

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

ERICSSON INC.,
Petitioner,

v.

UNILOC 2017 LLC,
Patent Owner.

IPR2020-00376
U.S. Patent No.: 7,016,676
Issued: March 21, 2006
Application No.: 10/089,959
Filed: August 8, 2001

Title: METHOD, NETWORK AND CONTROL STATION FOR THE TWO-
WAY ALTERNATE CONTROL OF RADIO SYSTEMS OF DIFFERENT
STANDARDS IN THE SAME FREQUENCY BAND

**PETITION FOR *INTER PARTES* REVIEW OF
U.S. PATENT NO. 7,016,676**

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LIST OF EXHIBITS

No.	Description
1001	U.S. Patent No. 7,016,676, “METHOD, NETWORK AND CONTROL STATION FOR THE TWO-WAY ALTERNATE CONTROL OF RADIO SYSTEMS OF DIFFERENT STANDARDS IN THE SAME FREQUENCY BAND,” issued March 21, 2006 (the “ 676 patent ”)
1002	File History for U.S. Patent No. 7,016,676, Application No. 10/089,959 (“ 676 FH ”)
1003	<i>Reserved</i>
1004	Declaration of Peter Rysavy, including Appendix 1 thereto, signed and dated Dec. 22, 2019 (“ Rysavy Dec. ”)
1005	Excerpts of “Webster’s New World College Dictionary, 4 th Edition”, © 1999 by Macmillan USA (“ Webster’s ”)
1006	“HomeRF: Wireless Networking for the Connected Home”, by Kevin J. Negus <i>et al.</i> , IEEE Personal Communications, Vol. 7, Issue 1, pgs. 20-27, Feb. 2000 (“ HomeRF ”)
1007	Declaration of Gerard P. Grenier, including Exhibit A thereto, signed and dated January 2, 2020 (“ Grenier Dec. ”)
1008	“HomeRF: Bringing Wireless Connectivity Home”, by Jim Lansford, Technical Committee Chair for the Home RF Working Group, March 9, 1999 (“ HomeRF Tutorial ”)
1009	“HomeRF TM Working Group 3rd Liaison Report”, by Tim Blaney of Commcepts, July 1998 (“ HomeRF Liaison Report ”)
1010	Declaration of Christina Boyce, including Exhibits A-D thereto, signed and dated January 3, 2020 (“ Boyce Dec. ”)
1011	Declaration of Jennifer Stephens, including Exhibits A and B thereto, signed and dated January 2, 2020 (“ Stephens Dec. ”)

No.	Description
1012	U.S. Patent No. 6,937,158, “METHOD AND APPARATUS FOR WIRELESS COMMUNICATION BETWEEN ELECTRONIC DEVICES,” filed December 29, 1999 and issued August 30, 2005 (“ Lansford ”)
1013	Order regarding Ericsson’s Motion to Intervene, <i>Uniloc 2017 LLC v. Verizon Communications Inc., et al.</i> , Case No. 2:18-cv-00513, ECF No. 35 (E.D. Tex. Apr. 22, 2019)
1014	Order regarding Ericsson’s Motion to Intervene, <i>Uniloc 2017 LLC v. AT&T Services, Inc., et al.</i> , Case No. 2:18-cv-00514, ECF No. 42 (E.D. Tex. Apr. 23, 2019)

MANDATORY NOTICES UNDER 37 C.F.R. § 42.8

1. Real Party-In-Interest (37 C.F.R. § 42.8 (b)(1))

Ericsson Inc. (“Ericsson” or “Petitioner”) and its corporate parent Telefonaktiebolaget LM Ericsson are each a real party-in-interest.

2. Related Matters (37 C.F.R. § 42.8 (b)(2))

The ’676 patent (Ex. 1001) has been asserted by Uniloc 2017 LLC in the following litigations:

- *Uniloc 2017 LLC v. Microsoft Corporation*, 8:18-cv-02053 (C.D. Cal.), filed November 17, 2018;
- *Uniloc 2017 LLC, et al. v. Google LLC*, 2:18-cv-00495 (E.D. Tex.), filed November 17, 2018;
- *Uniloc 2017 LLC v. Verizon Communications Inc., et al.*, 2:18-cv-00513 (E.D. Tex.), filed November 17, 2018 (“the Verizon case”);
- *Uniloc 2017 LLC v. AT&T Services, Inc., et al.*, 2:18-cv-00514 (E.D. Tex.), filed November 17, 2018 (“the AT&T case”);
- *Uniloc 2017 LLC, et al. v. Google LLC*, 2:18-cv-00448 (E.D. Tex.), filed October 31, 2018;
- *Uniloc 2017 LLC, et al. v. AT&T, Inc., et al.*, 2:18-cv-00379 (E.D. Tex.), filed August 29, 2018;
- *Uniloc 2017 LLC, et al. v. Verizon Communications Inc., et al.*, 2:18-cv-00380 (E.D. Tex.), filed August 29, 2018; and
- *Uniloc 2017 LLC, et al. v. Microsoft Corporation*, 8:18-cv-01279 (C.D. Cal.), filed July 24, 2018.

Microsoft Corporation previously challenged claims 1 and 2 of the ’676

patent in IPR2019-01116 (“Microsoft IPR-1116”). The Board instituted review of claims 1 and 2 based on Microsoft’s petition. IPR2019-01116, Paper 8 (PTAB Dec. 4, 2019).

Additionally, various claims of the ’676 patent were or are being challenged in the following PTAB matters:

- *Microsoft Corporation v. Uniloc 2017 LLC*, IPR2019-01125 (P.T.A.B.) (claim 5), institution denied;
- *Marvell Semiconductor, Inc. v. Uniloc 2017 LLC*, IPR2019-01349 (P.T.A.B.) (challenging claims 1, 2, and 5);
- *Marvell Semiconductor, Inc. v. Uniloc 2017 LLC*, IPR2019-01350 (P.T.A.B.) (challenging claims 3, 6, 7, 8, and 9);
- *Google, LLC v. Uniloc 2017 LLC*, IPR2019-01541 (P.T.A.B.) (challenging claims 1, 2, 4, and 9); and
- *Ericsson Inc. v. Uniloc 2017 LLC*, IPR2019-01550 (P.T.A.B.) (challenging claims 1, 2, and 8).

Ericsson is a party in the Verizon case and the AT&T case, as its motion to intervene in each case was granted. *See* Ex. 1013, Ex. 1014. Both cases are stayed pending instituted IPRs regarding the patents at issue in those cases. *Uniloc 2017 LLC v. Verizon Commc’ns Inc., et al.*, Case No. 2:18-cv-00513, ECF No. 65 (E.D. Tex. Dec. 31, 2019) (Order granting stay); *Uniloc 2017 LLC v. AT&T Services, Inc., et al.*, Case No. 2:18-cv-00514, ECF No. 77 (E.D. Tex. Jan. 2, 2020) (Order granting stay).

Petitioner is unaware of any other related matters, or of other patents that claim priority to, or share a claim of priority with, the challenged patent.

**3. Lead and Back-Up Counsel
(37 C.F.R. § 42.8 (b)(3)) and Service Information**

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Petitioner consents to service via email at the above email addresses.

Pursuant to 37 C.F.R. § 42.10(b), concurrently filed with this Petition is a Power of Attorney executed by Petitioner and appointing the above counsel.

4. Proof of Service (37 C.F.R. §§ 42.6 (e) and 42.105 (a))

Proof of service of this Petition is provided in the attached Certificate of Service.

5. Word Count Certification (37 C.F.R. § 42.24)

Certification of the compliance with the word count limit set forth in 37 C.F.R. § 42.24 (a)(1)(i) is provided in the attached Certificate of Compliance with Type-Volume Limits.

I. SUMMARY OF ARGUMENT

The '676 patent is directed to the use of a control station that facilitates and controls alternate access to a common (i.e., the same) frequency band by multiple radio stations operating in accordance with at least two different radio standards or variants of those standards. At the time the '676 application was filed, however, there was nothing new about providing such alternate access to a common frequency band. To the contrary, as further described below, multiple patents and printed publications disclosed the same subject matter claimed by the '676 patent, years before the earliest possible priority date of the '676 patent.

II. GROUNDS FOR STANDING (37 C.F.R. § 42.104(a))

Petitioner certifies that the '676 patent is available for *inter partes* review, and that Petitioner is not barred or estopped from requesting an *inter partes* review challenging the patent claims on the grounds identified in this Petition.

III. IDENTIFICATION OF CHALLENGE AND RELIEF REQUESTED (37 C.F.R. § 42.104(b))

Pursuant to 35 U.S.C. § 311 and 37 C.F.R. § 42.100, Ericsson Inc. ("Ericsson" or "Petitioner") respectfully requests inter partes review of U.S. Patent No. 7,016,676 (Ex. 1001, also referred to herein as the "'676 patent", "challenged patent," or "the patent"), allegedly assigned to Uniloc 2017 LLC ("Patent Owner").

Petitioner asserts that there is a reasonable likelihood that claims 1 and 2 of the '676 patent (the "Challenged Claims") are unpatentable on the grounds set forth

herein. For the reasons set forth below, claims 1 and 2 should be found unpatentable and cancelled.

As noted above in the Mandatory Notices section, the Board previously instituted review of claims 1 and 2 based on Microsoft's petition in Microsoft IPR-1116. The challenges to claims 1 and 2 presented herein are substantively identical to Microsoft's challenges in Microsoft IPR-1116 and are based on the same grounds presented in Microsoft IPR-1116, as further explained in the motion for joinder submitted with this petition.

A. Claims For Which Review Is Requested (37 C.F.R. § 42.104(b)(1))

Petitioner requests *inter partes* review of claims 1 and 2 (each a "Challenged Claim," and collectively the "Challenged Claims") of the '676 patent under 35 U.S.C. § 311.

B. Statutory Grounds For Challenge (37 C.F.R. § 42.104 (b)(2))

The Challenged Claims are each unpatentable as obvious under 35 U.S.C. § 103, based at least on the following specific grounds presented in this Petition:

Ground	Reference(s)	Basis	Claims
Ground 1	HomeRF (Ex. 1006)	35 U.S.C. § 103	1 and 2
Ground 2	HomeRF in view of HomeRF Tutorial (Ex. 1008)	35 U.S.C. § 103	1 and 2
Ground 3	HomeRF in view of HomeRF Liaison Report (Ex. 1009)	35 U.S.C. § 103	1 and 2
Ground 4	Lansford (Ex. 1012)	35 U.S.C. § 103	1 and 2

For each ground, in Section VII below, the Petition demonstrates at least a

reasonable likelihood that each Challenged Claim is unpatentable.

Other than in Microsoft IPR-1116, neither “the same or substantially the same prior art or arguments previously were presented to the Office,” 35 U.S.C. § 325(d).¹ Neither the applicants nor any Examiner addressed whether the references included in Grounds 1-4 (Exs. 1006, 1008, 1009, and 1012) (or any reference substantially identical thereto) was prior art or attempted to distinguish the Challenged Claims from those references.

Thus, other than in Microsoft IPR-1116 and in Ericsson’s earlier filed petition, no unpatentability ground asserted herein has been previously presented to the Patent Office.

IV. BACKGROUND AND STATE OF THE ART

The ’676 patent relates to a “Method, network and control station for the two-way alternate control of radio systems of different standards in the same frequency band”. ’676 patent, Title.

¹ Although Ericsson previously relied on the Lansford reference to challenge claims 1 and 2 in *Ericsson Inc. v. Uniloc 2017 LLC*, IPR2019-01550 (P.T.A.B.), as explained in Ericsson’s concurrently filed paper, Ericsson asks that the Board prioritize institution of Ericsson’s petition in IPR2019-01550 over institution of this petition, although the Board should still institute and join this petition given the identity of arguments between this petition and Microsoft IPR-1116.

A. Applicant's Admitted Prior Art

The '676 patent acknowledges that a number of the features recited therein were already known in the art.

1. Different Radio Interface Standards Operating In The Same Frequency Band Was Known

The '676 patent acknowledges that each of the exemplary radio interface standards it addresses in its “advantageous embodiments” was already established, and that stations operating in accordance with these standards operate in the same frequency band:

A radio system for wireless transmission of information is allowed to use transmission power only in accordance with standards. The national regulation authority determines on what frequencies with what transmission power and in accordance with what radio interface standard a radio system is allowed to transmit. For this purpose *there is provided for so-termed ISM frequency bands (Industrial Scientific Medical) that radio systems transmit in the same frequency band in accordance with different radio interface standards. An example of this is the US radio system IEEE802.11a and the European ETSI BRAN HiperLAN/2. The two radio systems transmit in the same frequency bands between 5.5 GHz and 5.875 GHz with approximately the same radio transmission method, but different transmission*

protocols.

'676 patent, 1:10-23.²

The specification goes on to describe these two transmission protocols and their operation, as well as their interaction within this common frequency band. The '676 patent further provides figures 1 and 2, illustrating the function of these “known” standards:

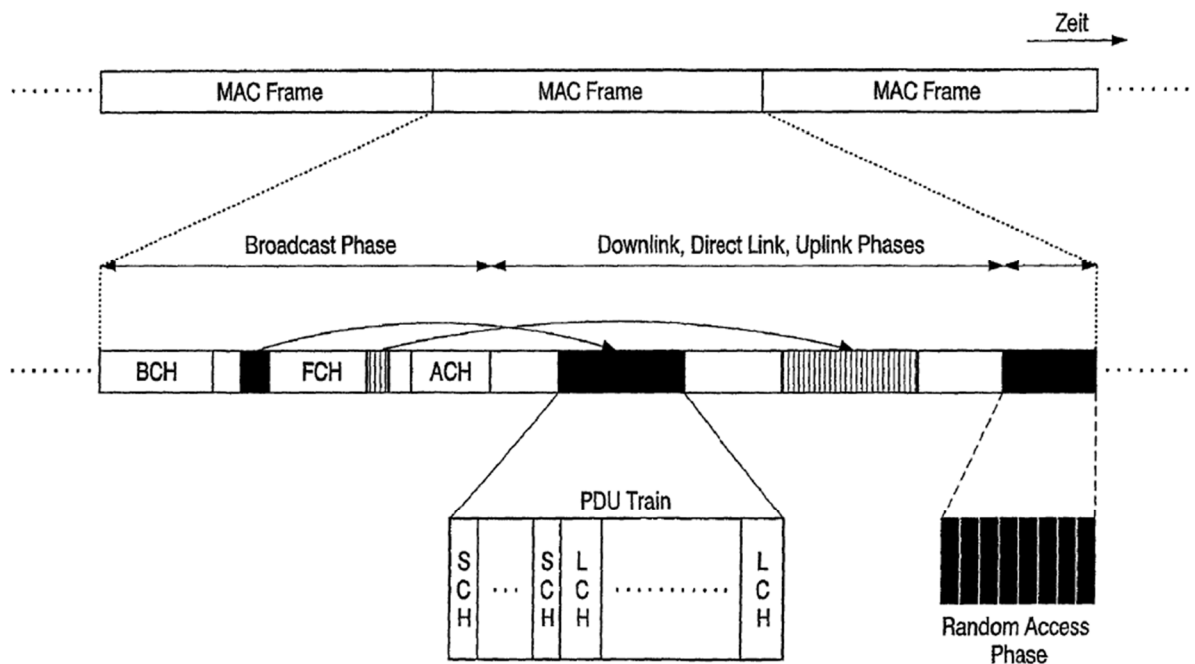


FIG. 1

'676 patent, Fig. 1, described *id.*, 4:38-39, 45-46, respectively, as “show[ing] the frame structure in accordance with the ETSI BRAN HiperLAN/2 standard” and

² Unless otherwise noted, emphasis in quoted language throughout this Petition is added, and not part of the original document cited.

“show[ing] the structure of the HiperLAN/2 frame” (German language in figure is in original).

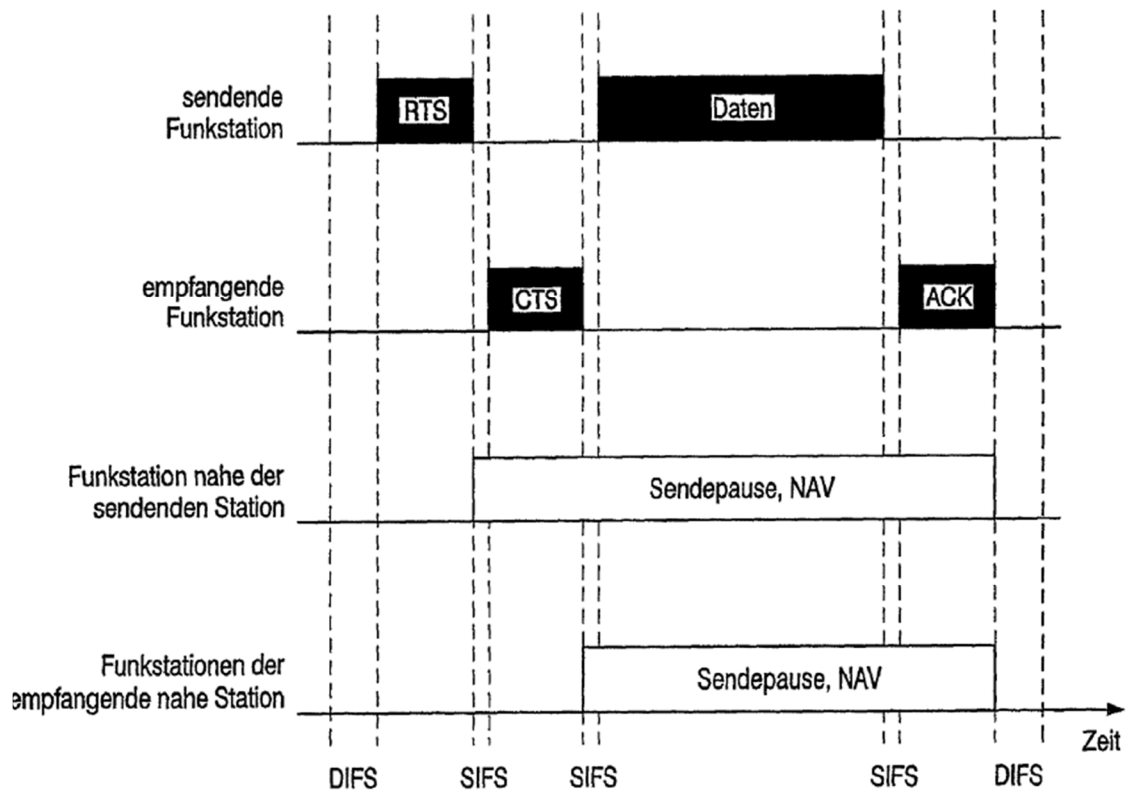


FIG. 2

'676 patent, Fig. 2, described *id.*, 4:47-49 as “diagrammatically show[ing] the media access in systems working in accordance with the radio interface standard IEEE802.11a” (German language in original).

A POSITA would have recognized, then, that both Figures 1 and 2 of the '676 patent, and the accompanying discussion, refer to the state of the art at the time that the '676 patent application was filed, as opposed to features introduced by the '676 patent itself. See Declaration of Peter Rysavy (Ex. 1004, “Rysavy Dec.”), ¶¶ 25-29.

2. **Using A Control Station To
Moderate Network Traffic Was Known**

The '676 patent further acknowledges that systems operating in accordance with each of these prior art radio interface standards provided Medium Access Control, and that systems operating in accordance with ETSI BRAN HiperLAN/2—referred to as the “first radio interface standard” in the claimed “advantageous embodiment” described in the specification – provided a control station, referred to as an “Access Point”:

The Medium Access Control (MAC) of the two systems is totally different. *ETSI BRAN HiperLAN/2 utilizes a centrally controlled reservation-based method in which a radio station takes over the role of a central instance co-ordinating the radio resources. This central radio station (Access Point, AP)* which may be an access point to the wide area network, periodically signals every 2 ms the MAC frame structure from the AP and the associated stations if required.

'676 patent, 1:34-42. Rysavy Dec., ¶ 30.

3. **“Switching” Frequency To Avoid Interference Was Known**

The '676 patent further acknowledges that both of the prior art radio interface standards utilized “standardized” methods for “active switching” to another frequency within the permitted frequency band in the event of interference:

In the event of interference, method [sic] were

standardized for an *active switching to another frequency within the permitted frequency band*, for controlling transmission power and for the adaptive coding and modulation *to reduce interference*. *Radio systems of wideband LANs of the radio interface standards ETSI BRAN HiperLAN/2 and IEEE802.11a utilize the same radio transmission method*, a 64-carrier OFDM method and an adaptive modulation and coding. About the same modulation and coding methods (Link Adaptation, LA) are defined for the two standards.

'676 patent, 1:24-33. Rysavy Dec., ¶ 31.

B. Summary Of The Prior Art To The '676 Patent

This Petition primarily relies on several pieces of prior art to challenge claims of the '676 patent, whether alone, or in conjunction with the patent applicant's own admissions regarding the state of the art at the time the '676 patent application was filed, as further described above. These prior art references are summarized at the beginning of each ground in which they are first introduced in Section VII, with a particular focus on their specific teachings that are relevant to the claim elements against which they are cited.

V. OVERVIEW OF THE '676 PATENT

The '676 patent, titled "METHOD, NETWORK AND CONTROL STATION FOR THE TWO-WAY ALTERNATE CONTROL OF RADIO SYSTEMS OF

DIFFERENT STANDARDS IN THE SAME FREQUENCY BAND” issued on March 21, 2006. The ’676 patent issued from U.S. Patent Application No. 10/089,959 (the “959 application”), filed on April 4, 2002, which is a National Stage Entry of PCT No. PCT/EP01/09258, filed August 8, 2001 and published as WO 02/13457 A2, which in turn claims priority to a German application, No. 100 39 532.5, filed August 8, 2000.³

A. The ’676 Patent’s Specification

The ’676 patent includes 5 independent claims 1, 6, 7, 8, 9, of which claim 1 is the only independent claim challenged here. Each of the first four independent claims recites “[a]n interface-control protocol method for a radio system which has at least one common frequency band that is provided for alternate use by a first and a second radio interface standard,” while claim 9 recites a “wireless network.”

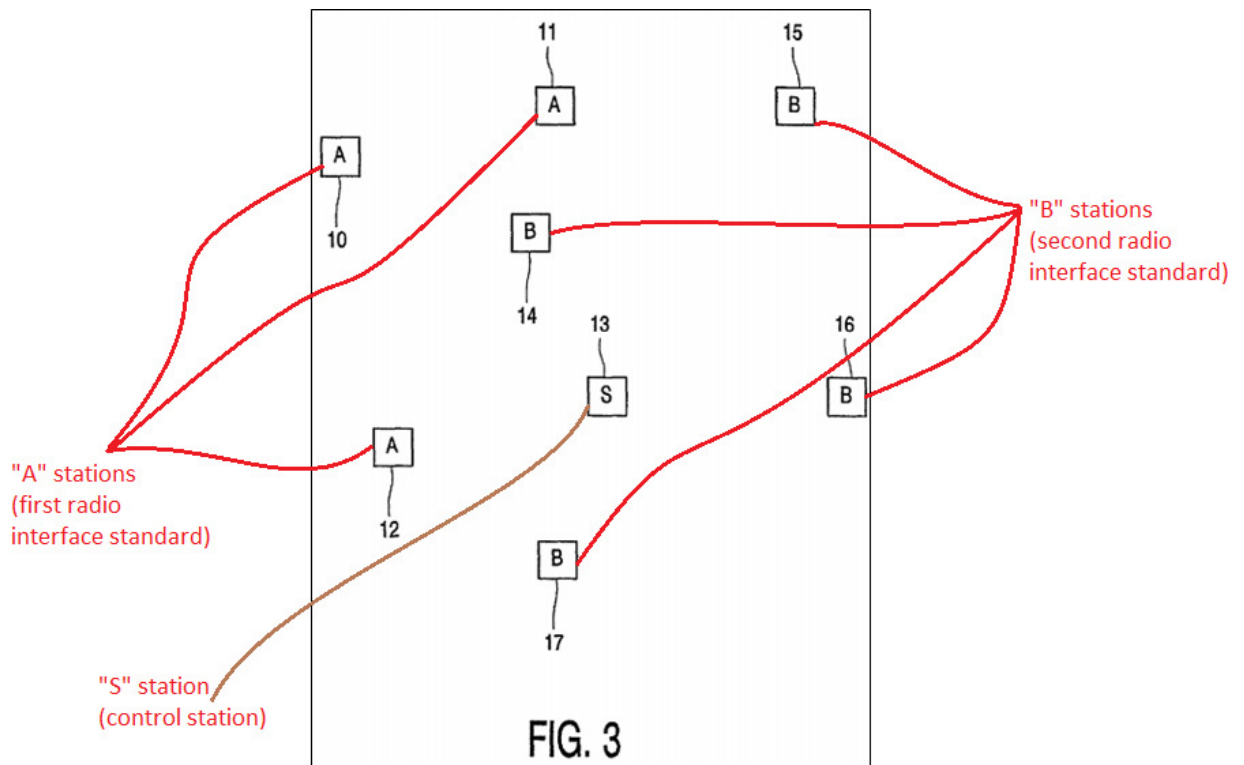
As discussed above, the ’676 patent applicant admits that it was known for radio systems using different radio interface standards to broadcast in the same frequency band, namely “US radio system IEEE802.11a and the European ETSI BRAN HiperLAN/2”. ’676 patent, 1:10-23, and that it was known to switch to a

³ While Petitioner does not agree that the ’676 patent is entitled to its earliest claimed priority date, resolution of this issue is not required to determine that the ’676 patent is unpatentable, and so the issue of the ’676 patent’s alleged priority is not addressed herein.

different frequency within a common frequency band in the event of detected interference. *Id.*, 1:24-28.

But, the specification claims “In case of alternating interference, [prior art] systems do not work efficiently and occupy a frequency channel even at low transmission rates.” *Id.*, 2:8-10. Against this backdrop, the specification purports to provide “a method, a wireless network and a control station which make efficient use of radio transmission channels possible.” *Id.*, 2:11-13. Rysavy Dec., ¶¶ 34-35.

FIG. 3 is the only figure that shows something more than what the patent admits is known technology. That figure shows providing a “central control station 13” (labeled “S”) to control alternate use of a frequency band by different stations operating on different standards: “three stations 10, 11 and 12 ... [each labeled “A”, that] work in accordance with the first radio interface standard A, for example, in accordance with the HiperLAN/2 standard” and “four stations, 14, 15, 16, and 17 ... [each labeled “B,” that] work in accordance with the second radio interface standard B, for example, in accordance with the IEEE802.11a standard.” *Id.*, 5:22-30. This control station “controls the alternate access by the first wireless network and the second wireless network to the common frequency band.” *Id.*, 5:39-41.



'676 patent, FIG. 3 (annotated). Rysavy Dec., ¶ 36.

The patent explains that “[t]he control of the alternate use of the common frequency band may be effected in various ways.” ’676 patent, 2:51-52.

In one example: “it is possible to provide certain predefinable time intervals for the use of the first and second radio interface standard and allocate the frequency band alternately to the first radio interface standard and then to the second radio interface standard in a kind of time-division multiplex mode.” *Id.*, 2:52-57.

In another example, the first radio interface is prioritized, as the second wireless network stations are provided frequency band access “if stations operating in accordance with the first radio interface standard do not request access”:

as claimed in claim 2, the control station is provided, on

the one hand, for controlling the access to the frequency band for stations operating in accordance with the first radio interface standard. In that case the stations of the [first radio interface standard] send a request for capacity to the control station and the control station allocates transmission capacity to each respective station.

On the other hand, the control station is provided ... for releasing the common frequency band for access by stations operating in accordance with the second radio interface standard, if stations operating in accordance with the first radio interface standard do not request access to the frequency band. In this advantageous embodiment of the invention the first radio interface standard is given priority over the second radio interface standard in this manner. The release of the common frequency band for the second radio interface standard may be effected, for example, explicitly by the sending of control information to the stations of the second radio interface standard.

Id., 2:63 – 3:19. Rysavy Dec., ¶¶ 37-39. Such a scheme was recited in original claim 2, which was later canceled, and its subject matter added to claim 1 (see discussion of prosecution history below).

The patent further explains that “[t]his [control] may be effected in an advantageous manner in that the [control station] sends a broadcast message to the

[second wireless network] stations ... when the [first wireless network] stations ... do not need transmission capacity.” *Id.*, 5:42-45.

The specification further states:

When the integrated controller in accordance with the invention is used, *different radio systems may be made compatible in the way that they constructively coexist in the same frequency band and then can provide services that require a high service quality*. The radio spectrum is clearly used more efficiently; *without the implementation of the new method this is only possible with respective exclusively used radio channels*.

Id., 5:11-18.

In view of the prior art described below, however, this assertion – that the prior art only relied on “exclusive” use of radio channels by competing protocols to allow coexistence of different radio systems operating within a common frequency band – is simply untrue. Numerous prior art references expressly disclosed: 1) coexistence of stations using disparate radio interface protocols within the same frequency band, 2) allowing these stations to “share” the same radio channels within a frequency band, and 3) using a control station to allow for this coexistence within the same frequency band and even on the same channels of the frequency band. Rysavy Dec., ¶¶ 40-42.

B. The Prosecution History

The original application included three independent claims (1, 10, and 11), and eight dependent claims, each depending from claim 1. Claim 1 was directed at “[a]n interface-control protocol method for a radio system which has at least one frequency band that is provided for the alternate use by a first and a second radio interface standard,” and more specifically “stations which operate in accordance with a first radio interface standard and/or a second radio interface standard.” The only purported step of the method is “a control station being provided which controls the alternate use of the frequency band.” ’676 FH, Ex. 1002, pgs. 135, 163.⁴ “Claims 10 and 11 were “wireless network” and “control station” claims, respectively, but otherwise involving similar subject matter, without reciting a specific method. *Id.*, pgs. 136, 164.

On September 22, 2004, the Examiner rejected all pending claims as anticipated over a single prior art reference, U.S. Patent No. 6,587,680 to *Ala-Laurila et al. Id.*, pgs. 65-69.

The Applicant responded on February 25, 2005, amending dependent claims 2-9 “to put them in better form,” and arguing that the independent claims were

⁴ Unless otherwise noted, page number citations throughout are to the page numbers added at the bottom of the pages, in the format “Page X of Y” – as opposed to any original page numbers contained in the respective exhibits.

allowable because, *inter alia*, “Ala-Laurila et al. fails to teach, show or suggest a central station being provided to control the alternate access by a first wireless network and a second wireless network to the common frequency band, as specifically cited in base claims.” *Id.*, pg. 56; *see generally id.*, pgs. 51-57.

On May 25, 2005, the Examiner issued a final action, again rejecting all claims as anticipated by Ala-Laurila. *Id.*, pgs. 44-49.

On July 15, 2005, the Applicant responded, amending each of the independent claims to recite a “common frequency band”. Similar amendments were made to several dependent claims. *Id.*, pgs. 36-42.

On August 10, 2005, the Examiner issued an Advisory Action, stating that the amendments did not put the application in condition for allowance. *Id.*, pgs. 34-35.

On August 19, 2005, the Applicant filed a Request for Continued Examination (RCE) requesting that the previously submitted amendments be considered. *Id.*, pg. 32.

On November 1, 2005, the Examiner issued a second non-final rejection, again rejecting each of the independent claims, as well as dependent claims 3-4 and 9, as anticipated by a different prior art reference, U.S. Patent No. 6,687,243 to Sayers *et al.* The action indicated that claims 2 and 5-8 would be allowable if rewritten in independent form. *Id.*, pgs. 25-30. Then-pending claim 2 recited:

The method as claimed in claim 1, wherein the control

station controls the access to the common frequency band for stations working in accordance with the first radio interface standard and renders the frequency band available for access by the stations working in accordance with the second radio interface standard if stations working in accordance with the first radio interface standard do not request access to the frequency band.

Id., pg. 37.

On November 17, 2005, the Applicant responded, canceling claims 2 and 11, amending claims 1 and 10 to incorporate the subject matter of canceled claim 2, and rewriting claims 6-8 in independent form. *Id.*, pgs. 13-19. On December 6, 2005, the Examiner issued a notice of allowance on the remaining claims, 1 and 3-10, which were “renumbered to 1-4, 6-8, 5, 9 respectively.” *Id.*, pgs. 5-8. As such, previously pending claim 9 was renumbered to claim 5, and previously pending claim 3 was renumbered to claim 2.

C. The Challenged Claims

Claim 1 recites:

1. An interface-control protocol method for a radio system which has at least one common frequency band that is provided for alternate use by a first and a second radio interface standard, the radio system comprising:

stations which operate in accordance with a first radio

interface standard and/or a second radio interface standard, and

a control station which controls the alternate use of the frequency band,

wherein the control station controls the access to the common frequency band for stations working in accordance with the first radio interface standard and-- renders the frequency band available for access by the stations working in accordance with the second radio interface standard if stations working in accordance with the first radio interface standard do not request access to the frequency band.

Claim 2 recites:

2. The method as claimed in claim 1, herein⁵ the control station determines the respective duration in which the stations working in accordance with the second radio interface standard are allowed to utilize the frequency band.

VI. CLAIM CONSTRUCTION (37 C.F.R. § 42.104(b)(3))

Each claim “shall be construed using the same claim construction standard that would be used to construe the claim in a civil action under 35 U.S.C. § 282(b),

⁵ Petitioner is treating this word throughout this Petition as if it reads “wherein”.

including construing the claim in accordance with the ordinary and customary meaning of such claim as understood by one of ordinary skill in the art and the prosecution history pertaining to the patent.” 37 C.F.R. § 42.100(b). Thus, terms should be “given their ordinary and customary meaning, as understood by a POSITA, at the time of the invention, taking into consideration the language of the claims, the specification, and the prosecution history of record . . .” *Panel Claw, Inc. v. Sunpower Corp.*, No. IPR2014-00386, at 7 (P.T.A.B. June 30, 2014), Paper No. 7 (citing *Phillips v. AWH Corp.*, 415 F.3d 1303, 1312–13 (Fed. Cir. 2005)); *see also ClassCo, Inc. v. Apple, Inc.*, 838 F.3d 1214, 1223 (Fed. Cir. 2016) (“Because the patent has expired, the Board construed the claims applying the principles explained in *Phillips*.”).

The claim construction analysis here is not, and should not be viewed as, a concession by Petitioner as to the proper scope of any other claim term in any litigation. These constructions are not a waiver of any argument in any litigation that the claim terms are indefinite, e.g., that one or more claims of the ’676 patent fail to satisfy the Patent Act’s particular-and-distinct claiming requirement, 35 U.S.C. § 112 (b), or that they are otherwise unpatentable, invalid, or unenforceable. The patent statute demands “clarity and precision” in claims. *See Nautilus, Inc. v. Biosig Instruments, Inc.*, 572 U.S. 898 (2014). The Board may find that claims are amenable to construction sufficient to be judged against the prior art, without reaching “the

essential inquiry” (determining the “clarity and precision” required) for indefiniteness. *Id.* at 912.

A. Level Of Skill In The Art

The person of ordinary skill in the art at the time the ’676 application was filed (“POSITA”) would have had a Bachelor’s Degree in Electrical Engineering, Computer Science, or a related subject and one or more years of experience working with wireless networks and related standards, and would have had an understanding of work being done by companies within the field of wireless networks and related standards, including, e.g., systems or protocols for shared access of wireless networks by different protocols. Less work experience may be compensated by a higher level of education, such as a Master’s Degree, and vice versa. *Rysavy Dec.*, ¶¶ 46-47.

B. Proposed Constructions

Under the standard of claim construction set forth above, and as viewed in terms of the level of skill of the POSITA, Petitioner proposes the following constructions. *See Rysavy Dec.*, ¶ 48. Each is pertinent because the prior art describes the elements of the proposed constructions.

1. (Claim 1) “Stations Which Operate In Accordance With A First Radio Interface Standard And/Or A Second Radio Interface Standard”

As an initial matter, the plain meaning of “stations” is plural, requiring that

there be at least two devices. And, the stations are recited as operating in accordance with radio interface standards, which a POSITA would understand requires a wireless network. In fact, the patent itself provides two primary examples of radio interface standards: the ETSI BRAN HiperLAN/2 standard and the IEEE802.11a standard. Each of these is a standard for transmission within a wireless network. Additionally, the patent itself describes “an object of the invention to provide a method, *a wireless network* and a control station which make efficient use of radio transmission channels possible.” ’676 patent, 2:11-13. So, a POSITA would have understood stations to refer to “at least two devices operating in a wireless network.” Rysavy Dec., ¶¶ 49-51.

And, the PTAB has interpreted that claims reciting “A and/or B” “cover embodiments having element A alone, element B alone, or elements A and B taken together.” *Ex Parte John Nicholas Gross*, Appeal No. 2011-004811, 2013 WL 6907805, at *2 (P.T.A.B. Dec. 31, 2013). So, combining these, there must be at least two devices, each of which operates in a wireless network in accordance with a first radio interface standard (alone), a second radio interface standard (alone), or operate in accordance with both standards.

The ’676 specification itself describes:

1) radio systems that operate in accordance with specified standards to comply with rules laid down by a “national regulation authority” that the patent states

“determine[] on what frequencies with what transmission power and in accordance with what radio interface standard a radio system is allowed to transmit,” e.g., “US radio system IEEE102.811a and the European ETSI BRAN HiperLAN/2” (’676 patent, 1:10-20);

2) radio stations that operate in accordance “with a variant of [such a] standard” (*id.*, 1:53-62); and

3) that a radio station may “operate in accordance with both [a] first and [a] second radio interface standard” (*id.*, 2:31-35). Rysavy Dec., ¶¶ 52-53.

The ’676 patent does not specifically define, however, what it means to operate in accordance with a radio interface standard. The plain and ordinary meaning of “accordance”, however, is “agreement; harmony; conformity”. Ex. 1005, Webster’s New World College Dictionary, 4th Ed., pg. 3.

Accordingly, a POSITA would have understood “*stations which operate in accordance with a first radio interface standard and/or a second radio interface standard*” to mean “*two or more devices in a wireless network, each of which operates in a manner that is in agreement with or conforms to a first radio standard, a second radio standard, or both a first and a second radio standard, or variants thereof.*” Rysavy Dec., ¶¶ 54-55.

2. **(Claim 1) “Renders The Frequency Band Available For Access By The Stations Working In Accordance With The Second Radio Interface Standard If Stations Working In Accordance With The First Radio Interface Standard Do Not Request Access To The Frequency Band”**

While Petitioner understands that claim 1 cannot properly be challenged on indefiniteness in an IPR, it should be noted that claim 1 appears to be an improper system/method claim, similar to the claims found invalid in *IPXL Holdings LLC v. Amazon.com Inc.*, 430 F.3d 1377 (Fed. Cir. 2005).

One difficulty in interpreting the scope of the claim as a whole resulting from this improper system/method claim is the interpretation of the conditional limitation “*if* stations ... do not request access ...”. For a claimed *method* to be performed, a contingent step need not be performed if the condition for performing the contingent step is not performed. *See Cybersettle, Inc. v. Nat’l Arbitration Forum, Inc.*, 243 F. App’x 603, 607 (Fed. Cir. 2007). On the other hand, in a claimed *system*, it may be necessary to have structure for performing the recited function, whether or not the function is actually performed. *See Ex Parte Randal C. Schulhauser*, Appeal No. 2013-007847, 2016 WL 6277792, at *7 (P.T.A.B. Apr. 28, 2016).

In an abundance of caution, for purposes of this IPR, Petitioner is treating the “*if*” limitation as if it must be performed by the cited prior art, but it should be understood that if the claims are interpreted as strictly method claims, performance of this step may not be required if the condition precedent does not exist, namely

“render[ing] the frequency band available for access by the stations working in accordance with the second radio interface standard” need **not** occur “if stations working in accordance with the first radio interface standard **do** request access to the frequency band.”

“The frequency band” as recited in this claim clearly refers back to the “common frequency band” recited in the preamble, and Petitioner interprets it as such herein. The ’676 specification provides no express definition for what it means to “render the [common] frequency band available for access,” let alone what it means to do so if “stations ... do not request access.” According to its plain and ordinary meaning, however, one of ordinary skill would have understood this phrase to mean that if stations working in accordance with the first radio interface standard (“first stations”) are not requesting to use the common frequency band for transmission (“transmitting”), the frequency band is available for use (e.g., “transmission”) by stations working in accordance with the second radio interface standard (“second stations”). This interpretation is supported by the description in the specification of when “no information is sent or received by a radio station in accordance with a first radio interface standard”, “the additional sending of information in accordance with another radio interface standard becomes possible.” Rysavy Dec., ¶¶ 56-59, citing ’676 patent, 3:39-45.

There is no antecedent basis for “**the** stations [plural] working in accordance

with the second radio interface standard”, however. As explained above, claim 1 does recite “stations,” which is properly interpreted as a plurality of stations. However, there is no express requirement as to the number of these stations (if any) working in accordance with the second radio interface standard. Putting this antecedent issue aside, this phrase adds an implicit requirement that for whatever such stations exist (if any), they have access to the frequency band for periods during which the band is not being used by stations operating in accordance with the first radio interface standard that have requested access to the band.

In view of this, one of ordinary skill would understand that granting access to the common frequency band to the “second” stations if the “first” stations do not request access to the frequency band applies to the *entire* frequency band. If a “first” station requests access to a portion of the frequency band, for example, it would be counterintuitive to say that the first station has not requested access to the frequency band. Rysavy Dec., ¶¶ 60-61

“Renders the frequency band available for access by stations working in accordance with the second radio interface standard if stations working in accordance with the first radio interface standard do not request access to the frequency band” should therefore be interpreted as “makes the frequency band available for transmissions by stations working in accordance with the second radio interface standard for periods during which the common frequency band is

not being used by stations operating in accordance with the first radio interface standard that have requested access to the band.” Rysavy Dec., ¶ 62.

3. **(Claim 2) “Respective Duration” In Which The Stations Working In Accordance With The Second Radio Interface Standard Are Allowed To Utilize The Frequency Band**

Ignoring the inherited antecedent issue for “the stations” addressed above, a POSITA would understand that “*respective duration*”, as recited in claim 2, should be construed as a “*time period*.” This is consistent with both claim 3 (an original claim), which recites “a time duration in which the common frequency band can be used by stations working in accordance with the second radio interface standard”, as well as the specification, which describes that “the control station ... informs the stations of a *time period* in which the frequency band can be used by stations operating in accordance with the second radio interface standard.” Rysavy Dec., ¶ 63.

VII. **EACH CHALLENGED CLAIM OF THE '676 PATENT IS UNPATENTABLE OVER THE CITED PRIOR ART (37 CFR § 42.104 (b)(4), 37 CFR § 42.104(b)(5))**

A detailed explanation of each ground for challenging claims of the '676 patent and an application of the prior art to those claims is presented below. Each of the challenged claims is unpatentable as obvious under 35 U.S.C. § 103.

A. **GROUND 1: CLAIMS 1 AND 2 ARE OBVIOUS OVER HOMERF**

As explained in this section, claims 1 and 2 are obvious over HomeRF.

Rysavy Dec., ¶¶ 77-111.

1. HomeRF: Wireless Networking For The Connected Home

“HomeRF: Wireless Networking for the Connected Home” (Ex. 1006, “HomeRF”) is an article authored by Kevin J. Negus, Adrian P. Stephens, and Jim Lansford for the February 2000 issue of IEEE Personal Communications. *See* Declaration of Gerard P. Grenier (Ex. 1007, “Grenier Dec.”), Exhibit A. HomeRF was published in February 2000, and public copies were available no later than February 29, 2000 on the public IEEE digital library website. Grenier Dec., ¶¶ 8-12.

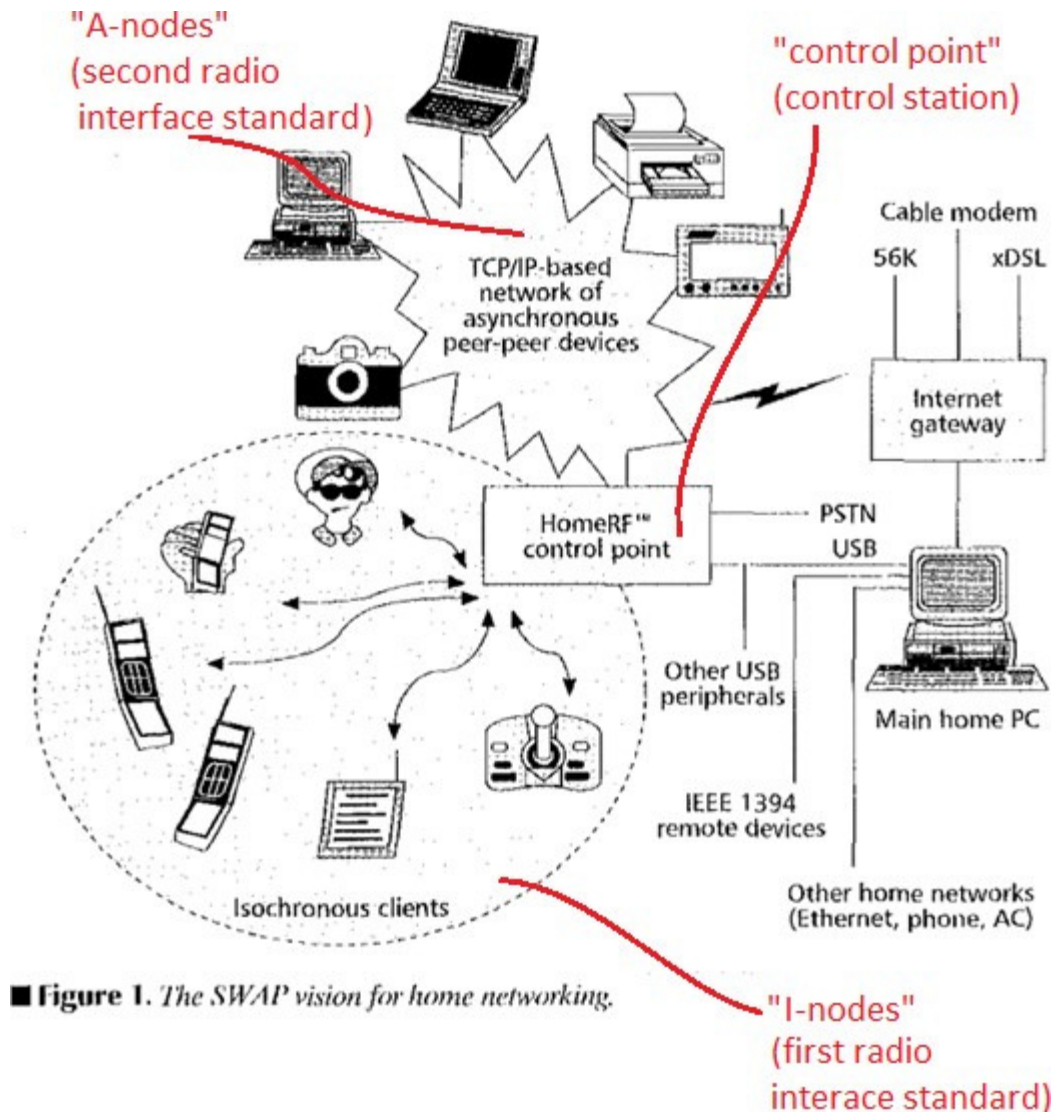
Thus, HomeRF qualifies as prior art to the Challenged Claims under at least pre-AIA § 102(a) and 102(b), as it is a publication that was publicly available over a year before the earliest U.S. filing date, August 8, 2001.^{6 7} HomeRF was not cited or considered by the Patent Office during prosecution of the ’676 patent.

⁶ Pre-AIA Section 102(b) time bars are triggered off “the date of the application for patent *in the United States*” (emphasis added), not any earlier foreign application to which the Patent Owner may allege the ’676 patent is entitled to priority. *See* 35 U.S.C. § 102(b) (Pre-AIA). Regardless, HomeRF qualifies as prior art under § 102(a).

⁷ As noted above, Petitioner does not agree that the ’676 patent is entitled to its earliest claimed priority date, though that issue need not be decided in this IPR.

a) **HomeRF Shows A Protocol Method For
Alternate Use Of The Same Frequency Band
By Two Different Radio Interface Standards**

HomeRF is a specification for a protocol that combines two different radio transmission methods based on two different communications standards in the same frequency band. TDMA/DECT-based communications is the first radio interface standard and the CSMA/802.11-based communications is the second radio interface standard. HomeRF's control of this common (i.e. same) frequency band by devices operating in accordance with these two radio interface standards is further detailed below.



HomeRF, Figure 1 (annotated). Rysavy Dec., ¶ 79.

b) **HomeRF Shows A Control Station Controlling Use Of The Same Frequency Band By Stations Using Different Radio Interface Standards**

As illustrated in Figure 1 above, the HomeRF Shared Wireless Access Protocol (“SWAP”) architecture provides a central control station, referred to as a “connection point,” or “control point”, as well as a plurality of “asynchronous peer-

to-peer devices”, or “I-nodes”, operating in accordance with a first radio interface standard, and a plurality of “isochronous clients”, or “A-nodes”, operating in accordance with a second radio interface standard:

The [Shared Wireless Access Protocol] SWAP architecture is a unique combination of a managed network that provides isochronous services such as interactive voice, and an ad hoc peer-to-peer network that provides traditional data networking. The protocol has been optimized to provide the kinds of services most needed from untethered devices in the home. Three kinds of devices can be in a SWAP network:

- **A connection point** (CP), which acts as the gateway between the personal computer, PSTN, and SWAP-compatible devices
- Voice devices (**isochronous data devices**, also called I-nodes)
- **Asynchronous data devices**, also called A-nodes

...

Thus, the SWAP protocol is a hybrid in several ways; it is client-server between the control point and voice devices, but peer-to-peer between data devices. The interactive voice transactions are circuit-switched, time-division

multiple access (TDMA), but the asynchronous transactions are packet switched, carrier sense multiple access (CSMA).

HomeRF, pg. 21, 2:52 – pg. 22, 1:11.⁸

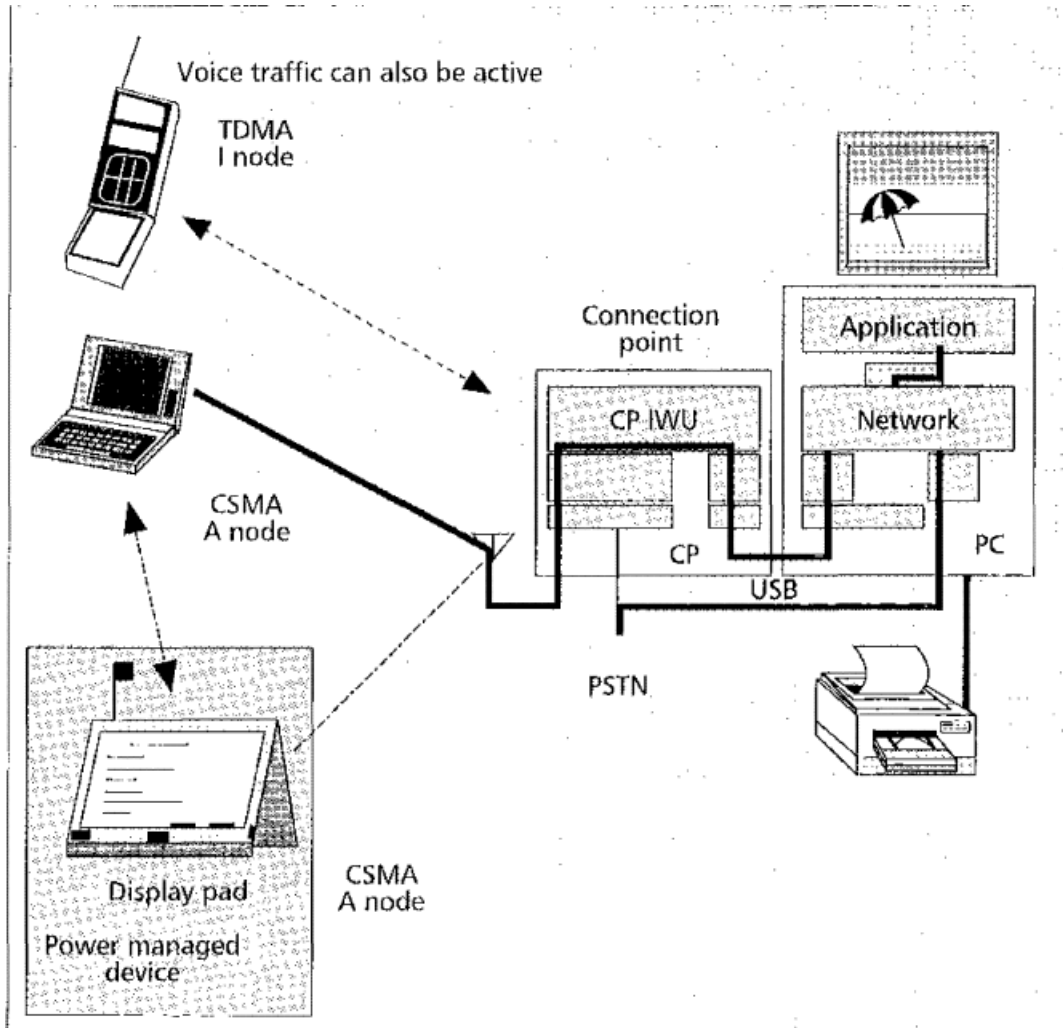
HomeRF makes clear that it supports communications based on two different communications standards: TDMA/DECT (the first radio interface) and CSMA/CA/802.11 (the second radio interface):

The SWAP MAC has been optimized for the home environment and is designed to carry both voice and data traffic and interoperate with the PSTN using a subset of the Digital Enhanced Cordless Telecommunications (DECT) standard, a digital cordless telephone standard used in residential applications throughout Europe. The MAC is designed for use with a frequency-hopping radio and includes a TDMA service to support the delivery of isochronous data (e.g. interactive voice), and a CSMA with collision avoidance (CSMA/CA) service derived from wireless LAN standards such as IEEE 802.11 and OpenAir to support the delivery of asynchronous data.

HomeRF, pg. 23, 1:10–21. Rysavy Dec., ¶¶ 80-81.

⁸ Citations to HomeRF, e.g. “pg. 21, 2:52”, are to the original journal article page number(s), along with the column(s) on that page (left=1, right=2), and approximate line number(s) for the cited portion.

As shown in Figure 2, below, the I-nodes, which HomeRF describes providing with priority access, operate in accordance with a first radio interface standard, utilizing the TDMA (DECT) mode of communication, while the A-nodes use the CSMA (802.11) mode of communication.



■ **Figure 2.** *SWAP network topology flexibility.*

HomeRF, Figure 2. Rysavy Dec., ¶ 82.

c) **HomeRF Shows The Control Station Granting First Radio Interface Standard Devices “Priority” Over Second Radio Interface Standard Devices**

HomeRF further describes that the I-nodes operating in accordance with the first radio interface standard are provided with “priority” access to the network over the A-nodes:

Three kinds of devices can be in a SWAP network:

- *A connection point (CP)*, which acts as the gateway between the personal computer, PSTN, and SWAP-compatible devices
- Voice devices (*isochronous data devices*, also called I-nodes)
- *Asynchronous data devices*, also called A-nodes

The control point is usually connected to the main home PC, typically via USB. It may also have a connection to the PSTN. It is capable of performing data transfers to and from other data devices using an asynchronous contention-based protocol. *The control point manages the network to provide priority access to the radio medium for isochronous devices.*

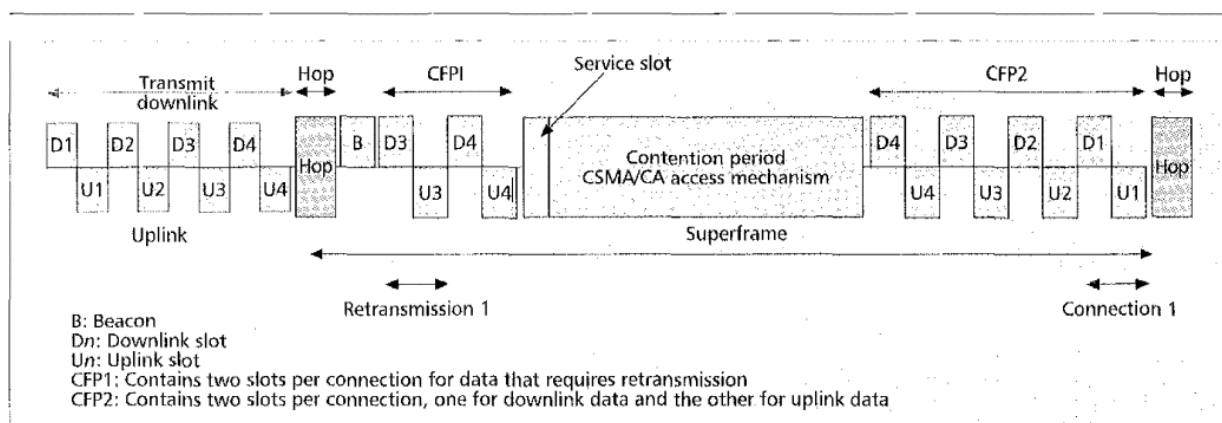
HomeRF, pg. 21, 2:57 – pg. 22, 1:5. Rysavy Dec., ¶ 83.

d) **HomeRF Shows Second Stations That Can Access The Same Frequency Band When First Stations Do Not “Request” It**

As shown in Figure 4, below, HomeRF describes providing access to the

common frequency band for the two different standards operating at different times.

It provides this access during a time period it refers to as a superframe, which includes “contention-free” periods (“CFP”s, labeled CFP1 and CFP2, below) for DECT-based voice communications and a “contention period” for 802.11-based data communications. Examples of the various elements of the superframe are further shown below. Rysavy Dec., ¶ 84, citing HomeRF, Figure 4, below, both in full and in selected portions:



■ Figure 4. A SWAP frame description.

“CFP1” and “CFP2”
(transmission by first radio interface standard stations)

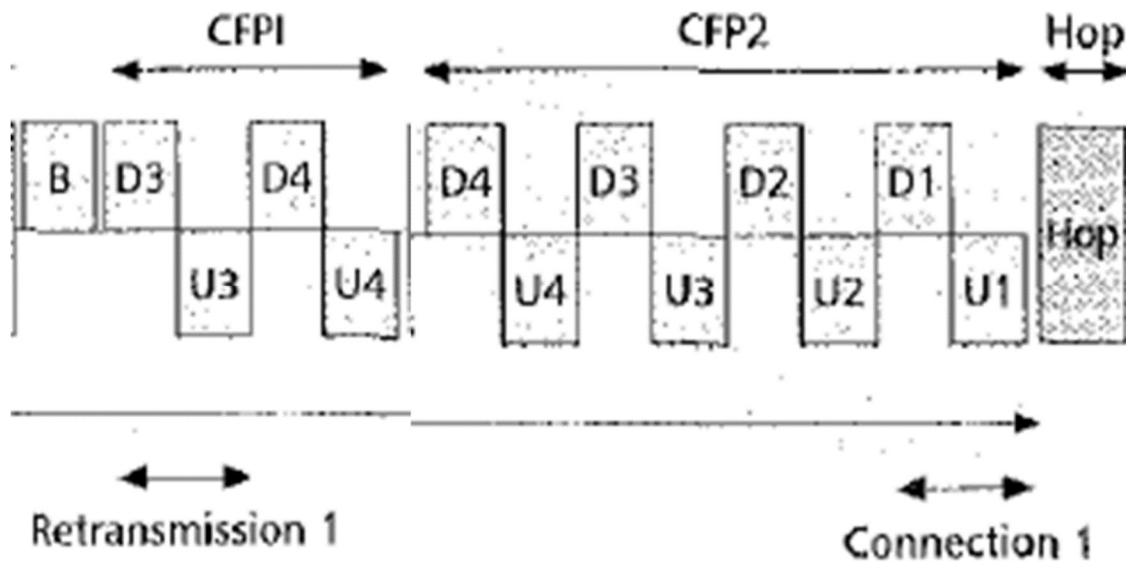


Fig. 4, selected portions.

“Contention period”
(transmission by second radio interface standard stations)

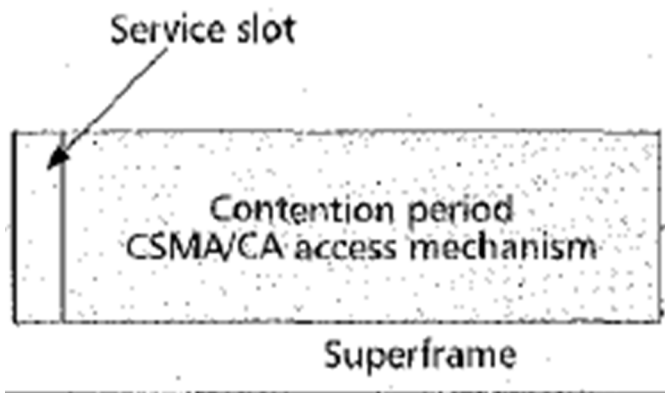


Fig. 4, selected portion.

*Control point “Beacon” (“B”)
transmitted after “hop”, before CFP1*

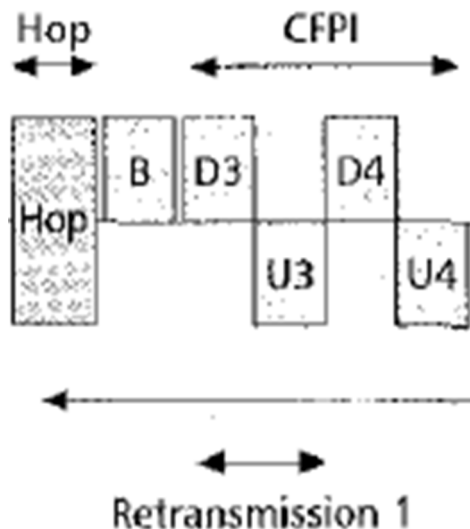


Fig. 4, selected portion.

HomeRF explains how the control point controls the alternate use of the same frequency band, including through the use of the beacon, which as illustrated above is transmitted after a hop, and prior to CFP1.

The MAC protocol uses a superframe as illustrated in Fig. 4, which incorporates *two contention-free periods (CFPs)* and a *contention period*. The start of the superframe is the point at which a station begins to hop to a new channel and ends immediately before the station starts to hop to the next channel. The duration of the superframe is fixed and is the same as the dwell or hop period. *The access mechanism used during each CFP is TDMA, while the access mechanism used during the contention period is CSMA/CA.*

Each CFP is divided into a number of pairs of fixed-length slots, two per voice connection. The first slot in each pair is used to transmit voice data from the CP to a node (downlink), and the second is used to transmit voice data from a node to the CP (uplink). In a managed network a beacon is transmitted immediately after the hop. This beacon is used to maintain network synchronization, control the format of the superframe, and manage when each node should transmit and receive data.

HomeRF, pg. 23, 2:8-25.

The beacon controls communications, including communications by the first radio interface protocol stations transmitting during the contention-free periods. HomeRF explains that the CP beacon lists active voice connections, which dictate the number of assigned slots for requested voice communications:

This system allows the CP to determine prior to a hop which voice data transmissions were lost, determine the retransmissions required, and advertise these retransmissions in the beacon at the start or the next superframe: each voice data packet can only be retransmitted once.

HomeRF, pg. 23, 2:51 – pg. 24, 1:2.

The beacon transmitted by the CP is also used to manage

the network during the CFPs. The CP beacon (CPB) can include a list of active voice connections (and therefore slot assignments), retransmission slot assignments for the current superframe, connection status information, and paging information.

HomeRF, pg. 24, 2:8-13.

HomeRF further describes that voice nodes (stations of the first radio interface) can request access to the frequency band:

At the end of CFP1 in the superframe there is a space reserved for a service slot which is used by voice nodes to request connections from the CP.

HomeRF, pg. 23, 2:44-46.

Because the superframe consists of both voice (first interface standard) and data (second interface standard) traffic, as shown in figure 4 (shown above), if fewer “first standard” stations request voice connections, then the control point allocates additional time in the superframe for contention-based data traffic (second interface standard). Rysavy Dec., ¶¶ 85-88.

Additionally, since the duration of the superframe is fixed, and since time slots for voice are of fixed duration, less voice (first radio interface standard) traffic necessarily translates to more time allotted for data (second radio interface standard) traffic: Rysavy Dec., ¶ 89, citing HomeRF, pg. 23, 2:13-18 (“*Each CFP*

is divided into a number of pairs of fixed-length slots, two per voice connection.

... *The duration of the superframe is fixed* and is the same as the dwell or hop period.”)

As shown in Figure 4, above, the fixed-length superframe consists of both voice and data traffic. For example, D1 and U1 represent one voice call with D1 being a burst of voice bits on the downlink and U1 being a burst of voice bits on the uplink. Similarly, D2 and U2 represent a second voice call. The D and U slots are of fixed length. Rysavy Dec., ¶ 90, citing HomeRF, pg. 23, 2:16-24; Figure 4.

HomeRF further explains that data speeds are higher with fewer voice calls:

For data traffic a CSMA/CA access mechanism is used during the contention period of the superframe. With this scheme, the protocol provides efficient data bandwidth even with concurrent active voice calls and microwave oven interference. *Peak effective user throughputs or over 1 Mbps are possible under lightly loaded conditions* in the 1.6 Mb/s 4-frequency shift keying (FSK) mode. Furthermore, *data transfer rates of hundreds of kilobits per second can occur even with four voice calls active simultaneously.*

HomeRF, pg. 24, 1:3-11. Rysavy Dec., ¶ 91.

2. Claim 1 Is Obvious Over HomeRF⁹

All of the limitations of claim 1 are taught or suggested in HomeRF, as further set forth below. Rysavy Dec., ¶ 93.

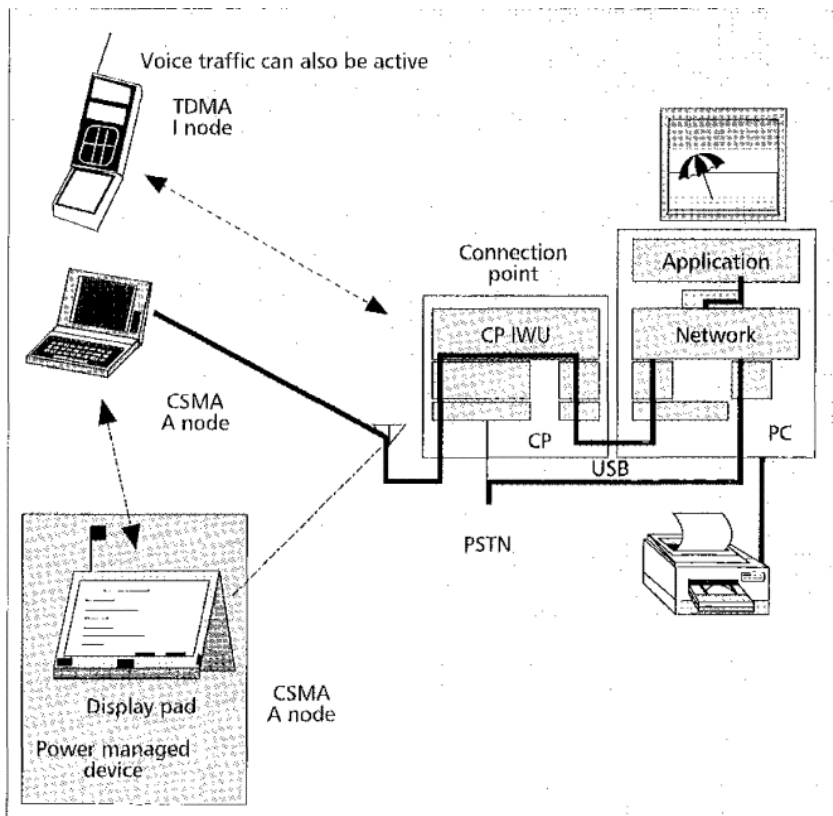
[1.1] An interface-control protocol method for a radio system which has at least one common frequency band that is provided for alternate use by a first and a second radio interface standard, the radio system comprising:

To the extent the preamble is limiting, HomeRF describes this limitation.

HomeRF is a specification for a protocol that combines two different radio transmission methods based on two different communications standards in the same frequency band. TDMA/DECT-based communications is the first radio interface standard and the CSMA/802.11-based communications is the second radio interface standard, as further discussed below. HomeRF, pg. 21, Figure 1; pg. 23, 1:16-21. *See also id.*, pg. 24, Figure 4, showing use of the common frequency band by TDMA I-nodes during contention-free periods, and CSMA A-nodes during a contention period. Rysavy Dec., ¶¶ 94-95.

[1.2] stations which operate in accordance with a first radio interface standard and/or a second radio interface standard, and

⁹ Reference numbers in the format of [claim#.limitation#] are added throughout for ease of reference.



■ Figure 2. SWAP network topology flexibility.

HomeRF describes a wireless network providing multiple stations (“two or more devices”), including voice devices, or I-nodes, which are isochronous data devices that operate based on the TDMA/DECT standard (“operate in a manner that is in agreement with or conforms to a first radio standard...or variants thereof”) (*see* HomeRF, pgs. 21-22, Figures 1 and 2) and peer-to-peer devices, or A-nodes, that are asynchronous data devices that function based on the CSMA/802.11 standard (“operate in a manner that is in agreement with or conforms to a second radio standard...or variants thereof”). *See id.*, Figure 2, above.

HomeRF makes clear that it supports communications based on two different communications standards: TDMA/DECT (the first radio interface) and

CSMA/CA/802.11 (the second radio interface). HomeRF, pg. 23, pg. 23, 1:16-21.

As shown in Figure 2, above, the I-nodes, which HomeRF describes providing with priority access, operate in accordance with a first radio interface standard, utilizing the TDMA (DECT) mode of communication, while the A-nodes use the CSMA (802.11) mode of communication. Rysavy Dec., ¶¶ 96-97.

[1.3] a control station which controls the alternate use of the frequency band,

[1.4] wherein the control station controls the access to the common frequency band for stations working in accordance with the first radio interface standard and

As illustrated in Figure 1 above, the HomeRF Shared Wireless Access Protocol (“SWAP”) architecture provides a central control station, referred to as a “connection point,” or “control point” or simply “CP”, as well as a plurality of “asynchronous peer-to-peer devices”, or “I-nodes”, operating in accordance with a first radio interface standard, and a plurality of “isochronous clients”, or “A-nodes”, operating in accordance with a second radio interface standard. HomeRF, pg. 21, 2:52 – pg. 22, 1:11.

The CP “manages the network to provide priority access to the radio medium for isochronous devices” HomeRF, pg. 22, 1:4-5. The CP utilizes a beacon to divide time within a superframe between the contention free traffic (first radio interface standard) and contention traffic (second radio interface standard), transmitting this beacon “to maintain network synchronization, control the format of the superframe,

and manage when *each node* should transmit and receive data.” *Id.*, pg. 23, 2:22-25.

HomeRF describes this beacon as being used to “manage the network during the CFPs. The CP beacon (CPB) can include a list of active voice connections (and therefore *slot assignments*) ...” *Id.*, pg. 24, 2:9-11. Rysavy Dec., ¶¶ 98-99.

In view of this, a POSITA would have understood that the CP controls alternate use of the frequency band between the “I-nodes” (first radio interface standard stations) and the “A-nodes” (second radio interface standard stations). Additionally, the CP would necessarily control access for the isochronous “I-nodes” operating during the contention free period(s) that “operate in a manner that is in agreement with or conforms to a first radio standard...or variants thereof” (utilizing the TDMA (DECT) mode of communication). This is necessarily so, because I-nodes depend on a reserved resource that allocates a specific amount of bandwidth (throughput), such as required for a voice call, and thus the CP must allocate such resources. The A-nodes, in contrast, use what is left and the throughput they obtain is variable, depending on the number of slots used by I-nodes. Rysavy Dec., ¶ 100.

Alternatively, in view of the disclosure of the CP managing when each node should send and receive data, and the presence of different slots within the contention-free period for the various I-nodes to transmit to and receive data from the CP, it would have been obvious that the CP “controls the access to the common frequency band” for these stations. Rysavy Dec., ¶ 101.

[1.5] wherein the control station ... renders the frequency band available for access by the stations working in accordance with the second radio interface standard if stations working in accordance with the first radio interface standard do not request access to the frequency band.

HomeRF describes that the I-nodes operating in accordance with the first radio interface standard are provided with “priority” access to the network over the A- nodes. HomeRF, pg. 22, 1:4-5.

As shown in Figure 4, above, HomeRF describes providing access to the common frequency band for the two different standards operating at different times. It provides this access during a time period it refers to as a superframe, which includes a contention-free period (CFP) for DECT-based voice communications and a contention period for 802.11-based data communications. HomeRF explains how the control point controls the alternate use of the frequency band, including through the use of a beacon. *Id.*, pg. 23, 2:10-25. HomeRF further explains that the control point (control station) transmits the beacon, which controls communications. HomeRF explains that the CP beacon lists active voice connections, which dictate the number of assigned slots for requested voice communications. HomeRF, pg. 24, 2:8-23. HomeRF further describes that voice nodes (stations of the first radio interface) can “request connections [to the frequency band] from the CP” (i.e., “request access”). HomeRF, pg. 23, 2:44-46. HomeRF explains that the CP beacon lists active voice connections, which dictate the number of assigned slots for

requested voice communications: HomeRF, pg. 24, 2:9-13. Rysavy Dec., ¶¶ 102-103.

Because the superframe consists of both voice (first interface standard) and data (second interface standard) traffic, as shown in figure 4 (shown above), if fewer “first standard” stations request voice connections, then the control point allocates additional time in the superframe for contention-based data traffic (second interface standard). Additionally, since the duration of the superframe is fixed, and since the time “slot” allocated for each individual voice call is fixed, less voice (first radio interface standard) traffic necessarily translates to more time allotted for data (second radio interface standard) traffic. Rysavy Dec., ¶ 104, citing HomeRF, pg. 23, 2:13-14 (“The duration of the superfame is fixed and is the same as the dwell or hop period.”).

As also shown in Figure 4, the fixed-length superframe consists of both voice and data traffic. For example, D1 and U1 represent one voice call with D1 being a burst of voice bits on the downlink and U1 being a burst of voice bits on the uplink. Similarly, D2 and U2 represent a second voice call. The D and U slots are of fixed length, as a POSITA would have understood from HomeRF’s recitation of utilizing Time Division Multiple Access (TDMA). *See* HomeRF, pg. 23, 2:14-18. In addition, HomeRF explicitly states that the voice connections employ fixed-length time slots. *Id.* Rysavy Dec., ¶¶ 105-106.

Because the superframe period is fixed, and because the time slots for each voice call are fixed, a fewer number of voice calls necessarily means that more of the superframe time period can be allocated for the contention period allotted for data (second radio interface standard) traffic, as a POSITA would have understood from HomeRF's disclosure.¹⁰ For example, referring to Figure 4, with only two voice calls (using D1, U1, D2, U2) the time that would otherwise be used by D4, U4, D3, and U3 can now be used to expand the contention period. With a longer contention period, the number of data bits transmitted in each superframe would increase, so data throughput would increase. This is further evidenced by the fact that HomeRF explains that data speeds are higher with fewer voice calls. HomeRF, pg. 24, 1:3-11. Rysavy Dec., ¶¶ 107-109.

Thus, a POSITA would have understood that HomeRF “makes the frequency band available for transmissions by stations working in accordance with the second radio interface standard for periods (namely “contention periods”) during which the common frequency band is not being used by stations operating in accordance with the first radio interface standard that have requested access to the band.” Rysavy Dec., ¶ 110.

¹⁰ This understanding is further evidenced by, e.g., the previously published HomeRF Tutorial (Ex. 1008), which in describing the superframe structure states: “data for entire frame if no voice.” HomeRF Tutorial, pg. 22.

3. HomeRF Shows The Added Limitations Of Claim 2

[2.1] The method as claimed in claim 1, herein the control station determines the respective duration in which the stations working in accordance with the second radio interface standard are allowed to utilize the frequency band.

HomeRF teaches or suggests each of the elements of claim 1 (see section VII.A.2, above). As described above, HomeRF describes providing a “contention period” within a superframe during which the A-nodes (data nodes) can transmit. Because the superframe consists of both voice (first interface standard) and data (second interface standard) traffic, as shown in figure, a POSITA would have understood that this contention period – set forth in the beacon transmitted by the control station – represents a time period not used by voice traffic that would be made available to data traffic. Thus, the control point determines the time period during which the second radio interface standard stations (A-nodes) can send data traffic within the superframe. Rysavy Dec., ¶ 111.

B. GROUND 2: CLAIMS 1 AND 2 ARE OBVIOUS OVER HOMERF IN VIEW OF HOMERF TUTORIAL

As explained in this section, claims 1 and 2 are obvious over HomeRF in view of HomeRF Tutorial. Rysavy Dec., ¶¶ 112-135.

1. HomeRF Tutorial

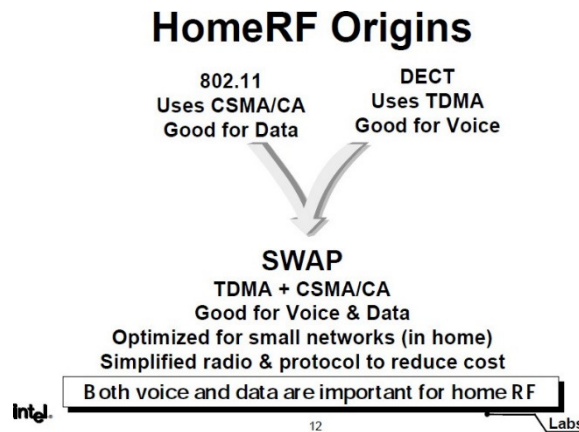
“HomeRF: Bringing Wireless Connectivity Home” (Ex. 1008, “HomeRF Tutorial”) is a tutorial presentation authored by Jim Lansford, Technical Committee

Chair for the Home RF Working Group, dated March 9, 1999 and uploaded to the IEEE 802 LAN/MAN Standards Committee website (<http://ieee802.org/>) on March 18, 1999. *See* Declaration of Christina Boyce (Ex. 1010, “Boyce Dec.”), ¶ 6, Exhibit B (pgs. 17-44). HomeRF Tutorial is maintained in the ordinary course of business and indexed on this publicly available website. Boyce Dec., ¶¶ 7-8, Exhibit D (“1999 index,” pgs. 65-76). According to the 1999 index, HomeRF Tutorial was last modified on the date it was uploaded, March 18, 1999. *See* Declaration of Jennifer Stephens (Ex. 1011, “Stephens Dec.”), ¶ 11, Exhibit B.

Thus, HomeRF Tutorial qualifies as prior art to the Challenged Claims under at least pre-AIA § 102(a) and 102(b), as it is a publication that was publicly available more than one year prior to the Challenged Claims’ earliest possible effective filing date. HomeRF Tutorial was not cited or considered by the Patent Office during prosecution of the ’676 patent.

a) **HomeRF Tutorial Further Describes A Control Station Controlling Use Of The Same Frequency Band By Stations Using Different Radio Interface Standards**

HomeRF Tutorial describes the same HomeRF system as described in the HomeRF article, and provides additional discussion regarding alternate use of the frequency band by first and second radio protocols. In particular, it shows the two modes of communications based on the two different standards, DECT and 802.11:



HomeRF Tutorial, pg. 12.¹¹

HomeRF Tutorial describes the I-node (voice) stations operating according to the first radio interface standard (used for circuit-switched, isochronous communications, and based on DECT/TDMA) and the A-node (data) stations carrying TCP/IP traffic (used for packet-switched, asynchronous communications, and based on 802.11/CSMA/CA).

It further describes that the CP can both manage the network and also act as an A node.

¹¹ HomeRF Tutorial cites are to the slide numbers from the original presentation.

Device Types

Isochronous (I node)
> minimum latency -
telephones, etc.

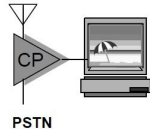


Cordless Telephone

Asynchronous (A node)
> TCP/IP traffic



Fridge pad



PSTN

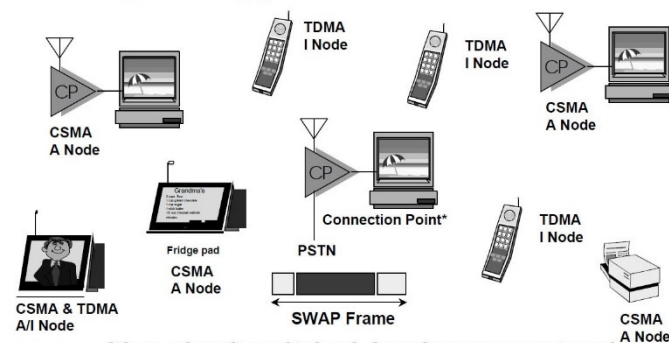
- CP - Connection point...can manage a network or act as an A node
- Can be USB, PCI, PC-Card, Device Bay, etc.
- CP can place calls even when PC is down

intel

15

Intel's
Labs

Topology



- It's a circuit switched, isochronous network
- It's a packet switched, asynchronous network
- It's both - I nodes get priority on bandwidth

intel

16

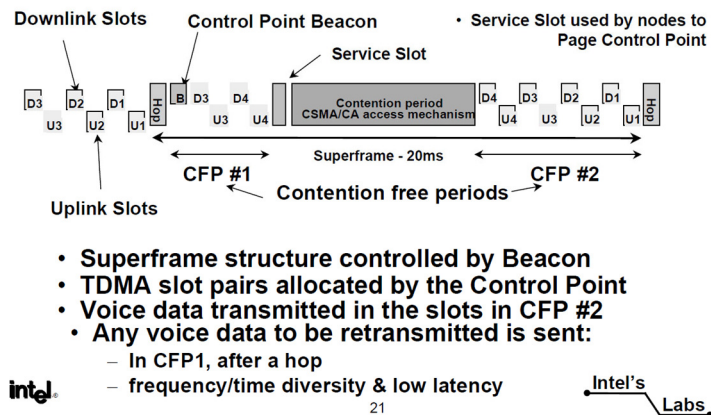
Intel's
Labs

HomeRF Tutorial, pgs. 15-16. Rysavy Dec., ¶¶ 114-116.

b) **HomeRF Tutorial Further Clarifies Granting
Second Stations Access To The Common Frequency
Band When First Stations Do Not “Request” It**

HomeRF Tutorial further describes that the CP, or Control Point, transmits the beacon, that the beacon controls the superframe structure, and that the control point allocates the TDMA slot pairs:

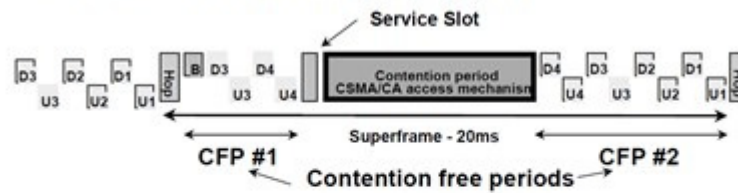
Voice: Robust clarity



HomeRF Tutorial, pg. 21.

HomeRF Tutorial further shows that the superframe also accommodates the CSMA traffic during the contention period, and that with fewer voice connections, the amount of time for network access by contention traffic (i.e., A-node transmissions) would increase, given the fixed duration of the superframe. If there is no use of the shared network by the voice (first radio interface system) traffic, HomeRF Tutorial explains that the entire superframe is available for data (second radio interface standard) traffic:

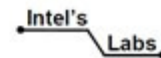
Data transmission



- CSMA/CA during the contention period
- Efficient for small networks
- Tolerant of interference
- Data for entire frame if no voice



22



HomeRF Tutorial, pg. 22 (emphasis added). Rysavy Dec., ¶¶ 117-118.

2. Motivation To Combine The HomeRF References

The primary HomeRF reference (Ex. 1006) is an article published in 2000 describes the HomeRF system under development by the Home RF Working Group. Each of the other two HomeRF references (Exs. 1008 and 1009) describes development of that same HomeRF system in 1999 and 1998, respectively.

A POSITA would naturally have been motivated to combine the teachings of these three references that describe different aspects of a common system. Moreover, a POSITA implementing the HomeRF system would have naturally sought out the different references, to learn different details or variations of the system. Finally, at least because they all describe aspects of the same system, a POSITA would have had a reasonable expectation of success in creating a system that combined the teachings of these references. Furthermore, a POSITA would have consulted each

of these references to understand the SWAP technology. Additional, and more specific, reasons for combining these references are discussed below with respect to specific claim features. Rysavy Dec., ¶¶ 119-121.

**3. Claim 1 Is Obvious Over
HomeRF In View Of HomeRF Tutorial**

A POSITA would have been motivated to combine HomeRF with HomeRF Tutorial for the reasons set forth in section VII.B.2, above, and as further detailed herein.

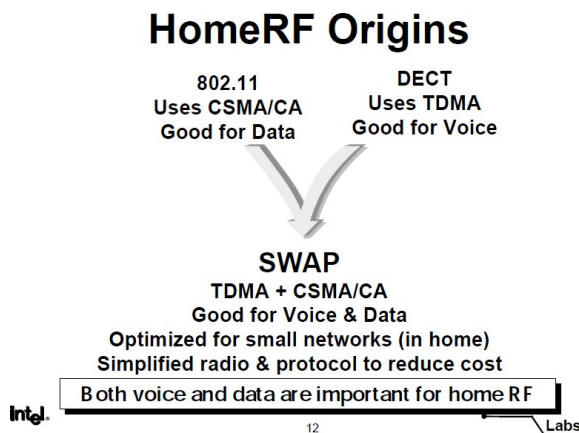
All of the limitations of claim 1 are taught or suggested in HomeRF, as set forth in section VII.A.2, above. Additionally, HomeRF Tutorial provides additional detail regarding the functioning of the HomeRF system, as further described below. Rysavy Dec., ¶¶ 122-123.

[1.1] An interface-control protocol method for a radio system which has at least one common frequency band that is provided for alternate use by a first and a second radio interface standard, the radio system comprising:

To the extent the preamble is limiting, HomeRF describes this limitation. (see section VII.A.2, above). Rysavy Dec., ¶ 124.

[1.2] stations which operate in accordance with a first radio interface standard and/or a second radio interface standard, and

HomeRF describes this limitation. (see section VII.A.2, above). Additionally, HomeRF Tutorial describes and shows the two modes of communications based on the two different standards, DECT and 802.11:



HomeRF Tutorial, pg. 12.

HomeRF Tutorial describes the I-node (voice) stations operating according to the first radio interface standard (used for circuit-switched, isochronous communications, and based on DECT/TDMA) and the A-node (data) stations carrying TCP/IP traffic (used for packet-switched, asynchronous communications, and based on 802.11/CSMA/CA). It further describes that the CP can both manage the network and also act as an A node. HomeRF Tutorial, pgs. 15-16. A POSITA would understand these to refer to the same I-node and A-node stations and CP referred to in HomeRF, and so would be motivated to apply these teachings to the same HomeRF system described therein. Rysavy Dec., ¶¶ 125-128.

[1.3] a control station which controls the alternate use of the frequency band,

[1.4] wherein the control station controls the access to the common frequency band for stations working in accordance with the first radio interface standard and

HomeRF describes these limitations. (see section VII.A.2, above). Rysavy

Dec., ¶ 129.

[1.5] wherein the control station ... renders the frequency band available for access by the stations working in accordance with the second radio interface standard if stations working in accordance with the first radio interface standard do not request access to the frequency band.

HomeRF describes this limitation. (see section VII.A.2, above). Additionally, HomeRF Tutorial further describes that the CP, or Control Point, transmits the beacon, that the beacon controls the superframe structure, and the that control point allocates the TDMA slot pairs. HomeRF Tutorial, pg. 21.

HomeRF Tutorial further shows that the superframe also accommodates the CSMA traffic, and that with fewer voice connections, the amount of time for network access by contention traffic (i.e., A-node transmissions) would increase, given the fixed duration of the superframe. If there is no use of the shared network by the voice (first radio interface system) traffic, HomeRF Tutorial explains that the entire superframe is available for data (second radio interface standard) traffic. HomeRF Tutorial, pg. 22. In view of this, a POSITA would understand that in describing its fixed length superframe with fixed length slots, HomeRF necessarily describes that the CP “makes the frequency band available for transmissions by stations working in accordance with the second radio interface standard for periods (namely “contention periods”) during which the common frequency band is not being used by stations operating in accordance with the first radio interface standard that have

requested access to the band.” Rysavy Dec., ¶¶ 130-132.

A POSITA would naturally look to HomeRF Tutorial to better understand the functionality of the various portions of the superframe and the relative use of the superframe by the stations alternately using the band, namely the A-nodes and I-nodes described in both HomeRF and HomeRF Tutorial. Rysavy Dec., ¶ 133.

4. HomeRF In View Of HomeRF Tutorial Shows The Added Limitations Of Claim 2.

[2.1] The method as claimed in claim 1, herein the control station determines the respective duration in which the stations working in accordance with the second radio interface standard are allowed to utilize the frequency band.

HomeRF describes this limitation. (see VII.A.3 above). Additionally, as described in section VII.B.1 above, HomeRF Tutorial further describes providing time periods (“contention periods”) during which the second interface standard stations are allowed to utilize the common frequency band. Rysavy Dec., ¶¶ 134-135.

C. GROUND 3: CLAIMS 1 AND 2 ARE OBVIOUS OVER HOMERF IN VIEW OF HOMERF LIAISON REPORT

As explained in this section, claims 1 and 2 are obvious over HomeRF in view of HomeRF Liaison Report. Rysavy Dec., ¶¶ 136-150.

1. HomeRF Liaison Report

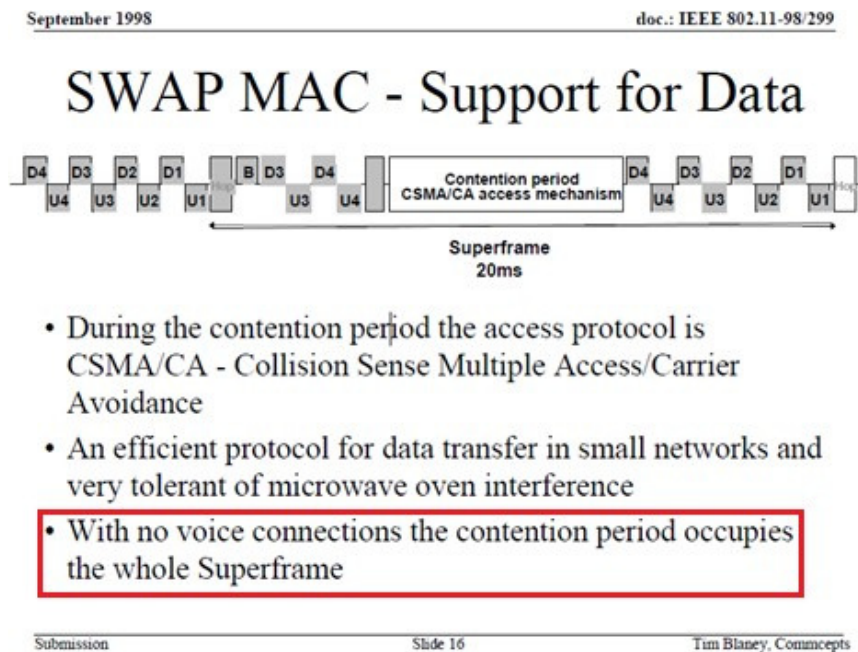
“HomeRF™ Working Group 3rd Liaison Report” (Ex. 1009, “HomeRF

Liaison Report”) is a presentation authored by Tim Blaney of Commcepts, dated July 1998 and uploaded to the publicly accessible IEEE 802 LAN/MAN Standards Committee website (<http://ieee802.org/>) on November 5, 1998. *See* Boyce Dec., ¶ 6, Exhibit A thereto (pgs. 3-16). HomeRF Liaison Report is maintained and indexed on this publicly available website. Boyce Dec., ¶¶ 7-8, Exhibit C thereto (“1998 index,” pgs. 45-64). According to the 1998 index, HomeRF Liaison Report was last modified on the date it was uploaded, November 5, 1998. *See* Declaration of Jennifer Stephens (Ex. 1011, “Stephens Dec.”), ¶ 7, Exhibit A.

Thus, HomeRF Liaison Report qualifies as prior art to the Challenged Claims under at least pre-AIA § 102(a) and 102(b), as it is a publication that was publicly available more than one year prior to the Challenged Claims’ earliest possible effective filing date. HomeRF Liaison Report was not cited or considered by the Patent Office during prosecution of the ’676 patent.

- a) **HomeRF Liaison Report Further Clarifies Granting Second Stations Access To The Common Frequency Band When First Stations Do Not “Request” It**

HomeRF Liaison Report describes the same HomeRF system as described in the HomeRF article and provides additional discussion regarding the alternate use of the frequency band by the first and second radio protocols. In particular, it confirms that with fewer voice requests, the contention period increases, to the point that it can occupy the entire superframe:



HomeRF Liaison Report, pg. 8 (emphasis added).

And, since it is during this contention period that the CSMA/CA protocol used by the A-nodes is used, in the absence of requests for voice calls during a given superframe, these second interface standard stations are provided access to the frequency band for the entire superframe period. Rysavy Dec., ¶¶ 138-139.

2. Motivation To Combine HomeRF Liaison Report, HomeRF

A POSITA would naturally have been motivated to combine the teachings of HomeRF Liaison Report with HomeRF for the reasons set forth in Section VII.B.2, above. Additional, and more specific, reasons for combining these references are discussed below with respect to specific claim features. Rysavy Dec., ¶¶ 140-141.

**3. Claim 1 Is Obvious Over HomeRF
In View Of HomeRF Liaison Report**

All of the limitations of claim 1 are taught or suggested in HomeRF, as set forth in section VII.A.2, above. Additionally, HomeRF Liaison Report provides additional detail about the functioning of the HomeRF system, as further described below. Rysavy Dec., ¶¶ 142-143.

[1.1] An interface-control protocol method for a radio system which has at least one common frequency band that is provided for alternate use by a first and a second radio interface standard, the radio system comprising:

To the extent the preamble is limiting, HomeRF describes this limitation.
(see section VII.A.2, above).

[1.2] stations which operate in accordance with a first radio interface standard and/or a second radio interface standard, and

HomeRF describes this limitation. (see section VII.A.2, above).

[1.3] a control station which controls the alternate use of the frequency band,

[1.4] wherein the control station controls the access to the common frequency band for stations working in accordance with the first radio interface standard and

HomeRF describes these limitations. (see section VII.A.2, above).

[1.5] wherein the control station ... renders the frequency band available for access by the stations working in accordance with the second radio interface standard if stations working in accordance with the first radio interface standard do not request access to the frequency band.

HomeRF describes this limitation. (see section VII.A.2, above). Additionally, HomeRF Liaison Report describes the same HomeRF system as described in the HomeRF article and provides additional discussion regarding the alternate use of the frequency band by the first and second radio protocols. In particular, it confirms that with fewer voice requests, the contention period increases, to the point that it can occupy the entire superframe. And, since it is during this contention period that the CSMA/CA protocol used by the A-nodes is used, in the absence of requests for voice calls during a given superframe, these second interface standard stations are provided access to the frequency band for the entire superframe period. HomeRF Liaison Report, pg. 8. Rysavy Dec., ¶ 147.

A POSITA would understand these to refer to the same I-node and A-node stations and CP referred to in HomeRF, and so would be motivated to apply these teachings to the same HomeRF system described therein. A POSITA would

naturally look to HomeRF Liaison Report to better understand the functionality of the various portions of the superframe and the relative use of the superframe by the stations alternately using the band, namely the A-nodes and I-nodes described in both HomeRF and HomeRF Tutorial. Rysavy Dec., ¶ 148.

a) **HomeRF In View Of HomeRF Liaison Report Shows The Added Limitations Of Claim 2.**

[2.1] The method as claimed in claim 1, herein the control station determines the respective duration in which the stations working in accordance with the second radio interface standard are allowed to utilize the frequency band.

HomeRF describes this limitation. (see section VII.A.3, above). Additionally, as described in section VII.C.1, above, HomeRF Liaison Report further describes providing time periods (“contention periods”) during which the second interface standard stations are allowed to utilize the common frequency band, which may be up to an entire superframe period. Rysavy Dec., ¶¶ 149-150.

D. GROUND 4: CLAIMS 1 AND 2 ARE OBVIOUS OVER LANSFORD

As explained in this section, claims 1 and 2 are obvious over Lansford. Rysavy Dec., ¶¶ 151-175.

1. U.S. Patent No. 6,937,158 (“Lansford”)

U.S. Patent No. 6,927,158, entitled “Method And Apparatus For Wireless Communication Between Electronic Devices” (Ex. 1012) issued to inventors

James Lansford *et al.* on August 30, 2005, from an application filed December 29, 1999. As such, Lansford is prior art under at least pre-AIA 35 U.S.C. §§ 102 (e)(2).

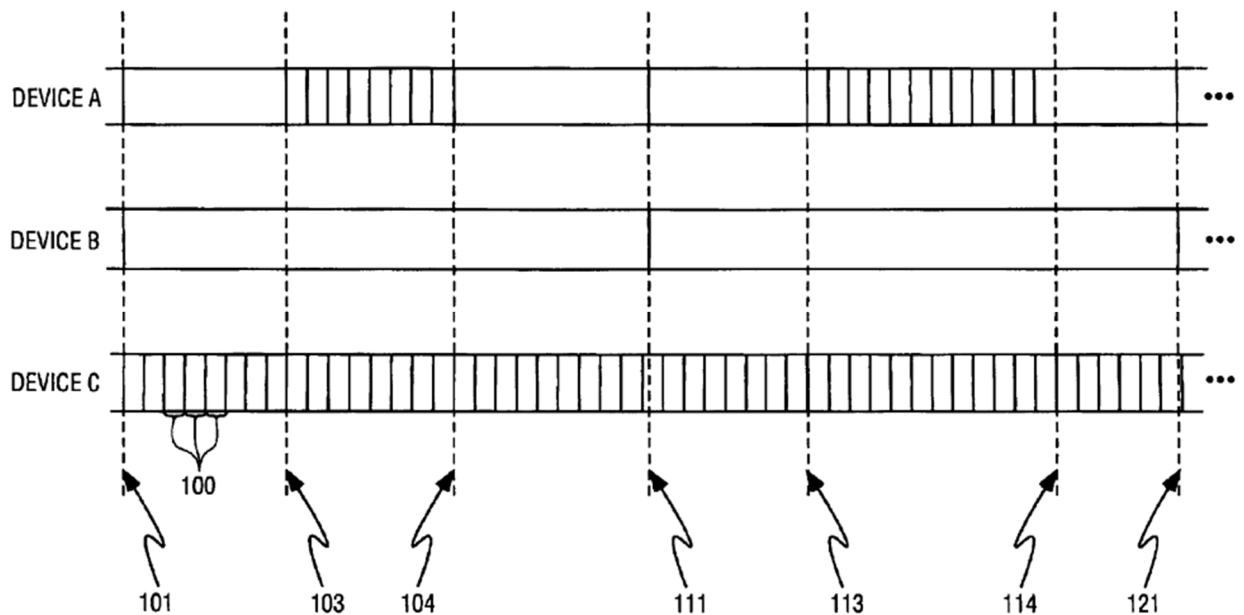
Lansford was not cited or considered by the Patent Office during prosecution of the '676 patent.

a) **Lansford Shows A Protocol Method For Alternate Use Of The Same Frequency Band By Wireless Devices Using Different Wireless Communication Protocols**

Lansford describes a method and apparatus for wireless communication between and among at least three wireless communication devices, utilizing at least two different wireless communication protocols – e.g., in a preferred embodiment, HomeRF and Bluetooth – within a common frequency band. Lansford's control of this common (i.e. same) frequency band by wireless communication devices operating in accordance with these two wireless communication protocols is further detailed below. Rysavy Dec., ¶ 153.

b) **Lansford Shows A Frequency Hopping “Controller” Transmission Device Controlling Use Of A Common Frequency Band By Additional Frequency Hopping Devices Using Different Communication Protocols**

As illustrated in Figure 1, below, Lansford describes at least three communication devices, Devices A, B, and C, each of which may include “a receiver, a processor, and a transmitter.” Lansford, 4:8-9.



Lansford, Figure 1. Rysavy Dec., ¶ 154.

Coordination of communication may be controlled by Device A, which “may be referred to as a controller.” *Id.*, 4:1-4. In some embodiments, Device A is described as coordinating communications with two different additional devices – Device B and Device C – each operating according to a different communication protocol. In the exemplary embodiment:

the first wireless communication protocol may be the HomeRF protocol* described in the Shared Wireless Access Protocol (SWAP) Specification 1.0, released Jan. 5, 1999. *The second wireless communication protocol may be the Bluetooth* protocol* described in the Bluetooth Specification, Version 1.0A, released Jul. 24, 1999. Other communication protocols may be used, however.

Id., 2:45-51 (emphases added).

Lansford's controller is able to communicate using both communication protocols:

[A]n electronic device is capable of operating at two different hopping frequencies. This electronic device is referred to herein as a "controller." ***Operation at the first hopping frequency allows wireless communication between the controller and a first class of electronic devices in accordance with a first wireless communication protocol. Operation at the second hopping frequency allows wireless communication between the controller and a second class of electronic devices in accordance with a second wireless communication protocol.***

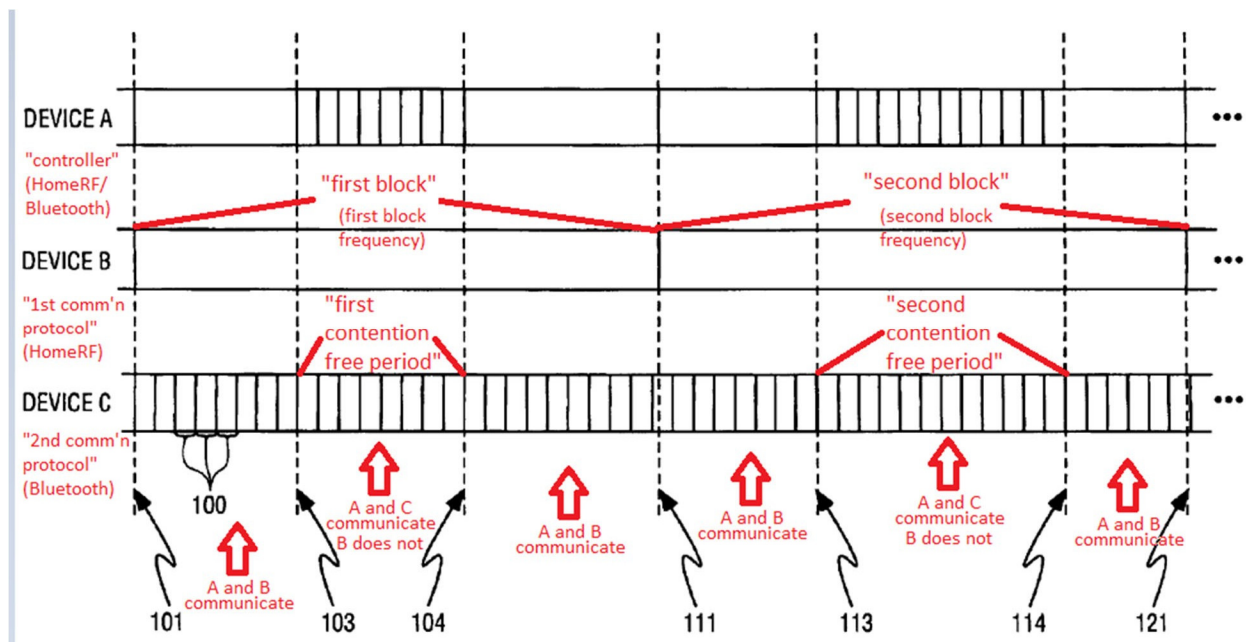
Lansford, 2:8-18. Rysavy Dec., ¶ 155-156.

Lansford further explains that each of these devices, while in some cases operating at different "hopping frequencies," is able to communicate within a similar range of operating frequencies (common frequency band), e.g., in the vicinity of 2.4 GHz:

As used herein, a "hopping frequency" is the rate at which a device hops from one frequency to another in accordance with a communication protocol. ***As used herein, a "block frequency" is the operating frequency***

at which a device communicates within a block in accordance with a communication protocol. For example, HomeRF devices (i.e. devices able to communicate in accordance with the HomeRF communication protocol) operate at a hopping frequency of 50 hops per second, meaning each block lasts 20 ms. Bluetooth devices (i.e. devices able to communicate in accordance with the Bluetooth communication protocol) operate at a hopping frequency of 1600 hops per second, meaning each block lasts 0.625 ms. ***In accordance with both the HomeRF and Bluetooth protocols, each block frequency is in the vicinity of 2.4 GHz.***

Lansford, 3:8-22.



Lansford, Figure 1 (annotated).

As illustrated in the annotated Figure 1 above, and as further described in the quoted sections, below, Lansford's controller alternates the time periods during which it communicates with, e.g., HomeRF devices and Bluetooth devices through the use of contention periods and contention-free periods within a "block" between frequency hops. Lansford, 2:64-66 ("As used herein, a 'block' is the period of time between frequency hops in accordance with a communication protocol."). *See, e.g.*, "first block" beginning at 101 and ending at 111 and "second block" beginning at 111 and ending at 121. Lansford discloses providing contention free periods during each of these blocks. *See* "first contention free period" beginning at 103 and ending at 104 and "second contention free period" beginning at 113 and ending at 114 in the annotated FIG. 1, above, and the further discussion below. Rysavy Dec., ¶¶ 157- 158.

Lansford further describes that during the contention-free period – the time set aside for communication requested by the Bluetooth devices (e.g., Device C) – the HomeRF devices (e.g., Device B) do not communicate – or, in some cases, do not even attempt to communicate – with the controller:

Device A, as the controller, listens for and receives a signal from Device C of FIG. 1. This signal requests communication between Devices A and C and may be spontaneously sent from Device C (e.g. in regular, predetermined intervals) or it may be sent in response to

an initiating signal from Device A. This initiating signal may be occasionally sent from Device A to detect the presence of electronic devices with which to communicate. Note that for an embodiment in which Device C is a Bluetooth device, the signal from Device C requesting communication with Device A may be referred to as an inquiry.

After Device A of FIG. 1 receives the signal from Device C requesting communication, Device A, as the controller, determines a time frame for a contention-free period.

Lansford, 4:16-29.

According to FIG. 1, *the time frame for the first contention-free period begins at time 103 and ends at time 104. During this contention-free period, communication between Device A and Device B is suspended. For one embodiment of the present invention, Device B, after receiving the signal from Device A indicating the time frame for the contention-free period, does not attempt to contend for communication with Device A during that period.*

Lansford, 4:49-56.

After a first block is completed, Devices A and B hop to a second block frequency, and the process repeats, with a contention-free period set aside during

which Devices A and C may communicate according to one communication protocol, and contention periods during which Devices A and B communicate according to another communication protocol:

Both Devices A and B hop to the next block frequency at time 111, and the process continues in the manner described above. For example, **Devices A and B may communication [sic] according to a first communication protocol within the block during the period of time outside the contention-free period.** That is from time 111 to 113 and from time 114 to 121. *The time period from 113 to 114 is reserved as the contention free period during which time Device B halts communication with Device A, and Devices A and C communicate according to a second communication protocol* over the course of twelve blocks.

Lansford, 5:23-35. Rysavy Dec., ¶¶ 159-160.

c) **Lansford Shows The Control Station Determining A Respective Duration For Stations To Utilize The Common Frequency Band**

Additionally, as described above, Lansford describes the controller controlling the respective durations during which a single device (e.g., HomeRF Device B) communicate, by sending, e.g., a “beacon” setting forth the “contention-free period” during which HomeRF device B does not communicate or “contend” for communication with the controller:

Once determined, Device A of FIG. 1 sends a signal to Device B indicating the time frame for the contention-free period. This signal may be sent during the period of time bounded by time 101 and 103, during which time Device A is operating according to the same communication protocol as Device B. *In accordance with an embodiment in which this communication protocol is HomeRF, the signal sent from Device A to Device B indicating the time frame for the contention-free period may be referred to as a beacon.*

According to FIG. 1, the time frame for the first contention-free period begins at time 103 and ends at time 104. During this contention-free period, communication between Device A and Device B is suspended. For one embodiment of the present invention, Device B, after receiving the signal from Device A indicating the time frame for the contention-free period, does not attempt to contend for communication with Device A during that period.

Lansford, 4:40-56.

Lansford also describes this contention free period applying to determine the respective duration for communication at a given hopping frequency by a first or second “class of electronic devices”:

Operation at the first hopping frequency allows wireless

communication between the controller and a first class of electronic devices in accordance with a first wireless communication protocol. Operation at the second hopping frequency allows wireless communication between the controller and a second class of electronic devices in accordance with a second wireless communication protocol. *The first wireless communication protocol includes provisions to define a contention-free period during which time the first class of electronic devices do not communicate with the controller.*

Lansford, 2:11-21.

These respective classes of managed electronic devices may include a number of different devices, including “any type of electronic device including, for example, a cell phone, cordless phone, set top box, desktop or mobile computer, automobile, etc.” Lansford, 5:36-38. Rysavy Dec., ¶¶ 161-163.

2. Claim 1 Is Obvious Over Lansford

All of the limitations of claim 1 are taught or suggested in Lansford, as further set forth below.

[1.1] An interface-control protocol method for a radio system which has at least one common frequency band that is provided for alternate use by a first and a second radio interface standard, the radio system comprising:
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To the extent the preamble is limiting, Lansford describes this limitation.

Lansford describes a wireless communication system in which signals are transmitted between and among at least three devices (Lansford, 4:8-9) operating according to at least two different communication protocols (see, *e.g.*, *id.*, 2:45-51, describing stations using HomeRF and Bluetooth protocols) in a common frequency band (*e.g.*, in the vicinity of 2.4 GHz). Lansford, 3:8-22. Lansford describes a controller that communicates using at least the two above-mentioned communications protocols controlling alternate use of the band, including use by a HomeRF station – or other devices in the “class of electronic devices” that may include “any type of electronic device including, for example, a cell phone, cordless phone, set top box, desktop or mobile computer, automobile, etc.” (Lansford, 2:20-21, 5:36-38) communicating with a controller during contention periods, but not during contention-free periods. During these contention-free periods, Bluetooth devices (or “stations”) may communicate with the controller. Lansford, FIG. 1, 2:11-21, 4:16-29 and 40-56; 5:23-55; *see, generally, id.*, 2:8 – 6:49. Rysavy Dec., ¶¶ 165-166.

[1.2] stations which operate in accordance with a first radio interface standard and/or a second radio interface standard, and

Lansford describes a “wireless network” (Lansford, 6:10) that includes a plurality of devices (“two or more devices”), operating using different wireless

protocols, e.g., Bluetooth, HomeRF or “other communication protocols.” *See, e.g., id.*, FIG. 1, 4:8-9, 2:45-51. For example, Device B is described as operating according to the HomeRF protocol (*id.*, 4:5-6), while Device C is described as operating according to the Bluetooth protocol (*id.*, 4:6). Device A, the controller, may communicate using both protocols, and so may serve as either a Bluetooth station or a HomeRF station, or both (*id.*, 3:23-28). (A POSITA would have understood each of these wireless protocols to be a radio interface standard (“operating in a manner that is in agreement with or conforms to a first radio standard...or variants thereof”). Rysavy Dec., ¶¶ 167-168.

[1.3] a control station which controls the alternate use of the frequency band,

[1.4] wherein the control station controls the access to the common frequency band for stations working in accordance with the first radio interface standard and

Lansford describes a first device, sometimes referred to as “Device A”, that serves as a HomeRF “controller” (i.e., a “control station”). *See* Lansford, 2:8-43.

This controller, Device A, allocates time slots (“controls the alternate use”) during which at least:

- a Bluetooth device, which is described as including “a receiver, a processor, and a transmitter” (*id.*, 4:8-9) and is sometimes referred to as “Device C” (i.e., a first radio interface standard “station”), and

- a HomeRF device also including “a receiver, a processor, and a transmitter”

(*id.*, 4:8-9) (i.e., a second radio interface standard “station”)

can communicate with the controller (*see id.*, FIG. 1, 2:11-21, 4:16-29 and 40-56; 5:23-55; *see, generally, id.*, 2:8 – 6:49) on one or more block frequencies that are “in the vicinity of 2.4 GHz” (the “common frequency band”) (*id.*, 3:8-22). Rysavy Dec., ¶¶ 169-170.

[1.5] wherein the control station ... renders the frequency band available for access by the stations working in accordance with the second radio interface standard if stations working in accordance with the first radio interface standard do not request access to the frequency band.

As discussed above, the controller controls the common frequency band. Lansford describes that the controller sends a “beacon” that indicates the time for a contention-free period during which communication is limited to only Bluetooth communication. Lansford, 4:40-56. HomeRF device, Device B (a station working in accordance with the second radio interface standard), can communicate during the time not used by the contention-free periods, namely the contention periods (*id.*, 5:23-35), while the above-referenced contention-free periods are reserved for Bluetooth communication with Device C, a Bluetooth device that has requested access to the frequency band (e.g., it has requested communication with the controller) (*id.*, 4:15-29). *See, generally, id.*, 4:15-6:49. Rysavy Dec., ¶¶ 171-172.

3. Lansford Shows The Added Limitations Of Claim 2

[2.1] The method as claimed in claim 1, herein the control station determines the respective duration in which the stations working in accordance with the second radio interface standard are allowed to utilize the frequency band.

Lansford teaches or suggests each of the elements of claim 1 (see section VII.D.2, above).

The controller controls the common frequency band, as described in section VII.D.2, above. Additionally, Lansford states that the controller sends a “beacon” setting forth a contention-free period, setting forth a time period during which HomeRF Station B, or as set forth above, other devices in the same “class” cannot communicate, while also establishing contention periods during which these devices can communicate (i.e., a respective duration in which these stations are allowed to use the common frequency band). Lansford, 4:40-56. Given this restriction on the duration, or time period, during which the HomeRF device, or other devices in the same “class” can communicate, and the fact that the controller controls this access through, e.g., use of the HomeRF beacon, it would have been obvious to a POSITA that such control would include the control unit determining the respective duration (or time period) in which the stations working in accordance with the second radio interface standard are allowed to utilize the frequency band. Rysavy Dec., ¶¶ 173-175.

VIII. NO OBJECTIVE INDICIA OF NON-OBVIOUSNESS

Petitioner is aware of no secondary considerations of non-obviousness. In the event Patent Owner enters such evidence in the record, Petitioner reserves the right to respond thereto.

IX. CONCLUSION

Petitioner requests institution for claims 1 and 2 on Grounds 1-4 specified in this petition.

Respectfully submitted,

Dated: January 3, 2020

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**CERTIFICATE OF COMPLIANCE WITH
TYPE-VOLUME LIMITATION PURSUANT TO 37 C.F.R. § 42.24**

This brief complies with the type-volume limitation of 37 C.F.R. § 42.24(a)(1)(i).

The brief contains 13,526 words, excluding the parts of the brief exempted by 37 C.F.R. § 42.24(a), using the Word Count feature of Petitioner's word processing program.

The brief has been prepared in a proportionally spaced typeface using Microsoft Word 365 ProPlus in a 14-point Times New Roman font.

Dated: January 3, 2020

/J. Andrew Lowes/

J. Andrew Lowes

Registration No. 40,706

Lead Counsel for Petitioner Ericsson

CERTIFICATE OF SERVICE IN COMPLIANCE WITH 37 C.F.R.
§ 42.6(e)(4)

The undersigned certifies that the **Petition for *Inter Partes* Review of U.S. Patent No. 7,016,676; Exhibits 1001 – 1014; and Petitioner’s Notice Regarding Filing Two Petitions** were served on January 3, 2020, via **Federal Express** on the Patent Owner at the following address of record as listed on PAIR:

Philips Intellectual Property & Standards
465 Columbus Avenue, Suite 340
Valhalla, NY 10595

The undersigned certifies that a copy of the Petition only was also sent via electronic mail to the attorneys of record for Plaintiff in the AT&T case and the Verizon case:

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