IN THE UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF DELAWARE

HYBRID AUDIO, LLC, Plaintiff, v. ADVANCED DIGITAL BROADCAST, INC., and ADVANCED DIGITAL BROADCAST SA, Defendant.	**Civil Action No. _____** **JURY TRIAL DEMANDED**

COMPLAINT FOR PATENT INFRINGEMENT

Plaintiff Hybrid Audio, LLC ("Hybrid Audio" or "Plaintiff"), for its Complaint against Advanced Digital Broadcast, Inc. ("ADB USA") and Advanced Digital Broadcast SA ("ADB") (collectively referred herein as "Defendants") alleges the following:

NATURE OF THE ACTION

1. This is an action for patent infringement arising under the Patent Laws of the United States, 35 U.S.C. § 1 *et seq*.

THE PARTIES

2. Plaintiff Hybrid Audio LLC is a limited liability corporation organized and existing under the laws of Virginia, with its principal place of business at 4041 University Drive, Suite 102, Fairfax, Virginia 22030.

3. Upon information and belief, ADB USA is a corporation organized and existing under the laws of the Delaware with its principal place of business at 10901 W. 120th Ave, #140, Broomfield, CO 80021 and can be served at that address.

4. Upon information and belief, ADB is a corporation organized and existing under the laws of Switzerland with it principal place of business at Route De Crassier 21, CH-1262 Eysins, Switzerland and can be served at that address.

5. Upon information and belief, each Defendant sells and offers to sell products and services throughout the United States, including in this judicial district, and introduces products and services into the stream of commerce and that incorporate infringing technology knowing that they would be sold in this judicial district and elsewhere in the United States.

JURISDICTION AND VENUE

6. This is an action for patent infringement arising under the Patent Laws of the United States, Title 35 of the United States Code.

7. This Court has subject matter jurisdiction under 28 U.S.C. §§ 1331 and 1338(a).

8. Venue is proper in this judicial district under 28 U.S.C. § 1400(b). On information and belief, ADB USA is incorporated in the State of Delaware.

9. On information and belief, each Defendant is subject to this Court's general and specific personal jurisdiction because each Defendant has sufficient minimum contacts within the State of Delaware and this District, pursuant to due process and/or the Delaware Long Arm statute because each Defendant purposefully availed itself of the privileges of conducting business in the State of Delaware and in this District, because Defendant regularly conducts and solicits business within the State of Delaware and within this District, and because Plaintiff's causes of action arise directly from each Defendant's business contacts and other activities in the

State of Delaware and this District. Further, this Court has personal jurisdiction over ADB USA because, on information and belief, it is incorporated in Delaware and has purposely availed itself of the privileges and benefits of the laws of the State of Delaware.

BACKGROUND

10. On February 25, 1997, Aware, Inc. ("Aware") filed an application for patent, Serial No 08/804,909 ('909 application"), entitled Signal Processing Utilizing a Tree-Structured Array, in the United States Patent and Trademark Office ("USPTO"). Aware is a corporation existing under the laws of Massachusetts, with an principal place of business at 40 Middlesex Turnpike, Bedford, Massachusetts 01730. The '909 application claimed priority to an original application filed on September 12, 1992. Following prosecution, the pending claims of the '909 application were allowed by the USPTO. On June 26, 2001, U.S. Patent No. 6,252,909 (the "'909 patent") was duly and legally issued by USPTO. A copy of the '909 patent is attached as Exhibit 1.

11. On November 23, 2004, a reissue application was filed for the '909 patent. On July 10, 2007, the '909 patent reissued with certificate number RE40,281. A copy of that Certificate is attached as Exhibit 2.

12. By assignment dated December 22, 2010, Aware assigned all right, title and interest in the RE40,281 and '909 patent to Hybrid Audio LLC ("Hybrid Audio-Texas").

13. On January 11, 2012, counsel for Hybrid Audio-Texas sent each Defendant a letter providing notice that Hybrid Audio-Texas believed that certain of Defendants' products infringed claims of the RE40,281 patent.

14. In April, 2011, Hybrid Audio-Texas filed a patent infringement lawsuit against other parties, asserting infringement of the RE40,281 patent. (*Hybrid Audio LLC v. High Tech*

Computer Corp., et. al Case No. 6:11-cv-00195 (E.D. Tex. 2011).) In that case, Hybrid Audio-Texas alleged that certain elements of so-called "MP3" technology infringed the RE40,281 patent. That prior litigation was subsequently resolved against each of those parties.

15. During the pendency of that prior litigation, on June 18, 2012, a request for reexamination of the RE40,281 patent was filed in the USPTO. That request was assigned Reexamination Request No. 90/012,364. That reexamination proceeded, with the result that every reexamined claim was confirmed. On December 1, 2015, the RE40,281 patent received Reexamination Certificate No. RE40,281 C1, confirming patentability of all of the reexamined claims. A copy of that Reexamination Certificate is attached as Exhibit 3. For convenience, the reexamined C1 patent, including the original '909 patent document and the first RE40,281 patent, are collectively referred to in this Complaint as the "RE281C patent."

16. The RE281C patent expired on September 21, 2012, twenty years after the priority filing date of the original parent application. However, Hybrid Audio-Texas was constrained from seeking royalties or filing lawsuits during the pendency of the most recent reexamination, from June, 2012 through December, 2015. At the same time, the entire period from Defendant's notice of the RE281C patent (at that time, the RE40,218 patent) through the patent expiration is within the statutory six year limitation on past damages under 35. U.S.C. § 286.

17. By assignment dated March 28, 2016, Hybrid Audio-Texas assigned all right, title and interest in the RE281C patent to Hybrid Audio.

18. Accordingly, in the present case, Hybrid Audio is seeking royalties, as set forth below, from the date on which Defendants received notice of their infringement of the RE281C patent, January 11, 2012, or six years prior to the filing of this complaint, whichever is later, to

the expiration of the RE281C patent, September 21, 2012.

19. The RE281C patent is related to certain signal processing technology. As set forth above, it was previously asserted against certain MP3 technologies.

20. MPEG, a working group formally named as ISO/IEC JTC1/SC29/WG11, was established by the ISO/IEC standardization body in 1988 to develop generic (i.e. useful for different applications) standards for the coded representation of moving pictures, associated audio and their combination. Since then, MPEG has undertaken the standardization of compression techniques for video and audio. Originally, its main goal was video coding together with audio coding for digital storage media. In the meantime, the MPEG audio coding standard found its way into many different applications.

21. On information and belief, certain technology included in what is generally known as "MP3" is set forth in technical standards designated "ISO/IEC 11172-3:1993," ("ISO/IEC 11172-3) and "HE-AACv2-ISO/IEC 14496-3:2009(E)" ("ISO/IEC 14496-3:2009(E)") (these relevant standards are collectively referred to herein as the "MP3 Standards"). Due in large part to the popularity of delivering music through the Internet and other electronic forms of distribution, use of audio files consistent with the MP3 Standards has become widespread.

22. Pursuant to relevant policies governing the standards organization, Aware disclosed to the ISO/IEC working group that it might have intellectual property related to one or more of the MP3 Standards. Accordingly, for example, Aware is identified on the "List of patent holders" set forth as Annex H to the ISO/IEC 11172-3 Standard. That Annex H is attached as Exhibit 4.

23. Aware agreed, and Hybrid Audio also agrees, to license users of MP3 technology on reasonable, and non-discriminatory (RAND) terms. Hybrid Audio intends to abide by such

terms by furnishing a courtesy copy of this Complaint upon filing, in advance of service, so that the Parties may amicably agree to such a RAND royalty. If any of the Defendants contests the obligation to abide by such terms, through action or inaction, then Plaintiff shall proceed against any such Defendant as an unwilling licensee and pursue the highest damages and/or other relief available under the law.

24. On information and belief, certain of Defendant's products and services made, used, offered for sale, sold, or imported during the applicable period for which Hybrid Audio seeks royalties practice the MP3 Standards using hardware and software that is not provided by Microsoft Corporation. These products and services incorporated inventions described and claimed in the RE281C patent. These products and services include, but are not limited to, products having designations ADB-2500W; ADB-2850ST; ADB-3721WN; ADB-3800W; ADB-4820CD; ADB-5721WNX; ADB-5810WX; and ADB-6880CDMX.

25. On information and belief, each of these products, as well as other of Defendant's products, practice the MP3 Standards using hardware and software that is not provided by Microsoft Corporation. All such products made, used, offered for sale, sold, or imported between January 11, 2012 (or six years prior to the filing of this complaint, whichever is later) and September 21, 2012 are collectively referred to herein as the "Infringing Instrumentalities."

COUNT I – INFRINGEMENT OF U.S. PATENT NO. RE40,281

26. The allegations set forth in the foregoing paragraphs 1 through 25 are incorporated into this First Claim for Relief.

27. The inventions of the RE281C patent resolve technical problems related to the use of signal processing technology. For example, the inventions allow parties to provide an improved communication system for sending a sequence of signals on a communications link.

Specifically, the communication signals may be arranged to approximate the bands of the human auditory system for audio signal processing applications.

28. The claims of the RE281C patent recite one or more inventive concepts that are rooted in signal processing technology, and overcome problems specifically arising in the realm of signal processing technology.

29. The claims of the RE281C patent recite an invention that is not merely the routine or conventional use of signal processing technology. Instead, to optimize transmission quality audio applications, signal processing is performed, for example, to approximate the bands of the human auditory system for audio signal processing applications. According to one aspect of the invention, this may be achieved through the utilization of specifically recited sets of filter banks, which interact in specifically recited manners.

30. The technology claimed in the RE281C patent does not preempt all ways of electronically transmitting information, nor preempt the use of all signal processing technology, nor preempt any other well-known or prior art technology.

31. Accordingly, each claim of the RE281C patent recites a combination of elements sufficient to ensure that the claim in practice amounts to significantly more than a patent on an ineligible concept.

32. Hybrid Audio is the assignee and owner of the right, title and interest in and to the RE281C patent, including the right to assert all causes of action arising under said patents and the right to any remedies for infringement of them, including remedies for past infringements.

33. Upon information and belief, Defendant has and continues to directly infringe at least claims 5-6, 9-13, 15-22, 24-30, 32-35, 38-42, 45-49, 50-51, 53, 55-61, 63, 65-121 of the

RE281C patent by making, using, selling, importing and/or providing and causing to be used the Infringing Instrumentalities.

34. The Infringing Instrumentalities infringe claim 5 of the RE281C patent. Claim 5 generally recites a signal processing method that includes splitting a signal into subbands using multiple filter banks that form a tree-structured array having a root node and greater than two leaf nodes. Each of the nodes includes a filter bank having greater than two filters, and at least one of the leaf nodes includes a number of filters that differs from the number of filters in another leaf node.

35. The Infringing Instrumentalities infringe claim 5 of the RE281C patent. (*See, e.g.*, ISO/IEC 11172-3, § 0.1 Encoding, p.v; ISO/IEC 11172-3, § 0.2 Layers, p.vi; ISO/IEC 11172-3, § 2.1 Definitions, p.5; ISO/IEC 11172-3, § C.1.1.1 Introduction, p.66; ISO/IEC 11172-3, § 2.4.3.4 Layer III, p.33; ISO/IEC 11172-3, § C.1.5.3.3 Analysis part of the hybrid filterbank, p.95; ISO/IEC 11172-3, § C.1.3 Analysis subband filter, p.67; ISO/IEC 11172-3, § C.1.5.3.3 Analysis part of the hybrid filterbank, p.96; ISO/IEC 11172-3, § 2.4.2.7 Audio data, Layer III, p.26; ISO/IEC 11172-3, § 2.4.2.7 Audio data, Layer III, p.27; ISO/IEC 14496-3:2009(E), Introduction; ISO/IEC 14496-3:2009(E), § 4.6.18.4 SBR filterbanks, p.238; ISO/IEC 14496-3:2009(E), § 4.6.18.5 SBR tool overview, p.246; ISO/IEC 14496-3:2009(E), § 8.6.4 Parametric stereo, p.42.)

36. The Infringing Instrumentalities infringe claim 6 of the RE281C patent. Claim 6 generally recites the method of claim 5, wherein at least one of the filter banks is designed to utilize cosine modulation.

37. The Infringing Instrumentalities infringe claim 6 of the RE281C patent. (*See, e.g.,* ISO/IEC 11172-3, § C.1.5.3.3 Analysis part of the hybrid filterbank, p.96; ISO/IEC 11172-3, § C.1.3 Analysis subband filter, p.67.)

38. The Infringing Instrumentalities infringe claim 9 of the RE281C patent. Claim 9 generally recites the method of claim 5, wherein the signal is an audio signal.

39. The Infringing Instrumentalities infringe claim 9 of the RE281C. (*See, e.g.,* ISO/IEC 11172-3, § 0.1 Encoding, p.v; ISO/IEC 11172-3, § C.1.1.1 Introduction, p.66; ISO/IEC 14496-3:2009(E), § 4.6.18.5 SBR tool overview, p.246; ISO/IEC 14496-3:2009(E), § 8.1 Scope, p.2; ISO/IEC 14496-3:2009(E), § 8.A.1 Overview, p.65; ISO/IEC 14496-3:2009(E), § 8.1 Scope, p.2.)

40. The Infringing Instrumentalities infringe claim 10 of the RE281C patent. Claim 10 generally recites the method of claim 5, wherein at least one of the filter banks is designed to utilize polyphase components.

41. The Infringing Instrumentalities infringe claim 10 of the RE281C patent. (*See, e.g.*, ISO/IEC 14496-3:2009(E), § 4.B.18.2 Analysis filterbank, p.106; ISO/IEC 11172-3, § 2.1 Definitions, p.8; ISO/IEC 14496-3:2009(E), § 4.6.18.4 SBR filterbanks, p.240.)

42. The Infringing Instrumentalities infringe claim 11 of the RE281C patent. Claim 11 generally recites the method of claim 10, wherein the polyphase components are generated using a window comprising 512 samples.

43. The Infringing Instrumentalities infringe claim 11 of the RE281C patent. (*See, e.g.*, ISO/IEC 11172-3, § C.1.3 Analysis subband filter, p.67; ISO/IEC 11172-3, Table C.1, p.68-69; ISO/IEC 11172-3, Figure C.4, p.78.)

44. The Infringing Instrumentalities infringe claim 12 of the RE281C patent. Claim 12 generally recites a signal processing method that includes splitting a signal into subbands using multiple filter banks connected in a tree-structured array having first and second levels. The first level includes a filter bank having more than two filters. The second level includes at least two second level filter banks, each of which has as its input an output from a different filter in the first level. One of the second level filter banks has a different number of filters than another second level filter bank.

45. The Infringing Instrumentalities infringe claim 12 of the RE281C patent. (*See, e.g.,* ISO/IEC 11172-3, § 2.1 Definitions, p.5.; *see also, e.g.,* ISO/IEC 11172-3, § C.1.1.1. Introduction, p.66; ISO/IEC 14496-3:2009(E), § 4.6.18.4 SBR filterbanks, p.238; ISO/IEC 14496-3:2009(E), § 4.6.18.5 SBR tool overview, p.246; ISO/IEC 14496-3:2009(E), § 8.A.3 Decoding process, p.65-66.)

46. The Infringing Instrumentalities infringe claim 13 of the RE281C patent. Claim 13 generally recites the method of claim 12, wherein at least one of the filter banks is designed to utilize cosine modulation.

47. The Infringing Instrumentalities infringe claim 13 of the RE281C patent. (*See, e.g.,* ISO/IEC 11172-3, § C.1.5.3.3 Analysis part of the hybrid filterbank, p.96; ISO/IEC 11172-3, § C.1.3 Analysis subband filter, p.67.)

48. The Infringing Instrumentalities infringe claim 15 of the RE281C patent. Claim 15 generally recites the method of claim 12, wherein the signal is an audio signal.

49. The Infringing Instrumentalities infringe claim 15 of the RE281C patent. (*See, e.g.,* ISO/IEC 11172-3, § 0.1 Encoding, p.v; ISO/IEC 11172-3, § C.1.1.1 Introduction, p.66; ISO/IEC 14496-3:2009(E), § 4.6.18.5 SBR tool overview, p.246.)

50. The Infringing Instrumentalities infringe claim 16 of the RE281C patent. Claim 16 generally recites the method of claim 12, wherein at least one of the filter banks is designed to generate polyphase components.

51. The Infringing Instrumentalities infringe claim 16 of the RE281C patent. (*See, e.g.*, ISO/IEC 11172-3, § 2.1 Definitions, p.8; ISO/IEC 14496-3:2009(E), § 4.6.18.4 SBR filterbanks, p.240.)

52. The Infringing Instrumentalities infringe claim 17 of the RE281C patent. Claim 17 generally recites the method of claim 16, wherein the polyphase components are generated using a window comprising 512 samples.

53. The Infringing Instrumentalities infringe claim 17 of the RE281C patent. (*See, e.g.*, ISO/IEC 11172-3, § C.1.3 Analysis subband filter, p.67.)

54. The Infringing Instrumentalities infringe claim 18 of the RE281C patent. Claim 18 generally recites a signal processing method, comprising synthesizing a signal using a plurality of synthesis filter banks connected to form a tree structured array having greater than two leaf nodes and a root node, wherein each of the nodes comprises one synthesis filter bank having greater than two filters, with at least one of the leaf nodes having a number of filters that differs from the number of filters in a second leaf node.

55. The Infringing Instrumentalities infringe claim 18 of the RE281C patent. (*See, e.g.*, ISO/IEC 11172-3, Fig. 2 §0.4 Decoding, p.vi; ISO/IEC 11172-3, § 2.1 Definitions, p.9; *see also e.g.*, ISO/IEC 11172-3, § 2.4.3.4 Layer III, p.33; ISO/IEC 11172-3, § C.1.5.3.3 Analysis part of the hybrid filterbank, p.95; ISO/IEC 11172-3, § 2.4.3.4.10 Synthesis filterbank, p.36; *see also e.g.*, ISO/IEC 11172-3, § 2.4.3.4.10.2 IMDCT, p.36; ISO/IEC 11172-3, § 2.4.3.4.10.3 Windowing, p.37.)

56. The Infringing Instrumentalities infringe claim 19 of the RE281C patent. Claim 19 generally recites the method of claim 18, wherein at least one of the synthesis filter banks is designed to utilize polyphase components.

57. The Infringing Instrumentalities infringe claim 19 of the RE281C patent. (*See, e.g.,* ISO/IEC 11172-3, § 2.1 Definitions, p.8.)

58. The Infringing Instrumentalities infringe claim 20 of the RE281C patent. Claim 20 generally recites the method of claim 19, wherein the polyphase components are generated using a window length of 512 samples.

59. The Infringing Instrumentalities infringe claim 20 of the RE281C patent. (*See, e.g.,* ISO/IEC 11172-3, § 2.4.3.3.5 Synthesis subband filter, p.32; ISO/IEC 11172-3, Table B.3, p.50-52; ISO/IEC 11172-3, Figure A.2, p.39.)

60. The Infringing Instrumentalities infringe claim 21 of the RE281C patent. Claim 21 generally recites the method of claim 18, wherein at least one of the synthesis filter banks is designed to transform frequency components into polyphase components by cosine modulating the frequency components.

61. The Infringing Instrumentalities infringe claim 21 of the RE281C patent. (*See, e.g.*, ISO/IEC 11172-3, § 2.4.3.3.5 Synthesis subband filter, p.32; ISO/IEC 11172-3, Fig. A.4 Annex A, p.41.)

62. The Infringing Instrumentalities infringe claim 22 of the RE281C patent. Claim 22 generally recites the method of claim 18, wherein the signal is a regenerated time-domain audio signal.

63. The Infringing Instrumentalities infringe claim 22 of the RE281C patent. (*See, e.g.*, ISO/IEC 11172-3, Fig. 2 §0.4 Decoding, p.vi; ISO/IEC 11172-3, Fig. A.4 Annex A, p.41.)

64. The Infringing Instrumentalities infringe claim 24 of the RE281C patent. Claim 24 generally recites the method of claim 18, wherein the tree-structured array is designed to synthesize a decompressed audio signal.

65. The Infringing Instrumentalities infringe claim 24 of the RE281C patent. (*See, e.g.*, ISO/IEC 11172-3, Fig. 2 §0.4 Decoding, p.vi; ISO/IEC 11172-3, Fig. A.4 Annex A, p.41.)

66. The Infringing Instrumentalities infringe claim 25 of the RE281C patent. Claim 25 generally recites the method of claim 18, wherein at least one of the synthesis filter banks is designed to transform sub-band components into polyphase components by cosine modulating the sub-band components.

67. The Infringing Instrumentalities infringe claim 25 of the RE281C patent. (*See, e.g.*, ISO/IEC 11172-3, § 2.4.3.3.5 Synthesis subband filter, p.32; ISO/IEC 11172-3, Fig. A.4 Annex A, p.41.)

68. The Infringing Instrumentalities infringe claim 26 of the RE281C patent. Claim 26 of the RE281C patent generally recites a signal processing method comprising synthesizing a signal using a plurality of synthesis filter banks connected in a tree-structured array having a first and a second level, wherein the first level comprises more than two first level synthesis filter banks, and one first level synthesis filter bank has a different number of filters than another first level synthesis filter bank, and the second level comprises one synthesis filter bank having more than two filters, the second level having as inputs the outputs of the first level synthesis filter banks.

69. The Infringing Instrumentalities infringe claim 26 of the RE281C patent. (*See, e.g.*, ISO/IEC 11172-3, Fig. 2 §0.4 Decoding, p.vi; ISO/IEC 11172-3, § 0.2 Layers, p.vi; *see also e.g.*, ISO/IEC 11172-3, Fig. A.4 Annex A, p.41; ISO/IEC 11172-3, § C.1.5.3.3 Analysis part of

the hybrid filterbank, p.95; ISO/IEC 11172-3, § 2.4.3.4.10 Synthesis filterbank, p.36; ISO/IEC 11172-3, Fig. A.4 Annex A, p.41; *see also e.g.*, ISO/IEC 11172-3, § 2.4.3.4.10.2 IMDCT, p.36; ISO/IEC 11172-3, § 2.4.2.7 Audio data, Layer III, p.26.)

70. The Infringing Instrumentalities infringe claim 27 of the RE281C patent. Claim 27 generally recites the method of claim 26, wherein at least one of the synthesis filter banks is designed to utilize polyphase components.

71. The Infringing Instrumentalities infringe claim 27 of the RE281C patent. (*See, e.g.*, ISO/IEC 11172-3, § 2.1 Definitions, p.8; ISO/IEC 11172-3, § 2.1 Definitions, p.9; ISO/IEC 11172-3, Fig. A.4 Annex A, p.41.)

72. The Infringing Instrumentalities infringe claim 28 of the RE281C patent. Claim 28 generally recites the method of claim 27, wherein the polyphase components are generated using a window length of 512 samples.

73. The Infringing Instrumentalities infringe claim 28 of the RE281C patent. (*See, e.g.*, ISO/IEC 11172-3, § 2.4.3.3.5 Synthesis subband filter, p.32; *See also e.g.*, ISO/IEC 11172-3, Figure A.2, p.39.)

74. The Infringing Instrumentalities infringe claim 29 of the RE281C patent. Claim 29 generally recites the method of claim 26, wherein the polyphase components are generated using a window length of 512 samples.

75. The Infringing Instrumentalities infringe claim 29 of the RE281C patent. (*See, e.g.*, ISO/IEC 11172-3, § 2.4.3.3.5 Synthesis subband filter, p.32; ISO/IEC 11172-3, Fig. A.4 Annex A, p.41.)

76. The Infringing Instrumentalities infringe claim 30 of the RE281C patent. Claim 30 generally recites the method of claim 26, wherein the signal is a reconstructed audio signal.

77. The Infringing Instrumentalities infringe claim 30 of the RE281C patent. (*See, e.g.*, ISO/IEC 11172-3, Fig. 2 §0.4 Decoding, p.vi; ISO/IEC 11172-3, Fig. A.4 Annex A, p.41.)

78. The Infringing Instrumentalities infringe claim 32 of the RE281C patent. Claim 32 of the RE281C patent generally recites the method of claim 26, wherein the tree-structured array is designed to synthesize a decompressed audio signal.

79. The Infringing Instrumentalities infringe claim 32 of the RE281C patent. (*See, e.g.*, ISO/IEC 11172-3, Fig. 2 §0.4 Decoding, p.vi; ISO/IEC 11172-3, Fig. A.4 Annex A, p.41.)

80. The Infringing Instrumentalities infringe claim 33 of the RE281C patent. Claim 33 generally recites the method of claim 26 wherein at least one of the synthesis filter banks is designed to transform sub-bandcomponents into polyphase components by cosine modulating the sub-band components.

81. The Infringing Instrumentalities infringe claim 33 of the RE281C patent. (*See, e.g.*, ISO/IEC 11172-3, § 2.4.3.3.5 Synthesis subband filter, p.32; ISO/IEC 11172-3, Fig. A.4 Annex A, p.41.)

82. The Infringing Instrumentalities infringe claim 34 of the RE281C patent. Claim 34 generally recites a signal processing system that includes multiple filter banks that can connect to form a tree-structured array to split a signal into subbands, the tree-structured array having a root node and more than two leaf nodes. Each of the nodes includes one filter bank having more than two filters, and at least one of the leaf nodes has a different number of filters than another of the leaf nodes.

83. The Infringing Instrumentalities infringe claim 34 of the RE281C patent. (*See, e.g.*, ISO/IEC 11172-3, § 2.1 Definitions, p.5; ISO/IEC 11172-3, § C.1.1.1 Introduction, p.66; ISO/IEC 14496-3:2009(E), Introduction.)

84. The Infringing Instrumentalities infringe claim 35 of the RE281C patent. Claim 35 generally recites the system of claim 34, wherein at least one of the filter banks is designed to utilize cosine modulation.

85. The Infringing Instrumentalities infringe claim 35 of the RE281C patent. (*See, e.g.*, ISO/IEC 11172-3, § C.1.5.3.3 Analysis part of the hybrid filterbank, p.96; ISO/IEC 11172-3, § C.1.3 Analysis subband filter, p.67.)

86. The Infringing Instrumentalities infringe claim 38 of the RE281C patent. Claim 38 generally recites the system of claim 34, wherein the signal is an audio signal.

87. The Infringing Instrumentalities infringe claim 38 of the RE281C patent. (*See, e.g.*, ISO/IEC 11172-3, § 0.1 Encoding, p.v; ISO/IEC 11172-3, § C.1.1.1 Introduction, p.66; ISO/IEC 14496-3:2009(E), § 4.6.18.5 SBR tool overview, p.246.)

88. The Infringing Instrumentalities infringe claim 39 of the RE281C patent. Claim 39 generally recites the system of claim 34, wherein at least one of the filter banks is designed to utilize polyphase components.

89. The Infringing Instrumentalities infringe claim 39 of the RE281C patent. (*See, e.g.*, ISO/IEC 11172-3, § 2.1 Definitions, p.8; ISO/IEC 14496-3:2009(E), § 4.6.18.4 SBR filterbanks, p.240.)

90. The Infringing Instrumentalities infringe claim 40 of the RE281C patent. Claim 40 generally recites the system of claim 39, wherein the polyphase components are generated using a window comprising 512 samples.

91. The Infringing Instrumentalities infringe claim 40 of the RE281C patent. (*See, e.g.*, ISO/IEC 11172-3, § C.1.3 Analysis subband filter, p.67; ISO/IEC 11172-3, Table C.1, p.68-69.)

92. The Infringing Instrumentalities infringe claim 41 of the RE281C patent. Claim 41 generally recites a signal processing system that includes multiple filter banks that can connect to form a tree-structured array to split a signal into subbands, the tree-structured array having first and second levels. The first level of the array includes one first level filter bank having more than two filters; and the second level of the filter bank includes at least two second level filter banks. Each second level filter bank has as its input an output from a different filter in the first level, and one second level filter bank has a different number of filters than another second level filter bank.

93. The Infringing Instrumentalities infringe claim 41 of the RE281C patent. (*See, e.g.*, ISO/IEC 11172-3, § C.1.1.1 Introduction, p.66; ISO/IEC 11172-3, § 2.4.3.4 Layer III, p.33; ISO/IEC 14496-3:2009(E), Introduction; ISO/IEC 14496-3:2009(E), § 8.6.4 Parametric stereo, p.42; ISO/IEC 14496-3:2009(E), § 8.C.6.2 Parameter Estimation, p.106; ISO/IEC 14496-3:*see also e.g.*, 2009(E), § 8.6.4.3 Low frequency filtering, p.44.)

94. The Infringing Instrumentalities infringe claim 42 of the RE281C patent. Claim 42 of the RE281C patent generally recites the system of claim 41, wherein at least one of the filter banks is designed to utilize cosine modulation.

95. The Infringing Instrumentalities infringe claim 42 of the RE281C patent. (*See, e.g.*, ISO/IEC 11172-3, § C.1.5.3.3 Analysis part of the hybrid filterbank, p.96; ISO/IEC 11172-3, § C.1.3 Analysis subband filter, p.67.)

96. The Infringing Instrumentalities infringe claim 45 of the RE281C patent. Claim 45 generally recites the system of claim 41, wherein the signal is an audio signal.

97. The Infringing Instrumentalities infringe claim 45 of the RE281C patent. (*See, e.g.,* ISO/IEC 11172-3, § 0.1 Encoding, p.v.; ISO/IEC 11172-3, § C.1.1.1 Introduction, p.66; ISO/IEC 14496-3:2009(E), § 4.6.18.5 SBR tool overview, p.246.)

98. The Infringing Instrumentalities infringe claim 46 of the RE281C patent. Claim 46 generally recites the system of claim 41, wherein at least one of the filter banks is designed to generate polyphase components.

99. The Infringing Instrumentalities infringe claim 46 of the RE281C patent. (*See, e.g.,* ISO/IEC 11172-3, § 2.1 Definitions, p.8; ISO/IEC 14496-3:2009(E), § 4.6.18.4 SBR filterbanks, p.240.)

100. The Infringing Instrumentalities infringe claim 47 of the RE281C patent. Claim 47 generally recites the system of claim 46, wherein the polyphase components are generated using a window comprising 512 samples.

101. The Infringing Instrumentalities infringe claim 47 of the RE281C patent. (*See, e.g.,* ISO/IEC 11172-3, Table C.1, p.68-69.)

102. The Infringing Instrumentalities infringe claim 48 of the RE281C patent. Claim 48 generally recites a signal processing system comprising a plurality of synthesis filter banks that can connect to form a tree-structured array to synthesize a signal, the tree-structured array having greater than two leaf nodes and a root node, wherein each of the nodes comprises one synthesis filter bank having greater than two filters, with at least one of the leaf nodes having a number of filters that differs from the number of filters in a second leaf node.

103. The Infringing Instrumentalities infringe claim 48 of the RE281C patent. (*See, e.g.,* ISO/IEC 11172-3, Fig. 2 §0.4 Decoding, p.vi; ISO/IEC 11172-3, § 2.4.3.4.10 Synthesis

filterbank, p.36; *see also e.g.,* ISO/IEC 11172-3, § C.1.5.3.3 Analysis part of the hybrid filterbank, p.95.)

104. The Infringing Instrumentalities infringe claim 49 of the RE281C patent. Claim 49 generally recites the system of claim 48, wherein at least one of the synthesis filter banks is designed to generate polyphase components.

105. The Infringing Instrumentalities infringe claim 49 of the RE281C patent. (*See, e.g.*, ISO/IEC 11172-3, § 2.1 Definitions, p.8; ISO/IEC 11172-3, § 2.1 Definitions, p.9; *See also* e.g., ISO/IEC 11172-3, Fig. A.4 Annex A, p.41.)

106. The Infringing Instrumentalities infringe claim 50 of the RE281C patent. Claim 50 generally recites the system of claim 48, wherein at least one of the synthesis filter banks is designed to transform frequency components into polyphase components by cosine modulating the frequency components.

107. The Infringing Instrumentalities infringe claim 50 of the RE281C patent. (*See, e.g.*, ISO/IEC 11172-3, § 2.4.3.3.5 Synthesis subband filter, p.32; ISO/IEC 11172-3, Fig. A.4 Annex A, p.41.)

108. The Infringing Instrumentalities infringe claim 51 of the RE281C patent. Claim 51 generally recites the system of claim 48, wherein the signal is a decompressed audio signal.

109. The Infringing Instrumentalities infringe claim 51 of the RE281C patent. (*See, e.g.*, ISO/IEC 11172-3, Fig. 2 §0.4 Decoding, p.vi; ISO/IEC 11172-3, Fig. A.4 Annex A, p.41.)

110. The Infringing Instrumentalities infringe claim 53 of the RE281C patent. Claim 53 generally recites the system of claim 48, is designed to synthesized decompressed audio signal.

111. The Infringing Instrumentalities infringe claim 53 of the RE281C patent. (*See, e.g.,* ISO/IEC 11172-3, Fig. 2 §0.4 Decoding, p.vi; ISO/IEC 11172-3, Fig. A.4 Annex A, p.41.)

112. The Infringing Instrumentalities infringe claim 55 of the RE281C patent. Claim 55 generally recites the system of claim 48, wherein at least one of the synthesis filter banks is designed to transform sub-band components into polyphase components by cosine modulating the sub-band components.

113. The Infringing Instrumentalities infringe claim 55 of the RE281C patent. (*See, e.g.*, ISO/IEC 11172-3, § 2.4.3.3.5 Synthesis subband filter, p.32; ISO/IEC 11172-3, Fig. A.4 Annex A, p.41.)

114. The Infringing Instrumentalities infringe claim 56 of the RE281C patent. Claim 56 generally recites the system of claim 55, wherein the polyphase components are generated using a window length of 512 samples.

115. The Infringing Instrumentalities infringe claim 56 of the RE281C patent. (*See, e.g.*, ISO/IEC 11172-3, § 2.4.3.3.5 Synthesis subband filter, p.32; ISO/IEC 11172-3, Table B.3, p.50-52.)

116. The Infringing Instrumentalities infringe claim 57 of the RE281C patent. Claim 57 generally recites a signal processing system comprising plurality of synthesis filter banks designed that can connect to form a tree-structured array to synthesize a signal, the tree-structured array having a first and a second level, wherein the first level comprises more than two first level synthesis filter banks, and one first level synthesis filter bank has a different number of filters than another first level synthesis filter bank, and the second level comprises one synthesis filter bank having more than two filters, the second level having as inputs the outputs of the first level synthesis filter banks.

117. The Infringing Instrumentalities infringe claim 57 of the RE281C patent. (*See, e.g.*, ISO/IEC 11172-3, Fig. 2 §0.4 Decoding, p.vi; ISO/IEC 11172-3, § 0.2 Layers, p.vi; ISO/IEC 11172-3, § 2.4.3.4.10 Synthesis filterbank, p.36; ISO/IEC 11172-3, Fig. A.4 Annex A, p.41.)

118. The Infringing Instrumentalities infringe claim 58 of the RE281C patent. Claim 58 generally recites the system of claim 57, wherein at least one of the synthesis filter banks is designed to generate polyphase components.

119. The Infringing Instrumentalities infringe claim 58 of the RE281C patent. (*See, e.g.*, ISO/IEC 11172-3, § 2.1 Definitions, p.8; ISO/IEC 11172-3, § 2.1 Definitions, p.9.)

120. The Infringing Instrumentalities infringe claim 59 of the RE281C patent. Claim 59 generally recites the system of claim 58, wherein the polyphase components are generated using a window length of 512 samples.

121. The Infringing Instrumentalities infringe claim 59 of the RE281C patent. (*See, e.g.*, ISO/IEC 11172-3, § 2.4.3.3.5 Synthesis subband filter, p.32; ISO/IEC 11172-3, Figure A.2, p.39.)

122. The Infringing Instrumentalities infringe claim 60 of the RE281C patent. Claim 60 generally recites the system of claim 57, wherein at least one of the synthesis filter banks is designed to transform frequency components into polyphase components by cosine modulating the frequency components.

123. The Infringing Instrumentalities infringe claim 60 of the RE281C patent. (*See, e.g.*, ISO/IEC 11172-3, § 2.4.3.3.5 Synthesis subband filter, p.32; ISO/IEC 11172-3, Fig. A.4 Annex A, p.41.)

124. The Infringing Instrumentalities infringe claim 63 of the RE281C patent. Claim 63 generally recites the system of claim 57, wherein the tree-structured array is designed to synthesize a decompressed audio signal.

125. The Infringing Instrumentalities infringe claim 63 of the RE281C patent. (*See, e.g.*, ISO/IEC 11172-3, Fig. 2 §0.4 Decoding, p.vi; ISO/IEC 11172-3, Fig. A.4 Annex A, p.41.)

126. The Infringing Instrumentalities infringe claims 65 of the RE281C patent. Claim 65 generally recites the system of claim 57, wherein at least one of the synthesis filter banks transforms sub-band components into polyphase components by cosine modulating the sub-band components.

127. The Infringing Instrumentalities infringe claim 65 of the RE281C patent. (*See, e.g.*, ISO/IEC 11172-3, § 2.4.3.3.5 Synthesis subband filter, p.32; ISO/IEC 11172-3, Fig. A.4 Annex A, p.41.)

128. The Infringing Instrumentalities infringe claim 66 of the RE281C patent. Claim 66 generally recites a signal processing system that includes means for splitting a signal into subbands using multiple filter banks that can connect to form a tree-structured array having a root node and greater than two leaf nodes. Each node includes one filter bank having greater than two filters, and at least one of the leaf nodes has a different number of filters than a second of the leaf nodes.

129. The Infringing Instrumentalities infringe claim 66 of the RE281C patent. (*See, e.g.*, ISO/IEC 11172-3, § 0.1 Encoding, p.v.; ISO/IEC 11172-3, § 2.1 Definitions, p.5; ISO/IEC 14496-3:2009(E), § 4.6.18.4 SBR filterbanks, p.238.)

130. The Infringing Instrumentalities infringe claim 67 of the RE281C patent. Claim 67 generally recites the system of claim 66 wherein at least one of the filter banks is designed to utilize cosine modulation.

131. The Infringing Instrumentalities infringe claim 67 of the RE281C patent. (*See, e.g.*, ISO/IEC 11172-3, § C.1.5.3.3 Analysis part of the hybrid filterbank, p.96; ISO/IEC 11172-3, § C.1.3 Analysis subband filter, p.67.)

132. The Infringing Instrumentalities infringe claim 68 of the RE281C patent. Claim 68 generally recites the system of claim 66, wherein the signal is an audio signal.

133. The Infringing Instrumentalities infringe claim 68 of the RE281C patent. (*See, e.g.*, ISO/IEC 11172-3, § 0.1 Encoding, p.v; ISO/IEC 11172-3, § C.1.1.1 Introduction, p.66.)

134. The Infringing Instrumentalities infringe claim 69 of the RE281C patent. Claim 69 generally recites the system of claim 66, wherein at least one of the filter banks is designed to generate polyphase components.

135. The Infringing Instrumentalities infringe claim 69 of the RE281C patent. (*See, e.g.*, ISO/IEC 11172-3, § 2.1 Definitions, p.8; ISO/IEC 14496-3:2009(E), § 4.6.18.4 SBR filterbanks, p.240.)

136. The Infringing Instrumentalities infringe claim 70 of the RE281C patent. Claim 70 generally recites the system of claim 69, wherein the polyphase components are generated using a window comprising 512 samples.

137. The Infringing Instrumentalities infringe claim 70 of the RE281C patent. (*See, e.g.*, ISO/IEC 11172-3, Table C.1, p.68-69.)

138. The Infringing Instrumentalities infringe claim 71 of the RE281C patent. Claim 71 generally recites a signal processing system that includes means for splitting a signal into sub-

bands using multiple filter banks that can connect to form a tree-structured array having first and second levels. The first level of the array includes one filter bank having more than two filters. The second level of the array includes at least two second level filter banks. Each second level filter bank has as its input an output from a different filter in the first level, and one second level filter bank has a different number of filters than another second level filter bank.

139. The Infringing Instrumentalities infringe claim 71 of the RE281C patent. (*See, e.g.*, ISO/IEC 11172-3, § 0.1 Encoding, p.v.; ISO/IEC 11172-3, § C.1.5.3.3 Analysis part of the hybrid filterbank, p.96; ISO/IEC 14496-3:2009(E), Introduction; ISO/IEC 14496-3:2009(E), § 4.6.18.4 SBR filterbanks, p.238.)

140. The Infringing Instrumentalities infringe claim 72 of the RE281C patent. Claim 72 generally recites the system of claim 71, wherein at least one of the filter banks is designed to utilize cosine modulation.

141. The Infringing Instrumentalities infringe claim 72 of the RE281C patent. (*See, e.g.*, ISO/IEC 11172-3, § C.1.5.3.3 Analysis part of the hybrid filterbank, p.96; ISO/IEC 11172-3, § C.1.3 Analysis subband filter, p.67; ISO/IEC 14496-3:2009(E), § 8.A.3 Decoding process, p.65-66; ISO/IEC 14496-3:2009(E), § 8.6.4.3 Low frequency filtering, p.47.)

142. The Infringing Instrumentalities infringe claim 73 of the RE281C patent. Claim 73 generally recites the system of claim 71, wherein the signal is an audio signal.

143. The Infringing Instrumentalities infringe claim 73 of the RE281C patent. (*See, e.g.*, ISO/IEC 11172-3, § 0.1 Encoding, p.v; ISO/IEC 11172-3, § C.1.1.1 Introduction, p.66; ISO/IEC 14496-3:2009(E), § 4.6.18.5 SBR tool overview, p.246; ISO/IEC 14496-3:2009(E), § 8.A.1 Overview, p.65.)

144. The Infringing Instrumentalities infringe claim 74 of the RE281C patent. Claim 74 generally recites the system of claim 71, wherein at least one of the filter banks is designed to generate polyphase components.

145. The Infringing Instrumentalities infringe claim 74 of the RE281C patent. (*See e.g.*, ISO/IEC 11172-3, § 2.1 Definitions, p.8; ISO/IEC 14496-3:2009(E), § 4.6.18.4 SBR filterbanks, p.240.)

146. The Infringing Instrumentalities infringe claim 75 of the RE281C patent. Claim 75 generally recites the system of claim 74, wherein the polyphase components are generated using a window comprising 512 samples.

147. The Infringing Instrumentalities infringe claim 75 of the RE281C patent. (*See, e.g.*, ISO/IEC 11172-3, Table C.1, p.68-69; ISO/IEC 11172-3, § C.1.3 Analysis subband filter, p.67.)

148. The Infringing Instrumentalities infringe claim 76 of the RE281C patent. Claim 76 recites a signal processing system comprising means for synthesizing a signal using a plurality of synthesis filter banks that can connect to form a tree-structured array having greater than two leaf nodes and a root node, wherein each of the nodes comprises one synthesis filter bank having greater than two filters, with at least one of the leaf nodes having a number of filters that differs from the number of filters in a second leaf node.

149. The Infringing Instrumentalities infringe claim 76 of the RE281C patent. (*See, e.g.*, ISO/IEC 11172-3, Fig. 2 §0.4 Decoding, p.vi; ISO/IEC 11172-3, § 0.2 Layers, p.vi; ISO/IEC 11172-3, § 2.4.3.4.10 Synthesis filterbank, p.36; ISO/IEC 11172-3, § C.1.5.3.3 Analysis part of the hybrid filterbank, p.95; ISO/IEC 11172-3, § 2.4.3.4.10.2 IMDCT, p.36.)

150. The Infringing Instrumentalities infringe claim 77 of the RE281C patent. Claim 77 generally recites the system of claim 76, wherein at least one of the synthesis filter banks is designed to utilize polyphase components.

151. The Infringing Instrumentalities infringe claim 77 of the RE281C patent. (*See, e.g.*, ISO/IEC 11172-3, § 2.1 Definitions, p.8; ISO/IEC 11172-3, § 2.1 Definitions, p.9.)

152. The Infringing Instrumentalities infringe claim 78 of the RE281C patent. Claim 78 generally recites the system of claim 77, wherein the polyphase components are generated using a window length of 512 samples.

153. The Infringing Instrumentalities infringe claim 78 of the RE281C patent. (*See, e.g.*, ISO/IEC 11172-3, § 2.4.3.3.5 Synthesis subband filter, p.32; ISO/IEC 11172-3, Table B.3, p.50-52.)

154. The Infringing Instrumentalities infringe claim 79 of the RE281C patent. Claim 79 generally recites the system of claim 76, wherein at least one of the synthesis filter banks is designed to transform frequency components into polyphase components by cosine modulating the frequency components.

155. The Infringing Instrumentalities infringe claim 79 of the RE281C patent. (*See, e.g.*, ISO/IEC 11172-3, § 2.4.3.3.5 Synthesis subband filter, p.32; *see also e.g.*, ISO/IEC 11172-3, Fig. A.4 Annex A, p.41.)

156. The Infringing Instrumentalities infringe claim 80 of the RE281C patent. Claim 80 generally recites the system of claim 76, wherein the signal is a reconstructed audio signal.

157. The Infringing Instrumentalities infringe claim 80 of the RE281C patent. (*See, e.g.*, ISO/IEC 11172-3, Fig. 2 §0.4 Decoding, p.vi; ISO/IEC 11172-3, Fig. A.4 Annex A, p.41.)

158. The Infringing Instrumentalities infringe claim 81 of the RE281C patent. Claim 81 generally recites the system of claim 76, wherein the tree-structured array is designed to synthesize a decompressed audio signal.

159. The Infringing Instrumentalities infringe claim 81 of the RE281C patent. (*See, e.g.*, ISO/IEC 11172-3, Fig. 2 §0.4 Decoding, p.vi; ISO/IEC 11172-3, Fig. A.4 Annex A, p.41.)

160. The Infringing Instrumentalities infringe claim 82 of the RE281C patent. Claim 82 generally recites the system of claim 76, wherein at least one of the synthesis filter banks is designed to transform sub-band components into polyphase components by cosine modulating the sub-band components.

161. The Infringing Instrumentalities infringe claim 82 of the RE281C patent. (*See, e.g.*, ISO/IEC 11172-3, § 2.4.3.3.5 Synthesis subband filter, p.32; ISO/IEC 11172-3, Fig. A.4 Annex A, p.41.)

162. The Infringing Instrumentalities infringe claim 83 of the RE281C patent. Claim 83 generally recites a signal processing system comprising means for synthesizing a signal using a plurality of synthesis filter banks that can connect to form a tree-structured array having a first and a second level, wherein the first level comprises more than two first level synthesis filter banks, and one first level synthesis filter bank has a different number of filters than another first level synthesis filter bank, and the second level comprises one synthesis filter bank having more than two filters, the second level having as inputs the outputs of the first level synthesis filter banks.

163. The Infringing Instrumentalities infringe claim 83 of the RE281C patent. (*See, e.g.*, ISO/IEC 11172-3, Fig. 2 §0.4 Decoding, p.vi; ISO/IEC 11172-3, § 2.4.3.4.10 Synthesis

filterbank, p.36; ISO/IEC 11172-3, Fig. A.4 Annex A, p.41; *see also e.g*. ISO/IEC 11172-3, § 2.4.3.4.10.2 IMDCT, p.36; ISO/IEC 11172-3, § 2.4.2.7 Audio data, Layer III, p.27.)

164. The Infringing Instrumentalities infringe claim 84 of the RE281C patent. Claim 84 generally recites the system of claim 83, wherein at least one of the synthesis filter banks is designed to utilize polyphase components.

165. The Infringing Instrumentalities infringe claim 84 of the RE281C patent. (*See, e.g.*, ISO/IEC 11172-3, § 2.1 Definitions, p.9; ISO/IEC 11172-3, Fig. A.4 Annex A, p.41.)

166. The Infringing Instrumentalities infringe claim 85 of the RE281C patent. Claim 85 generally recites the system of claim 84, wherein the polyphase components are generated using a window length of 512 samples.

167. The Infringing Instrumentalities infringe claim 85 of the RE281C patent. (*See, e.g.*, ISO/IEC 11172-3, § 2.4.3.3.5 Synthesis subband filter, p.32; ISO/IEC 11172-3, Figure A.2, p.39)

168. The Infringing Instrumentalities infringe claim 86 of the RE281C patent. Claim 86 of the RE281C patent generally recites the system of claim 83, wherein at least one of the synthesis filter banks is designed to transform frequency components into polyphase components by cosine modulating the frequency components.

169. The Infringing Instrumentalities infringe claim 86 of the RE281C patent. (*See, e.g.*, ISO/IEC 11172-3, § 2.4.3.3.5 Synthesis subband filter, p.32; ISO/IEC 11172-3, Fig. A.4 Annex A, p.41; ISO/IEC 11172-3, Fig. A.4 Annex A, p.41.)

170. The Infringing Instrumentalities infringe claim 87 of the RE281C patent. Claim 87 generally recites the system of claim 83 wherein the signal is a reconstructed audio signal.

171. The Infringing Instrumentalities infringe claim 87 of the RE281C patent. (*See, e.g.*, ISO/IEC 11172-3, Fig. 2 §0.4 Decoding, p.vi; ISO/IEC 11172-3, Fig. A.4 Annex A, p.41.)

172. The Infringing Instrumentalities infringe claim 88 of the RE281C patent. Claim 88 generally recites the system of claim 83, wherein the tree-structured array is designed to synthesize a decompressed audio signal.

173. The Infringing Instrumentalities infringe claim 88 of the RE281C patent. (*See, e.g.*, ISO/IEC 11172-3, Fig. 2 §0.4 Decoding, p.vi; ISO/IEC 11172-3, Fig. A.4 Annex A, p.41.)

174. The Infringing Instrumentalities infringe claim 89 of the RE281C patent. Claim 89 generally recites the system of claim 83, wherein at least one of the synthesis filter banks is designed to transform sub-band components into polyphase components by cosine modulating the sub-band components.

175. The Infringing Instrumentalities infringe claim 89 of the RE281C patent. (*See, e.g.*, ISO/IEC 11172-3, § 2.4.3.3.5 Synthesis subband filter, p.32; ISO/IEC 11172-3, Fig. A.4 Annex A, p.41.)

176. The Infringing Instrumentalities infringe claim 90 of the RE281C patent. Claim 90 generally recites an information storage media storing information that when executed splits a signal into subbands using multiple filter banks connected to form a tree-structured array having a root node and greater than two leaf nodes. Each node includes one filter bank having greater than two filters, and at least one of the leaf nodes has a different number of filters than a second of the leaf nodes.

177. The Infringing Instrumentalities infringe claim 90 of the RE281C patent. (*See, e.g.*, ISO/IEC 11172-3, § 2.1 Definitions, p.5*;* ISO/IEC 14496-3:2009(E), § 4.6.18.4 SBR filterbanks, p.238; ISO/IEC 14496-3:2009(E), § 8.A.3 Decoding process, p.65-66.)

178. The Infringing Instrumentalities infringe claim 91 of the RE281C patent. Claim 91 generally recites the media of claim 90, wherein at least one of the filter banks is designed to utilize cosine modulation.

179. The Infringing Instrumentalities infringe claim 91 of the RE281C patent. (*See, e.g.,* ISO/IEC 11172-3, § C.1.5.3.3 Analysis part of the hybrid filterbank, p.96; ISO/IEC 11172-3, § C.1.3 Analysis subband filter, p.67.)

180. The Infringing Instrumentalities infringe claim 92 of the RE281C patent. Claim 92 generally recites the media of claim 90, wherein the signal is an audio signal.

181. The Infringing Instrumentalities infringe claim 92 of the RE281C patent. (*See, e.g.,* ISO/IEC 11172-3, § 0.1 Encoding, p.v.; ISO/IEC 14496-3:2009(E), § 4.6.18.5 SBR tool overview, p.246.)

182. The Infringing Instrumentalities infringe claim 93 of the RE281C patent. Claim 93 generally recites the media of claim 90, wherein at least one of the filter banks is designed to utilize polyphase components.

183. The Infringing Instrumentalities infringe claim 93 of the RE281C patent. (*See, e.g.,* ISO/IEC 11172-3, § 2.1 Definitions, p.8; ISO/IEC 14496-3:2009(E), § 4.6.18.4 SBR filterbanks, p.240; ISO/IEC 14496-3:2009(E), § 4.B.18.2 Analysis filterbank, p.106.)

184. The Infringing Instrumentalities infringe claim 94 of the RE281C patent. Claim 94 generally recites the media of claim 93, wherein the polyphase components are generated using a window comprising 512 samples.

185. The Infringing Instrumentalities infringe claim 94 of the RE281C patent. (*See, e.g.,* ISO/IEC 11172-3, § C.1.3 Analysis subband filter, p.67.)

186. The Infringing Instrumentalities infringe claim 95 of the RE281C patent. Claim 95 of the RE281C patent generally recites an information storage media storing information that when executed splits a signal into sub-bands using multiple filter banks connected in a tree-structured array having a first and a second level. The first level of the array includes one filter bank having more than two filters. The second level of the array includes at least two filter banks. Each second level filter bank has as its input an output from a different filter in the first level, and one second level filter bank has a different number of filters than another second level filter bank.

187. The Infringing Instrumentalities infringe claim 95 of the RE281C patent. (*See, e.g.*, ISO/IEC 11172-3, § 0.2 Layers, p.vi; ISO/IEC 11172-3, § C.1.1.2 The filterbank, p.67; ISO/IEC 14496-3:2009(E), § 4.6.18.4 SBR filterbanks, p.238; ISO/IEC 14496-3:2009(E), § 8.6.4 Parametric stereo, p.42; ISO/IEC 14496-3:2009(E), § 8.A.3 Decoding process, p.65-66.)

188. The Infringing Instrumentalities infringe claim 96 of the RE281C patent. Claim 96 of the RE281C patent generally recites the media of claim 95, wherein at least one of the filter banks is designed to utilize cosine modulation.

189. The Infringing Instrumentalities infringe claim 96 of the RE281C patent. (*See, e.g.*, ISO/IEC 11172-3, § C.1.3 Analysis subband filter, p.67; ISO/IEC 11172-3, § C.1.3 Analysis subband filter, p.67.)

190. The Infringing Instrumentalities infringe claim 97 of the RE281C patent. Claim 97 generally recites the media of claim 95, wherein the signal is an audio signal.

191. The Infringing Instrumentalities infringe claim 97 of the RE281C patent. (*See, e.g.*, ISO/IEC 11172-3, § 0.1 Encoding, p.v.; ISO/IEC 14496-3:2009(E), § 4.6.18.5 SBR tool overview, p.246.)

192. The Infringing Instrumentalities infringe claim 98 of the RE281C patent. Claim 98 generally recites the media of claim 95, wherein at least one of the filter banks is designed to generate polyphase components.

193. The Infringing Instrumentalities infringe claim 98 of the RE281C patent. (*See, e.g.*, ISO/IEC 11172-3, § 2.1 Definitions, p.8; ISO/IEC 14496-3:2009(E), § 4.6.18.4 SBR filterbanks, p.240.)

194. The Infringing Instrumentalities infringe claim 99 of the RE281C patent. Claim 99 generally recites the media of claim 98, wherein the polyphase components are generated using a window comprising 512 samples.

195. The Infringing Instrumentalities infringe claim 99 of the RE281C patent. (*See, e.g.*, ISO/IEC 11172-3, Table C.1, p.68-69.)

196. The Infringing Instrumentalities infringe claim 100 of the RE281C patent. Claim 100 recites an information storage media having stored thereon information that when executed synthesizes a signal using a plurality of synthesis filter banks connected to form a tree structured array having greater than two leaf nodes and a root node, wherein each of the nodes comprises one synthesis filter bank having greater than two filters, with at least one of the leaf nodes having a number of filters that differs from the number of filters in a second leaf node.

197. The Infringing Instrumentalities infringe claim 100 of the RE281C patent. (*See, e.g.* ISO/IEC 11172-3, § 0.2 Layers, p.vi; ISO/IEC 11172-3, § 2.4.3.4.10 Synthesis filterbank, p.36; ISO/IEC 11172-3, § 2.4.3.4 Layer III, p.33; ISO/IEC 11172-3, Fig. A.4 Annex A, p.41; ISO/IEC 11172-3, § 2.4.2.7 Audio data, Layer III, p.27.)

198. The Infringing Instrumentalities infringe claim 101 of the RE281C patent. Claim 101 generally recites the media of claim 100, wherein at least one of the synthesis filter banks is designed to utilize polyphase components.

199. The Infringing Instrumentalities infringe claim 101 of the RE281C patent. (*See, e.g.,* ISO/IEC 11172-3, § 2.1 Definitions, p.8; ISO/IEC 11172-3, Fig. A.4 Annex A, p.41.)

200. The Infringing Instrumentalities infringe claim 102 of the RE281C patent. Claim 102 generally recites the media of claim 101, wherein the polyphase components are generated using a window length of 512 samples.

201. The Infringing Instrumentalities infringe claim 102 of the RE281C patent. (*See, e.g.,* ISO/IEC 11172-3, § 2.4.3.3.5 Synthesis subband filter, p.32; ISO/IEC 11172-3, Table B.3, p.50-52.)

202. The Infringing Instrumentalities infringe claim 103 of the RE281C patent. Claim 103 generally recites the media of claim 100, wherein at least one of the synthesis filter banks is designed to transform frequency components into polyphase components by cosine modulating the frequency components.

203. The Infringing Instrumentalities infringe claim 103 of the RE281C patent. (*See, e.g.,* ISO/IEC 11172-3, § 2.4.3.3.5 Synthesis subband filter, p.32; ISO/IEC 11172-3, Fig. A.4 Annex A, p.41.)

204. The Infringing Instrumentalities infringe claim 104 of the RE281C patent. Claim 104 generally recites the media of claim 100, wherein wherein the signal is a reconstructed audio signal.

205. The Infringing Instrumentalities infringe claim 104 of the RE281C patent. (*See, e.g.*, ISO/IEC 11172-3, Fig. 2 §0.4 Decoding, p.vi; ISO/IEC 11172-3, Fig. A.4 Annex A, p.41.)

206. The Infringing Instrumentalities infringe claim 105 of the RE281C patent. Claim 105 generally recites the media of claim 100, wherein the tree-structured array is designed to synthesize a decompressed audio signal.

207. The Infringing Instrumentalities infringe claim 105 of the RE281C patent. (*See, e.g.*, ISO/IEC 11172-3, Fig. 2 §0.4 Decoding, p.vi; ISO/IEC 11172-3, Fig. A.4 Annex A, p.41.)

208. The Infringing Instrumentalities infringe claim 106 of the RE281C patent. Claim 106 generally recites the media of claim 100, wherein at least one of the synthesis filter banks is designed to transform sub-band components into polyphase components by cosine modulating the sub-band components.

209. The Infringing Instrumentalities infringe claim 106 of the RE281C patent. (*See, e.g.*, ISO/IEC 11172-3, § 2.4.3.3.5 Synthesis subband filter, p.32; ISO/IEC 11172-3, Fig. A.4 Annex A, p.41.)

210. The Infringing Instrumentalities infringe claim 107 of the RE281C patent. Claim 107 generally recites an information storage media having stored thereon information that when executed synthesizes a signal using a plurality of synthesis filter banks connected in a tree-structured array having a first and a second level.

211. The Infringing Instrumentalities infringe claim 107 of the RE281C patent. (*See, e.g.*, ISO/IEC 11172-3, § 0.2 Layers, p.vi; ISO/IEC 11172-3, § 2.4.3.4.10 Synthesis filterbank, p.36; ISO/IEC 11172-3, § C.1.5.3.3 Analysis part of the hybrid filterbank, p.95.)

212. The Infringing Instrumentalities infringe claim 108 of the RE281C patent. Claim 108 generally recites the media of claim 107, wherein at least one of the synthesis filter banks is designed to generate polyphase components.

213. The Infringing Instrumentalities infringe claim 108 of the RE281C patent. (*See, e.g.,* ISO/IEC 11172-3, § 2.1 Definitions, p.8; ISO/IEC 11172-3, § 2.1 Definitions, p.9; ISO/IEC 11172-3, Fig. A.4 Annex A, p.41.)

214. The Infringing Instrumentalities infringe claim 109 of the RE281C patent. Claim 109 generally recites the media of claim 108, wherein the polyphase components are generated using a window comprising 512 samples.

215. The Infringing Instrumentalities infringe claim 109 of the RE281C patent. (*See, e.g.*, ISO/IEC 11172-3, § 2.4.3.3.5 Synthesis subband filter, p.32; ISO/IEC 11172-3, Figure A.2, p.39.)

216. The Infringing Instrumentalities infringe claim 110 of the RE281C patent. Claim 10 recites the media of claim 107, wherein at least one of the synthesis filter banks is designed to transform frequency components into polyphase components by cosine modulating the frequency components.

217. The Infringing Instrumentalities infringe claim 110 of the RE281C patent. (*See, e.g.*, ISO/IEC 11172-3, § 2.4.3.3.5 Synthesis subband filter, p.32; ISO/IEC 11172-3, Fig. A.4 Annex A, p.41.)

218. The Infringing Instrumentalities infringe claim 111 of the RE281C patent. Claim 11 generally recites the media of claim 111, wherein the signal is a decompressed audio signal.

219. The Infringing Instrumentalities infringe claim 111 of the RE281C patent. (*See, e.g.*, ISO/IEC 11172-3, Fig. 2 §0.4 Decoding, p.vi; ISO/IEC 11172-3, Fig. A.4 Annex A, p.41.)

220. The Infringing Instrumentalities infringe claim 112 of the RE281C patent. Claim 112 generally recites the media of claim 107, wherein the tree-structured array is designed to synthesize a decompressed audio signal.

221. The Infringing Instrumentalities infringe claim 112 of the RE281C patent. (*See, e.g.,* ISO/IEC 11172-3, Fig. 2 §0.4 Decoding, p.vi; ISO/IEC 11172-3, Fig. A.4 Annex A, p.41.)

222. The Infringing Instrumentalities infringe claim 113 of the RE281C patent. Claim 113 generally recites the media of claim 107, wherein at least one of the synthesis filter banks is designed to transform sub-band components into polyphase components by cosine modulating the sub-band components.

223. The Infringing Instrumentalities infringe claim 113 of the RE281C patent. (*See, e.g.,* ISO/IEC 11172-3, § 2.4.3.3.5 Synthesis subband filter, p.32; ISO/IEC 11172-3, Fig. A.4 Annex A, p.41; ISO/IEC 11172-3, § 2.1 Definitions, p.5; ISO/IEC 11172-3, § 2.4.3.4 Layer III, p.33; ISO/IEC 11172-3, § 2.4.2.7 Audio data, Layer III, p.26; ISO/IEC 14496-3:2009(E), § 8.C.6.2 Parameter Estimation, p.106; ISO/IEC 14496-3:2009(E), § 8.6.4.3 Low frequency filtering, p.44.)

224. The Infringing Instrumentalities infringe claim 114 of the RE281C patent. Claim 114 generally recites an information storage media storing audio information having been split into subbands using multiple filter banks connected to form a tree-structured array having a root node and greater than two leaf nodes. Each node includes at least one filter bank having greater than two filters, and at least one of the leaf nodes has a different number of filters than a second one of the leaf nodes.

225. The Infringing Instrumentalities infringe claim 114 of the RE281C patent. (*See, e.g.,* ISO/IEC 11172-3, § 0.2 Layers, p.vi.; ISO/IEC 11172-3, § 2.1 Definitions, p.5; ISO/IEC 14496-3:2009(E), § 4.6.18.5 SBR tool overview, p.246; ISO/IEC 14496-3:2009(E), § 8.6.4 Parametric stereo, p.42; ISO/IEC 14496-3:2009(E), § 8.6.4.3 Low frequency filtering, p.44.)

226. The Infringing Instrumentalities infringe claim 115 of the RE281C patent. Claim 115 generally recites the media of claim 114, wherein the information is audio information.

227. The Infringing Instrumentalities infringe claim 115 of the RE281C patent. (*See, e.g.*, ISO/IEC 11172-3, § 0.1 Encoding, p.v; ISO/IEC 14496-3:2009(E), § 4.6.18.5 SBR tool overview, p.246; ISO/IEC 14496-3:2009(E), § 8.A.1 Overview, p.65.)

228. The Infringing Instrumentalities infringe claim 116 of the RE281C patent. Claim 116 generally recites an information storage media storing audio information having been split into sub-bands using multiple filter bands connected in a tree-structured array having first and second levels. The first level of the array includes one filter bank having more than two filters. The second level of the array includes at least two filter banks. Each second level filter bank has as its input an output from a different filter in the first level, and one second level filter bank has a different number of filters than another second level filter bank.

229. The Infringing Instrumentalities infringe claim 116 of the RE281C patent. (*See, e.g.*, ISO/IEC 11172-3, § 0.2 Layers, p.vi; ISO/IEC 11172-3, § C.1.3 Analysis subband filter, p.67; ISO/IEC 14496-3:2009(E), § 4.6.18.4 SBR filterbanks, p.238; ISO/IEC 14496-3:2009(E), § 8.A.3 Decoding process, p.65-66.)

230. The Infringing Instrumentalities infringe claim 117 of the RE281C patent. Claim 117 generally recites the media of claim 116, wherein the information is audio information.

231. The Infringing Instrumentalities infringe claim 117 of the RE281C patent. (*See, e.g.*, ISO/IEC 11172-3, § 0.1 Encoding, p.v.; ISO/IEC 11172-3, § C.1.1.1 Introduction, p.66; ISO/IEC 14496-3:2009(E), § 4.6.18.5 SBR tool overview, p.246; ISO/IEC 14496-3:2009(E), § 8.A.1 Overview, p.65.)

232. The Infringing Instrumentalities infringe claim 118 of the RE281C patent. Claim 118 generally recites a method of regenerating a signal using a plurality of synthesis filter banks connected to form a tree-structured array having greater than two leaf nodes and a root node, wherein each of the nodes comprises one synthesis filter bank having greater than two filters, with at least one of the leaf nodes having a number of filters that differs from the number of filters in a second lead node.

233. The Infringing Instrumentalities infringe claim 118 of the RE281C patent. (*See, e.g.*, ISO/IEC 11172-3, § 2.4.3.4.10 Synthesis filterbank, p.36; ISO/IEC 11172-3, § 2.4.3.4 Layer III, p.33; ISO/IEC 11172-3, Fig. A.4 Annex A, p.41; ISO/IEC 11172-3, § 2.4.3.4.10.3 Windowing, p.37.)

234. The Infringing Instrumentalities infringe claim 119 of the RE281C patent. Claim 119 generally recites the media of claim 118, wherein the regenerated signal is an audio signal.

235. The Infringing Instrumentalities infringe claim 119 of the RE281C patent. (*See, e.g.*, ISO/IEC 11172-3, Fig. 2 §0.4 Decoding, p.vi.)

236. The Infringing Instrumentalities infringe claim 120 of the RE281C patent. Claim 120 generally recites a method of reconstructing a signal using a plurality of synthesis filter banks connected in a tree-structured array having a first and a second level, wherein the first level comprises more than two first level synthesis filter banks, and one first level synthesis filter bank has a different number of filters than another first level synthesis filter bank, and the second level comprises one synthesis filter bank having more than two filters, the second level having as inputs the outputs of the first level synthesis filter banks.

237. The Infringing Instrumentalities infringe claim 120 of the RE281C patent. (*See, e.g.*, ISO/IEC 11172-3, § 2.1 Definitions, p.9; ISO/IEC 11172-3, § 2.4.3.4.10 Synthesis

filterbank, p.36; ISO/IEC 11172-3, § C.1.5.3.3 Analysis part of the hybrid filterbank, p.95; ISO/IEC 11172-3, § 2.4.3.4.10.2 IMDCT, p.36.)

238. The Infringing Instrumentalities infringe claim 121 of the RE281C patent. Claim 121 generally recites the media of claim 120, wherein the regenerated signal is an audio signal.

239. The Infringing Instrumentalities infringe claim 121 of the RE281C patent. (*See, e.g.*, ISO/IEC 11172-3, Fig. 2 §0.4 Decoding, p.vi; ISO/IEC 11172-3, Fig. A.4 Annex A, p.41.)

240. On information and belief, the Infringing Instrumentalities are used marketed, provided to, and/or used by or for Defendant's partners, clients, customers and end users across the country and in this District.

241. Upon information and belief, since at least the date of Hybrid Audio-Texas' notice letter, Defendant has induced and continues to induce others to infringe at least one claim of the RE281C patent under 35 U.S.C. § 271(b) by, among other things, and with specific intent or willful blindness, actively aiding and abetting others to infringe, including but not limited to Defendant's partners, clients, customers, and end users, whose use of the Infringing Instrumentalities constitutes direct infringement of at least one claim of the RE281C patent.

242. In particular, Defendant's actions that aid and abet others such as its partners, customers, clients, and end users to infringe include advertising and distributing the Infringing Instrumentalities and providing instruction materials, training, and services regarding the Infringing Instrumentalities. On information and belief, Defendant has engaged in such actions with specific intent to cause infringement or with willful blindness to the resulting infringement because Defendant has had actual knowledge of the RE281C patent and knowledge that its acts were inducing infringement of the RE281C patent since at least the date Defendant received notice that such activities infringed the RE281C patent.

243. Upon information and belief, Defendant is liable as a contributory infringer of the RE281C patent under 35 U.S.C. § 271(c) by offering to sell, selling and importing into the United States wireless communications devices to be especially made or adapted for use in an infringement of the RE281C patent. The Infringing Instrumentalities are a material component for use in practicing the RE281C patent and are specifically made and are not a staple article of commerce suitable for substantial non-infringing use.

244. Upon information and belief, since at least the time Defendant received notice, Defendant's infringement has been willful.

245. Hybrid Audio has been harmed by Defendant's infringing activities.

JURY DEMAND

Pursuant to Rule 38 of the Federal Rules of Civil Procedure, Hybrid Audio demands a trial by jury on all issues triable as such.

PRAYER FOR RELIEF

WHEREFORE, if Plaintiff Hybrid Audio is unsuccessful securing a reasonable and non-discriminatory royalty prior to service of this Complaint, Plaintiff Hybrid Audio demands judgment for itself and against Defendant as follows:

A. An adjudication that Defendant has infringed the RE281C patent;

B. An award of damages to be paid by Defendant adequate to compensate Hybrid Audio for Defendant's past infringement of said patents, and any continuing or future infringement through the date such judgment is entered, including interest, costs, expenses and an accounting of all infringing acts including, but not limited to, those acts not presented at trial;

C. A declaration that this case is exceptional under 35 U.S.C. § 285, and an award of Plaintiff's reasonable attorneys' fees; and

D. An award to Hybrid Audio of such further relief at law or in equity as the Court deems just and proper.

Dated: February 7, 2018

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