QUALCOMM INC.,
Petitioner

v.

BANDSPEED, INC.
Patent Owner

SUPPLEMENTAL DECLARATION OF DR. ZHI DING
IN SUPPORT OF PETITIONER'S REPLY
TO PATENT OWNER'S RESPONSE UNDER 37 C.F.R. § 42.120

1 Case IPR2015-01580 has been joined with this proceeding.
I, Dr. Zhi Ding, hereby declare as follows:

1. I have been retained by Qualcomm Inc. to provide testimony for this *inter partes* review proceeding. This testimony is intended to supplement my original declaration in these proceeding.

2. I have reviewed the Patent Owner’s Response, dated January 21, 2016, and its accompanying exhibit, the declaration of Dr. Jose Melendez.

**Level of Ordinary Skill**

3. In my prior declaration, I stated that one of ordinary skill in the art would have a B.S. degree in Electrical and/or Computer Engineering, or an equivalent field, as well as at least 3-5 years of academic or industry experience in the communications field.

4. Dr. Melendez states that “a person of ordinary skill in the relevant art of the ‘624 Patent in the relevant time period would have had a Bachelor of Science degree in Electrical or Computer Engineering or Computer Science and/or equivalent industrial work experience.”

5. I do not agree with Dr. Melendez that a person of ordinary skill in the art would have a Bachelor of Science degree without the need for experience in the communications field. Nevertheless, even adopting Dr. Melendez’s definition of one of ordinary skill in the art, my previous testimony remains unchanged and it is
still my opinion that the prior art references disclosed in the petition render the challenged claims of the ‘624 patent obvious.

**Claim Construction**

6. The Patent Owner’s Response and Dr. Melendez asserts that the Patent Trial and Appeal Board’s (“PTAB”) interpretation of “vote to use the particular communications channel” is unreasonably broad. Various portions of the ’624 specification are cited which indicate that, in some embodiments, votes come from “participants.” I would note, however, that the language of the ’624 specification regarding these examples explicitly states that the embodiments are exemplary in nature. A person of ordinary skill in the art reading the ’624 patent would understand that the cited examples from the specification are not necessarily limiting on the claims and that the claimed votes could come from various devices other than participants.

7. It is further noted that the claims do not require that a “mobile station” is providing the votes, as argued by Patent Owner. The claims do not define master or slave devices, nor do they require that votes come from a slave to a master. The claims only require that a “channel” receives votes. In my previous testimony, I noted that the base station (which would actually be a “participant” in the network) of Cuffaro compiles information and assigns tallies (i.e., votes) to various channels. In fact, the “channel selection criteria” of the ’624 patent, which
tracks data and voting, is implemented a master device; this is similar to how Cuffaro is implemented on a base station. Cuffaro’s disclosure is sufficient to meet the claimed voting to use the particular communications channel.

**Anticipation by Gerten**

8. The Patent Owner and Dr. Melendez state that Gerten does not disclose any device “capable of maintaining a master synchronized with more than one slave in a given piconet where the master and a slave are using a default set of channels while the same master and a different slave are using different subsets of channels (having eliminated channels), changing subsets of channels over time.” Ex. 2001 at ¶¶ 34, 35. These arguments are incorrect, and they also argue concepts that are not limitations of the claims (e.g., the claims do not specify piconets, they do not limit the master/slave relationships, nor do they require that this limitation applies to a single piconet only).

9. Gerten teaches multiple embodiments in which a device can communicate over an adaptive hopping sequence with one device while communicating over a normal sequence with another device. One embodiment was discussed in my previous declaration at, e.g., paragraphs 45 and 60-65. In Figure 3 of Gerten, the master unit performs a discovery process (block 110) upon connecting with a new slave unit. If the slave unit is capable of using interference avoidance, the master will begin the process to determine a modified set of
channels for use (block 120). When a second slave unit enters the piconet, if it is determined that the new slave unit cannot utilize interference avoidance, Gerten uses normal/default frequency hopping for that second slave (block 115).

10. Patent Owner takes the stance that, under Gerten, when such a second slave enters the network, the first slave would necessarily have to revert back to utilizing the default hopping sequence. According to Patent Owner, the master is not capable of utilizing the inventive aspects of Gerten while functioning in a legacy setting for communicating with the second slave. Gerten contains no such teaching, nor would a person of ordinary skill in the art read such a requirement into Gerten, because it would render the invention useless in the very likely event that at least one legacy device would enter a communication network. In fact, Gerten discloses that its “process can be applied to a Bluetooth example and includes identification of a Bluetooth device’s ability to support interference avoidance, ... [and] a method of modifying the Bluetooth hop sequence so that it will avoid channels containing strong or fixed interferers while still supporting standard Bluetooth hopping with other non-enabled members of the piconet . . . .”

11. Gerten teaches another embodiment where mobile unit 22 acts as a master in one piconet but acts as a slave in a second piconet. This is shown in Figure 1:
12. Gerten teaches that the two piconets (i.e., 12 and 14) are "independent" and "non-synchronized." Ex. 1003 3:15-39; Fig. 1. In this circumstance, based on the teachings of Gerten, when mobile unit 22 is acting as a slave in the second piconet (12), it could be configured to utilize adaptive frequency hopping according to its capabilities. When acting as a master in the first piconet (14), in the event that a slave in the first piconet is not able to utilize adaptive hopping, the master will maintain a normal hopping sequence with that slave according to the flow described in Figure 3. This would create a circumstance where a first participant (the master/slave device) is able to communicate with a third participant via a normal mode, while also
communicating with another participant via an adaptive hopping sequence. Such functionality would meet each limitation of the present claim.

13. In this second embodiment, all master/slave communications within a particular piconet would be synchronized, and the two separate piconets are unsynchronized. Such an embodiment would comply with Patent Owner’s incorrect argument (Ex. 2001 at ¶¶ 33-34) asserting that Gerten would require that all master-slave communications within a piconet to communicate over the same set of channels. Therefore, even if such a requirement were assumed to exist (which it does not), Gerten would still teach this limitation.

**Obviousness over Gerten in view of Cuffaro**

14. When discussing the limitation requiring that a “specified” number of votes be received to select a channel, Patent Owner states that a person of ordinary skill in the art would not be able to resolve the situation where multiple channels receive the same specified number of votes. It is noted that this theory is not supported by Dr. Melendez. One of skill in the art would understand that such situation only means that there is a non-unique selection when selecting a channel. One of skill in the art would understand that the case of having more frequencies than the number of channels could be deemed as acceptable. This circumstance would be accounted for and even expected because the normal use of a Bluetooth network may encounter many environments with minimal interference. In fact,
such a circumstance could happen within embodiments of the '624 patent, and the '624 patent does not find it necessary to teach a method of handling this issue. This circumstance is also possible under Cuffaro's usage of a "maximum" number of votes and under the system implemented in the '624 patent. A person of ordinary skill in the art reading Cuffaro's teachings regarding making decisions based on a "maximum" number of votes would find it obvious to select a "specified" number of positive votes when determining whether to use a particular channel. Such selections of vote levels reflect threshold levels of quality for a channel and it would be obvious to select any particular threshold for channel quality based on design choices that dictate performance of the overall communication system.

15. Patent Owner argues that Gerten and Cuffaro are in different technical fields, address different problems, would not be seen as analogous art, and could therefore not be combined. I disagree. A person of ordinary skill in the art designing the system of Gerten, which monitors interference on communication channels in order to select particular frequencies to use in a hopping sequence, would look to knowledge derived from designing other wireless communication systems that monitor and select channels for the same purposes. In fact, Gerten itself states that its invention can be applied to different types of networks. Gerten at 2:63-3:2.
16. The close relationship between Bluetooth and cellular communications technologies is illustrated by facts such as the assignment of the Gerten patent to Motorola, Inc., a cellular device manufacturer. In fact, at least two other cellular device manufacturers, Ericsson and Nokia, are founding members of the Bluetooth Special Interest Group. A person of ordinary skill could easily translate many actions that are taken with respect to separate uplink or downlink channels and could apply those actions to systems where the uplink/downlink channels are shared, so long as there exists no insurmountable technical obstacles.

17. Moreover, the proposed person of ordinary skill in the art has been agreed upon as having, *e.g.*, a degree in electrical engineering. Such a person obtaining knowledge in the area of interference avoidance would not presume that the knowledge was limited to specific frequency ranges. This is especially true in light of the close frequency ranges of cellular and Bluetooth communications (1.9 GHz vs. 2.4 GHz). Additionally, in both licensed or unlicensed frequency bands, there is a need to avoid interference.

18. Patent Owner made similar augments on other grounds regarding the addition of the Sage reference. Those arguments are likewise without merit for the reasons discussed above.
**Obviousness over Gendel in view of Haartsen**

19. Patent Owner further argues that nothing in Gendel teaches communicating over a default set of channels. As stated in my previous declaration, a person of ordinary skill in the art would understand that block 126 in Gendel is provided to support legacy communication systems, such as systems that do not support segment substitution. It would make little sense to create specific Bluetooth interference avoidance systems that do not function with legacy devices. Therefore one of skill in the art would find it obvious to configure Gendel such that it communicates over a default set of channels.

20. Patent Owner argues that block 126 of Gendel could be utilized to implement interference avoidance methods other than those described in Gendel, and therefore Gendel does not necessarily require that a default hopping sequence be used. It was not my assertion that block 126 can only implement communications over a default sequence, rather one of skill in the art would have recognized that the primary purpose of this block is to provide for such legacy functionality.

21. Patent Owner and Dr. Melendez assert that Gendel and Haartsen would not be combined by a person of ordinary skill in the art. Essentially, the argument is that even though both references teach methods to select/deselect channels, utilize hopping sequences, and are implemented to avoid interference a
person of ordinary skill in the art would not look to the solutions provided in these references, because Gendel works with segments of frequencies whereas Haartsen works on a frequency-by-frequency basis, i.e., where each segment has a single channel only. I disagree.

22. One of skill in the art could easily derive and apply knowledge from these references. Both references address the same problems and implements solutions in substantially the same manner. Merely changing the granularity of the frequencies would require little modification as it merely modifies the size of the segments, i.e., the number of frequencies contained in each segment.

23. Patent Owner also states that the proposed combination of Gendel and Haartsen is improper, because it would change the principle of operation of Gendel. This argument misconstrues the rationale for combining references as provided in paragraph 131 of my declaration. The proposed combination does not require an actual physical combination of devices. Rather, the proposed combination notes that various conceptual teachings are common between references and one of skill in the art would understand that certain concepts could be applied in a predictable way in order to achieve expected results.

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24. I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code.

Date

Zhi Ding, Ph.D.