

**IN THE UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF COLORADO**

Civil Action No. 20-cv-856

SONOHM LICENSING LLC,

Plaintiff,

v.

**AVALUE TECHNOLOGY INC.,
a Colorado Corporation**

Defendant.

JURY TRIAL DEMANDED

PATENT CASE

ORIGINAL COMPLAINT FOR PATENT INFRINGEMENT

Plaintiff Sonohm Licensing LLC files this Original Complaint for Patent Infringement against Avalue Technology Inc. and would respectfully show the Court as follows:

I. THE PARTIES

1. Plaintiff Sonohm Licensing LLC (“Sonohm” or “Plaintiff”) is a Texas limited liability company with its principal place of business at 15922 Eldorado Pkwy, Suite 500-1641, Frisco, TX 75035.

2. On information and belief, Defendant Avalue Technology Inc. (“Defendant”) is a corporation organized and existing under the laws of Colorado with a place of business at 9 Timber Lane, Marlboro, NJ 07746. Defendant has a registered agent at Vincent Hsu, 9 Timber Lane, Marlboro, NJ 07746.

II. JURISDICTION AND VENUE

3. This action arises under the patent laws of the United States, Title 35 of the United States Code. This Court has subject matter jurisdiction of such action under 28 U.S.C. §§ 1331 and 1338(a).

4. On information and belief, Defendant is subject to this Court's specific and general personal jurisdiction, pursuant to due process and the Colorado Long-Arm Statute, due at Defendant being a Colorado corporation and, under the patent laws, therefore only resides in this district.

5. Without limitation, on information and belief, within this state, Defendant has used the patented inventions thereby committing, and continuing to commit, acts of patent infringement alleged herein. In addition, on information and belief, Defendant has derived revenues from its infringing acts occurring within Colorado. Further, on information and belief, Defendant is subject to the Court's general jurisdiction, including from regularly doing or soliciting business, engaging in other persistent courses of conduct, and deriving substantial revenue from goods and services provided to persons or entities in Colorado. Further, on information and belief, Defendant is subject to the Court's personal jurisdiction at least due to its incorporation in Colorado, and/or sale of products and/or services within Colorado. Defendant has committed such purposeful acts and/or transactions in Colorado such that it reasonably should know and expect that it could be haled into this Court as a consequence of such activity.

6. Venue is proper in this district under 28 U.S.C. § 1400(b). On information and belief, Defendant is incorporated in Colorado. Under the patent laws, because Defendant is incorporated in Colorado, Colorado is the only district in which it resides. On information and

belief, from and within this District Defendant has committed at least a portion of the infringements at issue in this case.

7. For these reasons, personal jurisdiction exists and venue is proper in this Court under 28 U.S.C. § 1400(b).

III. COUNT I
(PATENT INFRINGEMENT OF UNITED STATES PATENT NO. 6,651,207)

8. Plaintiff incorporates the above paragraphs herein by reference.

9. On November 18, 2003, United States Patent No. 6,651,207 (“the ‘207 Patent”) was duly and legally issued by the United States Patent and Trademark Office. The ‘207 Patent is titled “Method and System for Improving Voice Quality in Cordless Communications.” A true and correct copy of the ‘207 Patent is attached hereto as Exhibit A and incorporated herein by reference.

10. Sonohm is the assignee of all right, title and interest in the ‘207 patent, including all rights to enforce and prosecute actions for infringement and to collect damages for all relevant times against infringers of the ‘207 Patent. Accordingly, Sonohm possesses the exclusive right and standing to prosecute the present action for infringement of the ‘207 Patent by Defendant.

11. The application leading to the ‘207 patent was filed August 20, 1999. (Ex. A at cover).

12. The invention in the ‘207 Patent relates to the field of telecommunications and more particularly improving voice quality in cordless communications. (*Id.* at col. 1:8-10).

13. In conventional cordless voice communication systems, there is typically a base station which acts as a master supporting a plurality of mobile units, which act as slaves. (*Id.* at

col. 1:13-17). The master base station establishes communication links with the mobile units and has a function to detect errors over the communications links with the mobile units. (*Id.* at col. 1:17-20).

14. Predictive methods have been used to suppress distorted data packets in order to improve voice quality over the communication link. (*Id.* at col. 1:21-24). The particular method chosen generally depends on the speed at which errors over the communication links can be detected. (*Id.* at col. 1:24-26). In cordless systems in which the single carrier is used, data packets are correlated from transmission to transmission such that if the quality of a first transmission is poor then it is highly likely that the next transmission will also be poor. (*Id.* at col. 1:26-28). As a result, from the data packets from the first transmission, the quality of the data packets for the next transmission can be predicted and the base station can suitably and prospectively suppress distorted data packets. (*Id.* at col. 1:29-33).

15. However, frequency hopping systems, which use various carriers over each communication link and change the carriers from time to time, a problem arises when a communication link encounters interference problems affecting the quality of the communications link. (*Id.* at col. 1:35-40). In a frequency hopping scheme, the base station and mobile units generally move in sync in time from frequency to frequency. (*Id.* at col. 3:55-57). Mobile units not initially synced with a base unit “listen” to a specific radio frequency to attempt to lock on to the base station. (*Id.* at col. 3:57-61). When the base station hops to that specific frequency, the mobile units identify and receive control data transmitted by the base station, which allows the mobile units to lock with the base station and sync with the frequency hopping scheme. (*Id.* at col. 3:61-65). The frequency hopping scheme therefore helps the wireless

communication system to avoid bad channels or frequencies due to radio frequency interference and other problems. (*Id.* at col. 3:65 – col. 4:1).

16. The challenging problem of the frequency hopping scheme is that the system algorithms ensure that, unlike same carrier wireless communications, the contents of consecutive data packets are not correlated. (*Id.* at col. 4:4-7). There is also no way to derive from the first transmission the necessary parameters to perform packet suppression for the second transmission. (*Id.* at col. 1:46-48). In other words, the quality of a prior data packet cannot be used to predict the quality of successive data packets. (*Id.* at col. 1:42-46, col. 4:7-10). This problem frustrates users and has been a longstanding challenge to the developers of cordless communication devices. (*Id.* at col. 48-51). The inventors therefore sought ways to improve voice quality in cordless communications that used frequency hopping schemes.

17. The following is an exemplary implementation of the claimed invention. To improve the voice quality over each communication link, the base station can select a frequency in which to establish a link between the base station and a mobile unit. (*Id.* at col. 4:11-15). The base station monitors the quality of the frequency used on the link. (*Id.* at col. 4:15-16). The quality of the frequency can be determined by measuring parameters that indicate that signal bursts or parts of signal bursts are lost or corrupted over the communication link, or the strength of the signal over the communication link. (*Id.* at col. 4:16-20). If the quality of the frequency is unacceptable, the frequency may be marked as bad such that the next time the marked frequency is used in the frequency hopping scheme, the base station corrects the error. (*Id.* at col. 4:20-27). For example, the base station may mute the data or communicate to the mobile unit that it should use the prior data packet. (*Id.* at col. 4:27-29). Because the base station evaluates on a frequency-by-frequency basis, each mobile unit may actively communication with the base

station on the same or individual frequencies that minimize the loss of voice information over individual links associated with each unit. (*Id.* at col. 4:36-41). For example, if a mobile communication system defines twelve different subsets for groups channels within the frequency band, the system can select the current best ten out of the twelve available subsets to communicate and block the remaining two subsets because those subsets represent poor quality for that communication link. (*Id.* at col. 6:17-24).

18. The claimed invention has a technical advantage over the prior art through its ability to automatically monitor the quality of the frequency used on an individual communications link so that the base station may then perform data correction on the frequency in response to monitored quality of the frequency. (*Id.* at col. 2:14-19). This scheme to improve voice quality can be used with any algorithm to prevent interference with multiple base stations in a system. (*Id.* at col. 4:42-44). Furthermore, this scheme can also avoid selecting frequencies yielding poor quality for individual communication links. (*Id.* at col. 4:50-52).

19. During the prosecution history of the '207 patent, applicant discussed the unconventional features of the claimed invention that distinguished the invention from the prior art. A distinguishing claim limitation discussed was "selecting another frequency after the first time period to transmit and receive data over the communication link; after selecting the another frequency, selecting, during a second time period, the frequency that was monitored during the first time period; and performing, during the second time period, error correction on the selected frequency in response to the monitored quality monitored during the first time period," and similar limitations. (Ex. B at 8-9). The prior art did not disclose being able to "select and monitor a first frequency, select a second frequency, then select the first frequency again, and then perform error correction for the first frequency in response to the monitoring of the first

frequency prior to a selection of the second frequency.” (*Id.* at 8). Rather the prior art disclosed using coder and decoder for detection and correction of errors and carrying out judgement and correction of errors in data as the signal is received. (*Id.* at 8-9).

20. The ‘207 patent was cited during the prosecution history of patents and patent applications owned by companies including Sprint Communications Company L.P., Cisco Technology, Inc. AT&T Intellectual Property I, L.P., RF Micro Devices, Inc. Qualcomm Incorporated, and Samsung Electronics Co. (See <http://patft.uspto.gov/netacgi/nph-Parser?Sect1=PTO2&Sect2=HITOFF&p=1&u=%2Fnetacgi%2FPTO%2Fsearch-bool.html&r=3&f=G&l=50&co1=AND&d=PTXT&s1=6,651,207&OS=6,651,207&RS=6,651,207>; <https://patents.google.com/patent/US6651207B1/en?q=6%2c651%2c207>).

21. **Direct Infringement.** Upon information and belief, Defendant has been directly infringing at least claim 11 of the ‘207 patent in Colorado, and elsewhere in the United States, by performing actions comprising at least using or performing the claimed method for improving voice quality in cordless communications by using the RiTab-10T1 Tablet (“Accused Instrumentality”).

22. Upon information and belief, the Accused Instrumentality performs the step of selecting a unique carrier frequency over an individual communication link, the communication link operable to carry data between at least one mobile unit and a base station. For example, the Accused Instrumentalities implement Bluetooth 4.0 (or later version). (*E.g.*, http://web.archive.org/web/20170523082930/http://www.avalue.com.tw/Product/Intelligent-Systems/Mobile-&-Tablet/Semi-Rugged-Tablet/RiTab-10T1_2384). Using Bluetooth 4.0 (or later version) selects a unique carrier frequency (*e.g.*, a frequency that is determined by adaptive frequency hopping (AFH) pattern) over an individual communication link (Bluetooth link), the

communication link (*e.g.*, Bluetooth link) operable to carry data between at least one mobile unit (*e.g.*, slaves, such as a Bluetooth device) and a base station (*e.g.*, master, such as a computer, laptop, tablet, or mobile phone). (*E.g.*, http://download.ni.com/evaluation/rf/intro_to_bluetooth_test.pdf; https://www.bluetooth.org/docman/handlers/downloaddoc.ashx?doc_id=456433 at 17, 234).

23. Upon information and belief, the Accused Instrumentality performs the step of monitoring the quality of the selected frequency during a first time period. For example, using Bluetooth 4.0 (or later version) monitors the quality of the selected frequency during a first time period for example by assessing whether a channel should be classified as bad because an interference-level measure associated with it has exceeded a threshold. (*E.g.*, https://cdn.rohde-schwarz.com/pws/dl_downloads/dl_application/application_notes/1c108/1C108_0e_Bluetooth_BR_EDR_AFH.pdf; https://www.bluetooth.org/docman/handlers/downloaddoc.ashx?doc_id=456433 at 178).

24. Upon information and belief, the Accused Instrumentality performs the step of selecting another frequency after the first time period to transmit and receive data over the communication link. For example, with Bluetooth 4.0 (or later version), the physical channel is sub-divided into time units known as slots. (*E.g.*, https://www.bluetooth.org/docman/handlers/downloaddoc.ashx?doc_id=456433 at 19, 25). Data is transmitted/received between Bluetooth devices in packets that are positioned in these slots. (*Id.*). Frequency hopping takes place between the transmission or reception of packets. (*Id.*).

25. Upon information and belief, the Accused Instrumentality performs the step of after selecting the another frequency, selecting, during a second time period, the frequency that was monitored during the first time period. For example, Bluetooth 4.0 (or later version) after

selecting another frequency (*e.g.*, frequency hopping) selects at a second time period the frequency that was monitored during the first time period (*e.g.*, the system returns to monitor the first frequency again to determine whether the first frequency is still bad). (*E.g.*, https://cdn.rohde-schwarz.com/pws/dl_downloads/dl_application/application_notes/1c108/1C108_0e_Bluetooth_BR_EDR_AFH.pdf; https://www.bluetooth.org/docman/handlers/downloaddoc.ashx?doc_id=456433 at 66).

26. Upon information and belief, the Accused Instrumentality performs the step of performing, during the second time period, error correction on the selected frequency in response to the monitored quality monitored during the first time period. For example, Bluetooth 4.0 (or later version) performs the step of performing, during the second time period, error correction (*e.g.*, marking the frequency as bad, suppresses any data packets that are to be next transmitted utilizing the bad frequency, and/or retransmitting the data packet) on the selected frequency in response to the monitored quality monitored during the first time period. (*E.g.*, https://cdn.rohde-schwarz.com/pws/dl_downloads/dl_application/application_notes/1c108/1C108_0e_Bluetooth_BR_EDR_AFH.pdf; https://www.bluetooth.org/docman/handlers/downloaddoc.ashx?doc_id=456433 at 43, 66, 178; http://download.ni.com/evaluation/rf/intro_to_bluetooth_test.pdf).

27. Plaintiff has been damaged as a result of Defendant's infringing conduct. Defendant is thus liable to Plaintiff for damages in an amount that adequately compensates Plaintiff for such Defendant's infringement of the '207 patent, *i.e.*, in an amount that by law

cannot be less than would constitute a reasonable royalty for the use of the patented technology, together with interest and costs as fixed by this Court under 35 U.S.C. § 284.

28. On information and belief, Defendant has had at least constructive notice of the '207 patent by operation of law and marking requirements have been complied with.

IV. COUNT II
(PATENT INFRINGEMENT OF UNITED STATES PATENT NO. 7,106,705)

29. Plaintiff incorporates the above paragraphs herein by reference.

30. On September 12, 2006, United States Patent No. 7,106,705 (“the ‘705 Patent”) was duly and legally issued by the United States Patent and Trademark Office. The ‘705 Patent is titled “Method and Communication System for Transmitting Data for a Combination of Several Services via Jointly Used Physical Channels.” A true and correct copy of the ‘705 Patent is attached hereto as Exhibit C and incorporated herein by reference.

31. Sonohm is the assignee of all right, title and interest in the ‘705 patent, including all rights to enforce and prosecute actions for infringement and to collect damages for all relevant times against infringers of the ‘705 Patent. Accordingly, Sonohm possesses the exclusive right and standing to prosecute the present action for infringement of the ‘705 Patent by Defendant.

32. The U.S. application leading to the ‘705 patent was filed May 21, 2001 based on a PCT filed date of November 24, 1999. (Ex. C at cover).

33. The invention in the ‘705 Patent relates to the field of communication for transmitting data for a combination of a plurality of services via jointly used physical connections. (*Id.* at col. 1:8-11).

34. A communication system provides one or more physical transmission channels for transmitting data between a data source and a data sink. (*Id.* at col. 1:15-16). Transmission channels may be a wide variety of types including cable-conducted using electrical or optical signal, or radio transmission via a radio interface using electromagnetic waves. (*Id.* at col. 1:17-20).

35. Radio transmission is used in mobile radio systems in order to set up a connection to a nonstationary subscriber, such as a mobile station. (*Id.* at col. 1:24-24). A mobile station, for example, can be a mobile phone, a laptop computer, or a Bluetooth device. Within coverage of the network, the mobile stations can request a connection from any desired location, or a connection can be set up to the mobile station. (*Id.* at col. 1:25-28). The most common mobile radio system at the time of the patent application was GSM, which was developed for a single service (voice transmission). (*Id.* at col. 1:28-31).

36. In contrast, at the time the application was filed, Europe was standardizing another mobile radio generation, UMTS, which could provide a plurality of services. (*Id.* at col. 1:35-40). Such a standardization had documentation that typically provide an overview of how a transmission protocol can support the transport of data for a plurality of services. (*Id.* at col. 1:41-48). The use of a physical channel for transmitting data for a plurality of services presupposes that a unique mapping specification indicates the allocation of the services to different segments of the physical channel. (*Id.* at col. 1:49-52). For example, a physical channel could be defined as a frequency band, a spread code, and a time slot within a frame. (*Id.* at col. 1:52-55). In order to be able to select the currently used combinations of the transport

formats for the various services in line with requirements, the TFC¹ needs to be able to be changed and therefore the TFCI² needs to be signaled regularly. (*Id.* at col. 2:15-18). However, this signaling ties up transmission capacity. (*Id.* at col. 2:18-19). The greater the number of possible combination options, the more capacity is required for signaling. (*Id.* at col. 2:19-21).

37. Recognizing this problem, the inventors developed a method and communication system that reduces the required signaling capacity without limiting the number of combination options and the selection thereof. (*Id.* at col. 2:25-28). The invention draws a distinction between services with high and low data rate dynamics and uses a matched type of signaling for the transport format currently being used. (*Id.* at col. 2:33-35). No joint signaling for all services takes place, but instead signaling can be individualized. (*Id.* at col. 2:41-45). For services with high data rate dynamics, in-band signaling of the transport format is carried out, and for services with low data rate dynamics, the transport format is signaled in a separate channel. (*Id.* at col. 2:45-48). In-band signaling supports the high dynamics of the data rate change in many services by signaling newly chosen transport formats at an appropriate speed, whereas somewhat slower signaling accompanying the connection is chosen for services with data rates which change only slowly or to a limited extent. (*Id.* at col. 2:48-54).

38. On the basis of stipulating a combination of the currently used transport formats for the services and the signaling thereof, the data for the services are transmitted via the currently available common physical channels on the basis of the combination of the transport formats and, at the reception end, are evaluated on the basis of the signaled combination of the

¹ TCF is the Transport Format Combination which indicates a possible combination of the transport formats for the various services which are mapped onto a common physical channel. (*Id.* at col. 2:1-4).

² TCFO is Transport Format Combination Identifier which indicates the currently used combination of the transport formats within the TFCs. (*Id.* at col. 2:9-11).

transport formats. (*Id.* at col. 2:55-61). With the same number of combination options, less capacity is required for in-band signaling, since only a portion of the services need to be served constantly. (*Id.* at col. 2:62-64).

39. The prosecution history of the ‘705 patent further explains the unconventional features of the claimed invention. The prior art did not disclose transmitting data for first and second services in a first channel, signaling one or more first transport formats for the first services in-band in the first channel, and signaling a second transport format for the second service in a second, separate channel. (Ex. D at 9-10). One reference only disclosed transmitting at different data for a single service without disclosing transmission of first and second services having different data rate dynamics. (*Id.* at 10). Another prior art reference only disclosed transmitting data over a channel that is separate from the signaling information. (*Id.*). However, in the claimed invention, a combination of data for first and second services is transmitted over one channel, signaling information for the first services (having a high data rate dynamics) is also transmitted over the first channel, and signaling information for the second service (having lower data rate dynamics) is transmitted in a second, separate channel. (*Id.* at 11). The claimed method was therefore not the conventional operation disclosed in the prior art. The claims were then allowed.

40. **Direct Infringement.** Upon information and belief, Defendant has been directly infringing at least claim 1 of the ‘705 patent in Colorado, and elsewhere in the United States, by performing actions comprising using or performing the claimed method by using the RiTab-10T1 Tablet (“Accused Instrumentality”).

41. Upon information and belief, the Accused Instrumentality performs the step of specifying one or more first transport formats for first services and a second transport format for

a second service, the first services having higher data rate dynamics than the second service. For example, the Accused Instrumentalities implements Bluetooth 4.0 (or later version). (*E.g.*, http://web.archive.org/web/20170523082930/http://www.avalue.com.tw/Product/Intelligent-Systems/Mobile-&-Tablet/Semi-Rugged-Tablet/RiTab-10T1_2384). Bluetooth 4.0 (or later version) specifies one or more first transport formats (*e.g.*, air bit rate, modulation schemes, etc.) for first services (*e.g.*, Basic Rate/Enhanced Data Rate (“BR/EDR”) services like audio streaming to wireless speakers and/or headphones) and a second transport format (*e.g.*, symbol rate, modulation format etc.) for a second service (*e.g.*, Low Energy (“LE”) services like sensors working on LE), the BR/EDR service having higher data rate dynamics than the LE service. (*E.g.*, https://www.bluetooth.org/docman/handlers/downloaddoc.ashx?doc_id=456433 at 17, 18, 20, 80).

42. Upon information and belief, the Accused Instrumentality performs the step of transmitting a combination of data for the first services and data for the second service over a first channel based on the first and second transport formats. For example, using Bluetooth 4.0 (or later version) transmits a combination of data for the first services (*e.g.*, BR/EDR audio streaming data) and data for the second service (*e.g.*, Low Energy services like sensors transmitting on LE) over a first channel based on the first and second transport formats. (*E.g.*, https://www.bluetooth.org/docman/handlers/downloaddoc.ashx?doc_id=456433 at 49, 54).

43. Upon information and belief, the Accused Instrumentality performs the step of signaling, in-band in the first channel, the one or more first transport formats for the first services. For example, using Bluetooth 4.0 (or later version) sets up channels where the signaling of a transport format, like error connection codes or QoS (Quality of Service)

parameters, is shared on the same channel as data communication. (*E.g.*, https://www.bluetooth.org/docman/handlers/downloaddoc.ashx?doc_id=456433 at 41, 42).

44. Upon information and belief, the Accused Instrumentality performs the step of signaling, in a second channel, the second transport format for the second service, the first channel and the second channel comprising separate channels. For example, using Bluetooth 4.0 (or later version), LE mode is restricted to a communication format where the signaling information is established on a separate channel (*e.g.*, additional links), and not on the data communication channel. Furthermore, physical links between the connected devices are used to transport the logical links. Upon information and belief, the additional links created for signaling in a LE service, signals the information regarding the second service having lower rate dynamics (*e.g.*, an LE service) on a separate channel which is different from the first link/channel (*e.g.*, the channel over which the data communication is taking place and which carries the signaling information regarding BR/EDR services). (*E.g.*, https://www.bluetooth.org/docman/handlers/downloaddoc.ashx?doc_id=456433 at 19, 42, 83).

45. Plaintiff has been damaged as a result of Defendant's infringing conduct. Defendant is thus liable to Plaintiff for damages in an amount that adequately compensates Plaintiff for such Defendant's infringement of the '705 patent, *i.e.*, in an amount that by law cannot be less than would constitute a reasonable royalty for the use of the patented technology, together with interest and costs as fixed by this Court under 35 U.S.C. § 284.

46. On information and belief, Defendant will continue its infringement of one or more claims of the '705 patent unless enjoined by the Court. Each and all of the Defendant's infringing conduct thus causes Plaintiff irreparable harm and will continue to cause such harm without the issuance of an injunction.

IV. JURY DEMAND

Plaintiff, under Rule 38 of the Federal Rules of Civil Procedure, requests a trial by jury of any issues so triable by right.

V. PRAYER FOR RELIEF

WHEREFORE, Plaintiff respectfully requests that the Court find in its favor and against Defendant, and that the Court grant Plaintiff the following relief:

- a. Judgment that one or more claims of United States Patent No. 6,651,207 have been infringed, either literally and/or under the doctrine of equivalents, by Defendant;
- b. Judgment that one or more claims of United States Patent No. 7,106,705 have been infringed, either literally and/or under the doctrine of equivalents, by Defendant;
- c. Judgment that Defendant account for and pay to Plaintiff all damages to and costs incurred by Plaintiff because of Defendant's infringing activities and other conduct complained of herein;
- d. That Plaintiff be granted pre-judgment and post-judgment interest on the damages caused by Defendant's infringing activities and other conduct complained of herein; and
- e. That Plaintiff be granted such other and further relief as the Court may deem just and proper under the circumstances.

March 30, 2020

Respectfully Submitted,

/s/ David R. Bennett

David R. Bennett

(Admitted to the District of Colorado)

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