EXHIBIT 1003

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re *Ex Parte* Reexamination of:	Schmidt
U.S. Patent No.:	7,058,040
App. Ser. No.:	09/962,718
Issue Date:	June 6, 2006
Filing Date:	September 21, 2001
Title:	Channel Interference Reduction
Requester Atty. Dkt. No:	4910-0106

DECLARATION OF JAMES GEIER

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I, James Geier, declare as follows:

I. INTRODUCTION

1. I have been retained by Rothwell, Figg, Ernst, and Manbeck, P.C. on behalf of Unified Patents, LLC ("Unified") to provide my opinion concerning the validity of claims 1-6 and 16 (the "Challenged Claims") of U.S. Patent No. 7,058,040 (the "'040 Patent" or the "Patent," EX1001) in support of Unified's Request for Ex Parte Reexamination of the '040 Patent (the "Request").

2. The facts and opinions expressed herein are true and accurate to the best of my knowledge and understanding based on the information I have reviewed to date.

II. QUALIFICATIONS

3. I believe I am well qualified to serve as a technical expert in this matter based upon my extensive experience in mobile wireless devices and wireless networking. A detailed description of my professional qualifications, including a listing of my specialties/expertise and professional activities, is contained in my *curriculum vitae*, a copy of which is provided as Appendix A. Below is a short summary of my professional qualifications.

4. I earned my Master's degree in Electrical Engineering in 1990 from the Air Force Institute of Technology and my Bachelor of Science in Electrical Engineering in 1985 from California State University. My Master's thesis involved the development of a wireless mesh network for the U.S. Department of Defense, which included the design, implementation and testing of a packet routing algorithm and supporting hardware and software.

5. I have over 30 years of experience in the communications industry and assisted over 100 companies in designing, analyzing, and implementing communications systems, wireless, and wired networks, and mobiles devices. I have 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).

6. Currently, I am the principal consultant and founder of my own company Wireless-Nets, Ltd., which I founded in 2000, where I provide independent technical consulting services relating to design, analysis, and implementation of communication systems, wireless and wired networks, and mobile devices. I have been involved in designing large-scale wireless networks for various facilities to support voice, video, and data applications. I have also designed and integrated Wi-Fi, Bluetooth, cellular, Ethernet and USB transceivers into dozens of mobile devices.

7. For example, throughout the period 2000 to present, I've performed RF interference testing and analysis for dozens of product manufacturers and helped them resolve issues resulting from RF interference. This involved analyzing the interference using a spectrum analyzer and determining the resulting impacts on 802.11 and Bluetooth transceivers located within products, such as bar code scanners, wireless voice-over IP phones and industrial wireless computer interfaces. This involved assisting in the implementation of methods to lessen the impacts of the interfering signals. Also, for example, I assisted Draeger Medical Systems in solving issues they were experiencing with wireless (IEEE 802.11) heart monitoring devices that hospitals were using to monitor patients in hospitals. In this project, I performed substantial packet / protocol testing in multiple hospitals, analyzed the resulting data, identified the underlying issues, and assisted Draeger with redesigning the functions related to roaming and handoff mechanisms within the firmware and network driver used for interfacing with the wireless transceiver. Through Wireless-Nets, I have also helped companies integrate Bluetooth

transceivers into their products. For example, I analyzed and designed a solution for integrating Bluetooth transceivers into devices used to for drivers and plant operators to monitor the functions and status onboard concrete trucks as they entered and departed a plant.

8. From 1977 to 1992, I served under the U.S. Air Force and was a commissioned officer from 1986 to 1992. As a Lieutenant, I was involved in the testing and development of government computer networks and long-haul communications systems, many of which utilized time-division multiplexing (TDMA) protocols. As a Captain, I was heavily involved in wireless LAN technology and represented the U.S. Air Force as part of the IEEE 802.11 wireless LAN standards development. My responsibilities included analyzing the effectiveness of wireless technology for mobile and portable military environments and designing large-scale LANs and WANs for various government organizations. For example, in 1990 at Wright-Patterson AFB in Ohio, I designed a WAN that supported the interconnection of 20,000 users to a supercomputer and multiple mainframe computers. This network included numerous routers tying together terminals, PCs, servers, and LANs.

9. Following the U.S. Air Force, I held several senior engineering positions with different companies and managed various aspects of the design and implementation of wireless network technologies. At Adroit Systems Inc., I was a Senior Systems Engineer and developed a software tool for the maintenance of shipboard computer networks. After two years, I took a position as a Senior Systems Engineer at TASC, Inc., where I designed and implemented an enterprise-wide Ethernet/ IEEE 802.3 and wireless network to support the migration from mainframe to client/server systems. Later, I began as a Product Engineer and then, was promoted to an engineering Director position at Monarch Marking Systems. There, I designed and implemented wireless middleware software for improving performance between mobile wireless

devices and applications servers. Also at Monarch, I integrated early Bluetooth and 802.11 transceivers into Monarch's handheld data collectors and tabletop printers. I also co-founded and served as the President and CEO of my company Health Grade Networks, LLC, a company that provided strategic recommendations for implementing wireless network (IEEE 802.11) solutions.

10. I am also an active participant in standards organizations, such as IEEE 802.11 Working Group and the Wi-Fi Alliance. I have served as Chairman of the IEEE Computer Society, Dayton Section. I have also attended and provided presentations at several international conferences relating to wireless networking and communication systems, such as Supercomm (Asia), Scantech (Germany), and IBC (England).

11. I also regularly instruct and develop courses related to wireless networking and computer communications. I have taught these courses at the U.S. Naval Post Graduate School, Wright State University, and Educational Services Institute. I have also instructed workshops internationally on wireless network implementation in India, Singapore, and Malaysia. Additionally, I have provided various trainings relating to wireless network design and deployment. For instance, I had developed and implemented a 240 hour training course on wireless system test and evaluation for USAF Test and Evaluation School.

12. Since around 2005, I have served as an expert in a number of litigation matters. In the last four years, I have been engaged as an expert or consultant on a number of occasions, and have testified at trial and in deposition as detailed in my *curriculum vitae* (Appendix A).

13. I am being compensated at my standard consulting rate of $450 per hour. My compensation is not contingent upon the results of my study and analysis, the substance of my opinions, or the outcome of any proceeding involving the Challenged Claims. I have no

financial interest in the outcome of this matter, any other matters relating to the '040 Patent, or in Unified or the owner of the '040 Patent.

III. MATERIALS CONSIDERED

14. The analysis that I provide in this declaration is based on my knowledge, education, experience, research, and training in the field that I have accumulated over the years, as well as the documents that I have considered, including the '040 Patent (EX1001).

15. I have also reviewed the prosecution history of the '040 Patent (EX1002) and the materials listed and discussed below, including the prior art and other technical sources. *See* Section VI (Technology Background) and Section VIII (Overview of Prior Art References).

IV. SUMMARY OF OPINIONS

16. It is my opinion that claims 1-6 and 16 of U.S. Patent No. 7,058,040 (the "Challenged Claims") would have been obvious as of the earliest asserted filing date of September 21, 2001.

17. Claims 1-6 and 16 of the '040 Patent were allowed on the basis of the claim limitation of dynamically adjusting time-slot channels to remain within a desired level of service. The other claim limitations (computing time-slot channels, and allocating time-slot channels) are tied to this same idea. But it is nothing new. Jokinen – entitled "Dynamic allocation of radio capacity in a TDMA system" – describes precisely this, i.e., "allocating dynamically more capacity, i.e. more time slots, to the form of service requiring it at a given time." EX1004, 1:62-64. Similarly, Joeressen discloses an allocation pattern (which controls the allocation of time slots) that is preferably variable, and in particular, may be variable depending on whether particular devices require higher communication rates or real time communication for example. EX1005, 1:57-58, 7:12-15. Stanwood, in turn, also discloses dynamic allocation of bandwidth

(time slots) that is responsive to the needs of a particular link, and that may vary due to several factors including the type of service provided over the link and the user type. EX1006, 4:13-31.

18. The '040 Patent also explains that it was motivated by the desire to reduce RF interference specifically in the context of Bluetooth and 802.11, which operate in overlapping frequencies. EX1001, 1:5-67. Claims 2 and 3 require, respectively, that one of the transmission media conforms to an 802.11 specification or a Bluetooth specification. But the dynamic allocation method of the '040 Patent is not inventive even in this more specific context. Although the Bluetooth and 802.11 specifications were relatively new as of the priority date of the '040 Patent, it was widely recognized that it was desirable to provide a mobile terminal which could operate in both specifications simultaneously, and that doing so would require minimizing interference since those specifications operate in overlapping frequency ranges. *See, e.g.*, EX1007, Abstract, claim 8, 1:40-50, 1:52-57; EX1008, ¶¶ [0002], [0006], claim 16; EX1009, ¶¶ [0003], [0006], [0014], [0017], claims 7 and 9; EX10010, Abstract; 1:41-48, 1:56-59. In particular, a POSITA would have been motivated to use the interference reducing teachings of Jokinen and Joeressen in order to provide a system where both 802.11 and Bluetooth could operate simultaneously in view of the overlapping frequency ranges of those protocols and the known interference problems that could create.[1]

19. I understand that the Request raises eight Substantial New Questions ("SNQs"), which are summarized as follows:

[1] The claims do not require *both* 802.11 and Bluetooth. Claim 2 depends from claim 1 and requires one of the media conform to an 802.11 specification. Claim 3 depends from claim 1 and requires, instead, that one of the media conform to a Bluetooth specification. The specification describes an example where both 802.11 and Bluetooth are operating simultaneously, although the claims do not require that.

SNQ	Reference(s)	Claims
SNQ 1	Jokinen (EX1004)	1-6 and 16
SNQ 2	Jokinen (EX1004) in view of Nevo (EX1007) or Bridgelall (EX1010)	2-3
SNQ 3	Joeressen (EX1005)	1-6 and 16
SNQ 4	Joeressen (EX1005) in view of Stanwood (EX1006)	1-6 and 16
SNQ 5	Joeressen (EX1005) in view of Nevo (EX1007) or Bridgelall (EX1010)	2-3
SNQ 6	Joeressen (EX1005) and Stanwood (EX1006) in view of Nevo (EX1007) or Bridgelall (EX1010)	2-3
SNQ 7	Jokinen (EX1004) and Joeressen (EX1005)	1-6 and 16
SNQ 8	Jokinen (EX1004) and Joeressen (EX1005) in view of Nevo (EX1007) or Bridgelall (EX1010)	2-3

20. The Challenged Claims of the '040 Patent would have been obvious based on the prior art and each of these SNQs. *See* Section IX. The details of my opinions are set forth below.

V. LEGAL STANDARDS

A. Obviousness

21. I have been informed that a person cannot obtain a patent on an invention if the differences between the invention and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person of ordinary skill in the art or "POSITA." I have been informed that a conclusion of obviousness may be founded upon more than a single item of prior art. I have been further informed that obviousness is determined by evaluating the following factors: (1) the scope and content of the prior art, (2) the differences between the prior art and the claim at issue, (3) the level of ordinary skill in the pertinent art, and

(4) secondary considerations of non-obviousness. In addition, the obviousness inquiry should not be done in hindsight. Instead, the obviousness inquiry should be done through the eyes of a POSITA at the time of the alleged invention.

22. In considering whether the prior art renders a patent claim obvious, I have been informed that I can consider the scope and content of the prior art, including the fact that one of skill in the art would regularly look to the disclosures in patents, trade publications, journal articles, conference papers, industry standards, product literature and documentation, texts describing competitive technologies, requests for comment published by standard setting organizations, and materials from industry conferences, as examples. I have been informed that for a prior art reference to be proper for use in an obviousness analysis, the reference must be "analogous art" to the claimed invention. I have been informed that a reference is analogous art to the claimed invention if: (1) the reference is from the same field of endeavor as the claimed invention (even if it addresses a different problem); or (2) the reference is reasonably pertinent to the problem faced by the inventor (even if it is not in the same field of endeavor as the claimed invention). In order for a reference to be "reasonably pertinent" to the problem, it must logically have commended itself to an inventor's attention in considering his problem. In determining whether a reference is reasonably pertinent, one should consider the problem faced by the inventor, as reflected either explicitly or implicitly, in the specification. I believe that all of the references I considered in forming my opinions are well within the range of references a POSITA would have consulted to address the type of problems addressed by the claims of the '040 Patent.

23. I have been informed that, in order to establish that a claim was obvious based on a combination of prior art elements, a clear articulation of the reason(s) why a claim would have

been obvious must be provided. Specifically, I am informed that, under the U.S. Supreme Court's decision in *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 401 (2007) ("KSR"), a combination of multiple items of prior art renders a patent claim obvious when there was an apparent reason for one of ordinary skill in the art, at the time of the invention, to combine the prior art, which can include, but is not limited to, any of the following rationales: (A) combining prior art methods according to known methods to yield predictable results; (B) substituting one known element for another to obtain predictable results; (C) using a known technique to improve a similar device in the same way; (D) applying a known technique to a known device ready for improvement to yield predictable results; (E) trying a finite number of identified, predictable potential solutions, with a reasonable expectation of success; (F) identifying that known work in one field of endeavor may prompt variations of it for use in either the same field or a different one based on design incentives or other market forces if the variations are predictable to one of ordinary skill in the art; or (G) identifying an explicit teaching, suggestion, or motivation in the prior art that would have led one of ordinary skill to modify the prior art reference or to combine the prior art references to arrive at the claimed invention. I am also informed that where there is a motivation to combine, claims may be prima facie obvious provided a POSITA would have had a reasonable expectation of success regarding the proposed combination.

24. I am informed that the existence of an explicit teaching, suggestion, or motivation to combine known elements of the prior art is a sufficient, but not a necessary, condition to a finding of obviousness. This so-called "teaching-suggestion-motivation" test is not the exclusive test and is not to be applied rigidly in an obviousness analysis. In determining whether the subject matter of a patent claim is obvious, neither the particular motivation nor the avowed purpose of the patentee controls. Instead, the important consideration is the objective reach of

the claim. In other words, if the claim extends to what is obvious, then the claim is invalid. I am further informed that the obviousness analysis often necessitates consideration of the interrelated teachings of multiple patents, the effects of demands known to the technological community or present in the marketplace, and the background knowledge possessed by a person having ordinary skill in the art. All of these issues may be considered to determine whether there was an apparent reason to combine the known elements in the fashion claimed by the patent.

25. I am also informed that, in conducting an obviousness analysis, a precise teaching directed to the specific subject matter of the challenged claim need not be found because it is appropriate to take account of the inferences and creative steps that a POSITA would employ. The prior art considered can be directed to any need or problem known in the field of endeavor at the time of invention and can provide a reason for combining the elements of the prior art in the manner claimed. In other words, the prior art needs not be directed towards solving the same specific problem as the problem addressed by the patent. Further, the individual prior art references themselves need not all be directed towards solving the same problem. I am informed that, under the *KSR* obviousness standard, common sense is important and should be considered. Common sense teaches that familiar items may have obvious uses beyond their primary purpose.

26. I also am informed that the fact that a particular combination of prior art elements was "obvious to try" may indicate that the combination was obvious even if no one attempted the combination. If the combination was obvious to try (regardless of whether it was actually tried) or leads to anticipated success, then it is likely the result of ordinary skill and common sense rather than innovation. I am further informed that in many fields it may be that there is little discussion of obvious techniques or combinations, and it often may be the case that market demand, rather than scientific literature or knowledge, will drive the design of an invention. I

am informed that an invention that is a combination of prior art must do more than yield predictable results to be non-obvious.

27. I am informed that, for a patent to be obvious, the claim must have been obvious to a POSITA at the time of the alleged invention. I am informed that the factors to consider in determining the level of ordinary skill in the art include (1) the educational level and experience of people working in the field at the time the invention was made, (2) the types of problems faced in the art and the solutions found to those problems, and (3) the sophistication of the technology in the field. *See* Section VII.D.i below.

28. I am informed that it is improper to combine references if the references teach away from their combination. I am informed that a reference may be said to teach away when a POSITA, upon reading the reference, would be discouraged from following the path set out in the reference, or would be led in a direction divergent from the path that was taken by the patent applicant. In general, a reference will teach away if it suggests that the line of development flowing from the reference's disclosure is unlikely to be productive of the result sought by the patentee. I am informed that a reference teaches away, for example, if (1) the combination would produce a seemingly inoperative device, or (2) the references leave the impression that the product would not have the property sought by the patentee. I also am informed, however, that a reference does not teach away if it merely expresses a general preference for an alternative invention but does not criticize, discredit, or otherwise discourage investigation into the invention claimed.

B. Claim Construction

29. I understand that the primary focus in determining the meaning of a claim limitation is the intrinsic evidence of record, which includes the claims themselves, the specification, and the prosecution history, from the perspective of one of ordinary skill in the art.

30. I understand that claims must be adequately grounded in the specification and the meaning of claim terms must be discerned in the context of the disclosed invention and in the field of art. I further understand that extrinsic evidence, which includes information external to the claims, specification, and prosecution history, such as expert and inventor testimony, dictionaries, and textbooks, may also be considered, but may not be used to contradict or override the intrinsic evidence. I also understand that the words used in a claim are generally given their plain and ordinary meaning as understood by a person of ordinary skill in the art in question at the time of the invention. If a disputed term has no previous meaning to those of ordinary skill in the art, the meaning must be found elsewhere in the patent, including the meaning given by the term's usage in the specification.

31. I have been informed that a somewhat different claim construction analysis applies with respect to means-plus-function and step-plus-function claim elements. As to such claim elements, I am informed that a claim element can be expressed in a manner that recites a means or step for performing a specified function without the recital of structure, material, or acts in support thereof. I am further informed that for such a claim, the claim is to be construed to cover the corresponding structure, material, or acts described in the patent specification and equivalents thereof. Thus, in construing such claims, one must consult the patent specification in order to determine the relevant structures for performing the stated function. And I understand

that when a claim is directed to a computer-implemented means for performing a function, the corresponding structure performed by a programmed computer includes the algorithm itself.

VI. TECHNOLOGY BACKGROUND

32. In this section, I provide a brief overview of the background art as would have been understood by a person of ordinary skill in the art or "POSITA" as of September 21, 2001.

A. Data Transmission Over Multiple Transmission Media

33. By the year 2001, methods for data transmission over first and second media that overlap in frequency were well understood and regularly used in daily life. The need for managing interference between the transmissions on the first and second media was likewise well understood.

34. For example, the background of the '040 Patent explains that as of the time of the invention there was "a high demand" for wireless Personal Area Networks (PANs) and Local Area Networks (LANs), and that it was recognized it was important for Bluetooth and 802.11 to coexist in close proximity:

> Because of a high demand for both wireless PANs and LANs, it's important that Bluetooth and 802.11 coexist in close proximity. A current problem, though, is that the two standards operate in the same 2.4 GHz unlicensed radio band and equally use frequency hopping modulation. This commonality poses a strong potential for radio frequency interference.

EX1001, 1:20-26.

35. The background of the '040 Patent also explains that the number of products incorporating Bluetooth was expected to grow, and that Bluetooth and 802.11 are relevant to wireless communications for devices such as mobile phones, PDAs, and the like:

> Bluetooth, which establishes wireless connections between devices such as mobile phones, PDAs, and headsets, operates at relatively low data rates over short distances using very little power. On the other hand, IEEE 802.11 is a wireless LAN standard approved by IEEE a couple years ago and operates at

> higher data rates over longer distances using more power. Companies today are strongly benefiting from using 802.11-compliant wireless LANs to support efficient mobile communications between handheld data collectors and corporate IS databases.

EX1001, 1:7-19.

36. In addition to mobile phones using Bluetooth and 802.11 standards, mobile phones also used various cellular standards as of the priority date, including cellular communications over frequencies that overlap with those of Bluetooth and 802.11 standards. *See, e.g.*, EX1001, 1:58-59.

37. As an example, Jokinen (EX1004) teaches a system where radio capacity is divided between a packet radio service and circuit switched service. EX1004, Abstract. A POSITA would understand this to include the case where the packet radio service and the circuit switched service overlap in frequency. As another example, Joeressen (EX1005) teaches a "terminal for simultaneously operating in a first mobile radio communications network and a second different radio communications network." EX1005, Abstract. A POSITA would understand this to include the case where the first and second mobile radio communications networks overlap in frequency. Each of Nevo (EX1007), Sugar (EX1008), Chen (EX1009), and Bridgelall (EX1010) teach a device that uses both 802.11 and Bluetooth together, and each teaches that a known problem was to handle interference resulting from the overlapping frequency of these protocols. *See, e.g.*, EX1007, Abstract, claim 8, 1:40-50, 1:52-57; EX1008, ¶¶[0002], [0006], claim 16; EX1009, ¶¶[0003], [0006], [0014], [0017], claims 7 and 9; EX10010, Abstract; 1:41-48, 1:56-59.

B. TDMA Time-slot Assignment

38. Time division multiple access (TDMA) technology predates the '040 Patent's priority date. Indeed, most 2G cellular technology is based on TDMA, and it had been in use since the 1990s, well before the September 21, 2001 priority date. In TDMA, transmissions (e.g., from multiple users) are separated in time, such that they do not occur simultaneously on the same channel. *See, e.g.*, EX1005, 1:11-27; EX1004, FIG. 1.

39. As an example, Jokinen (EX1004) – entitled "Dynamic allocation of radio capacity in a TDMA system" – "relates to a method by which radio capacity is divided dynamically between packet radio service and circuit switched service in a TDMA system in which two-way traffic between base stations and mobile stations takes place in time slots on predetermined channels." EX1004, 1:6-10. Joeressen (EX1005), as another example, explains in its background section that GSM, D-AMPS, and PDC networks use TDMA, and that in TDMA systems, each time slot represents a channel through which a mobile terminal and a base station communicate:

> For example, the GSM, D-AMPS and PDC networks operate using time division multiplexing (TDMA). For each frequency channel, a TDMA time frame is defined. The TDMA time frame has a fixed number of time slots of fixed duration and each time slot represents a channel through which a mobile terminal and a base station communicate. A particular terminal uses a time slot to transmit a message to the base station once per time frame and the base station uses another slot to transmit a message to the particular terminal once per time frame. The TDMA time frames are cyclically repeated one after the other.

EX1005, 1:11-22. Other references, such as Stanwood (EX1006) and Sugar (EX1008) also discuss TDMA. *See* EX1006, 1:62-63, 1:65-2:2; EX1008, ¶ [0067].

40. In short, TDMA was a mature technology, and assigning TDMA time-slot channels to competing transmission media was commonplace as of the priority date.

C. Dynamic Adjustment to Remain within Limits of a Desired Level of Service

41. Dynamic adjustment of channel allocations, and particular, dynamic adjustment to remain within limits of a desired level of service, was also well known by the priority date of the '040 Patent.

42. As an example, Jokinen (EX1004) – entitled "Dynamic allocation of radio capacity in a TDMA system" – "relates to a method by which radio capacity is divided dynamically between packet radio service and circuit switched service in a TDMA system in which two-way traffic between base stations and mobile stations takes place in time slots on predetermined channels." EX1004, 1:6-10. Joeressen (EX1005), as another example, explains that the "allocation pattern is preferably variable," and that it "may depend upon the type and number of devices which are active as slave units in the LPRF network," as "[p]articular devices may require higher communication rates or real time communication for example." EX1005, 1:57-58, 7:12-15. As another example, Stanwood explains that its dynamic allocation scheme may be responsive to changing bandwidth needs:

> The present ATDD invention flexibly and dynamically allocates time slots for either uplink or downlink transmissions in response to the changing bandwidth needs of the communication links. The present invention is particularly useful in wideband or broadband wireless communication systems, although it may also be used in any data communication system where an adaptive and dynamic time division duplexing transmission scheme is desirable.

EX1006, 4:53-60.

43. In particular, it was well known to measure quality of service type parameters, and to make adjustments dynamically based on those measurements, e.g., in order to improve performance, to guarantee a certain quality of service, or otherwise to provide for more efficient and effective communications.

VII. THE '040 PATENT

A. Summary of the '040 Patent

44. U.S. Patent No. 7,058,040 to Schmidt is entitled "Channel interference reduction," and was filed on September 21, 2001.

45. The '040 Patent is directed to "minimizing RF channel interference." *See* EX1001, 1:5. In particular, the '040 Patent is directed to the interference problem that arises when two radio frequency (RF) standards operate in the same frequency bands. *See id.* at 1:22-27 ("A current problem, though, is that the two standards operate in the same 2.4 GHz, unlicensed radio band and equally use frequency hopping modulation. This commonality poses a strong potential for radio frequency interference.").

46. To address this issue – when first and second media overlap in frequency – the '040 Patent provides methods and systems for data transmission that "allocate[e] one or more time slot channels to the first medium for data transmission; allocate[e] one or more of the remaining time-slot channels to the second medium for data transmission; and instruct[] transceivers for the first and second media to communicate only in their allocated time-slot channels." EX1001, 2:1-12. In other words, the transceivers for the first and second media take turns for transmissions. *See, e.g., id.* at 3:51-53. In some embodiments, "[t]he system can also (a) determine a desired level of service for one of the media during a transmission; and (b) dynamically adjust a number of time slots assigned to the media during the transmission to remain within limits of said desired level of service." *Id.* at 2:17-21. One alleged advantage of the '040 Patent's approach is that "allows an end-user of a mobile wireless device, such as a mobile phone or portable computer, to minimize interference and thus to transmit messages and information quickly over wireless channels." *Id.* at 2:60-64.

47. The '040 Patent uses transmissions conforming to the Bluetooth and IEEE 802.11 WiFi specifications as examples of the first and second transmission media. *See, e.g.*, EX1001, 1:6-40, 2:13-17. As explained further in Section VIII(E) (Admitted Prior Art) and Section VI (Technology Background), by 2001 it was well-understood that devices using Bluetooth and 802.11 WiFi lead to interference issues due to their overlapping spectrum, and those in the field were already addressing this problem. And although Bluetooth and 802.11 WiFi are used as examples, the '040 Patent makes clear that its disclosures relate to other transmission media, such as cellular communications and GPS signaling. *See, e.g.*, EX1001, 1:50-51 ("other wireless products such as GPS can also cause interference"), 1:58 ("cellular bands"), 1:61 -63 ("a number of wireless transceivers use local oscillators that are at around 1 to 1.1 GHz").

B. The Challenged Claims

48. A full listing of the Challenged Claims is provided as Appendix B to my declaration.

49. Claim 1 requires:

> **[1.0]** A method for data transmission over first and second media that overlap in frequency, comprising:
>
> **[1.1]** computing one or more time division multiple access (TDMA) time-slot channels to be shared between the first and second media for data transmission;
>
> **[1.2]** allocating one or more time-slot channels to the first medium for data transmission;
>
> **[1.3]** allocating one or more of the remaining time-slot channels to the second medium for data transmission; and
>
> **[1.4]** dynamically adjusting a number of time-slot channels assigned to one of the first and second media during the data transmission to remain within limits of a desired level of service.

EX1001 at 9:17-29 (bracketing added). Claim 1 is the only independent claim that is challenged.

50. The dependent Challenged Claims relate to standard concepts in wireless communications, including conforming to an "802.11 specification" (claim 2) or a "Bluetooth

specification" (claim 3), determining a desired level of service (claim 4), dynamically adjusting assigned time slots (claim 5), and instructing transceivers which time slots to communicate in (claims 6 and 16).

C. Prosecution History

51. The '040 Patent issued from U.S. Application 09/962,718 (the "'718 Application"), filed on September 21, 2001. A copy of the prosecution history is attached as Exhibit 1002 (the "File History").

52. A first Office Action was mailed on May 4, 2005. EX1002, p. 101. Claims 1-4 and 8-16 were rejected under 35 U.S.C. § 102 as anticipated by U.S. Publication No. 2001/0010689 to Awater et al. ("Awater"). *Id.* at pp. 103-104. However, an Office Action indicated that (then) claims 5-7 and 17 were objected to as being dependent upon a rejected base claim, but would otherwise contained allowable subject matter. *Id.* at p. 104.

53. In response, the applicant accepted the allowable subject matter of original claim 5, amending claims 1-2 as follows:

> Claim 1 (currently amended): A method for data transmission over first and second media that ~~overlaps~~ overlap in frequency, comprising[[.]] :
>
> computing one or more time division multiple access (TDMA) time-slot channels to be shared between the first and second media for data transmission;
>
> allocating one or more time-slot channels to the first medium for data transmission;
>
> allocating one or more of the remaining time-slot channels to the second medium for data transmission; and
>
> ~~instructing transceivers for the first and second media to communicate only in their allocated time slot channels~~
>
> dynamically adjusting a number of time-slot channels assigned to one of the first and second media during the data transmission to remain within limits of a desired level of service.
>
> Claim 2 (currently amended): The method of claim 1, where at least one of the first and second media ~~medium~~ conforms to an 802.11

specification.

EX1002, p. 82. Specifically, claim 1 was amended to require "dynamically adjusting a number of time-slot channels assigned to one of the first and second media during the data transmission to remain within limits of a desired level of service." *Id.*

54. A second Office Action issued on October 12, 2005, which rejected certain new claims and found that each of the Challenged Claims (now claims 1-6 and 16) were allowable. *See* EX1002, pp. 65-68. Following additional remarks and an amendment to a non-challenged claims, a Notice of Allowance was mailed on January 13, 2006. The '040 Patent issued June 6, 2006.

D. Claim Construction

i. Definition of One of Ordinary Skill in the Art

55. I understand that the patent claims must be considered through the eyes of a hypothetical person of ordinary skill in the art or "POSITA." I understand that a POSITA is not a specific or real individual, but rather a hypothetical individual having qualities determined by the following criteria: (a) the type of problems encountered in the art; (b) prior art solutions to those problems; (c) the rapidity with which innovations are made; (d) the sophistication of the technology; and (e) the education level of active workers in the field. Furthermore, a POSITA is presumed to be familiar with all relevant prior art. I have been instructed to assume for purposes of this proceeding that the relevant time period is September 21, 2001.

56. The '040 Patent describes the field of the invention as follows:

> The invention relates to minimizing RF channel inter[fer]ence....
>
> In one aspect, a method for data transmission over first and second media that overlap in frequency includes computing one or more time division multiple access (TDMA) time-slot channels to be shared between the first and second media for data transmission; allocating one or more time-slot channels to the first medium for data transmission; allocating one or more of the remaining time-slot

> channels to the second medium for data transmission; and instructing transceivers for the first and second media to communicate only in their allocated time-slot channels.

EX1001, 1:5, 2:3-12.

57. The claims of the '040 Patent are drawn to a method for data transmission over first and second media that overlap in frequency, comprising, *inter alia*, dynamically adjusting time-slot channels assigned to one of the first and second media.

58. In my opinion, a person of ordinary skill in the art in the relevant field as of the asserted September 21, 2001 priority date of the '040 Patent would have had at least a bachelor's degree in electrical engineering, computer engineering, or a related field, and at least two years of practical experience with wireless communications. These descriptions are approximate, and a higher level of education or skill might make up for less experience, and vice-versa.

59. As I have both a Master's Degree and over 30 years of experience in industry (*see* Appendix A), I am well acquainted with the level of ordinary skill that would be required to implement the systems described in the '040 Patent. I am also capable of rendering informed opinions as to the understanding of one of ordinary skill in the art as of the time of the inventions, including the meaning of terms found in the asserted claims.

60. I am qualified as a person of ordinary skill in the art, both now and as of the alleged priority date.

ii. All Claim Terms of the '040 Patent Should Be Given Their Plain and Ordinary Meaning

61. For purposes of this proceeding, I was instructed to apply the claim construction standards set forth above in Section V(B).

62. None of the Challenged Claims recite "means for…" or similar language.

63. Moreover, the terms at issue are used consistent with their plain meaning. For example, "TDMA," "time-slot channels," and "level of service," are all well understood, and are used in their ordinary sense. Similarly, the "allocating" and "dynamically adjusting" terms are also well understood, and are likewise used in their ordinary sense.

64. Regarding the claims' use of "media" and "medium" (as in "first and second media"), these terms are also well understood and used in their ordinary sense, and the '040 Patent does not expressly redefine "media" or "medium" in the specification. The usage of "media" and "medium" in the claims and specification is further discussed below.

65. Starting with the claim language itself, the claims refer to a medium for data transmission, which may be allocated time slots for data transmission, and further refer to transceivers for a particular medium that may communicate via the medium. The claims also refer to the highest rate supported by the medium, and note that the medium may conform to either an 802.11 specification or a Bluetooth specification. *See, e.g.*, claim 1 ("[a] method for data transmission over first and second media"); claim 1 ("allocating one or more time-slot channels to the first medium for data transmission; allocating one or more of the remaining time-slot channels to the second medium for data transmission"); claim 2 (requiring that one of the media "conforms to an 802.11 specification"); claim 3 (requiring that one of the media "conforms to a Bluetooth specification"); claim 5 ("detecting the medium that fails to meet said desired level of service"); claim 6 ("instructing transceivers for the first and second media to communicate only in their previously presentedly [sic, newly] allocated time-slots."); claim 10 ("the highest rate supported by both media."); claim 11 ("a first [second] transceiver coupled to the processor to communicate via a first [second] medium.").

66. Turning to the specification, it refers to a "standard" (such as the "802.11 standard") as being selected as the default communication medium. EX1001, 4:10-16 ("In the second embodiment of FIG. 1B, one standard is selected as the default communication medium. For example, if 801.11 standard were the standard medium, Bluetooth data is encoded into 802.11 data and transmitted using the 802.11 transceiver, and vice versa. As such, the process 30 is equivalent to two 802.11 transceivers operating over the 2.4 GHz band without interference."). The specification also refers to "a desired level of service for one of the media during a transmission," EX1001, 3:57-61.

67. Turning now to the meaning in the field: "In data communication terminology, a transmission medium is a physical path between the transmitter and the receiver i.e. it is the channel through which data is sent from one place to another." *See* EX1011, *available at* https://www.geeksforgeeks.org/types-transmission-media/; *see also* EX1012, *available at* https://en.wikipedia.org/wiki/Transmission_medium ("A transmission medium is a system or substance that can mediate the propagation of signals for the purposes of telecommunication."). These definitions are consistent with my understanding of how the terms are used in the field.

68. In my opinion, the claims and specification use the term media consistently with its usage in the field: *i.e.*, as meaning the channel over which data is sent, or a system or substance that can mediate the propagation of signals for the purposes of telecommunication. A medium is not the transceiver itself (the claims refer to transceivers for the first and second media separately from the media itself). A medium is also not the protocol or standard itself (the claims note that the media "conforms" to a particular protocol, such as the 802.11 or Bluetooth specification, though the specification in one place refers to the standard being selected as the common medium,

apparently in a loose usage of the term). Also, the claims note that the communication occurs "via" the medium, and that time slots are allocated "to" the medium "for data transmission."

69. In sum, the "media" and "medium" terms should receive their plain and ordinary meaning. It would have been clear to a POSITA that the specification does not re-define or otherwise restrict the meaning of these terms, and instead uses the terms in accordance with their plain and ordinary meaning.

VIII. OVERVIEW OF PRIOR ART REFERENCES

A. Jokinen

70. I understand that U.S. Patent No. 5,729,534 to Jokinen et al. (EX1004), entitled "Dynamic allocation of radio capacity in a TDMA system," is prior art under at least 35 U.S.C. § 102(b) (pre-AIA), as it was issued on March 17, 1998, more than three years before the earliest claimed priority date of September 21, 2001.

71. Jokinen relates to a method for dividing radio capacity in a TDMA system dynamically between packet radio service and circuit switched service. EX1004, Abstract. According to the invention, some basic number of time slots are reserved for packet radio service and the rest are reserved for circuit switched service. When the traffic requirement of packet radio service increases, information regarding this is obtained by means of a request from a mobile station or through traffic measurement at the base transceiver station. EX1004, Abstract. This information is used as a criterion in allocating more time slots to packet radio service. EX1004, Abstract. As Jokinen explains, "[t]he purpose of the invention is to indicate a method by which the capacity of a radio channel can be better exploited." EX1004, 1:56-58.

72. Jokinen explains that the "easiest method" for dividing resources between packet radio traffic and circuit switched services is to permanently allocate one or more time slots to the

packet radio traffic, with the remainder being reserved to circuit switched services. EX1004, 3:18-24. This lacks flexibility, however, and therefore, Jokinen provides a more dynamic approach. EX1004, 3:24-26, 4:6-8. One basic mode of service is to allocate a predetermined first number of time slots to the packet radio traffic; allocate a predetermined second number of time slots to the circuit switched services; and then allocate additional time slots on the basis of predetermined criteria, deallocate time slots, and so on, pursuant to continual monitoring of the capacity required for each service. EX1004, 4:9-20. A POSTA would recognize that Jokinen's allocation includes computing one or more time division multiple access (TDMA) time-slot channels, as well as dynamically adjusting the time slots. In the context of elaborating on this basic mode, Jokinen provides five examples.

73. First example: Jokinen describes a minimum number of time slots parameter, which guarantees a minimum number of time slots for packet radio traffic, in order to maintain and guarantee a minimum level of service for packet radio traffic. This parameter may be automatically adjusted, for example, on the basis of traffic requirement measured by the base station. If circuit switched services are needed, these can be allocated from time slots outside the minimum number of time slots reserved for packet radio traffic. EX1004, 4:23-5:47.

74. Second example: In this example, a minimum service level is required in a cell. There may be a utilization percentage limit, and at a utilization ratio higher than this the channel becomes overloaded and weakens. Therefore, if the limit is reached, an additional time slot is reserved for the traffic. The base station may measure the quantity of traffic over the packet radio channel, for example, and compute the utilization ratio. On the other hand, when the utilization ratio decreases and reaches another, lower level, one of the time slots may be deallocated for the traffic. This example gives higher priority to packet radio services over

circuit switched services. EX1004, 5:50-6:13. A POSITA would recognize from these teachings that dynamically adjusting the time slots based on traffic measurements (for example) is performed during data transmission and in order to remain within limits of a desired level of service – the utilization ratio threshold disclosed in Jokinen is set so that if the service quality is too low, then allocating more time slots will improve the quality. *See id.*; *see also* EX1004, 4:9-20.

75. Third example: In this example, a mobile station may request additional time slot channels from the base station. These may be granted immediately, or some of them may be granted at a later time to give the base station time to allocate the resources. EX1004, 6:15-28.

76. Fourth example: In this example, there are no reserved packet radio channels, and if one needs to be requested, it can be requested on a different channel, e.g., the circuit switched service or other signaling channels. EX1004, 6:32-44.

77. Fifth example: This example is a combination of the first two examples, to ensure that packet radio services and circuit switched services share the channel in a fair manner. EX1004, 6:47-60.

78. In sum, through these examples and its other disclosures, Jokinen describes processes by which data transmissions of two radio services are managed, such that the capacity is effectively shared as each radio service operates in its allocated time slot(s). Specifically, Jokinen teaches dynamic allocation of time slots in a TDMA system, such that the time slots may be allocated and then dynamically adjusted based on traffic measurement, utilization ratio thresholds, or other service level requirements. Accordingly, Jokinen teaches the elements of the Challenged Claims. During prosecution the examiner indicated that dynamic adjustment of time

slots was allowable, never finding this element in the prior art before then before the examiner. Thus, Jokinen is also materially different from the art before the examiner during prosecution.

B. Joeressen

79. I understand that U.S. Patent No. 7,039,031 to Joeressen (EX1005), entitled "Integrating communications networks," is prior art under at least 35 U.S.C. § 102(e) (pre-AIA), as it claims priority to a PCT application that was filed on December 3, 1998, almost three years before the earliest claimed priority date of September 21, 2001.

80. Joeressen describes "[a] terminal for simultaneously operating in a first mobile radio communications network and a second different radio communications network." EX1005, Abstract. Joeressen explains that existing mobile communication networks use TDMA, that they can have rigidly defined specific parameters, and that in particular, the time frames for different radio networks may be different. EX1005, 1:6-36. In particular, Joeressen describes creating a "super-frame" so that the timing of two radio networks can be aligned, and that the two radio networks may be operated simultaneously by a mobile terminal. EX1005, 1:43-2:5.

81. Joeressen describes that mobile network 106 is typically a TDMA network, and that each of the mobile time frames 112 and 114 are subdivided into mobile time slots 116, 118, 120, ..., 130 each having a length L. The Bluetooth low power radio frequency (LPRF) network has a slot length that is selected so that synchronization between the mobile network and LPRF network is possible. EX1005, 5:26-44. In this way, the mobile terminal may be adapted or adaptable to operate in two different mobile networks which use different mobile frame lengths. EX1005, 5:55-57.

82. Because concurrent activity, and especially concurrent transmission on both networks may cause interference issues, Joeressen describes an algorithm for determining an

allocation pattern such that the mobile terminal does not transmit simultaneously in both networks. *See, e.g.*, EX1005, 5:26-62, 6:57-7:8. In that algorithm, the control unit determines the period of next transmission by the mobile terminal in the mobile network, and time slots falling within this period are reserved for reception by the LPRF network. The remaining slots may then be allocated to either transmission or reception by the LPRF network. Joeressen further teaches that the allocation pattern may depend upon the type and number of devices which are active as slave units in the LPRF network. Particular devices may require higher communication rates or real time communication for example. EX1005, 6:57-7:15. A POSTA would recognize that Joeressen' s determinations and allocations include computing one or more time division multiple access (TDMA) time-slot channels, as well as dynamically adjusting the time slots.

83. In sum, Joeressen teaches an allocation pattern (which allocates time slots) that is preferably variable, and may vary in particular based on whether particular devices require higher communication rates or real time communication for example. Accordingly, Joeressen teaches the elements of the Challenged Claims. During prosecution the examiner indicated that dynamic adjustment of time slots was allowable, never finding this element in the prior art before then before the examiner. Thus, Joeressen is also materially different from the art before the examiner during prosecution.

C. Stanwood

84. I understand that U.S. Patent No. 6,925,068 to Stanwood et al. (EX1006), entitled "Method and apparatus for allocating bandwidth in a wireless communication system," is prior art under at least 35 U.S.C. § 102(e) (pre-AIA), as it was filed on May 21, 1999, more than two years before the earliest claimed priority date of September 21, 2001.

85. Stanwood discloses an adaptive time division duplexing system where time slots are adaptively or dynamically allocated based on service and user needs, such as channel bandwidth needs or requirements of a given service or user type. EX1006, 4:61-5:1 ("In contrast to the TDD systems of the prior art which have time slots dedicated for either uplink or downlink transmissions, the present ATDD invention dynamically changes the time slot designation as either an uplink or downlink transmission period. Consequently, the uplink/downlink bandwidth allocation can be changed to accommodate the uplink/downlink bandwidth requirements of the link."); 5:15-21 ("An alternative frame-based approach similarly allows the system to dynamically allocate a first number of time slots of a frame for downlink (alternatively uplink) transmissions only, however the remaining time slots of the frame may be allocated for either uplink or downlink transmissions, depending upon the channel bandwidth needs."); 7:14-16 ("The present ATDD invention flexibly and dynamically allocates time slots for either uplink or downlink transmissions in response to the changing bandwidth needs of the communication links."); 7:21-24 ("The present ATDD method and apparatus adapts the time slot uplink/downlink ratio to meet the uplink/downlink bandwidth requirements of a given service and for a given user type.").

86. In sum, Stanwood teaches dynamic allocation of time slots that is, for example, responsive to the needs of the link and may vary depending on the type of service provided over the link and the user type. Accordingly, Stanwood teaches the elements of the Challenged Claims. During prosecution the examiner indicated that dynamic adjustment of time slots was allowable, never finding this element in the prior art before then before the examiner. Thus, Stanwood is also materially different from the art before the examiner during prosecution.

D. 802.11 and Bluetooth References

87. I understand that U.S. Patent No. 6,600,726 to Nevo et al. (EX1007), entitled "Multiple Wireless Communication Protocol Methods and Apparatuses," is prior art under at least 35 U.S.C. § 102(e) (pre-AIA), as it was filed November 12, 1999, almost two years before the earliest claimed priority date of September 21, 2001.

88. Nevo discloses a wireless device capable of communicating over first and second wireless networks in a coordinated manner, and specifically discloses as examples of the first and second wireless networks, networks conforming to 802.11 and Bluetooth specifications. EX1007, Abstract ("A wireless device is provided with at least one wireless transceiver and at least one controller manager to transmit and receive signals wirelessly to and from network devices of a first and second wireless network, in a coordinated manner, in accordance with a first and a second protocol respectively."); claim 8 ("The apparatus of claim 1, wherein the first and the second protocol are two protocols selected from a group consisting of Bluetooth, 802.11 frequency hopping, 802.11 direct sequence, 802.11a, 802.11b, and Home RF.").

89. Nevo discloses a general need in the field (as background to its invention) to operate concurrently in multiple wireless protocols, including Bluetooth and 802.11. EX1007, 1:40-50 ("A need has emerged in a number of applications that it is desirable for a device to be able to operate "concurrently" in multiple wireless protocols. One such applications is having a notebook computer being able to communicate with peripheral devices such as a phone, a printer, a scanner and the like, in accordance with the Bluetooth protocol; and with other computing devices, such as other peer computers or servers, communication devices, such as modems or adapters, and networking devices, such as gateways, routers, switches and the like, in accordance with one of the 802.11 protocols or Home RF."). One problem with doing so,

however, is interference that results from transmitting at the same time on both protocols. EX1007, 1:52-57 ("However, the need cannot be met by simply providing the device with multiple transmitters, one for each protocol. The reason is because if multiple ones of these transmitters were to transmit at the same time. The transmitters are going to interfere with each other, resulting in corruption and/or loss of data, as well as degradation in performance."). A POSITA would recognize Nevo as teaching both the desire for devices that transmit on both Bluetooth and 802.11, as well as the need for intelligent control over such transmissions to avoid interference.

90. I understand that U.S. Patent No. 6,895,255 to Bridgelall (EX1010), entitled "Dual mode wireless data communications," is prior art under at least 35 U.S.C. § 102(e) (pre-AIA), as it was filed October 20, 2000, almost one year before the earliest claimed priority date of September 21, 2001.

91. Bridgelall discloses a dual mode mobile unit that is arranged to communicate in either a first or second data communications standard, such as combined Bluetooth and 802.11 operation. EX1010, Abstract; 1:41-48 ("It is an object of the present invention to provide a dual mode mobile unit capable of operating in **both the 802.11 system and in a Bluetooth system** for communications between the dual mode mobile unit and other units using either system. It is a further object of the invention to provide methods whereby **802.11 systems and Bluetooth systems** can co-exist without signal interference.") (emphasis added); 1:56-59 ("The mobile unit uses the first wireless protocol to reserve a transmission time interval in a frame of the first wireless protocol for purposes of operating under the second wireless protocol. During the reserved time interval the mobile unit operates under the second wireless protocol to send and receive signals."). As with Nevo, Bridgelall recognizes both the need for devices that transmit

on both Bluetooth and 802.11, as well as the need for intelligent control over such transmissions to avoid interference.

E. Admitted Prior Art

92. The '040 Patent contains admissions confirming that numerous features of the Challenged Claims were known at the time of filing, and that the background knowledge of a POSITA would have been significant.

93. For instance, the '040 Patent admits that "the recently approved Bluetooth wireless standard" is known, and that "[t]he number of products incorporating" this standard "is expected to explode during the first couple years of the new millennium." EX1001, 1:6-8. In other words, products incorporating the Bluetooth wireless standard were known in the art. The '040 Patent also admits that Bluetooth "establishes wireless connections between devices such as mobile phones, PDAs, and headsets," and that it "operates at relatively low data rates over short distances using very little power." EX1001, 1:8-12.

94. The '040 Patent admits that "IEEE 802.11 is a wireless LAN standard approved by IEEE a couple years ago," and that it "operates at higher data rates over longer distances using more power." EX1001, 1:12-15. Further, the '040 Patent admits that "[c]ompanies today are strongly benefiting from using 802.11-compliant wireless LANs to support efficient mobile communications between handheld data collectors and corporate IS databases." EX1001, 1:15-19. Moreover, there was a "high demand" for both "Bluetooth and 802.11" to "coexist in close proximity." EX1001, 1:20-22.

95. In particular, it was known ("[a] current problem") "that the two standards operate in the same 2.4 GHz unlicensed radio band and equally use frequency hopping modulation" – a "commonality [that] poses a strong potential for radio frequency interference." EX1001, 1:22-

27. The '040 Patent admits that it was known to avoid possible interference issues; indeed, "[m]uch design effort in Bluetooth—including limits on physical range and use of spread-spectrum frequency hopping—went toward avoiding conflict with other transmission schemes." EX1001, 1:36-39.

96. Taken together, these admission show that Bluetooth and 802.11 standards were known, it was known that they operate in overlapping frequencies, there was an existing demand for Bluetooth and 802.11 to coexist, and it was known to take measures to reduce their interference. In particular, these admissions support my opinions below regarding the motivation to combine references, and show that in particular the specific requirements of claims 2 and 3 regarding the transmission media conforming to either an 802.11 specification or a Bluetooth specification would have been obvious and well known to a POSITA.

IX. THE PRIOR ART REFERENCES PRESENT SUBSTANTIAL NEW QUESTIONS OF PATENTABILITY

97. I have reviewed the claims of the '040 Patent, the prior art cited in the Request, and the mapping of the prior art charted against the Challenged Claims in Exhibit AA, and I agree with Requester. Each of the Challenged Claims recite limitations that either are disclosed by, or are obvious in view of, the prior art cited in the Request as illustrated in Exhibit AA.

A. SNQ 1

98. Jokinen raises a substantial new question of patentability as to claims 1-6 and 16. The prior art of SNQ 1 discloses or renders obvious every element of claims 1-6 and 16 of the '040 Patent. Jokinen teaches the same data transmission method involving dynamic allocation of time-slots among first and second media as recited in the claims of the '040 Patent.

99. I agree with Requester's limitation-by-limitation mapping of the prior art to the '040 Patent as set forth in the claim charts provided in Exhibit AA. This includes, for instance,

that Jokinen teaches or would have suggested claim element [1.1] ("computing one or more time division multiple access (TDMA) time-slot channels to be shared between the first and second media for data transmission"). Specifically, because Jokinen uses TDMA time-slots, a POSITA would recognize those slots are computed (and subsequently used in the dynamic allocation or division of capacity). *See* Section VIII.A. As another example, I agree with the mapping and analysis relating to claim element [1.4] ("dynamically adjusting a number of time-slot channels assigned to one of the first and second media during the data transmission to remain within limits of a desired level of service"). First, this claim element is taught by Jokinen's disclosures relating to the use of traffic measurement as a criterion to dynamically reallocate time-slot channels between first and second radio services. *See, e.g.*, EX1004, Abstract, 1:61-64, 4:9-20, 5:60-6:3, 6:47-49; *see also* Section VIII.A. Second, to the extent it is argued that this claim element is not disclosed, it would have been obvious. It would have been obvious to a POSITA at the time of the invention to perform the dynamic adjustment of time slots based on traffic measurements as described in Jokinen in order to remain within limits of a desired level of service. This is so because the amount of time slots a service is allocated has a direct impact on the traffic measurements and the ensuing quality of service of the service. *See id.* Therefore, a POSITA would have been motivated to adjust the time slots in order to remain within limits of a desired level of service.

100. I likewise agree with Requester's mapping and arguments with respect to the dependent claims. For instance, with respect to **claim 2** ("wherein at least one of the first and second media conforms to an 802.11 specification"), a POSITA would have understood at the time of the invention that an example of a service that could be used as Jokinen's packet switched radio service was a service adhering to the 802.11 specification. It would have been

obvious to a POSITA to conform the packet radio service to an 802.11 specification, at least because it is a simple substitution of one known element (a packet radio service such as disclosed in Jokinen) for another (a service adhering to an 802.11 specification) to obtain predictable results, and it is an obvious-to-try example of a packet switched radio service. Additionally, 802.11 was common, popular, and well-known as of the priority date of the '040 Patent, and would have been an obvious choice for a POSITA implementing a data communications service. *See, e.g.*, Sections VI and VIII.E. With respect to **claim 3** ("wherein at least one of the first and second media conforms to a Bluetooth specification"), Jokinen does not specifically refer to Bluetooth, but a POSITA would have been aware of this protocol as of the time of the invention, and been motivated to use it. Specifically, a POSITA would have understood at the time of the invention that Bluetooth is a popular type of radio-based service. It would have been obvious to a POSITA to substitute the packet radio service with a radio service that conforms to a Bluetooth specification, at least because it is a simple substitution of one known element (a packet radio service such as disclosed in Jokinen) for another (a radio service adhering to a Bluetooth specification) to obtain predictable results, and it is an obvious-to-try example of a radio service. *See, e.g.*, Sections VI and VIII.E. With respect to **claim 4** ("determining the desired level of service…"), Jokinen's teachings regarding dynamic allocation to remain within limits of a desired level of service disclose this claim (*see* Section VIII.A). At a utilization ratio above the threshold, the service level weakens to a point where additional resources (time slots) are allocated. The setting of the utilization ratio threshold, therefore, determines the desired level of service for one of the packet radio service and circuit switched service (*i.e.*, the first and second media during data transmission). To the extent it is argued that this is not disclosed, a POSITA would also have been motivated to determine a desired level of service for one of the packet

radio service and circuit switched service, e.g., based on a user's preference settings, other users or other network constraints, etc., so that the user could obtain a reasonable level of service while also ensuring other network traffic is properly prioritized. Differential levels of service to maintain network traffic was well known by this time. A POSITA would also understand that the utilization ratio threshold would be adjusted based on the desired level of service. With respect to **claim 5**, based on Jokinen's disclosures regarding how to allocate freed time slots (*see, e.g.*, EX1004, 4:12-17, 5:8-54), a POSITA would understand that available time slot resources are determined, because determining these resources is a preliminary step to allocating time slots to a service needing more capacity, and is the reason for the base station system 12 monitoring the capacity required for each service. *See id.* Additionally, it would be obvious to determine available time slot resources, for these same reasons – in order to be able to effectively allocate time slots to a service needing more capacity. That is, even if Jokinen is not read to literally disclose this step (which it does disclose), a POSITA would be motivated to modify it so that the step (*i.e.*, determining available time-slot resources) is performed, for the reasons above. Further, with respect to claim element [5.3], a POSITA would recognize that the specification of time slots allocated to a given service is a "configuration" because it indicates a specific manner in which the device will operate (*i.e.*, which channels to use). *See, e.g.*, EX1004, 2:10-16. And with respect to claim element [5.4], Jokinen discloses transmitting information regarding the division of radio capacity between packet radio service and circuit switched service, *i.e.*, channel configurations, and a POSITA would understand these transmissions to constitute a "channel assignment message." *See* EX1004, 2:10-16, 4:17-20. With respect to **claim 6** and **claim 16**, a POSITA would understand that upon receiving the configurations indicating usage for the time slots, that the transceivers for the first and second media would be instructed to communicate in

their currently allocated time slots. *See* EX1004, 2:10-16, 4:17-20, 5:29-33. This would also be obvious to a POSITA because instructing the transceivers to communicate only in their allocated time slots would prevent interference issues that may arise if a transceiver communicated in a time slot allocated to a different transceiver.

B. SNQ 2

101. Jokinen in view of either Nevo or Bridgelall raises a substantial new question of patentability as to claims 2-3.

i. Motivation to Combine

102. A POSITA would have been motivated to combine Jokinen and either Nevo or Bridgelall (collectively, "the 802.11 and Bluetooth references"). Specifically, a POSITA would have been motivated to use the 802.11 and Bluetooth references' teaching of a device that uses both 802.11 and Bluetooth together, and their teaching that a known problem was to handle interference resulting from the overlapping frequency of these protocols. *See* Section VIII.D. A POSITA would have been motivated in view of each of these references to utilize the method of Jokinen with one or both of an 802.11 and Bluetooth protocol as one of the networks.

103. Nevo discloses a wireless device capable of communicating over first and second wireless networks in a coordinated manner, and specifically discloses as examples of the first and second wireless networks, networks conforming to 802.11 and Bluetooth specifications. EX1007, Abstract ("A wireless device is provided with at least one wireless transceiver and at least one controller manager to transmit and receive signals wirelessly to and from network devices of a first and second wireless network, in a coordinated manner, in accordance with a first and a second protocol respectively."); claim 8 ("The apparatus of claim 1, wherein the first and the second protocol are two protocols selected from a group consisting of **Bluetooth**, **802.11**

frequency hopping, **802.11** direct sequence, **802.11a**, **802.11b**, and Home RF.") (emphasis added).

104. Nevo also discloses a general need in the field (as background to its invention) to operate concurrently in multiple wireless protocols, including Bluetooth and 802.11. EX1007, 1:40-50 ("A need has emerged in a number of applications that it is desirable for a device to be able to operate 'concurrently' in multiple wireless protocols. One such applications is having a notebook computer being able to communicate with peripheral devices such as a phone, a printer, a scanner and the like, in accordance with **the Bluetooth protocol**; and with other computing devices, such as other peer computers or servers, communication devices, such as modems or adapters, and networking devices, such as gateways, routers, switches and the like, in accordance with one of **the 802.11 protocols** or Home RF.") (emphasis added). One problem with doing so, however, is interference that results from transmitting at the same time on both protocols. EX1007, 1:52-57 ("However, the need cannot be met by simply providing the device with multiple transmitters, one for each protocol. The reason is because if multiple ones of these transmitters were to transmit at the same time. The transmitters are going to **interfere with each other**, resulting in corruption and/or loss of data, as well as degradation in performance.") (emphasis added).

105. Similarly, Bridgelall discloses a dual mode mobile unit is arranged to communicate in either a first or second data communications standard, such as combined Bluetooth and 802.11 operation. EX1010, Abstract; 1:41-48 ("It is an object of the present invention to provide a dual mode mobile unit capable of operating in **both the 802.11 system and in a Bluetooth system** for communications between the dual mode mobile unit and other units using either system. It is a further object of the invention to provide methods whereby

802.11 systems and Bluetooth systems can co-exist without signal interference.") (emphasis added); 1:56-59 ("The mobile unit uses the first wireless protocol to reserve a transmission time interval in a frame of the first wireless protocol for purposes of operating under the second wireless protocol. During the reserved time interval the mobile unit operates under the second wireless protocol to send and receive signals.").

106. In view of either Nevo or Bridgelall, and as discussed above, a POSITA would have been motivated to provide both 802.11 and Bluetooth protocols simultaneously in a user device. A POSITA would have also been aware of potential interference concerns, as the frequencies of those protocols overlap. Therefore, the teaching of a system such as in Jokinen would have appealed to a POSITA as a solution to providing both 802.11 and Bluetooth protocols simultaneously in a user device. Jokinen describes advantageous ways in which to allocate capacity between two types of data transmissions by adjusting the time slots for each transmission type (e.g., by allocating/deallocating time slots pursuant to continual monitoring of the capacity required for each service). Thus, for a user device with co-located Bluetooth and 802.11 transmissions (as suggested by Nevo or Bridgelall), such transmissions would only occur on allocated time slots according to the teachings of Jokinen to avoid interference (*i.e.*, to avoid transmissions on both protocols occurring at the same time) in an efficient and effective manner. *See* Section VIII.A. For example, a station's 802.11 transceiver conforming to 802.11 could be allocated time slots 1, 3 and 5, making it possible for that station to transmit over the 802.11 medium only during time slots 1, 3 and 5. The same station's Bluetooth transceiver (*i.e.*, co-located with the 802.11 transceiver) would be allocated non-overlapping time slots, such as time slots 2 and 4, and would only transmit over the Bluetooth medium during time slots 2 and 4, thus avoiding simultaneous transmissions of the 802.11 and Bluetooth transceivers.

107. Moreover, incorporating the 802.11 and Bluetooth references' teachings of 802.11 and Bluetooth protocols operating simultaneously in a user device would have simply been a matter of using a known radio communication protocols (802.11 and Bluetooth) to improve components in similar systems (the two-radio system of Jokinen).

108. Furthermore, incorporating the 802.11 and Bluetooth references' teachings of 802.11 and Bluetooth protocols operating simultaneously in a user device would have simply required combining prior art elements in radio communication networks to yield predictable results; specifically, implementing the 802.11 and Bluetooth references' teachings of 802.11 and Bluetooth protocols operating simultaneously in a user device in the system of Jokinen where the packet radio service of Jokinen utilizes the 802.11 specification and the circuit switch services of Jokinen utilize the Bluetooth specification.

109. Additionally, a POSITA would have had a reasonable expectation of success in combining the cited teachings of either of the 802.11 and Bluetooth references with the system of Jokinen.

110. The system of Jokinen generally concerns a method by which radio capacity is divided dynamically between two data transmission services (packet radio service and circuit switched service), while the 802.11 and Bluetooth references disclose specific radio communication specifications that a POSITA would recognize to be applicable in the system of Jokinen. Thus, a POSITA would have had the reasonable expectation of success in making the proposed combination related to the 802.11 and Bluetooth protocols because it would have required, at most, minor modifications to the systems described in the references and would have

yielded predictable results related to radio communication over those protocols.[2] The combination does not require modification to either the 802.11 or Bluetooth protocol. Rather, the combination applies the time-based radio channel sharing concepts taught by Jokinen such that the 802.11 and Bluetooth transmission take turns in an effective and efficient manner. A POSITA would have recognized that Jokinen's teachings are not limited to packet or circuit switched transmissions; but rather, its transmission sharing methods are applicable whenever any two services share frequencies. *See, e.g.*; Ex. 1004, 1:6-12, 1:56-58. The concept of allowing one service to use a channel for a period and then switching to allow another service to use the channel is a simple idea that is agnostic to which two services specifically overlap.

111. Additionally, Nevo and Bridgelall are analogous art to the '040 Patent. Nevo and Bridgelall are from the same field of endeavor of the '040 Patent (*i.e.*, radio communications networks) and reasonably pertinent to the particular problem the '040 Patent was trying to solve (*i.e.*, minimizing RF channel interference).

ii. The Claims Would Have Been Obvious In Light of Jokinen and either Nevo or Bridgelall

112. The prior art of SNQ 2 discloses or renders obvious every element of claims 2-3 of the '040 Patent. As explained above, Jokinen disclose the same data transmission method involving dynamic allocation of time-slots among first and second media as recited in the claims of the '040 Patent. *See* Section IX.A. Additionally, both Nevo and Bridgelall disclose a radio communications medium conforming to an 802.11 and/or Bluetooth specification as set forth in claims 2-3.

[2] I note that Joeressen confirms that local area network (LAN) transmission protocols, such as Bluetooth, can be implemented in devices with wide area network (WAN) transmission protocols, such as cellular communications, and with TDMA-based concepts for time slot allocation. *See, e.g.*, EX1005, 1:6-36; Section VIII.B; *see also* SNQ 8.

113. I agree with Requester's limitation-by-limitation mapping of the prior art to the '040 Patent as set forth in the claim charts provided in Exhibit AA.

C. SNQ 3

114. Joeressen raises a substantial new question of patentability as to claims 1-6 and 16. The prior art of SNQ 3 discloses or renders obvious every element of claims 1-6 and 16 of the '040 Patent. Joeressen discloses the same data transmission method involving dynamic allocation of time-slots among first and second media as recited in the claims of the '040 Patent.

115. I agree with Requester's limitation by limitation mapping of the prior art to the '040 Patent as set forth in the claim charts provided in Exhibit AA. This includes, for instance, that a POSITA would understand that Joeressen teaches, or would have suggested, claim element [1.0]. Based on Joeressen' s teachings regarding Bluetooth, transmissions in the microwave band, and interference, a POSITA would understand this reference to disclose that the first and second mobile radio communications networks overlap in frequency. *See, e.g.*, EX1005, 2:61-62, 1:29-31, 1:43-46, 6:39-44. In addition, it would be obvious to a POSITA that such a case would be applicable to the teachings of Joeressen, at least because the interference concerns that Joeressen addresses would be especially heightened where the frequencies of the networks overlap. *See id.* As another example, with respect to claim element [1.2], a POSITA would have understood that in order for the mobile network of Joeressen to transmit or receive in its time slots, the time slots had to be *allocated* to the mobile network. *See* EX1005, 5:26-36, 7:58-60, FIGs. 6-10. Additionally, it would have been obvious to a POSITA at the time of the invention to allocate one or more time slots to the mobile network in order to ensure that the mobile network could safely and efficiently (e.g., without interference) transmit and receive in those time slots. With respect to claim element [1.4], Joeressen discloses a variable allocation pattern

that defines the time slots on which the LPRF network may receive or transmit. *See, e.g.*, EX1005, 1:57-58, 1:63-67, 6:23-27, 7:12-15, FIGs. 6-10. Therefore, the time slots on which the mobile network may transmit are also defined, since they may not both transmit concurrently and in some embodiments may not receive while one is transmitting. Based on the teachings of Joeressen, a POSITA would understand that varying the allocation pattern based on device service requirements (for example, for a higher communication rate or real time communication) is performed in order to remain within limits of a desired level of service. *See id.*; Section VIII.B. That is, a POSITA would understand that the disclosure regarding varying allocation pattern teaches, or would have suggested, "dynamically adjusting time-slot channels to remain within limits of a desired level of service." Finally, to the extent it is argued that this claim element is not disclosed, it would have been obvious to a POSITA at the time of the invention to perform the dynamic adjustment of time slots based on device service requirements such as described in Joeressen in order to remain within limits of a desired level of service. In particular, it was obvious at the time of the invention to provide guaranteed quality of service (QoS) to ensure real time communication (which Joeressen mentions), and one obvious way to do so is to dynamically adjust time slots to remain within limits of a desired level of service, *i.e.*, to guarantee a particular QoS. *See, e.g.*, EX1005, 7:12-15.

116. I likewise agree with Requester's mapping and arguments with respect to the dependent claims. For instance, with respect to **claim 2** ("wherein at least one of the first and second media conforms to an 802.11 specification"), a POSITA would have understood at the time of the invention that an example of a mobile radio communications network is a network adhering to the 802.11 specification. It would have been obvious to a POSITA to implement Joeressen to conform the mobile radio communications network to an 802.11 specification, at

least because it is a simple substitution of one known element (a mobile radio communications network such as disclosed in Joeressen) for another (a radio service adhering to an 802.11 specification) to obtain predictable results, and it is an obvious-to-try example of a mobile radio communications network. For example, as of the priority date, 802.11 was a common radio network that a POSITA would have been motivated to apply to Joeressen's teachings. With respect to **claim 3** ("wherein at least one of the first and second media conforms to a Bluetooth specification"), the LPRF network is described as a *Bluetooth* low power radio frequency (LPRF) network. *See* EX1005, 1:29-31, 6:10-17. With respect to **claim 4**, as discussed with respect to claim element [1.4] above, Joeressen discloses, and it would have been obvious to a POSITA at the time of the invention, varying the allocation pattern based on device service requirements (for example, for a higher communication rate or real time communication) in order to remain within limits of a desired level of service. To do so, a POSITA would understand that the desired level of service for one of the mobile network and the LPRF network would be determined, and it would have been obvious to so determine the desired level of service. With respect to **claim 5**, Joeressen's disclosures regarding variable allocation (*see* discussion of claim element [1.4]) teach, or would have suggested this claim. For instance, a POSITA would understand these disclosures to mean that available time slot resources are determined, because determining these resources is a preliminary step to allocating time slots to a service needing more capacity. *See* claim elements [1.4] and [5.3]; *see also* EX1005, 1:57-58, 5:26-36, 6:28-29, 7:12-15, 7:58-60. Additionally, it would be obvious to determine available time slot resources, for these same reasons – in order to be able to effectively allocate time slots to a service needing more capacity. Moreover, it would be obvious to a POSITA that in order to vary allocation patterns based on whether a device requires higher communication rates or real

time communication (*i.e.*, a particular desired level of service or other service requirements), the system would also monitor the service requirements and detect when the desired level of service is not met. *See id.* Similarly, it would be obvious to a POSITA that in order to vary allocation patterns based on service requirements, the system would allocation additional time slots to ensure that service requirements can be met. With respect to **claim 6** and **claim 16**, Joeressen discloses providing the allocation pattern to the transceiver unit 40. EX1005, 6:28-38; *see also* Section VIII.B. As discussed, the allocation pattern determines which time slots are allowed for use by the second communication network and therefore, which are allowed for use by the first communication network. And Joeressen recognizes concurrent transmission "may cause interference." EX1005, 6:39-44. A POSITA would recognize from these disclosures that the transceivers only communicate in their allocated slots.

D. SNQ 4

117. Joeressen in view of Stanwood raises a substantial new question of patentability as to claims 1-6 and 16.

i. Motivation to Combine

118. A POSITA would have been motivated to modify the method of Joeressen to use the dynamic allocation approach of Stanwood. In particular, a POSITA would use the teaching of Stanwood that dynamic allocation of time slots may be performed to meet bandwidth requirements of a given service and/or user type, *i.e.*, in order to remain within limits of a desired level of service. This is so at least because it is a simple substitution of one known element (varying the time slot allocation pattern as disclosed in Joeressen) for another (dynamically adjusting time slots to meet bandwidth requirements) to obtain predictable results.

119. Stanwood discloses an adaptive time division duplexing system where time slots are adaptively or dynamically allocated based on service and user needs, such as channel bandwidth needs or requirements of a given service or user type. EX1006, 4:61-5:1 ("In contrast to the TDD systems of the prior art which have time slots dedicated for either uplink or downlink transmissions, the present ATDD invention dynamically changes the time slot designation as either an uplink or downlink transmission period. Consequently, the uplink/downlink bandwidth allocation can be changed to accommodate the uplink/downlink bandwidth requirements of the link."); 5:15-21 ("An alternative frame-based approach similarly allows the system to dynamically allocate a first number of time slots of a frame for downlink (alternatively uplink) transmissions only, however the remaining time slots of the frame may be allocated for either uplink or downlink transmissions, depending upon the channel bandwidth needs."); 7:14-16 ("The present ATDD invention flexibly and dynamically allocates time slots for either uplink or downlink transmissions in response to the changing bandwidth needs of the communication links."); 7:21-24 ("The present ATDD method and apparatus adapts the time slot uplink/downlink ratio to meet the uplink/downlink bandwidth requirements of a given service and for a given user type."). The benefit of combining Stanwood with Joeressen is that Stanwood discloses a method for varying Joeressen's time slots in a dynamic manner. Since the dynamic allocation of time slots versus dedicated allocation makes it possible to accommodate varying service requirements among different stations and media over time, there is better use of the medium because it avoids idle time slots that could be used for other stations having more demanding applications. For example, a station needing to support a real-time video call over 802.11 could be allocated more time slots during the video call.

120. Moreover, incorporating Stanwood's teaching that dynamic allocation of time slots may be performed to meet bandwidth requirements of a given service and/or user type, *i.e.*, in order to remain within limits of a desired level of service, would have simply been a matter of using a known allocation method (dynamic allocation) to improve components in similar systems (the radio communications system of Joeressen).[3]

121. Furthermore, incorporating Stanwood's teaching that dynamic allocation of time slots may be performed to meet bandwidth requirements of a given service and/or user type, *i.e.*, in order to remain within limits of a desired level of service, would have simply required combining prior art elements in radio communication networks to yield predictable results; specifically, implementing Stanwood's teaching that dynamic allocation of time slots may be performed to meet bandwidth requirements of a given service and/or user type, *i.e.*, in order to remain within limits of a desired level of service, in the system of Joeressen such that the variable allocation pattern is dynamically allocated to meet bandwidth requirements of a given service and/or user type, *i.e.*, in order to remain within limits of a desired level of service.

122. Additionally, a POSITA would have had a reasonable expectation of success in combining the cited teachings of Stanwood with the system of Joeressen.

123. The system of Joeressen generally concerns a system that integrates two different radio communications networks which use time slots for allocating radio capacity, while Stanwood discloses specific dynamic allocation techniques that a POSITA would recognize to be applicable in the system of Joeressen. Thus, a POSITA would have had the reasonable

[3] I note that motivation for this combination can be found within Joeressen itself. Joeressen explicitly states that the "allocation pattern is preferably variable" (*see, e.g.*, Ex. 1004, 1:57-58), but it lacks details on how to do so. A POSITA, so motivated by Joeressen's disclosure, would look to Stanwood for implementation details because Stanwood describes variable allocation patterns (*see, e.g.*, Ex. 1006, 7:14-24).

expectation of success in making the proposed combination related to Stanwood's dynamic allocation teachings because it would have required, at most, minor modifications to the system of Joeressen and would have yielded predictable results related to radio communication over the two different radio communications networks.

124. Additionally, Stanwood is analogous art to the '040 Patent. Stanwood is from the same field of endeavor of the '040 Patent (*i.e.*, radio communications networks) and reasonably pertinent to the particular problem the '040 Patent was trying to solve (*i.e.*, minimizing RF channel interference).

ii. The Claims Would Have Been Obvious In Light of Joeressen and Stanwood

125. The prior art of SNQ 4 discloses or renders obvious every element of claims 1-6 and 16 of the '040 Patent. As explained above, Joeressen discloses the same data transmission method involving dynamic allocation of time-slots among first and second media as recited in the claims of the '040 Patent. *See* Section IX.C. Additionally, Stanwood discloses that dynamic allocation of time slots may be performed to meet bandwidth requirements of a given service and/or user type, *i.e.*, in order to remain within limits of a desired level of service.

126. I agree with Requester's limitation by limitation mapping of the prior art to the '040 Patent as set forth in the claim charts provided in Exhibit AA.

E. SNQ 5

127. Joeressen in combination with either Nevo or Bridgelall raises a substantial new question of patentability as to claims 2-3.

i. Motivation to Combine

128. The motivation to use the 802.11 and Bluetooth references' teachings regarding 802.11 and Bluetooth, as set forth in Section IX.B.i, applies to SNQ 5.

129. Similarly, the reason for modifying the system of Jokinen with the 802.11 and Bluetooth references' teachings is similar to the reason for modifying the system of Joeressen.

130. The teaching of a system such as in Joeressen would have appealed to a POSITA as a solution to providing both 802.11 and Bluetooth protocols simultaneously in a user device. With respect to claim 3, Joeressen already explains that one of its networks is a Bluetooth low power radio frequency (LPRF) network. *See e.g.*, EX1005, 1:29-31. And with respect to claim 2, it would have been obvious to a POSITA extend these teachings to other popular and well-known LAN protocols, such as 802.11. *See* EX1005, 1:34-36 ("It would be desirable to integrate the new or proposed communications networks with an existing communications network or networks."). For example, it would have been an obvious design choice to use 802.11 in the manner that Bluetooth (another LAN protocol) is used in Joeressen together with cellular radio services. Additionally, in view of the teachings of the 802.11 and Bluetooth references, a POSITA would have also been motivated to integrate an 802.11 communication network with the Bluetooth (LPRF) network already disclosed in Joeressen. *See, e.g.*, EX1007, 1:40-50; EX1010, 1:14-40. As I explained above, the references disclose that it was well known that Bluetooth and 802.11 were desirable transmission protocols for user devices, there was an existing demand for Bluetooth and 802.11 to coexist, and it was known to take measures to reduce their interference.

131. Moreover, incorporating the 802.11 and Bluetooth references' teachings of 802.11 and Bluetooth protocols operating simultaneously in a user device would have simply been a matter of using a known radio communication protocols (802.11 and Bluetooth) to improve components in similar systems (the radio communications system of Joeressen).

132. Furthermore, incorporating the 802.11 and Bluetooth references' teachings of 802.11 and Bluetooth protocols operating simultaneously in a user device would have simply required combining prior art elements in radio communication networks to yield predictable results; specifically, implementing the 802.11 and Bluetooth references' teachings of 802.11 and Bluetooth protocols operating simultaneously in a user device in the system of Joeressen, where the first radio transceiver means of Joeressen utilizes the 802.11 specification and the second radio transceiver means of Joeressen utilize the Bluetooth specification.

133. Additionally, a POSITA would have had a reasonable expectation of success in combining the cited teachings of the 802.11 and Bluetooth references with the system of Joeressen.

134. The system of Joeressen generally concerns a method by which two radio communications networks are operated simultaneously in a mobile terminal, while the 802.11 and Bluetooth references disclose specific radio communication specifications that a POSITA would recognize to be applicable in the system of Joeressen. Thus, a POSITA would have had the reasonable expectation of success in making the proposed combination related to the 802.11 and Bluetooth protocols because it would have required, at most, minor modifications to the system of Joeressen and would have yielded predictable results related to radio communication over those protocols. Joeressen itself confirms that local area network (LAN) transmission protocols can be implemented in devices with wide area network (WAN) transmission protocols, such as cellular communications, and with TDMA-based concepts for time slot allocation. *See, e.g.*, EX1005, 1:6-36; Section VIII.B.

ii. The Claims Would Have Been Obvious In Light of Joeressen and either Nevo or Bridgelall

135. The prior art of SNQ 6 discloses or renders obvious every element of claims 2-3 of the '040 Patent. Joeressen discloses the claimed elements of the '040 Patent. *See* Section IX.C. Additionally, both Nevo and Bridgelall disclose a radio communications medium conforming to an 802.11 and/or Bluetooth specification as set forth in claims 2-3.

136. I agree with Requester's limitation by limitation mapping of the prior art to the '040 Patent as set forth in the claim charts provided in Exhibit AA.

F. SNQ 6

137. The combination of Joeressen and Stanwood in further view of one or more of Nevo and Bridgelall raises a substantial new question of patentability as to claims 2-3.

i. Motivation to Combine

138. The motivation to use the 802.11 and Bluetooth references' teachings regarding 802.11 and Bluetooth, as set forth in Section IX.B.i and IX.E.i, apply to SNQ 6.

139. Similarly, the reason for modifying the system of Jokinen with the 802.11 and Bluetooth references' teachings, and the reason for modifying the system of Joeressen with the 802.11 and Bluetooth references' teachings, is similar to the reason for modifying the combined system of Joeressen and Stanwood.

ii. The Claims Would Have Been Obvious In Light of Joeressen, Stanwood, and either Nevo or Bridgelall

140. The prior art of SNQ 6 discloses or renders obvious every element of claims 2-3 of the '040 Patent. The combination of Joeressen and Stanwood discloses the claimed elements of the '040 Patent. *See* Section IX.D. Additionally, each of Nevo and Bridgelall discloses a

radio communications medium conforming to an 802.11 and/or Bluetooth specification as set forth in claims 2-3.

141. I agree with Requester's limitation by limitation mapping of the prior art to the '040 Patent as set forth in the claim charts provided in Exhibit AA.

G. SNQ 7

142. The combination of Jokinen and Joeressen raises a substantial new question of patentability as to claims 1-6 and 16. Moreover, the knowledge of a POSITA would have been extensive – to the extent it is argued that a claim element is not disclosed by these reference, any such claim element would have been obvious in view of the numerous admissions of the Patent regarding the prior art (*see* Section VIII.E) and the background knowledge of a POSITA (*see* Section VI). That is, the Admitted Prior Art confirms my opinions regarding the disclosures of the prior art, and how they would have been understood by a POSITA.

i. Motivation to Combine

143. The motivations to combine set forth above also apply to SNQ 7. *See* Sections IX.A-F. For example, Jokinen provides for dynamic allocation techniques that are applicable to the system of Joeressen, and Joeressen discloses that LANs (such as Bluetooth) can be integrated with other radio services in a time-allocated scheme.

144. Jokinen and Joeressen are both analogous art and each sets forth the benefits of its invention. These stated benefits provide a POSITA motivations to combine these references. For instance, Jokinen provides a method by which radio capacity is divided dynamically between two radio communications services (packet radio service and circuit switched service). EX1004 at Abstract. The teachings of Joeressen provides a terminal for simultaneously operating in a first mobile radio communications network and a second different radio communications network.

EX1005 at Abstract. Moreover, Joeressen explains that it's "allocation pattern is preferably variable" (*see, e.g.*, EX1004, 1:57-58), and Jokinen provides variable allocation for two-radio systems (*see, e.g.*, EX1004, 4:9-20). Joeressen describes "[a] terminal for simultaneously operating in a first mobile radio communications network and a second different radio communications network," where a LAN (*e.g.*, Bluetooth) protocol may be used was part of a variable allocation scheme. *See* EX1005, Abstract; *see also* Section VIII.B.

145. Such a combination is combining prior art elements according to known methods to yield predictable results. The radio networks, TDMA time slot allocation, and other components of Joeressen are similar to those in Jokinen, and could readily be combined by a POSITA.

146. Such a combination is a simple substitution of one known element for another to obtain predictable results. The radio networks, TDMA time slot allocation, and other components of Joeressen are similar to those in Jokinen, and could readily be substituted by a POSITA.

147. Such a combination uses or applied a known technique to improve similar devices in the same way. The radio networks, TDMA time slot allocation, and other components of Joeressen are similar to those in Jokinen, and could readily be combined by a POSITA. And Jokinen's time slot allocation teachings would improve the Bluetooth-based systems of Joeressen.

148. As I explained above (see Section VIII(E)), the '040 Patent admits that Bluetooth and 802.11 standards were known, it was known that they operate in overlapping frequencies, there was an existing demand for Bluetooth and 802.11 to coexist, and it was known to take measures to reduce their interference. In particular, these admissions support my opinions here

regarding the motivation to combine references, and show that in particular the specific requirements of claims 2 and 3 regarding the transmission media conforming to either an 802.11 specification or a Bluetooth specification would have been obvious and well known.

ii. The Claims Would Have Been Obvious In Light of Jokinen and Joeressen

149. The prior art of SNQ 7 discloses or renders obvious every element of claims 1-6 and 16 of the '040 Patent for the reasons explained above. *See* Sections IX.A-F.

150. I agree with Requester's limitation by limitation mapping of the prior art to the '040 Patent as set forth in the claim charts provided in Exhibit AA.

151. To the extent it is argued that the combination of Jokinen and Joeressen does not teach or suggest a limitation of any of claims 1-6 and 16, it would have been obvious in further view of the Admitted Prior Art. *See* Sections VI.A-C (Technology Background) and VIII.E (Admitted Prior Art). The admissions in the '040 Patent confirm that numerous claimed features were known, and that the background knowledge of a POSITA would have been significant.

H. SNQ 8

152. The combination of Jokinen and Joeressen in view of either Nevo or Bridgelall raises a substantial new question of patentability as to claims 2-3. Moreover, the knowledge of a POSITA would have been extensive – to the extent it is argued that a claim element is not disclosed by these reference, any such claim element would have been obvious in view of the admissions of the '040 Patent regarding the prior art (*see* Section VIII.E) and the background knowledge of a POSITA (*see* Section VI). That is, the Admitted Prior Art confirms my opinions regarding the disclosures of the prior art, and how they would have been understood by a POSITA.

i. Motivation to Combine

153. The motivations to combine set forth above also apply to SNQ 8. *See* Sections IX.A-G. Moreover, the Admitted Prior Art confirms the motivation to combine discussed throughout. *See* Section VIII.E.

ii. The Claims Would Have Been Obvious In Light of Jokinen, Joeressen, and either Nevo or Bridgelall

154. The prior art of SNQ 8 discloses or renders obvious every element of claims 1-6 and 16 of the '040 Patent for the reasons explained above. *See* Sections IX.A-G.

155. I agree with Requester's limitation by limitation mapping of the prior art to the '040 Patent as set forth in the claim charts provided in Exhibit AA.

156. Again, my opinions – including how a POSITA would understand the teachings of the prior art – are confirmed by the Admitted Prior Art. *See* Sections VI.A-C (Technology Background) and VIII.E (Admitted Prior Art). The admissions in the '040 Patent confirm that numerous claimed features were known, and that the background knowledge of a POSITA would have been significant.

X. SECONDARY CONSIDERATIONS

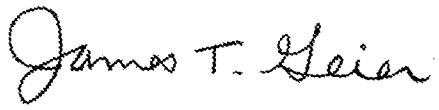
157. At this time, I am not aware of any objective evidence (or "secondary considerations") that would suggest that any of the Challenged Claims were not obvious. For example, I am not aware of any evidence relating the purported invention to any commercial success, evidence of a long-felt need that was solved by the purported invention, evidence that others have copied the purported invention, failure of others facing the same state of the art to develop a satisfactory solution, professional approval or skepticism, or evidence that the purported invention achieved a surprising result. And no such evidence was submitted during prosecution of the '040 Patent. It is my opinion that the Challenged Claims would have been obvious to one of skill in the art.

XI. CONCLUSION

158. I hereby declare that all statements made herein of 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 and/or imprisonment under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the patent which is under review in this proceeding.

Dated: September 21, 2023

Respectfully submitted,



James Geier

Appendix A: Curriculum Vitae of James 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 Cortication 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:

Ericsson v. Apple

Law firm: Fish & Richardson

Expert on behalf of the defendant (Apple) during 2022 regarding patent litigation within the International Trade Commission. Analyzed patents, products, prior art and other case documents associated with wireless roaming algorithms; analyzed product firmware; wrote expert reports regarding patent invalidity and non-infringement; testified at deposition; testified at the International Trade Commission in 2022 (Judge Elliot).

IOENGINE v. Ingenico, Inc.

Law firm: Sunstein Kann Murphy & Timbers

Expert on behalf of Ingenico during 2021-2022 regarding patent litigation within the U.S. District Court – Delaware. Analyzed patents, products, prior art and other case documents associated with wireless credit card processing systems; analyzed product firmware; wrote expert reports regarding patent noninfringement and invalidity; testified at deposition; testified at a jury trial within the District Court of Delaware in 2022 (Judge Bryson).

AIG Specialty Insurance Company v. Pegatron Corporation

Law Firm: Gordon Rees

Expert on behalf of the plaintiff (AIG Specialty Insurance Company) during 2020-2021 regarding Wi-Fi /cellular interference issues within the Northern District of Georgia. Analyzed test reports and case documents; wrote a declaration; testified at deposition.

NTT Corporation, et al. v. MediaTek, Acer, and Texas Instruments

Law Firm: Dickinson Wright

Expert on behalf of the plaintiff (NTT Corporation) during 2020-2021 regarding claim construction within district court of the Western District of Texas. Analyzed patents and case documents related to wireless communications; wrote a declaration regarding claim construction; testified at deposition.

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; testified at a jury trial within the District Court of Eastern Texas in 2017 (Judge Gilstrap).

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. 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 the International Trade Commission in 2012 (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. 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 the International Trade Commission in 2011 (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.

Appendix B: Challenged Claims of U.S. Patent No. 7,058,040

1. A method for data transmission over first and second media that overlap in frequency, comprising:

computing one or more time division multiple access (TDMA) time-slot channels to be shared between the first and second media for data transmission;

allocating one or more time-slot channels to the first medium for data transmission;

allocating one or more of the remaining time-slot channels to the second medium for data transmission; and

dynamically adjusting a number of time-slot channels assigned to one of the first and second media during the data transmission to remain within limits of a desired level of service.

2. The method of claim 1, wherein at least one of the first and second media conforms to an 802.11 specification.

3. The method of claim 1, wherein at least one of the first and second media conforms to a Bluetooth specification.

4. The method of claim 1, further comprising determining the desired level of service for one of the first and second media during the data transmission.

5. The method of claim 1, wherein the dynamic adjusting comprises:

determining available time-slot resources;

detecting the medium that fails to meet said desired level of service;

allocating the medium to a configuration having additional time slots; and

transmitting a channel assignment message including information on the allocated configuration with the additional time slots.

6. The method of claim 5, further comprising instructing transceivers for the first and second media to communicate only in their previously presentedly allocated time-slots.

16. The method of claim 1, further comprising instructing transceivers for the first and second media to communicate only in their allocated time-slot channels.