of a claim term.

27. I understand that expert testimony can be useful in connection with claim construction particularly to provide the background of the technology at

issue, to explain how an invention works, and to explain that a particular term in the patent or the prior art has a particular meaning in the pertinent field.

28. It is my opinion that one of ordinary skill in the field of the patent would have at least a bachelor's degree in electrical engineering, computer engineering, or a comparable field, which included course work in digital wireless communications or comparable work experience, and at least two years of work experience in designing, operating, or maintaining wireless computer networks or networking products.

29. For consistency and ease of review, all of my column and line citations to the patent specifications are in "column:line" format.

III. MATERIALS CONSIDERED

30. I have reviewed the '551 patent, including the challenged claims, and its prosecution history. I have also reviewed the Petition for *inter partes* review filed by Petitioner, as well as the Exhibits attached, including:

- Ex. 1003: Declaration of Tim A. Williams.
- Ex. 1005: U.S. Patent Appl. Pub. No. 2003/0206532 A1 ("Shpak")
- Ex. 1006: U.S. Patent Appl. Pub. No. 2003/0169769 A1 ("Ho")
- Ex. 1007: U.S. Patent Appl. Pub. No. 2003/0220112 A1 ("Bugeja")
- Ex. 1008: U.S. Patent No. 6,560,292 ("Lundby")
- Ex. 1035: U.S. Patent Appl. Pub. No. 2003/0003863 A1 ("Thielecke")

31. I have also reviewed various other sources cited within this Declaration.

32. In forming my opinions, I have considered the materials listed above and any documents cited in this declaration. I have also relied on my own education, knowledge, and experience in the relevant art.

33. I have also considered the understanding of a POSA around the time of the invention the '551 patent.

IV. LEGAL PRINCIPLES

34. I am not an attorney and will not offer opinions on the law.

35. In forming the analyses and conclusions expressed in my declaration, I have applied the legal principles described in the following paragraphs, which were provided to me by counsel for the Patent Owner.

A. Priority

36. I understand that a patent may claim the benefit of the filing day of an earlier filed application if the earlier filed application provides adequate disclosure of the patent's claims. I understand that the disclosure requirement is satisfied if a POSA could clearly conclude that the inventor invented the claimed subject matter as of the earlier filing date sought. I understand that the earlier filed application does not need to describe the claimed subject matter in precisely the same terms as found in the claims at issue.

B. Anticipation

37. I have been informed that a patent claim is invalid as anticipated under 35 U.S.C. § 102 if each and every element of a claim, as properly construed, is found either explicitly or inherently in a single prior art reference. Under the principles of inherency, if the prior art necessarily functions in accordance with, or includes the claimed elements, it anticipates.

38. I have been informed that a claim is invalid under 35 U.S.C. § 102(a) if the claimed invention was known or used by others in the U.S., or was patented or published anywhere, before the Applicant's invention. I further have been informed that a claim is invalid under 35 U.S.C. § 102(b) if the invention was patented or published anywhere, or was in public use, on sale, or offered for sale in this country, more than one year prior to the filing date of the patent application (critical date). And a claim is invalid, as I have been informed, under 35 U.S.C. § 102(e), if an invention described by that claim was described in a U.S. patent granted on an application for a patent by another that was filed in the U.S. before the date of invention for such a claim.

C. Obviousness

39. I have been informed that a patent claim is invalid as "obvious" under 35 U.S.C. § 103 in light of one or more prior art references if it would have been obvious to a person of ordinary skill in the art at the time of the alleged invention

(“POSA”), taking into account (1) the scope and content of the prior art, (2) the differences between the prior art and the claims, (3) the level of ordinary skill in the art, and (4) any so called “secondary considerations” of non-obviousness, which include “long felt need” for the claimed invention, commercial success attributable to the claimed invention, unexpected results of the claimed invention, skepticism of others, failure by others to achieve the claimed invention, and “copying” of the claimed invention by others.

40. I have been informed that a claim can be obvious in light of a single prior art reference or multiple prior art references. To be obvious in light of a single prior art reference or multiple prior art references, there must be a reason that would have prompted a POSITA to modify the single prior art reference, or combine two or more references, in a manner that provides the elements of the claimed invention. This reason may come from a teaching, suggestion, or motivation to combine, or may come from the reference(s) themselves, the knowledge or “common sense” of a POSITA, or from the nature of the problem to be solved, and this reason may be explicit or implicit from the prior art as a whole. I have been informed that, under the law, the combination of familiar elements according to known methods is likely to be obvious when it does no more than yield predictable results. I also understand it is improper to rely on hindsight in making the obviousness determination.

D. Claim Construction

41. I understand that claim construction is a matter that will be decided by the Board presiding over this IPR. I understand that the relevant inquiry in claim construction is the question of how a POSA would have understood the claim terms at the time of the earliest priority date, in light of the patent specification, the prosecution history, and any other relevant intrinsic and extrinsic evidence.

V. PERSON OF ORDINARY SKILL IN THE ART

42. All of the opinions that I express here have been made from the standpoint of a person of ordinary skill in the art at the time of the invention of the '551 patent, which I may refer to as a "POSA."

43. I understand that, for the purposes of this proceeding, the '551 patent is entitled to a priority date of no later than September 9, 2003.

44. I understand that the Petitioner has proposed that a POSA at about the priority date of the '551 patent would have had at least a B.S. in Electrical Engineering or the equivalent, and 3-4 years of experience designing wireless packet communication devices, including 802.11-compliant devices. I understand that Petitioner has asserted that more education could substitute for less experience, and vice-versa.

45. For the purposes of this proceeding, I will accept Petitioner's proposed level of skill. At the relevant time frame, I was a person of more than

ordinary skill in the art during the relevant timeframe. However, I worked with and managed many people who fit the characteristics of the POSA, and I am familiar with their level of skill. When developing the opinions set forth in this declaration, I assumed the perspective of a person having ordinary skill in the art, as set forth above.

VI. TECHNOLOGY OF THE '551 PATENT

46. In its overview of the '551 Patent, it is my opinion that the Petition does not provide sufficient context for understanding the claimed invention. I will discuss these aspects of the technological background below.

A. The '551 Patent Relates to Multi-channel Systems

47. In my opinion, the '551 Patent is specifically addressed to multi-channel systems, and not single-channel systems.

48. The '551 Patent teaches that the 802.11-1999 standard discloses methods for sharing a *single* channel using CSMA. '551 Patent at 1:25-37 (citing 802.11-1999, “carrier sense...allows a plurality of stations (hereinafter STA) **to share one wireless channel** in a staggered manner.”) (emphasis added). By contrast, during the time frame relevant to this petition, non-standardized methods for transmitting a plurality of wireless packets to a given receiving station using multiple frequency channels existed. *Id.* at 1:43-48. The latter are what the '551

Patent refers to as transmission “using multiple wireless channels at the same time,” (or, hereinafter, “multi-channel” techniques). *Id.*

49. As understood by a POSA, “multi-channel” techniques allow a single user to access multiple frequency channels. This is not the same as assigning a user a *single* channel from among multiple channels available in a particular frequency band, as is the case in 802.11-1999. For example, as the Petitioner’s cited Bugeja reference acknowledges, there are generally three non-overlapping channels available for use in the 2.4 GHz band as provided by federal regulation. Bugeja at ¶4. An 802.11 user can use only one of these available channels, which has been assigned to it by an access point (AP). *Id.* Thus, while an AP might have multiple users within its network at a given time, only *one channel* will be assigned to any given user at a time. This is considered a *single* channel communication method within the terms of the ’551 Patent. *Id.* at 1:30-32. By contrast, Bugeja acknowledges that “multi-channel” communication techniques exist whereby a given “multi-channel client” has the capability to transmit and download on more than one channel, such that uplink and downlink speeds could be up to three times faster, thereby increasing throughput. *See* Bugeja at ¶46.

50. The ’551 Patent is directed to a scenario more akin to the “multi-channel” client referred to in Bugeja, in that it relates to communications systems wherein more than one channel is accessible to a given user. For instance, the

specification explicitly distinguishes the transmission of wireless packets using “multiple wireless channels” as being different from the single-channel transmission provided for in 802.11-1999. *See* ‘551 at 1:43-44 (“**On the other hand**, a wireless packet communication method is known in which, when **multiple wireless channels** are found idle by carrier sense...” (emphases added). Further, the ‘551 Patent emphasizes that an advantage of its claimed methods is improving throughput between a *single* transmitting STA and receiving STA. For example, the specification teaches that the problem of power leakage arises when “in case of transferring a wireless packet, *a transmit-side STA* transmits the wireless packet and thereafter *a receive-side STA* transmits an acknowledgment packet (Ack) for the received wireless packet to the transmit-side STA,” while “another wireless channel used *for simultaneous transmission*” is in use. ‘551 Patent at 2:30-37 (emphases added). As a result, “*throughput* cannot be improved even if simultaneous transmission is performed using multiple wireless channels at the same time.” *Id.* at 2:48-51 (emphasis added).

51. A POSA understands that “throughput,” as used in the ‘551 Patent, relates to transmission to a given user. Specifically, the ‘551 Patent relates to channel throughput, which depends on conditions relevant to the transmission channel and their effect on receipt by a given user, such as data rate, radio frequency interference, cross-channel interference, and multipath propagation. *See*

e.g., '551 Patent at 3:33-35 (“It is an object of the present invention to avoid leakage power from affecting an adjacent channel so as to improve throughput by simultaneous transmission.”); EX2006. The specification’s repeated references to interference occurring across frequency regions (*i.e.*, leakage) in the context of throughput (*e.g.*, 2:26-30, 34-37, 3:2-5), make this clear. The discussion of MIMO technology further confirms that the '551 Patent is directed to multiple channels accessible to a single user. Indeed, the '551 Patent treats single-channel MIMO and using “multiple wireless channels” as *alternatives* to each other for transmitting packets simultaneously, which would make little sense if each of the “multiple wireless channels” were assigned to different users. *E.g.*, '551 Patent at cl. 1.

52. The '551 Patent addresses issues affecting throughput to a single user in a multichannel architecture by setting a “mandatory channel,” which is one of several available channels for transmission to that user. *E.g.*, '551 Patent at 5:52-57 (“In this embodiment, wireless channels #1, #2, and #3 are provided, and the wireless channel #1 is set as a mandatory channel for every STA...When the mandatory channel is busy, ***each STA*** does not perform transmission ***even if there is other idle wireless channel.***”) (emphasis added). In other words, setting of a “mandatory channel” can help avoid a situation where ACK packets are not received on one channel while another channel is in use, thereby improving

throughput. *E.g., id.* at 11:67-12:6 (“Thus, it is possible to avoid a situation that the transmit-side STA cannot receive a wireless packet addressed to an own STA. On the other hand, the other STAs can surely transfer a wireless packet to the transmit-side STA by transmitting the wireless packet after the mandatory channel becomes idle. Thus, throughput can be improved.”).

B. The ’551 Patent Pertains to CSMA Systems

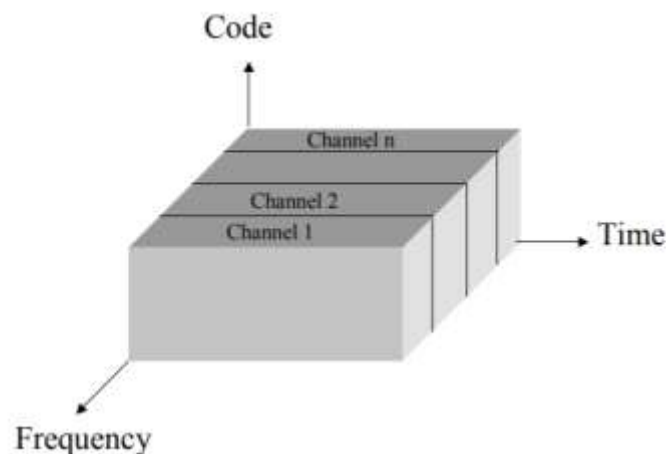
53. I understand that in some of its arguments, such as in Ground 2, the Petitioner proposes to combine references pertaining to Code Division Multiple Access (CDMA) systems with Carrier Sense Multiple Access (CSMA) systems. However, CDMA and CSMA systems are fundamentally different in ways that would affect whether and how a POSA might consider combining such references.

54. Both the claims and specification of the ’551 Patent make clear that its invention pertains to CSMA systems, not CDMA. Specifically, the ’551 Patent’s claims provide a novel channel architecture wherein a transmission is sent “only when the mandatory channel is *idle*.” *E.g., ’551 Patent at cl. 1.* Further, the specification teaches that a channel is sensed to be idle by means of carrier sense, such as provided in the 802.11-1999 standard. *Id.* at 1:27-29, 43-47. Thus, the ’551 Patent is directed to a wireless communication system that relies on CSMA as its underlying media access protocol. This is significant because, as explained further below, the use of sensing-based access that lies at the heart of CSMA is a

fundamentally different approach from the code-based access provided by CDMA, such that a POSA generally would not graft aspects of one system on to the other.

55. As of 2003, a POSA understood that there are different classes of methods for allowing multiple users to share a wireless channel: (1) those that **partition** the channel among users using some parameter, such that each user has exclusive use within that parameter (“channel partition” methods), (2) those that allow users “**random access**” to the channel, and (3) those wherein users take turns in a fixed fashion (“**polling**” methods). *E.g.*, EX2007, EX2008, EX2009, EX2010 at 849, 862.

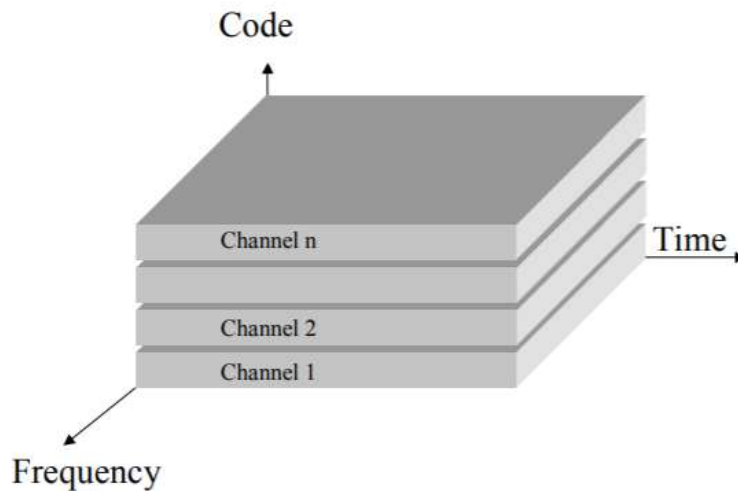
56. “Channel partition” methods manage user access to the channel in a static way, such as by assigning different frequencies, time slots, or codes to different users. For example, in Frequency Division Multiple Access (FDMA), each user is allotted a distinct frequency band, or channel, for their exclusive use, as illustrated in the figure below. *E.g.* EX2007 at 6.



EX2007 at 6.

57. Another channel partitioning method is Code Division Multiple Access (CDMA), wherein each user is assigned a different code for transmissions. Receivers of a transmission are able to use this code to retrieve transmissions. *E.g.*, EX2010 at 849, EX2008 at 126. When the selected codes are orthogonal to each other, multiple users can share the same frequency channel without interference. *Id.* CDMA may also be conceptualized as providing distinct “code-channels” in an abstract “code-space,” as illustrated below. But, as a practical matter, CDMA is in fact a method for sharing access to a single channel. *E.g.*, EX2008 at 126 (“While FDMA and TDMA isolate transmissions into distinct frequencies or time instants, CDMA allow transmissions **to occupy the channel at the same time** without interference.”) (emphasis added); EX2010 at 843 (“In this method, each user is assigned a unique code sequence or signature sequence that allows the user to **spread the information signal across the assigned frequency band....the signal transmissions among the multiple users completely overlap both in time and in frequency.**”) (emphases added). CDMA is the multiple access method implemented in standards such as cdma2000. *Id.*, citing Lundby at 6:35-42. Various types of codes may be used to implement CDMA-based access, but the most common type are Walsh codes, which are a type of orthogonal code. *See e.g.*, Lundby at 2:8-11 (“In a CDMA system, one could double the effective

bandwidth on the forward link by halving the length of the Walsh codes used for orthogonally spreading the encoded bit stream.”); EX2011. Walsh codes are used to establish “channels” that occupy the same frequency, but are differentiated by assigned code. *See id.*; EX2007 at 6.



EX2007 at 6.

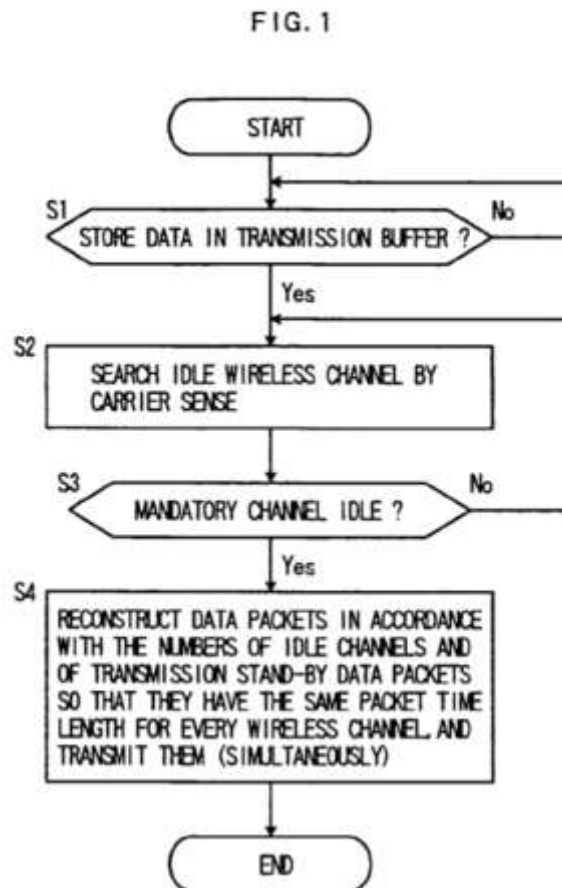
58. “Polling methods” are similar to “channel partitioning” methods in that there is a fixed system for awarding channel access, such as having an AP sequentially “poll” stations one after the other in a fixed cycle.¹ *E.g.*, EX2009 at 5.

59. CSMA, in contrast, falls within the category of “random access.” *E.g.*, EX2010 at 862. In a CSMA scheme, there is no assignment of channel access. *E.g.*, EX2009 at 5-6. Instead, each user must first “sense” whether the

¹ Some commentators group channel partitioning and polling methods together as a form of “coordinated access,” to contrast these with “random access” methods such as CSMA. *E.g.*, EX2022 at 5.

wireless channel is in use (busy) or clear (idle) before transmitting. *E.g.*, EX2010 at 868. Thus, CSMA is considered a “contention-based” method, because each user must “contend” for an opportunity to transmit. *E.g.*, EX2012 at 16. CSMA is implemented in 802.11-1999, and serves as the foundation on which multi-access is based for the entire 802.11 family of standards.

60. A POSA would understand that the '551 Patent pertains to a CSMA system, because the claims require that transmission be governed by detection of an “idle” state. *E.g.*, '551 Patent at cl. 1. The specification teaches that detection of an “idle” state by means of carrier sensing, such as shown in Fig. 1 below:



61. By contrast, channel partitioning systems such as CDMA, generally do not use such sensing methods because they rely on fixed codes for providing multi-user access, which is antithetical to the “random” access provided by sensing.

VII. CLAIM CONSTRUCTION

A. “...Transmitting a plurality wireless packets simultaneously...”

62. At the time of this writing, I understand that the parties to the parallel district court litigation, including the Petitioner, dispute whether this phrase appearing the preamble is limiting, although both sides appear to have agreed that it should be given its plain meaning. EX2013, EX2016. Petitioner has not proposed this term, nor indeed any other terms, for construction in its Petition for this proceeding.

63. Whether the preamble is limiting does not affect my opinion as to the Petitioner’s Grounds in this declaration.

B. “Multiple wireless channels”/ “wireless channels”

64. At the time of this writing, I understand that the parties to the parallel district court litigation, including the Petitioner, have proposed different constructions for the phrase “multiple wireless channels” and “wireless channels.” EX2013, EX2016. These constructions are set forth below:

Patent Owner’s proposal: “multiple frequency ranges provided to transmit packets”

Petitioner’s proposal: “distinct frequency regions used to transmit different wireless packets”

65. The parties disagree on certain aspects of the construction, such as whether frequency regions may be characterized as “distinct” and whether channels must be “used to transmit different wireless packets.” I do not agree with these aspects of the Petitioner’s proposal, but these aspects of the claim construction proposals do not affect my opinion in this declaration.

66. However, for the purposes of developing my opinion here, it is only relevant that both sides have agreed that “wireless channels,” as used in the ‘551 Patent, refers to frequency regions or ranges. It is my opinion that there is no meaningful difference between “frequency regions” as opposed to “ranges” in the context of frequency, since frequency is one-dimensional. Nonetheless, it is my opinion that “range” is more accurate because it better conveys that channels may be represented by maximum and minimum values.

C. Petitioner Misconstrues “Mandatory Channel”

67. The term “mandatory channel” is recited in claims 1, 2, 5, and 6 of the ‘551 Patent. I understand that Patent Owner has proposed that the term be construed as “one of several frequency ranges provided between two STAs, whose

busy/idle state determines whether there is transmission regardless of idle state of the other available channels.” I also understand that Petitioner has proposed that the term be construed as plain meaning. EX2013, EX2016.

68. It is my opinion that the construction proposed by Patent Owner is how a POSA, informed by the specification and teachings of the patent, would interpret the phrase “mandatory channel” in claims 1, 2, 5, and 6 of the ‘551 Patent. It is also my opinion that Petitioner’s proposed construction of the term of plain meaning is insufficient to describe how a POSA would interpret the phrase.

69. It is my opinion that a plain meaning claim construction of mandatory channel is inappropriate because the term “mandatory channel” is not a known term having a predefined meaning to a POSA at the time of the ‘551 Patent’s invention. As one example, the 1999 version of the 802.11 standard nowhere uses the term “mandatory channel.” ANSI/IEEE, 802.11 Standard: Part 11: Wireless LAN Medium, Access Control (MAC) and Physical Layer (PHY) Specifications (1999). At various points in the standard, the words “mandatory” and “channel” are used, but not in connection with each other. Furthermore, I have conducted a technical literature search and was not able to locate any references earlier than September 3, 2003 that uses the term “mandatory channel” with respect to carrier sense as described in the ‘551 Patent.

70. First, with respect to the language of the claims themselves, Claim 1 introduces the term “mandatory channel” in the first step of the claimed method as “setting a mandatory channel that is always used for transmission.” ’551 Patent at cl. 1. Claim 1 describes a transmission step which includes the mandatory channel “only when the mandatory channel is idle.” *Id.* Claim 5 is similar to claim 1, and describes an apparatus comprising “a unit setting a mandatory channel that is always used for transmission, and transmitting the wireless packets only when the mandatory channel is idle by using a wireless channel or wireless channels that includes/include the mandatory channel.” *Id.* at cl. 5. Claim 2 describes a method using two stations, STA A and STA B, “the STA A for which a mandatory channel is set, the STA B for which no mandatory channel is set, the mandatory channel being always used for transmission.” *Id.* at cl. 2. Claim 2 next provides that packets addressed to STA A are transmitted using channels including “the mandatory channel, only when the mandatory channel is idle,” if that STA has a “mandatory channel” set, but transmissions to STA B can simply use “idle wireless channel(s).” *Id.* Claim 6 describes an apparatus similar to the method of claim 2 that transmits to “STA A only when said mandatory channel is idle by using a wireless channel or wireless channels that includes/include a mandatory channel” where “the mandatory channel being always used for transmission.” *Id.* at cl. 5. The claim language clearly ties transmission, including on other available

channels, to the idle state of the “mandatory channel.” It is therefore my opinion, consistent with Patent Owner’s proposed construction, that the “mandatory channel” is the channel “whose busy/idle state determines whether there is transmission regardless of idle state of the other available channels” consistent with Patent Owner’s proposed construction.

71. Second, it is my opinion that the specification further supports that a POSA would understand that the “mandatory channel” is the channel “whose busy/idle state determines whether there is transmission regardless of idle state of the other available channels.” For example, the first recitation of “mandatory channel” in the specification states, “The wireless packet communication method includes setting a mandatory channel that is always used for transmission and transmitting the wireless packets by using a wireless channel or wireless channels that includes/include the mandatory channel, *only when the mandatory channel is idle.*” *Id.* at 3:44-49 (emphasis added). The specification then further teaches:

In other words, for transmitting a plurality of wireless packets simultaneously, transmission is performed by using the wireless channel(s) including the mandatory channel. Transmission is not performed when the mandatory channel is not idle. Moreover, wireless packets are always transmitted via wireless channels including the mandatory channel, and when the mandatory channel is busy, transmission is not performed even if there is another wireless channel. In other words, the mandatory channel can be regarded as a wireless channel having “the highest priority among wireless channels that have a plurality of priorities,” because of how its idle state governs transmissions. *Id.* at 3:50-60.

72. These passages make clear, that, in the context of the ‘551 Patent, the purpose of the mandatory channel is, when set, to control whether or not transmission is possible regardless of the busy/idle state of the other available channels. As such, a POSA would understand that the construction of the term, as used in the ‘551 Patent, reflects a channel “whose busy/idle state determines whether there is transmission regardless of idle state of the other available channels” as is reflected in the Patent Owner’s proposed construction.

73. Third, a POSA would understand that the “mandatory channel” is necessarily one of multiple available channels, as Patent Owner’s proposed construction reflects. This is confirmed by the language of them claims themselves. All of the independent claims (claims 1, 2, 5, and 6) recite that the claimed method or apparatus may transmit “a plurality of wireless packets simultaneously by using multiple wireless channels.” *Id.* Additionally, the body of claims 1 and 5 require “setting a mandatory channel that is always used for transmission,” but setting a mandatory channel is only meaningful when there is more than one possible channel. *Id.* Likewise, claims 2 and 6 require “STA A for which a mandatory channel is set” and “STA B for which no mandatory channel is set.” *Id.* Thus, STA B, in contrast to STA A, may simply transmit on whatever channel(s) is/are idle without regard to the idle state of any specific one of the

available channels. However, where there is only one channel provided to a given user, there would be no distinction between channels in order to determine whether or not a mandatory channel had been set, which would read these limitations out of the claim. The same conclusion may be drawn from dependent claim 4, which describes a further step of “selectively using the multiple wireless channels or the MIMO in accordance with a number of pieces of data or a number of MIMOs that depends on a channel condition.” This additional step would not make sense if independent claim 1, from which claim 4 depends, did not embrace the possibility of using multiple wireless channels.

74. The specification of the ‘551 patent further confirms that the invention relates to communications involving multiple channels. In *every* embodiment, a “mandatory channel” is identified from *one of multiple* available channels provided between a transmitting and receiving stations (STAs). *E.g.*, ‘551 Patent, at 5:52-57 (“In this embodiment, wireless channels #1, #2, and #3 are provided, and the wireless channel #1 is set as a mandatory channel for every STA.”); 7:8-12 (“In this example, for wireless packets addressed to the STA A, simultaneous transmission is performed using two wireless channels as the wireless channels #1 and #2 because the wireless channel #1 set as the mandatory channel is idle.”). As a result, it is my opinion that a POSA skill in the art would understand that the

“mandatory channel” must be one of several channels provided between two STAs.

75. Further, the specification teaches that an advantage of its claimed methods is improving “throughput” of simultaneous transmission. *See e.g.*, ’551 Patent at 3:33-35 (“It is an object of the present invention to avoid leakage power from affecting an adjacent channel so as to improve throughput by simultaneous transmission.”). A POSA understands that “throughput” relates to transmission to a given user. *E.g.*, EX2006. The discussion of MIMO techniques further confirms that the ’551 Patent is directed to multiple channels accessible to a single user. Indeed, the ’551 Patent treats single-channel MIMO and using “multiple wireless channels” as alternatives to each other for transmitting packets simultaneously, which would make little sense if each of the “multiple wireless channels” were assigned to different users. *E.g.*, ’551 Patent at cl. 1.

**VIII. PETITIONERS FAIL TO DEMONSTRATE THAT THERE IS REASONABLE
LIKELIHOOD ANY CHALLENGED CLAIM IS UNPATENTABLE UNDER
GROUND 1 (CLAIMS 1, 3, 5, 7)**

76. In its first ground, Petitioner relies on Shpak as allegedly disclosing a “mandatory channel.” This is incorrect. It is my opinion that Shpak discloses only a *single channel* for wireless communication. *See also* Paper No. 2 at 24 (“POSAs would have understood Shpak to disclose a conventional SISO system in which an AP transmits packets to a station over a SISO “common frequency channel”). As

explained above, the '551 Patent teaches that the “mandatory channel” is necessarily one of several available channels between two stations, and cannot merely be the *only* channel provided.

77. Further, because Petitioner relies on Ho only for the disclosure of MIMO in a general sense, the combination of Shpak and Ho (“Shpak-Ho”) also fails to disclose the claimed “mandatory channel.”

1. Claim 1

(a) [1PRE]

78. Petitioner asserts that the word “or” in the preamble indicates that the claimed method may be met if only one channel is used. However, it is my opinion that even if one channel is used, that one channel must include the “mandatory channel,” which is necessarily one of multiple available channels. As explained in more detail below, the combination of Shpak-Ho provides only a *single channel* for transmission, and thus cannot satisfy this claim.

(b) [1A] setting a mandatory channel that is always used for transmission;

79. The combination of Shpak-Ho does not disclose “setting a mandatory channel,” as this phrase is properly construed, because this step is directed to identifying *one of several* frequency channels provided for transmission between two associated stations as a “mandatory channel,” not merely “arranging” to use the only channel available.

80. As explained above, the '551 Patent is directed to multi-channel transmission techniques, wherein *multiple channels* are provided between two devices, such as an AP and client device. Indeed, the '551 Patent teaches that the mandatory channel “can be regarded as a wireless channel having the highest priority *among wireless channels* that have a plurality of priorities.” '551 Patent at 3:57-60 (emphasis added). Moreover, one of the stated goals of the '551 Patent is to improve *throughput* of simultaneous transmission by addressing power leakage, a scenario that can only occur when multiple channels are provided between a single AP and associated client. '551 Patent at 3:33-35.

81. Thus, the combination of Shpak-Ho fails to disclose a “mandatory channel” because Shpak-Ho’s “common frequency channel” is not one of multiple channels provided for transmission, but rather the *only* channel available. Further, Shpak-Ho fails to disclose the step of “setting a mandatory channel” because the '551 Patent teaches that identification of a “mandatory channel” does not render it the only channel available—rather, as some preferred embodiments indicate, stations with an associated “mandatory channel” have the ability to use this channel together with another channel that is idle. *E.g.*, '551 Patent at 6:8-11 (“In this example, since the wireless channel #1 as the mandatory channel is idle, the wireless packets is simultaneously transmitted by using two wireless channels as the wireless channels #1 and #2.”). In other words, “setting a mandatory channel”

does not change the fact that the “mandatory channel” is but one of multiple available channels. Thus, Petitioner’s interpretation of this phrase in the context of Shpak-Ho clearly contradicts the specification.

82. Petitioner appears to suggest that the phrase “that is always used for transmission” supports its reading of “mandatory channel.” *See* Paper 2 at 34. While it is true that the “mandatory channel” must always be used, Petitioner’s interpretation of this step—that “setting a mandatory channel” can result in it being the *only* channel—would render it a nullity. Indeed, the claim language itself indicates the presence of other channels. For example, the very use of the qualifier “mandatory” indicates the existence of a non-mandatory state, which Petitioner’s interpretation fails to acknowledge. Specifically, the ’551 Patent clearly teaches that a “mandatory channel” may be so termed because its idle state governs transmissions in a way that differs from that of other available channels. However, if “setting a mandatory channel” means little more than assigning a single channel for use, this channel paradoxically stops being “mandatory”; once assigned, every legacy 802.11 channel, such as in Shpak, would be used in exactly the same way as any other assigned channel—a transmission would occur if the assigned channel is idle, regardless of the state of other channels. Put another way, in a single-channel system, there are no other channels against which a purported “mandatory channel” may be distinguished as “mandatory.”

83. As another example, the language requiring the “mandatory channel” to “always” be used likewise indicates that other channels are provided. Common sense dictates that if no other channels *could* be used (such as in a SISO system), there would be no need to specify that the “mandatory channel” must “always” be used. Petitioner’s interpretation of this language would render it trivial, as any wireless communication must use some form of channel, regardless of whether it is “mandatory” or not.

(c) **[1B] transmitting the wireless packets by using a wireless channel/wireless channels that includes/include the mandatory channel, only when the mandatory channel is idle.**

84. The combination of Shpak-Ho fails to disclose the step of “transmitting...by using a wireless channel/wireless channels that include/includes the mandatory channel,” because, *inter alia*, Shpak-Ho fails to disclose the claimed “mandatory channel,” as discussed above.

85. Further, similar to step [1A], the language of step [1B] plainly indicates that multiple channels are provided for transmission, such as by sending wireless packets using “wireless channels that...include the mandatory channel.” The language limiting transmission to times “*only* when the mandatory channel is idle” also relies on the availability of other channels—were it otherwise, this language, too, would be rendered a nullity because single-channel CSMA systems

have always waited for the channel to be idle before transmitting. *See e.g.*, '551 Patent at 1:30-37. It is not trivial, however, to limit transmission to times when only one of multiple channels is idle, even if other idle channels are available. This is precisely what the '551 Patent teaches—“[w]hen the mandatory channel is busy, each STA does not perform transmission even if there is another idle wireless channel.” *E.g.*, '551 Patent at 3:56-57. The claim language limiting transmission to times “only when the mandatory channel is idle” is clearly directed to this type of scenario.

2. Claim 3

86. Claim 3 depends from claim 1 or claim 2. Shpak-Ho fails to disclose the limitations of claim 3 for at least the following reasons: First, because claim 3 depends from claim 1, Shpak-Ho fails to disclose this claim because it fails to disclose the elements of claim 1. Second, Petitioner has not attempted to argue that Shpak-Ho discloses the elements of claim 2. Thus, Petitioner fails to meet its burden to show that Shpak-Ho can meet the requirements of claim 3 to the extent it depends from claim 2.

3. Claim 5

- (a) **a unit setting a mandatory channel that is always used for transmission; and transmitting the wireless packets only when the mandatory channel is idle by using a wireless channel or wireless channels that includes/include the mandatory channel.**

87. Claim 5 is the apparatus-analog of claim 1. Thus, Shpak-Ho fails to disclose claim 5 because it fails to disclose a unit for performing the steps of claim 1.

4. Claim 7

88. Dependent claim 7 depends from claims 5 or 6, and is the apparatus analog of claim 3. Because Shpak-Ho fails to disclose claim 5, it necessarily also fails to disclose claim 7 for similar reasons. Petitioner has not attempted to show that Shpak-Ho can meet the requirements of claim 6.

IX. PETITIONERS FAIL TO DEMONSTRATE THAT THERE IS REASONABLE LIKELIHOOD ANY CHALLENGED CLAIM IS UNPATENTABLE UNDER GROUND 2: CLAIMS 1, 3-5, 7-8

89. Petitioner argues that a POSA would be motivated to combine the Shpak reference with Lundby such that Shpak's "common frequency channel" can be treated as a "primary channel" as disclosed in Lundby, which can be supplemented by another "secondary channel" "on an ad hoc basis." Paper 2 at 41-42. This argument fundamentally misrepresents what Lundby's "primary" and "secondary" channels are. Contrary to Petitioner's assertion, Lundby does not

teach addition of a distinct frequency channel to Shpak's single channel. Rather, as addressed further below, Lundby's "primary" and "secondary" channels are *code channels* that occupy *the same frequency*. Thus, the introduction of Lundby fails to cure Shpak's deficiencies, in that neither reference, alone or in combination, provides a mandatory channel that is one of multiple available frequency channels. POSA would not be motivated to alter Shpak and Lundby in the manner suggested by Petitioner, as there is no suggestion in Lundby to use anything other than code channels. Given the substantial differences between 802.11's CSMA system and Lundby's CDMA system, a POSA would not have been motivated to combine these references at all.

90. Further, even if the references could be combined, Lundby's reliance on codes teaches against sensing of the idle state of a "mandatory channel" as a precondition for transmission, because code-based access is antithetical to sensing-based access.

1. Claim 1

(a) [1PRE]

91. Petitioner claims that the combination of Shpak and Lundby ("Shpak-Lundby") meets the preamble's scenario of using "multiple wireless channels" to transmit wireless packets, but this is not correct. As discussed above, the '551 Patent uses "multiple wireless channels" to refer to multiple *frequency*-based

channels provided for transmission between an associated client and AP. Shpak-Lundby, however, at most discloses multiple *code*-based channels that occupy the **same** frequency channel.

92. Specifically, Lundby teaches that “[i]n a CDMA system, one could double the effective bandwidth on the forward link by halving the length of the **Walsh codes** used for orthogonally spreading the encoded bit stream.” Lundby at 2:8-11. Lundby is concerned with the way in which such codes may be allotted, balanced against power limitations in CDMA systems: “What is desired is a way to increase the system performance of a telecommunications system...by taking into account the fact that the system is **both code limited and power limited.**” *Id.* at 2:57-61. Lundby addresses these issues by providing methods for using “primary” and “secondary” code channels, such that use of a “secondary” code channel is determined based on balancing criteria such as transmit power. *E.g., id.* at 4:58-67 (“[N]ot only must “excessive” power be determined, but also the number of available spreading codes must be above the first threshold value in order for the process to move to block 250... This check is done because, although it is desirable to reduce power by transmitting data over two channels, **a code needs to be available to allocate to the secondary channel.**”).

93. As it was well-known in the art that channels distinguished by the use of Walsh codes occupy the *same* frequency, Lundby’s primary and secondary

channels actually occupy a single channel within the meaning of the '551 Patent, in this case the forward link channel to a mobile user. Lundby at 2:8-11, 6:39-40.

Specifically, in conventional CDMA systems such as cdma2000, two distinct frequency bands are set out for use, one for transmitting data to a mobile user (forward link), and another for transmitting data back from a user to the base station (reverse link). *E.g.*, EX2014. Notably, while it is known that CDMA does involve the use of frequency channels, Lundby **does not** teach the addition of a distinct frequency channel, but relies on partitioning the forward link channel using codes instead. *See* Lundby at 4:58-67.

94. It is my opinion that a POSA seeking to apply Lundby would not be motivated to add another frequency channel to Shpak. Lundby neither teaches nor suggests adding another 802.11b channel to serve as a “secondary” channel, as Petitioner suggests. Rather, Lundby confines itself to code-based channels occupying the forward link frequency channel. Indeed, the problem that Lundby purports to address is rooted in the way in which Walsh codes are used: “Although decreasing the Walsh code length effectively increases the bandwidth between the remote station and the base station, it is undesirable to decrease the Walsh code length because doing so **decreases the pool of Walsh codes**...the system is said to be **‘code limited.’**” Lundby at 2:14-24 (emphasis added). Lundby’s solution, too, is specific to code channels: For example, Lundby provides detailed circuitry

tailored to implement multiple code channels for one user, such as Walsh despreaders, which are responsible for generating the codes responsible for the primary and secondary channels to exist (*e.g., id.* at 14:54-65, 15:45-60, 18:17-83, Figs 6, 7 and 9,), and routines for determining the pool of available codes (*e.g., id.* at 4:56-67, 8:8-19). Absent hindsight, a POSA would not have taken Lundby's code-specific teachings as a basis for adding a *frequency* channel.

95. Rather, *if* Lundby could be combined with Shpak *at all*, it would at most be used to partition Shpak's single "common frequency channel" into two code channels that each occupy *the same frequency range*. Indeed, as pointed out above, Lundby deliberately implements code-based channels in a single frequency channel even though it was known that multiple frequency channels may be used in the context of CDMA.

96. However, it is my opinion a POSA would not have been motivated to combine Lundby with Shpak in the first instance. Shpak's system, which is based on 802.11's CSMA system, is a fundamentally different technology from CDMA. A POSA cannot simply replace or add CDMA-based access to a CSMA system. For instance, CDMA requires the management of a distinct code for each code channel. With CDMA, multiple users transmit at the same time by each using a different orthogonal code, which means that the users share the total bandwidth of a channel. With CSMA, users can transmit at a higher rate while using the entire

channel. The transmission rate and corresponding performance of each CDMA user is limited as compared to CSMA, especially as the number of users increases. *E.g.* EX2007 at 19-20. As a result, CDMA as a channel access method is not suited for higher rate transmissions required by wireless LANs. Because of the use of codes, CDMA is fundamentally different than CSMA, which does not use codes and merely regulates access to the medium based on the presence of a busy medium. As a result, CDMA introduces substantial complexity as compared to CSMA. For example, additional hardware and software would be needed to control these additional functions required of CDMA. The use of CSMA is a much simpler form of medium access, which avoids this additional hardware due to the use of carrier-sense access protocols. The expense and complexity of CDMA equipment is one of the well-known trade-offs of such systems. *E.g.* EX2007 at 20 (citing implementation complexity as a disadvantage of CDMA); EX2015 (describing testing complexity for CDMA systems). Thus, replacement of CSMA with CDMA or addition of CDMA to a CSMA system would not be predictable and require significant redesign and testing. In addition, a POSA would also have been discouraged from altering standardized forms of transmission by the potential interoperability issues with standardized devices on the market.

97. Moreover, Shpak itself teaches against deviating from 802.11's standardized forms of transmission. In fact, Shpak repeatedly emphasizes that

transmissions between an AP and a mobile station uses then-existing 802.11 protocol, including in the process of associating a mobile station with a given AP (Shpak at ¶¶37-38), and transmitting data within 802.11's time constraints (*e.g.*, *id.* at ¶¶39, 46). Shpak teaches that one of the key advantages of its system is maintaining compatibility with legacy 802.11 devices. *Id.* at ¶38. Shpak deliberately limits the use of other methods like CDMA to communication amongst the APs themselves, so as to maintain 802.11 compliance for transmissions to clients on its "common frequency channel." *See id.* at ¶41. Thus, Shpak itself teaches against altering the common frequency channel using CDMA. Similarly, Shpak teaches against modifying existing single-channel 802.11 communications to incorporate another frequency channel, as this too would defeat Shpak's ability to accommodate legacy 802.11 devices.

98. Finally, Shpak-Lundby does not teach the use of carrier sensing to detect the idle state of multiple wireless channels. As discussed above, carrier-sensing is the hallmark of a random-access form of multi-user access scheme. Lundby, on the other hand, is directed to CDMA systems, which rely on the fixed assignment of codes to organize access. Thus, Lundby teaches against sensing of an idle state on its primary channel, because its availability is based on fixed assignment. There is no teaching or suggestion that either the primary or secondary channels should or could be used based on idle state, because carrier

sensing requires a distinct carrier (*i.e.*, frequency) whereas code channels share the same carrier. There is simply nothing in Lundby that suggests its teachings are compatible with CSMA systems, nor any hint of how to modify its methods for CSMA.

(b) [1A] setting a mandatory channel that is always used for transmission;

99. The Shpak reference, as discussed with respect to Ground 1, discloses neither the claimed “mandatory channel” nor the step of “setting a mandatory channel.” Lundby does not cure these defects.

100. As discussed above, Lundby does not teach the use of multiple frequency channels, but rather confines itself to the use of code-based channels sharing a single frequency channel. Thus, Lundby does not teach either a “mandatory channel” that is one of multiple frequency channels provided for transmission, nor the step of “setting a mandatory channel.”

101. Further, for at least the reasons addressed with respect to the preamble ([1PRE]), a POSA would not be motivated to combine Shpak with Lundby to add another frequency channel to Shpak. Lundby’s teachings are directed to the use of codes to create code channels, with no hint or suggestion that these teachings could be applied to frequency channels.

- (c) **[1B] transmitting the wireless packets by using a wireless channel/wireless channels that includes/include the mandatory channel, only when the mandatory channel is idle.**

102. Shpak-Lundby also fails to teach the step of transmitting wireless packets using “wireless channels that...include the mandatory channel, only when the mandatory channel is idle.” As discussed above, neither Shpak nor Lundby teach a “mandatory channel” that is one of multiple frequency channels provided for transmission. Further, a POSA would not be motivated to add a frequency channel to Shpak’s single channel using Lundby, because Lundby’s teachings are limited to code channels. Thus, Shpak-Lundby does not teach the step of transmitting on a “mandatory channel.”

103. Moreover, as discussed above, Lundby teaches against transmission based on an idle state because its teachings are directed to the use of codes to govern access. As such, Lundby teaches that there is no need to sense the state of a primary channel or secondary channel, because channel availability is based only on the availability of codes. *E.g.*, Lundby at 4:56-67, 8:8-19. A POSA would not have been motivated to convert Lundby’s code channels into frequency channels as there is no suggestion to do so.

2. Claim 3

104. Dependent claim 3 depends from claims 1 or 2. Thus, Shpak-Lundby does not disclose claim 3 for at least the reasons addressed with respect to claim 1.

Further, Petitioner has shown that Shpak-Lundby discloses the elements of claim 2, and thus cannot meet its burden as to claim 3 to the extent it incorporates claim 2.

105. Thus, Shpak-Lundby does not disclose a “wireless packet communication method according to claim 1 or 2, wherein the plurality of wireless packets transmitted simultaneously are set to have a same or equivalent packet time length that corresponds to a packet size or a transmission time.”

3. Claim 4

106. Dependent claim 4 depends from claims 1 or 2. Shpak-Lundby does not disclose any of the methods of claims 1 or 2 for at least the reasons addressed above in claim 3. Further, neither Shpak nor Lundby discloses the use of MIMO, or “multiple wireless channels” within the meaning of the ’551 Patent. Thus, Shpak-Lundby does not disclose “simultaneously transmitting wireless packets selectively using the multiple wireless channels or the MIMO.”

4. Claim 5

107. Independent claim 5 is the apparatus analog of claim 1. As discussed with respect to claim 1, Shpak-Lundby fails to disclose the step of “setting a mandatory channel that is always used for transmission” or “transmitting...only when the mandatory channel is idle by using ...wireless channels that include...the mandatory channel.” Thus, for similar reasons, Shpak-Lundby fails to disclose a unit for performing these steps.

5. Claim 7

108. Claim 7 depends from claims 5 or 6, and is the apparatus analog of claim 3. Thus, Shpak-Lundby fails to disclose claim 7 for reasons similar to those addressed for claims 5 and 3. Petitioner has not attempted to show that Shpak-Lundby can meet the requirements of claim 6.

6. Claim 8

109. Claim 8 depends from claims 5 or 6, and is the apparatus analog of claim 4. Thus, Shpak-Lundby fails to disclose claim 8 for reasons similar to those addressed for claims 5 and 4. Petitioner has not attempted to show that Shpak-Lundby can meet the requirements of claim 6.

**X. PETITIONER FAIL TO DEMONSTRATE THAT THERE IS REASONABLE
LIKELIHOOD ANY CHALLENGED CLAIM IS UNPATENTABLE UNDER
GROUND 3: CLAIMS 1-3, 5, 7**

110. Petitioner argues that Bugeja, in combination with Ho (“Bugeja-Ho”), discloses transmission using “a single wireless channel determined to be idle and MIMO” and therefore meets the claims’ requirement of transmitting on a “mandatory channel that is always used for transmission.” However, Bugeja, like Shpak, teaches that a *single* channel is generally assigned to a given client. Paper No. 2 at 59. This is not a “mandatory channel,” which is one of multiple channels provided between associated STAs, because it is the *only* channel provided.

111. Moreover, Bugeja teaches against the idea of using a “mandatory channel,” because its only teaching relevant to a multi-channel architecture within the meaning of the ’551 Patent is that all available channels should be used indiscriminately. This is the opposite of what the ’551 Patent teaches.

1. Claim 1

(a) [1PRE]

112. As for Ground 1, Petitioner argues that Bugeja-Ho’s assignment of a single channel meets the preamble because of the word “or.” However, as discussed below, provision of a single channel cannot meet the claims of the ’551 Patent.

(b) [1A]

113. Bugeja-Ho does not disclose the step of “setting a mandatory channel,” because these references, alone or in combination, fail to disclose a “mandatory channel.” Since Petitioner relies on Bugeja for the alleged disclosure of a “mandatory channel,” the below discussion focuses on this reference.²

114. As discussed above, the claimed “mandatory channel,” properly construed, is one of several frequency channels between two associated STAs, such as an AP and client. Thus, Bugeja’s assignment of a single channel to a given client cannot satisfy the claimed “mandatory channel.” In other words, for reasons

² As in Ground 1, Ho is cited only for a general disclosure of single-channel MIMO.

similar to those addressed as to Ground 1, assignment of a single channel cannot meet the step of “setting a mandatory channel,” because to do so would, by definition, render it not a “mandatory channel.”

115. Moreover, Bugeja teaches against setting of a mandatory channel within the meaning of the '551 Patent. Specifically, the '551 Patent makes clear that the “mandatory channel” is mandatory because it is treated *differently* from other channels, in that transmission can occur *only* when the “mandatory channel” is idle, as opposed to when *any* channel is idle. *E.g.*, '551 Patent at 3:56-57.

Bugeja, however, teaches that transmission can take place on a secondary channel regardless of whether the primary channel is idle. Specifically, Bugeja indicates that transmission on this channel would occur whenever it is idle, without *any* indication that transmission on the secondary channel is tied to the idle state of the primary channel assigned to a different client. *See* Bugeja at ¶32 (“A client 410 in the inner region 410 is assigned the primary channel **or any of the secondary channels...**) (emphasis added); Paper No. 2 at 63 (Bugeja-Ho uses standard CSMA/MA protocols to determine idle state before transmitting). In this sense, Bugeja treats all channels the same because transmission on any channel—whether primary or secondary—does not depend on the idle state of another.

116. Petitioner admits that a single-channel client may be assigned to only a secondary channel for transmission, but contends that this channel would not be a

“mandatory channel.” Paper No. 2 at 59, 68. However, Petitioner’s arguments only reinforce the fact that Bugeja does **not** disclose a “mandatory channel.” One need only consider the logical implications of Petitioner’s proposal that a “mandatory channel” is only one that is always used for transmission “for a particular device” (Paper No. 2 at 62). If this construction were adopted, then a secondary channel assigned to a single-channel client in the inner region also becomes “mandatory” for that device. In other words, if Petitioner’s understanding were adopted, there would be no distinction between Bugeja’s primary and secondary channels—they would, paradoxically, all be “mandatory” upon assignment to a single-channel client, which in effect means that *none* of them are “mandatory” because they are treated the same way for transmission purposes.

117. Analysis of Bugeja’s multichannel clients yield the same results. For example, Petitioner argues that Bugeja’s secondary channels are not mandatory because a multichannel client in the inner region may transmit on *either* of the secondary channels, such that neither one is necessarily used. Paper No. 2 at 68, 70. This argument is contradicted by Bugeja’s explicit teachings. First, Petitioner argues that the primary channel cannot be assigned to a client in the inner region (*id.* at 70), but this is not correct. Rather, Bugeja explicitly teaches that the primary channel can be assigned to inner region clients: for example, Bugeja teaches that “[a] client 410 in the inner region 410 is assigned **the primary**

channel or any of the secondary channels,” (Bugeja at ¶32), that “[a] client 410 located within the inner region 406 can communicate **on all three channels”** (*id.* at ¶33), and that **“the three channels can be used simultaneously** to upload or download when the client is located in the inner region 614 of the cell” (*id.* at ¶46). And, since the Petitioner admits that a multichannel client in the inner region need not use all channels provided to it at any given time (Paper No. 2 at 70), it follows that this multichannel client could transmit on a secondary channel and not the primary channel. Once again, Petitioner’s arguments lead to a conclusion that none of Bugeja’s channels are “mandatory.”

118. Bugeja fails to teach any channel that is “always used for transmission.” Specifically, since Bugeja explicitly teaches that a client in the inner region may be assigned to *one* of the secondary channels, this means that the primary channel **will not be used** if there is no client in the outer region, or if at a given moment the AP is only transmitting to the inner region client. *See* Bugeja at ¶35. Thus, Bugeja’s primary channel, which Petitioner alleges is the claimed “mandatory channel,” is **not** “always used for transmission,” as the claim requires.

(c) [1B]

119. Bugeja-Ho fails to disclose the step of “transmitting wireless packets...only when the mandatory channel is idle.” As discussed above with respect to [1A], Bugeja-Ho does not disclose the claimed “mandatory channel.”

Thus, it follows that Bugeja-Ho also fails to disclose transmission on a mandatory channel.

120. Further, Bugeja teaches against transmitting “only when the mandatory channel is idle.” For example, as discussed above with respect to [1A], Bugeja teaches that transmission on *any* channel—whether secondary or primary—will take place regardless of the state of any other channel. Thus, Bugeja does not teach transmitting *only* when the “mandatory channel” is idle.

121. It is my opinion that Bugeja teaches against tying transmission to the idle state of a “mandatory channel,” even when multiple channels are available. Specifically, there is only one embodiment in Bugeja that provides anything approaching the multi-channel architecture that the ’551 Patent is directed to—the multi-channel client in Bugeja’s inner region, which may use up to three channels to transmit and receive packets simultaneously. Bugeja at ¶46. Petitioner acknowledges this embodiment but, tellingly, provides no explanation of its significance. Paper No. 2 at 55. In fact, Bugeja indicates that this multi-channel client uses any one of, or all three channels, indiscriminately. *See* Bugeja at ¶46. The only discernable criteria for channel use in this embodiment is a channel’s own idle state, not the idle state of the primary channel.

2. Claim 2

122. For at least the reasons addressed below, Bugeja-Ho fails to disclose the limitations of claim 2, which require distinguishing between a STA A, which has a “mandatory channel” set, from a STA B, which does not have a “mandatory channel.”

(a) [2PRE]

123. As for claim 1, whether Bugeja-Ho discloses use of a single channel that may be combined with MIMO transmission technology is beside the point. Bugeja-Ho does not disclose a “mandatory channel” as required by the claims, as discussed further below and with respect to claim 1.

(b) [2A]

124. Bugeja-Ho does not disclose the step of “distinguishing an STA A from an STA B, the STA for which a mandatory channel is set, the STA B for which no mandatory channel is set, the mandatory channel being always used for transmission.”

125. First, as discussed for claim 1, Bugeja-Ho does not disclose a “mandatory channel” because, in general, only a *single channel* is assigned to a given client, and because Bugeja does not teach any distinction between its primary and secondary channels based on whether it’s idle state governs transmission.

126. Second, since Bugeja teaches that channel(s) assigned to a client are used indiscriminately, there is no way to distinguish between an STA with an alleged “mandatory channel” from one without. For example, as discussed for claim 1, Petitioner appears to interpret “mandatory channel” as being merely a channel that is always used for a particular device, even if it is the only channel available. However, if this interpretation is adopted, then there is no way to distinguish between clients that are assigned the primary channel from those that have been assigned a secondary channel on the basis of whether they have a “mandatory channel”—rather, under Petitioner’s interpretation, clients assigned to a secondary channel also have a “mandatory channel” because they have one channel that is “always used” for transmission. The same result obtains for multichannel clients, because Bugeja teaches that multichannel clients can access all three of the primary and secondary channels, but need not transmit on any particular one. *See supra* at [1A]. Thus, multichannel clients likewise cannot be distinguished on the basis of whether they have a “mandatory channel.”

127. Petitioner argues that because Bugeja can distinguish between clients “based on their distance from the AP,” this can satisfy claim element [2A]. Paper No. 2 at 68. This argument is beside the point—claim 2 requires distinguishing clients based on **whether it has a “mandatory channel,”** not whether it is close to an AP or not. As discussed above, if Petitioner’s interpretation of “mandatory

channel” were adopted, then a secondary channel assigned to a single-channel client in the inner region also has a “mandatory channel.”

(c) [2B]

128. Bugeja-Ho does not transmit to an STA A using a mandatory channel, for at least the reasons addressed above for claim element [1B].

(d) [2C]

129. Bugeja-Ho does disclose transmission using idle wireless channels without use of a “mandatory channel,” as to a multichannel client in Bugeja’s inner region. However, as pointed out above with respect to claim elements [1A] and [2A], this is the *only* form of transmission that Bugeja-Ho discloses. Indeed, the only criterion for transmission on a given channel in Bugeja is its own idle state. Thus, by Petitioner’s own reasoning, a multichannel client in Bugeja’s inner region may transmit over any one, two, or all three available channels, including transmitting over a secondary channel without concurrent use of a primary channel. *See supra* at [1A], Paper No. 2 at 70.

3. Claim 3

130. Claim 3 depends from claim 1 or claim 2. Bugeja-Ho fails to disclose the limitations of claim 3 because it fails to disclose either the elements of claim 1 or 2.

4. Claim 5

131. Claim 5 is the apparatus-analog of claim 1. Thus, Bugeja-Ho fails to disclose claim 5 because it fails to disclose a unit for performing the steps of claim 1.

5. Claim 6

132. Claim 6 is the apparatus-analog of claim 2. Thus, Bugeja-Ho fails to disclose claim 2 because it fails to disclose a unit for performing the steps of claim 2.

6. Claim 7

133. Claim 7 depends from claims 5 or 6, and is the apparatus analog of claim 3. Thus, Bugeja-Ho fails to disclose claim 7 for reasons similar to those addressed for claims 3, 5, and 6.

XI. PETITIONER FAIL TO DEMONSTRATE THAT THERE IS REASONABLE LIKELIHOOD ANY CHALLENGED CLAIM IS UNPATENTABLE UNDER GROUND 4: CLAIMS 4 AND 8

134. Claims 4 and 8 are dependent claims. Claim 4 depends from claims 1 or 2, and claim 8 depends from claims 5 or 6. Neither Shpak-Ho-Thielecke nor Bugeja-Ho-Thielecke disclose claims 4 or 8 for at least the following reasons.

1. Shpak-Ho-Thielecke fails to disclose claims 4 or 8

135. As discussed with respect to Ground 1, Shpak-Ho fails to disclose the elements of claim 1 because, *inter alia*, it fails to disclose the claimed “mandatory

channel.” Thielecke does not cure these deficiencies, because it also pertains to the use of a single frequency channel on which MIMO transmissions may take place. *E.g.*, Thielecke at ¶9, 32. Thus, Shpak-Ho-Thielecke fails to disclose claim 4 for at least the same reasons as those discussed for claim 1. Petitioner has not attempted to argue that Shpak-Ho meets the requirements of claim 2.

136. Claim 8, which is the apparatus analog of claim 4, depends from claims 5 or 6. Thus, Shpak-Ho-Thielecke does not disclose claim 8 for at least the same reasons as addressed for claim 5. Petitioner has not attempted to argue that Shpak-Ho meets the requirements of claim 6.

137. Further, Shpak-Ho-Thielecke fails to disclose claims 4 or 8 because merely reducing the number of MIMO streams cannot satisfy “selectively using the **multiple wireless channels or the MIMO.**” Petitioner admits that Shpak-Ho only discloses a single channel that is MIMO, but argues that selecting between “multiple wireless channels or the MIMO” can consist simply of adjusting the number of MIMO data streams. Paper No. 2 at 73. This is plainly not what the claim language requires—the choice presented in claims 4 and 8 is between “multiple wireless channels” and “MIMO,” **not** between “single channel without MIMO” and “single channel with MIMO.” As the ’551 Patent teaches, MIMO technology permits multiple data streams in a *single channel*, and thus reducing or increasing the number of MIMO paths (“layers” or “strata” in Thielecke) does not

affect the number of channels involved. *See e.g.*, '551 Patent at 1:61-63 (“In MIMO, different wireless packets are transmitted from a plurality of antennas at the same time on **the same wireless channel.**”) (emphasis added).

2. Bugeja-Ho-Thielecke fails to disclose claims 4 or 8

138. As discussed above with respect to Ground 3, Bugeja-Ho fails to disclose the claims 1, 2, 5, or 6, because Bugeja-Ho fails to disclose a “mandatory channel,” and because Bugeja-Ho fails to disclose distinguishing between stations based on whether they have a “mandatory channel.” Thielecke fails to remedy these defects. Thus, Bugeja-Ho-Thielecke fails to disclose claims 4 and 8 for at least the same reasons as those addressed with respect to claims 1, 2, 5 and 6.

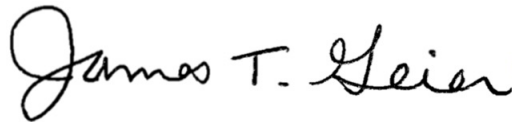
139. Further, as for Shpak-Ho-Thielecke, Bugeja-Ho-Thielecke also discloses no more than adjusting the number of MIMO data streams *within a single channel*. There is no selection between “multiple wireless channels” and MIMO, as claims 4 and 8 require.

XII. CONCLUSION

140. I currently hold the opinions that I have expressed in this declaration. However, my analysis may continue, and I may acquire or receive additional information or insights that may result in revised or supplemental observations or opinions.

141. I declare that all statements made herein on my own knowledge are true and that all statements made on information and belief are believed to be true, and further, that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 or Title 18 of the United State Code, and that such willful false statements may jeopardize the validity of the '551 Patent.

Executed: November 20, 2020 in Grand Rivers, Kentucky.

A handwritten signature in black ink that reads "James T. Geier". The signature is written in a cursive style with a large initial "J".

James T. Geier

James T. Geier**CONTACT INFORMATION****Name:** James T. Geier**Title:** Principal Consultant**Company:** Wireless-Nets, Ltd.**Address:** 2468 Locust Hill Blvd., Beavercreek, Ohio 45431 U.S.A.**Email:** jimgeier@wireless-nets.com**Cell Phone:** +1 937-829-0008**Website:** www.wireless-nets.com**PROFILE**

James Geier has 40 years of experience in the communications industry designing, analyzing, and implementing communications systems, wireless networks, and mobile wireless devices. He has authored over a dozen books on mobile and wireless topics, including Designing and Deploying 802.11 Wireless Networks (Cisco Press), Implementing 802.1X Security Solutions (Wiley), Wireless Networking Handbook (New Riders) and Network Re-engineering (McGraw-Hill). He had been an active participant within standards organizations, such as the IEEE 802.11 Working Group and the Wi-Fi Alliance. He has served as Chairman of the IEEE Computer Society, Dayton Section, and various conferences dealing with wireless networking.

PROFESSIONAL EXPERIENCE**Principal Consultant and Founder – Wireless-Nets, Ltd. (Apr 2000 - present)**

- Designs mobile devices and implements corresponding software / firmware.
- Designs and integrates Wi-Fi, Bluetooth, cellular, Ethernet and USB transceivers into mobile devices, such as smart phones, hospital patient monitors, cable T.V. boxes, and bar code scanners.
- Designs large-scale wireless networks for municipalities, hospitals, airports, and manufacturing facilities for supporting voice, video and data applications.

President, CEO, and Cofounder – Health Grade Networks LLC. (Aug 2014 – Dec 2015)

- Provided strategic direction and management of the company for implementing wireless network solutions.

Product Engineer / Manager - Monarch Marking Systems (Aug 1996 – Mar 2000)

- Designed and implemented RF radios for Monarch's bar code scanners and printers.
- Integrated Ethernet and USB transceivers into tabletop printers.
- Designed and implemented wireless middleware software for improving performance between mobile wireless devices and application servers.
- Designed and implemented wireless network infrastructures for wireless bar code scanners and portable printers used in retail and manufacturing applications.

Senior Systems Engineer - TASC, Inc. (Mar 1994 to Jul 1996)

- Designed and implemented an enterprise-wide Ethernet / IEEE 802.3 and wireless network for Dayton Power and Light to support the migration from mainframe to client/server systems.
- Designed an information system architecture that supports internal and external communications for the U.S. Navy's NSSN attack submarine.
- Analyzed requirements for hardware, software, and support of the Joint Logistics Systems Center (JLSC) Materiel Management Standard System (MMSS) for the combined U.S. militaries.

Senior Systems Engineer - Adroit Systems, Inc. (Aug 1992 to Feb 1994)

- Researched and analyzed emerging wireless network technologies as part of the Department of Defense Airborne Reconnaissance Data Link Architecture (ARDA) study, supporting communications for airborne systems.
- Designed a software tool that aids network engineers in planning, upgrading and maintaining shipboard computer networks - based on a Small Business Innovative Research (SBIR) government grant obtained from the U.S. Navy.

Systems Design Engineer - Information Systems Center, Captain U.S. Air Force (Sep 1990 – Jun 1992)

- Evaluated the effectiveness of wireless LAN technology for use in mobile and portable military environments.
- Represented the Air Force as part of the IEEE 802.11 Wireless LAN standards development.
- Designed and implemented large-scale Ethernet / IEEE 802.3 LANs and WANs for various government organizations.

Communications Test Engineer - AFCC Operational Test and Evaluation Center, Lieutenant U.S. Air Force (Sep 1986 - May 1989)

- Performed analog, digital, and protocol tests on various government wireless computer networks and long-haul communications systems.
- Developed approaches and methods for testing computer networks.

Radar Technician - 75th TCF, U.S. Air Force (Dec 1977 - Jun 1983)

- Performed acceptance testing of newly designed radar systems.
- Maintained automatic tracking radar systems in support of tactical Air Force operations worldwide.

EDUCATION

M.S., Electrical Engineering, Air Force Institute of Technology (1990) – thesis involved designing and implementing a wireless mesh network for the U.S. Department of Defense.

B.S., Electrical Engineering, California State University (1985).

MILITARY EXPERIENCE

U.S. Air Force, Dec 1977 – Jun 1992 (Commissioned Officer Mar 1986 – Jun 1992).

BOOK PUBLICATIONS

- *Designing and Deploying 802.11 Wireless LANs (2nd Edition)*, Cisco Press, 2015.
- *Designing and Deploying 802.11n Wireless LANs*, Cisco Press, 2010.
- *Implementing 802.1x Security Solutions*, Wiley, 2008.
- *Deploying Voice over Wireless LANs*, Cisco Press, 2007.
- *Computer Security*, Wiley, 2007.
- *Computer Transfer and Backup*, Wiley, 2007.
- *CCIE Routing and Switching – Official Exam Certification Guide*, 2nd Edition, Cisco Press, 2006.
- *Wireless Networks – 5-minute Fixes*, Wiley, 2006.
- *PCs – 5-minute Fixes*, Wiley, 2006.
- *Wireless Networks – First Step*, Cisco Press, 2005 (translated to Chinese, French, Hungarian, Italian, Korean, Polish, Portuguese, and Romanian).
- *Certified Wireless Analysis Professional - Official Study Guide*, McGraw-Hill, 2004.

- *Wireless LANs, 2nd Edition*, SAMS, 2001.
- *Wireless LANs*, Macmillan Technical Publishing, 1999.
- *Wireless Networking Handbook*, Macmillan (New Riders) Publishing, 1996.
- *Network Re-Engineering*, McGraw-Hill, 1996.

INDUSTRY AFFILIATIONS

Chairman, IEEE Computer Society - Dayton Section:

- Managed the 900-member organization and established a continuing education program.

Chairman, IEEE International Conference on Wireless LAN Implementation:

- Managed all aspects of the conference from 5/91 to 12/92.

Member, Wi-Fi Alliance

- Voting member of the Wireless ISP for Roaming (WISPr) committee.

IEEE 802.11 Wireless LAN Working Group

- Represented interests of the Department of Defense for dealing with applications and frequency allocations.

TEACHING EXPERIENCE

U.S. Naval Post Graduate School

- Developed and regularly instructed a course on wireless network design and security to students and faculty.

Wright State University

- Periodically instructed graduate courses on computer communications.

USAF Test and Evaluation School

- Developed and instructed a 240 hour training course on wireless system test and evaluation.

Conferences

- Regularly gives presentations at international conferences, including Supercomm (Asia), Scantech (Germany), and IBC (England).

Infocomm Solutions

- Developed and instructed workshops in India, Singapore and Malaysia on wireless network implementation.

Technology Training Corporation (TTC)

- Developed and instructed international training courses in Mexico and South America on wireless networking and network re-engineering.

Educational Services Institute

- Developed and instructed courses on software project management, software testing, system integration and network re-engineering as part of the Project Management Institute (PMI) Project Management Professional (PMP) certification program.

Onsite Training

- Regularly instructs workshops on wireless network design and deployment for product developers, system integrators, hospitals, and enterprises worldwide.

TESTIFYING EXPERIENCE

Cases where James Geier has testified at depositions and trials:

Bertram Communications, LLC v. Simon Westlake, et al.

Law Firm: Kilpatrick Townsend

Expert on behalf of the plaintiff (Bertram Communications) during 2019-2020 regarding trade secret litigation within the State of Wisconsin, Circuit Court, Sheboygan County. Analyzed wireless designs and other case documents associated with wireless ISP systems in relation to trade secret analysis; wrote expert reports regarding associated analysis; testified at deposition.

Ingenico, Inc.

Law firm: Sunstein Kann Murphy & Timbers

Expert on behalf of Ingenico regarding an Inter Partes Review (IPR) with the USPTO Patent Trial and Appeal Board during 2018-2020. Analyzed patents, prior art and other case documents associated with wireless credit card processing systems; wrote declarations regarding patent invalidity; testified at depositions.

Next Caller, Inc.

Law firm: McDermott Will & Emery

Expert on behalf of Next Caller regarding an Inter Partes Review (IPR) with the USPTO Patent Trial and Appeal Board during 2018-2019. Analyzed patents, prior art and other case documents associated with caller profile systems; wrote a declaration regarding patent validity; testified at deposition.

Samsung, Inc.

Law firm: Kirkland & Ellis

Expert on behalf of Samsung regarding an Inter Partes Review (IPR) with the USPTO Patent Trial and Appeal Board during 2018-2019. Analyzed patents, prior art and other case documents associated with battery charging systems for mobile devices; wrote declarations regarding patent invalidity; testified at deposition.

Foxconn Technology Group

Law firm: McDermott Will & Emery

Expert on behalf of Foxconn regarding an Inter Partes Review (IPR) within the USPTO Patent Trial and Appeal Board during 2018. Analyzed patents, prior art and other case documents associated with short circuit protection for reversible connectors; wrote a declaration regarding patent invalidity; testified at deposition.

ZTE, Inc.

Law firm: McDermott Will & Emery

Expert on behalf of ZTE, Inc. regarding an Inter Partes Review (IPR) within the USPTO Patent Trial and Appeal Board during 2018. Analyzed patents, prior art and other case documents associated with supplying a power source to mobile devices over standardized ports; wrote a declaration regarding patent invalidity; testified at deposition.

Certain Wireless Headsets

Law firm: Haynes Boone

Expert on behalf of defendants (BlueAnt, Creative, GN Netcom, Jawbone and Sony) during 2015-2018 regarding patent litigation within the International Trade Commission (ITC). Analyzed patents and other case documents associated with wireless audio headsets; wrote expert reports regarding patent written description and inception date; testified at deposition.

Camsoft Data Systems, Inc. v. Southern Electronics Supply and Active Solutions, LLC

Law firm: Melancon & Rimes

Expert on behalf of the plaintiff (Camsoft Data Systems) during 2014-2018 regarding trade secret litigation within the 19th Judicial District Court – State of Louisiana. Analyzed wireless designs and other case documents associated with wireless video surveillance systems in relation to trade secret analysis; wrote expert reports regarding associated analysis; testified at deposition.

United States of America v. IBM Corporation

Law firm: Jones Day

Expert on behalf of the defendant (IBM Corporation) during 2017 regarding litigation within the U.S. District Court, Northern District of Illinois - Eastern Division. Analyzed designs, contracts, and other case documents associated with wireless networks and integration methods; wrote an expert report regarding associated analysis; testified at deposition.

Emerson Electric Co.

Law firm: Ropes & Gray

Expert on behalf of Emerson Electric Co. regarding an Inter Partes Reviews (IPRs) within the USPTO Patent Trial and Appeal Board during 2016-2017. Analyzed patents, prior art and other case documents associated with optimum route determination over computer networks; wrote declarations regarding patent invalidity; testified at multiple depositions.

Emerson Electric Co.

Law firm: Ropes & Gray

Expert on behalf of Emerson Electric Co. regarding a Covered Business Method Patent Review (CBMPR) within the USPTO Patent Trial and Appeal Board during 2016-2017. Analyzed patents, prior art and other case documents associated with systems for communicating information; wrote declarations regarding patent invalidity; testified at multiple depositions.

Chrimar v. Aerohive

Law firm: Wilson, Sonsini, Goodrich & Rosati

Expert on behalf of the defendant (Aerohive) during 2016-2017 regarding patent litigation within the U.S. District Court – Eastern Division of Texas (Judge Gilstrap). Analyzed patents, products, and other case documents associated with power-over-Ethernet technologies; performed testing of power-over-Ethernet products; wrote an expert report regarding patent non-infringement; testified at deposition and jury trial.

Intellectual Ventures v. AT&T

Law firm: Dechert

Expert on behalf of the plaintiff (Intellectual Ventures) during 2014-2017 regarding patent litigation within the U.S. District Court - Delaware. Analyzed patents, prior art and other case documents associated with IEEE 802.11 encryption and quality of service (QoS) technologies; performed testing and protocol

analysis of Wi-Fi products; wrote expert reports regarding patent infringement and validity; testified at deposition.

Chrimar v. AMX

Law firm: McDermott, Will & Emery

Expert on behalf of the defendant (AMX) during 2016 regarding patent litigation within the U.S. District Court – Eastern Division of Texas. Analyzed patents, products, prior art and other case documents associated with power-over-Ethernet technologies; performed testing of power-over-Ethernet products; wrote expert reports regarding patent non-infringement and invalidity; testified at deposition.

Universal Remote

Law firm: Ostrolenk Faber

Expert on behalf of Universal Remote regarding an Inter Partes Review (IPR) within the USPTO Patent Trial and Appeal Board filed during 2015. Analyzed patents, prior art and other case documents associated with TV remote control technologies; wrote a declaration regarding patent invalidity; testified at deposition.

Skyhook v. Google

Law firm: Tensegrity

Expert on behalf of the plaintiff (Skyhook) during 2012-2015 regarding patent litigation within the U.S. District Court - Boston. Analyzed patents, software, and other case documents associated with Wi-Fi-based location systems; performed in-depth review and analysis of associated software; wrote an expert report regarding patent infringement; testified at deposition.

MTEL v. UPS

Law firm: Reed & Scardino

Expert on behalf of the plaintiff (MTEL) during 2014 regarding patent litigation within the U.S. District Court – Atlanta. Analyzed patents, prior art and other case documents associated with mail delivery notifications; wrote an expert report regarding patent validity; testified at deposition.

Motorola v. Microsoft

Law firm: Sidley Austin

Expert on behalf of the defendant (Microsoft) during 2012 regarding patent litigation within the International Trade Commission (ITC). Analyzed patents, products, prior art and other case documents associated with data addressing and data update mechanisms; wrote expert reports on patent invalidity and indirect non-infringement; testified at deposition; testified at trial within the International Trade Commission (Judge Shaw).

Motorola v. Microsoft

Law firm: Sidley Austin

Expert on behalf of the defendant (Microsoft) during 2011 regarding patent litigation within the International Trade Commission (ITC). Analyzed patents, products, prior art and other case documents associated with security and encryption protocols; analyzed product firmware; wrote expert reports regarding patent invalidity and non-infringement; testified at deposition; testified at trial within the International Trade Commission (Judge Shaw).

Motorola v. Microsoft

Law firm: Sidley Austin

Expert on behalf of the defendant (Microsoft) during 2011 regarding patent litigation within the U.S. District Court – Southern Florida. Analyzed patents, products, prior art and other case documents associated with application registry and data update technologies; wrote expert reports regarding patent invalidity and non-infringement; testified at deposition.

Autocell v. Cisco Systems

Law Firm: Hanify & King

Expert on behalf of the plaintiff (Autocell) during 2009-2011 regarding patent litigation within the U.S. District Court - Delaware. Analyzed patents, products, prior art and other case documents associated with transmit power control of 802.11 radios and access points; performed laboratory and field testing of associated products; analyzed product firmware; wrote expert reports regarding patent infringement and validity; testified at deposition.

Truckstop.Net v. Sprint Communications

Law Firm: Holland & Hart

Expert on behalf of the plaintiff (Truckstop.Net) during 2004-2010 regarding contract litigation within the U.S. District Court - Idaho. Analyzed case documents including wireless network designs and contracts associated with wireless networks installed at truck stops; performed in-depth field testing and analysis of wireless signal coverage and performance at truck stops located throughout the U.S.; wrote expert reports regarding test results and review of case documents; testified at deposition.