

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

RØDE MICROPHONES, LLC AND
FREEDMAN ELECTRONICS PTY LTD,
Petitioners

v.

ZAXCOM, INC.,
Patent Owner.

IPR2025-00230
IPR2025-00232

Patent 7,711,443
Patent 10,276,207

DECLARATION OF DR. CHRIS KYRIAKAKIS IN SUPPORT OF
REPLIES TO PATENT OWNER'S RESPONSES

Zaxcom Exhibits		
Exhibit Name	230 IPR Exhibit #	232 IPR Exhibit #
Declaration of James D. Defilippis	2140	2058
Dr. Kyriakakis Deposition Transcript	2119	2030
Jeffrey Wexler Declaration	2126	2037
William Sarokin Declaration	2127	2036
Glenn Sanders Technical Achievement Award #2	2114	2045
Glenn Sanders Emmy Award Photo #3	2112	2043
68th Engineering Emmy Awards Program	2128	2038
Engineering Emmy Awards Press Release	2129	2039
Engineering Emmy Awards Entry Form	2130	2040
TRX900AA Manual	2131	2031
TRX900LA & TRX900LAS Manual	2132	2032
Glenn Sanders Emmy Award Photo #1	2110	2041
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I. SUMMARY OF MATERIALS REVIEWS AND CONSIDERED

1. All of the opinions contained in this Declaration are based on the documents I reviewed and my knowledge and professional judgment. In forming the opinions expressed in this Declaration, while drawing on my experience in the field of audio signal processing and sound localization (including my teaching, research, and consulting experiences), I reviewed the Challenged Patents, their file histories, the prior art, Patent Owner's Response, and all exhibits cited in this declaration, including the documents in the Table of Exhibits submitted with the Petitioners' Reply filed concurrently with this Declaration.

2. I may rely upon these materials and/or additional materials to rebut arguments raised by Zaxcom. Further, I may also consider additional documents and information in forming any necessary opinions including documents that may not yet have been provided to me.

3. My opinions are additionally guided by my appreciation of how a POSA would have understood the claims of the Challenged Patents at the time of the alleged invention, which I have been asked to assume is July 14, 2005.

II. LEVEL OF SKILL IN THE ART

4. I see no reason to deviate from the definition of a POSA set out in my previous Declaration. I maintain that a person of ordinary skill in the art at the time of the claimed priority date of the Challenged Patents would have had a Bachelor's degree in electrical engineering or a related or equivalent field, and two or more years of experience working with audio systems. Based upon my personal experience, with that level of education and experience a POSA would be familiar with the technologies and techniques relevant to the challenged claims. This includes technology relating to the recording of audio signals, RF transmission technology, storage technology, audio signal processing, timing signals, GPS, etc. The audio technology claimed in the challenged claims was neither complex nor unpredictable as of July 2005, and a POSA would not have had any difficulty understanding or implementing the technologies at issue. I easily qualified as a POSA prior to July 2005, and indeed consider myself to be an expert in the technologies relevant to the challenged patents. Indeed, I would be a POSA even under Mr. DeFilippis' formulation of the level of ordinary skill.

5. Mr. DeFilippis seeks to add the extra requirements of “two to five years of experience working with multi-track audio and wireless communications systems in the professional performance industry.” I do not agree. There were multiple

wireless radio technologies available off-the-shelf prior to July 2005 that were suitable for communicating audio. This includes WiFi 802.11(g), Bluetooth 2.0, GSM, 3G, and 900 MHz and 2.4 GHz cordless digital phone systems. There would have been no need for a POSA to have actually worked two to five years with wireless technologies in order to implement transmitters and receivers to carry timecodes and audio as recited in the claims. Such off-the-shelf technology could be readily implemented without such lengthy hands-on experience. Nor do I agree with needing two to five years of hand-on experience specifically with "multi-track audio." The concept of multi-track audio is fairly basic and includes, for instance, stereo audio files that have been known and created for over half a century. It essentially entails multiple streams or channels of audio and some very basic knowledge of mixing. My proposed level of skill, which includes two years of working with audio systems, would already be more than sufficient for a POSA to understand multi-track audio at a level relevant to the challenged patents. And I certainly do not agree with needing two to five years of experience in the "professional performance industry." Neither the challenged claims, nor even the patent specifications, limit the claimed inventions to a professional environment. They merely require a generic audio "creator" or "user," which could

include amateurs or prosumers. Nor do the claims impose any particular performance requirements on the claimed components or functions that would even suggest they are limited to a professional context.

III. CLAIM CONSTRUCTION

6. I have been informed that claim terms are normally afforded their ordinary and customary meaning as would have been understood by a POSA at the time of invention. In determining the ordinary meaning, the language of the claims, the specification, and the prosecution history are to be taken into account. I further understand that a claim term may not possess its ordinary meaning if the specification provides a clear definition for the term or if the patentee unmistakably disclaimed or disavowed the full scope of the ordinary meaning either in the specification or during prosecution.

“locally generated audio”

7. In paragraph 131, Mr. Defilippis contends that this claim term means “separate, isolated audio created by the wearer of the local audio device receiving the locally generated audio, such audio suitable for use as an independent track of audio.” Ex. 2140, ¶ 131. Then in paragraph 156, he offers the somewhat different construction: “audio created by the wearer of the local audio device receiving the

locally generated audio, such audio suitable for use as an independent track of audio.” *Id.*, ¶ 156. His explanation for this second construction in paragraph 156 contradicts his first proposed construction. More particularly, in paragraph 156, he states that according to the specification, the local audio device captures “only, ***or primarily***, the audio created by the performer wearing the local audio device” *Id.* But if the captured audio merely needs to be “primarily” the audio generated by the performer, then some of the captured audio may be from a different source(s). But this contradicts his first construction that requires the locally generated audio to be the “***separate, isolated*** audio created by the wearer.” *Id.*, ¶ 131. In any event, I disagree that a POSA would understand “locally generated audio” to mean either of the proposed constructions.

8. To the extent that either of Mr. Defilippis’ constructions require that “locally generated audio” be generated solely by the wearer of the local audio device, I disagree. The challenged claims in the ’443 and ’207 patents, which are all apparatus claims, merely recite that the local audio device be “wearable” and not that it actually be worn at all. Therefore, it does not make much sense that “locally generated audio,” by itself, should be defined in terms of who is wearing the local audio device, i.e., “audio *created by the wearer* of the local audio device.”

9. I also disagree with Mr. Defilippis' requirement that "locally generated audio" must be "suitable for use as an independent track of audio." A POSA would understand that to be an intended use for the audio but not the meaning of "locally generated audio" itself. I further observe that the only reference to an "independent track of audio" appears in the paragraph at column 10, lines 4-34 of the '443 specification. This paragraph does not mention "local audio" or "locally generated audio" and therefore a POSA would not understand this paragraph to be defining disclaiming the meaning of these terms in some manner, let alone in a manner different from their ordinary meaning.

10. Mr. Defilippis cites three passages from the specification as allegedly supporting his view that "locally generated audio" is limited to audio from a particular performer and must be suitable for multi-track recording. *Id.*, ¶ 134. The first quoted passage is from the Abstract of the '443 patent. *Id.*, (i). But the ellipsis omits that the Abstract states that "[i]n **some aspects** of the present invention, each performer is equipped with a local audio device capable of locally recording the respective performer's audio while also transmitting it to a master recorder." Ex. 1001, Abstract (emphasis added). Thus, the invention is not limited to capturing only the audio of the performer equipped with the local audio device. Similarly, the

second quoted passage is written in permissive, not limiting, language, such as “performers **may** each don a local audio device ... audio from multiple local audio devices **may be** transmitted to a multi-track recorder” Ex. 2140, ¶ 134 at (ii) (citing *id.*, 12:27-28 and 13:18-21) (emphasis added). And again, Mr. Defilippis omits the prefatory “[f]or example” language of both cited passages. The third quoted passage is also couched in permissive language – “e.g.” and “may be.” *Id.*, (iii) (citing Ex. 1001, 15:19-21). In sum, the patent specification does not expressly define “locally generated audio” or otherwise limit the invention to a local audio device that receives audio only from the wearer and that such audio must be suitable for use as an independent track of audio. At most, Mr. Defilippis relies on passages that are merely exemplary embodiments of the invention. A POSA would not understand these passages or the specification to be modifying or limiting the ordinary meaning of “locally generated audio.” In view of the foregoing, it is my opinion that a POSA would understand “locally generated audio” to have its plain ordinary meaning – “audio generated near the local audio device.”

11. Patent Owner cites my deposition testimony referring to “the goal of multitrack recording.” POR, 9. But I was merely reciting one of the stated goals and purported advantages of the invention. I did not testify, and do not believe, that

a POSA would understand the claims that do not expressly recite multi-track recording to be limited to this goal, or that the meaning of “locally generated audio” includes this goal. Further, my testimony about multi-track recording applies only to “multi-track” claims such as dependent Claim 15 and would not apply to other claims.

12. The POR also cites my testimony about an “ambient mic.” POR, 10 (citing Ex. 2119, 54:2-55:2). But that testimony was in response to a question about “a track that has all of the audio on it,” which I considered to be a “strange” hypothetical involving a “distant microphone[]” that would not actually pick up all of the audio but would instead “pick up the reflected sound in the hall,” resulting in a track that would not be usable in production. Ex. 2119, 53:21-55:10. Even if an ambient track comprising sound reflections from the entire concert hall would not be usable in production, it does not follow, as Patent Owner implies, that a track containing two or more voices as recorded by a local audio device would be useless. For instance, there could be three performers singing harmony wherein just one performer has a local audio device, which collectively records their harmony vocals. In my view, all three of their voices would comprise “locally generated audio” and

“local audio” within the ordinary meaning of these terms and within the scope of the claim.

13. Mr. Defilippis also construes “audio data” to mean “mono or stereo audio files created from independent, isolated locally generated audio, such files suitable for creation of a multi-track audio file.” Ex. 2140, ¶ 131. This construction again introduces the concept that the locally generated audio contains only the audio of the performer wearing the local audio device (“independent, isolated locally generated audio”) and adds the requirement that the audio files are suitable for creation of a multi-track audio file. I disagree with this construction for substantially the reasons I have already explained. The specification does not restrict the invention to having the local audio device record the audio of a single person, nor does it require the recorded audio to be suitable for multi-track. At most there are exemplary embodiments that describe using audio data to create multi-track files. But as noted above, whether a track is suitable for creation of a multi-track file is an intended use of the “audio data” and not the ordinary meaning of the term. I also note that such a construction would appear to make claim 15 of the ’443 patent redundant, as element 1[F] requires “creating local audio data from said locally generated audio,”

and claim 15 adds the requirement that the “local audio data is combined electronically to create a single multi-track data file.”

14. I also do not believe that “stereo or mono” should be part of the construction. The ’443 specification does not mention “mono,” and while it mentions “stereo” once, it does so in an exemplary non-limiting manner. Ex. 1001, 11:14-19 (“The operating mode of each local audio device *can* encompass *any one of a number of modes*. *For example*, the operating modes *may* include USA or European modes, as well as stereo modes.”) (emphasis added).

“local audio device wearable by a creator of said locally generated audio”

15. Mr. Defilippis proposes a construction of “a local audio device suitable to be worn by the performer who creates *the* audio that is recorded by that performer’s local audio device.” Ex. 2140, ¶ 137 (emphasis added). I agree that “wearable” means “suitable to be worn.” I also agree that a “creator” includes any performer/person who generates audio. And I also agree that the structure of the claim sets forth that audio generated by a creator is received by the audio input device and is ultimately recorded/stored in the memory as audio data. However, I take issue with the definite article “the” (highlighted above). To the extent that this “the” requires or implies that the device must record *only* the audio generated by the

creator for whom the device is wearable and must exclude all other audio, I believe that is an incorrect and overly narrow reading of the claim language. As I understand it, claim 1 is a “comprising” claim that permits additional unrecited elements so long as they are not expressly excluded. In my view, audio generated by performers/persons who are not wearing the local audio device that is recorded by the local audio device is not outside the claim so long as the device also records some audio generated by the creator for whom the device is wearable.

16. Additionally, the phrase being construed recites “a creator,” which I understand can mean one or more creators. Therefore, there could be two creators/performers for whom the local audio device is “wearable.” Those two performers may engage in a conversation with one another wherein they are both generating audio that gets recorded by a single local audio device that is worn by only one of the performers. In my view, recording the audio of both such creators would be consistent with the claim. As I noted above, the specification passages cited by Mr. Defilippis do not require every performer to wear a local audio device, as the passages are couched in permissive and exemplary language. Nor does the specification or claims expressly exclude a local audio device from recording audio generated by sources other than the creator for whom the device is wearable.

17. In view of the foregoing, I would modify Mr. Defilippis' construction to eliminate the highlighted definite article: "a local audio device suitable to be worn by the performer who creates [] audio that is recorded by that performer's local audio device."

"multi-track data file"

18. This claim term is relevant to dependent claim 15 of the '443 patent. In my opinion, this term should bear its ordinary meaning, as I do not see any definitions or disclaimers in the specification that alter the ordinary meaning. To a POSA, this term just means "a data file comprising multiple tracks of audio." The ordinary meaning of the term is agnostic as to the source or content of the audio tracks.

19. Mr. Defilippis contends that this term should be construed to mean: "a data file consisting of multiple, separate streams of sound with individual instruments or voices recorded on separate tracks." *Id.*, ¶ 141. My initial observation is that the '443 specification does not mention "instruments" or "voices," let alone "individual" instruments or voices. Therefore, I do not see how the specification is definitional in a manner that supports Mr. Defilippis's construction that alters the ordinary meaning.

20. Nor do the specification passages cited by Mr. Defilippis support limiting the broad term “multi-track data file” in the manner he proposes. These passages are expressly exemplary and merely state that the recorded audio from multiple local audio devices can be recorded or combined into a multi-track file. *Id.*, ¶ 142 (citing Ex. 1001, 13:18-21 (“**For example**, audio from multiple local audio devices **may** be transmitted to a multi-track recorder for recording of the audio event while each local audio device locally records its performer's audio.”), 15:18-21 (“[t]he audio received from each of the local audio devices (**e.g.**, the local audio device of each performer) **may** be combined to create one or more multi-track audio files.”)). These passages do not state or even suggest that a “multi-track data file” must comprise “multiple, separate streams of sound with individual instruments or voices recorded on separate tracks.”

21. Mr. Defilippis also cites Claim 15 of the '443 Patent (*id.*, ¶ 143), but that claim says nothing about whether the audio comes from a single performer who's wearing the device, nor does it suggest that each track is limited to a single instrument or voice.

22. I have also reviewed a declaration submitted by Mr. Jack Norflus, who opines on “Multi-Track Recording.” Ex. 2021, ¶¶ 12-21. He alleges that this term

means “recording two or more sources of audio – where each source would be recorded to an individual isolated track – that are then combined into a single file.”

Id., ¶ 12. I do not believe the evidence supports his opinion.

23. Mr. Norflus cites Exhibit 2014 in support of his position. This exhibit appears to be a screenshot from some government website that provides a definition for “multitrack (audio).” Ex. 2014. But this document is undated and Mr. Norflus does not provide information as to where this web page came from, when it was created, and when the exhibit was printed. So, it is unclear if it is contemporaneous with the invention of the ’443 patent.

24. More importantly, to the extent the definition is contemporaneous and relevant, it does not support Mr. Deflippis’ or Mr. Norflus’ constructions. In particular, it is the first sentence that provides a definition – “[a] multitrack recording consists of multiple separate streams of sound without defined locations in a sound field.” *Id.* That definition does not require each separate stream to be independent or isolated, or that each stream only includes one individual voice or instrument. Separate streams would just need to be separate. There could be one stream with performer/instrument A, a second stream with performer/instrument B, and a third stream with performers/instruments A and C. Those are all separate streams with

different content, even though the third stream has audio from two instruments/performers, including performer A. The second sentence of the passage refers to “individual instruments or voices” being recorded on separate tracks and appears to be primarily what Mr. Defilippis and Mr. Norflus’ constructions rely upon. However, this sentence is prefaced by the phrase – “[d]uring a typical recording session ...” Therefore, in my opinion this second sentence is not definitional or limiting, but is simply an illustration within the scope of the definition provided by the first sentence.

25. A contemporaneous dictionary definition demonstrates that the limitations added by Mr. Defilippis and Mr. Norflus, such as requiring each track to be an “isolated track” of individual instruments or voices, is unjustified. For instance, the Modern Dictionary of Electronics, 7th Ed. (1999) defines “multi-track recording system” to mean “a recording system in which the medium has two or more recording paths, which may carry the *same or different material* but are played at the same time.” Ex. 1066, 3 (emphases added). This definition is consistent with my view that multi-track requires separate tracks, but the content of those tracks is not limited. The tracks may be completely isolated/different from one another, they

may be the same, or they may be different but include common sound (e.g., Track 1: performer A, Track 2: performers A and B).

“master timecode generator” and “master timecodes”

26. For the term “master timecode generator” I believe that a POSA would understand the term to bear its ordinary meaning, which would simply be “a generator of master timecodes.” *See, e.g.*, Ex. 1056, Abstract (“The timecode generator generates the timecode....”); Ex. 1057, 5:48-50 (“[t]he timecode generator...generates...timecode....”), FIG. 2 (depicting timecode generator 38 generating timecodes).

27. Mr. Defilippis’ construction is “a producer of a master time reference signal that controls at least one other timecode generator.” Ex. 2140, ¶ 149. I disagree that the master timecode generator needs to control another timecode generator. That is one, but not the only, function of a master timecode generator disclosed in the challenged patents.

28. More particularly, the ’443 and ’207 patent specifications describe two embodiments – a “synchronous” mode and an “asynchronous” mode. Mr. Defilippis cites to specification passages describing the synchronous embodiment as support for this aspect of his construction. *Id.*, ¶ 150. And I agree that for the synchronous

embodiment the master timecodes are used to synchronize (control) a local timecode generator. See Ex. 1001, 5:42-48, 9:1-12, 9:39-45 (“During synchronous operation of recording system 100, a portion of the received data may be used to synchronize local timecode generator 304 to the master timecode generator integral to one of the components of recording system 100 (e.g., RCU 104, recorder 108, etc.) using a process such as that described below with respect to FIGS. 4A, 4B, and 5 or an equivalent thereof.”).

29. For the asynchronous embodiment, however, the master timecodes are not used to synchronize or control another timecode generator. Instead, the master timecodes are received and used to directly timestamp the audio data without the use of a local timecode generator. *Id.*, 5:52-57 (“In contrast, when recording system 100 is operating in an asynchronous mode, transmission of the master time reference signal allows the files containing recorded audio to be timestamped with the master time reference information to allow the recorded audio to be accurately synchronized post-recording.”), 9:45-52 (“Alternatively, during asynchronous operation of recording system 100, the received data may include master timecodes from the master timecode generator that may be used to timestamp individual audio samples and/or files such that the audio received at multiple local audio devices 102 may be

synchronized post-recording using one of the methods discussed below with respect to FIGS. 9 and 10 or an equivalent thereof.”). Indeed, asynchronous mode enables deletion of a local timecode generator in the local audio device so that there would not be another timecode generator to control. *See id.*, 17:10-16 (“Operation of the present invention in asynchronous mode allows one or more components of local audio devices such as local audio devices 102 (e.g., **local timecode generator**, comparator, counter, etc.) **to be eliminated** in embodiments in which the local audio devices utilize master timecodes generated by the master timecode generator rather than locally generated timecodes.”).

30. In my opinion, Mr. Defilippis’ construction is not correct, as it would exclude a “master timecode generator” from being used in the described asynchronous mode.

31. Similarly, with respect to the claim term “master timecodes,” Mr. Defilippis’ proposed construction requires that they be “used to synchronize at least one device.” Ex. 2140, ¶ 149. Therefore, Mr. Defilippis’ construction again excludes the asynchronous embodiment in which the local audio device may not have a local timecode generator to synchronize, and the master timecodes are used instead to directly timestamp the audio data.

“body pack”

32. “Body pack” needs no construction, but if the Board chooses to construe it, it should be given its plain and ordinary meaning to a POSA: “a compact bundle of equipment arranged for convenience for carrying on the body.”

33. This term consists of a noun – “pack” – prefaced by the modifying adjective “body.” My construction conforms to the plain and ordinary dictionary definition of “pack”—“a bundle arranged for convenience in carrying especially on the back”—while recognizing that this term is modified such that the pack is carried on the “body.” See Ex. 1058, 6. Strub discloses this claim element under this construction since the recording units are shown to be compact bundles of components that are conveniently carried on the body, such as in specialized backpacks. Ex. 1003, FIGS. 1, 6, and 8.

34. In contrast, Mr. Defilippis’ proposed construction is plainly *not* the ordinary meaning of the term “body pack” since there is nothing in the ordinary meaning of this term that evokes a “small box” or a “transmitter.” Ex. 2140, ¶ 151. In any event recording unit 300 includes a receiver 310/311 and transmitter 309, and those components can be part of any of the recording units in accordance with the invention, including those depicted in FIGS 1, 6, and 8.

35. The specification mentions a “body pack” five times. Ex. 1001, 1:40-47, 7:50-52, 10:52-53. But none of these is definitional. Instead, the specification is merely using the term when describing preferred embodiments.

36. Mr. Defilippis cites (Ex. 2140, ¶ 152) to Ex. 1001, 1:40-42, which states: “Such wireless transmitters *may* take the form of body packs that are worn by each performer.” (emphasis added). Ex. 2140, ¶ 152. First, the cited sentence is part of a paragraph describing the prior art (“Other such systems ...”) rather than the invention. Ex. 1001, 1:38-40. Second, it uses qualifying optional language—“wireless transmitters *may* take the form of body packs” *Id.*, 1:40-42. The passage merely conveys that a **transmitter** may be included in a **body pack**, not that **all body packs** include a **transmitter**. This passage also says nothing about a body pack being a “small box.”

37. Mr. Defilippis also cites Ex. 1001, 7:46-52, which is part of the paragraph at 7:46-60. Ex. 2140, ¶ 152. That passage also contains optional language—“one embodiment,” “may,” and “[i]n the depicted embodiment”—and thus is not a definition. Similarly, the passage at 10:52-53 merely describes a non-limiting example; it says that the local audio devices “may” be bodypacks “such as” depicted in FIG. 3B. Furthermore, none of the cited passages mention a “small box.”

38. Mr. Defilippis also cites figures 3B and 1. *Id.*, ¶ 153. In my opinion, a POSA would view the figures to be exemplary embodiments and not definitions of the term “body pack.” The figures do not purport to be the only type of “body pack,” nor do they expressly or implicitly exclude other form factors. The body packs depicted in the drawings fit comfortably within my own proposed claim construction—“a compact bundle of equipment arranged for convenience for carrying on the body.” Thus, the drawings do not distinguish between the proposed constructions.

39. In my opinion, claims of related patents refute Mr. Deflippis’ proposed construction. For instance, independent claim 16 of the related ’605 patent recites that there is “a remote receiver.” Ex. 1053, Claim 16. Claim 19, which depends from Claim 16, further recites “wherein the at least one local audio device, the at least one receiver, or combinations thereof is at least one bodypack.” *Id.*, Claim 19. Therefore, claim 19 expressly permits the bodypack to comprise a receiver rather than a transmitter, which is directly contrary to Mr. Defilippis’ construction.

40. Mr. Defilippis’ extrinsic evidence is unhelpful. Ex. 2140, ¶ 153. Exhibit 2020 is dated 2012, Ex. 2020, so it is not contemporaneous. It also does not define “body pack” or say that all body packs include transmitters. Indeed, it states

that a transmitter can be “within the handheld unit **or** within the bodypack.” *Id.*, 5. *See also id.*, 14 (“The transmitter is built directly into the handheld microphone; headworn and lapel mics connect to a bodypack transmitter.”). Furthermore, the reference to a “bodypack transmitter,” (*id.*) refers to a **specific kind** of bodypack that has a transmitter. If “body pack” necessarily meant inclusion of a transmitter, then the term “body pack transmitter” would be redundant. The fact that the depicted bodypack is a small box is of no moment because this does not demonstrate that all body packs are small boxes or exclude other form factors.

41. Mr. Defilippis also cites a second document that he calls “prior art.” Ex. 2140, ¶ 153 (citing Ex. 2025). However, it was published in December 2016 and thus is 11 years after the priority date of the challenged claims. Ex. 2025, 26 (“Publ. 12/16”). Moreover, far from defining “body pack,” it repeatedly refers to a “bodypack transmitter.” *Id.*, 7. Again, this would be redundant if the meaning of “body pack” necessarily included a transmitter. And once again, the fact that the paper depicts a small box merely shows that body packs can be in that form factor, not that other form factors are excluded.

42. In my opinion, other extrinsic sources are more probative of the meaning of “body pack” to a POSA. For instance, in 2003, Sweetwater, a retailer of

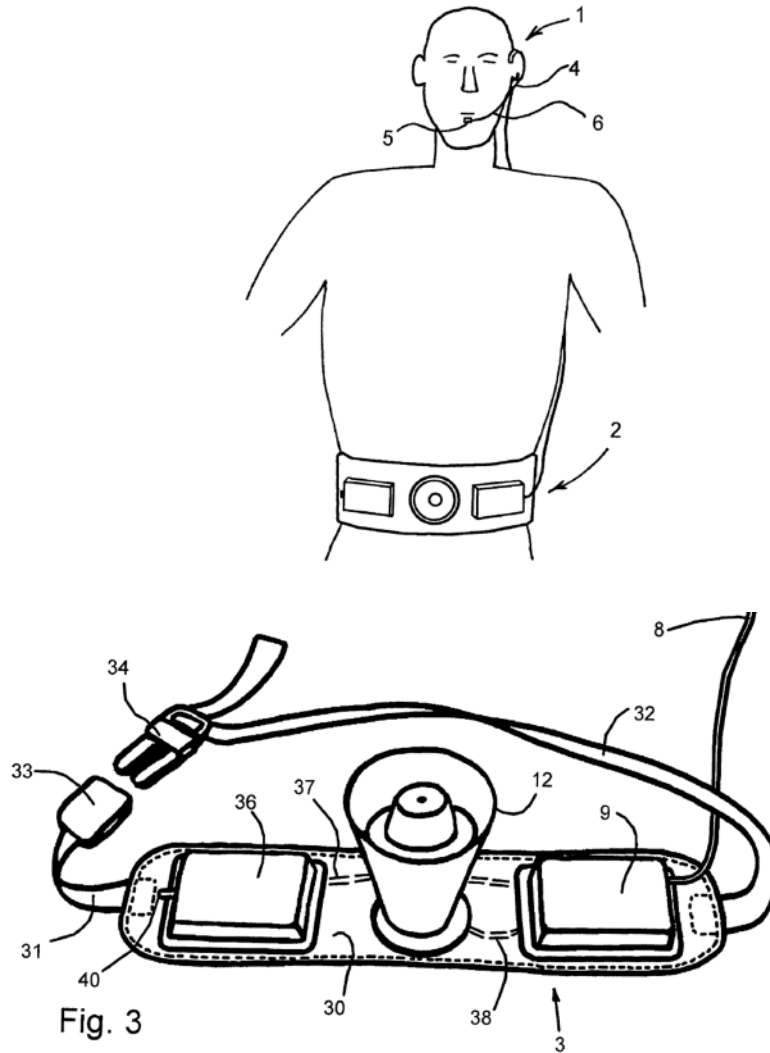
professional audio and musical equipment since 1979, *see* Ex. 1059, published a definition for “body pack” on its website:

In the world of wireless performance a **body pack** is the ***device a performer wears somewhere on his or her body that houses the electronics*** that handle sending a signal to a remote receiver or, as in the case of personal monitoring systems, receives a signal from a remote location. ***Typically*** body packs hold a battery and some combination of electronics that do the transmitting or receiving, and amplifying.

Ex. 1060 (emphasis added).

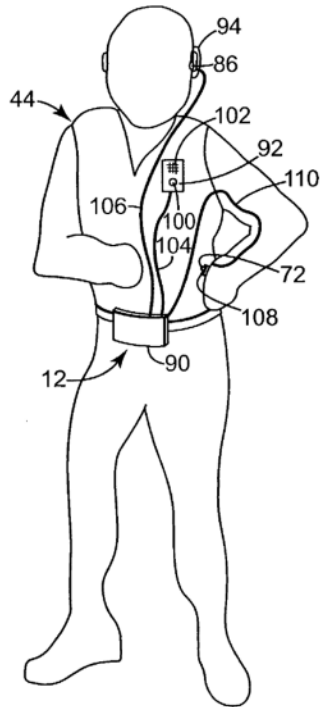
43. This definition is consistent with my proposed ordinary meaning construction: A compact bundle of equipment (“the device ... that houses the electronics”) arranged for convenience for carrying on the body (“wears somewhere on his or her body”). Sweetwater’s definition does not require the device to be shaped like a “box” or to house a transmitter. *See also* Ex. 1002, ¶ 244.

44. In my opinion, several prior art references reinforce that a “body pack” need *not* be shaped like a “box.” *See, e.g.*, U.S. Patent Pub. No. 2002/0176586:



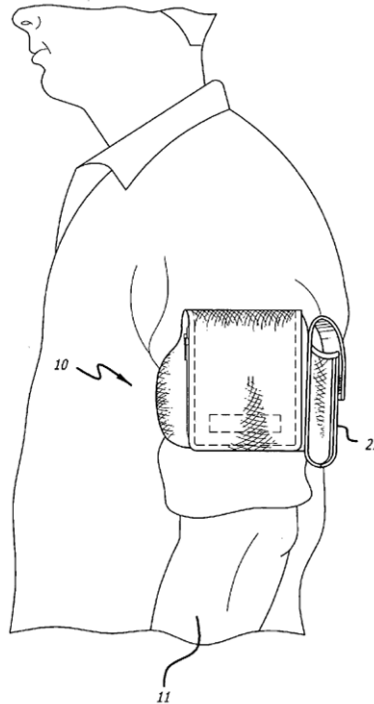
Ex. 1061, FIGS. 1, 3, [0019]-[0021] (describing “body pack 2”) [0022]-[0025]
 (Body pack contains associated audio electronics in housing 9 for receiving and
 processing audio from a microphone.), FIGS. 2, 3.

See also U.S. Patent Pub. No. 2004/0164896:



Ex. 1067, FIG. 3, [0039]-[0041] (showing “body pack 90”) , [0017], [0024] (body pack “includes a recorder” and “collects audio files” using a microphone), FIG. 2.

See also U.S. Patent Pub. No. 2005/0145657:



Ex. 1068, FIG. 1, [0018] (referring to “body pack” 10), [0010], [0024], [0028] (body pack for carrying electronic equipment such as cell phones and radios, including devices that utilize a microphone), FIG. 2.

IV. '443 CLAIM 1[PRE] AND 1[F] – “LOCALLY GENERATED AUDIO” & “LOCAL AUDIO DATA”

45. As explained above in my section on claim construction, it is my opinion that the “locally generated audio” is simply the audio that is generated nearby the local audio device. Contrary to Patent Owner, the locally generated audio need not be generated by someone actually wearing the local audio device. Nor do I

agree that the locally generated audio must be “suitable for use as an independent track of audio.”

46. Strub teaches that the local audio devices (i.e. recording units 105-108, 200, 300), receive “locally generated audio,” such as audio generated during an event. Ex. 1003, 8:50-52 (“Typically, a recording unit according to the invention is also adapted to obtain audio data representing an aural record of the event.”), 8:7-20, 3:30-38. This locally generated audio is received and acquired by an audio acquisition device 303. *Id.*, Fig. 3, 12:4-16. This audio acquisition device can include a microphone for receiving the audio. *Id.*, 21:65-22:2. After acquisition, the locally generated audio can then be processed (e.g., compressed) and then stored (recorded) in an on-board data storage device 305. *Id.*, 12:16-21. The data storage device can comprise a memory. *Id.*, 35:31-41. The Strub recording units are also wearable. 11:9-13. Therefore, in my opinion, the recording units of Strub receive and record “locally generated audio” at an event in accordance with the ordinary meaning of the claim language.

47. The recording unit of Strub is wearable. *Id.*, Abstract (“advantageous aspects of the invention can be provided by small, lightweight, **wearable** recording unit.”), FIG. 1 and 7:39-40 (illustrating “recording units” being worn), 4:28-30 (“As

described in more detail below, advantageous aspects of the invention can be provided by a small, lightweight, **wearable** recording unit.”), 22:4-7 (“the audio data acquisition device, like the visual data acquisition device, is desirably adapted to be mounted on (e.g. attached on or **worn** by, as opposed to held) the recorder.”), 67:8-10 (“For example, it can be desirable to integrate components of a recording unit according to the invention into clothing to be **worn** by a recorder.”), *See also id.*, FIGS. 9A & 9B, 7:65-8:3, 73:18-23, FIGS. 8A-C, 7:61-64, 70:52-63, 11:11-17.

48. Additionally, Strub depicts and describes the person wearing the recording unit as being a “participant” at an event (i.e., someone who is generating audio) as opposed to someone who merely observes the event. *Id.*, 8:7-18 (“Each of the recording units ... in accordance with the invention, enables the corresponding **participant** (recorder) to obtain a recording of the event in a manner that does not interfere with **participation in** ... the event.”), 11:11-17 (“Further, it is highly desirable that the recording unit be adapted to be mounted on (e.g. attached on, or **worn by**), rather than held by, the recorder. The recording unit should be mounted, and components of the recording unit interconnected, so that the recording unit does not obstruct the recorder’s vision, hearing, or motion, or distract the recorder from

participation in the event.”), 1:24-35 (“The invention ... relates ... to ... recording of the event **by multiple participants...**”).

49. As a “participant” in an event, the person wearing the recording unit would also generate local audio for that recording unit. This is confirmed by several teachings of Strub. For instance, Strub describes a birthday party and the “singing of ‘Happy Birthday.’” *Id.*, 52:18-26. As a “participant” the person wearing the recorder would also be singing and therefore be generating local audio. Similarly, Strub teaches group events such as a “group hike” and a “family’s trip to an amusement park” (*id.*, 2:55-65) as well as playing “ping pong” (*id.*, 67:56-64), wherein the participating person with the recorder would again be contributing to the event and generating local audio at the event. Additionally, Strub teaches solitary events such as snow skiing (*id.*, 67:59-61), bicycling (*id.*, 65:15-22, 26:32-39, 47:35-48), and water skiing (*id.*, 70:52-71:3), where the participant/recorder would be the only person generating local audio, such as when narrating their journey or their own experience during the event. Indeed, why else would they be wearing an audio recording unit if they are not the person generating audio during such solitary events? At a minimum, from the foregoing it would have been obvious to a POSA that the wearer of the recording device can themselves generate audio to be recorded, and

indeed a POSA would understand that they could be the only person generating such audio.

50. Mr. Defilippis argues that the audio of Strub is not generated by the recording person and cites Ex. 1003 at 22:16-33 as support because that paragraph describes orienting the audio acquisition device (e.g. microphone) to favor recording sound from the front. Ex. 2140, ¶ 157. But the first sentence of the cited paragraph makes clear this is merely an example of how Strub can be used – “[i]t is believed to be preferable (though not necessary)” Ex. 1003, 22:16. Moreover, the cited paragraph actually contradicts the stated proposition that audio is not generated by the person recording. In particular, the paragraph suggests favoring sound from the front because “a person or persons with whom the recorder is having a **conversation** will typically be in front of the recorder.” *Id.*, 22:23-25. The fact that recorder is having a “conversation” indicates that the recorder is also generating audio (i.e., their side of the conversation). Mr. Defilippis also quotes Ex. 1003 at 23:8-11, which states that a directional microphone may be used when people are distant from the recorder. Ex. 2140, ¶ 158. But this passage does not say to *always* use a directional microphone. Indeed, the first sentence of the paragraph states that a directional microphone “can be desirable” in situations where the sensitivity is needed towards

the front. Ex. 1003, 22:64-23:8. In any event, the exemplary use cases cited by Mr. Defilippis do not erase or negate the other disclosures, described above, where Strub teaches that the recorder is a “participant” who generates audio by singing Happy Birthday, by participating in group events, and by performing in solitary events where the audio would be only that of the person wearing the recording unit.

51. The other aspect of Patent Owner’s proposed construction is that the locally generated audio be “suitable for use as an independent track of audio.” To the extent the Board adopts this aspect of Patent Owner’s proposed construction, it is my opinion that this is also disclosed by Strub. A POSA would understand that each recording unit of Strub is creating a unique and independent recording since the participants/recorders are in different spatial locations. *See, e.g., id.*, FIG. 1. As a result, the audio received by each recording unit will not be identical, and each unit will record an independent track of audio. For instance, when singing Happy Birthday, a given participant’s recorder will primarily receive audio in the form of the singing voice of that participant and secondarily from the other singing participants who are further away. This is due to the fact that the microphone/recorder is closer to the participant who is wearing it than it is to the other participants. Similarly, a given recording unit will receive audio from the other

participants in accordance with their relative distance, as the amplitude of their audio will decrease in accordance with the inverse-square law. For instance, in Figure 1, participant 104's received local audio will comprise, in order of amplitude (assuming approximately equally loud voices), the local audio generated by 104, 103, 102, and then 101. Conversely, the received local audio for participant 101 will comprise in order of amplitude the local audio generated by 101, 102, 103 and then 104. Therefore, the locally generated audio received and recorded by participant 101 will be different than that received and recorded by participant 104 or by the other participants. A POSA would consider these to be "independent track[s] of audio" because the recorded audio at each participant is not the same and, in fact, will be quite different.

52. At paragraph 170 of his declaration, Mr. Defilippis contends that "independent" requires the recording of audio from only a single source such that the recording cannot include a mix of audio from multiple sources. Ex. 2140, ¶ 170. As should already be clear, I disagree that the proper construction of "locally generated audio" requires that it be "suitable for use as an independent track of audio." Additionally, to the extent that this is the proper construction, I believe it is met because the recordings at each of Strub's local audio devices would be different

(i.e. independent) as explained above. However, to the extent that Patent Owner's construction is adopted, and to the extent that "independent" is further interpreted to require that the recording only capture the sound of the wearer (i.e., a single source), then in my opinion this is still disclosed by Strub, as would be appreciated by a POSA. More particularly, participants 101-104 can be far enough apart from each other that they do not hear one another, and so they each record only their own voice, such as a narration of what they are seeing or doing. Alternatively, each participant 101-104 can participate in their own solitary event such as snow skiing, water skiing or cycling, where the locally generated audio would include only the wearer's audio (e.g., their personal narration of the event) and would not include audio from other participants. At a minimum, this would have been an obvious possibility to a POSA upon reading the disclosure. Thus, the recordings made by participants 101 and 104 would be isolated, independent tracks of audio even in accordance with Mr. Defilippis' overly narrow view of the claims. Finally, I note that the challenged claims do not require more than one local audio device, let alone multiple local audio devices, to be at the same event. This strongly suggests that Patent Owner's and Mr. Defilippis' proposed construction is erroneous because without two or more local audio devices, there is no reference or comparison to determine if a recording made

by the claimed local audio device is “independent” of recordings made by other unclaimed local audio devices.

53. In view of the foregoing, it is my opinion that Strub traches “locally generated audio” in accordance with the challenged claims even under Patent Owner’s construction.

V. ’443 CLAIM 1[B] – “AT LEAST ONE LOCAL AUDIO DEVICE WEARABLE BY A CREATOR OF SAID LOCALLY GENERATED AUDIO”

54. Claim element 1[B] requires that the local audio device be “wearable.” Figure 1 of Strub “illustrates use of recording units according to the invention.” Ex. 1003, 8:7-8. Further, Figure 1 depicts each of the participants 101-104 wearing “a recording unit (designated by the numerals 105, 106, 107 and 108).” *Id.*, 8:7-13. Mr. Defilippis, however, disagrees that Strub teaches a wearable recording unit that includes the claimed features, including a receiver and transmitter. Ex. 2140, ¶ 163. In general, Mr. Defilippis’s argument appears to be that recording units 105-108 cannot comprise recording unit 300 that is depicted in Figure 3, which includes the various claim elements, such as a transmitter, receiver, data storage device, audio acquisition device, etc. *Id.*, ¶¶ 163-164.

55. I disagree. Figure 1 illustrates wearable “recording units [105-108] in accordance with the invention.” Ex. 1003, 8:7-15. Then, the top of column 11 introduces section I.A. entitled “Overview of Recording Unit Apparatus and Operation.” *Id.*, 11:1-2. As indicated by the first sentence, this section also describes “a recording unit according to the invention.” *Id.*, 11:3-4. The first paragraph of this section also states that “it is highly desirable that the recording unit be ... **worn** by ... the recorder.” *Id.*, 11:11-13. The next two paragraphs (*id.*, 11:32-56) describe a “recording unit 200 in accordance with the invention” that has “basic capabilities.” *Id.*, 11:33-35. And then the subsequent two paragraphs (*id.*, 11:57-12:52) describe “another recording unit 300 in accordance with the invention” that has “enhanced capabilities.” *Id.*, 11:58-60. Thus, a POSA would understand that the Strub specification introduces the concept of a wearable recording unit generally, as depicted in Figure 1 (recording units 105-108) and 11:1-13, and then provides at least two preferred embodiments for such a wearable recording unit – a basic 200 version and an enhanced 300 version.

56. Moreover, it is clear that recording units 105-108 are not distinct from recording units 200 and 300. Nowhere in the Strub specification are the internal components of 105-108 separately described. Instead, it is apparent that the internal

components of recording units 105-108 may comprise the components depicted and described for recording unit 200 in Figure 2 or the components depicted and described for recording unit 300 in Figure 3. Indeed, recording units 105-108 are described as “adapted to obtain data regarding the position of the recording unit” (*id.*, 8:59-62) as well as “communicate with each other” (*id.*, 10:40) to “enable recordings to be shared” (*id.*, 10:25-32). These functions necessarily require a receiver and transmitter and would confirm to a POSA that recording units 105-108 can include the components of recording unit 300. One reason that the recording units in Figure 1 bear different numbers (105-108 rather than 200 and 300) is because the convention used for all the drawings in Strub is to use labels that begin with the number of the figure. *See id.*, FIGS. 1-9. Further, it is proper to give recording units 105-108 a different number than recording units 200 and 300 because recording units 105-108 represent a genus, whereas 200 and 300 are species of that genus. In any event, section 1.A. makes clear that both recording units 200 and 300 may be “worn,” and therefore reliance on Figure 1 and its recording units 105-108 is not even necessary. *Id.*, 11:9-13.

57. Mr. Defilippis quotes the Strub specification at 8:13-29 to argue that recording units 105-108 are limited to basic recording unit 200. Ex. 2140, ¶ 163.

But the quoted passage merely states that there are multiple recording units that can simultaneously record an event from multiple points of view. The passage never states that recording units 105-108 are limited to species 200. Mr. Defilippis is engaging in the logical fallacy of *argumentum ex silentio*. His argument is essentially that because the cited passage does not mention a receiver or transmitter, they must be absent and therefore the recording units must be species 200 rather than 300. But since both recording units 200 and 300 make recordings (Ex. 1003, 11:32-12:52), the passage is fully consistent with either species.

58. Mr. Defilippis makes the same error when criticizing the Petition's citation to Strub 4:21-31. Ex. 2140, ¶ 165 (citing Petition, 4:21-31). That passage comprises the first paragraph of the Summary of the Invention and states that "the invention can be provided by a small, lightweight, wearable recording unit." Ex. 1003, 4:28-30. Mr. Defilippis asserts that this passage refers only to a "basic" recording unit because it "does not mention an integral receiver." Ex. 2140, ¶ 165. But, again, this is an argument from silence. The passage does not affirmatively state that the recording unit must be a basic recording unit such as 200 or state that an enhanced recording unit 300 with a receiver is excluded. Nor would it make much sense for the first paragraph of the Summary of the Invention to do so since it

is providing an introduction to the invention generally and is not directed to a particular embodiment.

59. Mr. Defilippis also criticizes the Petition’s citation to Ex. 1003 at 66:33-51. *Id.*, ¶ 165; Petition, 39. This passage states that the components of the recording unit can be integrated “together as part of a single apparatus” in a “flexible encasement” so as to “make the recording unit more comfortable to wear.” Again, Mr. Defilippis contends that this applies only to basic recording unit 200, even though the cited passage uses the term “recording unit” generally and does not state that it is limited to recording unit 200. Mr. Defilippis argues that this passage discusses a “data acquisition device,” which is only a component of the “basic” recording unit, and therefore the entire passage is only about a wearable basic recording unit 200 that lacks a receiver or transmitter. *Id.* I disagree. First, as noted above, this passage makes no reference to a “basic” recording unit or recording unit 200. Second, although this passage mentions a “data acquisition device,” and Figure 200 depicts a “data acquisition device” 202, a POSA would understand that “data acquisition device” is a genus that includes both “audio data acquisition device[s]” 303 and “video data acquisition device[s]” 302 as species, both of which are illustrated and described as components of the enhanced recording unit in Figure 3

and at 12:4-21. *See, e.g.*, Ex. 1003, 11:37-56 (“data acquisition device 202” not described as being limited to any particular type of data, indicating this component is a genus), 7:3-9 (“data acquisition device” described as acquiring data “representing the visual and/or aural phenomenon” indicating it can comprise the species of a video data acquisition device such as 302 and/or an audio data acquisition device 303.), 68:43-46 (similar). Third, Mr. Defilippis’ interpretation of Ex. 1003 at 66:33-51 as being limited to a “basic” recording unit fails under his own logic. More particularly, his argument is that because this passage recites a “data acquisition unit,” which is allegedly only described in the context of component 200 of Figure 2, this passage must be limited to such a basic recording unit. However, the passage also describes “display device[s].” 66:33-45. But the basic recording unit 200 does not include any display devices. *Id.*, FIG. 2, 11:32-56. Instead, it is only the enhanced recording unit 300 that includes display devices 306 and 307. *Id.*, FIG. 7, 12:4-27. Therefore, Mr. Defilippis’ contention that the passage at Ex. 1003 at 66:33-51 is limited to a basic recording unit such as 200 that lacks a receiver and transmitter is erroneous.

60. Mr. Defilippis also contends that “Strub at 66:33-51 makes clear that even this Basic Strub Recording Unit without a receiver may not be wearable, as

Strub states that ‘it is desirable to “package” the recording unit components in any manner that achieves some or all of the desired characteristics of a recording unit according to the invention, e.g. small size, low weight, unobtrusiveness, and capability of being mounted on the a recorder (**or, at least, capability of being easily carried by the recorder**).’” Ex. 2140, ¶ 165 (emphasis by Mr. Defilippis). In my opinion, the mere fact that the passage indicates that the recorder should “at least” be able to be “easily carried” does not negate the express teaching that the recording unit is designed to “wear.” Ex. 1003, 66:45-51. *See also id.*, 11:11-13 (“Further, it is highly desirable that the recording unit be adapted to be ... worn by ... rather than held by, the recorder.”). Indeed, the cited passage provides particular design guidance for making the recording unit wearable, including making it “small size, low weight,” “unobtrusive[,],” “compact as possible,” a “single apparatus” housing all the components, and using a “flexible encasement” to make the unit “comfortable to wear.” *Id.*, 66:27-51.

61. With respect to the Petition’s citation to 67:54-68:10 (Petition, 39), which states that it is “desirable to tailor a recording unit according to the invention ... with an increased emphasis on the **wearability** characteristics of the recording unit ...” (*id.*, 67:64-67) (emphasis added), Mr. Defilippis argues that this passage

refers only to basic recording unit 700 that lacks a receiver. Ex. 2140, ¶ 165. I disagree. At 12:53-57, Strub teaches that “[p]articular apparatus ... can be used to embody the components of recording unit ...300 ... described in more detail below.” This indicates that subsequent recording units such as 700 and 800 can embody the components of recording unit 300.

62. I further note that Column 67 introduces section 11 entitled “Specialized Recording Unit Implementations” and its first subsection a. “Recording Unit for Use by Vigorously Active Recorder.” Ex. 1003, 67:54-55. The disclosure about “wearability” occurs in the first introductory paragraph, and it is directed generally to “a recording unit according to the invention” *Id.*, 67:64-67. The next paragraph then introduces Figure 7 and “a recording unit 700 according to a particular embodiment **of the invention**” *Id.*, 68:3-5 (emphasis added). *See also id.*, 68:14-15 (“A recording unit according to the invention **such as** the recording unit 700”). Therefore, it would be clear to a POSA that the first paragraph concerning “wearability” is applicable to “a recording unit according to the invention” *generally*, which would include recording unit 300, whereas recording unit 700 is merely another exemplary recording unit. So, whether recording unit 700 is “basic” or not does not diminish the fact that the section’s introductory paragraph

applies generally to recording units, which would include recording unit 300 having a transmitter, receiver, and other components. I also note that the specification indicates that recording unit 700 can undergo “other such modifications” that are in “accordance with the invention,” which a POSA would understand to mean that other teachings of the invention, including the receiver, transmitter, and other components of recording unit 300 may be included in recording unit 700. *Id.*, 68:14-22.

63. Mr. Defilippis similarly criticizes the Petition’s citation of 72:9-19 (Petition, 39) as also being directed to a “basic” recording unit lacking a receiver or transmitter. Ex. 2140, ¶ 165. The cited passage refers to “wearing the recording unit 800.” Recording unit 800 represents a particular installation of recording unit 700. Ex. 1003, 70:52-54. And as I have noted above, Strub teaches that recording unit 700 can be modified in accordance with the invention. *Id.*, 68:14-22. Therefore, a POSA would understand that recording unit 700, and hence recording unit 800, can be modified to include other disclosed components of the invention, including the germane components of recording unit 300, such as transmitter 309, receiver 310, position sensing device 311, etc. Therefore, the disclosure of “wearing” recording unit 800 also serves to teach that a recording unit having the components

relevant to the challenged claims is wearable by a creator. At a minimum, Strub's repeated teachings of various recording units being worn or wearable would have made it obvious to a POSA that a recording unit in accordance with recording unit 300 could also be wearable and worn.

64. Also, in regards to wearability, Mr. Defilippis asserts that Strub's recording unit is "not wearable, rather, it's portable." Ex. 2140, ¶ 166. He relies on Figure 6 and the fact that the recording unit is a backpack and purportedly weighs 24 pounds. *Id.* Similarly, most of Mr. Norflus' opinion is predicated on the recording unit purportedly weighing 24 pounds. Ex. 2021, ¶ 22-23. In my opinion, their position is flawed for multiple reasons. First, as discussed above, Strub repeatedly and expressly depicts and teaches that a recording unit in accordance with the invention may be worn or is wearable. Ex. 1003, FIG. 1, 4:21-31, 11:9-13, 66:33-51, 67:54-68:2, 72:9-19. And, as also noted above, Strub provides guidance on how to design the recording unit for such wearability. *Id.*, 66:33-51. These disclosures can't be erased or negated by a single embodiment that Mr. Defilippis asserts is not wearable. Second, Figure 6 is merely one exemplary embodiment that is in accordance with the invention. *Id.*, 7:54-55 ("FIG. 6 illustrates **another way** of packaging a recording unit according to the invention.") (emphasis added), 67:30-

31, 7:53-54. It does not purport to apply to all embodiments. Third, weighing 24 pounds does not make the recording unit unwearable, and Figure 6 expressly shows it being worn. That amount of weight configured as a backpack would be readily wearable by many, if not most, adults. I note that the claims do not require that the local audio device be wearable by everyone or place qualifiers on the degree of wearability (e.g., “easily wearable” or “wearable by all persons”) or limit the amount of weight. Additionally, the embodiment of Figure 6 includes a visual data acquisition device, i.e., a camera, that would contribute a meaningful fraction of the 24 pounds, yet the challenged claims do not require video, and therefore this camera could be removed to lighten the recording unit. Indeed, Strub expressly teaches that the recording unit of Figure 6 can be made “lighter (and smaller).” *Id.*, 67:50-51. Fourth, Mr. Defilippis’ “wearable” versus “portable” distinction does not appear to be logically grounded or explained. Why would a 24 pound recording unit be “portable” but not “wearable”? In my opinion, it would be easier to wear 24 pounds as a backpack rather than to carry 24 pounds around by a handle.

65. Mr. Defilippis further contends that the recording unit “is not worn – it is carried within a backpack.” Ex. 2140, ¶ 166. However, the specification does not limit the wearable form factor to only a backpack. Ex. 1003, 16:50-53 (“a recording

unit according to the invention **can be** implemented so that components of the recording unit are positioned within a backpack”). Instead, the recording unit of the invention is generally described as being “small, lightweight, wearable.” *Id.*, 4:28-30. *See also id.*, 11:9-13 (“it is generally desirable that the recording unit be relatively small and that the recording unit be relatively lightweight. Further, it is highly desirable that the recording unit be adapted to be mounted on (e.g., attached on, or worn by), rather than held by, the recorder.”). Moreover, all recording units must have an enclosure of some kind to house their components. When that enclosure is in the form of a backpack, the recording unit is worn when the backpack is worn.

66. Mr. Defilippis’ analogy that carrying a sandwich in a backpack does not make the sandwich wearable is predicated on the false assumption that the backpack of Strub is a generic carry-all backpack as opposed to being the form factor of the recording unit itself. Ex. 2140, ¶ 166. It is clear from Strub that the recording unit is *in the form of* a backpack and that the backpack is its enclosure, not that the recording unit has a separate housing that is being carried in a generic backpack. For instance, Figures 1, 6, and 8B depict recording units that are in the form of specialized backpacks, not recording units being carried in a generic backpack.

Indeed, Strub describes the recording units themselves as being made in a form that is “similar to” a backpack, again indicating that the recording units themselves possess a backpack form factor, not that they are carried in a conventional backpack. See Ex. 1003, 70:6-60 (“Additionally, the recording unit 800 *is constructed* in a manner *similar to* a conventional backpack ...”). Finally, *even if* the recording unit has a separate enclosure and is carried by a generic backpack, in my opinion this would still make the unit “wearable” because it is designed (lightweight, small size, etc) to be contained in something (e.g., a backpack) that is wearable. Indeed, the claims do not require that the recording unit be “directly” wearable or preclude it from using a secondary wearable enclosure (e.g. backpack).

67. Dr. Defilippis also argues that Strub fails to disclose a local audio device suitable to be worn by a “**performer**.” Ex. 2140, ¶ 167. But as I have explained, Strub teaches that a “participant” may wear the recording unit when engaging in group and solo activities like singing Happy Birthday or skiing. In these situations, the wearer is most certainly a “creator” and “performer,” since they are performing the act of singing Happy Birthday. Similarly, engaging in an athletic activity like skiing or bicycling would also make someone a creator and performer. Mr. Defilippis appears to limit a performer to an actor who is “filming” or to

someone who needs the recording device to be small and unobtrusive. *Id.* But this is not the ordinary meaning of “performer,” which is not even the claim language (“creator”, “user”). A performer is simply anyone who performs, which could be singing or speaking, or playing an instrument. The meaning of “performer” is not limited to a particular activity – filming – or to the particular needs of the performer, such as having a small and unobtrusive device. Similarly, Mr. Norflus assumes that the recording device must be small and light enough “for use by performers in a professional recording context” such as the “film and television industry.” Ex. 2021, ¶¶ 24-26 But the claims simply do not require any degree of wearability or unobtrusiveness and are not limited to particular use cases (e.g., film and television, professional studio recording, etc.). In any event, Strub expressly teaches that the recording unit can be small, relatively lightweight, and unobtrusive. Ex. 1003, 11:9-13, 66:26-39, 66:45-51. Therefore, it is my opinion that Strub teaches a wearable recording unit suitable for use by a performer even under Mr. Defilippis’ and Norflus’ narrow view of the claim requirements.

VI. ’443 ELEMENT 1[A] – “AT LEAST ONE MASTER TIMECODE GENERATOR FOR GENERATING A PLURALITY OF MASTER TIMECODES”

68. Mr. Defilippis contends that this claim element is not taught by Strub or Woo. Ex. 2140, ¶¶ 172-186. The Petition cites to Strub as disclosing a “master timecode generator for generating a plurality of master timecodes” because of Strub’s described use of GPS satellites (master timecode generators) and GPS signals (master timecodes) to time-stamp audio data and to synchronize the internal clocks (i.e., local timecode generators) of the recording units (i.e., local audio devices). See Petition, 16, 30, 38, 58 (citing Ex. 1003, 13:50-58, 62:26-63:50, 63:50-60, 79:54-80:9, etc.). The GPS signals convey this time information as bitstream data using codes. See, e.g., Ex. 1004, 6:40-42, 6:48-55, 8:19-22. By synchronizing the internal clocks of the recording units, a POSA would understand Strub to teach that the recorded audio samples may be timestamped to enable synchronization of their recorded audio data (i.e. audio samples). See Ex. 1003, 63:46-49 (“The GPS time signals are extremely accurate; thus, since all of the recording units are receiving this time signal, the time-stamps of all recording units are adequately synchronized.”), 13:48-54 (“the system controller can include a clock that is used to time-stamp the recording data ...”). See also *id.* 63:41-43 (“A GPS receiver can also be used to receive a signal representing the current time that can be used as a clock to generate time-stamps for the recording data.”).

69. In his declaration Mr. Defilippis states that “Strub and Woo disclose situations in which either GPS time signals or the internal clock are used for time data, but neither reference discloses a master time code generator that ... **controls** a least one other timecode generator.” Ex. 2140, ¶ 177. I disagree. As an initial matter, Mr. Defilippis appears to agree that the Strub recording units can include an “internal clock ... used for time data.” *Id.* Indeed, Strub expressly discloses that the system controller of the recording unit includes a clock to generate timestamps (i.e. a local timecode generator). *See* Ex. 1003, 13:52-58 (“For example, the system controller can include a clock that is used to time-stamp the recording data obtained by the recording unit.”), 63:56-60 (“Additionally, a recording unit according to the invention typically also includes an internal clock ... [that] can also be used to accurately time-stamp data.”). Therefore, there is no dispute that Strub discloses that the recording units include internal local timecode generators in the form of clocks.

70. Mr. Defilippis is incorrect in stating that the internal clocks (local timecode generators) of the Strub recording units are not controlled by the GPS signals from the GPS satellites. Control of the internal clocks by the GPS signals is

described in at least two different places in Strub. The first instance occurs in the following two paragraphs:

Depending upon the speed of the processing device(s) of the recording unit, the GPS time signal can be **updated about once a second**. The GPS time signals are extremely accurate; thus, since all of the recording units are receiving this time signal, the time-stamps of all recording units are adequately synchronized. Though the recording unit must not be constantly blocked from GPS satellites in order for the recording unit to receive such time signals, the recording unit need only be exposed to a GPS satellite for about a minute to enable the time signals to begin. Further, **after that point, clock drift occurs slowly**, even if the recording unit is blocked from the GPS satellites for a period of time. Additionally, a recording unit according to the invention typically also includes an internal clock, as described above, that, while not as accurate as the GPS time signals, can also be used to accurately time-stamp data.

Id., 63:43-60 (emphasis added). A key phrase in these paragraphs is the reference to “clock drift.” This is a reference to the internal clock of the recording unit. The term “drift” indicates that the time reported by this internal clock is deviating from some other time reference. That other time reference is GPS time. The drift is described as beginning “after [the] point” that the recording unit acquires the GPS time signals, which takes “about a minute.” The paragraph further states that the drift will continue, albeit slowly, when the GPS signals are “blocked.”

71. A POSA would understand from the above-quoted passage that it takes about a minute for the recording unit to acquire the GPS signals and enable GPS time signals to be output from the recording unit's GPS receiver. Once those GPS time signals are available, they are used to synchronize (i.e., control) the internal clock to GPS time and will continue to do so "about once a second." However, if the GPS signals are blocked, the internal clock will begin to "drift" away from GPS time until the GPS signals can be reacquired. In my opinion, this is the only plausible interpretation of these paragraphs. Otherwise, the reference to "clock drift" does not make any sense. Importantly, the internal clock can only "drift" from the GPS time if it has been previously synchronized to (and hence controlled by) that GPS time. I note that the last sentence of the second paragraph states that "the invention typically also includes an internal clock, as described above, that, while not as accurate as the GPS time signals, can also be used to accurately time-stamp data." This sentence reflects an alternative embodiment where the time-stamping is performed solely by the internal clock without GPS being used to synchronize that internal clock. Of course, this embodiment is "not as accurate" as when using the GPS to synchronize the internal clock. I further note that the first sentence of the first paragraph – "A GPS receiver can also be used to receive a signal representing the current time that

can be used as a clock to generate time-stamps for the recording data.” – represents an embodiment in which the GPS master timecodes are directly applied to audio data for time-stamping purposes, similar to the asynchronous mode of the challenged patents. Ex. 1003, 63:41-43; Petition, 58 (element 1[I]). At a minimum, it would have been obvious to a POSA that the GPS master timecodes could be directly stamped to some or all of the audio data as this would eliminate the need for an internal clock and jam sync circuitry, thereby reducing circuit complexity.

72. That GPS can be used to synchronize/control the internal clock is confirmed by yet a second passage in Strub that discloses:

As described above, a recording unit according to the invention typically ***includes a clock that is used to time-stamp*** recording data as the recording data is acquired. However, the ***clocks*** of different recording units ***may not be adequately synchronized*** to enable use of the time-stamps associated with the recordings obtained from different recording units to synchronize those recordings. (If recording units according to the invention each include a ***GPS*** receiver, ***such mis-synchronization*** will only exist to an appreciable degree if one or more recording units are shielded from a GPS transmitter system for an extended period of time, e.g., several hours.) Or, the recording units may not include clocks for enabling time-stamping of the recordings.

Id., 79:63-80:9 (emphasis added). The first two sentences (and the parenthetical) are addressing the case in which there is an internal clock that is used for timestamping. The last sentence is addressing an alternative case where there is no internal clock for timestamping. Nowhere in this passage is there any teaching or suggestion that GPS timestamps are being directly applied to the recording. A POSA would understand this passage to be teaching that: (1) the recording units may include internal clocks for timestamping, (2) these internal clocks may not be “adequately synchronized,” and (3) GPS can be used to correct “such mis-synchronization” by synchronizing (i.e. controlling) the clocks in all the recording devices to GPS time. I further note that this passage states that when using GPS, “such mis-synchronization will only exist to an appreciable degree if one or more recording units are shielded from a GPS transmitter system for an extended period of time, e.g., several hours.” This is a reference to time drift of the internal clock relative to GPS time when one of the recording units is shielded/blocked from the GPS signals, similar to what I discussed above for the first passage. Importantly, in order for the shielded recording unit to become “mis-synchronized” from GPS time (and hence from the other recording units) its internal clock must necessarily have been previously synchronized (i.e. controlled) to GPS time. From the foregoing, it

is my opinion that Strub discloses this claim element, even under Patent Owner's claim construction.

73. The Woo reference also teaches a master timecode generator generating a plurality of master timecodes. Mr. Defilippis disagrees and appears to make two principal arguments. First, he says that Woo fails to disclose a master clock to “control at least one other (slave) timecode generator as there is no mention of any such secondary timecode generator in Woo.” Ex. 2140, ¶ 181. Second, he contends that the “output of the GPS receiver is insufficient to achieve synchronization” because the GPS signal must be supplemented with an internally-generated “accurate pulse” provided by a video sync generator. *Id.*, ¶ 183. I disagree with both of these arguments.

74. With respect to the first argument, Woo clearly discloses the use of a local secondary timecode generator that is controlled by a master time code generator. More particularly, column 3 describes:

A common feature of ***time code generators*** is the ***slave*** or ***jam-sync process***. This allows a time code generator to follow the time code off another source, e.g., a tape machine. This would allow for regeneration of time code. There are two basic modes of ***slaving*** or ***jam-syncing*** time code, hard slave or hard jam and soft slave or one-

shot jam. Method one, the hard slave, forces the generator output to always follow the input. Method two, the soft slave, locks up to the input at first but runs free after that.

Ex. 1004, 3:38-45 (emphasis added). This paragraph describes the use of a “jam sync process” for synchronizing timecode generators. To a POSA, the term “jam sync” itself means that one time reference or clock is synchronized to another time reference or clock. That is the ordinary meaning of “jam sync.” *See, e.g.*, Ex. 1039, 8:46-54, 9:27-29, 10:7-11. Further, one of the timecode generators is expressly referred to as a “slave,” as it is the secondary (controlled) timecode generator. The use of “slave” indicates that the other timecode generator in the “jam sync process” is a master timecode generator, which is referred to in the passage as “another source.” The passage further explains that the slave timecode generator can be controlled in one of two ways by the master. The first method (“hard slave”) “*forces* the [secondary timecode] generator output to always *follow* the input” from the master timecode generator. The second method (“soft slave”) is when the secondary (slave) timecode generator “locks up” to the input [i.e., the output of the master timecode generator] at first but runs free after that.” A POSA understood this to mean that the secondary timecode generator detects the master timecodes at its input

(i.e. “locks up”) and then zeros-out any difference between its own clock and that of the master timecode generator so that they are the same (i.e., synchronized). Unlike the first method that provides continuous control of the secondary timecode generator, the second (“one-shot jam”) method controls the secondary timecode generator only once such that it “runs free” after it is synchronized to the master timecode generator. In this case, the time of the master and secondary timecode generator will start to drift apart relative to one another until they are “soft slave” jam-sync’d again. The foregoing disclosure is generalized and not limited to GPS being the master timecode generator. As a result, Mr. Defilippis’ contention that the GPS implementation in Woo is inadequate to synchronize the local clock is inapplicable.

75. In view of the foregoing, it is my opinion that Woo also discloses using a master timecode generator to control (jam sync) a slave/secondary timecode generator so that their times are synchronized. Strub also teaches jam-syncing since the local clocks are sync’d to GPS time once GPS is acquired, and again if GPS is blocked and then re-acquired. However, to the extent that Strub fails to teach using GPS to jam-sync the clocks of its recording units, it would have been obvious to do so. This would have provided the advantage of permitting the recording units to

accurately timestamp recordings even if GPS signals were being blocked or shielded since the local internal clocks would have been synchronized to the GPS signal and would maintain usable accuracy for a period of time until the clock drift accumulated to unacceptable levels. But by that time, it is likely that the GPS signals could be reacquired to again jam sync the internal clock to GPS time. A POSA would also have been motivated to use GPS to control and jam-synchronize a local timecode generator in Strub, as disclosed in Woo, because it avoids having to design and sell a dedicated master timecode generator as GPS is widely available and free. It reduces cost and complexity.

76. In addition to the foregoing, Woo also describes a particular embodiment in which GPS is used as a master timecode generator to sync a local timecode generator. More particularly, Figure 3 depicts GPS satellite receivers 18 and 22 that output “date and time information” (master timecodes). Ex. 1004, FIG. 3, 7:18-25. The system further includes a local “timecode generator 43 ... e.g., the SB-2 GPS” that can act as its own “time code source” for local equipment. *Id.*, FIG. 3, 7:26-35. Importantly, this SB-2 local timecode generator “will **jam** to ... output connection 38” of GPS receivers 18, 22. *Id.*, FIG. 3, 7:35-38. Again, to one of ordinary skill, this means that the local timecode generator 43 will act as a slave and

either follow the GPS master timecode generator or “lock up” to the master timecode generator and then free run, as explained above in the context of the disclosures in column 3 of Woo. Either way, local timecode generator 43 is being controlled by the master timecodes generated by the GPS satellites as received by GPS receiver 18, 22. Therefore, I believe that Mr. Defilippis’ first argument is incorrect since this embodiment of Woo also teaches that the local timecode generator is controlled by the master timecode generator and master timecodes.

77. Mr. Defilippis’ also argues that the output of the GPS receiver is insufficient to achieve synchronization. This is also incorrect. His argument is predicated on disclosures in Woo at 4:16-20, 8:13-18, and 9:5-19, which he argues support his contention that GPS is “insufficient to achieve synchronization” because Woo relies on a “video sync generator to provide the accurate pulse to the time code.” Ex. 2140, ¶¶ 182-183. There are several flaws in his argument. First, it is inapplicable to Woo’s generalized disclosure in column 3 which, as explained above, expressly teaches the use of a master timecode generator to control a slave timecode generator via a jam sync process. Woo’s description of a particular GPS embodiment does not erase or negate this clear disclosure. Second, Dr. Defilippis’

premise is incorrect because it is clear that the signals used for synchronization are derived from the GPS signal (master timecodes).

78. More particularly, Woo teaches that the received GPS signals comprising the master timecodes result in two streams of timing information at the recording device. The first stream comprises standard GPS time decoded from the GPS signals. Ex. 1004, 8:16-18 (“the conventional date and time information from deciphering the navigation satellite transmissions.”), 9:11-14 (“A second digital signal processor 150 is used for deciphering date and time information publicly broadcast over orbiting navigation satellite transmissions that are detected by the receiver 142.”). The second stream comprises a signal of one pulse per second. Id., 4:17-19 (“a highly-accurate one pulse-per-second (+/- one microsecond) ...”), 8:15 (“one-pulse-per-second”). More particularly, the coded GPS signal itself repeats every millisecond, forming a GPS code epoch. Woo’ recording device counts these millisecond GPS code epochs, and once 1,000 are counted, a highly-accurate pulse is generated every second. Id., 8:18-21 (“in the GPS, code transmission epochs repeat every one millisecond, these epochs are accumulated to for the one-pulse-per-second output, accurate to one microsecond.”), 9:6-11 (“The sync-generator 140 comprises a GPS navigation satellite receiver 142 and a first digital signal processor

144 for accumulating and averaging code epochs which occur each millisecond in time. A precision time-base signal 146 is output to a video sync-generator driver 148.”), 8:61-65, 6:40-42. The decoded GPS date-time information is “combined” with this highly accurate once-per-second pulse. Id., 4:13-19, 8:13-18, 9:13-16. Importantly, both streams of timing information – the decoded GPS date/time and the once-per-second pulses – are derived and generated from information contained in the received coded GPS signals. Therefore, Mr. Defilippis’ argument that the received coded GPS signals do not provide sufficient data to synchronize recording devices is erroneous as it is predicated on the faulty assumption that the highly accurate pulses are created based on something other than the information provided in the coded GPS signals. Indeed, the GPS satellites employ atomic clocks to ensure that the timing information they provide is of very high accuracy, sufficient for military and aerospace applications.

79. Mr. Defilippis also attempts to distinguish Strub and Woo’s disclosure of GPS master timecodes by arguing that they are unsuitable, because GPS signals are not always available in “all locations” since the GPS signals might be blocked. Ex. 2140, ¶ 184. Similarly, Mr. Norflus contends that GPS is inadequate in “subways or other underground locations.” Ex. 2021, ¶ 27. But the systems

disclosed by Strub and Woo plainly operate in accordance with the pertinent claim elements most, or at least some, of the time. If it were otherwise, the use of GPS for master timecodes would not be disclosed at all, let alone by multiple references – Strub, Woo, Winningstad. And the challenged claims do not include any claim elements that limit or constrain the availability of master timecodes. For instance, there are no claim requirements that the master timecodes must “always” be available or that they must be “continuously” received. Nor are there any negative claim limitations that prohibit the use of GPS. Indeed, the ‘443 patent specification itself contemplates that the master timecodes may not be continuously received, which is why jam sync is used to periodically synchronize the local clock in the synchronous mode. See Ex. 1001, 12:56-64 (“The jam sync synchronizes the local audio device with the RCU while allowing the local audio device to supply its own timecode. Local supply of synchronized timecodes ensures proper timing **during periods in which the master timecodes cannot be read** (e.g., the RCU is temporarily unstable, wireless communication dropouts, etc.)”) (emphasis added).

80. In view of the foregoing, it is my opinion that Strub and Woo disclose “master timecode generator” and a “plurality of master timecodes” even under Mr. Defilippis’ proposed constructions.

VII. '443 CLAIM 15 – “A SINGLE MULTI-TRACK DATA FILE”

81. Although Mr. Defilippis challenges some of the citations to Strub that are in the Petition, he fails to challenge the citations to the clearest and most significant passages of Strub. Ex. 2140, ¶ 187. More particularly, cited passage 37:18-40, which Mr. Defilippis does not explicitly contest, demonstrates that each recording unit can obtain the recordings made by other recording units. As a result, all the recordings can be consolidated in one place after an event. Mr. Defilippis also does not contest or attempt to explain the disclosures in column 92 of Strub, which further discloses, in pertinent part:

It may be possible and desirable to integrate audio recordings obtained by different audio data acquisition devices by ***blending the audio recording data*** acquired by those audio data acquisition devices. It may be particularly desirable—and most feasible—to blend audio recordings obtained by multiple data acquisition devices that are part of the same recording unit. It may also be possible to ***blend audio recordings obtained by multiple data acquisition devices that are part of the different recording units***. However, in the latter case, during some or all of an event recorders may be sufficiently far removed from each other that their recording units acquire audio recordings including audio content that is so different that the audio content cannot be blended in a meaningful way.
Audio recording data can be blended in any appropriate way. For example, an ***audio mixer*** can be used to select audio recording data from multiple audio recordings in

accordance with specified characteristics, and the selected audio recording data used to generate an audio display.

Ex. 1003, 92:24-42 (emphasis added). In my opinion, the teaching that the audio recordings from different recording units can be blended in “any appropriate way” would include taking the individual recordings from each of the recording units and combining them into a single file as separate tracks (i.e. a single multi-track recording). Indeed, this was a rudimentary editing operation well known to audio professionals such as sound engineers for many years prior to the priority date of the challenged patents.

82. For example, recording data from recording units A and B can be blended by a mixer and stored as a Right track, and as a Left track, thereby creating a single stereo (multi-track) data file. Alternatively, for example, recorded audio from recording units A and B can be blended into a Left track and audio from recording units C and D blended into a Right track, also resulting in a single stereo data file. These were common and well-understood mixing operation that had been performed in recording studios for more than 50 years. Strub even makes reference to stereo audio. *Id.*, 25:35-48, 68:63-65. Moreover, Strub repeatedly stresses the importance of preserving the “spatial” aspect of a recorded audio performance. *Id.*,

93:3-11 (“Simultaneous display of audio recordings can give a more complete representation of the audio content over the space traversed by recorders during an event, both by better reproducing the content that existed and by better replicating the richness of the audio space (particularly if the audio display is implemented so as to reproduce the spatial relationships of the recording units during recording) that may have existed in that space.”). *See also id.*, 22:59-63, 23:28-31, 24:18-30, 24:43-60. It has been known for many decades that multi-track (L+R) stereo recordings and stereo playback better reproduce the spatial aspects of a sonic performance and enhance the sonic image as to where the performers are located. A single monophonic track cannot generate the acoustic spatial information or imaging necessary to reproduce the sonic experience of being present at a performance. My opinion is supported by prior art references. *See, e.g.*, Ex. 1041, 11:18-24 (“stereo (i.e., spatial) information”); Ex. 1043, 5:1-2 (“Thus, a stereo sound with excellent spatial impression can be reproduced.”); Ex. 1040, 1:55-58 (“... a good stereo image is perceived ...”), 5:12-23; Ex. 1042, FIG. 1, 2:52-57 (“FIG. 1 represents a typical stereo sound field or sound image, in which listener 2 who is positioned in from of two loudspeakers 4 and 6 perceives the musical instruments, shown generally at 8,

to be spread across a sound stage extending between left and right loudspeakers 4 and 6.”).

83. My opinion that such editing techniques, including those to mix multiple tracks down to a two-track stereo file, were well understood by those in the art is confirmed by, for example, Ex. 1046, 1:17-36 (“The art of mixing audio source signals is well known and generally referred to as recording engineering. In the recording engineering process, a plurality of source signals are input to a multi-channel mixing board (one source signal per channel) ... it is possible for an individual person to record the performance of a song by recording the playing of different instruments at different times on different channels, then mixing the channels together to produce a stereophonic master recording”), FIG. 1, 4:66-5:22 (“Sound signals may be provided to the mixing console 10 by various analog or digital audio sources (not shown), such as microphones ... or other audio equipment, such as multitrack tape deck, and each sound signal is therefore connected to a single channel.... The output signals 11 from the mixing console 10 are available from each channel 12. The final mix will generally comprise a two channel stereophonic mix which can be recorded on a storage media”).

84. Mr. Defilippis vaguely attempts to minimize Strub’s disclosures by apparently asserting that they are limited to recording unit 300 and do not apply to Strub’s recording units 105-108. Ex. 2140, ¶¶ 187-188. In my opinion, this assumption is incorrect. First, as I have explained previously, his premise is inaccurate since recording unit 300 is a species of recording units 105-108. Second, my citations from column 37 and 92 of Strub are generalized teachings that are not limited to any particular type of recording unit. For instance, 37:18-40 appears in section “5. Communication with Other Recording Units and Recorders.” Ex. 1003, 35:51-52. Nothing in this section refers to any particular type of recording unit, let alone limits the disclosure to recording unit 300 or excludes recording units 105-108. *Id.*, 35:51-41:52. In the case of the disclosures in column 92, this column appears in the section “II. Post-Event Use of Event Recording.” *Id.*, 79:42. Again, this section is not limited to any particular type of recording unit, let alone limits the disclosure to recording unit 300, or excludes recording units 105-108. *Id.*, 79:42-93:11.

85. Next, Mr. Defilippis argues that the disclosed “audio mixer” is “more akin to a ‘video mixer.’” Ex. 2140, ¶ 188. In my opinion this is a non-sequitur since “audio mixer” is expressly disclosed, and “audio” is referred to multiple times in the

pertinent paragraphs. Ex. 1003, 92:24-50. Relatedly, he seems to be under the misimpression that the audio is visually displayed on a “display screen” Ex. 2140, ¶ 188. But that is not correct. While this section of Strub perhaps awkwardly uses the term “display,” Strub explains that in the context of audio the term “display” means to play or reproduce the sound. See Ex. 1003, 92:7-9 (“the audio recording display will be generated *using speakers*”), 92:14-16 (“... recording content to be displayed that *includes sounds* emanating from a particular source”), 59:26-28.

86. Finally, Mr. Defilippis contends that the blended and mixed recordings are not “save[d] to a file.” Ex. 2140, ¶ 188. I disagree. Even though it is not explicitly stated that the blended and mixed audio tracks are stored as a multitrack file, that is the objective of this subsection at columns 92 and 93. This subsection is directed at editing the recordings from multiple recorders. To do this, the subsection explains that a user can “display” (i.e., play through speakers) the recordings and in the process “*blend* audio recordings obtained by multiple data acquisition devices that are part of different recording units” using “an audio *mixer*” to “select audio *recording data* from multiple audio recordings.” Ex. 1003, 92:24-42. The purpose of this exercise is to create a new multitrack recording (i.e., a data file comprising the selected recording data). Why else would the user be listening to and blending

the various recordings? It is implausible that the user is merely doing this once in real-time without any intention of saving the recording data of the best blend/mix that they have created. Indeed, the paragraph at 92:51-93:11 describes potential problems in the original recordings, such as the recorder's voice being too loud, certain sounds of interest being "minimized or eliminated," and recordings being overly "different [in] audio content." *Id.*, 92:53-93:3. The paragraph then describes the solution being the "addition of other recordings" to ameliorate these issues and to "better replicat[e] the richness of the audio space." *Id.*, 92:60-66, 93:3-11. A POSA would plainly understand Strub to be teaching that the original recordings are being mixed, blended, and added together to create a single multi-track file comprising recording data from the various recording units that fixes these issues and represents a final improved audio presentation of the event. Additionally, the above-quoted passages of Strub are dealing with "recording data," so a POSA would understand the recordings and editing to be performed in the digital domain such that the output would comprise a digital data file.

87. Therefore, in my opinion, Strub discloses the claim elements of claim 15. At a minimum, claim 15 would have been obvious as it covers standard audio editing functionality that was well known in the art and that could be performed with

widely-available software such as Pro Tools, Avid Media Composer, Short/cut 2000, etc. See Ex. 1002, ¶ 240.

88. As I explained in my previous declaration, Woo also discloses claim 15 or at least renders it obvious. *Id.*, ¶ 241. Woo clearly teaches recording of “audio” and “sound.” Ex. 1004, 1:24-28, 2:56-66, 5:16-19, 5:45-50, 8:58-59. And it further teaches “editing,” “blend[ing],” and “combining” the recordings using an “audio [p]layback suite” [sic]. *Id.*, 1:25-28, 5:37-45, 8:45-59. Mr. Defilippis advances three rebuttal arguments: (1) Woo does not teach multi-track recording, (2) Woo does not teach creation of a multi-track file, and (3) Woo does not employ “local audio data,” which Patent Owner defines as audio generated by a performer wearing the recording unit. Ex. 2140, ¶ 190.

89. With respect to his first argument, I disagree that Woo does not disclose multi-track recording. While Woo may not recite the term “multi-track,” a POSA would understand that multi-track recording is taking place. This is demonstrated by the use of separate recording units 14 and 16 that each “captures the same performance from its own vantage point.” Ex. 1004, FIG. 1, 5:3-8. Each recording unit therefore records a separate track of audio of the same performance at the same time, resulting in multiple tracks of audio being available (multi-track).

90. In regards to his second argument that Woo does not create a multi-track file, I again disagree because this is implicit or at least obvious to a POSA. More particularly, the multiple audio recordings are sent to an “editing station 34” comprising “an audio [p]layback suite.” *Id.*, 5:37-42. The plurality of recorded tracks are then “combine[d]” to create a “composite third recording” that represents a “seamless blend of the performance from a plurality of viewpoints.” *Id.*, 8:45-59, FIG. 4 at 114 and 116, 1:25-28 (“Editing is therefore relied upon to combine the recorded sounds ... in a single final product.”). From these disclosures, a POSA would appreciate that the third recording may comprise multiple tracks that are derived from the plurality of recorded tracks input into the editing station. As discussed above, a well-known and ubiquitous example of such a multi-track recording would be a stereo recording comprising Left and Right tracks that have been edited down from the multiple recorded tracks input into the editing suite.

91. Finally, he argues that Woo does not teach the use of “local audio data” because there is no express teaching that the recorders are recording the audio of the “operator” rather than “another entity.” Ex. 2140, ¶ 190. But as I have explained previously, this is not a reasonable interpretation of the claims, which do not require the recorded audio to come from a particular source. In any event, Woo is being

combined with the teachings of Strub, which as I have explained teaches or makes obvious that a performer wearing a recording unit can record their own audio (e.g., singing Happy Birthday, narrating while skiing, narrating while bicycling). Therefore, it is my opinion that to the extent that Woo does not teach this alleged requirement, the combination of Strub and Woo does.

VIII. '443 CLAIM 17 – “WHEREIN SAID AT LEAST ONE CONTROL UNIT IS A DIGITAL SIGNAL PROCESSOR.”

92. As I explained in my previous declaration, Strub teaches that the recording unit may include a digital signal processor for processing audio, such as performing “beam forming” using input from multiple microphones to isolate sound of interest. Ex. 1002, ¶ 242 (citing Ex. 1003, 31:51-62). In particular, Strub discloses that such signal processing “can be performed by the system controller or data processing device(s) operating in accordance with a computer program stored in the data storage device.” Ex. 1003, 31:54-57. Strub then goes on to state that a “processing device” may comprise a “digital signal processor[.]” *Id.*, 31:57-59. Therefore, Strub teaches the interchangeability of a system controller and processing device and further indicates that the processing device may comprise a DSP. A POSA would therefore understand that the system controller may comprise a DSP to perform the system control functions along with audio processing functions such

as beam forming. *Id.*, 31:51-62. In addition to beam forming, additional audio functions performed by the DSP could include conversion of analog audio received by the recording unit's microphone(s) into digital data. This functionality is described in Strub at 27:45-51. Strub states that “[s]uch processing can be accomplished using conventional techniques and apparatus,” which to a POSA would include a DSP, since such conversion involves processing the signal to create a digital representation of the audio. *Id.*, 27:50-51. Additionally, Strub describes the function of compressing the recording data, which is another function that a DSP would perform. *See id.*, 12:16-21, 38:15-20.

93. Mr. Defilippis makes two points in his declaration. First, he states that Strub teaches that the system controller is a “microcontroller” rather than a DSP. Ex. 2140, ¶ 192 (citing Ex. 1003, 14:7-13). But the cited paragraph expressly states that the “system controller for use in the recording unit according to the invention **can be** embodied by a Motorola 68HC11 microcontroller” Ex. 1003, 14:7-9 (emphasis added). Thus, the use of a microcontroller for the system controller is exemplary. *See also id.*, 14:1-4 (“In general, the system controller can be embodied by **any device** or devices that can be operated to accomplish the necessary functions, **such as** a microcontroller **or other processing device.**”) (emphasis added).

Additionally, Strub’s teaching that the system controller can be a microcontroller supports my opinion because it was well-known in the art that a DSP is a species of (or at least was often integrated within) a microcontroller. My opinion in this regard is supported by the prior art. *See, e.g.*, Ex. 1049, FIG. 4a, 8:32 (“a digital signal processor/microcontroller”), 9:20-23 (“the digital signal processing of the microcontroller 48 ...”); Ex. 1044, FIG. 5, 8:1-8 (“microcontroller” 74 includes CPU 82 that may be a “digital signal processor (DSP)”); Ex. 1052, 5:46-47 (“audio decompression is performed by a general purpose DSP microcontroller”).

94. His second argument is that Strub teaches that the DSP must be a “separate device” from the microcontroller. Ex. 2140, ¶ 192. He does not explain this position or cite anything in Strub for support. I disagree because, as noted above, Strub expressly states that the “system controller” can be “any device or devices” such as a “processing device” as opposed to a “microcontroller.” Ex. 1003, 14:1-13. And as also noted above, a POSA would have understood that microcontrollers often included an integrated DSP for audio processing applications. In sum, a POSA would have understood from Strub’s disclosure, or at least found it obvious, to use a DSP to perform the various audio processing functions, and that this DSP could be integrated into the microcontroller. A POSA would have been further motivated in

this regard by Woo’s use of a DSP. At the time, audio DSPs were ubiquitous in both the professional and consumer audio space, including in DVD players, mixing consoles, effects for musical instruments, home theater receivers (e.g. Dolby and DTS audio processing), etc.

IX. ’443 CLAIM 19 – WHEREIN SAID AT LEAST ONE LOCAL AUDIO DEVICE IS A BODY PACK

95. As I have discussed previously, I do not agree with Patent Owner’s proposed construction of “body pack” as being “a small box housing a transmitter capable of being worn on a belt or in a pocket,” as I believe this does not reflect ordinary meaning, is overly limiting, and is unsupported by any lexicographic definition or disclaimer. Under any reasonable ordinary meaning, Strub discloses use of a body pack.

96. More particularly, Strub teaches that the recording unit can be wearable. *Id.*, 11:11-13 (“Further, it is highly desirable that the recording unit be adapted to be mounted on (e.g., attached on, or **worn by**), rather than held by, the recorder.”), Abstract (“advantageous aspects of the invention can be provided by a small, lightweight, **wearable** recording unit”), 66:45-49 (“enclosing those components within a flexible encasement can be advantageous, since the flexibility may make the recording unit more comfortable **to wear** and may enable the recording

unit to be made even more compact”), 67:66-67 (“increased emphasis on the **wearability** characteristics of the recording unit”), 4:28-30 (“advantageous aspects of the invention can be provided by a small, lightweight, wearable recording unit.”).

97. In addition to expressly and repeatedly teaching that the recording unit is wearable, Strub further illustrates and discloses that the recording unit can take the form of a backpack. *Id.*, FIGS. 1, 6, 8, 67:30-33 (“... a backpack 601 that is worn by a recorder 602.”), 16:50-53 (“a recording unit according to the invention can be implemented so that components of the recording unit are positioned within a backpack that is worn by the recorder”). A POSA would certainly consider a backpack to be a type of body pack since it is convenient to carry on the body and encloses the recording unit.

98. Mr. Defilippis again argues that a backpack does not make the recording unit wearable because the recording unit is not “worn directly by a user.” Ex. 2140, ¶ 194. In my opinion, this argument does not make much sense. The circuitry and components of the recording unit must be housed within some enclosure. In Strub, that enclosure is the backpack. I note that the backpacks of Strub are not generic backpacks but plainly specifically designed to house the recording unit components. Indeed, the recording units are not depicted as having any form

factor or enclosure other than a backpack. Stated differently, the backpacks are part of the recording unit – the recording unit’s enclosure. Therefore, when the backpack is worn, the recording unit is being worn. Taking Mr. Defilippis’ argument to its logical conclusion, the preferred embodiments of the challenged ’443 and ’207 patents would not be wearable body packs either because the electrical components are not “worn directly,” but are instead housed within a box that must be worn.

99. I also observe that Mr. Defilippis’ construction includes “being ... in a pocket” as an indicator of the wearability necessary for a body pack. *Id.*, ¶ 194. This indicates that if the recording unit is in a form that can be **carried**, as in a pocket, then it is sufficiently wearable to constitute a body pack. And in the case of Strub, the recording units can, at a minimum, be carried – at least in a backpack as opposed to a pocket.

100. Mr. Defilippis argues that the citation to Strub column 11:11-17 merely states that the recording unit can be “adapted” to be worn. *Id.*, ¶ 195. I fail to see the relevance of his argument. If the recording unit can be “adapted” to be worn, then Strub taught to a POSA that the recording unit could be worn, even if non-wearable embodiments might also be within the scope of Strub’s invention. And this is confirmed by numerous other disclosures in Strub. Ex. 1003, Abstract, 4:28-30,

66:45-49, 67:66-67. Moreover, the “adapted to” passage does not in my view negate the other clear passages describing a wearable recording unit.

101. Mr. Defilippis again argues that the recording units in FIGS. 1, 4, 6, 8, and 9 do not include the pertinent components of the recording unit (e.g., transmitter, receiver, etc). Ex. 2140, ¶ 195. For reasons I have already articulated above, he is incorrect. The pertinent recording unit 300 is an exemplary of recording unit “in accordance with the invention” (Ex. 1003, 11:57-59) and hence can be one the “recording unit[s]” in Figure 1 (*id.*, 8:7-15), Figure 6 (*id.*, 67:30-31), Figure 8 (*id.*, 67:56-59, 68:3-8, 70:52-54), Figure 9 (*id.*, 67:56-59, 68:3-8, 73:18-20) that are also in accordance with the invention. That is how a POSA would have understood Strub in my opinion.

102. Mr. Norflus argues that a body pack “must have particular physical characteristics to be used in a professional setting (i.e. movie takes, newscasting, etc.)” such that it needs to be “small and discrete” and not cause “discomfort.” Ex. 2021, ¶ 25. But the claims merely require the local audio device to be “a body pack” and do not impose any requirements with regards to particular usages, professional or otherwise. Ex. 1001, claim 19. Nor does the claim require the body pack to be a particular size, be discrete, or be comfortable. But even assuming Mr. Norflus’ many

unclaimed requirements for a “body pack,” they are expressly taught by Strub, which teaches that the recording unit can be made small, relatively lightweight, comfortable, and to not interfere or distract from the wearers participation in events or activities. Ex. 1003, 11:1-17, 66:26-51, 67:54-68:2.

103. Finally, I note that the components needed from Strub’s enhanced recording device to satisfy the challenged claims that are directed at the local audio device include the transmitter 309, receiver 310, position sensing device (GPS) 311, audio data acquisition device (mic) 303, system controller 301, and a data storage device (memory) 305. *See* Petition, *passim*; Ex. 1003, FIG. 3, 11:57-12:52. The challenged claims that are directed to the local audio device do not require a control interface device 308, audio, recording display device 307, video recording display device 306, or video data acquisition device (camera) 302. These video and display components would comprise the largest components and the most power hungry components. A POSA would understand that by dispensing with these components the necessary components could be readily packaged into a small box that could, for example, be worn on a belt.

104. By way of example, by late 2004 cellular phones were popular and included essentially the same necessary components as Strub’s enhanced recording

unit: microphone, a system microprocessor/CPU/DSP, a radio transceiver, a GPS receiver, and a memory. *See, e.g.*, Ex. 1069, FIGs 3A, 3B, 5, 4:45-5:36. Therefore, it was well within the capability of a POSA to package the components of Strub that read on the challenged claims into a small, compact, lightweight, unobtrusive form factor as demonstrated by cellular phones. This would include a small box that could be affixed to a belt using a belt clip, so that it would be concealed by a shirt, jacket, or coat.

X. MOTIVATION TO COMBINE

105. The declaration of Mr. Defilippis disputes that a POSA would have been motivated to combine Strub and Woo. Ex. 2140, ¶¶ 266-273. Additionally, he further disputes that a POSA would have been motivated to combine Strub and/or Woo with Winningstad with a reasonable expectation of success. *Id.*, ¶¶ 197-204. As explained previously, I disagree. Ex. 1002, ¶¶ 105-107, 111-113, 251-253, 301-306, 308-311.

106. The first argument presented by Mr. Defilippis is that the “Petitioners have failed to show why a POSA would attempt to solve the dropout problem” by combining the Strub, Woo, and Winningstad. Ex. 2140, ¶¶ 197, 201. As an initial matter, I disagree with the premise that the prior art references must be seeking to

solve this particular problem in order for a POSA to have been motivated to combine their teachings. Instead, a POSA would have been motivated to combine their teachings for different reasons. Here, Strub, Woo, and Winningstad are all generally directed to the issue of recording audio. Even at a more granular level, they are directed to “the same type of apparatus used for the same purpose.” Ex. 1002, ¶ 106. For instance, both Strub and Woo are directed to: (a) using local audio recording units to record an event (Ex. 1003, 4:20-30, 8:7-53; Ex. 1004, 4:3-5, 4:62-5:20), (b) transmission of the recording data (Ex. 1003, 12:31-46, Ex. 1004, 5:37-42), (c) use of timecodes for synchronization (Ex. 1003, 7:11-24, 13:48-58, 63:56-60, 79:63-65; Ex. 1004, 4:6-8, 4:20-26), (d) the use of GPS timing signals (Ex. 1003, 63:41-56, 80:2-7; Ex. 1004, 4:13-19, 8:13-19), and (e) post-event editing of the recording data (Ex. 1003, 92:24-50; Ex. 1004, Abstract, 5:42-45, 8:34-59). I also note that dropout correction is not an element in any of the challenged claims, although it is an element in unchallenged claims. *See, e.g.*, unchallenged claim 75 of the ’207 patent (“wherein the remote device is configured to permit an operator to correct for dropouts or interference in the locally generated audio transmitted to the remote device using the audio data retrieved from the memory post-recording”).

107. Given the similarity of the Strub and Woo apparatus and objectives, and their use of similar, mature, and predictable components, a POSA would have been motivated to consider and apply the teachings of both when designing similar types of audio recording units. For instance, to the extent that Strub does not teach jam synchronization in which a master time code generator controls a slave timecode generator (which I believe it does teach), a POSA would have been motivated to apply the teachings of Woo (*e.g.*, Ex. 1004, 3:37-45) in this regard to address Strub’s stated desire to coordinate the timestamps applied to recording data by different recording units. Ex. 1003, 63:46-49, 63:56:60, 79:63-80:7. Conversely, as both Strub and Woo are addressing the use of recording units to record an event or performance, a POSA would have been motivated to take Strub’s teachings of a wearable bodypack recording unit and apply them to the recording units of Woo, as this would provide the persons operating the recording units in Woo with more flexibility, mobility, and convenience.

108. Mr. Defilippis also contends that a POSA would not have combined Strub and Woo because “Strub already discloses a solution to post-production editing (i.e. participants share their locally recorded audio after a recorded event),” and therefore “applying the Woo solution in post-production in Strub would have

been unnecessary.” Ex. 2140, ¶ 201. There are several problems with this contention. First, “shar[ing]” recordings merely brings them together in one place, which is a pre-requisite for, but is not itself, post-production editing. Sharing and editing are obviously not the same. Second, Strub, like Woo, expressly teaches the use of post-production editing, which reinforces the substantial similarity between the two references and their similar objectives and solutions. Strub discloses use of an “audio mixer” to “blend” audio from different recording units. Ex. 1003, 92:38-42. A POSA would understand such mixing and blending to be a form of post-production editing. Similarly, Woo teaches “combining” audio recordings using an “audio layback [sic] suite” such as an “editing station.” Ex. 1004, 8:45-59, 5:37-42. Given the foregoing, it is my opinion that a POSA seeking to design an audio recording system, especially one involving post-event editing, would have considered and applied the teachings of Strub and Woo.

109. In his section on motivation to combine, Mr. Defilippis again criticizes Strub and Woo’s use of GPS timecode information, going so far as to assert that the ’443 patent “requires” a “time reference signal [that] is non-GPS based.” Ex. 2140, ¶ 199. I disagree. As I have already noted above, the challenged claims do not preclude the use of GPS, nor do they require continuous reception of timecodes or

any particular level of availability or performance from the master timecode generator or master timecodes. GPS would work at least some, if not most, of the time, and therefore satisfies the claims. Moreover, Strub (Ex. 1003, 63:41-56), Woo (Ex. 1004, 8:13-34), and Winningstad (Ex. 1008, 8:9-20) all utilize GPS for timestamping and/or synchronization of recording units, indicating that many in the art viewed GPS as being adequate for such tasks. Therefore, a POSA knowing the use of GPS as a master timecode generator, and the use of those GPS master timecodes to jam sync a local timecode generator, as is disclosed in Woo (Ex. 1004 at 3:37-45 (“common feature” of timecode generators is “jam sync,” 4:13-19 (GPS used as timecode generator))), such a POSA would have been motivated to use such a GPS jam-sync process in Strub to the extent that it is not already disclosed in Strub (which it is). A POSA would have been further motivated to do so because GPS signals are free, and it avoids the cost and complexity of providing an alternate master timecode generator. A POSA would have been yet further motivated to utilize GPS jam-syncing, because, as acknowledged by Mr. Defilippis, in some situations (e.g., outdoor filming where a car goes into a tunnel), GPS signals may not be continuously available. By jam syncing the clocks of the local audio devices to GPS time prior to entering the tunnel, the local clocks will maintain sufficient

accuracy for video/audio timestamping for a useful period of time after the GPS signals are blocked. It takes a while, especially with temperature compensated local oscillators, for the local clock to drift enough that it affects the timestamping, especially during filming, which has a maximum frame rate of only 60 frames per second. Once the car emerges from the tunnel, the GPS signals can be reacquired, and the local clock can be jam-sync'd again to GPS time to eliminate any accumulated drift.

110. Mr. Defilippis argues that “[a] POSA would not have been motivated to change Strub’s simple system used by recreational recorders with a complex technical solution requiring multiple GPS receivers, video sync generators, delay circuitry, commands and requests, etc., especially because doing so would dramatically increase the size, weight and battery requirements of the Strub recording units. Such an increase would make them even more unwieldy, cumbersome and impractical than they already are.” Ex. 2140, ¶ 201-202. I disagree with his premise, as he appears to again be assuming that Strub’s recording unit 300 is somehow different and incompatible with the recording units Strub depicts and describes as being wearable in Figures 1, 6, 8 and 9. But as I have previously explained, Strub describes the circuitry and components of recording unit 300 as

being a species of a recording unit that is generally applicable to the wearable recording units in all the figures of Strub. And as described in the Petition, my previous declaration, and above, recording unit 300 (Fig. 3) already includes all the pertinent discussed components of a recording unit, including a controller, audio and video acquisition devices, receiver, transmitter, position sensing device (GPS), data processing device, data storage device, etc. So contrary to Mr. Defilippis, combining aspects of Strub with Woo and/or Winningstad does not make the recording unit of Strub meaningfully more complex, large or heavy. For instance, Strub already discloses use of GPS as part of position sensing device 311 as well as use of timecodes; therefore, to the extent any modification is even necessary, adopting the master-slave jam syncing approach described in Woo would not add additional weight, bulk, or complexity. Instead, adjusting how the recording unit of Strub utilizes timecodes for synchronization and timestamping could be performed via software.

111. On the issue of size and weight, I make the additional observation that for recording unit 300 of Strub the video data acquisition device (i.e., camera, Ex. 1003, 14:38-40) and video recording display device 306 (i.e., an LCD display, *id.*, 45:8-15) will typically be the bulkiest and heaviest components of the recording unit.

See, e.g., id., 22:3-15 (noting that the audio acquisition device is “very lightweight” and typically “lighter than the visual acquisition device”). However, the challenged claims do not require video cameras or displays, so a POSA designing an audio-only recording unit would dispense with them, thereby substantially lowering the size, weight, and complexity of Strub’s disclosed recording unit. Similarly, the video camera and LCD screen are generally the largest consumers of power, so a POSA would further understand that their elimination would substantially reduce power consumption and permit use of a smaller battery, which would further save on size and weight. Finally, I note that even with the video components and all the other components (e.g., GPS, audio acquisition device, controller, storage, etc), Strub repeatedly indicates that the recording unit can be made light, small, and wearable. *See id.*, Abstract (“advantageous aspects of the invention can be provided by a small, lightweight, wearable recording unit”), 11:9-13, 14:59-15:11, 20:34-38, 39:1-5, 43:2-6, 66:26-32.

112. Mr. Defilippis also argues that a POSA would not have combined Strub and Winningstad. Ex. 2140, ¶¶ 201-203. Such a combination is relevant to challenged dependent claims 4 and 9 of the ’443 patent. More particularly, dependent claims 2 and 8 require a remote control unit, and claims 4 and 9 add the

requirement that this remote control unit includes an “external interface port for connection of said at least one remote control unit to an external interface selected from the group consisting of a personal computer, a dumb terminal, a recorder, a receiver, and combinations thereof.” As explained in my previous declaration, Strub teaches the use of a remote control unit for sending commands to the recording unit. Ex. 1002, ¶ 210. And as I also explained, Winningstad describes a remote control unit having an external interface port, and a POSA would have incorporated the same into Strub/Woo. *Id.*, ¶ 307.

113. Mr. Deflippis contends that a POSA would not have combined Winningstad with Strub or the other references because it allegedly teaches away from post-production editing. Ex. 2140, ¶ 201. The basis of his opinion is that Winningstad’s device uses a password to prevent tampering and therefore prevents the editing of recorded data. *Id.* In my opinion, this is a non-sequitur. That the recording device may be password protected does not prevent post-production editing. The user would simply enter the password and then proceed to modify the device settings and perform any editing as needed. Additionally, Winningstad discloses that such password protection is optional rather than mandatory. Ex. 1008, 2:33-35 (“Passwords and authentication keys **can** also be used to improve security

and integrity of the recorded data.”), 8:12-16 (“To ensure that the time and date encoder 88 in the DD device 26 is not tampered with, an internal password **may be** required to be entered via interface 98 in order to modify the clock settings provided by data and time encoder 88.”). Thus, there is no teaching away from the combination of Strub and Winningstad.

114. Contrary to Mr. Defilippis, there was a clear motivation for a POSA to incorporate the external interface port of Winningstad into the remote control of Strub. Strub teaches the use of a control interface device that connects to the recording unit. Ex. 1003, FIG. 3 (308), FIG. 5, FIG. 7 (702), 12:27-31, 45:51-46:9, 60:12-62:25, 70:26-37. This control interface device is expressly described as being “implemented in a manner similar to remote control devices used in other consumer electronic equipment.” *Id.*, 45:56-60. *See also id.*, 70:26-29 (“the control interface unit 702 can be embodied by the Sony RM-95 Remote Commander remote control unit.”). Winningstad also teaches a recording unit and remote control unit. More particularly, circuit 13 comprises a recording unit having a microphone 20, a memory 80 for storing the recording, and a transmitter 82 for transmitting the recording. Ex. 1008, FIGS. 3, 4, 5:54-67. The Data Display and Report Submission device 26 (DD) comprises, *inter alia*, a remote control unit. *Id.*, FIGS. 3, 5, 6:19-

28. Device 26 includes the ability to send “commands” to recording unit 13, such as compression settings. *Id.*, 6:29-35. Device 26 can also receive audio transmitted from transceiver 82 of recording unit 13 and store it in its own memory storage 90. *Id.*, FIGS. 4, 5, 6:7-9, 6:28-38, 6:55-65. Remote control unit 26 of Winningstad is described as being able to connect to a “docking station” at base station 44 or at headquarters (computer) 56 for purposes of recharging its batteries and/or downloading media files from its memory 90. *Id.*, FIG. 3, 8:38-41, 5:17-20. Because remote control unit 26 is inserted into a “docking station,” a POSA would understand the remote control to include an external interface port for connecting to a personal computer for the downloading of the media files and recharging of the battery.

115. In view of the foregoing, a POSA would have been motivated to combine the external interface port of Winningstad’s remote control with the remote control of Strub, independent of whether or not Winningstad teaches multi-track recording or post-recording editing. The external interface port of Winningstad provides an easy and convenient way to recharge a remote’s batteries as well as to have a connected computer change any of the remote’s configuration settings.

XI. ANALOGOUS ART

116. Mr. Defilippis argues that Strub, Woo and Winningstad are not in the same field and are not pertinent to the problems addressed in the challenged patents. Ex. 2140, ¶ 203. I do not agree. Mr. Defilippis contends that the challenged patents are directed to “professional sound recording,” while Strub, Woo, and Winningstad are not. *Id.* I have several disagreements with this argument. First, none of the challenged claims are directed or limited to “professional” users or equipment. Nor does the word “professional” appear in the challenged patents. Second, who or what even qualifies as a “professional”? Mr. Defilippis does not fully explain what he means by his use of this term. I am cautious concerning his usage because any line between professional and amateur/non-professional evolves with time as feature and technologies from “professional” equipment typically migrate down into less expensive equipment designed for prosumers and amateurs. Therefore, I do not find his delineation clear or useful since prior art directed at amateurs or non-professionals discloses features and technologies that at one time were in professional equipment. Third, Woo clearly discloses use in the professional space as it is directed at the “filming, video and audio industries” who require “high performance recordings.” Ex. 1004, 1:21-28.

117. Similar to his arguments concerning motivation to combine, Mr. Defilippis argues that the use of GPS by Strub, Woo, and Winningstad to generate timecodes/timestamps means that a POSA would not have looked to them to address the problems identified in the challenged patents. Ex. 2140, ¶ 204. Again, I disagree. The challenged patents use a source of master timecodes to synchronize audio recorders and/or to timestamp audio recordings. Ex. 1001, 3:32-41, 5:25-29, 8:65-9:12, 10:47-51. Strub discloses the use of GPS as a source of master timecodes for the same purpose. Ex. 1003, 63:41-49. As does Woo. Ex. 1004, 4:13-22, 8:25-9:4. As does Winningstad. Ex. 1008, FIG. 5, 6:42-44, 8:17-22. Mr. Defilippis' technical criticism – that GPS has insufficient availability for certain locations such as subways and underground – is in my opinion insufficient to overcome the clear preference in the art (as reflected by Strub, Woo, and Winningstad) to use GPS, including by Woo, which is directed at the film making industry. This is because, as is implicit in Mr. Defilippis' criticism, GPS is normally available in the vast majority of circumstances, including outdoor events and usually most indoor events as well. Indeed, GPS was developed by the military for navigation and precision ordinance delivery and has been designed to be robust. I don't believe that audio

recording art that uses GPS timecodes is in a fundamentally different field or addresses a different problem than the challenged patents.

118. More importantly, I think Mr. Defilippis has too narrow of a view of the field of the challenged patents and the prior art. Like the challenged patents, Strub, Woo, and Winningstad are all directed to audio recording units that record local audio, use timecodes to synchronize and/or timestamp the audio recorders/recordings, and transmit the audio from their recording units. *See, e.g.*, Ex. 1001, 1:15-17 (“Embodiments of the present invention generally relate to systems and methods for recording and processing audio received from one or more wireless devices”); Ex. 1003, 1:24-25 (“The invention relates, in general, to recording an event and to devices used to record an event.”); Ex. 1004, 5:3-17 (“A recorder 14 captures the performance from its vantage point while another recorder 16 independently captures the same performance from its own vantagepoint.... The recorders 14 and 16 preferably comprise audio tape recorders”); Ex. 1008, Abstract (“A wireless data acquisition and recording (DAR) system includes

acquisition circuitry including a video camera and/or a microphone carried by an operator for capturing video and audio events viewed and/or heard by the operator.”).

119. Thus, there is significant overlap in the features and operations of the recording units, which is more important than whether any given recording unit is intended for professional or amateur users or whether GPS is used for master timecodes. In my opinion, Strub, Woo and Winningstad are in the same field as the challenged patents or are at least addressing similar problems (e.g., how to synchronize audio recorders/recordings).

120. I believe that my opinion is consistent with, and supported by, the fact that Strub and Woo are cited on the face of challenged Patent No. 10,276,207 (which is a descendent of the challenged ’443 patent), and they formed the basis of rejections in the Lectrosonics IPRs. *See, e.g., Lectrosonics, Inc. v. Zaxcom, Inc.*, IPR2018-01130, Paper 32 (PTAB Jan. 24, 2020). I also note that Winningstad cites Strub patent number 6,563,532 (Ex. 1047), which has a substantially overlapping disclosure as the Strub ’875 patent relied upon in the Petition. *See, e.g., id.*, FIGs 1-9B, 7:31-53, 11:29-12:10, 62:66-63:7. Conversely, Strub cites Winningstad patent

number 5,886,739 (Ex. 1045), which overlaps with the Winningstad '485 patent relied upon in the Petition. *See id.*, FIGs 1-3, 3:45-64. I further note that the PTAB has previously rejected Patent Owners' arguments that Woo is not analogous art in the Lectrosonics IPRs. *See, e.g., Lectrosonics, Inc. v. Zaxcom, Inc.*, IPR2018-01129, Paper 33 at 30-31 (PTAB Jan. 24, 2020) (Ex. 1062). The foregoing is supportive of my opinion that Strub, Woo, and Winningstad are in the same field, or at least address similar problems, as the challenged patents.

XII. '207 ELEMENT 17[PRE], 17[G], 17[H], 59 [PRE], 59[F], AND 59[G] – “LOCALLY GENERATED AUDIO”

121. Essentially the same as his arguments for challenged claim 1 of the '443 patent, Mr. Defilippis again argues that “locally generated audio” is “audio created by the wearer of the local audio device receiving the locally generated audio, such audio suitable for use as an independent track of audio.” Ex. 2140, ¶¶ 230-235. As I have explained previously, and incorporate herein, I do not agree with this claim construction. Mr. Defilippis asserts that this element is not taught by Strub or Woo, as the recording units in those references do not receive audio generated by the recording person but instead receive audio generated by others. *Id.*, ¶ 232. He also argues that the recording units do not record audio suitable for use as an independent

track of audio because “it does not record each performer on an individual, dedicated audio track.” *Id.*, ¶ 235.

122. To the extent Patent owner’s claim construction is adopted by the Board, it is my opinion that this element is at least taught by Strub for the reasons I have previously discussed above in the context of the ’443 patent and incorporate here. In sum, Strub teaches that the wearer of the recording unit is a “participant” who participates in the events such as singing “Happy Birthday,” water skiing, snow skiing, and bicycling. As a participant, the wearer would also be generating audio, or this at least would have been obvious to a POSA. Further, the audio received and recorded by each wearer would be different, and hence independent, of the other wearers because each recorder is necessarily located in different places and therefore would receive the sounds differently. Further, in cases of solo activities like skiing and bicycling, the *only* audio would be that of the wearer themselves, or again this would have been an obvious choice or variation. The specification passages cited by Mr. Defilippis relating to microphone placement and directivity are merely exemplary/optional embodiments of Strub and, in any event, support my opinion that the wearer also generates audio while being engaged in “conversation” with others.

XIII. '207 ELEMENT 17[PRE], 59[PRE] – “AN AUDIO DEVICE WEARABLE BY A USER”

123. For this claim language, Mr. Defilippis again repeats the arguments he made for the similar “at least one audio device wearable by a creator of said locally generated audio” language of claim 1 of the '443 patent. *Id.*, ¶¶ 236-247. In the interest of brevity, I incorporate my discussion above for the '443 patent here.

124. In sum, I believe Mr. Defilippis is incorrect in arguing that when Strub describes the recording units as being wearable in the Summary of the Invention, FIG. 1 105-108, and Figs 7 and 8, Strub is excluding enhanced recording unit 300. As I explain above, recording unit 300 is a species of recording unit in accordance with the invention that is applicable to all the exemplary figures.

125. As also explained above, Mr. Defilippis is incorrect when arguing that the recording unit of Strub is merely portable, given that Strub expressly describes it as wearable, provides design guidance on how to make it wearable, and indicates that it can be made lighter. Further, 24 pounds is readily wearable by most adults as a backpack, and the claims place no requirement on the necessary degree of wearability.

126. Relatedly, as also explained previously, I believe Mr. Defilippis' fine distinction between the recording unit components themselves being worn, as

opposed to their being placed in a wearable backpack, is unfounded. Strub makes clear that the enclosure of the recording unit is in the form of a wearable backpack, not that the recording unit has a different enclosure and is merely carried inside a generic backpack. And even if the recording unit is carried in a standard backpack, it is my opinion this still meets the wearability requirement of the claims since the claims do not require that the recording unit be “directly” worn or preclude use of a secondary enclosure that is wearable.

XIV. '207 – “RECEIVE A MASTER TIMECODE FROM A MASTER TIMECODE GENERATOR AND JAM SYNCHRONIZE THE LOCAL TIMECODE GENERATOR TO THE MASTER TIMECODE GENERATOR.”

127. Mr. Defilippis argues that Strub fails to teach this element. *Id.*, ¶¶ 248-264. He states that Strub only “discloses the use of GPS time signals **or** the internal clock as producers of time data, [so] Strub is absent of any language that would indicate the internal clock is aligned with the GPS time signal.” *Id.*, ¶ 258. I disagree and believe that Strub teaches this claim element for the reasons set forth above for the similar claim element in claim 1 of the '443 patent, which for brevity are incorporated herein. In sum, Strub teaches the use of GPS time signals to control/sync the internal clocks of the recording units. Ex. 1003, 63:41-56, 79:63-80:9. Moreover, this process of syncing one clock to a time reference or another

clock is known as a “jam sync.” Therefore, Strub teaches the use of a master timecode generator (GPS) generating master timecodes (GPS signals) that are used to jam sync the internal clocks of the recording units.

128. And as also explained previously and incorporated here, Woo also expressly teaches using a “jam-sync process” that “locks up” a slave timecode generator to another time source. Ex. 1004, 3:37-45. And Woo expressly teaches the use of GPS for this “jam” process. *Id.*, 7:26-53. As discussed above, Mr. Defilippis mistakenly believes that the GPS signal “is insufficient to achieve synchronization” because a “highly accurate pulse” is also needed. Ex. 2140, ¶ 261. Actually, the pulse he refers to is generated by counting the epochs of the coded GPS signal and therefore is also based on GPS.

129. Finally, Mr. Defilippis again criticizes the availability of the GPS signals. *Id.*, ¶ 263. But as I have discussed above, the claims do not require any degree of availability, and GPS is available outdoors and often indoors as well. Thus, a POSA would have considered GPS a viable master timecode source for jam syncing (as they did in Strub and Woo). Use of free GPS avoids the need for a separate master timecode generator for the system, thereby reducing cost and complexity.

XV. MOTIVATION TO COMBINE

130. Mr. Defilippis essentially repeats his previous arguments that a POSA would not have combined Strub and Woo because they allegedly do not employ multi-track recording or seek to address the “dropout” problem and because it would purportedly increase size and weight. *Compare id.*, ¶¶ 266-273 with ¶¶ 197-204. I disagree and incorporate herein my discussion above for the ’443 patent.

XVI. OBJECTIVE INDICIA OF NON-OBVIOUSNESS

131. Mr. Defilippis’ urges three objective indicia of nonobviousness grounds: (1) long felt need, (2) failure by others, and (3) industry praise. *Id.*, ¶¶ 281-286. He further asserts that there was a “strong nexus” between these indicia and the challenged claims of the ’443 and ’207 patents. *Id.*, ¶¶ 287-289. I do not find these purported indicia to be compelling, nor do I believe that nexus to the challenged claims has been shown.

132. With respect to long-left but unsolved need, Mr. Defilippis relies on the declarations of Mr. Wexler (Ex. 2126) and Mr. Sarokin (Ex. 2127). *Id.*, ¶ 282-283. But Mr. Wexler does not really explain how there was a long-felt unsolved need in the art. For instance, he provides no evidence or explanation that there was a pre-existing and persistent need for the features of the claimed invention that was

recognized by those in the field. To the contrary, he admits that until he actually received and used Zaxcom's system, he "hadn't really thought about what a significant achievement this was or how useful it might be" and that only after using the system he "realized that this was truly a 'game changer.'" Ex. 2126, ¶ 5. This indicates that there was no preexisting and persistent need for such a system. Instead, he was pleasantly surprised and impressed by the alleged benefits of such a system once he received and used it. Nor does Mr. Wexler discuss any prior art or attempts by others and explain how they failed to satisfy the alleged need.

133. Mr. Sarokin's declaration is similarly flawed with respect to long-felt need. Ex. 2127. At most, Mr. Sarokin claims that Zaxcom's system was the first one and that "no other company ha[d] anything remotely close." *Id.*, ¶¶ 5-6. But Mr. Sarokin fails to provide evidence of any pre-existing and persistent need for the features of the claimed system that was recognized by those in the field. Indeed, he fails to describe giving any thought to such a system or capabilities prior to Mr. Sanders of Zaxcom "show[ing] up with a small radio receiver and tiny transmitter" and demonstrating it to Mr. Sarokin. *Id.*, ¶ 5. Nor does Mr. Sarokin discuss any prior art or attempts by others and explain how they failed to satisfy the alleged need.

134. In addition to relying on the flawed testimony of Mr. Wexler and Mr. Sarokin, Mr. Defilippis also opines that the claimed inventions solved a long felt need. Ex. 2140, ¶ 283. But his assertion is conclusory as he provides no additional evidence or examples of their being a persistent and pre-existing need for the claimed invention to those in the industry. Nor does he discuss any prior art or prior devices and explain how they failed to satisfy the alleged need. Similarly, Mr. Defilippis makes the conclusory assertion that “[i]t is also my opinion that others failed to achieve what Glenn Sanders accomplished with the patented invention of the ’443 Patent and the ’207 patent.” *Id.* But he identifies no particular attempts by others to provide the features of the claimed inventions that resulted in failure. At most, Mr. Defilippis and the other witnesses appear to be claiming that the Zaxcom system was first (novel), but this does demonstrate failures by others or that there was a long-felt need.

135. In addition to long-felt unsolved need and failure of others, Mr. Defilippis also relies on the declarations of Mr. Wexler and Mr. Sarokin as evidence of praise by people in the field. *Id.*, ¶ 284. As an initial matter, these declarations were plainly prepared for purposes of these IPR proceedings, and Mr. Defilippis fails to cite any similar or corroborating statements from 2005, when the Zaxcom system

was allegedly introduced, until when the IPRs began in late 2024, nearly twenty years later. Therefore, I believe this diminishes the probative weight of these declarations.

136. More significantly, the declarations fail to provide a nexus between the claimed features of the invention and the alleged praise, long-felt-need, and failure by others. For instance, Mr. Wexler’s declaration focuses on the benefits provided by the radio technology used by the transmitter, in particular that the transmitters use **digital** transmission. See Ex. 2126, ¶ 5 (“Zaxcom produced the first wireless systems designed specifically for our usage in sound for picture that utilized digital RF transmission. This went a long way in solving some of the problems associated with frequency allocation.”). He also praises the fact that the recorded audio is on microSD cards that “can be directly delivered to post production engineers.” *Id.*, ¶ 6. But these features are not recited in the challenged claims of the ’443 or ’207 patents (except ’443 dependent claim 24 – “digital transmission”). But even then, digital transmission of data was known for decades before the patents at issue and is not in any way a novel feature. Indeed, Patent Owner and Mr. Defilippis do not contend otherwise and make no specific non-obviousness argument for claim 24 of the ’443 patent. Further, the specifications of the challenged ’443 and ’207 patents

do not describe analog transmission as being a problem or tout the benefits of digital transmission. To the contrary, they indicate that analog transmission is within the scope of the invention. *See* Ex. 1001, 8:8-10 (“This audio may then be processed and sent via local transmitter 308 in either analog or digital form.”). Therefore, to the extent there is any nexus, it is only for a dependent claim for which Patent Owner has not made any separate or independent argument for non-obviousness.

137. Additionally, the challenged claims of the ’443 and ’207 patent are heavily focused on the use of timecodes and the timestamping of recording data. *See id.*, claim 1 (elements A, C, H, I, J), ’207 patent, claim 17 (elements D, E, F, I), ’207 patent, claim 59 (elements B, D, E, H). Mr. Wexler makes no mention of timecodes or timestamping at all. In my opinion, the invention is not simply the idea of a device that both transmits and records audio; instead, the recorded audio is also timestamped using timecode information. But Mr. Wexler merely describes the general ability to record and transmit audio as being significant. Ex. 2126, ¶ 5 (“Soon after introducing digital wireless transmitters, Zaxcom developed a transmitter that had recording capability. When I first used the recording wireless transmitters, I hadn’t really thought about what a significant achievement **this was** or how useful it might be.”). But recording and transmitting is a basic concept that was well known

in the art, including by Strub, Woo, and Winningstad. As a result, it is my opinion that Mr. Wexler has not demonstrated a nexus between the patented invention and the objective indicia of nonobviousness.

138. Mr. Sarokin’s declaration has similar issues demonstrating nexus. Even moreso than Mr. Wexler, Mr. Sarokin places great emphasis on the fact that Zaxcom’s system uses “digital” transmission of the audio data. Indeed, his short declaration uses the term “digital” eighteen times and repeatedly emphasizes its importance. *See, e.g.*, Ex. 2127, ¶ 5 (“To my knowledge, that was the first use of a **digital** radio in the field during filming of a motion picture. It worked beautifully ... By the time Sony came out with their first **digital** radio, Zaxcom was already on its 3rd generation.”), ¶ 6 (“outdated analog FM transmission ... Zaxcom first introduced **digital** radio mics ... cut the transmission bandwidth tenfold”), ¶ 7 (“called **digital** radio mics the holy grail ... NO ONE else has reduced bandwidth **digital** radios”). Again, digital transmission is not a recited feature in the challenged claims except for dependent claim 24 of the ’443 patent. And as I have noted above, digital transmission was not novel and is not described in the challenged patents as being significant to the invention. Mr. Sarokin also focuses on other unclaimed

features such as the size of the device. *Id.*, ¶7 (“**micro-sized** digital radios”). The challenged claims do not restrict the size of the recording unit.

139. Further, Mr. Sarokin places a lot of emphasis on the Zaxcom system having a remote control capability. *Id.*, ¶ 5 (“Mr. Sanders was already speaking of the next generation units that would be **fully remote controllable**”), ¶ 6 (“Not only could they transmit audio, they could also receive time code sync signals and **remote control commands**.”), ¶ 6 (“long-range **remote-control capability**”), ¶ 7 (“Being able to control that gain **remotely** from that distance is a life saver NO ONE ELSE has **remote control capability** of more than a few feet, if at all.”). But remote control capability is only recited in certain dependent claims – ’443 patent claims 2, 4, 8, 9, 26, 27 and ’207 patent claim 66 - and neither Patent Owner nor Mr. Defilippis make separate non-obviousness arguments for these claims based on there being a remote control unit. Therefore, to the extent there is any nexus, it is only for certain dependent claims for which there is no separate or independent argument for non-obviousness that relate to a remote control.

140. Mr. Defilippis also claims that awards from the Academy of Motion Picture Arts and Sciences (Oscars) and from the Academy of Television Arts and Sciences (Emmys) demonstrate industry praise and recognition. Ex. 2140, ¶¶ 284-

286. But these too fail to demonstrate a nexus with the challenged claims. In his opinion relating to nexus, Mr. Defilippis claims that the Academy Award was due to the Zaxcom device's "ability to locally record while simultaneously transmitting the audio." *Id.*, ¶ 284. As an initial matter, I note that the challenged claims of the '207 do not require "simultaneous" or "real time" transmission of audio. Further, the actual award certificate instead emphasizes the "fully digital modulation" used by the Zaxcom transmitter. Ex. 2114. *See also* Ex. 2112 ("Digital Recording Wireless"). Indeed, this is consistent with Zaxcom's own press release relating to the Academy Award which states:

"It's truly an honor," says Sanders. "The holy grail of wireless microphone technology is for the audio quality to be identical to that of a hardline system. We knew if we made incremental improvements to ***analog audio*** it would only be a band aid solution to wireless transmissions. With our ***Digital*** Recording Wireless, we are the first to achieve performance equivalent to a hardline system."

Zaxcom's ***Digital*** Recording Wireless including a variety of wireless receivers and transmitters for today's audio professional. Built from the ground, wireless transmitters including the ZMT3, TRX743 and TRXLA3, feature fully encrypted ***100% digital modulation***.

Ex. 1063 (emphasis added). From the foregoing, it is clear that it was the use of digital modulation to transmit the audio that was the major reason for the praise and award, as such digital modulation, in contrast to analog transmission, enabled the audio quality to be “equivalent to a hardline system.” But as explained previously, only challenged dependent claim 24 of the ’443 patent recites that the audio is transmitted in “digital form.” And Patent Owner makes no separate non-obviousness argument for this claim, so Mr. Defilippis’ evidence of secondary considerations is irrelevant.

141. Mr. Defilippis’ evidence relating to the Emmy Award is similarly flawed. Again, the description of the award by the Television Academy focuses heavily on the fact that the audio in Zaxcom’s system was transmitted digitally rather than in analog form. *See* Ex. 2128, 11 (emphasis added):

Before Zaxcom, all wireless microphones used for production sound capture utilized ***analog*** FM transmission systems to get sound from the actors on set to an external recording device. Starting in 2002, Zaxcom developed and produced a ***digital*** wireless transmission system for microphones.

See also Ex. 2129, 3 (“Its innovative products include the first ***digital*** wireless transmission system for microphones ...”) (emphasis added). Additionally, many

other features of the Zaxcom system mentioned in the Emmy Award are not recited in, or limited by, the claims, including:

- “Unique audio file format (MARF)”
- “Record audio file protection in the case of power failure or media removal using a unique file directors structure embedded within the recording file.”
- “... digital, low latency IFB (interrupted fold back) audio return signal.”
- “Full-range microphone capture (126dB) using dual precision A/D converters.”
- “Low latency digital compression and transmission (3.5mS)” [i.e., 3.5 milliseconds of latency]
- “Efficient, high quality digital compression to increase the number of wireless microphone channels available. (4:1 increase over analog wireless microphones).”

Ex. 2128, 11. The award also mentions “[w]ireless digital remote control of the wireless microphone transmitter including pre-amp gains.” *Id.* However, as explained above, remote control capability is only recited in certain dependent claims – ’443 claims 2, 4, 8, 9, 26, 27; ’207 claim 66 - and neither Patent Owner nor Mr. Defilippis make separate non-obviousness arguments for these claims based on there being a remote control unit. Therefore, to the extent there is any nexus, it is only for certain dependent claims for which there is no separate or independent argument for non-obviousness that relate to a remote control. Similarly, the Emmy

Award entry form lists mostly unclaimed features or features not relied upon by Patent Owner for non-obviousness (e.g., remote control):

- It allows for the elimination of lost audio due to wireless transmission problems.
- It eliminates audio distortion due to analog wireless transmission and limiter distortion.
- It allows for remixing and rerecording while production is in process.
- It provides a wireless remote control system to speed production.
- It allows for up to 4 times the number of wireless channels to operate together.

Ex. 2130, 3.

142. Mr. Defilippis repeats many of these unclaimed or not-relied-upon features in his declaration. Ex. 2140, ¶ 288. He also quotes statements of general praise directed at Zaxcom that is not tied to any particular features or technology recited in the challenged claims – “industry leader,” “significantly contributed to the advancement of television broadcasting,” and “innovative products.” *Id.* Finally, Mr. Defilippis essentially recites the various elements of the challenged claims and makes the conclusory statement that there is a “strong nexus” between these elements and the secondary considerations. *Id.*, ¶ 287. However, other than the exhibits and declarations cited by Mr. Defilippis, which I have addressed above, he provides no explanation or basis for his conclusion.

143. In view of the foregoing, it is my opinion that the evidence for secondary considerations of non-obviousness is not compelling because it is not adequately tied to the challenged claims. Instead, the declarations and awards that are relied upon focus on numerous features unrecited in the claims, especially the use of digital, rather than analog, transmission of the audio. As a result, in my opinion the challenged claims are obvious, especially given that the Strub and Woo references are each very close to the claimed inventions. Further, even if the purported objective evidence of non-obviousness is credited, in my opinion it is insufficient to overcome the obviousness presented by the prior art given how close the prior art is to the challenged claims and the fact that there were several inventors (e.g., Strub, Woo, Winningstad) going down this similar line of invention.

144. Mr. Defilippis also cites and charts product manuals for the TRX900A (Ex. 2131) and TRX900LA/LAS (Ex. 2132) as allegedly showing that the products for which Zaxcom received the awards practiced all the claim elements of the challenged independent claims. *Id.*, ¶ 289. But none of the award documentation refers to a TRX900. *See, e.g.*, Ex. 2128-30, 2110-14. Additionally, the claim charts in his declaration gloss over certain claim elements and fail to show that they are practiced or implemented by the TRX900-series products.

145. For instance, challenged claim 1 of the '443 patent includes claim element 1[F] that recites:

at least one control unit in communication with said local audio device, and said memory for creating local audio data from said locally generated audio and storing said local audio data in said memory.

For this claim element, Mr. Defilippis cites pages 7 (“Transport Control”) and 12 (“IFB Receive to Transmit time”) of both Exhibits 2131 and 2132. But these pages provide no support for claim element 1[F]. More particularly, there is no description of a “control unit,” let alone a control unit that is in communication with: (a) the local device receiver, (b) the audio input device, and (c) the memory. Nor is there any description of the claimed function, wherein the control unit is for “creating local audio data from locally generated audio and storing said local audio data in said memory.” The manuals do not explain any “creating” function being performed by a control unit on the locally generated audio.

146. Mr. Defilippis also glosses over elements 1[H-J]. These elements require that the local audio data stored include “stamped local audio data,” wherein this stamped audio data includes at least one timestamp “to reference at least a portion of said local audio data to at least one of said *master timecodes*.”

Additionally, the local audio data must also include “unstamped local audio data” that does not include such a reference to master timecodes. Mr. Defilippis cites to Ex. 2131 at pages 5, 14-15. Collectively, at most these pages merely indicate that audio data is recorded in memory, that the unit receives master timecodes via ZaxNet, and that the unit will jam sync to these timecodes. There is no disclosure as to whether any of the local audio data is actually stamped. And even if it were stamped, there is no disclosure as to whether any such timestamps reference a master timecode as opposed to a local timecode or something else. Finally, even assuming that the local audio data includes timestamps to reference a master timecode, there is no disclosure of any “unstamped local audio data” that lacks such timestamps. Mr. Defilippis also cites Ex. 2132 page 6, but this also fails to disclose any of the foregoing. At most, this page merely discloses that the unit can receive and transmit ZaxNet timecodes. But it fails to address whether the local audio data is stamped with a timestamp to reference a master timecode or whether any of the local audio data is unstamped.

147. Mr. Defilippis similarly glosses over similar claim elements from the challenged independent claims of the '207 patent. Ex. 2140, pgs. 101-103. For instance, elements 17[E]/59[D] require a “control unit” that is coupled to: (a) the

wireless transmitter [17E only], (b) the audio input port, (c) the memory, and (d) the local timecode generator. But as explained above, the pages he cites in the user manuals (Exs. 2031 and 2032) do not describe a “control unit,” let alone one coupled to the foregoing hardware components. More particularly, pages 7 and 12 of these exhibits contain no description of a “control unit,” let alone a control unit that is coupled to the hardware components listed above. Elements 17[I]/59[H] further require that at least a portion of the audio data be stamped with the local timecode. Mr. Defilippis again cites pages 7 and 12 of exhibits Ex. 2031 and 2032. But these pages merely demonstrate that the unit receives ZaxNet timecodes. They say nothing about stamping the local audio data or whether those stamps are local timecodes or master timecodes. Mr. Defilippis’ failure to demonstrate that these documents disclose this element of the challenged claims is highlighted by the fact that he cites these same manuals for elements 17[I]/59[H] of the ’207 patent, which require stamping the local audio data with a local timecode, and for elements 1[H]/[I] of the ’443 patent, which requires the local audio data to be stamped with a reference to master timecodes. Ex. 2140, pg. 104. Yet, Mr. Defilippis fails to explain how the TRX900 allegedly does both, or how the manuals demonstrate that. The manuals

do not describe the actual time stamping of the local audio data, let alone the nature of the timestamps, i.e., master, local, or both.

148. Finally, I note that the Lectrosonics IPRs involved similar claims to those being presently challenged. *Compare, e.g.*, Ex. 1030, claim 1 and Ex. 1001, claim 1. In those IPRs, except with respect to claims that expressly included using the recorded audio for repair/replacement/dropout correction, the PTAB rejected Patent Owner's arguments that the objective indicia supported non-obviousness. Ex. 1014, 23-25; Ex. 1017, 31-15; Ex. 1018, 28-31. Here, none of the challenged claims of the '443 and '207 patents include repair/replacement/dropout correction limitations. While I do not rely on these facts for my opinion, I believe that they are confirmatory.

XVII.ENABLEMENT OF STRUB

149. It is my understanding that the prior art needs to enable a POSA to make the invention of the challenged claims without undue experimentation. I further understand that prior art need not enable its own full disclosure but only needs to enable the portions of its disclosure that are relevant to the invention of the challenged claims. Similarly, I understand that a prior art reference need not enable the full scope of the challenged claim but instead need only enable a single

embodiment of that claim. I further understand that the enablement inquiry includes whether a person of ordinary skill in the art could have combined the prior art's description of the invention with their own knowledge to make the claimed invention. Finally, I understand that in assessing whether prior art is enabling, it can be useful to consider the so-called "Wands Factors," which include: (1) the quantity of experimentation necessary, (2) the amount of direction or guidance presented, (3) the presence or absence of working examples, (4) the nature of the invention, (5) the state of the prior art, (6) the relative skill of those in the art, (7) the predictability or unpredictability of the art" and (8) the breadth of the claims.

150. Mr. Defilippis argues that the Strub reference is not enabling to a POSA. Ex. 2140, ¶¶ 290-320. I disagree. As an initial matter, Mr. Defilippis appears to use an incorrect formulation of the enablement standard as applied to prior art. In particular, he states that "it is further my understanding that for a reference to be prior art, it must be enabled and teach one of ordinary skill in the art how to make **and use** the invention without undue experimentation." *Id.*, ¶ 12 (emphasis added), ¶ 290 ("These suggested parts are not readily combinable and are not designed or feasible **for use** in a portable, battery powered device, particularly one **used** for activities 'such as hiking, snow skiing, or ping pong.'"), ¶ 303 ("The

68HC11G is unsuitable **for use** in unit 300.”). However, it is my understanding that what constitutes enablement for prior art differs from the enablement standard for patent claims under 35 U.S.C. § 112. More particularly, it is my understanding that prior art need not teach a POSA how to “use” the invention. I also note that Mr. Defilippis references “Wands Factors 4, 5, and 7” but does not explain what those are. *Id.*, ¶ 320.

151. Mr. Defilippis also implicitly assumes that Strub must enable the full scope of his invention, as opposed to Strub and the knowledge of a POSA enabling the challenged claims. But it is my understanding that it is at most the latter that would need to be enabled. This erroneous assumption infects and permeates Mr. Defilippis’ opinion because he asserts that Strub fails to enable certain features that are disclosed in Strub but that are not claimed in the challenged claims. One example of this is Mr. Defilippis’ contention that Strub discloses the use of artificial intelligence in the recording unit but that AI allegedly did not exist until 2011. *Id.*, ¶ 299. But AI is not included in any of the challenged claims, so this argument is irrelevant.

152. An even more important example is Mr. Defilippis’ argument that a POSA could not have constructed a video recording/transmission system as

described in Strub in 2000. *See id.*, ¶ 295 (batteries in 2000 not capable of supporting “**video** processing chips ... and **video** capture and playback equipment”), ¶ 297 (Strub fails to teach RF shielding from RF impairments that affect “picture noise, and loss of color”), ¶ 297 (“Strub fails to address **video** synchronization in its entirety”), ¶ 297 (Strub fails to teach “MPEG compression to enable **video** transmission”), ¶ 301 (it was “technically infeasible” to use Strub’s disclosed Motorola 68HC11G chip as a control unit because it had “no graphics or **video** capture hardware” and was “wholly incapable of processing a single real-time live **video** feed” and could not “receive and process real time A/V data from **video** data acquisition device 302 or receiver 310 nor can it transmit such data to a **video** recording display device”), ¶ 303 (the Motorola 68HC11G lacks sufficient sampling rate to “digitize composite **video**”; it lacks “dedicated **video**-decode hardware”; it is not designed for “raster **video** capture”; it lacks the RAM and high-speed bus/host storage to store “raw **video** frames”; and did not support NTSC transmission for transmitting a “coherent picture”), ¶ 304 (Motorola 68HC11G was not capable of performing the combination of Strub tasks that included: “incorporating the auxiliary data with the **video** ... [and] synchronizing the audio data with the **visual** data”), ¶ 311 (RGB video interface incompatible with 68HC11G), ¶ 312 (In 2000, there was

no mainstream, portable, battery-powered device that combined A/V recording, wireless transmission of A/V data, and wireless reception of A/V data in a single, battery powered unit.”), ¶¶ 314-315 (discussing “camcorders” and streaming “audiovisual data”), ¶ 318 (discussing availability of “picture in picture” camcorders). But again, the challenged claims are all limited to audio, and none require video. Therefore, his whole opinion is off-base because it is reliant on the assumption that a wearable video recording/transmission system must have been enabled.

153. In my opinion, the technology involved in the challenged claims was neither complex nor unpredictable. To the contrary, it involves straightforward electrical and mechanical design using elements and building blocks that were well known and well understood for many years before the April 2000 date that Mr. Defilippis uses in his analysis. The challenged claims focus generally on receiving and recording audio, transmitting audio, and using timecodes. Receiving and recording audio has been well-known for over a century. Microphones were used to capture the audio and then record it onto magnetic wire or tape. By the 1970’s, digital audio recording was demonstrated by Soundstream, Denon, Sony, 3M, and others. Indeed, Sony introduced Digital Audio Tape (DAT) digital audio recording

and playback in 1987, which could record 90 minutes of audiophile quality audio (48 kHz, 16-bits) onto a cassette. DAT units were sold throughout the 1990's, including the compact Sony TCD-D7 Walkman, that was sold starting around 1993 and that measured just 5.25 x 1.5 x 3.5 in., weighed just over a pound, and consumed just 1.2W of power. Ex. 1070. This supports my opinion that compact digital audio recorders were well known at least a decade before the challenged patents. Digital audio recording technology was mature and predictable by the year 2000. It would not have required any undue experimentation to make a small audio recording unit that could be wearable, as these were already available off-the-shelf. And adding a transmitter and timecode capability would have been well within the skill of a POSA and would not have significantly increased the size or complexity.

154. Additionally, by April 2000 it was well-known in the art that solid state memory (which is not prone to vibration and other issues identified by Mr. Defilippis) could be used to store audio data. *See, e.g.*, Ex. 1048 (filed March 23, 2000), FIGS. 1 and 3, 1:21-26, 4:63-5:10, 7:20-25, 8:14-19 (audio recording/reproducing apparatus writes audio data to flash memory); Ex. 1051 (filed November 23, 1999), 1:7-10, 6:10-13, 6:19-26 (portable cordless phone with “flash memory” to store and play audio files). Indeed, prior to April 2000, several

manufacturers were selling 128MB CompactFlash (CF) cards, including Delkin Devices, Pretec Electronics, and Simple Technology. At this size, the flash memory card can store approximately 24 minutes of CD audio (16-bit, 44.1 kHz), 15 minutes of professional-grade audio (24-bit, 48 kHz), 133 minutes of CD-quality audio (128kbps CBR MP3), and 266 minutes of ISDN landline quality audio (8-bit, 8 kHz). All of these amounts of time had utility. Indeed, even at very high bit-depth and sampling rates, the memory could store two to three typical songs. I note that the challenged claims place no requirements or limits on the size of the memory or the length of the recording.

155. Prior to April 2000, it was also known to transmit audio using RF technology. This included RF transceiver technology used in small cordless phones operating in the 900 MHz UHF and 2.4 GHz bands, which would include the Conexant RF105 and RF109 digital direct sequence spread spectrum chipsets. Ex. 1071; Ex. 1072. It would also include GSM transceiver technology used in mobile phones since the mid-1990's. It would also include 802.11b WiFi technology which was introduced in 1999. *See id.*, 3:58-65, 7:35-46 (transmitting audio using RF transceiver), 1:25-29, 2:10-18. Mr. Defilippis' concerns about "setting frequencies or coordinating among the units" are inapplicable to the foregoing technologies. Ex.

2140, ¶ 298. Spread spectrum technology enables multiple devices to operate in the same spectral band. And GSM utilized time-division multiple access (TDMA) technology so that multiple devices could time share a given channel. And 802.11b utilized carrier sense multiple access with collision avoidance (CSMA/CA) along with request-to-send/clear-to-send (RTS/CTS) to mitigate multiple devices potentially interfering with each other. In short, by the year 2000, RF interference and channel selection was well understood and presented no significant challenge to implementing the claimed inventions.

156. Despite Strub expressly disclosing use of a Motorola 68HC11 microcontroller as being an example of one possible control unit (Ex. 1003, 14:1-13, FIG. 3), Mr. Defilippis argues with Strub and contends that such a microcontroller would not work. *Id.*, ¶¶ 300-304. But his argument focuses heavily on this microcontroller allegedly being unsuitable for processing and transmitting “video,” and is therefore irrelevant to the challenged claims. Relatedly, he claims that 10-bit/15kHz ADC sampling is “unsuitable for digitized audio and video.” *Id.*, ¶ 301. But that is perfectly suitable for audio. Indeed, AT&T and other telcos have used 8-bit 8kHz sampling for ISDN landline voice since the early 1980’s. Notably, the challenged claims place no performance requirements on the audio in terms of

quality, let alone sampling rate or bit depth. And the specification of the challenged patents indicates the invention can be used for “news announcers,” which would be spoken voice content that does not require more than 8-bit/8kHz sampling such that the 10-bit/15 kHz provided by the Motorola chip is more than adequate. Mr. Defilippis also ignores that a POSA would have understood that the A/D sampling could be performed by a separate converter rather than the Motorola chip, and high precision “audiophile quality” ADCs (16+ bit, 48+ kHz) were well-known well before the year 2000. Additionally, Mr. Defilippis overlooks the fact that the Texas Instruments TM320C series of DSPs was widely available before April 2000, including the TMS320C5x family, wherein the specification of the challenged patents described the TMS320C5509A family member for the preferred embodiment. Ex. 1001, 8:26-29; Ex. 1064 (TMS320C5x User’s Guide, June 1998). My review of the Texas Instruments documentation indicates that other members of this family available before April 2000 would have been satisfactory control units for the challenged claims, as they included adequate processing power, and sufficient interfaces to connect to a transceiver, memory, audio input, etc.

157. In sum, I do not perceive any enablement issues with a POSA being able to make the claimed inventions prior to April 2000. Strub provides over 92

columns of detailed explanation for how to implement its preferred embodiments. By the year 2000, the technologies for recording and storing audio, processing audio, and transmitting audio were all mature, well-developed and well understood. The audio technology described in Strub, as well as covered by the challenged claims, was neither complex nor unpredictable prior to April 2000. It would not have required undue experimentation by a POSA to construct the invention of the challenged claims using the teachings of Strub and the knowledge of the POSA.

158. While Mr. Defilippis does not appear to rely upon it, implementing and using timecodes was also well-known and well understood, as SMPTE timecodes have been standardized since 1975 (SMPTE 12M), and the standard was updated in 1999. *See also* Ex. 1001, 1:22-37 (admitting timecodes to be prior art and to be implemented and in use). And GPS has been widely available since the mid-1990's and was specifically designed to provide highly precise position and timing information, including for purposes of military navigation and munitions delivery. Using GPS for timecodes and timestamping would have been an expected, routine, and well understood use of the technology prior to April 2000. Indeed, at least three prior art references use it for such – Strub, Woo, and Winningstad.

159. I note that the POR cites my deposition testimony that it would purportedly “take a ‘team of engineers,’ to create a Strub product.” POR, 37 (citing Ex. 2119, 138:21-139:7). Patent Owner seems to erroneously construe this as meaning that a POSA would be unable to make the Strub product based on Strub’s disclosure. As an initial matter, the question was: “[s]o could you make **the invention of Strub** based on what is taught by Strub.” Ex. 2119, 138:13-14. But this question is not germane to the enablement inquiry because the issue is whether the **challenged claims** are enabled by Strub’s disclosure, not whether Strub’s own invention is enabled by his disclosure. Further, even in that regard I was clear that Strub’s disclosure did enable his invention. *Id.*, 137:20-138:11 (“Q. And is it your position that somebody of skill in the art could make the invention of Strub by reading the Strub patent? A. Yes. It is my opinion”). Similarly, I also testified that “I don’t think experimentation would be required.” *Id.*, 139:9-16. Finally, Patent Owner selectively quotes only the three words “team of engineers” from my testimony. But right before that I testified that “I could” implement Strub’s invention. *Id.*, 138:16-22. My subsequent discussion of a “team of engineers” was not to suggest that only a team, and not a POSA, could implement Strub’s invention. Instead, I was merely recounting that as a practical reality portions of such a project

would be broken up into tasks and assigned to different engineers to complete – design of the enclosure, place antennas and design of the PC board, etc. That’s simply how such projects are efficiently carried out in the real world. Indeed, I expressly noted that such tasks comprised “common engineering knowledge.” *Id.*, 138:16-139:7.

160. I do not express a legal opinion as to the appropriate date for assessing when the challenged claims would have been enabled for a POSA. For purposes of my analysis above, I have assumed the April 21, 2000 filing date of the Strub reference as has been assumed by Mr. Defilippis. However, I have also been asked to look at the enablement issue from the perspective of a POSA one year prior to the priority date of the challenged patent – July 13, 2004. Using that date, the enablement of the prior art, especially Strub, is even clearer as explained below.

161. By July 13, 2004, memory cards were even larger and continued to be widely available in many different formats. *See, e.g.*, Ex. 1054 (filed December 23, 2003), Abstract, [0033] (“small audio players/recorders” can use memory cards such as “PC Card (formerly PCMCIA device), Flash card (e.g. Compact Flash Type I and II), Secure Digital (SD) card, Multimedia card (MMC), ATA card (e.g., Compact Flash card), memory stick, Smart-Media card, and x-D-Picture card. As an example,

the memory card can use Flash-type or EEPROM-type memory cells to store the data.”); Ex. 1055 (filed Jan. 11, 2004), [0049] (disclosing storing audio files on “Memory Crad, memory Stick, Secure Digital (SD) card, Multimedia (MMC) card, Compact Flash card, Smart media card, USB Flash Disk”). Again, I note that the challenged claims do not require the memory to be any particular size or that it must store audio for a minimum amount of time. By July 2004, CompactFlash (CF) cards were up to 1GB in size and widely available from SanDisk, Pretec Electronics, and Lexar. Such flash memories are approximately 8 times the size of the 128MB memories I discussed above and could store about 8 times as much audio.

162. In early 2004, it continued to be well-known how to enable the transmission (including duplex transmit-receive) of digital audio over radio frequencies. Multiple technologies were widely available to do so. For instance, 3G wireless technology was standardized in 1999 and was commercially available and deployed in 2002-2003. Additionally, Bluetooth was first standardized in 1999 and widely available before July 2004. And WiFi wireless LAN (802.11a/b/g) were also all widely available prior to July 2004, with 802.11g providing data rates as high as 54mbps. POSAs were well aware that these off-the-shelf could support transmission of audio, especially after compression using widely available techniques such as

MP3. *See, e.g.*, Ex. 1050, (filed November 25, 2003), FIGS. 4, 8, 10, Abstract, 2:53-3:10, 6:59-7:26, 9:52-10:3, 11:20-24 (depicting and describing portable device for receiving and recording audio via a microphone 40/158, storing it in a flash memory card 46/170, and transmitting the audio files via antenna 36/transceiver 164 using a “wireless LAN standard protocol, the Bluetooth protocol, a proprietary cordless telephone data protocol, or the 2.4 GHz cordless protocol.”); Ex. 1055 (filed Jan. 11, 2004), [0049], [0148] (describing transmission of digital audio via Bluetooth 802.11a/b/g wifi, 3G, and other available technologies).

163. Mr. Defilippis states that Strub fails to disclose how the transmitter would select clear channels and frequencies. Ex. 2140, ¶ 298. But as explained above, there were several off-the-shelf radio technologies available to a POSA to transmit the audio, including 3G, WiFi, and Bluetooth. All of these technologies utilize automatic channel selection and protocols to mitigate interference problems. For instance, it was widely known at the time that WiFi master nodes (e.g. access points) would perform passive (listening for beacons) or active (probe requests) channel scanning to identify and utilize a channel with the least interference. Wifi, such as 802.11g, also employed transmission protocols such as Carrier Sense Multiple Access with Collision Avoidance (CSMA/CA) and Request to Send/Clear

to Send (RTS/CTS) to avoid collisions and interference. The Bluetooth systems available before July 2004 did not require channel selection because they were designed to use Frequency-Hopping Spread Spectrum (FHSS), which minimized interference by randomly hopping across 79 channels so as to spectrally spread the data and reduce interference. At the relevant time, 3G radios also employed techniques that did not require manual channel selection. In particular, 3G radios employ direct sequence Code Division Multiple Access (CDMA) that permit multiple radios to operate on the same RF channel without interfering with one another as each radio uses an orthogonal chipping code. I note that Strub expressly discloses that 2.4 GHz transmitters can be used, and WiFi and Bluetooth both operate in that band. Ex. 1003, 38:1-7. I also note that Bluetooth, WiFi, and 3G were designed and developed to operate in small, portable, low power devices such as phones. In sum, the radio technology available and known to a POSA before July 2004, was easily capable of transmitting audio and doing so using common and known protocols to mitigate interference. Therefore, the transmission aspects of the challenged claims were enabled by Strub and the knowledge of a POSA before July 2004.

164. Additionally, the very same control unit disclosed in the challenged patents – the TI TMS320C5509A – was available prior to July 13, 2004. *See* Ex. 1065 (June 28, 2004, press release announcing availability of Texas Instruments TMS320C5509A). Moreover, the substantially similar TMS320VC5509A chip was available as of late-2022, and which differed in ways unimportant to the challenged claims. In particular, the VC variant used CMOS technology having separate core/peripheral power supplies.

Executed on December 1, 2025 in Los Angeles, California.

A handwritten signature in black ink, appearing to read 'Chris Kyriakakis', written over a horizontal line.

Dr. Chris Kyriakakis