

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

DISH NETWORK L.L.C.,
Petitioner,

v.

ENTROPIC COMMUNICATIONS, LLC,
Patent Owner.

CASE: IPR2024-00373

U.S. PATENT NO. 7,594,249

DECLARATION OF REGIS J. BATES JR. (Ex. 2007)

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I, Regis J. (Bud) Bates Jr., declare as follows:

1. I am over eighteen years of age, and I am competent to testify regarding the matters set forth in this declaration if called upon to do so.

2. I have been retained in this matter on behalf of Patent Owner Entropic Communications, LLC (“Entropic”).

3. I submit this declaration at the request of K&L Gates, counsel for Entropic in this proceeding.

4. I have been asked to provide an opinion in response to Petitioner Dish Network L.L.C. and its expert Dr. Acton’s papers in this proceeding regarding whether the Petition and Dr. Acton have established whether any claim of U.S. Patent No. 7,594,249 (the “’249 Patent”) is unpatentable under the United States Patent and Trademark Office’s *inter partes* review standard of a preponderance of the evidence.

5. In preparing this declaration, I have studied the ’249 Patent (Ex. 1001), its file history (Ex. 1002), the Declaration of Dr. Scott Acton (Ex. 1003), four references, U.S. Patent 7,127,734 (“Amit”) (Ex. 1005), “ADSL/VDSL Principles: A Practical and Precise Study of Asymmetric Digital Subscriber Lines and Very High Speed Digital Subscriber Lines” (“ADSL/VDSL”) (Ex. 1006), “An Efficient Digital Modulation Scheme for Multimedia Transmission on the Cable Television Network” (“Jacobsen”) (Ex. 1007), and “DSL: Simulation Techniques and

Standards Development for Digital Subscriber Line Systems” (“DSL-Book”) (Ex. 1008). I have also considered the other documents or references cited in this declaration.

6. In forming the opinions, I expressed below, I have considered the documents listed above, the relevant legal standards as provided to me by counsel, and my own knowledge and experience.

7. I reserve the right to supplement my opinions in the future to respond to any arguments raised by the opposition and to take into account new information that becomes available to me. I understand Dr. Acton has already provided his opinions in Ex. 1003 [Acton Decl.] however if he is permitted to offer additional opinions, I reserve my right to respond to those should I be asked.

I. BACKGROUND AND QUALIFICATIONS

8. This section briefly summarizes my career history, education, publications, and other relevant qualifications. My full *curriculum vitae* (“CV”) is included as Appendix A.

9. I am the founder and President of TC International Consulting, Inc. (“TCIC”). Our offices are located at 3413 Ponderosa Loop, Heber, AZ 85928. At TCIC, I have consulted and worked with the telecommunications industry since 1989.

10. I earned a Bachelor of Science degree in Business Management (BSBM) in 1979 from Stonehill College in Easton, Massachusetts, and I completed coursework towards a Master of Business Administration (“MBA”) degree at Lehigh University in Bethlehem, Pennsylvania and St. Joseph’s College in Philadelphia, Pennsylvania. I completed all the coursework but not the thesis required for the MBA degree.

11. Since 1966, I have been involved in designing, building, optimizing and training others in many aspects of telecommunications systems, including multiuser cellular and cable-based systems as well as Private Branch Exchange (“PBX”), IP PBX Systems and computer networks. In that time, I have had an active role in the growth of the telecommunication industry and have personally witnessed, and contributed to, the industry’s growth in terms of various technologies, infrastructure, and legal, regulatory and technical services.

12. My experience spans all layers of Open Systems Interconnection (“OSI”) model, including the physical, data-link (including media access control) and network layers. For example, in my various professional roles, described below, I have been responsible for implementing telecommunications systems up to the application layer.

13. I have written numerous books on telecommunications technology, many of which have been best sellers for publisher McGraw-Hill. My textbook titled

“Voice and Data Communications Handbook” led McGraw-Hill’s sales for three consecutive years and has been used by over 166 colleges and universities around the world. Other books that I have written include “Securing VoIP Systems,” “Disaster Recovery for LANs,” “Wireless Networked Communications,” “Wireless Broadband Communications,” “cdmaOne and cdma2000,” “General Packet Radio Services (GPRS),” “Principles of Voice and Data,” “Broadband Telecommunications Handbook versions 1 and 2” and “Optical Networking and Switching.” I am the co-author of a book entitled “Wireless Networks Dictionary” published by Althos Publishing.

14. I have personally developed curricula and taught telecommunications classes on-site with many of the world’s leading manufacturers and providers of telecommunications equipment and services. These have included classes titled or on the following topics: “Hands on Voice over IP,” “Implementing VoIP,” “Securing VoIP,” “Ethernet and Gigabit Ethernet,” “LAN and WAN Communications,” “IP PBX Solutions,” “Introduction to Voice Communications,” “Hands on Telephony,” “Installing and implementing a PBX solution,” “Call Center Convergence,” “Introduction to Data Communications,” “Hands on Data Communications,” “Introduction to T1 and T3,” “Optical Networking and SONET,” “Data and Internet Communications, a How to Course for implementing solutions,” “Asynchronous Transfer Mode (ATM),” “Frame Relay a Data Communications

design,” “Wireless Communications,” “Hands on Securing Wireless Networks,” “Hands on Integrating Wireless Networks,” “TCP/IP,” “Linking LANs and WANs with Bridging and Routing,” “GPRS,” “GSM (including WAP and MMS),” “Next Generation Wireless,” “Cisco RF Design” and “Cisco Wireless Mesh.” As indicated by these names and titles, I have deep experience teaching others about the implementation of use of telecommunications networks at varying levels of generality and at most layers of OSI protocol stack, including and especially Cellular Communications (1G-5G, SIP and VoIP).

15. I have also been personally involved in developing curricula and teaching courses on the certification of products and services with various technical specifications and standards, including LAN technologies, WAN technologies, Cabling Systems, Wi-Fi Certifications (CWNA), Wi-Fi Security Certification (CWSP), and CompTIA courses on WiMAX certification (Wi-MAX RF Engineer), RFID Certification (RFID+) and Convergence Technologies Professional (CTP) Certification.

16. Through my decades of involvement with the telecommunications industry, I have first-hand knowledge regarding the relationship between service providers and carriers on one hand, and their equipment vendors, on the other, including on the extent to which providers and carriers dictate and require that equipment be certified to, or otherwise comply with, standards specifications and

other technical requirements. I am also familiar with the extent to, and manner in which, providers and carriers evaluate vendor equipment on technical and business grounds, select certain equipment for use in their network, evaluate the equipment's performance and determine whether to upgrade such equipment or its associated software. I am also familiar with the criteria and methodologies that providers and carriers use to monitor data activities on their network and the extent to which providers and carriers disallow certain types of network activities or traffic patterns.

17. From 1966 to 1972, I served as a Captain of the United States Army Signal Corps. In this role, I was immersed in telecommunications technology. The Army put me through extensive RF and engineering courses as well as hands on wired and wireless systems. I also participated in a six-month engineering program on communications systems and RF basics. I worked in and with fixed and mobile Radio Relay VHF systems, satellite systems, long haul troposcatter and various two-way communications models. I performed communications systems and signal analysis on an almost daily basis and worked in communications system algorithm design, modulation and demodulation techniques and other technical issues often in the context of rapidly changing and unpredictable network deployment scenarios. For example, while in Vietnam, I worked with mobile and fixed location radio-based systems and installed a system that spanned over 400 miles for military tactical forces. I was responsible for the operation and control of the Automatic Voice

Network (AUTOVON) system in Donnersberg, Germany, and I had operational responsibility for the Pirmasens, Germany Satellite terminal. At Ft. Devens, I ran the Communications Center, which facilitated Voice communications, secure telex, teletype and facsimile services for the U.S. Army. Based on my work on these and other projects, I received significant telecommunications wired and wireless system training while working for the Army.

18. From 1972 to 1974, I was a Telecommunications and Facilities Manager for Damon Corporation in Needham, MA. My responsibilities included overseeing voice and data (limited analog dial up) communications for locations across the country. The corporate communications budget was approximately \$2.5 million annually.

19. From 1974 to 1977, I was Manager of Administrative Services for Hills Department Stores in Canton, MA. In this role, my responsibilities included analyzing, selecting, and implementing major communications projects in 50 stores spread throughout the east and mid-west of the United States.

20. From 1977 to 1979, I was Telecommunications Manager for Manufacturing and International Sites for Data General Corporation in Westboro, MA. In this role, I was responsible for selecting equipment (from the Bell System and competitors) for 100 sites across the world, selecting services (voice, data and fax traffic) from the common carriers and selecting the appropriate means and

protocols to use these goods and services. I installed a T1 network from coast to coast. I was also responsible for the installation of 30 PBXs and 40 key telephone systems. Moreover, at Data General I was responsible for acquiring and operating a private microwave radio system.

21. From 1979 to 1986, I was Telecommunications Manager for Air Products and Chemicals, Inc., with an annual budget of \$50 million. In this role, I designed, selected, analyzed, and implemented all communications projects for the use of voice and data communications at the corporation's 440 sites around the US and 35 international sites. This included the use of telephone systems, dial up telephony and data, leased lines for voice and data and analog and digital circuits (including T1, T3 and fiber optics). I was also responsible for research, selection, and installation of over 250 telephone systems (PBX and Key Systems along with integration systems).

22. While at Air Products and Chemicals, Inc., I also worked on a project to integrate the company's voice, data, TV-video and local area network (LAN) services into what is now known as a Campus Area Network (CAN). The CAN was on a broadband cable television (CATV) system and implemented a "triple play" service on campus well before CATV companies started offering such services. In connection with this work, I worked with major cable providers on various Data Over Cable Service Interface Specification (DOCSIS) services. I understand that

the CAN system was studied and written up as a Harvard Business School case related to the integration scheme and other business aspects.

23. From 1986 to 1989, I was Chief Information Officer (CIO) for the law firm Pepper, Hamilton and Scheetz, in Philadelphia, PA. In that role, I performed complete automation of the firm's multiple offices around the country. I was also responsible for the selection and installation of 10 PBX systems, all with major integration services, and the design, final installation and testing of local area networks (LANs). In fact, during a major move of Corporate Headquarters, I was personally instrumental in installing the LAN technologies. I also created the WAN access and usage through a network of digital circuits using T1 services from many of the common carriers and new competitors in the industry.

24. As noted above, I am President and Founder of TCIC, where I have worked since 1989. At TCIC, I have consulted and worked with many of the leaders in the telecommunications industry. I have provided analyses and findings to clients regarding the selection of vendors or products and directly provided training in various technologies including Voice, Telephone Systems, Data Networks, Video, Internet, Wireless (Cellular), Wireless LAN Technologies, VoIP Systems and Services, Cabling systems, Fiber Optics and Infrastructure. My company has been responsible for selecting and implementing over 100 PBX systems for client companies.

25. At TCIC, I develop and conduct training for corporate users, manufacturers, and telecommunications carriers. I have personally trained individuals at all of the Regional Bell Operating Companies (“RBOCs”), over 150 Competitive Local Exchange Carriers (“CLECs”), LTE carriers, including AT&T, MCI/WorldCom (now Verizon), Sprint (now T-Mobile), MetroPCS and Cellular One, many of the CATV Companies (including RCN, Cox, WOW and others), and most of the large telecommunications equipment manufacturers (Nortel-Networks, Lucent (now Nokia), Avaya, Mitel, Siemens, Alcatel (now Nokia), Newbridge, Marconi and Cisco), the United States government and other Fortune 500 companies. I was a badged contractor for Cisco Systems on their Wi-Fi products and the integration of VoIP over wireless technologies. I was the external Subject Matter Expert (SME) for Cisco business units while rolling out their VoIP Call Manager systems and their Wi-Fi/VoIP systems integration.

26. I have authored approximately 20 books, published numerous articles and papers in magazines, and taught courses and seminars in telecommunications and computers in over a dozen countries globally. My materials have received hundreds of citations from other authors. I have been a technical editor for IPTV Magazine from 2016- 2022. I am a Life member of the IEEE. I have also been a keynote speaker at conferences, events and meetings, including Comdex, the International Communications Association, BICSI, RBOCs and annual meetings for

Ameritech and PacBell. I have also been the keynote speaker at Disaster Recovery Journal Annual seminars regarding DR Planning for Telecommunication Networks and DR Planning for LANS.

27. Additional information regarding my background, qualifications, publications, and presentations is included as part of my curriculum vitae (“CV”), which is included in **Appendix A**.

28. I have served as an expert witness in several IPR proceedings, district court patent infringement and validity cases, Trade Secret cases, Contract Disputes and International Trade Commission (“ITC”) investigations in the field of telecommunications, including Wireless (Cellular), VoIP and SIP based technologies, as shown in my CV.

29. I am being compensated for my work associated with this case at my standard consulting rate of \$385 per hour. My compensation is not contingent on my opinions or the outcome of this case, and I have no other interest in the case or the parties thereto.

II. LEGAL STANDARDS

30. Although I am not a lawyer, I have been advised of the relevant legal principles by Entropic’s counsel and have used them as a basis for my opinions. These are consistent with my understanding of the legal principles based on my prior experience with patent litigation matters.

31. I understand that the person of ordinary skill in the art (POSITA) is a hypothetical person who is presumed to have known the relevant art at the time of the invention. I further understand that the factors that may be considered in determining the ordinary skill in the art include the following: the type of problems encountered in the art, prior art solutions to those problems, rapidity with which innovations are made, sophistication of the technology, and the educational level of workers in the field.

32. I understand that the claims within a patent set forth what the inventors have presented as their inventions. I understand that claims can be independent or in dependent form, meaning that they depend from the identified independent claim and add requirements to those claims.

33. I understand that claim construction is a matter of law for the arbiter of law to decide. I further understand that claim terms should be given their ordinary and customary meaning within the context of the patent in which the terms are used, i.e., the meaning that the term would have to a person of ordinary skill in the art in question at the time of the invention in light of what the patent teaches.

34. I understand that to determine how a person of ordinary skill would understand a claim term, one should look to those sources available that show what a person of skill in the art would have understood disputed claim language to mean. Such sources include the words of the claims themselves, the remainder of the

patent's specification, the prosecution history of the patent (all considered "intrinsic" evidence), and "extrinsic" evidence concerning relevant scientific principles, the meaning of technical terms, and the state of the art.

35. I understand that a person of ordinary skill in the art is deemed to read a claim term not only in the context of the particular claim in which the disputed term appears, but in the context of the entire patent, including the specification. For this reason, the words of the claim must be interpreted in view of the entire specification. The specification is the primary basis for construing the claims and provides a safeguard such that correct constructions closely align with the specification.

36. I understand that claim terms must be construed in a manner consistent with the context of the intrinsic record. In addition to consulting the specification, one should also consider the patent's prosecution history.

37. I understand that in addition to the intrinsic record, courts may also look to extrinsic evidence to construe claim terms. I understand that extrinsic evidence can be helpful in many ways, including to explain scientific principles, the meaning of technical terms, and terms of art that appear in the patent and prosecution history. However, any extrinsic evidence should be afforded less weight than the intrinsic evidence, as the intrinsic evidence is a better indicator of how the applicants understood their invention.

38. I understand that commonly, determining the ordinary and customary meaning of the claim requires examination of terms that have a particular meaning in a field of art. I understand that extrinsic evidence can educate the court regarding the field of the invention and can help the court determine what a person of ordinary skill in the art would understand claim terms to mean.

39. I understand that, unlike at the district court, patents subject to *inter partes* review, such as this proceeding, are not presumed to be valid, such that a lower burden of proof is used to judge the patentability of challenged claims. Unlike the district court's "clear and convincing" burden, here a "preponderance of the evidence" burden exists.

40. I understand that a patent claim is invalid as "anticipated" by a single "prior art" reference if the reference discloses every single element of the claim with sufficient precision and detail to establish that the subject matter of the claim existed in the prior art. In particular, I understand that it is not sufficient to establish that all of the elements are collectively disclosed within the four corners of a particular document. Instead, the operative question is whether a person of ordinary skill would have understood the elements as being arranged as in the claim itself. I also understand that a prior art reference cannot "anticipate" a patent claim unless that reference enables one of ordinary skill in the art to make and use what is disclosed without undue experimentation. Thus, if the reference does not enable one of

ordinary skill to make or use each and every claim limitation, then the claim cannot be “anticipated” by the reference.¹

41. I understand that a prior art reference can disclose a given claim element actually or inherently.

42. In the case of actual disclosure, I understand that a person of ordinary skill would need to have understood that the disclosure corresponds to the claim element in question. I also understand that such disclosure may be implicit rather than explicit. For example, prior art need not use the same words as the claimed invention. However, I understand that ambiguous references do not anticipate.

43. In the case of alleged “inherent” anticipation, I understand that the claim element in question must necessarily be present when practicing the described technology even though the prior art reference itself contains no express description of the element in question. In particular, I understand that “possibilities or probabilities” are not sufficient to establish inherency. The mere fact that a certain thing may result from a given set of circumstances is not sufficient. Instead, the essence of inherency is that one of ordinary skill in the art would recognize that a reference unavoidably teaches the property in question.

¹ I understand that Petitioner and Dr. Acton are not advancing any anticipation-based theories of unpatentability.

44. I understand that a patent claim may describe an invention that was new (i.e., not anticipated by any prior art reference), but nevertheless be invalid for “obviousness” if the differences between the patented subject matter and the prior art are such that the subject matter as a whole would have been obvious to a person of ordinary skill in the art at the time of the invention was made.²

45. I understand that an invention is not rendered obvious simply on the basis of two or more different disclosures that collectively disclose all of the claimed elements. In other words, an invention is not obvious just because all of the elements that comprise the invention may have been independently known in the prior art. Instead, a person of ordinary skill in the art must have had a reason or basis to make any alleged modification or combination as well as a reasonable expectation of success in pursuing the possibility that turns out to succeed and is claimed. In particular, I understand that knowledge of a goal does not itself render achievement of that goal obvious.

46. I also understand that determining whether or not a claimed invention would have been obvious requires assessing facts related to (1) the scope and content of the prior art, (2) the differences between the prior art and the claimed invention,

² I understand that the Petition and Dr. Acton are advancing four “obviousness” theories.

(3) the level of ordinary skill in the art, and (4) any objective evidence (“secondary considerations”) of non-obviousness. I understand that this is known as consideration of the “Graham Factors.”

47. I further understand that an invention is not obvious just by demonstrating that each of its elements was, independently, known in the prior art. To prove that an invention is obvious, I understand that it can be important to point to a reason or reasons, such as a teaching, suggestion, or motivation (although such a reason need not be found in the references themselves), that would have prompted a person of ordinary skill in the relevant field to combine or modify the elements in the way the claimed invention does. I understand that this is because inventions in most (if not all) instances rely upon building blocks already known, and claimed discoveries almost of necessity will be combinations of what, in some sense, is already known, therefore it can be important to point to such a reason or reasons. I understand that in identifying such a reason, the analysis need not require precise teachings in the prior art directed to the specific subject matter of the challenged claim.

48. I understand that it will often be necessary for a court to look to interrelated teachings of multiple patents and the background knowledge possessed by a person having ordinary skill in the art in order to determine whether there was an apparent reason to combine the known elements in the fashion claimed by the

patent at issue. I understand that any need or problem known in the field of endeavor at the time of invention and addressed by the patent can provide a reason for combining the elements in the manner claimed. I understand that when a work is available in one field of endeavor, design incentives and other market forces can prompt variations of it, either in the same field or a different one. I understand that the combination of familiar elements according to known methods may be obvious when it does no more than yield predictable results.

49. I also understand that a claim is not invalid as obvious if it is more than the predictable use of prior art elements according to their established functions.

50. Further, I understand that while predictability is a touchstone of obviousness, the concept of a “predictable result” under the law refers not only to the expectation that prior art elements are capable of being physically combined, but also that the combination would have worked for its intended purpose.

51. I also understand that if the prior art teaches away from combining known elements in the manner claimed by the invention at issue, discovering a successful way to combine them is less likely to be obvious. In particular, I understand that a reference may be said to teach away when a person of ordinary skill, 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 applicant, or would understand based on the reference that the line of

development flowing from the reference's disclosure is unlikely to be productive of the result sought by the applicant. Likewise, I understand that similar subject matter may not be sufficient motivation for a person of skill in the art to combine references if the references have conflicting elements.

52. Further, I understand that even if a reference does not necessarily “teach away,” its statements regarding preferences are relevant to a finding whether a person of ordinary skill would have had reason to combine that reference with another reference.

53. I also understand that one must be cautious and resist the temptation to rely on hindsight reasoning when attempting to combine references to suggest that a claim may be obvious. It is important to analyze validity based on the perspective of one at the time of the invention, which I understand is at least as early as the effective filing date. I understand that objective indicia (or “secondary considerations”) of non-obviousness or obviousness may be particularly probative and helpful in avoiding hindsight.

54. I also understand that the burden of persuasion concerning unpatentability (in other words, the ultimate burden to prove the relevant facts to the specified degree of certainty—here, preponderance of the evidence) remains at all times on the party challenging patentability—here, the Petitioner, Dish Network. If

the Board is left uncertain as to validity issues, Petitioner has thus failed to meet its burden.

III. LEVEL OF ORDINARY SKILL IN THE ART

55. I understand from counsel that the '249 Patent is analyzed from the viewpoint of a person of ordinary skill in the art ("POSITA") in and around May 2001. My analysis and opinions below are given from the perspective of a POSITA in the technological field in the relevant time frame, unless stated otherwise.

56. I satisfied the definition of a POSITA long before the filing date of the application leading to the '249 Patent. I now consider myself an expert in the relevant field of technology for the '249 Patent.

57. I understand that Dr. Acton opined that a POSITA relating to the '249 Patent as of May 4, 2021, would have held a bachelor's degree in electrical engineering or computer engineering or a related field (or equivalent understanding through actual work experience), and had at least two to three years of experience related to the design or development of signal processing and communication systems or networks. Ex. 1003 [Acton Decl.] ¶ 17. Additionally, Dr. Acton opines that graduate education could substitute for professional experience, or significant experience in the field could substitute for formal education. Ex. 1003 [Acton Decl.] ¶ 17.

58. I disagree with Dr. Acton's opinion regarding the experience of a POSITA. It is my opinion that a POSITA would have a bachelor's degree in electrical engineering or a related field (or equivalent understanding through actual work experience) and had at least two or three years of experience relating to the design and development of broadband networks over coaxial cables. However, I still agree that additional graduate education may substitute for professional experience, and professional experience in the field could substitute for formal education.

59. Notably, Dr. Acton relies on disclosures relating to different types of cable mediums indiscriminately. I disagree with such interpretations, and indicates specific instances in which I disagree throughout this declaration.

60. For example, the '249 Patent is titled "Network interface device and broadband local area network using coaxial cable[.]" Ex. 1001 ['249] Title. The abstract specifies that the network "uses coaxial cable wiring for interconnection of terminal devices." Ex. 1001 ['249] Abstract. The background describes coaxial cable-based LAN networks, and indicates that prior systems have addressed "the problem of tap port-to-port isolation and providing a suitable signal path for terminal-to-terminal communication in a *coaxial cable wired building*." Ex. 1001 ['249] 1:20-22, 3:4-7. Indeed, the detailed description notes that "[i]n addition to coaxial wiring used for cable TV services, many homes and buildings are wired for

satellite TV services” and that these satellite television wiring systems include converters which convert the transmission frequency to a frequency “suitable for transmission through coax.” Ex. 1001 [’249] 7:3-22. In fact, the ’249 Patent claims a coaxial network. Ex. 1001 [’249] cl. 5, 10.

61. Experience with coaxial cable networks is specifically important. Reference to “port-to-port isolation” and “signal splitter/combiners” in the summary of the invention makes use of coaxial cabling clear to a POSITA. Ex. 1001 [’249] 3:10-37. Signal splitters and recombiners on a coaxial cable networks are used to distribute downstream signals from a POE to various terminals on the network. Ex. 1001 [’249] 1:27-31. The use of signal splitters is explicitly claimed in Claim 1, making it clear it claims a coaxial network. Ex. 1001 [’249] Cl. 1. Port-to-port isolation relates to the high attenuation experienced between tap ports on the coaxial network. Ex. 1001 [’249] 2:8-14. Other types of networks, for example, networks on a twisted pair would not use these types of splitters. For example, the splitters described in DSL networks on twisted pair cabling use splitters for splitting and recombining the two types of signals (data signals and telephony signals), not providing signals to separate endpoints like in the coaxial-based network of the ’249 Patent. Ex. 1001 [’249] 3:18-20; Ex. 1006 [ADSL/VDSL] 6; Ex. 2009³ [DSL-Book (Full)], 6.

³ DSL-Book’s published pagination is used for Ex. 2009.

62. Therefore, the limitations of the '249 Patent may be misunderstood by those who do not have experience with broadband coaxial cable-based networks. Moreover, viewing the prior art without this specific coaxial cable-focused lens could cloud the analysis of whether non-coaxial cable teachings are relevant to the obviousness inquiry or would be combined with coaxial based references.

IV. THE '249 PATENT

63. I have reviewed the specification and prosecution history of the '249 Patent. The specification of the '249 Patent is focused on “broadband communication networks and specifically network interface devices and network wiring.” Ex. 1001 ['249] 1:14-16. Local Area Networks (LANs) can make use of coaxial cabling to communicate between nodes on the LAN by transmitting on a different frequency band than the cable TV service. Ex. 1001 ['249] 1:20-31.

64. These nodes, or terminal devices are often customer premise equipment (CPE) such as cable converter boxes, televisions, and cable modems. Ex. 1001 ['249] 1:27-31. These devices receive downstream signals that enter from a building point of entry (POE) through use of one or more signal splitters. Ex. 1001 ['249] 1:27-31. Signal splitters share the signal from the common port amongst the tap ports, resulting in decreases in the power shared to each terminal device. Ex. 1001 ['249] 1:41-51, 1:63-66. Additionally, in practical applications, there are other sources of more modest power loss, such as impedance mismatches, non-zero

resistances, dissipative losses in circuit elements, and other non-ideal properties. Ex. 1001 ['249] 1:51-56.

65. Splitters also isolate upstream signals, meaning upstream communication from one terminal device has significant attenuation and cannot be easily communicated to a second terminal device. Ex. 1001 ['249] 2:8-14. Systems which operate like conventional cable TV are agnostic to such isolation, or may even find such isolation desirable, as they only communicate through the POE with the cable head-end. Ex. 1001 ['249] 2:15-18. However, a LAN system which seeks to enable communications between terminal devices as claimed in the '249 Patent will be significantly impacted by such attenuation.

66. Accordingly, the '249 Patent provides a system which “addresses the problem of tap port-to-port isolation and providing a suitable signal path for terminal-to-terminal communication in a coaxial cable wired building.” Ex. 1001 ['249] 3:4-7. The '249 Patent shares coaxial cable used in cable television (or community antenna television (CATV)), between a local area network (LAN) and a CATV service. To share the coaxial cable, frequency separation must exist between the two services. In general, the LAN can use one grouping of frequencies (or frequency band), while the CATV service can use a different frequency band (to communicate television Channels). Ex. 1001 ['249] 4:14-17.

67. The '249 Patent communicates over the LAN through use of a frequency selective network interface device at a building's point of entry (or "POE"), which reflects upstream signals from terminal devices back into the building distribution system to be received by other terminal devices, providing a reflected communications path between terminal devices. Ex. 1001 ['249] 3:11-20.

68. In repurposing the coaxial cabling within a building initially used for CATV, an inventor would face multiple different impediments. For example, the coaxial cabling within buildings use splitters or have other imperfections that may contribute to inter-symbol interference (ISI) on the network due to imperfect connection points. Ex. 1001 ['249] 5:65-6:7.

69. The '249 Patent also provides descriptions of considerations to limit this ISI, such as equalization and multicarrier modulation techniques. Ex. 1001 ['249] 6:7-7:59. As of the time of filing, these systems and teachings described in the '249 Patent had not been implemented on a LAN communicating over coaxial cable. Ex. 1001 ['249] 3:4-7.

70. Independent claim 1 of the '249 Patent recites:

A signal distribution network comprising:

a filter located at the point of entry of a building tuned to reject network signals originating in the building, such that the network signals originating in the building do not pass through the filter, but rather are reflected back into the building;

at least one signal splitter, the signal splitter having a common port and a plurality of tap ports, the common port of the signal splitter being coupled to the filter; and

a plurality of terminal devices, each terminal device being coupled to a tap port of at least one signal splitter, at least one of the terminal devices providing frequency bins with more transmit bits which occupy parts of the channel where the signal to noise ratio (SNR) is high;

wherein the reflections from the filter provide a path for terminal devices back through the tap port to transmit signals to other terminal devices thus allowing terminal devices to communicate directly with each other to form the signal distribution network.

Claims 1-17 are at issue, the text of which can be found at Ex. 1001.

71. Claim 5 recites similar limitations adding in an OFDM requirement.

72. Claim 10 recites:

A broadband local area network for transmitting modulated signals using coaxial cable building wiring containing a plurality of branches comprising:

a filter located at the point of entry of the building wiring that rejects network signals originating in the building wiring such that the rejected network signals do not pass through the filter, but rather are reflected by the filter back into all branches of the building wiring;

at least one signal splitter;

a plurality of terminal devices connected to the wiring branches, each terminal device capable of communicating with other terminal devices the reflected signal path created by the filter, wherein the

terminal devices perform equalization on the received signal that restores a flat frequency response to overcome communication channel impairments caused by the reflected signals.

73. The '249 Patent describes a system which uses techniques not previously implemented on the coaxial cabling of a LAN within a building. In attempts to prove the claims of the '249 as obvious, Dr. Acton and the Petition draw upon multiple different types of networks, networks used for different purposes, and networks that operate on different physical medium.

V. TECHNICAL BACKGROUND

74. As background for CATV service, in the 1940s⁴ a community antenna was used to rebroadcast basic TV channels to areas that where reception of these channels was extremely poor (or non-existent). In addition to the basic TV channels, CATV operators were able to add additional services, for example in 1972 Home Box Office (HBO) was created to bring premium TV services to the home. However, the main thrust of the CATV service was to deliver TV services.

75. CATV systems use a tree and branch topology. A central headend station distributes signals through a network of coaxial cables called trunks, which then branch out to smaller distribution hubs, and ultimately reach individual

⁴ It is said that the first commercially available CATV system occurred in 1950 by a company called Jerrold Communications.

subscriber's homes using what are called taps. The local cable entering into the customer's premises is called a drop. On this route amplifiers and splitters are used so that sufficient signal reception is achieved by a large number of users in a community. CATV systems typically use frequency division multiplexing to deliver and separate the different channels on the cable system. A typical layout of a CATV system is shown in Figure 1 below.

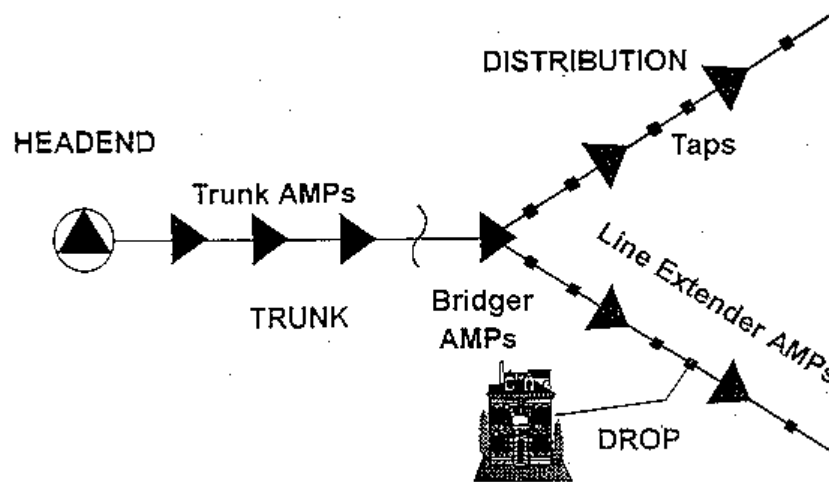


Figure 1

76. A cable system is installed from the headend to the local community. Each of the trunks can host up to approximately 500 local connections (in the past this could have been 2500). A number of trunks, originally constructed out of large diameter coaxial cable, carry the signals from the headend to a series of distribution points. To maintain adequate signal strength over long distances, amplifiers are required at regular intervals, spaced approximately 2,000 feet apart. The number of

amplifiers may be cascaded (approximately 30-40)⁵, because each amplifier introduces additional noise and distortion to the signal.

77. As the trunks extended into the community smaller feeder cables branched out in different directions to serve the local neighborhood. Finally, a tap is used to create a local connection, and a drop cable is extended from the tap into the trunk, to the customer's premises (home). The drop cables are limited to approximately 150 feet.

78. In the initial design, CATV was a one-way service, strictly to deliver TV to the consumer. However, in the mid-1990s, cable was upgraded to what is known as broadband networks which enabled the suppliers to introduce high-speed Internet access to the customer door. Cable modems were introduced to allow this two-way access to the system, allowing customers to connect the cable to a PC/MAC computer. To no one's surprise, homeowners wanted to connect multiple devices in the residence. Splitters were used to provide the additional interfaces for such devices. Using this broadband network, upstream and downstream communications are assigned frequencies that do not interfere with each other. The industry standard

⁵ Fiber Optics has since been introduced in Cable systems which changes the number of amplifiers from approximately 30-40 to around 6 and after 1988 the number of amplifiers was reduced to about 1-2 for most networks.

allows for uplink channels between 5-42 MHz, and downlink at approximately 50 MHz-up to 1 GHz. In the late 1980s General Signal introduced analog cable signals to digital signals on a standard 6 MHz channel. Using compression techniques, a CATV system can transmit up to 10 video channels in the same 6 MHz capacity. This allows much more available bandwidth for the data communications needs such as high-speed Internet, Video on demand, Cable telephony (using VoIP) etc.

79. As can be seen in the '249 Patent, customers wanted the connectivity to the high-speed CATV to receive TV and to utilize the cable's bandwidth for two-way communications over the Internet. However, as sophistication in data communications increased, these same customers demanded added capabilities such as multiple TVs, an increased number of PCs, added printers and fax machines, as well as connecting VoIP telephones for voice communications. In fact, the customers expected the cable companies to provide LAN capabilities. Users wanted to communicate to the various devices in-house such as PC-to-PC and PC-to-Printers, etc. While doing so it became evident that when the user transmitted data between desks, the signal was being sent upstream to the cable headend and then back down to the device. This created a problem of interference and unnecessary traffic on the cable. The '249 Patent provides a system that enables communication between devices on a local area network (LAN) while also reducing interference on the network over coaxial cable in a building. Ex. 1001 ['249] 3:4-7.

80. Cable Internet and in-home LANs run on the same copper coaxial cables that deliver cable TV to the home. Because its popularity, cable TV is available in many areas across the country. It is highly reliable and immune to outages caused by storms. Cable internet is much faster than alternatives like DSL. Coaxial cables use RG-6, RG-11 or RG-59, 75 Ohm wire. The cable itself is made of the following:



Figure 2

First there is a center conductor using RG-6 solid copper conductor (AWG 18 or approximately 1 mm thick). The center core is then surrounded with a dielectric (an insulator). Next is likely a foil shield and then a braided shield. Finally, the outer jacket made of PVC or other material. The data is transmitted on the center core. To prevent interference, it is shielded. The second axis (co-axis) is the braided shield which provides what is known as a Faraday cage (a shield that reflects electromagnetic radiation). This reduces interference from the outside noise, and from the signals radiating outward potentially interfering with other devices. In

transmission coax uses Frequency division multiplexing (FDM) to transmit multiple signals simultaneously over a wide range of frequencies.

81. The most common system today used by cable TV suppliers to offer Internet is DOCSIS (Data over Cable Service Interface Specification), making it an important standard for understanding coaxial communications. DOCSIS comes in different versions. Using the coax each channel is 6MHz wide, a whole channel is used for downstream (a theoretical maximum of 42.88 Mbps⁶) in all of the DOCSIS versions. In the downstream, DOCSIS uses quadrature amplitude modulation (QAM) either 64 or 256. Upstream uses QPSK or QAM, depending on the speed. Theoretical upstream speed is 10.24 Mbps.⁷ Indeed, DOCSIS 3.1 was the first version to support OFDM (2013). Below is a table of the version of DOCSIS and speeds:

Version	Max Downloads	Max Uploads	Year
1.0	40 Mbps	10 Mbps	1997
1.1	40 Mbps	10 Mbps	2001
2.0	40 Mbps	30 Mbps	2002
3.0	1 Gbps	200 Mbps	2006
3.1	10 Gbps	1 Gbps	2013
4.0	10 Gbps	6 Gbps	2024 ?

Table 1⁸

⁶ In reality only about 38 Mbps is available for user.

⁷ In reality 9 Mbps is available for users.

⁸ Compiled from <https://www.cablelabs.com/>.

82. Interestingly the '249 patent uses OFDM for the use of CATV LANs which preceded acceptance by DOCSIS. In fact, OFDM communications were not used until DOCSIS 3.1 which was adopted in 2013. Ex. 2018 [Volkov] [0003]

83. Asymmetrical Digital Subscriber Line (ADSL) and Very High Speed DSL (VDSL) are fundamentally different technologies from the CATV systems.

84. As a means of competing with internet access methods, the Bell Telephone Companies looked to their developers to find a way of using the unshielded twisted pair cables (UTP) running to each homeowner's and business' door. It should be noted that telecommunications companies (or "Telcos") have 24 gauge wires running in bundles from the Central Office to the customer's door. The benefit to DSL is that the local loop is dedicated to a single user. Thus, during the day if a large group of users log on at the same time, it should be invisible to the user. The disadvantage to DSL is that it operates much slower than CATV data.

85. When considering ADSL, the key new network infrastructure equipment required to make ADSL a commercial reality is the digital subscriber-line access multiplexer (DSLAM). The DSLAM aggregates a large number of ADSL subscribers into a single or a few uplink ports to a Frame Relay or ATM backbone network (at the edge switch or router). Ex. 2017 [ADSL/VDSL (Full)], 18. ADSL speeds are governed by wire gauge and distance. The table below is a guideline of the combination of the two components.

Current Data Rate (Mbps)	Wire Gauge	Distance (ft)	Distance (km)
1.5–2.048	24	18,000	5.5
1.5–2.048	26	15,000	4.6
6.3	24	12,000	3.7
6.3	24	9,000	2.7

Table 2

Ex. 2016⁹ [Voice-and-Data], 801.

86. ADSL uses Discreet Multitone (DMT) or OFDM as we now call it. DMT uses multiple narrowband carriers, all transmitting simultaneously in a parallel transmission mode. Each of these carriers carries a portion of the information being transmitted. These multiple discrete bands—or in the world of frequency-division multiplexing, subchannels—are modulated independently of each other, using a carrier frequency located in the center of the frequency being used. These carriers are then processed in parallel form. In order to process the multicarrier frequencies at the same time, a lot of digital processing is required. In the past, this was not economically feasible, but integrated circuitry has made this more feasible.

87. The American National Standards Institute (ANSI) selected DMT with the use of 256 subcarriers, each with a standard 4.3125-kHz bandwidth. These subcarriers can be independently modulated with a maximum of 15 bps/Hz. This

⁹ Voice and Data’s published pagination is used for Ex. 2016.

allows up to 60 Kbps per tone used. This next figure shows the use of the frequency spectrum for the combination of voice and two-way data transmission. In this representation, voice is used in the normal 0- to 4-kHz band on the lower end of the spectrum (although the lower 20 kHz are provided). Separation is allowed between the voice channel and the upstream data communications, which operates between 20 and 130 kHz. Then separation is allowed between the upstream and the downstream channels.

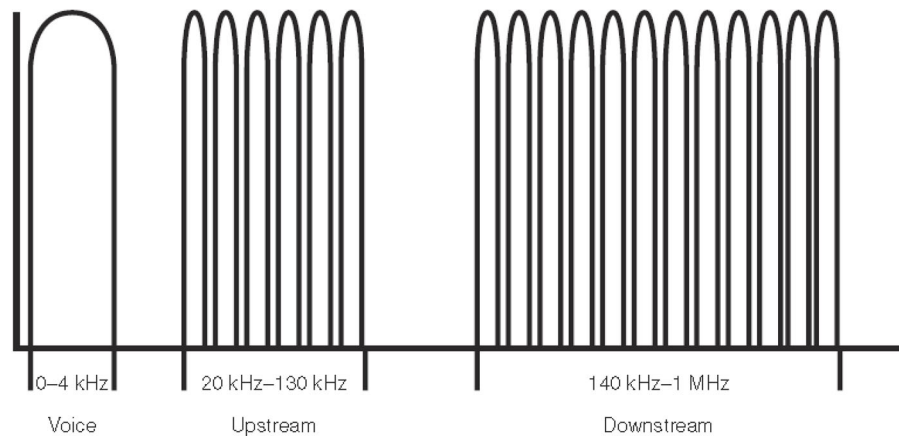


Figure 3

Ex. 2016 [Voice-and-Data] 811.

88. The downstream flow is between 140 kHz and 1 MHz. As shown in the above Figure, the separation allows for the simultaneous up and down streams and the concurrent voice channel. It is on this spectrum that the data rates are sustained. Each of the subchannels operates at approximately 4.3125 kHz, and a separation of 4.3125 kHz between channels is allocated. Ex. 2016 [Voice-and-Data] 810.

89. Orthogonal frequency-division multiplexing (OFDM) is a digital communication technique initially developed for use in cable television systems. OFDM is based on the broadcasting technique known as frequency division multiplexing (FDM), which uses a multitude of transmitters and receivers to send information on different frequencies over a single wire, such as an electrical power cable.

VI. CLAIM CONSTRUCTION

90. I understand that Dr. Acton has not offered any opinions about the “plain and ordinary” or “ordinary and customary” meaning of any claim elements and has further not identified any specific constructions that should be adopted for any terms. To the extent he is permitted to supplement his opinion, I reserve my right to respond to any new opinions he may offer. In the absence of any opinions on specific meanings or constructions of any term of the ’249 Patent, I have applied the plain and ordinary meaning of those terms as would be understood by a POSITA (as I defined earlier).

VII. PRIOR ART

91. I have reviewed the prior art Dr. Acton relies upon for his four grounds of unpatentability: Amit (Ex. 1005), ADSL/VDSL (Ex. 1006), Jacobsen (Ex. 1007), and DSL-Book (Ex. 1008). While I provide more technical details relating to these references as I discuss them in my opinion below, brief overviews are provided here.

A. Amit

92. Amit is a U.S. Patent which issued on October 24, 2006. Ex. 1005 [Amit] Title Page. Amit describes systems and methods for home cable network communications. Ex. 1005 [Amit] 1:10-12. Amit's Home Cable Network (HomeCN) operates in two different modes or embodiments depending on whether or not a notch filter is installed. Ex. 1005 [Amit] 7:12-14.

93. When the notch filter is not installed, the HomeCN operates in Connected Home mode. Ex. 1005 [Amit] 7:29-30. Connected Home mode is considered to be more complex of the two modes. Ex. 1005 [Amit] 7:30-31. It uses wider frequency operation, frequency division multiplexing and the associated frequency selection, and additional capabilities. Ex. 1005 [Amit] 7:31-35. Due to the associated complexity, the Connected Home operation mode is only viable when these functions are managed by the Cable Modem Termination System (CMTS). Ex. 1005 [Amit] 7:52-53. In such a mode, multiple LANs would be connected to the CMTS and the management functions must be centralized at the CMTS to ensure interoperability. Otherwise, signals from one home network would interfere with signal from another home network.

94. Conversely, when the notch filter is installed, the HomeCN operates in Single Home mode. Ex. 1005 [Amit] 7:25-28. In Single Home mode, the HomeCN is a simple design, and the HomeCN is disconnected from the regional cable

network. Ex. 1005 [Amit] 7:16-19. The Single Home mode does not connect to the CATV plant and does not allow for communication with the CMTS. Ex. 1005 [Amit] 7:25-28. In the Single Home mode, HomeCN is unable to exploit certain technologies and protocols, because it would not have the more advanced management and control functionality of the CMTS. Ex. 1005 [Amit] 16:46-47. However, the Single Home mode is valuable in that it reduces the price and increases performance of home networking functionality. Ex. 1005 [Amit] 7:45-47.

95. A home in Amit's system is not capable of simultaneously operating in the Single Home mode and the Connected Home mode as the operation mode of Amit's HomeCN is determined by the presence of the notch filter at the home's entrance. Ex. 1005 [Amit] 7:12-14.

96. Additionally, Amit does not describe multicarrier functionality in the Single Home mode or the Connected Home mode. Amit describes modulation through QPSK, QAM 16, QAM 64, and QAM 256, as well as channel allocation techniques like Frequency Division Multiplexing (FDM), Time Domain Multiplexing (TDM), and Code Domain Multiplexing (CDM) protocols. Ex. 1005 [Amit] 8:30-33, 26:15-65. None of these are multicarrier systems.

97. Not only does Amit not disclose multicarrier modulation, the more complex protocols like FDM, TDM, and CDM would not function in Amit's Single Home mode. FDM is not described as operating on the LAN but operating on the

regional cable network level. Ex. 1005 [Amit] 8:45-46, 9:43-47. TDM and CDM require synchronization from the CMTS, so they are unavailable in the LAN operation of the single home embodiment as well. Ex. 1005 [Amit] 26:15-65. Additionally, Amit advocates against more complex protocols that require channel allocations, like FDM and TDM. Ex. 1005 [Amit] 26:11-14. In fact, Amit's Single Home mode uses only one channel, as its frequency range is 900-906 MHz with a channel spacing of 6.25 MHz. Ex. 1005 [Amit] 8:20-30. It does not provide sufficient space to allow for more than one, single carrier channel. Accordingly, Amit's Single Home mode would use single carrier modulation on its LAN.

98. Amit also describes a two-frequency mode that can be implemented in houses where there is a problem with reflection, and which allows for a device to receive LAN communications with no echo. Ex. 1005 [Amit] 20:15-44. The two-frequency mode, (also referred to as the dual frequencies mode) requires a transponder module to be installed at the entrance of the home. Ex. 1005 [Amit] 20:26-27. The transponder module receives a signal from a first networking device at an upstream frequency range, changes the signal frequency to a downstream frequency range, and transmits the signal (on the downstream frequency range) to a second network devices. Ex. 1005 [Amit] 20:26-31. The second network device receives the signal with no echo. Ex.1005, [Amit] 20:31. This way, Amit can reduce

all ISI caused by echoes or micro-reflections. There is no need to mitigate ISI further with multicarrier modulation, equalization, or any other technique.

B. ADSL/VDSL

99. ADSL/VDSL is a textbook which introduces and describes DSL technologies, and more specifically, Asymmetric Digital Subscriber Line (ADSL) and Very High Speed Digital Subscriber Line (VDSL) technology. Ex. 1006 [ADSL/VDSL] 3. ADSL and VDSL was developed to coexist on twisted pair wires and operate on a wide area network (WAN) rather than a LAN. Ex. 1006 [ADSL/VDSL] 4. Typically, this would be from the customer premise to a Central Office (CO). Ex. 1006 [ADSL/VDSL] 5. Twisted pair wires were not designed to carry high bit rates due to their lack of insulation and limited operable frequency range. Despite the limited bit rates, twisted pair lines were relied on by ADSL and VDSL technologies because they were already installed in buildings. Ex. 1006 [ADSL/VDSL] 6-7.

100. Around the time of publication, ADSL and VDSL technologies were being implemented on twisted pair so that twisted pair could compete with and approach the superior data rates and bandwidths that coaxial cable networks were already providing. Ex. 1006 [ADSL/VDSL] 6-7, 10-12. However, ADSL/VDSL does not discuss implementation of a LAN through use of a reflected signal and/or signal splitters.

101. ADSL and VDSL are different technologies than the CATV systems. As a means of competing with internet access methods, the Bell Telephone Companies looked to their developers to find a way of using the unshielded twisted pair cables (UTP) running to each homeowner's and business' door. The benefit to DSL is that the local loop is dedicated to a single user and need not share bandwidth with the neighborhood. Thus, during the day if a large group of users log on at the same time, it should be invisible to the user such that the user does not experience any reduced bandwidth or throughput. The disadvantage to DSL is that it operates at much slower speeds than CATV data.

C. Jacobsen

102. Jacobsen provides a comparison between single-carrier modulation with equalization and multicarrier modulation in a cable television (CATV) channel. Ex. 1007 [Jacobsen] 8. CATV networks utilize coaxial cables as the physical medium. Ex. 1007 [Jacobsen] 8. The network described in Jacobsen communicates from a headend to a home but Jacobsen does not describe any coaxial LANs existing in a home. Ex. 1007 [Jacobsen] 10. The results of Jacobsen's simulation indicated that multitone modulation is more computationally efficient than single-carrier modulation with equalization. Ex. 1007 [Jacobsen] 15. Jacobsen is silent with regard to any use of any reflected signal to communicate between devices.

D. DSL-Book

103. DSL-Book, like ADSL/VDSL, provides an overview of DSL technologies. Ex. 1008 [DSL-Book] 3. As noted, these technologies address high-speed digital transmissions between a CO and a home. Ex. 1008 [DSL-Book] 3, 10. Again DSL technologies communicate via twisted pair links outside of a home over a distance of kilofeet (or kilometers). Ex. 2009 [DSL-Book (Full)] 7. Further, DSL systems do not contemplate communicating data over a reflected signal across signal splitters, and would face very different implementation concerns than coaxial-based networks.

VIII. ADSL/VDSL AND DSL-BOOK PROVIDE FUNDAMENTALLY DIFFERENT SYSTEMS THAN THE '249 PATENT.

104. ADSL/VDSL and DSL-Book concern fundamentally different communication systems from that of the '249 Patent. I have also reviewed Dr. Russ's opinion as it relates to IPR2024-00452 (Paper 11) and his understanding of these distinctions are consistent with my own understanding.

105. The '249 Patent, is directed towards local area broadband coaxial cable networks. The '249 Patent describes "Network Interface Device and Broadband Local Area Network Using Coaxial Cable[.]" Ex. 1001 ['249] Title. Similarly, the abstract indicates that the invention involves a local area network which uses coaxial cable wiring. Ex. 1001 ['249] Abstract. The technical field is described relating to broadband communication but more specifically to network interfaces. Ex. 1001

[’249] 1:14-16. The background includes references to Figure 1, which describes a typical cable TV configuration in a home. Ex. 1001 [’249] 1:26-27. When describing issues in the field, the background of the ’249 Patent addresses issues associated with LAN communications. Ex. 1001 [’249] 2:15-21. Further, the ’249 Patent describes how terminal devices may communicate on a coaxial LAN. Ex. 1001 [’249] 3:64-4:8.

106. The claims of the ’249 Patent are consistent with this field. For example, the preamble of claim 5 describes a broadband LAN that uses coaxial cable wiring in a building. Ex. 1001 [’249] Cl. 5. Additionally, each independent claim describes how terminal devices on a LAN can communicate over the coaxial cable wiring. Ex. 1001 [’249] Cl. 1, 5, and 10.

107. An important aspect of the ’249 Patent’s network is that it is implemented on a building’s existing coaxial cable wiring. Ex. 1001 [’249] 1:20-22, 3:20-22. Coaxial cable is shielded with precisely controlled geometrics at manufacturing. *See* Ex. 2011¹⁰ [Signal-Integrity] 82 (“The term ‘coaxial’ refers to the fact that it has a small center conductor surrounded by a cylinder of insulating material, which is in turn surrounded by a cylindrically shaped conductor. The two conductors are coaxial (get it?) and so they make a capacitor.”). Due to their shielding, coaxial cables are less influenced by external noise. Ex. 2014 [Coaxial-

¹⁰ Signal Integrity’s published paginations are used for Ex. 2011.

vs-Twisted-Pair] 2. This enables coaxial based networks to utilize large bandwidths. For example, Amit describes an example frequency range of 40 MHz. Ex. 1005 [Amit] 22:63. This also allows for high-frequency bandwidths, for example 900 MHZ to 6 GHz. Ex. 2012 [Coaxial-Products] (“[coaxial cable] is designed to carry high-frequency signals, 900 MHz to 6 GHz, and to protect those signals against electromagnetic interference (EMI) form external sources.”).

108. As previously described, the '249 Patent's preexisting coaxial network provided in buildings commonly use splitters to distribute signals. Ex. 1001 ['249] 1:39-40. The preexisting network architecture is provided in the '249 Patent's Figure 1, below:

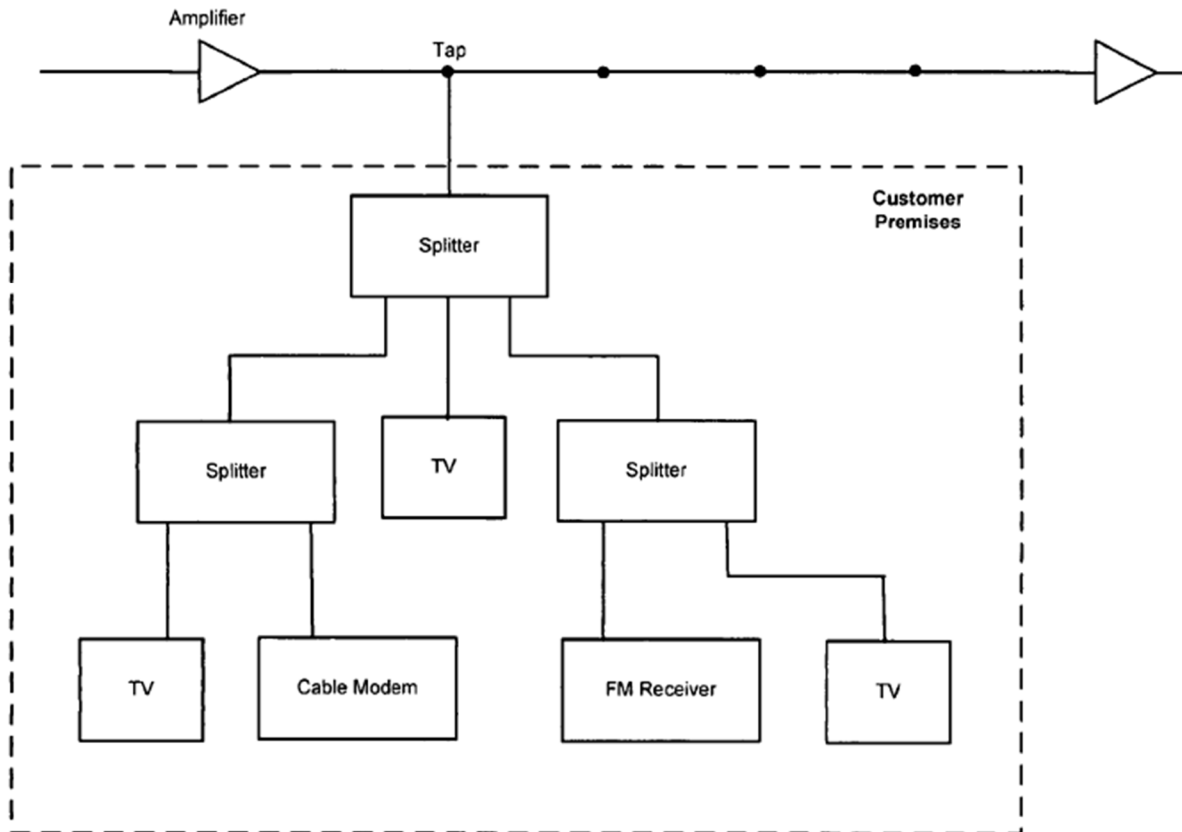


Figure 4

Ex. 1001 ['249] Fig. 1.

109. Splitters are radio-frequency devices designed to route signals from an input to multiple destinations with low signal distortion. As the '249 patent recognizes, these splitters isolate output ports and attenuates signal between tap ports, which may impede direct communications between terminal devices. Ex. 1001 ['249] 2:8-21.

110. The '249 Patent's system addresses "port-to-port isolation and providing a suitable signal path for terminal-to-terminal communications in a coaxial cable wired building" as clearly identified in the specification. Ex. 1001 ['249] 3:4-7; Ex. 1003 [Acton Decl.] ¶ 105. The '249 Patent addresses this problem by implementing a network interface at a POE of a building, so signals originating from a terminal device can be transmitted and reflected to another terminal device in the same LAN. Ex. 1001 ['249] 3:58-4:6

111. In contrast, ADSL/VDSL and DSL-Book concern entirely different systems which do not use coaxial cable. *See generally* Ex. 1006; Ex. 1008. They are unrelated to the broadband local area coaxial network described in the '249 Patent. Both ADSL/VDSL and DSL-Book concern communication through DSL standards over twisted-pair telephonic lines of a regional telephone network. Ex. 1006 [ADSL/VDSL] 6 ("Asymmetric Digital Subscriber Lines (ADSL) and Very

High Speed Digital Subscriber Lines (VDSL), the main DSLs discussed in this book, are methods of transporting data over twisted pairs.”); Ex. 1008 [DSL-Book] 5 (“The VDSL service range is expected to be between 1.5 to 4.5 kft. VDSL customers will be connected by short-distance copper twisted-pair loops to near Optical Networks Units (ONUs) that are linked to a CO with fiber optical cables.”); Ex. 2009 [DSL-Book (Full)] 7 (Section titled “DSL System Engineering” reads “The twisted-pair telephone loop between a CO and subscriber premises can have lengths of a few kilofeet (kft) to a few tens of kilofeet.”).

112. Twisted pair telephonic lines are unshielded to save costs of manufacturing. *See* Ex. 2011 [Signal-Integrity] 121 (“This is what Ethernet uses – unshielded twisted pair (UTP). This is important because, as one might guess, the unshielded cable is cheaper than shielded.”). Twisted pair provide two unshielded wires transmitting a signal and the inverse of that signal. When the communication is received, the signal and inverse signal are summed resulting in a boosted transmission without interference. This is fundamentally different than with coaxial cables, which provide a single copper core that carries all transmissions.

113. The lack of shielding, however, results in loss of signal energy over distance and, consequently, lossy signal propagation. Ex. 2011 [Signal-Integrity] 107, 112-115. Electrically, therefore, the medium appears as a low-pass filter. In other words, the twisted-pair wiring causes higher frequencies to be filtered out,

leaving only low frequencies successfully transmitted. *See, e.g.*, Ex. 1006 [ADSL/VDSL] Fig. 7.10 (showing frequency transmissions between 30kHz and 1,104 MHz); Ex. 1008 [DSL-Book] 5 (“The VDSL transmit spectrum can occupy a bandwidth of up to 15 MHz”). Likewise, at higher frequencies, like those commonly used over coaxial cable, signal attenuation becomes too high for there to be reasonable communication on DSL technologies. Ex. 2001 [DSL-Book (2)] 10-11. As evidence by U.S. Patent No. 5,682,419 (“Grube”) [Ex. 2013], a reference indicative of twisted pair technologies as of the filing of the ’249 Patent, this is also the technical reason why nearly all phone lines are point-to-point connections—they cannot carry enough information to distribute information to multiple users. Ex. 2013 [Grube] 2:65-67, 3:10-12, 4:44-46.

114. Similarly, DSL technologies do not describe the system’s ability to use a reflected signal as a main signal. For example, there is no discussion in ADSL/VDSL or DSL-Book of using a reflected signal to communicate information. In fact, any implicit references to reflections is with respect to ISI, and methods incorporate to limit ISI. Ex. 1006 [ADSL/VDSL] 49; Ex. 1008 [DSL-Book] 18, 20. There is no description in either reference how equalization would be implemented to target the “bad reflections” that result in signal degradation through ISI, and “good reflections” that are utilized to communicate between devices on the LAN.

Accordingly, implementation of this technology over a LAN would not be contemplated by a POSITA.

115. Due to increased desire for higher bit rates, telephone companies look to DSL technologies to improve data communications on the preexisting twisted pair base. Ex. 1006 [ADSL/VDSL] 6 (“[ADSL and VDSL] are methods of transporting data over twisted pair. As you will see, both technologies require considerable processing power, which normally increases cost and complexity. Much of this is due to the fact that twisted pairs, although capable, were never designed to carry high bit rates because they were originally designed and deployed for relatively low data content voice signals.”); Ex. 1008 [DSL-Book] 4 (“a DSL system can utilize the full potential of a copper telephone subscriber loop to deliver a transmission throughput of up to a few hundred times that of a voice band modem.”). Use of DSL technologies, like VDSL can increase the transmit spectrum to “up to 15 MHz[.] Ex. 1008 [DSL-Book] 5. However, ADSL and VDSL still made use of much smaller bandwidths than coaxial cable, which can reach 900 MHz to 6GHz. Ex. 2012 [Coaxial-Products] (coaxial cable “is designed to carry high frequency signals, 900 MHz to 6 GHz, and to protect those signals against electromagnetic interference (EMI) form external sources.”).

116. Moreover, ADSL/VDSL and DSL-Book concern regional telephonic networks rather than one within a building like the '249 Patent. As shown in Figure

1.2 of ADSL/VDSL, the conventional telephone system that DSL technologies operate on is between a Central Office (CO) and customer premise which may interface with telephones, computers, or other customer premise equipment.

Figure 1.2 A conventional telephone system coexisting with a data overlay network.

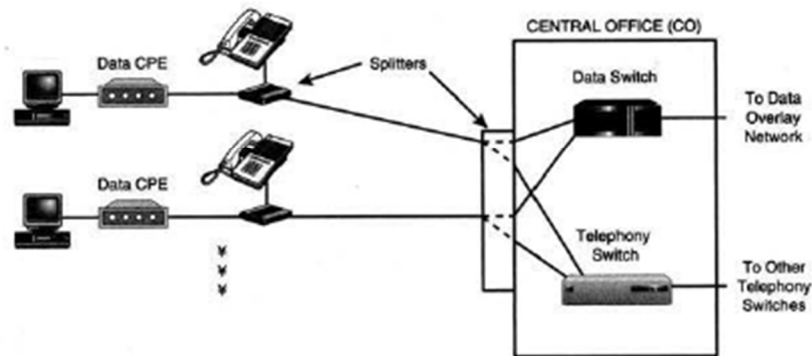


Figure 5

Ex. 1006 [ADSL/VDSL] Fig. 1.2. Note that the splitter depicted in Figure 1.2 is responsible for splitting and recombining the two types of signals (data signals and telephony signals) rather than providing signals to separate endpoints like in the coaxial-based network of the '249 Patent. Ex. 1001 ['249] 3:18-20; Ex. 1006 [ADSL/VDSL] 6.

117. In fact, twisted pair networks do not often utilize splitters, unlike the coaxial cable network describe in Amit and the '249 Patent. To use a splitter on a twisted pair network, a significant amount of power is needed at the common port to ensure the tap ports output significant signal to communicate to the subscriber device, the addition of which would be contrary to Amit's stated goal of a simple, inexpensive system. Ex. 1005 [Amit] 7:16-19, 18:33. Networks like those described

in ADSL/VDSL would likely make use of a switch and/or hub that can boost the separate signal paths. However, a single ADSL connection to the PSTN is used to provide the outbound traffic. There is no “sharing” of the ADSL link in the form of a LAN. Instead, a hub or switch used inside the customer premises would create the LAN and the ADSL would only serve as a dedicated outbound link to the PSTN. Accordingly, rather than communicate between devices in a single building, the ADSL and VDSL systems share data between a subscriber premise and a CO. Ex. 1006 [ADSL/VDSL] 6.

118. Likewise, DSL-Book book illustrates a similar network structure for data communication between a central office and subscriber premises where POTS splitters are used to merge and split telephony and data communications:

Figure 1.3 Digital Access Through a POTS Splitter

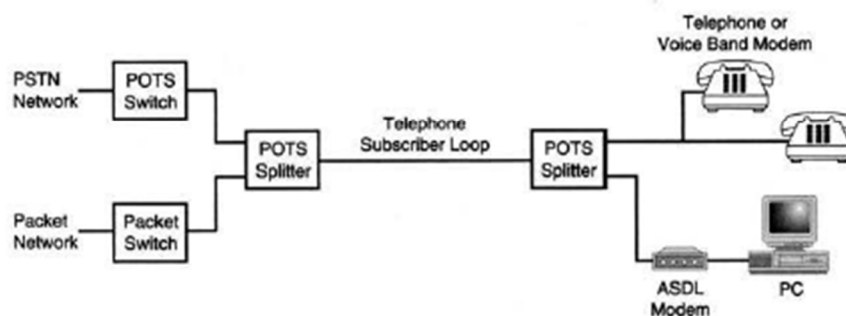


Figure 6

Ex. 2009 [DSL-Book (Full)], 6, Fig. 1.3.

119. So, both ADSL/VDSL and DSL-Book attempt to take advantage of increased throughput to utilize existing telephone lines to provide improved network

capabilities to subscriber premises. Ex. 1006 [ADSL/VDSL] 6; Ex. 1008 [DSL-Book] 4.

120. Also, twisted pair wires and coaxial cable provide very different performance. See Ex. 2014 [Coaxial-vs-Twisted-Pair] (describing major difference between and advantages of coaxial cable over twisted pair). While both lines and coaxial cables are transmission lines, the frequencies, and therefore wavelengths, involved are dramatically different due to coaxial cable's superior shielding and precisely controlled geometries at manufacturing. Ex. 2011 [Signal-Integrity] 82. A 1 MHz signal has a wavelength of roughly 300m or about 1000 feet ($\lambda = c/f$). Lower frequencies on a phone line have even longer wavelengths. Conversely, a cable signal at, e.g., 950 MHz (the range of the '249 patent's home network) has a wavelength of around 0.315m, or about one foot. This difference has physical significance—transmission-line effects, such as reflections, cause the frequency response of coaxial cable to be much more chaotic than telephone lines. Ex. 2011 [Signal-Integrity] 94-96, 99-101. Worse, these effects appear over much shorter cable lengths, such as those found inside homes, than telephone lines. Indeed, inside a home, it is clear that propagation over telephone lines is lumped, not distributed, and transmission-line effects such as reflections disappear.

121. Far-end reflected noise can also become a problem in twisted pair wires. There is a current for the transmitted side of the loop; on the return side of

the loop, there is an equal amount of current to balance the circuit. Frequently, this balance is disrupted by splices, cable taps, bridge taps, loops in the circuit, and impedance mismatches between the gauges of the wires. Loading coils are used on telephone wires; they must be removed. Distance is also a factor, where, depending on the wiring, no greater than 18 Kilofeet is allowed.

122. While Far-end reflected noise may also impact coaxial cables, it is less of a problem in practical application because coaxial cables are manufactured to a much tighter impedance standard than twisted pair cables.

123. Accordingly, the networks described in ADSL/VDSL and DSL-Book are fundamentally different than the network described in the '249 Patent.

IX. GROUND 1

A. Amit does not disclose a terminal device providing frequency bins based on SNR

124. Amit does not disclosure “at least one of the terminal devices providing frequency bins with more transmit bits which occupy parts of the channel where the signal to noise ratio (SNR) is high[.]” as recited in claim 1.

125. Amit, does not provide any disclosure of SNR. Accordingly, nothing in Amit that would suggest a system where frequency bin allocation is adjusted based on when SNR is high.

126. While Amit states that its modulation method is selected based on channel conditions and equipment capabilities (Ex. 1005 [Amit] 8:30-32), this does not disclose the specific claim limitation of the '249 Patent.

127. Further, the limitation “providing frequency bins with more transmit bits which occupy parts of the channel where the signal to noise ratio (SNR) is high” requires multicarrier modulation. For example, a single carrier system would be unable to provide frequency bins (plural).

128. Irrespective of operational mode, Amit is silent with respect to multicarrier protocols and systems. Instead, Amit describes single carrier systems with channel allocation protocols like Frequency Division Multiplexing (FDM), Time Domain Multiplexing (TDM), and Code Domain Multiplexing (CDM). Ex. 1005 [Amit] 26:15-65. None of these require multicarrier modulation. As Amit does not disclose multicarrier modulation, it cannot disclose all elements of claim 1.

129. Additionally, the frequency allocation or planning described in Amit with respect to FDM (Ex. 1005 [Amit] 8:45-49) is also insufficient to disclose this limitation. Even references cited by the Petition and Dr. Acton (e.g., Jacobsen) indicate that the relied upon protocol, FDM, assigns bits equally. Ex. 1007 [Jacobsen] 9-10.

130. Also, the relied upon frequency planning described in Amit only occurs in the Connected Home operation mode when the network is managed by the CMTS. Ex. 1005 [Amit] 7:51-52, 8:47-49.

131. I disagree with Dr. Acton's interpretation of Amit as containing a unitary mode of operation or system. Amit lays out two separate modes of operation which are "determined according to the existence/not existence of notch filter at the home entrance[.]" Ex. 7:12-14. However, Dr. Acton seems to draw on descriptions of both modes without consideration of whether such limitations are conflicting.

132. For example, consider Dr. Acton's simultaneous reliance on Amit's notch filter (from the Single Home mode) and the frequency allocation/planning used in FDM (in the Connected Home mode). Ex. 1003 [Acton Decl.] ¶¶ 81, 85. Amit states "The frequency plan is done only in connected home operational mode." Ex. 1005 [Amit] 8:47-48. However, the Connected Home operation mode does not include the notch filter Dr. Acton relies upon for other claim elements. Ex. 1005, 7:12-14. In fact, the Connected Home mode and Single Home mode operate on different frequency ranges with different bandwidths, and the Single Home mode does not support frequency selection capabilities. Ex. 1005 [Amit] 7:66-8:3, 8:20-30.

133. Further, even in the Connected Home mode, FDM is used across the networks, multiple frequency bands are not used in the same home or building. Amit

acknowledges that frequency reuse is a key functional advantage. Ex. 1005 [Amit] 9:28-29. Ex. 1005 [Amit] 3:31-35. Here, Amit assigns one frequency to each home in the Connected Home mode to efficiently allocate frequencies. Ex. 1005 [Amit] 8:45-49. The reuse of frequencies across the network is also aided by some homes operating in the Single Home mode, to reduce the size of branches. Ex. 1005 [Amit] 9:49, 9:52-55. A POSITA would not even consider implementing FDM onto Amit's Single Home mode, because the Single Home mode only has a narrow band of frequencies available. Ex. 1005 [Amit] 8:20-30. Amit does not contemplate changes to the CATV architecture that would enable FDM to be employed on the single home level as well.

134. Dr. Acton does not provide any basis that would motivate combining Amit's Connected Home mode with the Single Home mode, or whether that could be accomplished with a reasonable expectation of success. If Dr. Acton later opines on this issue, I reserve the right to respond to such opinions.

135. As the Single Home mode contains the notch filter, it is severed from the regional cable network, and accordingly, any management function provided by the CMTS. Ex. 1005 [Amit] 7:16-18, 8:47-49. Amit states that, in the Single Home mode, "[t]hese components do not support the frequency selection capability[.]" Ex. 1005 [Amit] 7:66-8:3. So, frequency planning does not occur in the Single Home mode.

B. Amit would not be modified to include multicarrier modulation

136. A POSITA would not be motivated to implement multicarrier modulation (or equalization for that matter) into Amit's single home mode. Even when FDM is available in the Connected Home mode, the CMTS management system conducts frequency planning by assigning a frequency channel to each home connected to the CMTS—this function is not performed by a terminal device. Ex. 1005 [Amit] 7:51-52, 8:45-49. Amit in no way suggests the terminal devices on the LAN are capable of frequency planning associated with FDM. To enable multicarrier modulation its LAN, the terminal device would need to conduct any necessary frequency allocation and synchronization itself.

137. Additional technical problems would also arise. For example, to utilize OFDM technologies, modification to the network devices is necessary to implement inverse fast Fourier transformations (IFFT) and fast Fourier transformations (FFT). Ex. 1007 [Jacobsen] 9. To communicate over OFDM, each terminal device would need to be upgraded or replaced with IFFT/FFT capable components. As described in Jacobsen, these systems are known to add complexity. Ex. 1007 [Jacobsen] 9. Each terminal device would need to be upgraded to enable this functionality, as Amit's current system is unable. Likewise, at Amit's terminal devices are disconnected from the CMTS, they would also need to perform all frequency planning themselves as well.

138. Modification of terminal devices to enable IFFT/FFT capabilities would not be within the abilities of a POSITA either. Recall, DOCSIS 3.1 was the first system to implement OFDM modulation, and that was not standardized until 2013. Accordingly, modifying devices to be capable of such functionality would be beyond someone with the experiences of a POSITA (having worked on coaxial networks). The alleged terminal devices in Amit (TVs, VCRs, DVD players, printers, scanners, computers, modems, etc. (Ex. 1005 [Amit] 1:18-30)) would each need to be modified or replaced, but such modification would likely not be uniform or simple. In isolations, replacing a single PC, printer, or WiFi modem may be of limited cost or complexity in isolation. However, replacing or modifying every device on the network may take considerable time. Additionally, given a POSITA may be incapable of such modifications, most homeowners would be unable to perform these modifications.

139. Similarly, there is no indication that other existing hardware (like splitter and amplifiers) would be compatible with multicarrier modulation. Similar modifications would be necessary for other components on the network. For example, filters would need to be upgraded or modified to allow for the frequency bins or subcarriers to be transmitted. Likewise, each amplifier would need to be compatible with multicarrier modulation. Without modifying the filters and amplifiers, the terminal devices would be unable to communicate.

140. These modifications would also be inconsistent with Amit's desire to have a simple system. Ex. 1005 [Amit] 18:24-44. For example, Amit teaches that for a system to be "truly effective and embraced by consumers" that there is no new wiring, simple to install and use, and the networking capability must grow without obsoleting existing devices. Ex. 1005 [Amit] 18:24-44, 19:55-56. Further, use of OFDM techniques predates Amit's system. Amit chose not to implement OFDM onto its LAN, opting for a simpler single-carrier system. Ex. 1005 [Amit] 7:16-22, 18:32, 26:11-14. In fact, Amit uses a "typical home coaxial cable infrastructure" and there is no basis to conclude that the existing hardware in place on Amit's home networks would be capable of this multicarrier modulation. Ex. 1005 [Amit] 5:51-54. This is consistent with implementing OFDM not being within the capabilities of a POSITA.

141. In fact, the Single Home mode does not even have sufficient bandwidth to accommodate multiple channels across the LAN. Ex. 1005 [Amit] 8:20-30. The Single Home mode in Amit only provides enough bandwidth (900-906 MHz) for a single (6 MHz) channel. Ex. 1005 [Amit] 8:20-30. A POSITA would avoid adding this complexity onto the simple Single Home mode Amit provides.

142. A POSITA would not have been motivated to go a step further than FDM and implement OFDM teachings in something like Amit with any sort of reasonable expectation of success. For instance, consider E.P. Patent No. 1,065,855

(“Konschak” (Ex. 2015)), which describes OFDM protocol near the filing date of the ’249 Patent. While Konschak describes a wireless modulation system, it illustrates the then-existing complications involved in implementing OFDM transmission, in particular the difficulties associated with managing timing for OFDM systems (Ex. 2015 [Konschak] ¶ 2), a problem not recognized or acknowledged by Amit, let alone obvious, over a multi-segment coaxial network. This confirms my opinion that the mere awareness of OFDM in unrelated systems would not have been a motivation to implement such teachings in the simple, low-cost environment of Amit.

143. Accordingly, implementation of OFDM into Amit’s system would not be straightforward.

C. Amit does not disclose use of time division duplex protocol synchronized by a beacon message

144. I disagree that Amit discloses a time division duplex (TDD) protocol which is synchronized by broadcasting a beacon message as required by claim 2.

145. For example, the Single Home mode is not compatible with any TDM based protocol. The TDM described in Amit requires synchronization to be performed by the CMTS. Ex. 1005 [Amit] 26:41-42. Again, the Single Home mode in Amit is not connected to the regional network. Ex. 1005 [Amit] 7:16-19. A network disconnected from the regional network cannot be synchronized by the CMTS. Accordingly, the Single Home mode would not utilize TDM.

146. Further, Amit makes no mention of the beacon message. I disagree that a POSITA would find a beacon message inherent in, or obvious in view of, Amit's system. For example, while different versions of TDM transmit multiple streams through a single communications channel through portioning the stream into unique time slots, there are multiple different types of TDM; synchronous, asynchronous, and dynamic. The different types of TDM include different ways to synchronize communications.

147. For example, in T1 synchronous TDM, a 1.544 Mbps channel is used. This channel is divided into 24 fixed slots, and each user is assigned a time slot. T1 systems are synchronized through a switch on both ends operating on a common (shared) clock (8 kHz). Each channel operates at 64 Kbps. Data from each assigned slot is transmitted within the allocated time. The 24 channels are multiplexed onto the 1.5 kHz channel (trunk). At the receiver, the data is demultiplexed and the original transmissions are reconstructed from each of the time slots.

148. Accordingly, use of a beacon message is not inherent in TDM.

X. GROUND 2

A. ADSL/VDSL is not analogous art

149. I disagree with Dr. Acton that ADSL/VDSL is analogous art to the '249 Patent. I have been informed by counsel that to be analogous art, a reference must either be from the same field of endeavor as the patent-at-issue or must be reasonably

pertinent to the particular problem the inventor of the challenged patent was involved with.

150. I understand the '249 Patent cites to both ADSL/VDSL and DSL-Book in its specification. Ex. 1001 ['249] 8:55-60. The '249 Patent does so with specific reference to OFDM technologies, indicating that teachings from the unrelated context of DSL could be applied to coaxial LANs in an inventive manner. Such reference would not indicate that ADSL/VDSL and DSL-Book are analogous art.

151. In determining the field of endeavor of the '249 Patent, I looked at, among other things, the title, background, technical field, abstract and claims. Based on these sources of information, it is clear that the field of endeavor is broadband local area coaxial cable networks.

152. For example, the '249 Patent reads "Network Interface Device and Broadband Local Area Network Using Coaxial Cable[.]" Ex. 1001 ['249] Title. Similarly, the abstract indicates that the invention involves a local area network which uses coaxial cable wiring. Ex. 1001 ['249] Abstract. The technical field is described relating to broadband communication but more specifically to network interfaces. Ex. 1001 ['249] 1:14-16. The background includes references to Figure 1, which describes a typical cable TV configuration in a home. Ex. 1001 ['249] 26-27. When describing issues in the field, the background of the '249 Patent addresses issues associated with LAN communications. Ex. 1001 ['249] 2:15-21. Further, the

'249 Patent describes how terminal devices may communicate on a coaxial LAN. Ex. 1001 ['249] 3:64-4:8.

153. The claims of the '249 Patent are consistent with this field of endeavor. For example, the preamble of claim 5 describes a broadband LAN that uses coaxial cable wiring in a building. Ex. 1001 ['249] Cl. 5. Additionally, each independent claim describes how terminal devices on a LAN can communicate over the coaxial cable wiring. Ex. 1001 ['249] Cls. 1, 5, and 10. Claims 1 and 10 also include signal splitters, which are commonly used in coaxial cable networks. Ex. 1001 ['249] Cls. 1, 10.

154. I disagree that ADSL/VDSL falls within this same field of endeavor. As noted on the very first page, ADSL/VDSL provides in depth discussion of ADSL and VDSL technologies. Ex. 1006 [ADSL/VDSL] 3. ADSL and VDSL technologies do not operate on a LAN, but instead are protocols used to communicate on a Plain Old Telephone Service (POTS). Ex. 1006 [ADSL/VDSL] 4-5, 6. Such communications are made between a CO and a subscriber premise, not between devices in a LAN. Ex. 1006 [ADSL/VDSL] 6. As already described, these communications are not over coaxial, but over twisted pair cables. Ex. 1006 [ADSL/VDSL] 6.

155. I agree with Dr. Acton that the pertinent problem the '249 Patent addresses is “port-to-port isolation and providing a suitable signal path for terminal-

to-terminal communications in a coaxial cable wired building” as clearly identified in the specification. Ex. 1001 [’249] 3:4-7; Ex. 1003 [Acton Decl.] ¶ 105. The ’249 Patent addresses this problem by implementing a network interface at a POE of a building, signals originating from a terminal device can be transmitted and reflected to another terminal device in the same LAN. Ex. 1001 [’249] 3:58-4:6

156. However, I disagree that ADSL/VDSL is pertinent to this problem. For example, Dr. Acton opines that ADSL/VDSL is pertinent to addressing port-to-port isolation because it recognizes that channels and noise conditions change over the lifespan of operation, like how twisted pair characteristics change due to difference in temperature during the day and night. Ex. 1003 [Acton Decl.] ¶ 105 (citing Ex. 1006 [ADSL/VDSL] 49). However, changing channel conditions of a regional network on twisted pair wiring is not pertinent to addressing port-to-port isolation on a LAN. For example, a LAN would experience significantly less temperature change during the course of a day because the cables exist within a building. Additionally, this passage specifically references twisted pair wires, which, as noted above, is a different physical medium than what is used in the ’249 Patent. Further, ADSL/VDSL does not describe communications along cables within a building. A POSITA would not find that these problems are pertinent to the problem that challenged the inventors of the ’249 Patent.

157. A POSITA would read ADSL/VDSL as directed towards implementing high speed DSL technologies on ordinary telephone lines. Consider the very first paragraph which reads, in part, that “[t]his book discusses networks capable of delivering high-speed data to all end users. Specifically, the book discusses ... users connected to the network using traditional telephone lines with access rates in excess of 1 Mbps.”. Ex. 1006 [ADSL/VDSL] 3. ADSL/VDSL notes that this technology was implemented on preexisting wires rather than installing a new base cabling which would require considerable time and cost. Ex. 1006, 6-7. While reviewing this text, including surveying the table of contents, I did not find any portion that covered addressing port-to-port isolation between terminal devices on a LAN.

B. There is no motivation to combine Amit and ADSL/VDSL

158. I also disagree that a POSITA would be motivated to combine ADSL/VDSL with *Amit*. ADSL/VDSL describes a very different system to *Amit*.

159. For instance, unlike *Amit*, ADSL/VDSL utilizes a multicarrier modulation scheme. Ex. 1005 [Amit] 8:30-33, 26:15-65; Ex. 1006 [ADSL/VDSL] 27. ADSL and VDSL are described as utilizing Orthogonal Frequency Division Multiplexing (OFDM), also known as Discrete Multitone modulation (DMT) in ADSL/VDSL. Ex. 1006 [ADSL/VDSL] 27. The Petition also relies on ADSL/VDSL’s DMT functionality. Petition, 27. As discussed in Section IX.A, a POSITA would not implement multicarrier modulation into a system like *Amit*.

160. Additionally, Amit and ADSL/VDSL provide fundamentally different technical solutions (as described in Section VIII), so a POSITA would not consider their combination.

161. The reasons offered by Dr. Acton to combine ADSL/VDSL with Amit are also insufficient.

162. A POSITA would not look to ADSL/VDSL to improve Amit's efficiency. In fact, use of a coaxial cable medium vastly outperforms the twisted pair medium described in ADSL/VDSL.

163. Consider for example, Amit's Connected Home mode in comparison with VDSL, (ADSL/VDSL's most advanced standard). Amit boasts bit rates of up to 40 Mbps for each 6 MHz channel. Ex. 1005 [Amit] 22:59-60. While in the Single Home mode, only one channel is available. Amit's Connected Home mode uses frequencies above 860 MHz or between 900-960 MHz to avoid interfering with CATV communications. Ex. 1005 [Amit] 3:24-30, 8:20-30. This frequency range (from 860 MHz to 960 MHz) could accommodate up to 16 separate 6 MHz channels (with minimal spacing) or 640 Mbps.

164. In contrast, in ADSL/VDSL the most advanced implementation of the DSL standards (VDSL) proposed a symmetric rate of 26 Mbps across the entire usable frequency band of twisted pair cables. Ex. 1006 [ADSL/VDSL] 14. Using all 16 channels of Amit's proposed frequency band, Amit transmits at 640 Mbps.

165. A POSITA would not consider improving the bit rate of Amit with a technology that has worse bit rate performance.

166. Additionally, I disagree with Dr. Acton's opinion that because Amit did not interfere with VDSL, a POSITA would be motivated to combine the technologies. Ex. 1003 [Acton Decl.] ¶ 103. Amit acknowledges and makes reference to xDSL technology. Ex. 1005 [Amit] 19:18-22. However, such acknowledgement falls short of providing a POSITA a motivation to combine the two technologies. In noting that Amit's system does not interfere with VDSL (Ex. 1005 [Amit] 28:67), Amit is merely referencing that it utilizes different frequency bands and a different medium than DSL technologies. The difference in frequency bands and medium is necessary to preserve that Amit's system does not interfere with ADSL/VDSL. Moreover, not causing a detrimental effect does not somehow suggest a basis to affirmatively incorporate. So, Amit's system would not make use ADSL or VDSL technologies.

167. In fact, the prior system that interfered with DSL technologies (HomePNA) utilized existing telephone wiring. Ex. 1005 [Amit] 1:38-41. The benefit highlighted in Amit's system—that it does not interfere with ADSL and VDSL—is only because it utilizes a different medium and frequency than those systems.

168. A POSITA would not look to improve Amit with DSL systems when one of Amit's key improvements provided over the prior system was avoiding interaction with these DSL networks. It is essential to Amit's operation that the systems maintain their differences to avoid interfering as HomePNA had interfered with ADSL or VDSL.

169. Amit provided an alternative to HomePNA, and it would be counterproductive to shift Amit back to a system reliant on the same technology as ADSL/VDSL. Rather than provide a reason to look to DSL systems (like those described in both ADSL/VDSL and DSL-Book), Amit's lack of interference was an improvement on HomePNA and would discourage a POSITA from combining Amit with ADSL/VDSL.

170. Accordingly, a POSITA would not be motivated to modify Amit to include teachings from ADSL/VDSL.

171. I also disagree with Dr. Acton's offered interpretations of Amit. The following paragraphs provide a couple of examples:

172. Dr. Acton states "Amit teaches that the modulation method will *change* 'according to the channel conditions.'" Ex. 1003 [Acton Decl.] ¶ 105 (citing Ex. 1005 [Amit] 8:30-32). In fact, Amit states that "the modulation method is QPSK, QAM 16, QAM 64, or QAM 256 according to the channel conditions, and according to the equipment capabilities. Ex. 1005 [Amit] 8:30-32. This merely indicates that

the network will utilize a modulation method that fits the contextual environment the network operates in. There is no indication that Amit will actively *change* its modulation method according to channel conditions. Amit also does not describe how it might change its modulation method according to hardware capabilities and channel conditions.

173. Instead, Amit's system sets the modulation method and would not change the modulation method after it is set. Amit's system will set the modulation method after determining the static factors that impact the channel. For example, the modulation method may be set based on the quality and length of the connective cabling, or the impact splitters have on the channel. Once set, the modulation method would not change.

174. Also, ADSL/VDSL do not describe a LAN, they describe communications between a subscriber premise and a CO. Amit's LAN network will be protected from its environment because it exists within a building and also includes its coaxial cable shielding. Even if Amit described altering the network based on changing channel conditions, a POSITA would not look to ADSL/VDSL's regional twisted pair network to remedy these conditions—the networks experience significantly different conditions and use different equipment.

175. Further, Dr. Acton also opines that a "POSITA would have thus been motivated to use ADSL/VDSL's OFDM teachings with Amit's terminal devices to

improve upon the QAM modulation[.]” Ex. 1003 [Acton Decl.] ¶ 109. However, use of QAM is very common in many different types of networks. For example, QAM is implemented in wireless networks, like Wi-Fi. The use of QAM is widespread and would not provide a motivation for a POSITA to look to ADSL/VDSL or DSL technologies more generally nor provide a POSITA with a reasonable expectation of success. Use of QAM would not suggest that a POSITA could combine Amit with ADSL/VDSL without consideration of the physical medium both technologies utilize.

176. Dr. Acton also mischaracterizes a portion of Amit, alleging that Amit states frequency resources are limited, including upstream frequencies, and that higher frequencies are for limited distances. Ex. 1003 [Acton Decl.] ¶111 (citing Ex. 1005 [Amit] 9:56, 19:32-37). Actually, Amit is advocating that “[i]t ***should not use*** limited US (up stream) frequencies. It can use some of the DS (down stream) frequencies or higher frequencies (even if their distance is limited).” Ex. 1005 [Amit] 19:34-36. Nothing in that cited passage of Amit would suggest to a POSITA to implement equalization or other methods in response to reflections as advocated.

177. Dr. Acton also states “there can be ‘houses where there is a problem with reflection.’” Ex. 1003 [Acton Decl.] ¶ 105, (quoting Ex. 1005 [Amit] 2:51-53, 20:42-43). However, this the full quote of this passage reads “Therefore this module can be inserted in the houses where there is a problem with reflection.” Ex. 1005

[Amit] 20:42-43. In this regard, Amit already provides this solution, such that it is not a problem that somehow needs to be solved. Amit would not provide a basis for a POSITA to look to a different reference, let alone the decidedly different DSL technology.

178. In fact, A POSITA would not read Amit to suggest modifications to counteract reflections (e.g., echoes), these reflections are already addressed by Amit's system. Ex. 1005 [Amit] 20:15-43. A POSITA would not research ways to counteract reflections if Amit already provides a solution to it.

179. I further disagree with Dr. Acton that Amit has a problem with reflections. In fact, Amit's goal is to use reflections as its main signal. Ex. 1005 [Amit] 14:1-5. In other instances, it advocates for using splitters that deliberately have high reflection levels. Ex. 1005 [Amit] 6:41-44. It is through the use of this reflection that Amit attempts to communicate between devices on the LAN.

180. To the extent Amit needs to reduce micro-reflections that result in ISI, Amit already provides a system to solve this problem with its dual frequency mode. Ex. 1005 [Amit] 20:15-43. This dual frequency mode allows for a signal to be received "with no echo." Ex. 1005 [Amit] 20:31.

181. Amit describes a dual frequency operation mode that eliminates the echo problem of homes in the single home environment. Ex. 1005 [Amit] 20:15-17. The "echo problem" referenced in Amit refers to a well-known phenomena in which

echoes or micro-reflections from imperfect transmission paths. These micro-reflections may interfere with the transmitted signal resulting in inter-symbol interference (ISI). Often imperfect transmission paths are due to mismatches in cable or tap impedance, poor isolation in splitters, taps and directional couplers.

182. Amit describes a system which, through use of a transponder module, changes the signal frequency from the upstream frequency to a separate downstream frequency when the transmission is sent from one terminal device to another terminal device. Ex. 1005 [Amit] 20:26-31. This allows for the receiving terminal device to receive the signal without the ISI caused by an echo.

183. Use of this transponder module would be valuable to homes which experience issues with micro reflections resulting in echoes. Because of the dual frequency mode, a POSITA would not be motivated to alter Amit to reduce ISI.

184. I also disagree that a POSITA would have sufficient reasons to implement equalization.

185. There is no basis to conclude that a POSITA would look to equalization to help efficiently use limited cable resources. Ex. 1003 [Acton Decl.] ¶ 111. In fact, Amit already provides a solution for the problem supposedly addressed by equalization, the dual frequency mode. Allegations that Amit would look to implement equalization is not based on any teachings found in either Amit or ADSL/VDSL.

186. In fact, CATV systems at the time of the '249 Patent perform equalization by having the CMTS perform a pre-equalization on the transmission before so the receiving device (e.g., a terminal device) would receive an equalized transmission. These terminal devices were designed to receive one-way transmissions. There is no evidence that one of *Amit's* terminal devices would be capable of performing equalization without assistance from a CMTS. Similarly, there is no evidence provided that the terminal devices could be modified to include adaptive filters that would enable equalization.

187. Accordingly, *Amit's* system already addresses ISI, and a POSITA would have no reason to implement methods like equalization. Likewise, absent the hindsight-based mischaracterizations provided by Dr. Acton and the Petition, there would be no motivation to combine ADSL/VDSL with *Amit*.

C. The combination does not disclose a terminal device providing frequency bins based on SNR

188. I disagree that the combination does describes “at least one of the terminal devices providing frequency bins[.]” As discussed, *Amit's* system did not include DMT/OFDM functionality as described. Ex. 1005 [*Amit*] 26:15-65. Further, the systems described in ADSL/VDSL are not utilized on a LAN, but rather communicate across a regional network with assistance of a CO. Accordingly, ADSL/VDSL does not explain how to implement these systems on a terminal device

in a LAN. Also, nothing in the opinions of Dr. Acton or the Petition explains why a POSITA might implement OFDM/DMT functions into a terminal device.

D. The combination does not disclose use of time division duplex protocol synchronized by a beacon message

189. I also disagree that the Amit-ADSL/VDSL combination describes using time division duplex protocol synchronized by broadcasting a beacon message. As described in claim 2, 9, and 17 of the '249 Patent, TDD-based communications of the claimed invention are synchronized by broadcasting a beacon message on the LAN.

190. As described above with respect to Ground 1 (Section IX.C) Amit's Single Home mode is not capable of TDD. Similarly, nothing in ADSL/VDSL describes a modification to enable one of Amit's terminal devices to perform this synchronization without aid from the CMTS.

191. Further, Dr. Acton relies on pilot tones mentioned in ADSL/VDSL as allegedly equivalent to beacon messages, however these pilot tones are a different synchronization system than beacon messages.

192. Pilot tones are not used in a TDD-based protocol. Pilot tones are utilized in DMT. DMT is not a type of TDD protocol (although DMT can sometimes be implemented with TDD). DMT is a protocol that divides transmissions across orthogonal frequency subcarriers, it does not divide transmissions across different time divisions.

193. While there is a type of synchronous DMT (SDMT), the referenced pilot tones are described for DMT. Ex. 1006, 76. It is inaccurate to say that plain DMT is a type of TDD.

194. Further, implementing SDMT would require even further modifications than just plain DMT. In fact, SDMT is not synchronized through use of a beacon message or pilot tone. Instead, SDMT requires synchronization across frames of VDSL lines in a common binder group. If all lines emanate from a single optical network units (ONU) (or terminal devices in the local area network context), this synchronization might be feasible by using a common clock. Ex. 1006 [ADSL/VDSL] 88. However, when independent optical network units provide VDSL signals in the same binder group, achieving frame synchronization is much more difficult. Nothing in the Petition addresses why to make these modifications or how to facilitate such changes on *Amit's* system.

195. Pilot tones are utilized to synchronize DMT, they are not beacon messages used in TDD. In fact, beacon messages are commonly used to synchronize TDD communications with ranging protocols in CATV systems. In contrast, pilot tones are used to synchronize clock sources at either ends of a DMT transmission path.

196. Accordingly, pilot tones are not the same as beacon messages, nor would they render beacon messages obvious.

XI. GROUND 3

197. I have been informed by counsel that Jacobsen was identified and authenticated through use of a MARC record number. In my experience, I have not used a MARC record to identify a document when conducting research. In fact, I'm not familiar with what a MARC record is or how it would be used nor would I have any expectation that a POSITA would be familiar with a MARC record or how it would be used. I am not offering an opinion about whether or not the Jacobsen reference qualifies as prior art.

A. There is no motivation to combine Amit and Jacobsen

198. I disagree that a POSITA would be motivated to modify Amit with Jacobsen.

199. First, a POSITA would not consider implementing equalization into Amit. Jacobsen's results indicated that DMT modulation was more efficient than single-carrier modulation with equalization. Ex. 1007 [Jacobsen] 15. In addition, implementing equalization would add complexity to Amit's system. Ex. 1007 [Jacobsen] 14. A POSITA would not consider applying equalization onto Amit in light of these results.

200. Second, A POSITA seeking to improve Amit's system would not look to Jacobsen. Jacobsen describes a regional cable network. Ex. 1007 [Jacobsen] Figure 2. In fact, the equalization performed by Jacobsen would be performed, or

facilitated by the CMTS, not a terminal device. In contrast, Amit's Single Home network has a notch filter which separates the LAN from communicating with the larger regional network. Ex. 1005 [Amit] 7:16-19, 7:25-28.

201. Further, a POSITA would not look to Jacobsen to modify Amit as Jacobsen does not describe Amit's principal of operation. Amit's system allows for communication between different points within a building through transmission of a reflected signal on the channel. Ex. 2005, 14:2-5. Jacobsen is silent as to this type of communications.

202. Use of a reflected signal across a regional CATV network, like Jacobsen would also not be successful. The distances between two points on Jacobsen's network, for example, from one home to another, is a much greater distance than on a network that exists within a building. Accordingly, a reflected signal would not have sufficient power and integrity to effectively communicate on the channel.

203. The concern with signal degradation on Jacobsen's network would also not be as pertinent to Amit's LAN. Jacobsen simulates transmissions at frequencies between 30 MHz to 36 MHz. Ex. 1007 [Jacobsen] 10. At this frequency band, Jacobsen is concerned with ISI and interference from ham radio signals. Ex. 1007 [Jacobsen] 8-9.

204. A POSITA would not be concerned with interference from ham radios in Amit's system. Amit's in-home network uses frequencies from 900 MHz to 960 MHz to avoid interfering with existing cable TV signals. Ex. 1005 [Amit] 3:24-30, 8:25-26.

205. With respect to claim 8, Dr. Acton opines the combination would communicate above the cable television band. Ex. 1003 [Acton Decl.] ¶¶ 309-312. However, as noted, the interference from alternative radio sources, like ham radios, occurs only in the frequency band Jacobsen occupies (within the cable television band). Amit's band of frequencies would not be interfered with by the transmission of ham radio frequencies (which according to Jacobsen may be fewer than 100 Hz and up to several megahertz (Ex. 1007 [Jacobsen] 9)) on the CATV bands.

206. Additionally, any kind of interference would be decreased considering the coaxial cables of Amit's LAN occupy a building rather than transmit information over a regional network.

207. A POSITA would also not be motivated to modify Amit due to concerns with ISI. As noted above, Amit utilizes a dual-frequency mode to avoid the problem with echoes and ISI on its network. Ex. 1005 [Amit] 20:15-43. A POSITA would not be motivated to complicate Amit's system when Amit already enables a signal to be received with no echo. Ex. 1005 [Amit] 20:31.

B. The combination does not disclose a terminal device providing frequency bins based on SNR

208. The Amit-Jacobsen combination also fails to disclose all claim limitations of the '249 Patent.

209. For example, the combination does not disclose a terminal device providing frequency bins. Jacobsen describes a regional network, it does not describe the functionality of terminal devices. Accordingly, a terminal device providing frequency bins is not taught by Jacobsen.

210. Similarly, in Amit, the CMTS assigns the frequency allocation in FDM. Ex. 1005 [Amit] 30:14-15. There is nothing in Amit that describes imputing such FDM functionality onto a terminal device in the LAN. Accordingly, OFDM functionality in a terminal device would be even more inappropriate, as it is not even contemplated in Amit.

C. The combination does not disclose use of time division duplex protocol synchronized by a beacon message

211. Jacobsen does not provide any discussion of time division duplex protocol which is synchronized by broadcasting a beacon message. As I have already opined that Amit's disclosure is insufficient for this element of Ground 1, it is also insufficient for Ground 3.

XII. GROUND 4

A. DSL-Book is not Analogous Art

212. I disagree that DSL-Book is analogous art to the '249 Patent.

213. DSL-Book is not within this same field of endeavor as the '249 Patent. DSL-Book states “[t]his book is a collection of simulation/implementation techniques and reference material for the design and development of DSL Systems.” Ex. 1008 [DSL-Book] 5. Further, “[i]t is intended for practicing engineers working in DSL and related fields.” Ex. 1008 [DSL-Book] 5. DSL-Book does not describe coaxial cable networks or LANs. Instead, it describes communication over a twisted pair telephone line between a central office and a subscriber premises. Ex. 2009 [DSL-Book (Full)] 15.

214. DSL-Book does not address “tap port-to-port isolation and providing a suitable signal path for terminal-to-terminal communication in a coaxial cable wired building.” DSL-Book instead addresses the development of DSL technologies on a telephone subscriber loop. Ex. 2009 [DSL-Book (Full)] 15. For example, the book states that “A basic knowledge of the telephone subscriber loop environment is necessary for the *understanding of many technical choices for the engineering of a particular DSL system.*” Ex. 2009 [DSL-Book (Full)] 15. Dr. Acton opines that DSL-Book relates to tap port-to-port isolation for terminal-to-terminal communication in a coaxial cable wired building but provides no evidence to support this conclusion. Ex. 1003 [Acton Decl.] ¶ 331. I find no basis to conclude that DSL-Book provides a solution to port-to-port isolation and terminal-to-terminal communication in a coaxial cable wired building.

B. There is no motivation to combine Amit and Jacobsen with DSL-Book

215. I disagree that equalization would be a reason to modify Amit-Jacobsen. As noted above (Section XI.A), Jacobsen discourages the use of equalization, preferring a multicarrier implementation instead. Further, as already noted, DSL-Book covers DSL standards, which operate over a twisted pair, adding further complexity.

216. In fact, a POSITA would not be motivated to implement teachings from DSL-Book due to its significant differences with Amit's system as described in Section VIII.

217. I disagree that a POSITA would see the teachings of DSL-Book and be motivated to implement them into Amit or the Amit-Jacobsen combination.

218. As discussed above, equalization is not a reason to modify Amit, especially in view of Jacobsen's teachings. DSL-Book does not change this conclusion.

219. A POSITA would not be motivated to implement teachings from DSL-Book to improve bit rate performance because twisted pair exhibits significantly worse bit rate performance than coaxial cables.

220. As described in DSL-Book, ADSL provided throughput at a rate of 1.544 Mbps in the upstream direction and 16 to 64 kps in the downstream direction. Ex. 1008 [DSL-Book] 10. For carrier serving area (CSA) range, ADSL was capable

of downstream transmission throughput of 6.443 Mbps. Ex. 2009 [DSL-Book (Full)] 11. VDSL is the most advanced DSL system described in DSL-Book. VDSL provided (asynchronous) bit rates of up to 52 Mbps. Ex. 1008 [DSL-Book] 5; Ex. 1006 [ADSL/VDSL] 17. The highest synchronous bit rate is 26 Mbps. Ex. 1006 [ADSL/VDSL] 17.

221. In comparison, Amit's system without any modification boasts bit rates of up to 40 Mbps on a single channel, and Jacobsen provides bit rates in the order of 80 Mbps on a single channel in its simulated network. Ex. 1005 [Amit] 21:21-22, 22:59-60; Ex. 1007 [Jacobsen] 10, 11. Coaxial networks exhibit bit rates on a **single channel** that compete with bit rates across the usable VDSL frequency band. At the time of filing the '249 Patent, Coaxial networks could accommodate up to 125 6-MHz channels. A POSITA would have no reason to look to improve Amit-Jacobsen's bit rates from systems that provided lower bit rates.

222. Further, a lack of interference between Amit and DSL networks is not a reason to modify Amit. In fact, the prior system that interfered with DSL technologies (HomePNA) utilized existing telephone wiring. Ex. 1005 [Amit] 1:38-41. The benefit highlighted in Amit's system—that it does not interfere with ADSL and VDSL—is only because it utilizes a different medium and frequency than those systems.

223. A POSITA would not look to improve Amit with DSL-Book when one of Amit's key improvements Amit provides over the prior system was avoiding interaction with these xDSL networks. It is essential to Amit's operation that the systems maintain their differences to avoid interfering as HomePNA had interfered with ADSL or VDSL. Amit provided an alternative to HomePNA, and it would be counterproductive to shift Amit back to a system reliant on the same technology. Rather than provide a reason to look to ADSL/VDSL, Amit's lack of interference was an improvement on HomePNA and would discourage a POSITA from combining Amit with ADSL/VDSL.

C. The combination does not disclose use of time division duplex protocol synchronized by a beacon message

224. I disagree that DSL-Book describes using a TDD that is synchronized by broadcasting a beacon message. As addressed above, Amit's single home embodiment does not describe use of TDD or its synchronization through a beacon message.

225. DSL-Book describes pilot tones with respect to DMT. Ex. 1008 [DSL-Book] 21. As discussed above, DMT is not a TDD-based protocol. So, the pilot tones are not used to synchronized TDD-based communications.

226. As noted above, pilot tones are fundamentally different than beacon messages. Pilot tones synchronize DMT using clock synchronization maintained through a timing recovery circuit in at least one transmission direction. Ex. 1008

[DSL-Book] 21. Beacon messages, are commonly used as a part of a ranging protocol.

227. Further, as described in DSL-Book, a pilot message is a subcarrier. Ex. 1008 [DSL-Book] 22. Meanwhile, TDD-based communications may be single-carrier, and may not even include subcarriers.

XIII. RESERVATION OF RIGHTS

228. I reserve the right to amend or supplement this declaration as this case proceeds and any additional information comes to light.

229. I understand that traditionally, no live expert testimony is used at the PTAB, and I presently have no plans to testify; however, should I be asked, I reserve my right to use exhibits to summarize or exemplify my opinion (including exhibits I have not yet created) if called to testify.

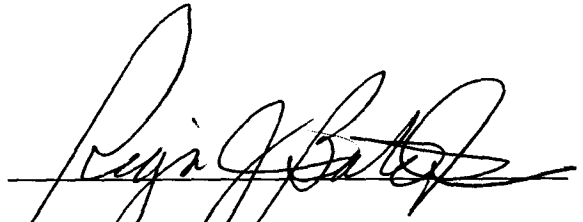
230. If it would be helpful to the Board, I am willing and able to provide additional background.

231. I further reserve the right to respond to any opinion presented by any of Petitioner's experts regarding the meaning of any claim term or limitation within the Asserted Claims.

232. I hereby declare that all statements made of my own knowledge are true and that all statements made on information and belief are believed to be true. I further declare that these statements were made with the knowledge that willful false

statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of the Title 18 of the United States Code. I declare under penalty of perjury that the foregoing is true and correct.

Dated: 11/01/2024



Regis J. Bates Jr.

APPENDIX A

Regis J. (Bud) Bates Jr. Curriculum Vitae

Professional Summary

Regis J. “Bud” Bates has more than 50 years of experience in Telecommunications and Information Services and has long been considered a technology “Guru.” He currently contributes to these fields as an author, consultant, expert witness, speaker, course developer and teacher. He has written numerous books on the technologies, many of which have been best sellers for McGraw-Hill. His “Voice and Data Communications Handbook” led McGraw-Hill’s sales for three consecutive years and has been used by over 166 colleges and universities around the world. With clients spanning the range of Fortune 100-500 companies, Mr. Bates has been involved in the design of major voice and data networks. His innovative ideas in implementation have been written up in trade journals and magazines. Many of his projects deal with multiple sites and countries using Frame Relay, ATM and MPLS architectures. A significant amount of Mr. Bates’ work has been in the wireless communications area both Cellular and Wi-Fi networks. In his work with venture capitalists, he has consistently been on the mark with his projections for various analyses and studies.

Mr. Bates is known for his dynamic keynote speaking. With a style that is power-packed and a delivery that is exciting, he knows how to captivate, engage and motivate the audience. He motivates the sales force, customers, management team, and capital investors trying to figure out where the technology is heading for the future and where to invest. Regis Bates also develops and conducts various public and in-house seminars ranging from a managerial overview to very technical hands-on classes on Voice over IP, VoIP Security, Wi-Fi Networking, WIMAX networking, MPLS, DWDM, Voice & Data, Next Generation Wireless Networking and IPv6. In the recent past he has focused much of his development and training activities on the convergence of three key areas; VoIP, Security and Wi-Fi.

Mr. Bates is a Cisco Certified Systems Instructor (CCSI #32076) and a registered partner for training and training development with Cisco Training Partners (Fastlane). He developed much of the Fastlane Wireless Curriculum including Wi-Fi Mesh, RF Design, and Wi-Fi Hands on classes. As a registered partner he is very familiar with the Cisco routing and switching products, security products and wireless products. He has also been used as an SME for many other training and development projects in the past.

As an independent Consultant, Mr. Bates regularly lends his expertise to third party assessment companies in the analysis, review and recommendation of technology patents. In particular, Mr. Bates has assessed several portfolios from Nokia, Nortel-Networks, Google and others, and rank ordered the patents and technologies on a technical superiority basis and monetized many of the portfolios so that his clients could acquire a reasonable portfolio for a reasonable price.

Expertise

- CATV Networks, Protocols and Equipment
- Convergence Technologies
- LAN, WAN, Internet, Ethernet, MPLS, ATM, Frame Relay
- Optical Networks and Equipment
- Project Management for Telecommunications and Wireless Projects
- TCP/IP Protocols and Applications

Regis J. (Bud) Bates Jr. Curriculum Vitae

- Telephone equipment & operations
- Voice over the Internet Protocol (VoIP)
- Voice over Wi-Fi
- VoIP Security
- Wired Networks (PBX, Voice, Data, VoIP, Call Centers, 800 services)
- Wireless Networks (Cellular, GSM, 3/4G, LTE, 5G, GPRS, & SMS/MMS)
- Wireless Technologies and Standards (Wi-Fi, Wi-Fi Mesh, WiMAX, Cellular (3/4G), LTE, GSM, GPRS, SMS, MMS, etc., CDMA2000, UMTS)

Education

<u>Year</u>	<u>College or University</u>	<u>Degree</u>
1979	Stonehill College, Easton, MA	Bachelor's Degree, Business Management
1985	Lehigh University, Bethlehem, PA St. Joseph's College, Philadelphia, PA	All coursework towards Masters of Business Administration (Thesis not complete)

Professional Experience

From: October 1989
To: Present
Organization: TC International Consulting, Inc.
Title: Founder and President
Summary: TCIC is a full-service Consulting and Training firm specializing in Communications and Computer Convergence. Mr. Bates' role is to assist his client companies with the analysis of options, selection of vendors or products to meet their strategic goals and the training of technologies including Voice, Telephone Systems, Data, Data Networks, Video, Internet, Wireless, Wireless LAN Technologies, VoIP systems and services, Fiber Optics and Infrastructure. This firm has been responsible for selecting and implementing over 100 PBX systems for their client companies. TCIC develops and conducts training for corporate users, manufacturers, and carriers alike.

- Trained at all of the Regional Bell Operating Companies (RBOCs), over 150 Competitive Local Exchange Carriers (CLECs), all of the major Long-Distance Companies (AT&T, SPRINT, MCI/WorldCom [now Verizon]) and most of the large manufacturers (Nortel-Networks, Lucent [now Alcatel-Lucent], Avaya, Mitel, Siemens, Alcatel, Newbridge, Marconi, Cisco), the US Government and Fortune 500 companies.
- Has been involved in and with this industry for more than 47 years and has seen the development and growth of the various technologies, infrastructure, legal, regulatory and technical services.

Regis J. (Bud) Bates Jr. Curriculum Vitae

-
- Developed curriculum and teaches classes that run at manufacturer and Telephone Company training programs teaching students in the operation of the systems, including:
 - Introduction to Voice Communications
 - Hands on Telephony classes
 - Installing and implementing a PBX solution
 - Hands on Voice over IP
 - Implementing VoIP
 - Securing VoIP
 - IP PBX Solutions
 - Call Center Convergence
 - Introduction to Data Communications
 - Hands on Data Communications
 - LAN and WAN communications
 - Introduction to T1 and T3
 - Optical Networking and SONET
 - Data and Internet Communications, a How to Course for implementing solutions.
 - Ethernet and Gigabit Ethernet
 - Asynchronous Transfer Mode (ATM)
 - Frame Relay a Data Communications design class.
 - Wireless Communications
 - Hands on Securing Wireless Networks
 - Hands on Integrating Wireless Networks (Wi-Fi and Cellular calling)
 - TCP/IP
 - Linking LANs and WANs with Bridging and Routing
 - GPRS
 - GSM (including WAP and MMS)
 - Next Generation Wireless
 - Wi-Fi Certifications (CWNA)
 - Wi-Fi Security Certification (CWSP)
 - Cisco RF Design
 - Cisco Wireless Mesh
 - WiMAX certifications (Wi-MAX RF Engineer)
-

Regis J. (Bud) Bates Jr. Curriculum Vitae

- o Convergence Technologies Professional (CTP) Certification
- o RFID Certification (RFID+)

From: September 1986
To: October 1989
Organization: Pepper, Hamilton and Scheetz, Philadelphia, PA
Title: Chief Information Officer- Major Law Firm
Summary:

- Performed complete automation of the law firm's multiple offices around the country.
- Chartered with the selection and placement of computer and communications systems in the offices and providing all the necessary external connections to the rest of the world for long distance, voice and data communications.
- Responsible for the selection and installation of 10 PBX systems all with major integration services.
- Designer of the local area networks (LANs) and the final installation and testing of these systems.
- Created the WAN access and usage through a network of digital circuits using T1 services from many of the common carriers and the new competitors in the industry.

From: September 1979
To: September 1986
Organization: Air Products and Chemicals, Inc. (APCI)
Title: Telecommunications Manager
Summary:

- Designed, selected, analyzed, and implemented all communications projects for the use of voice and data communications at the corporation's 440 sites around the US and 35 international sites. This included the use of telephone systems, dial up telephony and data, leased lines for voice and data, analog and digital circuits (including T1, T3 and fiber optics).
- Responsible for research, selection, and installation of over 250 telephone systems (PBX and Key Systems along with integration systems). While at APCI, was one of the major proponents of using a broadband cabling system (such as found in CATV systems- in 1983).
- Spearheaded a project from communications to integrate our voice, data, TV-video and local area network (LAN) services into what is now known as a Campus area network (CAN). Extended the network using private fiber optic links to many local sites and private microwave within the Allentown, PA area.
- Implemented a multi-site VSAT data network. The charter for the organization was to implement the most reliable communications infrastructure at the best available price. The corporate budget was in excess of \$40-50 million annually for telecommunications.

Regis J. (Bud) Bates Jr. Curriculum Vitae

From: April 1977
To: September 1979
Organization: Data General Corporation (DGC), Westboro, MA
Title: Telecommunications Manager for Manufacturing and International Sites
Summary:

- Responsibilities at DGC were to select the best mix of goods and services to be used for the growing corporate needs during a fast development and growth cycle.
- Responsible for selecting equipment (from Bell and competitors) for 100 sites across the world, select services (voice, data, and fax traffic) from the common carriers and to select the appropriate means and protocols to use these goods and service in a way that fostered growth and development of the company's revenue.
- Used a private microwave system to interconnect several sites in a cost-efficient manner.
- Installed a T1 network from coast to coast. The corporate operating budget at DGC was approximately \$20 million. Was responsible for the selection and installation of 30 PBXs and 40 key telephone systems.

From: September 1974
To: April 1977
Organization: Hills Department Stores, Canton, MA
Title: Manager of Administrative Services
Summary:

- Was responsible for all communications matters including voice, data, fax, telex and Teletype as printed materials (production print shop).
- Responsible for discount department store's implementation of fast and reliable communications without spending excess corporate funds.
- Responsible for analyzing, selecting, and implementing major communications projects in 50 stores spread throughout the east and mid-west. Charter was to minimize cost while maximizing service to the customer.

From: April 1972
To: September 1974
Organization: Damon Corporation
Title: Telecommunications and Facilities Manager
Summary: Conglomerate that included Medical-Biological Development, Veterinary Products, Clinical Labs, Security Manufacturing and Hobby Craft. The myriad of different systems and services challenged the ability to meet the diverse needs of a medical and security to a hobby shop environment. The responsibilities included the communications of voice and data (limited analog dial up) for the variety of locations across the country. The corporate communications budget was approximately \$2.5 million annually.

Regis J. (Bud) Bates Jr. Curriculum Vitae

From: September 1966
To: April 1972
Organization: US Army Signal Corps
Title: Captain
Summary:

- The assignments were in many varied locations including an assignment in Viet Nam with a mobile communications environment, as well as a fixed site using radio-based systems as one of the first troposcatter radio systems installed in this environment. Installed a system that spanned over 400 miles for the military tactical forces.
- As an officer in Germany, was responsible for the operation and control of the Automatic Voice Network (AUTOVON) system in Donnersberg, Germany. Donnersberg was the equivalent of a Central Office (class 3, 4 and 5). Had the operational responsibility for the Pirmasens, Germany Satellite terminal.
- One additional assignment was at the US Army 108th Military Intelligence Group in Ft. Devens, MA. At Ft. Devens, was responsible for providing fixed (landline and fixed radio) and mobile communications to a MI unit. Ran the Communications Center, which entailed telex, Teletype and facsimile services for the military.

Litigation Support Experience

Bolded represents the client I supported.

Expert Engagement- Settled

Type of Matter Contract Dispute
Law Firm: Armstrong Teasdale
Case Name: **Wide Open West inc., et al v Ribbon Communications**
Disposition: Oct 2024 prepared deposition preparations with Attorneys settled October 2024
Date 9/2024

Expert Engagement- Settled

Type of Matter Infringement
Law Firm: Fabricant LLC
Case Name: **Apex Beam Technologies, LLC v. TCT Mobile International Limited, et al**
Disposition: Declaration submitted July 2024 settled August 2024
Date 6/2024

Regis J. (Bud) Bates Jr. Curriculum Vitae

Expert Engagement- Active

Type of Matter Infringement
Law Firm: Fabricant LLC
Case Name: **AWT v. T-Mobile and Verizon**
Disposition: Declaration submitted July 2024 and Deposed July 2024
 Infringement declaration submitted Oct 2024 ongoing
Date 4/2024

Expert Engagement Active

Type of Matter: Infringement
Law Firm: Goldman Ismail Tomaselli Brennan & Baum LLP
Case Name: **Entropic Communications LLC v DirecTV and AT&T**
Disposition: Just started
Date: 11/ 2023

Expert Engagement Active

Type of Matter: Contract Dispute

Law Firm: Wrobel Markham LLP
Case Name: **Loxyssoft v Calltrol**
Disposition: Declaration submitted, Deposed June 2024 awaiting court date
Date: 12/2023

Expert Engagement- Settled

Type of Matter Infringement
Law Firm: Fabricant LLC
Case Name: **Multimodal Media LLC. V Samsung Electronics LTD. and Samsung Electronics
America, Inc**
Disposition: Declaration submitted February 2024 and Deposed February 2024, case settled
 July 2024
Date 1/2024

Expert Engagement Active

Type of Matter: Infringement 3 cases
Law Firm: GoldbergSegalla/ Devlin Law Firm
Case Name: **Marble v RingCentral and Marble v Zoom and Marble v Microsoft**

Regis J. (Bud) Bates Jr. Curriculum Vitae

Disposition: Declarations submitted Deposed April 2024 ongoing
Date: 10/2023

Expert Engagement: -Settled

Type of Matter: Non-Infringement
Law Firm: K&L Gates LLP
Case Name: Estech Systems IP, LLC v. **Mitel Networks, Inc., First American Financial Corp, Republic of Texas, Inc., and McKesson Corp.** C.A. No. 2:22-cv-00007-JRG-RSP
Disposition: Declarations submitted and Deposed 5/25/23. Case settled September 2023.
Date: 12/2022

Expert Engagement: -Settled

Type of Matter: IPR (3 IPRs)
Law Firm: McDonnell Boehnen Hulbert & Berghoff LLP
Case Name: IPR2022-00557, IPR2023-00583, IPR2023-00581 Ericsson Inc., v. **Koninklijke KPN N.V.**
Disposition: Declarations submitted in Dec 2022. Deposed March 2023
Date: 9/2022

Expert Engagement: -InActive

Type of Matter: Infringement
Law Firm: Kasowitz Benson Torres LLP
Case Name: **WSOU Investments, LLC D/B/A Brazos Licensing and Development** vs Netgear C.A No.1 :21-cv-01117-UNA
Disposition: Stayed pending IPRs
Date: 1/2022

Expert Engagement: -Closed

Type of Matter: IPR
Law Firm: McDonnell Boehnen Hulbert & Berghoff LLP
Case Name: IPR2022-00025 Xiaomi Communications Co. LTD. v. **Koninklijke KPN N.V.**
Disposition: Board denied institution of IPR 4/2022
Date: 12/2021

Expert Engagement: -InActive

Type of Matter: Noninfringement
Law Firm: Goldman Ismail Tomaselli Brennan & Baum LLP
Case Name: XR Communications v **Apple, Inc.**
Disposition: Stayed
Date: 10/2021

Regis J. (Bud) Bates Jr. Curriculum Vitae

Expert Engagement: -Closed

Type of Matter: Breach of Contract
Law Firm: THOMPSON & KNIGHT, LLP
Case Name: **Transtelco v Zayo**
Disposition: Settled 2/2023
Date: 5/2021

Expert Engagement: -Closed

Type of Matter: Noninfringement
Law Firm: Morgan, Lewis and Bockius
Case Name: **Ancora v LG**
Produced Report 3/2021
Disposition: Dismissed
Date: 6/2021

Expert Engagement: - Inactive

Type of Matter: IPR
Law Firm: Cooley
Case Name: **One-E-Way Inc. v. Apple Inc.**
Disposition: Declaration submitted December 2020. Awaiting further action
Date: 10/2020

Expert Engagement: Closed

Type of Matter: IPR (9)
Law Firm: Devlin Law Firm
Case Name: **Sisvel International S.A., 3G Licensing S.A., v. Cradlepoint, Inc., etc.**
Services Provided: IPRs demanded due to infringement asserted by Sisvel, et al.

Expert Engagement: Closed

Type of Matter: Infringement Case
Law Firm: Goldman Ismail Tomaselli Brennan & Baum LLP
Case Name: **Uniloc v. Apple** (No. 3:19-cv-01905-JD)
Services Provided: Infringement asserted by Uniloc regarding LTE network devices
Disposition: Dismissed
Date: 10/2020

Expert Engagement: Stayed Inactive

Type of Matter: Infringement Case
Law Firm: Arnold and Porter
Case Name: **Uniloc 2017 LLC v. Google LLC**, civil action nos. 2:18-cv-494 and 2:18-cv-498

Regis J. (Bud) Bates Jr. Curriculum Vitae

Services Provided: Infringement asserted by Uniloc regarding 802.11s and Mesh Networking
Disposition: 2019 case stayed pending IPR review
Date: 2019

Expert Engagement: Stayed Inactive

Type of Matter: Infringement Case
Law Firm: Cooley
Case Name: Uniloc 2017 LLC and Uniloc USA, Inc. v. **Google, LLC** (2:18-cv-00502)
Services Provided: Infringement asserted by Uniloc regarding 802.11a and HiperLAN
Disposition: 2019 case stayed pending IPR review
Date: 2019

Expert Engagement: Closed

Type of Matter: Mediation
Law Firm: Phelps Dunbar LLP
Case Name: Unknown
Services Provided: Dispute over the installation and implementation of a Wi-Fi Mesh Network in Texas.
Disposition: 2019 no further action
Date: 2019

Expert Engagement: Closed

Type of Matter: IPR
Law Firm: Hamilton Brook Smith Reynolds
Case Name: IPR2018-00558 LG Electronics, Inc. v. **Koninklijke KPN N.V.**
Services Provided: IPR regarding Patent 9,014,667 on regulating access to a telecommunications network
Disposition: Declaration submitted October 2018, deposed December 2018. Settled
Date: 2018

Expert Engagement: Closed

Type of Matter: IPR
Law Firm: McDonnell Boehnen Hulbert & Berghoff LLP
Case Name: IPR2018-00558 LG Electronics, Inc. v. **Koninklijke KPN N.V.**
Services Provided: IPR regarding Patent 9,014,667 on regulating access to a telecommunications network
Disposition: Declaration submitted May 2018. PTAB filed their report for continuing the IPR.
Date: 2018 see above case extension

Regis J. (Bud) Bates Jr. Curriculum Vitae

Expert Engagement: Closed

Type of Matter: IPR
Law Firm: Devlin Law Firm
Case Name: IPR2018-00559 LG Electronics, Inc. v. **Koninklijke KPN, N.V.**
Services Provided: IPR regarding Patent 7,995,091 on a multichannel access in a communications network
Disposition: Declaration submitted May 2018. PTAB decided not to initiate IPR case closed.
Date: 2018

Expert Engagement: Closed

Type of Matter: Infringement and Validity
Law Firm: Latham and Watkins
Case Name: **TC Technologies v. Sprint**
Services Provided: Expert working on patent Infringement in an LTE environment (patent dealt with CATV technologies using OFDM and SCOFDMA technologies developed by Cable Labs) being asserted on LTE technologies.
Disposition: Expert report filed and Validity report completed October 2018. Deposed December 2018 for Infringement and Validity December 2018. Case settled March 2022
Date: Aug 2017

Expert Engagement: Closed

Type of Matter: Declaration Only
Law Firm: Nelson Baumgardner Pc
Case Name: **Network Managing Solutions, LLC v. AT&T MOBILITY, LLC et al.**
Services Provided: Declaration on claim construction terms
Disposition: No further involvement
Date: March 2018

Expert Engagement: Closed

Type of Matter: Inequitable Conduct
Law Firm: Sterne, Kessler, Goldstein & Fox P.L.L.C.
Case Name: Civil Action No. 3:16-CV-01338-K **Securus Technologies, Inc. v Global Tel*Link Corporation**
Services Provided: Technical expert on Technologies
Disposition: Initial Report Submitted Case settled
Date: September 2017

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Expert Engagement: Closed

Type of Matter: Class Action Suit
Law Firm: Wilson Sonsini Goodrich & Rosati P.C.
Case Name: Cause No. 1:14-CV-00737-WTL-**DKLLATONYA SIMMS**, on behalf of herself, and all others similarly situated, v. **SIMPLY FASHION STORES LTD**, and **EXACTTARGET, INC**
Services Provided: Consulting Expert on alleged Telecommunications Consumer Protection Act violations
Disposition: Parties Settled
Date: Jun-Jul 2017

Expert Engagement: Closed

Type of Matter: Trade Secret Case
Law Firm: Quinn Emanuel Urquhart & Sullivan, LLP
Case Name: Civil Action No. 2:16-cv-582-JRG-RSP Genband US LLC, v. **Metaswitch** Networks Ltd., ET AL
Services Provided: Testifying expert on trade secret disclosures worked for Metaswitch
Disposition: Expert Rebuttal report submitted October 2016. Deposed November 2016. Court dismissed the case March 2017.
Date: 2016-2017

Expert Engagement: Closed

Type of Matter: IPR
Law Firm: McDonnell Boehnen Hulbert & Berghoff LLP
Case Name: IPR2016-00808 Samsung Electronics Co., LTD v **Koninklijke KPN N.V.**
Services Provided: Consulting expert on Validity of a patent for the Plaintiff regarding the Bates reference (GPRS Book)
Disposition: Declaration submitted June 2016. PTAB found that there was no need for further actions based on the declaration of the author of the GPRS book (me) in September 2016.
Date: 2016

2016-
2018

Expert Engagement: Closed

Type of Matter: Patent Infringement
Law Firm: Susman Godfrey
Case Name: Civil Action No. 2:14-cv-1165 **Koninklijke KPN N.V.** v. Samsung Electronics Co., LTD., et al.
Services Provided: Consulting expert on Validity of a patent for the Plaintiff regarding the Bates reference (GPRS Book)
Disposition: Consulting completed June 2016. Settled September 2016.
Date: 2016

Expert Engagement: Closed

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Type of Matter: Patent Infringement and IPR on Validity
Law Firm: Nelson Bumgardner Pc
Case Name: Currently involved in Case No. 3:15-cv-00742-TJC-MCR **Patent Asset Licensing, LLC v. Bright House Networks, LLC**. VoIP and Telephony case.
Services Provided: Worked for Plaintiff on both validity and infringement. Preliminary work completed May 2016 on Infringement, declarations on **9 different IPRs** completed October 2016. Submitted reports and declarations to PTAB April 2017. Deposed 3 times in May 2017. Deposed again in August 2017 based on Motions to Amend. Oral arguments presented at PTAB
Disposition: PTAB decision to institute
Date:

Expert Engagement: Closed

Type of Matter: Patent Infringement
Law Firm: Cooley; Farney Daniels; Haynes Boone; Kenyon & Kenyon and Le Clair Ryan
Case Name: ITC Case One-E-Way v. **Creative Labs et al.** Inv. No. 337-TA-943, In the Matter of Certain Wireless Headsets including Bluetooth headsets by GN (Jabra), Jawbone, Blue Ant, Creative Labs and Sony.
Services Provided: Worked for Defendants on both invalidity and non-infringement. Submitted reports on invalidity and non-infringement.
Disposition: Patent Invalidated, appealed and revised
Date: Jan 2018 Case settled July 2018

Expert Engagement: Closed

Type of Matter: VoIP System
Law Firm: Farney Daniels
Case Name: Undisclosed
Services Provided: Consulting expert
Disposition: Parties Settled
Date: 2015

Everything below is Closed and inactive.

Expert Engagement:

Type of Matter: Case dealing with providing message services through a private network and a mobile station.
Law Firm: Mintz, Levin, Cohn, Ferris, Glovsky and Popeo, P.C.
Case Name: **EST** v. Samsung, Apple, HTC and LG (et al) – ITC Case number 337-TA-925. Interveners were Apple and Google.
Services Provided: Produced infringement reports and validity reports. Deposed in April 2015
Disposition: Parties Settled
Date: 2015

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Expert Engagement:

Type of Matter: ITC case
Law Firm: Latham & Watkins LLP
Case Name: **Interdigital** v. Nokia, ITC Case number 337-TA-613
Services Provided: Consulting expert for Interdigital on the infringement of cellular phones
Disposition: Case appeared before ALJ Jan 2015
Date: 2014 – 2015

Expert Engagement:

Type of Matter: Case dealing with the data communications
Law Firm: Feinberg Day Alberti & Thompson LLP
Case Name: **Intellectual Ventures I and II** v. Motorola, U.S. District Court Southern District of Florida, Case number 0:3-cv-61358-RSR
Services Provided: Worked as a testifying expert for IV on a GPRS adverse to Motorola
Disposition: Case stayed
Date: 2014

Expert Engagement:

Type of Matter: Case involving the use of an SMS phone number only system
Law Firm: Devlin Law Firm
Case Name: What'sApp v. **ICC**, U.S. District Court Northern District of California, Case number 13-cv-04272-JST
Services Provided: Working for Defendant, filed Declaration
Disposition: Parties Settled
Date: 2014 – 2015

Expert Engagement:

Type of Matter: Contract Dispute over UMTS/WCDMA 3G Cellular installation and LTE conversion
Law Firm: Crowe & Dunlevy P.C.
Case Name: Pine Telecom v. **Alcatel-Lucent**, Case Number CIV-11-353-JHP
Services Provided: Worked for Alcatel-Lucent. Report submitted Nov 2013, deposed Dec 2013
Disposition: Court Ruled in favor of ALU
Date: February 2014

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Expert Engagement:

Type of Matter: Patent Infringement on local networking products (i.e. local access and PON)
Law Firm: Keker & Van Nest LLP
Case Name: BT v. **Comcast, et al.**, Case Number CA No. 11-843(SLR) and 10-658 (SLR)
Services Provided: Invalidity Reports submitted and rebuttals completed. Worked for Comcast on invalidity; deposed July 2013. One of the two patents was found invalid. Based on Markman Hearing in Jan 2014 using R. J. Bates T1/T3 book as prior art.
Disposition: Case dropped by Plaintiff.
Date: March 2014

Expert Engagement:

Type of Matter: Patent ownership case
Law Firm: Hunton Williams
Case Name: Ferguson, et al v. **NTP**, Case Number 08-09767CA
Services Provided: Submitted initial report in 2011, Deposed July 2013
Disposition: Parties Settled
Date: March 2014

Expert Engagement:

Type of Matter: Patent infringement on several products Wi-Fi, VoIP, CATV Modems etc.
Law Firm: Mayer Brown
Case Name: **Mosaid** v. Cisco
Services Provided: Engaged by attorneys representing Plaintiff
Disposition: Defendant Settled
Date: 2014

Expert Engagement:

Type of Matter: Patent interference case dealing with design and development of a Wi-Fi router
Law Firm: Boyle Fredrickson, S.C.
Case Name: Ruckus v. **Netgear**, Patent Interference No. 105,870 (JL) (Technology Ctr. 2400)
Services Provided: Submitted declarations on design issues.
Disposition: Settled in favor of Netgear
Date: 2013

Expert Engagement:

Type of Matter: Telephone system
Law Firm: Farney Daniels, representing Plaintiff
Case Name: Undisclosed
Services Provided: Consulting expert
Disposition: Settled
Date: 2013

Expert Engagement:

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Type of Matter: MMS
Law Firm: Farney Daniels, representing Plaintiff
Case Name: Undisclosed
Services Provided: Consulting expert
Disposition: Settled
Date: 2013

Expert Engagement:

Type of Matter: Breach of contract, good faith and fair dealing, unjust enrichment
Case Name: **Evelyn T. Begay** and Denise Nez, individually and on behalf of all others similarly situated, v. Navajo Communications Co., Inc., a NM corporation, District Court of the Navajo Nation Judicial District of Chinle, Case number CV 141-12
Services Provided: Submitted declarations and one report in July 2012
Disposition: No action to date
Date: 2012

Expert Engagement:

Type of Matter: RFID Technology
Law Firm: Farney Daniels, representing Plaintiff
Case Name: Undisclosed
Services Provided: Consulting expert
Disposition: Settled
Date: 2012

Expert Engagement:

Type of Matter: Patent infringement on several products
Law Firm: Hogan Lovells
Case Name: **Mosaid** v. Cisco, ITC Case Number 337_TA-778
Services Provided: Submitted expert reports in Dec 2011 and Jan 2012. Deposed Jan 2012
Disposition: Case dropped to move to new venue
Date: 2012

Expert Engagement:

Type of Matter: Arbitration Case dealing with a contract dispute over the installation and operation of a WiMAX system
Law Firm: Carpenter & Leland LLP
Case Name: **Intralot** v. Gibson Technical Services
Services Provided: Submitted report in October 2012
Disposition: Settled in favor of Intralot
Date: 2012

Expert Engagement:

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Type of Matter: Case involving 3G CDMA 2000 technologies
Law Firm: Niro Haller & Niro
Case Name: **MSTG** v. Sprint et al, Case Number 1:09-cv-03684
Services Provided: Reports on Invalidity and Infringement. Deposed twice
Disposition: Parties Settled
Date: 2010

Expert Engagement:

Type of Matter: Case involving infringement on a paging systems patent
Law Firm: Nixon & Vanderhye
Case Name: **Technology Patents LLC** v. Deutsche Telekom, et al, Case number 8:07-cv-03012-AW
Services Provided: Deposed 2009 and 2010 (Reports on Invalidity and Infringement)
Disposition: Most Parties Settled
Date: 2009 – 2010

Expert Engagement:

Type of Matter: 3G WCDMA and CDMA technologies and infrastructure
Law Firm: Niro Haller & Niro
Case Name: **MSTG** v. Deutsche Telekom et al (ATT, T-Mobile, Verizon, Cellular One), Case number 08 C 7411
Services Provided: Deposed in 2009, 2010 and 2011. (Reports on Invalidity and Infringement)
Disposition: Parties Settled
Date: 2009 – 2011

Expert Engagement:

Type of Matter: Case involving Central Office and VoIP technologies
Law Firm: Wilmer Hale
Case Name: CenterOne Communications v. **Vonage**, U.S. District Court for the Eastern District of Texas.
Services Provided: Reports on Claim Construction worked for Vonage.
Disposition: Dropped by Plaintiff
Date: 2009

Expert Engagement:

Type of Matter: Case involving infringement on a SMS patent
Law Firm: Niro, Haller & Niro
Case Name: **TCS** v. Mobil365, Case number Civil Action No. 3:06-CV-485 (JRS) (E.D. Va.)
Services Provided: Was deposed (Reports on Invalidity and Infringement) and appeared in Jury trial
Disposition: Jury trial awarded to Plaintiff
Date: 2007

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Expert Engagement:

Type of Matter: Case involving infringement of an 800 intelligent routing and delivery services
Law Firm: Allen, Dyer, Doppelt, Milbrath & Gilchrist, P.A.
Case Name: **800Adept** v. Murex Industries, Case number 6:02-cv-01354-PCF-DAB (M.D. Fla.)
Services Provided: Deposed April 2006. Reports on Invalidity and Infringement
Disposition: Jury awarded in favor of Plaintiff
Date: 2006

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Non-Litigation Consulting Projects

Training Project:

Client: Aruba Networks (HPE)
Services Provided: Ongoing TCIC training and certification classes for employees, partners and customers.
Date: 2007-Present

Consulting Project:

Client: DoceoTech
Services Provided: Conducted WIMAX/ Mobile WIMAX training and certification classes, reviewed training materials and added content as needed.
Date: 2012-2014

Consulting Project:

Client: United Lex
Services Provided: Reviewed a Wi-Fi patent as a consultant to describe the technical details of the Wi-Fi networks (specifically the mesh networks). This was a one-time fee for the review. All further actions and projects have ended.
Date: March 2020

Consulting Project:

Client: iRunway
Services Provided: Worked as technology consultant to assess various patents in different portfolios from Nokia, Nortel-Networks, Microsoft, Google and others. Researched necessary technical issues for iRunway's EE engineers who develop scenarios, claim charts and financial prospectus for various clients. Projects concluded in 2016. *iRunway offered my services to legal firms where they were the intermediary (similar to IMS, Forensis, Thomson Reuters, Rubin Scientific, etc.) and marked my hourly service fees up.*
Date: 2011 – 2016 Projects concluded in 2016.

Consulting Project:

Client: University of Arizona South, Continuing Education, Sierra Vista, AZ
Services Provided: Developed and conducted training sessions for more than a dozen topics and clients in and around Sierra Vista. These sessions were geared toward RFID+ and Convergence + certification classes for CompTIA, MPLS, DWDM, TCP/IP, IPv6, Networking, WLAN, Securing WLAN, WiMAX, VoIP hands on, Wireless Sharp certification, CWNA/CWSP certification and Securing VoIP. **Conducted a special Leadership Training Session for senior managers/ Officers.**
Date: 2004 – 2018

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Consulting Project:

Client: Motorola Solutions
Services Provided: Developed an Advanced Wireless Training class for internal employees and partners. Conducted classes for rollout and turned materials over to client.
Date: 2012

Consulting Project:

Client: Electronic Proving Grounds- Ft Huachuca, AZ
Services Provided: Training on wireless Cellular and WiFi technologies and site surveys for use within a practical environment.
Date: 2007 – 2009

Consulting Project:

Client: Cisco
Services Provided: Conducted hands on classes on the Mobility Services Engine that was used to provide location tracking of Wi-Fi users and active RFID/Wi-Fi enabled tags through a joint venture of Cisco and Aeroscout. The active RFID tags using chokepoints enabled the use of tracking of vehicular traffic, temperature, speed, and other environmental conditions. Also developed RF Engineering and Wireless Mesh Training classes, conducted training and tested students.
Date: 2006 – 2011

Consulting Project:

Client: Element K
Services Provided: An e-learning house that published several wireless courses for Cisco and others. Was the SME that put the content together and developed the hands-on labs.
Date: 2006 – 2008

Consulting Project:

Client: Deep Creek Center- Network Computing Magazine
Services Provided: Conducted training sessions in Boston for Network Computing Magazine on Designing and Securing Wireless Networks.
Date: 2006

Consulting Project:

Client: UTEK-EKMS
Services Provided: Patent research studies for various clients for the purpose of rounding our intellectual property portfolios. Also studies to determine market projections and directions for various wired and wireless needs. A technical consultant on-call to review various technologies for their client portfolios.
Date: 2005 – 2006

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Consulting Project:

Client: Airespace Corporation (now Cisco)
Services Provided: Conducted hands on training for many channel partners, internal employees, and customers on their WLAN products. CCSI for Wireless Products and RF Engineering Class.
Date: 2004 – 2009

Consulting Project:

Client: Univentures, Phoenix, AZ
Services Provided: Developed and conducted training for their clients on Network Security, WLANs etc. Nortel Networks, Cisco and UC Berkeley are the main players.
Date: 2003 – 2006

Consulting Project:

Client: University of California, Berkeley
Services Provided: Developed training materials and conducted training to their students on various topics including networking, WLANs, DR planning and VoIP. As an adjunct professor for this organization, conducted the classes around the globe.
Date: 2003 – 2004

Consulting Project:

Client: Andrew Corporation
Services Provided: Conducting various studies regarding frame relay, VPN studies, Long Distance contract negotiations, Network Operations Center studies, VoIP studies, IP Telephony studies, LAN cabling standards recommendations and Disaster Recovery Planning. Negotiated wide area networking contracts for 85 sites in 22 countries.
Date: 1992 – 2006

Consulting Project:

Client: Global Knowledge
Services Provided: Developed and conducted classes on myriad topics, also taught many of their existing classes regarding Wired and wireless networks.
Date: 2001 – 2006

Consulting Project:

Client: Gerson Lehrman Group
Services Provided: On call consultant to advise and discuss technologies, trends in the industry and portfolio trends in the telecommunications industry. As one of their top 5% consultants, occasionally go out to clients on a face-to-face basis.
Date: 2000 – 2006

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Consulting Project:

Client: Molex Corporation
Services Provided: Consulted on wide area networks, contract negotiations and disaster recovery planning. Renegotiated wide area networking contracts for 24 sites in 10 countries.
Date: 1999 – 2005

Consulting Project:

Client: Nortel Networks
Services Provided: Developed and conducted classes on Internet, TCP/IP, Business Aspects of the Internet, VoIP, Data, Routing and switching, Bridging, Routing and Gateways, Wireless Networking, Nortel specific classes, ATM, FR and more. Also consulted with BNR engineers regarding VoIP Protocols and design of SIP vs. H.323 products.
Date: 1998 – 2003

Additional prior consulting and training clients:

- | | |
|------------------------|-------------------------|
| ▪ Patrick Industries | ▪ WPVI-TV6 Philadelphia |
| ▪ Mahi Networks | ▪ Telcordia |
| ▪ AFC | ▪ CIA |
| ▪ US Army | ▪ FBI |
| ▪ Fidelity Investments | ▪ US Air Force |
| ▪ Weyerhaeuser | ▪ NSA |

Professional Affiliations, Achievements & Awards

- Technical Editor, IPTV Magazine, 2006 – 2022
- **Life Member of IEEE**
- Active trainer in the areas of:
 - Telecommunications Wired and Wireless
 - Voice
 - Data and Equipment for companies including Digital Equipment Corp., Global Knowledge, DataTech Institute, CAPE Institute, Fastlane, International Institute of Learning and Telcordia Technologies, Airespace, Aruba Networks and Cisco.

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Publications

Books and seminars have been used by more than 166 colleges and universities around the globe, and Mr. Bates teaches many communications/computer courses and seminars in over a dozen countries globally.

Books

- Securing VoIP, 2014- Syngress Publishing
- Voice and Data Communications Handbook- McGraw-Hill, 1996 first edition
- Voice and Data Communications Handbook- McGraw-Hill, 1998 signature edition
- Voice and Data Communications Handbook-McGraw-Hill, 2000, third edition
- Voice and Data Communications Handbook-McGraw-Hill 2001, fourth edition
- Voice and Data Communications Handbook-McGraw-Hill, 2006, fifth edition (4Q 2006)
- Broadband Telecommunications Handbook-McGraw-Hill, 1999
- Broadband Telecommunications Handbook-McGraw-Hill, 2002, second edition
- Wireless Broadband Communications, McGraw-Hill, 2000
- Nortel Networks Layer 3 Switching Handbook-McGraw-Hill, 2000
- Optical Networking and Switching, McGraw-Hill, 2001
- Wireless Networked Communications, McGraw-Hill, 1994
- General Packet Radio Services (GPRS), McGraw-Hill, 2002
- cdmaOne and cdma2000, McGraw-Hill, 2003
- Disaster Recovery for LANs, McGraw-Hill, 1994
- Disaster recovery for Telecommunications, Data and Networks, McGraw-Hill, 1991
- Introduction to T1/T3 Networking, Artech Publishing, 1992
- Client Server Internetworking, McGraw-Hill, 1998
- Principles of Voice and Data, McGraw-Hill Educational Group, 2006
- Co-author on Wireless Networks Dictionary from Althos Publishing, 2006.

Articles

Mr. Bates has written several articles for different magazines over the years extolling the benefits of convergence, movement of information across broadband networking strategies and user-oriented how to documents:

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Curriculum Vitae

1. IPTV Magazine Home PowerLine Networks- May 2006
2. IPTV Magazine Wireless Premises Distribution Networks- Mar 2006
3. IPTV Magazine Cable Premises Distribution Networks for IPTV –Jan 2006
4. CIO Magazine Pundit “Wireless Carriers Have the Goods” 2002
5. CIO Magazine Pundit “The Fiber Glut Myth” 2002
6. CIO Magazine Pundit “Cable vs DSL” 2002
7. Crisis Magazine “Disaster Recovery Planning 1998
8. International Journal of Management “Managing Telecommunications” 1997
9. Disaster Recovery Magazine “Planning for Telecommunications Disasters” 1997