

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

MEDIATEK INC. and
MEDIATEK USA, INC.
Petitioners,

v.

NIPPON TELEGRAPH AND TELEPHONE CORPORATION,
Patent Owner.

Case No. IPR2020-01404
Patent No. 7,280,551

REPLY DECLARATION OF TIM A. WILLIAMS, Ph.D.

MediaTek Exhibit 1062 MediaTek v. Nippon IPR2020-01404
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I, Tim A. Williams, declare:

1. I have been retained by Wolf, Greenfield & Sacks, P.C., counsel for Petitioners MediaTek Inc. and MediaTek USA, Inc. to assess claims 1-8 (the “challenged claims”) of U.S. Patent No. 7,280,551 (“the ’551 Patent”). I am being compensated for my time at my standard rate of \$675 per hour, plus actual expenses. My compensation is not dependent in any way upon the outcome of Petitioners’ petition for *inter partes* review of the ’551 Patent.

I. MATERIAL REVIEWED AND CONSIDERED

2. My findings, as explained below, are based on my years of education, research, experience, and background in fields related to wireless signal communications, including WiFi and cellular communications technologies, as well as by investigation and study of relevant materials for this declaration. When developing the opinions set forth in this declaration, I assumed the perspective of a person having ordinary skill in the art, as set forth in Section IV of my initial declaration submitted in this proceeding (EX1003, “First Declaration”).

3. Since submitting my First Declaration, I have reviewed the Patent Owner’s Response (Paper 19, “POR”) in IPR2020-01404, the Board’s Decision to Institute this IPR (Paper 14, “DI”), the transcript of the July 29, 2021 Deposition of James T. Geier (EX1061; “Geier-Depo.”); Declaration of James T. Geier (EX2026; “Geier-Decl.”) cited in the POR and exhibits cited therein.

4. In forming my opinions set forth in this declaration, I have also reviewed those exhibits cited in in paragraph 14 of my First Declaration as well as the following additional exhibits:

Exhibit	Description
1059	Prosecution History for European Patent No. 1 667 480 B1
1060	European Patent No. 1,667,480 B1
1061	Deposition Transcript of James T. Geier (July 29, 2021) (“Geier-Depo.”)
2026	Declaration of James T. Geier

II. MY UNDERSTANDING OF PATENT LAW

5. In paragraphs 15 to 26 of the First Declaration, I provided my understanding of patent law (including the law of claim construction) as it relates to the opinions I expressed in that declaration. I have continued to apply that understanding in this Reply Declaration.

III. MY REPLY TO THE CLAIM CONSTRUCTIONS THAT THE BOARD PRELIMINARY ADOPTED AND WHICH NTT PROPOSES

6. I understand the Board “preliminary determine[d]” in its decision on institution that “mandatory channel” means “one channel in a wireless multichannel communication system over which transmission must occur before transmission may occur over the other wireless channels.” Paper 14 at 21.

7. I further understand that NTT proposed a similar construction of “mandatory channel” in its Patent Owner Response (“POR”; Paper 19). According to NTT, a “mandatory channel” should be construed as “one channel in a wireless

multichannel communication system whose idle state determines whether there can be a transmission over the other channels.” POR at 11-12; Geier Decl., ¶¶ 63-67.

8. In my opinion, the Board’s preliminary construction and NTT’s proposed construction are incorrect at least because POSAs would not have understood the Challenged Claims to be limited to “multichannel systems.” In my opinion, the term “mandatory channel” should be afforded its plain meaning and that meaning in no way limits the Challenged Claims to “multichannel systems.” I explained this in my First Declaration at paragraphs 89 to 95, and neither the Board nor NTT demonstrate why my prior opinion was wrong.

A. My Reply to the Board’s and NTT’s Argument that the Plain Language of the Claims Limits Them to Multichannel Systems

9. I understand the starting point of any claim construction is the words of the claims themselves. First Declaration, ¶ 18. The term “mandatory channel” consists of two words that are readily understood by POSAs: “mandatory” and “channel.” Resorting to the specification or extrinsic evidence is unnecessary to understand the meaning of either word individually, and when they are used together in “mandatory channel” the words’ meaning makes sense: a “mandatory channel” is simply a “channel” that is “mandatory.” There is nothing in the words “mandatory” or “channel” that requires the existence of other channels beyond the “mandatory channel” as the Board and NTT suggest.

10. The surrounding context in which the phrase “mandatory channel” appears helps inform the phrase’s meaning. For example, claim 1 says that the “mandatory channel” is a channel that “is always used for transmission.” *See also* First Declaration ¶ 54. The claim therefore itself effectively defines what it means to be “mandatory”—it’s the channel that “is always used for transmission.” POSAs would have readily understood that a channel that “is always used for transmission” is a “mandatory channel,” and its status as a “mandatory channel” is independent of whether there are other channels potentially available for use.

11. As discussed below in Section III.E, my understanding of the Challenged Claims is consistent with what NTT told the European Patent Office (EPO) when NTT was addressing *identical* claim language during prosecution of a patent that issued as EP 1,667,480 (EX1060; “EP480”; prosecution history at EX1059). EP480 claims priority to the same PCT application that the ’551 Patent claims priority to and shares an identical specification with the ’551 Patent. EX1059, 98; EX1001 (’551 Patent), Cover (86)-(87)). Given their identical disclosures and common ancestry, POSAs would have considered NTT’s statements to the EPO during prosecution of EP480 to be relevant to understanding the meaning of terms appearing in the claims of the ’551 Patent.

12. In addressing claim language that is identical to challenged claim 1 of the ’551 Patent, NTT told the EPO that the “claims already define the mandatory

channel by stating that it is a channel ‘*that is always used for transmission.*’” EX1059, 130 (non-bolded italics original); *see also* EX1059, 123-197. I agree with what NTT told the EPO: the claims expressly state that a “mandatory channel” is “mandatory” because it is “always used for transmission.”

13. Contrary to the Board’s preliminary construction and NTT’s proposed construction in this matter, nothing in the claim language limits the “mandatory channel” to one of several available channels. As explained at paragraphs 89 to 95 in my First Declaration, the Challenged Claims’ preambles—which, as the Board correctly found are “identical” in this respect (DI, n.8)—are written in the disjunctive (“or”) and recite that “transmitting a plurality of wireless packets simultaneously” can be accomplished “by using [1] multiple wireless channels determined to be idle by carrier sense, [2] a single wireless channel determined to be idle and MIMO, *or* [3] the multiple wireless channels and the MIMO.” The preamble is therefore clear on its own: packets can be transmitted simultaneously using multiple channels (with or without MIMO on those channels), or alternatively by using “a single wireless channel determined to be idle and MIMO.”

14. Even Mr. Geier agrees that the preamble “treats single-channel MIMO and using ‘multiple wireless channels’ as *alternatives.*” Geier-Decl., ¶ 55 (citing claim 1) (emphasis original). There thus appears to be little dispute that POSAs

would understand that the claims cover single-channel *or* multi-channel systems, rather than just the latter.

15. POSAs would also find the interpretation of *method* claim 1 that the Board and NTT propose to be incorrect because under the Board’s and NTT’s interpretations two devices exchanging packets simultaneously over a single MIMO-implemented channel fall within the claims’ scope *only if* the *apparatus* on which the *method* is performed has other channels available, and this must be true even if those other channels *remain unused* when performing claim 1’s method. A POSA would not interpret a method claim that can be met by transmitting over a single channel to require the apparatus performing that method to have capabilities to transmit over multiple channels when multi-channel transmission is not required to meet the claimed method. Similarly, a POSA would understand the interpretation of *apparatus* claim 5 that the Board and NTT propose is incorrect because their interpretation effectively rewrites “or” as “and” by requiring the claimed apparatus to always have “multiple wireless channels” that it *could* use. POSAs would not agree with either the Board’s or NTT’s interpretation at least because claim 5 expressly recites a “single channel” as an alternative (the “or”) covered by the claim.

16. The Board preliminarily found “MIMO requires at least two channels or transmission links” and cited the Ho reference as proof. Paper 14 at 20. In my opinion, this preliminary finding is incorrect.

17. As I explained in my First Declaration at paragraphs 75 to 79, the Ho reference explicitly discloses MIMO over a single channel. Patent Owner and Mr. Geier agree with that understanding of Ho’s disclosure. POR at 49; Geier, ¶ 140; Geier-Depo., 113:17-116:13. This is also consistent with the ’551 Patent, which explicitly states that MIMO requires only a single channel: “In MIMO, different wireless packets are transmitted from a plurality of antennas at the same time on the same wireless channel.” EX1001 (’551 Patent), 1:61-63.

18. As I explained at paragraphs 39 to 41 of my First Declaration, POSAs knew MIMO increased channel capacity by effectively dividing a single channel into multiple, independent “subchannels” over which packets could be transmitted simultaneously. The ’551 Patent refers to these “subchannels” as “MIMOs” (*e.g.*, “two MIMOs” means two MIMO subchannels on a single channel). *E.g.*, EX1001 (’551 Patent), 2:4-6. A single channel that is implemented using MIMO is said to divide the channel into multiple MIMO *sub*channels but in that case there is still only a single channel.

19. I understand the Board preliminarily found (and NTT and Mr. Geier agree) that “there can be no ‘setting’” of a mandatory channel if only one channel is provided. Paper 14 at 20; POR at 13; Geier Decl., ¶ 65. The Board’s preliminary finding, however, presumes there is “only one channel provided” in conventional

802.11 systems (as described in the '551 Patent). I disagree with this finding and the underlying presumption and a POSA would disagree as well.

20. As I explained in paragraph 34 of my First Declaration, even in traditional single-channel 802.11 systems, there are *fourteen 2.4 GHz 802.11 channels* that are available for the system to select from as its transmission channel; and, by convention, in the United States three of the fourteen channels (1, 6, and 11) were available to each 802.11 network. This is corroborated by Shpak at [0006] and Bugeja at [0023]-[0025].

21. There is therefore nothing inconsistent with “setting a mandatory channel” in a single-channel system because one of fourteen available channels must have been set/selected as the channel to always be used by a station for transmissions in the system at given point in time. This fact thus refutes NTT’s argument that “there is nothing ‘mandatory’ about a channel if it is the only channel provided” (POR at 12; *see also* Geier Decl., ¶ 65) because even in a system where stations only transmit over one channel at a time there are thirteen other “provided” channels that, until a different mandatory channel is selected, are never used for transmission and one channel (the “mandatory” channel) that always is used for transmission.

22. In support of its proposed construction, NTT suggests the specification describes a two-step process wherein channels are first “determined” from among

those available in 802.11 and then one is “set” as the mandatory channel. POR at 12-13. I disagree, and in my opinion a POSA would disagree as well.

23. At least for an embodiment implementing the “single wireless channel ... *and MIMO*” claimed alternative, the specification does not describe an embodiment that engages in a two-step process like the one NTT suggests, wherein (1) the “single” MIMO channel is first selected from among the fourteen available 802.11 channels *and* then (2) an additional step is taken to “set” this single channel as the mandatory channel. That second alleged step is nowhere described in the specification.

24. The absence of that second step from the specification is not surprising because POSAs would understand that this second step would be entirely unnecessary because it would be redundant. By selecting a single channel among the fourteen available 802.11 channels to be used in a single-channel system that channel is necessarily the mandatory channel that will always be used for the transmissions, so there is no need to set the channel *again* as the mandatory channel. In contrast, NTT’s argument requires a POSA to interpret “setting” a channel to be narrower than “determining” a channel to use. NTT does not fully articulate why this is so and does not fully explain this interpretation; regardless, the specification does not support it as I just explained.

25. If NTT is suggesting that there *must be* some difference between “determining” a channel like conventional 802.11 systems did and “setting” a channel because, if there were no difference, the Challenged Claims would encompass what the ’551 Patent admits is prior art, I disagree and a POSA would disagree. Most notably, NTT’s arguments ignore the fact that the claims can be met by “*simultaneous* transmissions” over a single *MIMO*-implemented wireless channel. The patent does not admit that there were prior art 802.11-compliant systems that “determined in advance” a single wireless channel from among fourteen wireless channels to use for *simultaneous MIMO* transmissions. IEEE 802.11 systems did not incorporate MIMO until 802.11n, which was released in 2009 and even its draft version was not released until 2007, both of which were before the ’551 Patent’s earliest priority date. *See* ’551 Patent, (30) (Foreign Application Priority Date of September 9, 2003). As I discussed in my First Declaration, by the time of filing of the ’551 Patent single-channel MIMO systems based on 802.11 conventions were obvious (*see, e.g.*, Grounds 1 and 3), but they were not admitted prior art.

26. I understand the Board preliminarily found (and that NTT agrees) that “there is nothing ‘mandatory’ about a channel if it is the only channel provided.” POR at 12 (quoting Paper 14 at 20). I disagree and as I explain in Section III.E below, when discussing claim language that is *identical* to claim 1 of the ’551 patent,

NTT, in fact, told the EPO there were no “inconsistencies” with “in [the] case of only one channel [being present], this channel is defined as the mandatory channel.” EX1059, 130. When a station uses and only has available a single channel it is the “mandatory channel” because—as the claims plainly state—that channel “is always used for transmission.”

27. As alternatives to single-channel MIMO, the claims also cover multichannel systems with one or more non-mandatory channel(s) in addition to a mandatory channel. A POSA would understand that the claimed “single wireless channel...and MIMO” option does not have to be construed to require multiple channels to give “mandatory” meaning at least because multichannel systems are explicitly covered by the alternatives to the single-channel MIMO option recited in the claims.

28. Finally, in my opinion, NTT and Mr. Geier also mischaracterize claim 4 (POR at 13; Geier Decl., ¶ 67), which requires using “multiple wireless channels” or “MIMO.” As I explained in my First Declaration at paragraphs 149 to 151 and 249 to 252, *method* claim 4 does not require an apparatus capable of selectively using both techniques, it only requires simultaneously transmitting packets using *either* multiple wireless channels *or* multiple MIMO sub-channels (“number of MIMOs”) and then limits how the method implements *either* transmission technique.

29. Specifically, claim 4 depends from claim 1, and recites that the method further comprises “simultaneously transmitting wireless packets selectively *using the multiple wireless channels* or *the MIMO in accordance with a number of pieces of data* or *a number of MIMOs that depends on a channel condition*.” The language in **red** limits the use of “multiple wireless channels,” *i.e.*, the method selectively uses those channels based on the amount of data it has. For example, if there are three wireless channels available but only two pieces of data, then only two channels are used as shown in Figure 13(2) of the '551 Patent. On the other hand, the language in **green** limits how the method uses “MIMO,” *i.e.*, the method selectively uses a number of those MIMO sub-channels based on the condition of the MIMO-implement channel(s), which the '551 Patent says impacts the number of MIMOs (*i.e.*, MIMO subchannels) that can be used. EX1001 ('551 Patent), 1:63-2:3. Thus, claim 4 does not require that a station implementing the method to be able to perform both the **red** and **green** language, it need only be capable of performing either one.

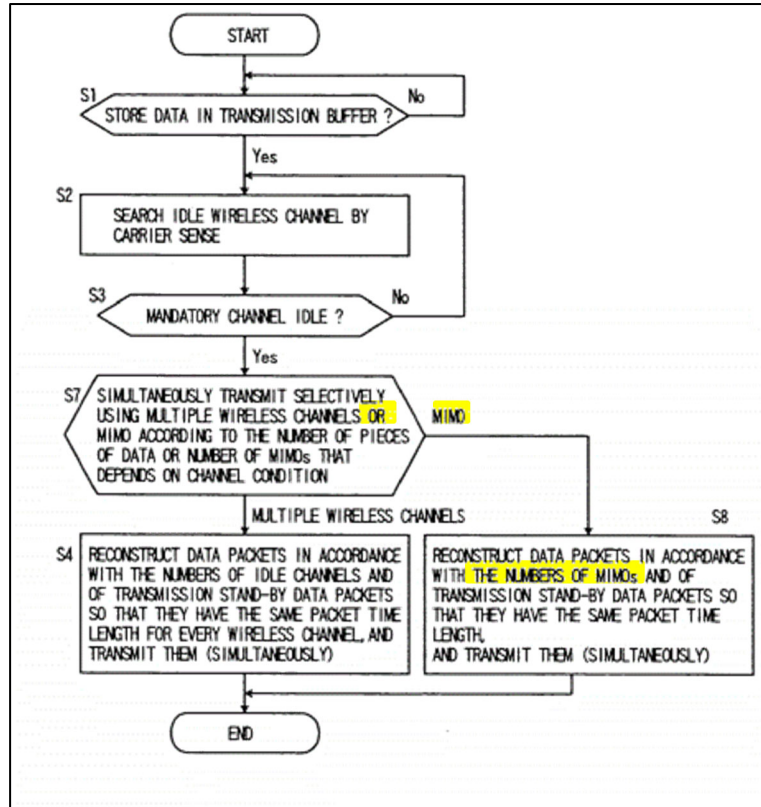
B. My Reply to the Board's and NTT's Argument that the Specification Supports Limiting the Claims to Multichannel Systems

30. Like the claims' plain language, the specification also provides no justification for limiting the claims to a multichannel system; instead, as I explained in my First Declaration at paragraph 93, the specification is *explicit* that the

“invention” includes both single-channel and multichannel systems as alternatives, consistent with the plain meaning of the claim language.

31. The specification says that simultaneous transmissions can occur using “a [singular] wireless channel or wireless channels that [singular] includes/[plural] include the mandatory channel.” EX1001 (’551 Patent), 3:44-49; *see also* Abstract, 3:50-52; 11:65-66. The patent further teaches that the “invention relates to...transmitting a plurality of wireless packets using multiple wireless channels ***or*** Multiple Input Multiple Output (hereinafter, MIMO).” EX1001 (’551 Patent), 1:15-19. Thus, the specification describes using single-channel MIMO as an alternative to having multiple channels; it does not restrict using a single MIMO-implemented channel to systems that have multiple channels available.

32. As the patent makes clear in Figure 8 (below with my highlights), if MIMO is selected at step S7, packets are reconstructed according to the number of MIMO subchannels (“MIMOs”) available for use over that single MIMO channel. EX1001 (’551 Patent), 8:10-22, 2:4-6. Figure 8’s method can be accomplished with a ***single*** MIMO-implemented channel divided into, *e.g.*, three MIMOs (*i.e.*, three MIMO ***sub***channels). Nothing in Figure 8 requires the existence of multiple channels:



33. The specification elsewhere says “when the mandatory channel is busy, transmission is not performed even if there is another wireless channel.” EX1001 (’551 Patent), 3:54-57. The “even if” clause would be unnecessary if, as NTT argues, having a mandatory channel always requires “another wireless channel.” Thus, the specification clearly contemplates embodiments where the mandatory channel exists without “another wireless channel,” consistent with the opinions in my First Declaration (*e.g.*, Grounds 1 and 3).

34. I thus agree with the Board that the specification “supports a determination that the invention is *not limited* to a ‘single wireless channel’” (Paper 14 at 20) because, as I discussed above and in my First Declaration at, for example,

Paragraphs 89 to 95, the alleged invention encompasses single-channel *and* multichannel systems and is not limited to either. *See also* Petition at 30-33.

35. I disagree, however, with the Board’s statement “[t]his is not a situation where *PO* [NTT] proposes reading a limitation from the Specification into the claim.” Paper 14 at 20. Respectfully, in my opinion, that is *exactly* what NTT proposes to do with its construction—NTT seeks to *limit* the claims to multichannel systems because the specification describes multichannel embodiments, even though the claims explicitly include transmission over no more than a single MIMO channel.

36. It appears that the Board agreed with NTT’s argument that “in every embodiment, a ‘mandatory channel’ is identified from one of multiple available channels provided between a transmitting and receiving station (STA).” POR at 14; Paper 14 at 20. Even if that were true, I understand that limitations from exemplary embodiments cannot be read into the claims absent a clear indication by the patentee that it intended the claims to be so limited. The specification of the ’551 Patent has no clear indication limiting the invention to multichannel systems. Although NTT and Mr. Geier say that “in *every* embodiment, a ‘mandatory channel’ is identified from *one of multiple* available channels” (POR at 14 (citing EX1001 (’551 Patent), 5:52-57 and 7:8-12); Geier Decl., ¶ 69 (emphasis original)), the cited embodiments do not use MIMO at all and thus would not inform a POSA’s understanding of the

single-channel MIMO option recited in the claims. A POSA would understand that the embodiments cited by NTT and Mr. Geier are examples of just one of the three claimed transmission techniques. If the claims were limited to the embodiments that NTT and Mr. Geier cites it would eliminate from the claims not only the single MIMO-implemented channel option but would also eliminate the multiple MIMO-implemented channels option because that too is not illustrated in the embodiments NTT and Mr. Geier cited. Regardless, limiting the claims to a multichannel system because the inventors focused their written description to multichannel systems is contrary to the applicants' express intent to cover other embodiments (as reflected in the plain claim language) that include a single MIMO-implemented channel, which the parties agree is covered by the claims (*see, e.g.*, POR at 13 (“claim 1 may be performed using a single channel with MIMO transmission”)) but, nonetheless, is not an embodiment explicitly illustrated by the patent (EX1001 ('551 Patent), 11:58-60).

C. My Reply to the Board's and NTT's Argument that the Problem of “Power Leakage” Only Occurs in Multichannel Systems

37. NTT and Mr. Geier argue the claims should be limited to multichannel systems to meet the “purpose of the invention,” because the problem the patent addresses—power leakage—purportedly only occurs in multichannel systems. POR at 14; Geier Decl., ¶ 68. The Board based its preliminary determination at least in

part on this understanding of the patent as well. Paper 14 at 19, 21. I disagree with NTT that the “power leakage” problem the ’551 Patent describes is limited to “multichannel systems.”

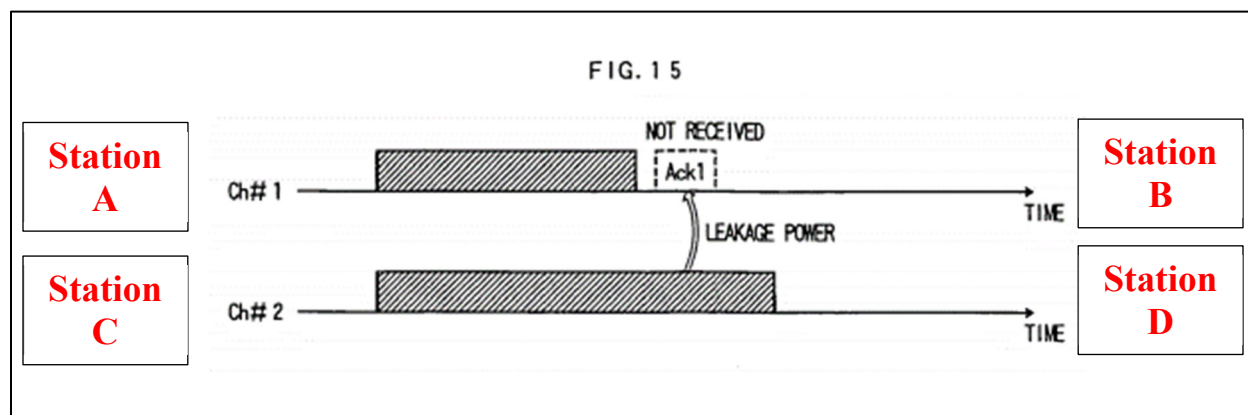
38. To begin, the ’551 Patent is explicit that “power leakage” (or “leakage power”) is not limited to multichannel system but also includes “conventional” single-channel systems wherein packets are transmitted over a single channel, not multiple channels. As the specification says:

This [“leakage power”] problem occurs not only in case of simultaneous transmission using multiple wireless channels but also in a conventional case where wireless packets are transmitted by using *one* wireless channel and an adjacent wireless channel that is affected by leakage power receives the wireless packets.

EX1001 (’551 Patent), 3:27-32. The reference to “conventional case” in this passage is a clear reference to the “conventional” 802.11 system described in column 1 at lines 24-42 that uses a single channel to transmit wireless packets—no other system is described as “conventional” in the specification.

39. That “power leakage” occurs in the context of conventional single-channel system makes perfect sense. For example, using Figure 15 from the ’551 Patent as a starting point, rather than having a single station on the left-hand side using multiple channels at the same time to transmit data to stations on the right-

hand side, there could be two stations on the left and two on the right, where pairs of stations transmit data between each other independently, *e.g.*, Station-A transmits to Station-B on Ch#1 and Station-C independently transmits to Station-D on Ch#2.



40. Leakage power from Station-C to Station-D's transmissions on Ch#2 can cause Station-B not to receive a transmission sent by Station-A via Ch#1. The “leakage power” problem in this case thus exists despite each station only having a single channel over which it transmits data, *i.e.*, each station is limited to a single-channel system. This power leakage across two adjacent channels used independently by two different single-channel systems is the same physical phenomena of leakage power across two adjacent channels used simultaneously in a multichannel system. Thus, NTT's argument and Mr. Geier's opinion that “the specification teaches that the problem addressed by the '551 arises specifically in the context of multichannel systems” is wrong. POR at 14; Geier Decl., ¶ 68.

41. Although the '551 Patent does not explicitly explain how “setting” a “mandatory channel” in a single-channel system would address the problem of

“power leakage,” POSAs would have known that one potential benefit of “setting” a particular channel as a “mandatory channel” would allow organization of adjacent single-channel systems so as to reduce power leakage between the two systems. The Bugeja reference described in my First Declaration provides a useful example.

42. In its Background and illustrated in its FIG. 1, Bugeja discloses a collection of access points (“APs”) operating physically near each other with distinct mandatory channels assigned in order to reduce interferences between nearby APs. Bugeja, [0002]-[0006]; *see* First Declaration at ¶¶ 162-167. Bugeja thus recognized and explained how even in single-channel systems, mandatory channels can be used so that a collection of single-channel systems can be organized so that the mandatory channel of each AP is assigned to avoid power leakage between the mandatory channels of nearby APs. A POSA would also understand that Bugeja’s use of mandatory channels in single-channel systems would not have been possible if there were not multiple wireless channels available from which to choose to select the mandatory channels of nearby APs.

D. My Reply to NTT’s Argument that the Prosecution History Supports Limiting the Claims to Multichannel Systems.

43. I discussed the prosecution history of the ’551 Patent in my First Declaration at paragraphs 62 to 63 and at paragraph 94. As I explained in paragraph 94, the applicants confirmed during prosecution that the claims cover transmissions using “one” channel, *i.e.*, a single MIMO-implemented channel. During

prosecution, the applicants also used the definitional phrase “*i.e.*” to confirm that the term “mandatory” meant “indispensable.” EX1002, 307 (“a mandatory channel (*i.e.*, an indispensable channel”). Thus, a POSA would understand that the “mandatory channel” is “indispensable” for a particular pair of transmitting and receiving devices because it is a channel that must be used for transmissions between those two devices (at least until a different mandatory channel is assigned).

44. NTT’s POR and Mr. Geier’s declaration do not address the above aspects of the prosecution history but instead argue that the applicants and Examiner “regarded the ’551 patent as pertaining to multichannel systems” because the Examiner rejected the claims over a multichannel reference. POR at 15; Geier Decl., ¶¶ 70-72. I disagree and a POSA would disagree that the prosecution history leads to that conclusion. The claims cover **both** single-channel **and** multichannel systems, which I understand means that prior art disclosing **either** would have been sufficient to reject the claims. That the Examiner based its rejection on a multichannel reference does not mean the Examiner was finding or that NTT argued the claims were limited to multichannel systems. The Examiner’s rejection of the claims over a multichannel reference simply means that the claims **can be** met by a multichannel system, not that they are **only** met by a multichannel system.

45. One of the references the Examiner used to reject the claims – Sonetaka (EX1010; discussed Geier Decl., ¶ 71) – further illustrates my opinion discussed

below in Section IV that it was known and beneficial to reserve channels for particular uses (*e.g.*, bandwidth augmentation) rather than let every available channel be a contested channel that could be used on-demand. Sonetaka discloses a system whereby certain channels – “service channels” – “are reserved in advance **only for traffic having a predetermined service ranks**, for instance, traffic having a high service rank.” Sonetaka, 1:64-66. Traffic having a service rank below the “predetermined service rank” are not permitted to use the service channel, even if it is unoccupied. Sonetaka, 1:64-2:7. By reserving the service channel for particular types of traffic, Sonetaka recognized that high priority traffic (*e.g.*, traffic for “an urgent call”) would be more likely to capture a channel compared to an alternative implementation where all channels were contestable and available to all types of traffic. Sonetaka, 2:8-11, 1:18-44. I note at his deposition, Mr. Geier agreed that Sonetaka reserves its service channel for certain types of data. Geier-Depo., 203-209; *see also* EX1002, 307 (inventors arguing that Sonetaka’s “mandatory channel” is “reserved for high priority traffic only, and is not assigned to low priority traffic”). Thus, similar to how a POSA would recognize the advantages of the Shpak-Lundby bandwidth-augmentation design – which I described in my First Declaration at §§ VI.B.1-3 and discuss further below in Section IV – Sonetaka also demonstrates that it was known in the prior art to restrict usage of channels to particular types of

traffic and that there were advantages in doing so, compared to letting an available channel be used on demand, without restricting its use for particular purposes.

E. The Claim Constructions that the Board Preliminary Adopted and Which NTT Proposes Are Inconsistent with NTT's Statements to the EPO

46. NTT filed a European application sharing an identical specification with, and claiming priority to the same PCT application as, the '551 Patent. That application became EP 1,667,480 (EX1060), and during its prosecution NTT made unambiguous admissions directly refuting its contention that “mandatory channel” limits the claims to multichannel systems. As I discuss below, NTT's admissions in Europe regarding *identical* claim language were made to resolve the *identical* dispute the parties have here.

47. EP 1,667,480's originally-filed claims were identical to the Challenged Claims. EX1059, 98-100. Below is a table that shows (1) on the left, the original version of the claim language during prosecution of EP 480 on the left and (2) on the right, the '551 patent's claim 1; the *only* difference between the two claims shown below is that the preamble of the claim in the EP480 file history has the

transitional phrase “the method **characterized by** comprising,” whereas the ’551 patent just recites “the method comprising”:¹

EP 480 Prosecution History (EX1059, 98)	’551 Patent, Claim 1 (EX1001 (’551 Patent))
<p>1. A wireless packet communication method for transmitting a plurality of wireless packets simultaneously by using multiple wireless channels determined to be idle by carrier sense, a single wireless channel determined to be idle and MIMO, or the multiple wireless channels and the MIMO, the method <u>characterized by</u> comprising:</p> <p>setting a mandatory channel that is always used for transmission; and</p> <p>transmitting the wireless packets by using a wireless channel/wireless channels that includes/include the mandatory channel, only when the mandatory channel is idle.</p>	<p>1. A wireless packet communication method for transmitting a plurality of wireless packets simultaneously by using multiple wireless channels determined to be idle by carrier sense, a single wireless channel determined to be idle and MIMO, or the multiple wireless channels and the MIMO, the method comprising:</p> <p>setting a mandatory channel that is always used for transmission; and</p> <p>transmitting the wireless packets by using a wireless channel/wireless channels that includes/include the mandatory channel, only when the mandatory channel is idle.</p>

48. The EPO rejected the above version of claim 1 as anticipated and interpreted “wireless channel/wireless channels” to be “an alternative” such that “[i]f

¹ I understand that the “characterized by” transitional phrase in European Patent claims indicates that everything preceding “characterized by” is admitted prior art, which is consistent with the ’551 patent’s specification and my opinions about a POSA’s knowledge of the prior art. *See* ’551 Patent, 1:23-2:3; First Declaration, § V.A.

only one channel is present, then said only channel is automatically defined as ‘**mandatory.**’” EX1059, 125-26 (emphasis original).

49. In response, NTT explained the claims cover “three ways of how [] wireless packets can be transmitted simultaneously,” including “using a single wireless channel.” EX1059, 130. NTT did not dispute that the phrase “wireless channel/wireless channels” should be interpreted as providing alternatives, but said “[t]he fact that, **in case of only one channel**, this channel is defined as the mandatory channel **does not lead to any inconsistencies.**” EX1059, 130. NTT thus explicitly said the claims cover “using a single wireless channel...and MIMO” and that when this single channel is the “only one,” *e.g.*, the “only one” available for use, that the single channel is “defined as the mandatory channel” was not “inconsisten[t]” with the patent. NTT’s description of claim 1’s language is entirely consistent with my opinions in my First Declaration, and directly contradicts NTT’s and Mr. Geier’s contention that interpreting the claims to cover “a single-channel system would render the claim language a nullity.” POR at 13; Geier Decl., ¶ 66.

50. NTT further argued to the EPO that the “claims already define the mandatory channel by stating that it is a channel ‘*that is always used for transmission.*’” EX1059, 130 (italicized original). This too is consistent with my opinions and (I understand) the District Court’s determination that no construction is necessary because the plain meaning is clear.

51. Notably, the EPO only allowed EP 1,667 480 *after* NTT narrowed the claims by (1) limiting the preamble to only one of the three original transmission techniques, *i.e.*, “using multiple wireless channels (Ch#1, Ch#2) determined to be idle by carrier sense and MIMO,” and (2) requiring the mandatory channel be one “among multiple wireless channels.” EX1059, 184; *see also* EX1059, 190. The absence of similar narrowing language in the ’551 Patent’s claims reinforces that the Challenged Claims—identical to the European claims before they were amending and narrowed to overcome the EPO’s rejections—are broader and do not require multiple channels (*i.e.*, do not require the mandatory channel to be “among multiple wireless channels).

IV. MY REPLY TO NTT’S ARGUMENTS REGARDING THE SHPAK-LUNDBY COMBINATION

52. For the reasons I discussed in my First Declaration at, for example, Paragraphs 125 to 126, Lundby’s teachings would have motivated a POSA to add a second channel to Shpak’s primary channel “to augment the primary channel’s bandwidth” in the manner I described in my First Declaration. *See also* Petition at 41-42. NTT and Mr. Geier do not appear to dispute that POSAs had reasons to add a second channel to Shpak as each concedes POSAs at least had “reason[s] to use two channels instead of one.” POR at 40-41 (conceding Petition provided “reason[s] to use two channels instead of one”); Geier-Decl., ¶¶ 118-122 (same). Instead, NTT and Mr. Geier argue POSAs would have implemented Shpak-Lundby’s

multichannel system differently than the manner I discussed in my First Declaration. In their proposed implementation, the secondary channel would have been added for a different purpose than what I described in my First Declaration.

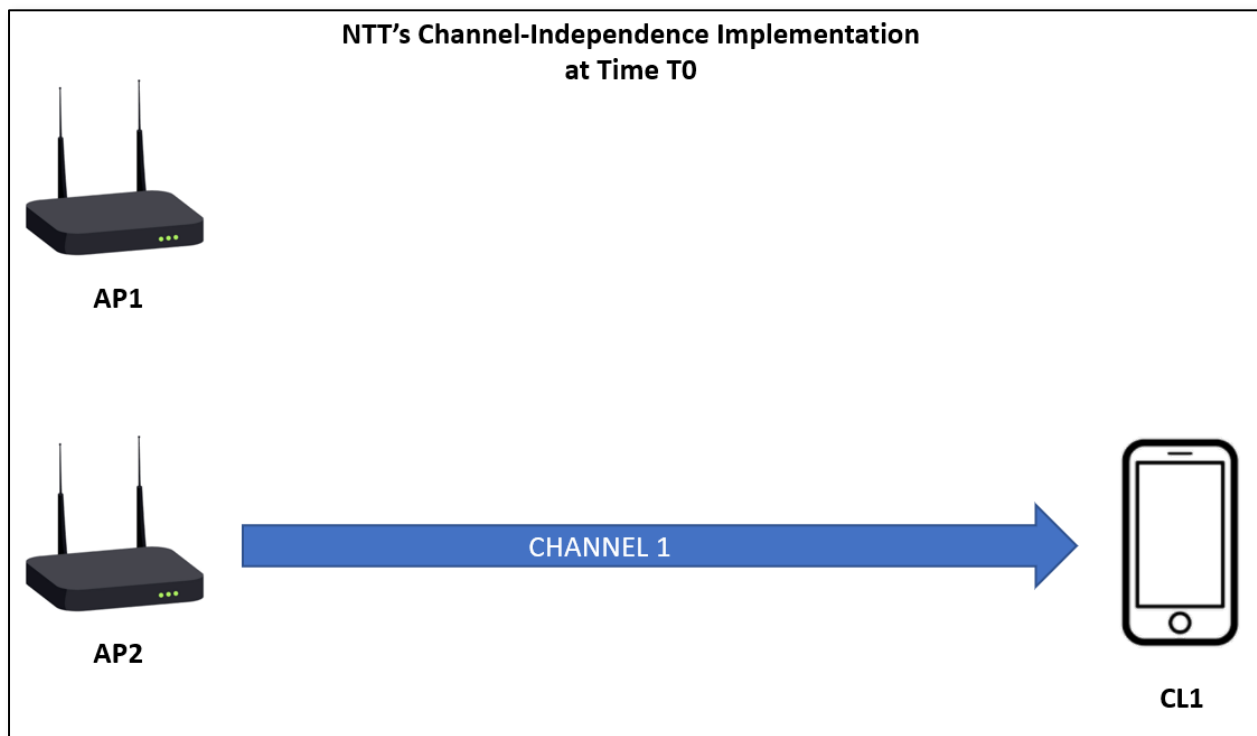
53. NTT and Mr. Geier argue a POSA would have used the “secondary” channel—not as a channel that is truly secondary to the primary channel as I proposed and Lundby describes—but as an independent channel that (if idle) any device may use, even when the primary channel is busy. POR at 32-37; Geier-Decl., ¶¶ 108-114. In NTT and Mr. Geier’s hypothetical implementation of Shpak-Lundby, the system would not have had primary and secondary channels in the manner Lundby proposes; instead, in NTT and Mr. Geier’s implementation of Shpak-Lundby, the system would have two co-equal, contested channels that would have been available to use independently of each other. POR at 36; Geier-Decl., ¶¶ 112-114. (By “contested” channels I mean that multiple devices can attempt to “capture” and “reserve” each channel separately and independently of other channels.)

54. NTT and Mr. Geier say their alternative independent-channel implementation of Shpak-Lundby would have been the “default” implementation for POSAs to pursue (POR at 33; Geier Decl., ¶ 110), and allege that “Petitioner has failed to allege any reason why a POSA would deviate from” that implementation (POR at 3; *see also* Geier Decl., ¶¶ 65-66, 74-75).

55. I disagree and in my opinion a POSA disagrees as well. In fact, the teachings from Lundby that I and Petitioners rely on provided just such a “reason” to implement Shpak-Lundby in the manner I described in my First Declaration at, for example, Paragraphs 125 to 126—“to augment the primary channel’s bandwidth [with the secondary channel] such that wireless packets are transmitted on both channels simultaneously.” *See also* Petition at 41-42. The implementation I discussed in my First Declaration has advantages over the implementation NTT proposed in its POR and Mr. Geier discusses in his declaration because the implementation I discussed would have ensured that the secondary channel was more-readily available for a ***bandwidth-augmentation*** purpose. This is because in that implementation, the secondary channel is ***only used*** along with the primary channel and ***only used*** when needed to augment the primary channel’s bandwidth, as I discussed in my First Declaration at Paragraphs 125-131, 133 and 140-14. *See also* Petition at 41-44, 46-47. In contrast, the alleged “default” implementation identified by NTT and Mr. Geier does not prioritize bandwidth augmentation—it prioritizes channel independence (POR at 38; Geier Decl., ¶¶ 116-117) which has the cost of making it less likely that a device that desires to use two-channels will be able to do so.

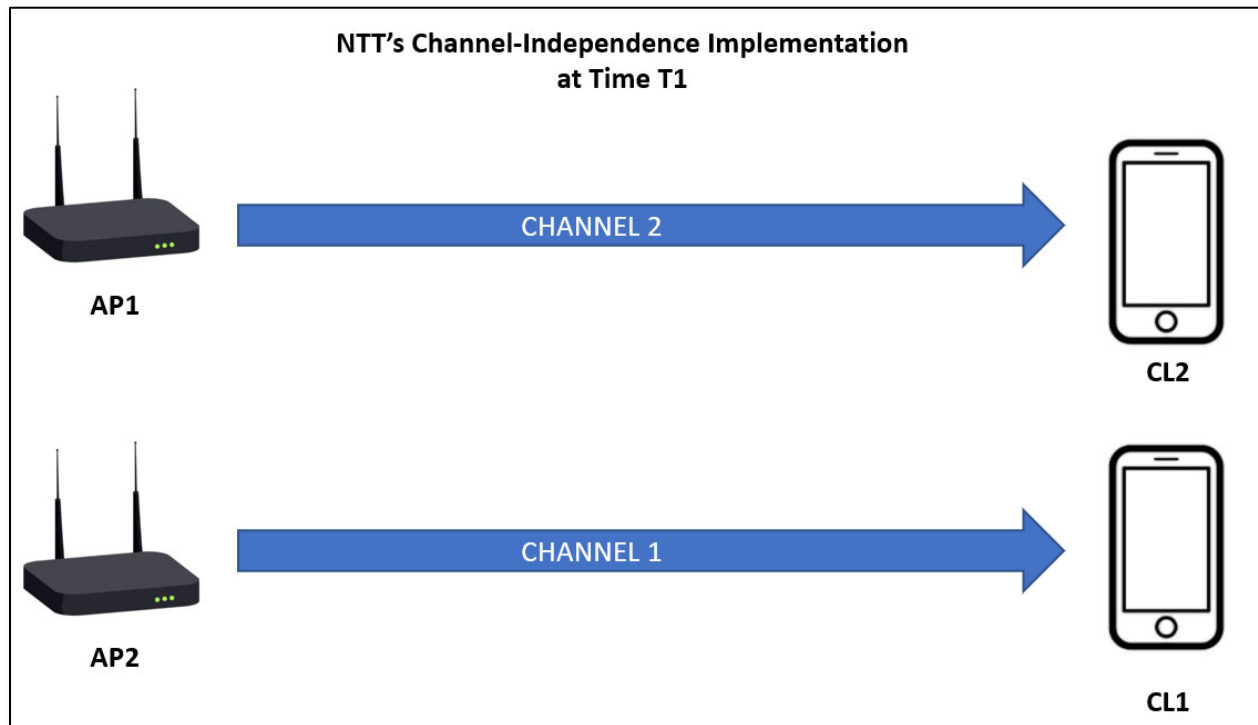
56. The difference between NTT and Mr. Geier’s proposed implementation and the obvious implementation I described in my First Declaration is illustrated in

the figures below. The first three figures below show two access points (“APs”) labelled AP1 and AP2, respectively, and illustrate NTT and Mr. Geier’s channel-independent implementation. With NTT and Mr. Geier’s channel-independence implementation, at Time T0, AP2 can service client 1 (“CL1”) over Channel-1 (lower-half of the figure below).



57. At a later time T1, while AP2 is still servicing CL1, AP1 can independently service a new client that has entered the network, *i.e.*, Client 2 (“CL2”), over Channel-2. However, because Channel-1 is currently occupied by the AP2-CL1 communication, AP1 cannot augment the bandwidth to CL2 at this time, and can only communicate with CL2 using Channel-2 (upper-half of the figure

below). Likewise, at this time AP2 cannot augment the bandwidth to CL1 at this time and can only communicate with CL1 using Channel-1.

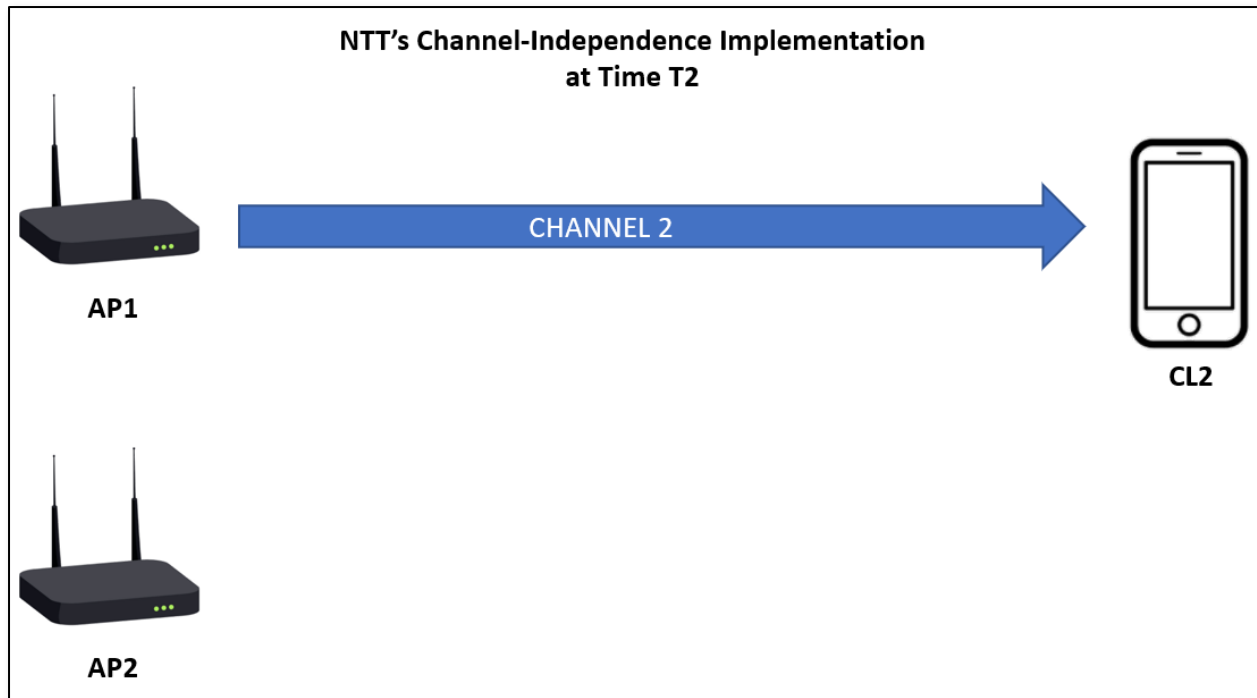


58. As seen above, NTT and Mr. Geier's channel-independence implementation allows AP1 and AP2 to respectively service CL1 and CL2 simultaneously using Channel-1 and Channel-2 at Time T1. However, this channel-independence implementation would not allow either AP1 or AP2 to augment channel bandwidth for their respective clients at T1 even if it was desirable to do so (*e.g.*, one of the clients began a data intensive operation like video streaming) because no channel is held in reserve for purposes of channel augmentation.

59. The inability for either AP to augment bandwidth may persist even after the other AP stops using its channel, *e.g.*, AP2 stops using Channel-1 at Time T2.

Once AP2 stops using Channel-1, that channel becomes an available “contested” channel within the system and any other device sensing that Channel-1 is idle may take “control” of that channel by sending a “Request to Send” or RTS frame over the channel. The RTS frame requests to reserve the wireless channel for a particular transmission, and an 802.11-compliant RTS frame includes a “duration” field that signifies how long the device seeks to reserve the channel for its data transmission. Therefore, when AP2 stops using Channel-1, AP1 is not guaranteed the ability to use Channel-1 because it becomes an available contested channel that all devices in the system can seek to reserve.

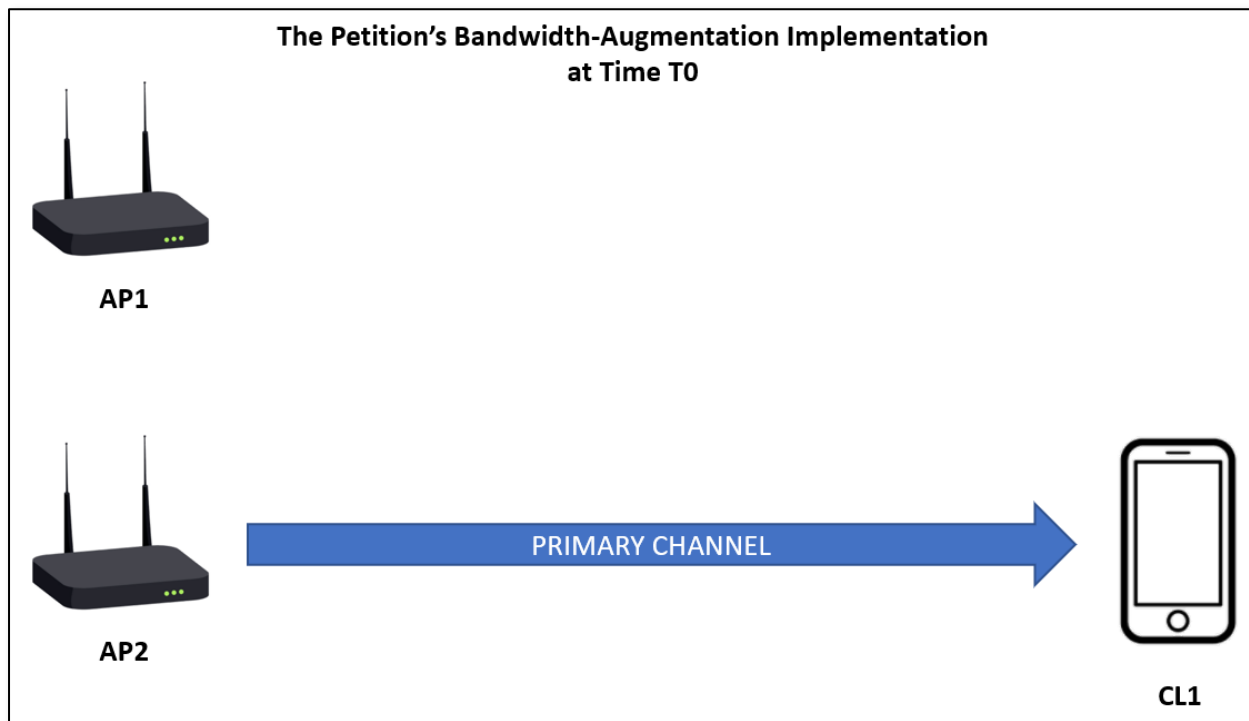
60. Moreover, once AP1 and CL2 have agreed to communicate using a single channel they will continue to do so for a predetermined amount of data and for a predetermined amount of time. For an 802.11-compliant system, this amount of time is identified in the duration field of the RTS frame. During that predetermined transmission period, AP1 cannot switch from single-channel to dual-channel transmission, and thus AP1 would not attempt to reserve Channel-1 until its predetermined transmission period with CL2 ends, but by that time another device (or AP2 again) may have captured and reserved Channel-1.

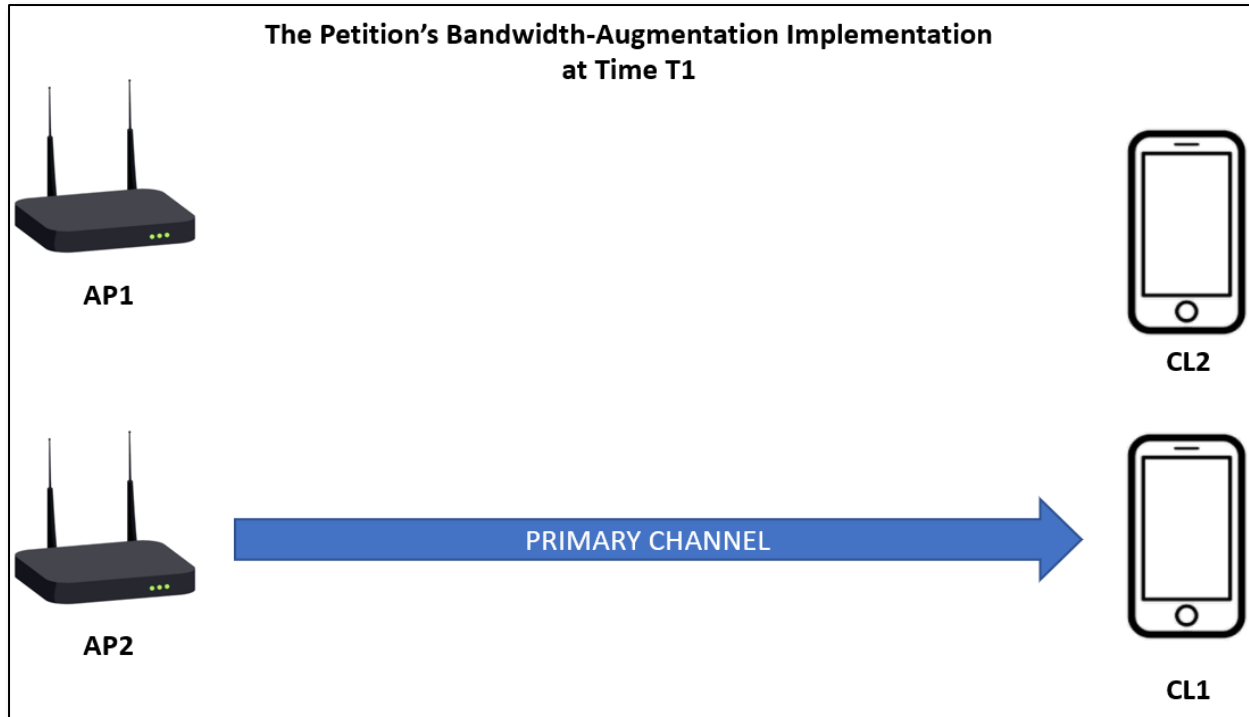


61. Conversely, as illustrated in the figures below, with the bandwidth-augmentation implementation that I discussed in my First Declaration and described in the Petition, when the Primary Channel is unavailable (*e.g.*, because AP2 is using it to service CL1), the Secondary Channel remains unoccupied and cannot be *not* used (*e.g.*, by AP1 to service CL2), thus ensuring the Secondary Channel will be available for its bandwidth-augmentation purpose once the Primary Channel frees up.

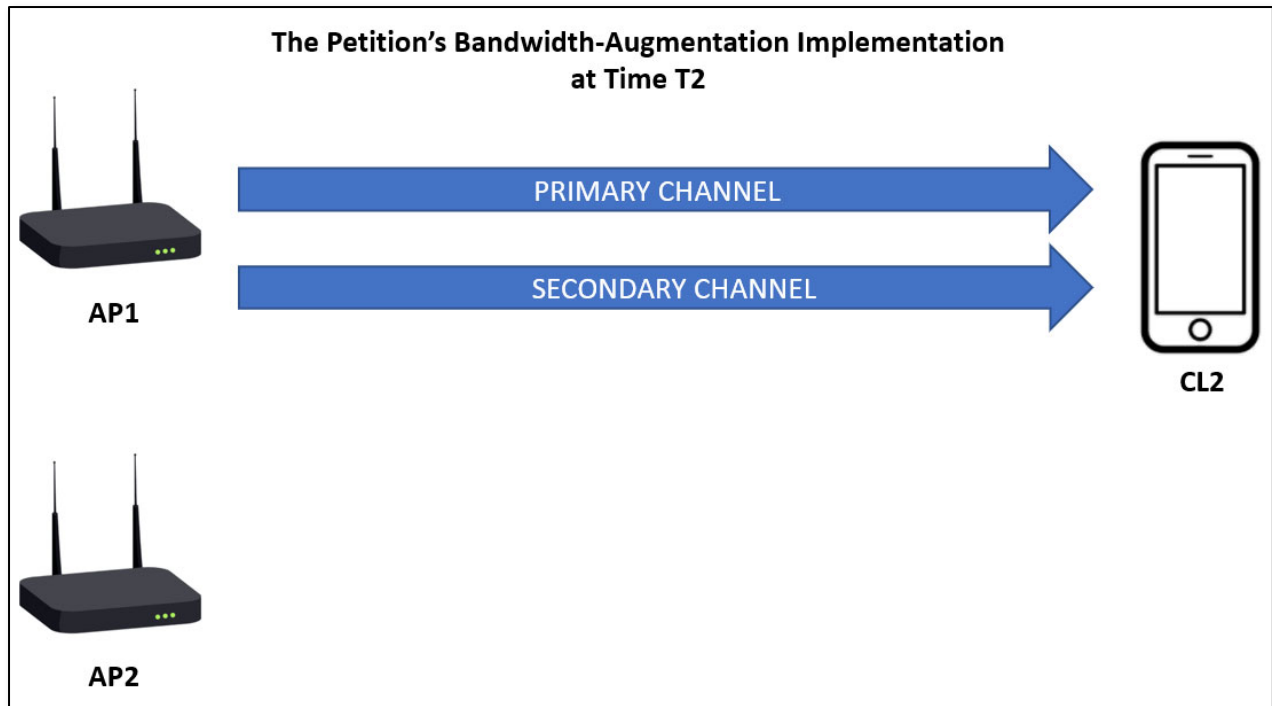
62. For example, as shown in the bottom half of the first two figures below, during Time T0 to T1, AP2 can communicate with CL1 over the Primary Channel and AP1 will not communicate with CL2 even when it enters the system at T1 and even though a “Secondary Channel” is available for use to service CL2. As seen

below, AP2 communicates with CL1 only over the Primary Channel because AP2 has determined that it is not beneficial to augment bandwidth for CL1, *e.g.*, AP2 determines the operation CL1 is performing can be appropriately serviced with just a single channel. AP2 could, however, augment bandwidth for CL1 at any moment should it become desirable to do so because no other device is using the Secondary Channel at Times T0 and T1.





63. While AP2 is using the Primary Channel, AP1 cannot communicate with CL2 because it cannot use the Secondary Channel by itself in the bandwidth-augmentation implementation of Shpak-Lundby and so AP1 wait until the Primary Channel becomes available. However, once the Primary Channel does become available (at Time T2), AP2 can use both the Primary and Secondary Channels to communicate with CL2:



64. Thus, my and Petitioners' bandwidth-augmentation implementation of Shpak-Lundby—unlike NTT and Mr. Geier's channel-independence implementation—reserves additional bandwidth for potential augmentation, which is advantageous for data-intensive operations like streaming video that requires higher bandwidth for each transmission, as I discussed in my First Declaration at Paragraph 126. *See also* Bugeja, [0037], [0046]; *see also* Petition, 42.

65. In contrast, NTT and Mr. Geier's channel-independence implementation is less effective at bandwidth augmentation than my and Petitioners' implementation because in the channel-independence implementation no channel is held in reserve, which may result in situations where bandwidth augmentation is not possible and/or delayed (because, as I explained above, another device may have

come along and captured the Secondary Channel before it could be used to augment the Primary Channel).

V. CONCLUSION AND SIGNATURE

66. In signing this declaration, I understand that the declaration will be filed as evidence in a contested case before the Patent Trial and Appeal Board of the United States Patent and Trademark Office. I acknowledge that I may be subject to cross-examination in this case and that cross-examination will take place within the United States. If cross-examination is required of me, I will appear for cross-examination within the United States during the time allotted for cross-examination.

67. I declare that all statements made herein of my knowledge are true, that all statements made on information and belief are believed to be true, and 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 Title 18 of the United States Code.

68. I declare under penalty of perjury that the foregoing is true and correct.

Date: August 11, 2021

By: 
Tim A. Williams