

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.

IPR2025-00557

Patent 12,051,444

DECLARATION OF DR. CHRIS KYRIAKAKIS IN SUPPORT OF
PETITIONS FOR *INTER PARTES* REVIEW

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I. INTRODUCTION

1. I have been retained by RØDE Microphones, LLC and Freedman Electronics Pty Ltd. (collectively, “Petitioner”) to provide my opinions concerning the validity of claims 1-7, 9, 10, 12-20, 22-24, 26, and 27 of the 12,051,444 Patent (“the ’444 Challenged Claims”).

2. This Declaration summarizes the opinions I have formed to date. I reserve the right to modify my opinions, if necessary, based on further review and analysis of information that I receive subsequent to the filing of this report, including in response to positions taken by Zaxcom, Inc. (“Zaxcom”) or its experts that I have not yet seen, including any secondary consideration evidence that Zaxcom or its expert may consider and present.

3. It is my opinion that the ’444 Challenged Claims are invalid based on the following grounds:

Ground	Claims	Basis	Prior Art
1	1-7, 9, 10, 13-15, 17-20, 22, 23, 27	35 U.S.C. § 103	U.S. Patent No. 6,825,875 (“Strub”) (Ex. 1003), U.S. Patent No. 5,479,351 (“Woo”) (Ex. 1004)
2	12, 26	35 U.S.C. § 103	Strub, Woo, U.S. Patent Pub. No. 2002/0159179 (“Nagai”) (Ex. 1005), U.S. Patent Pub. No. 2004/0028241 (“Gleissner”) (Ex. 1006)

Ground	Claims	Basis	Prior Art
3	16, 24	35 U.S.C. § 103	Strub, Woo, and U.S. Patent Pub. No. 2004/0267387 (“Samadani”) (Ex. 1007)

II. EXPERIENCE, QUALIFICATIONS, AND STATUS AS AN INDEPENDENT EXPERT WITNESS

4. My curriculum vitae, which lists a more detailed summary of my background, experience, publications that I have authored in the past ten years, and qualifications, is attached as the Appendix hereto.

5. I earned my Bachelor of Science degree in Engineering and Applied Science from the California Institute of Technology (Caltech) in 1985. I received my Master of Science degree in Electrical Engineering in 1987 and my Ph.D. in Electrical Engineering in 1993, both from the University of Southern California (“USC”).

6. I am a tenured Associate Professor in the Department of Electrical and Computer Engineering at USC.

7. My research interests lie at the intersection of acoustics, psychoacoustics (the science that studies human perception of sound), and audio signal processing. I have worked in the area of audio signal processing for more than 20 years with particular emphasis on spatial and 3D audio. I have published nearly 100 technical papers, including several peer-reviewed papers. I have

published a book on spatial audio entitled *Immersive Audio Signal Processing* and hold several patents in audio processing for headphone optimization, acoustic measurement of loudspeakers in rooms, loudspeaker crossover optimization, and loudspeaker response correction using signal processing. My publications examine various aspects of sound measurement, echo cancellation, microphone arrays, noise removal, filter banks, how sound interacts with the acoustical elements of the environment, novel methods for surround sound recording and reproduction, and the perception of sound by human listeners.

8. A major focus of my research has been on developing novel multichannel audio capture and rendering algorithms. In addition to the mathematical development of the algorithms, I have performed several multichannel recordings with multiple wired and wireless microphones over the past 20 years. For example, one of the first ones was in 2003 with a 64-track recording of a live performance of the group Duran Duran, 24-track recordings of the Boston Symphony and the Handel and Haydn Society, multi-track recordings of experimental music in the WGBH studios in Boston, 48-track recordings of the Dizzy Gillespie band at USC, live multi-track performances of Byzantine chanters in simulated ancient acoustic environments, as well 32-track Byzantine studio chant recordings of Cappella Romana. In all of these recordings, a combination of wired

and wireless microphones was used in conjunction with digital multitrack recording gear and SMPTE timecode synchronization.

9. Another focus of my early research was on head-related transfer functions (HRTFs) and how they can be measured and modeled using various signal processing approaches. I developed several implementations of HRTF-based 3D audio for rendering spatial sounds over headphones. I have also researched microphone arrays for applications in enhanced far field voice recognition. This includes methods for Direction of Arrival finding and beam forming from linear and circular microphone arrays. I have also investigated methods for noise removal and reverberation reduction from microphone signals. In addition, over the past few years year I have worked on methods for echo cancellation for applications in wearable devices. Previous other work includes loudspeakers and how they interact with their acoustical environment. In particular, I have researched the role of sound reflections, absorption, and diffusion in the performance of loudspeakers. I have also published several technical papers on acoustical measurement methods in rooms and device enclosures and developed novel signal processing algorithms for optimizing sound system performance. Other topics I have researched include multichannel audio acquisition and rendering, virtual microphones and virtual speakers, hybrid headphone-loudspeaker rendering methods, and advanced signal processing techniques for optimizing sound quality from small portable devices.

10. I am the founding Director of the USC Immersive Audio Laboratory with facilities for experimental work in room acoustics, multichannel audio, and psychoacoustics. This laboratory also serves as a unique teaching facility for my undergraduate course in Introduction to Digital Audio and my graduate course in Immersive Audio Signal Processing. Both courses have a major acoustics component that examines the interaction of sound with the acoustical environment and the basic principles of microphones (including wireless microphones) and loudspeaker design. The graduate course was developed through a two-year grant I received from the National Science Foundation entitled “Collaborative Learning in Engineering Using Immersive Environments,” and was the first of its kind to assess the impact of audio immersion in student learning. In addition to the courses I teach, I have also supervised and served on Ph.D. dissertation committees for more than 30 students.

11. From 2003-2018, I was the co-founder and Chief Technology Officer of Audyssey Laboratories, a USC spin-off company that develops and licenses audio technology to leading consumer electronics and automotive companies around the world. As part of my work at Audyssey, I developed a measurement methodology for headphones and earphones and created a database with 500+ measurements of products from nearly 100 manufacturers, created audio algorithms related to sound

optimization that are used in millions of home theater systems, cars, and IMAX theaters world-wide.

12. I also developed audio algorithms and designed speakers. These speakers were novel acoustical designs that used a combination of unique enclosures, passive radiators (i.e., speaker diaphragms that are driven by changes in surrounding air pressure), and audio signal processing to optimize their performance and overcome limitations that arise from small drivers and enclosures. For example, we used signal processing technologies combined with novel acoustical design to extend the bass response of small woofers and passive radiators beyond what was previously possible in small speaker enclosures. The innovations in these designs have received awards, including Popular Science's "Best of What's New."

13. In 2019, I joined Syng as the Chief Audio Scientist. Syng creates innovative products for next generation spatial audio and my role there includes research and development of audio algorithms for sound capture using microphone arrays to measure the acoustics of the room and loudspeaker beamforming for wirelessly rendering sound in various directions.

14. In April 2018 I was elected as Senior Member of the Institute of Electrical and Electronic Engineers (IEEE) in recognition of my contributions to the field of engineering. I am also a member of the Audio Engineering Society (AES), an association for professionals in the audio industry.

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15. In 2006, I received a World Technology Network Award. This organization presents awards to innovators in several areas in which technology can foster a paradigm change. My award was for innovations in immersive audio that enable new capabilities in media and journalism. Other award recipients at that event included Vice President Al Gore, Google, and Space-X. In addition, my work has been featured in multiple news articles, including pieces by [The Atlantic](#), the [BBC World Service](#), the [New York Times](#), and [National Public Radio](#).

16. In the late 1990s and early 2000s, I was a faculty researcher and later Deputy Director of the National Science Foundation's engineering research center established at USC. I studied the fundamental and technological limitations of immersive audio and the role of acoustics on the performance of microphones and loudspeakers. In 2003, together with one of my graduate students, I received the award for Best Paper at the Institute of Electrical and Electronics Engineers ("IEEE") Conference on Signals, Systems and Computers.

17. I am being compensated at the rate of \$525 per hour for my work on this declaration. My fee is not contingent on the outcome of any matter or on any of the technical positions I explain in this declaration.

18. I have no financial interest in Petitioner. I have been informed that Zaxcom claims ownership in the '444 patent. I have no financial interest in Zaxcom.

III. UNDERSTANDING OF RELEVANT LEGAL PRINCIPLES

19. I am not a legal expert, and I offer no opinions on the law. However, I have been advised by counsel about some of the legal principles relevant to an analysis of patentability of claims in a United States patent, as summarized below. I have conducted my analysis in accordance with these principles.

A. Prior Art

20. I understand that, for an invention claimed in a patent to be found patentable, or to be valid, it must be, among other things, new and not obvious in light of what came before it, which is referred to as “prior art.” I further understand that the frame of reference for determining whether a claim is obvious is from the perspective of a person of ordinary skill in the relevant art (“POSA”) at the time of the invention. I have been asked to assume that the effective priority date of the Challenged Patent is July 14, 2005. I have not been asked to determine whether that date is appropriate.

21. I have been informed that a reference qualifies as prior art for determining obviousness when it (a) predates the invention or was patented or published more than one year before the effective priority date of the claim in question under the criteria set out in 35 U.S.C. § 102, and (b) is analogous to the claimed invention. I understand that the version of § 102 that applies to the Challenged Claims is the version in effect before the Leahy–Smith America Invents

Act (“AIA”) went into effect (“pre-AIA § 102”). I further understand that prior art may be considered analogous if it is from the same field of endeavor, regardless of the problem addressed, as the claimed invention. I also understand that prior art may be considered analogous if it is “reasonably pertinent” to the particular problem with which the inventor is involved. I have been informed that a reference is “reasonably pertinent” if it is one which, because of the matter with which it deals, logically would have commended itself to an inventor’s attention in considering the inventor’s problem.

B. Standard of Proof

22. I understand that, in these proceedings, the burden is on the party asserting unpatentability to prove it by a preponderance of the evidence. I understand that “a preponderance of the evidence” is evidence sufficient to show that something is more likely than not.

C. Claim Construction

23. I understand that, unless otherwise construed by the U.S. Patent Trial and Appeal Board (“PTAB”) or a court, patent claims should be accorded their ordinary and customary meaning as understood by a POSA, in light of the intrinsic record. The intrinsic record includes the patent’s specification and claims, as well as its entire prosecution history. I also understand that a patentee is free to be his or her own lexicographer and thus may use a term in a manner contrary to or

inconsistent with its ordinary meaning, provided that the patentee makes the special meaning clear in the specification or as part of the record during prosecution.

24. I further understand that in construing claims, a POSA is deemed to read the claim term not only in the context of the particular claim in which the disputed term appears, but in the context of the entire patent, including the specification and the prosecution history. I understand that the construction that stays true to the claim language and most naturally aligns with the patent's description of the invention will generally be, in the end, the correct construction. Although the claims themselves provide substantial guidance as to the meaning of particular claim terms, the claims do not stand alone.

25. In addition, it has been explained to me that there is a form of claim element called a "Markush group," which lists specified alternatives in a patent claim, typically in the form "[a member] selected from the group consisting of [A], [B], [C], [etc.]." I further understand that, if a claim element is written in Markush form, the entire element is disclosed by the prior art if one alternative in the Markush group is in the prior art.

D. Anticipation

26. I have been informed that a patent claim is invalid as anticipated only if each and every element and limitation of that claim is publicly disclosed, either explicitly or inherently, in a single prior art reference, already in practice in the

industry in a single process or method, already in a single marketed product, or otherwise previously invented. I also understand that anticipation requires the presence in a single prior art disclosure of all elements of the claim arranged as in the claim. For a step or limitation to be inherent in a reference, I understand that the step or limitation must necessarily and inevitably occur or be present when one follows the teachings of the reference. I am informed that for a reference to be considered as anticipating, it must disclose the relevant technology in a manner such that a person of ordinary skill in the art would be able to carry out or utilize the technology that the reference describes without having to undertake considerable experimentation.

E. Obviousness

27. I have been informed that a patent claim is invalid as obvious only if it would have been obvious to a person of ordinary skill in the art at the time the patent was filed, in light of the prior art. A claim is invalid as obvious if the differences between the claimed invention and the prior art are such that the claimed invention as a whole would have been obvious to a POSA at the time the invention was made. The prior art may include one or more references that a POSA trying to solve the problem that the inventor addressed would likely have considered, as well as the body of knowledge that such a person would possess.

28. I have been informed that, in evaluating obviousness, one must consider: (1) the scope and content of the prior art; (2) the differences between the prior art and the claims; and (3) the level of ordinary skill in the art. In addition, I understand that objective indicia of non-obviousness, also known as “secondary considerations,” might be utilized to give light to the circumstances surrounding the origin of the claimed subject matter. I understand that secondary considerations can include, for example, evidence of commercial success of the alleged invention, evidence of a long-felt but unmet need that was solved by an invention, failure of others, evidence that others copied the alleged invention, or evidence that the alleged invention achieved a surprising result. I further understand that such evidence must have a nexus to the elements of a claim in an order to be relevant.

29. I have been informed that, although a challenger may rely on a combination of separate prior art references to support an obviousness challenge, a person of ordinary skill in the art at the time of filing should have had some motivation or reason to combine the references in such a way as to arrive at the claimed invention. That motivation can come from the problem the invention purports to solve, from other references, from the teachings of those references showing the invention is obvious, from market incentives, or from the common-sense knowledge of a person of ordinary skill in the art. Any need or problem known in the field at the time of the invention and addressed by the patent can provide a

reason for combining elements. However, obviousness findings grounded in common sense must contain explicit and clear reasoning providing some rational underpinning why common sense compels a finding of obviousness. A motivation to combine requires more than the mere fact that a POSA could have made the combination.

30. I have been informed that assessing which prior art references to combine and how they may be combined to match the asserted claim may not be based on hindsight reconstruction or ex-post reasoning. That is, one must view the prior art forward from the perspective of the person of ordinary skill in the art at the time of invention, not backwards from the current time through the lens of hindsight. It is my understanding that it is improper to use a patent claim as a template or road map to the prior art, and to pick and choose prior art references to meet the elements of that claim to show obviousness.

31. I understand that a combination of familiar elements according to known methods is likely to be obvious when it does no more than yield predictable results. I further understand that there need not be a precise teaching in the prior art directed to the specific subject matter of a claim because one can take account of the inferences and creative steps that a person of skill in the art would employ.

32. I understand that, when there is a reason to solve a problem and there are a finite number of identified, predictable solutions, a person of ordinary skill has

good reason to pursue the known options within his or her technical grasp. I further understand that, if this leads to the anticipated success, it is likely the product not of innovation but of ordinary skill and common sense, which bears on whether the claim would have been obvious.

IV. SUMMARY OF MATERIALS REVIEWED AND CONSIDERED

33. 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 multichannel audio recording (including my teaching, research, and consulting experiences), I reviewed the Challenged Patent, its file history, the prior art, and all exhibits cited in this declaration, including the documents in the Table of Exhibits submitted with each IPR Petition filed concurrently with this Declaration.

34. 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.

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

V. BACKGROUND OF THE TECHNOLOGY

36. The '444 Patent describes a system with a wearable local device for recording locally generated audio and transmitting the audio to a remote device. *See*, e.g., Ex. 1001, 1:40-2:5. The local device receives a master timecode from a master timecode generator, stamps local audio data with a timestamp to create time-referenced local audio data, and stores (i.e., records) the time-referenced local audio data in a local memory. *Id.* 3:62-66, 4:48-5:6, 10:41-65, 43:22-56.

37. This purported innovation was not new, but existed in the prior art. As non-limiting examples, Strub, Woo, and Samadani teach local devices which record locally generated audio, transmit the audio to a remote device, receive a master timecode from a master timecode generator and stamp the recorded audio data with a timestamp referencing at least a portion of the local audio data to the master timecode. *See*, e.g., Ex. 1003, 8:10-29, 8:50-53, 11:32-50, 12:13-21, 12:31-43 (transmitting recorded local audio data to remote devices), 25:35-49, 37:18-40, 38:1-4, 38:29-39 (“synchronization pulse” received from “‘master’ recording unit”), 62:26-63:49 (“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.”), Figs. 1-3; Ex. 1004, Abstract, 1:60-2:9, 2:39-48, 3:3-24, 4:3-32, 5:3-5 (recorders capture performance), 5:37-49 (recordings communicated to editing station), 5:5-67 (master timecodes used to “date and time tag[]” recordings), 7:26-

50, 8:32-44, 8:60-9:4, 9:40-43, 9:56-63, 10:15-64, Figs. 1, 3-6; Ex. 1007, [0036]-[0038] (audio recorded in local recorder and transmitted to central processing station 303; “The reference signal generator 309 is a timer-based generator in that a time stamp is generated as the reference data.”), [0042], [0044]-[0047] (“audio/visual recorder[s] 501a, 501b...in...FIG. 5...include reference signal receiver[s] 525a, 525b...that receive[] a main reference signal from a main reference signal generator 509....Each reference signal receiver 525a, 525b [receives a] wireless signal having timer-based or clock-based information....[T]he main reference signal generator 509 can provide an external time base (e.g., absolute time associated with a GPS signal”), [0048] (“[R]eference signal receiver 525a...receives a main reference signal and generates a reference signal that is stored as reference data in the reference data, visual data and audio file storage 508a.”), Claims 9, 10, 15, 19, 32, Figs. 3, 5.

VI. LEVEL OF SKILL IN THE ART AND PERSPECTIVE APPLIED IN THIS DECLARATION

38. In determining the level of ordinary skill, I have been asked to consider, for example, the types of problems encountered in the field, prior solutions to those problems, the rapidity with which innovations are made, the sophistication of the technology, and the educational level of active workers in the field. Taking those factors into consideration, a person of ordinary skill in the art at the time of the claimed priority date of the Challenged Patent would have had at least a Bachelor’s

degree in electrical engineering or a related or equivalent field, and two or more years of experience working with audio systems. However, additional years of education in the above-referenced fields may compensate for fewer years of experience.

39. I believe that I would have qualified as a person of at least ordinary skill in the art as of July 14, 2005. I further believe that I have a sufficient level of knowledge, experience, and education to provide an expert opinion in the field of the Challenged Patent.

40. My opinions in this Declaration are based on the perspective of a POSA as of July 14, 2005 or somewhat before. This is true even if the testimony is stated in the present tense. Each of the statements below reflects my opinion based on my review of the disclosures of the Challenged Patent, the file histories of the Challenged Patent, and the challenged claims.

VII. BACKGROUND

A. Overview of the Technology

41. In professional audio and video production, the precise synchronization and capture of multiple audio channels is crucial for post-production alignment and editing. This is especially true in environments such as live music events, film sets, and television studios, where multiple devices must be synchronized to capture high-quality, frame-accurate recordings. Wireless multitrack recording systems,

combined with timecode synchronization technology, address this need by enabling multichannel audio capture and consistent timing alignment across various recording devices, even in the absence of physical cabling. Such multichannel audio capture and consistent timing alignment has been in use since about the 1980s, when it started being used in film production.

1. Wireless multitrack recording systems

42. Wireless multitrack recording systems, which have existed since approximately the late 1990s, are designed to transmit and record multiple channels of audio data wirelessly while maintaining high-quality sound and low latency. In these systems, a central transmitter communicates with several receiver units, each dedicated to a single channel or track, creating a synchronized and cohesive audio capture.

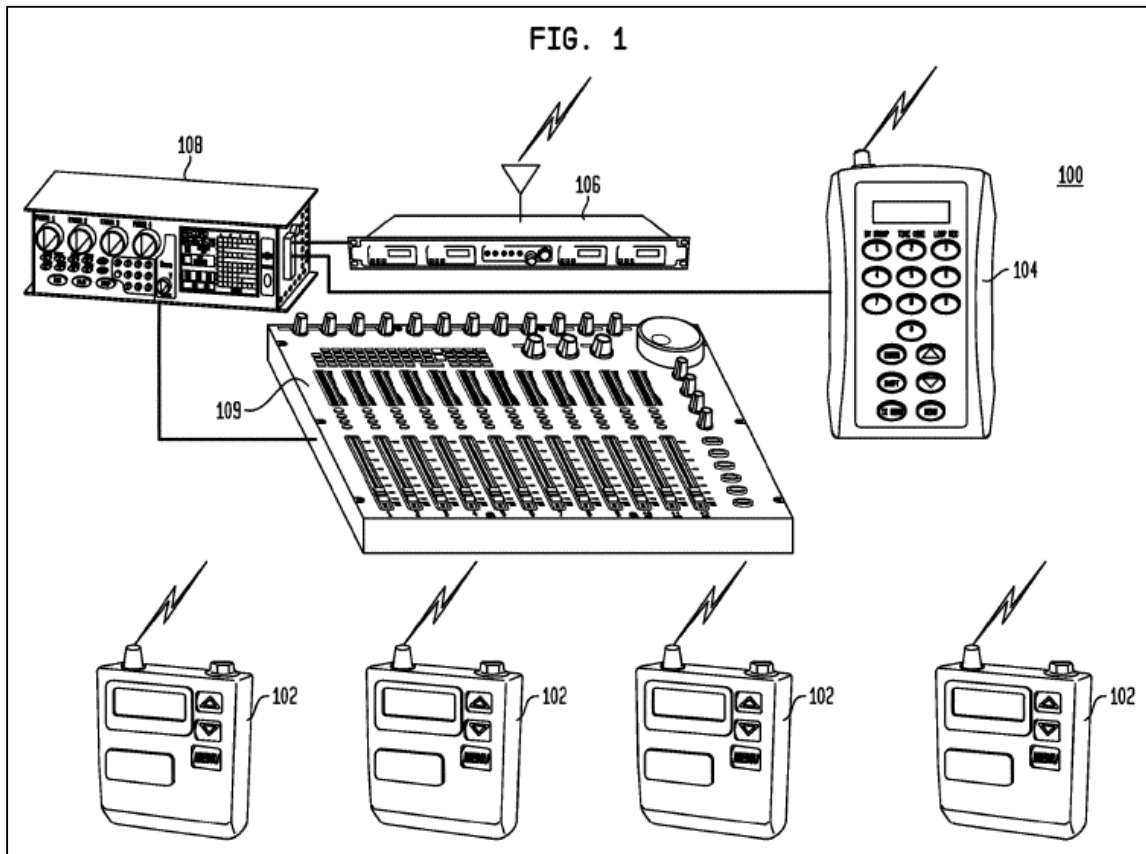
2. Timecode synchronization

43. Timecode synchronization is an essential component of professional audio-visual production. The use of timecode allows multiple devices to share a consistent timing reference, ensuring that audio and video recordings remain in sync from capture to post-production. SMPTE timecode, standardized by the Society of Motion Picture and Television Engineers in 1967, is the most widely adopted format for this purpose. SMPTE timecode enables precise timestamping of each frame or audio sample, supporting frame-accurate synchronization.

VIII. THE CHALLENGED PATENT

A. Summary of the Specification

44. The Challenged Patent describes well-known systems and methods for “recording and processing audio received from one or more wireless devices,” in particular a recording system 100 which wirelessly records audio performances by one or more performers. *See* Ex. 1001, 1:40-67, 2:1-5, 3:64-66, Fig. 1. The system 100 includes one or more wearable local audio devices 102, a remote receiver 106, a remote recorder 108 connected to the receiver 106, and a remote control unit (“RCU”) capable of transmitting a time reference signal, digital commands, and/or audio to the other components., as depicted in Figure 1:



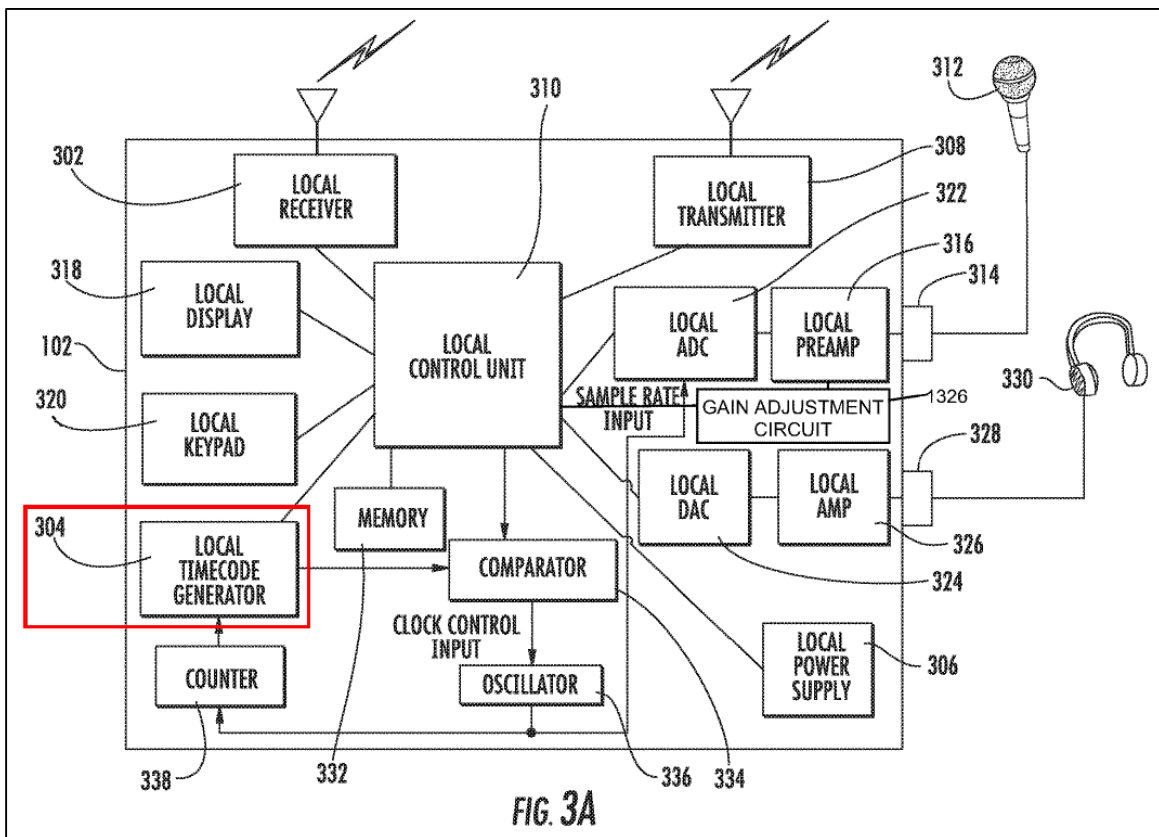
See *id.* 3:62-66, 4:23-35, 30:7-25, 43:22-32, 43:65-67, 44:12-13, Fig. 3B.

45. The local audio devices 102 record audio from the respective performers and transmit both live and replayed audio wirelessly to the remote receiver 106. *Id.* 4:36-42. The audio received by the receiver 106 is recorded by the recorder 108. *Id.* 4:36-38.

46. To support synchronization of the audio received by the receiver 106, the components of the system 100 are synchronized to allow each component to timestamp its recorded audio. *Id.* 3:62-4:8. The timestamps allow the system to

combine individual audio tracks into multi-track audio files, correct for lost audio data, and/or synchronize tracks in post-processing. *Id.* 4:8-22, 4:48-5:6.

47. To synchronize its devices, the system can include a master timecode generator, which generates master timecodes and sends them wirelessly to the local audio devices 102. *Id.* 11:23-40, 17:9-11, Fig. 6 (step 604). Each local audio device 102 can also have its own local timecode generator 304, as illustrated in Figure 3A:



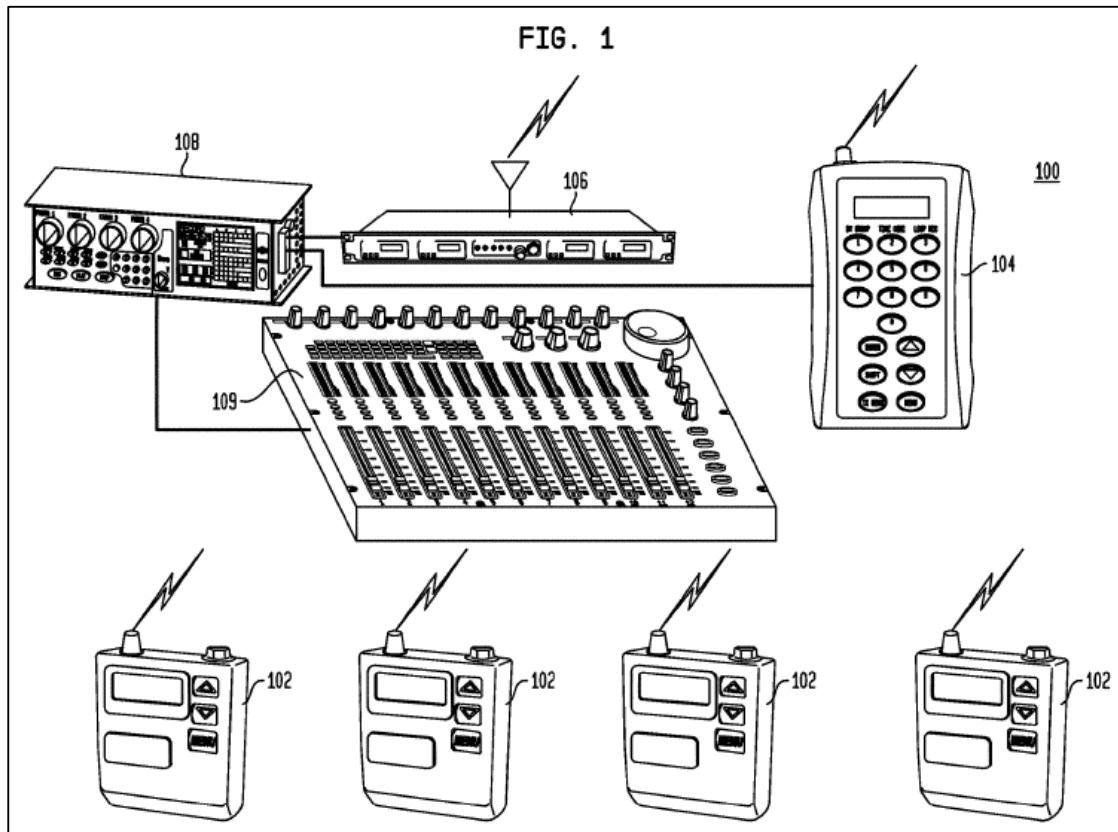
See *id.* 8:61-63, Fig. 3A.

48. The local audio devices 102 can use the master timecodes to timestamp the locally recorded audio. *Id.* 4:48-5:6, 5:65-6:4 (“This master time reference signal

provides a time reference for all local audio devices 102, which may use this information for...timestamping locally recorded audio, etc.”), 10:53-58 (“Furthermore, the locally stored audio files include timestamps...that indicate when, during the audio event, each segment of audio occurred. The timestamps may be...based upon master timecodes.”).

49. In my opinion, these concepts were well-known in 2005, particularly in view of the development of wireless recording technology and multitrack recording systems discussed above. The components of the patent were conventional and operate in a conventional manner.

50. The Challenged Patent discloses embodiments in which “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.” *Id.*, Abstract, Fig. 1 (reproduced below).



51. In my opinion, there is nothing unconventional about the claimed components, their configuration, or how they operate. As the patent describes, multiple users can be equipped with portable recording devices that can record audio locally and also transmit audio to a central recording device. This concept was well known in the industry in 2005. For example, Tascam introduced the DA-88 digital multitrack recorder in 1993, and this was routinely used with wireless microphone systems from Sennheiser (e.g., the SK50 transmitter and EK3041 receiver released around the same time), as well as similar wireless systems from Shure. Multitrack digital recorders were also available at that time from Sony (PCM-800).

B. Claims

52. The '444 Patent has 29 claims, of which Claims 1-7, 9, 10, 12-20, 22-24, 26, and 27 are challenged in this Petition. Claims 1 and 13 are independent. Each Challenged Claim refers to a wearable, local audio device which receives a master timecode, creates time-referenced local audio data from locally generated audio and the master timecode or a local timecode, and stores the time-referenced local audio data in a local memory, wherein the audio data is transmitted to a remote receiver substantially simultaneously with receiving of local audio data by the local audio device, the creating of the time-referenced local audio data, or the storing of the time-referenced local audio data in the local memory. *See* Ex. 1001, Claims 1, 13. The '444 Patent acknowledges that all or most of those features were known in the prior art, since they are described in the patent's Background section. *Id.* 1:40-42 (“**recording**...audio received from...**wireless devices**”), 1:54-56 (“In many...systems, the...audio is **timestamped with a time reference signal**...”), 1:63-2:5 (audio recorder and receiver “**receive audio wirelessly from one or more wireless transmitters**[, which are] **body packs that are worn by each performer**....”).

53. The challenged dependent claims add features that are part of the Background section of the '444 Patent, which I understand constitutes admitted prior art:

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Claim(s)	Feature	Location in '444 Background
2, 14	“wherein the local audio device is in the form of a body pack”	1:65-2:5 (“Such wireless transmitters may take the form of body packs that are worn by each performer. Typically, the audio receiver receives each performer's audio from the performer's respective body pack...and transmits it to the audio recorder. The audio recorder then combines the wireless transmissions received from all body packs....”)
4, 17	“wherein the at least one master timecode [and the at least one local timecode] include[s] hour data, minute data, second data, SMPTE timecode, or combinations thereof”	1:54-59 (“In many such systems, the received audio and/or the multitrack audio is timestamped with a time reference signal such as a...SMPTE...timecode signal containing information regarding the hour, minute, second, [etc.]”)
5, 18	“wherein the remote receiver is configured to communicate with a recording device”	1:63-2:5 (“Other such systems include a multi-track audio recorder and an associated audio receiver that receive audio wirelessly from one or more wireless transmitters....The audio recorder...combines the wireless transmissions received from all body packs....”)
6, 19	“wherein the recording device is a multi-track recorder, a personal computer, a cellular phone, or a camera”	1:48-54 (“Some such systems include a multitrack audio recorder [which] combines the single track of audio received from each microphone to create one multi-track audio file.”); 1:63-64 (“Other such systems include a multi-track audio recorder and an associated audio receiver....”)
9, 22	“wherein the time-referenced local audio data is configured to	1:52-62 (“The multi-track recorder combines the single track of audio

RØDE Exhibit 1002

RØDE Microphones, LLC, et. al v. Zaxcom, Inc.

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Claim(s)	Feature	Location in '444 Background
	facilitate synchronization of the time-referenced local audio data and the remotely recorded audio data”	received from each microphone to create one multi-track audio file. In many such systems, the received audio and/or the multitrack audio is timestamped with a...SMPTE...timecode signal [which] allows audio to be more easily matched....”)
25	“create time-referenced remote audio data from the audio data received from the local audio device”	1:54-59 (“In many such systems, the received audio and/or the multitrack audio is timestamped with a time reference signal such as a...SMPTE...timecode signal....”))
25	“store the time-referenced remote audio data in the at least one remote memory.”	1:41-42 (“systems...for recording...audio received from one or more wireless devices”), 1:54-59 (“In many such systems, the received audio and/or the multitrack audio is timestamped with a time reference signal such as a...SMPTE...timecode signal containing information regarding the hour, minute, second, [etc.]”), 1:63-2:5 (“Other such systems include a multi-track audio recorder and an associated audio receiver that receive audio wirelessly from one or more wireless transmitters....The audio recorder then combines the wireless transmissions received from all body packs to create one multi-track audio file.”)
12, 26	“at least one audio input configured to receive the local audio data”	1:48-52 (“Some such systems include a multitrack audio recorder wired to one or more microphones. Typically, one or more performers performing on a sound stage are

Claim(s)	Feature	Location in '444 Background
		recorded by one or more microphones that are directly wired to the multi-track recorder.”)

C. Lectrosonics IPRs

1. PTAB’s Findings Regarding Claim Elements in Prior Art and Obviousness of Combinations

54. I understand that the U.S. Patent No. 7,929,902 (“the ’902 Patent”), U.S. Patent No. 8,385,814 (“the ’814 Patent”) and U.S. Patent No. 9,336,307 (“the ’307 Patent”) were previously involved in the following IPRs filed by third party Lectrosonics:

- ’902 Patent: *Lectrosonics, Inc. v. Zaxcom, Inc.*, IPR2018-01129 (“the ’1129 IPR”);
- ’814 Patent: *Lectrosonics, Inc. v. Zaxcom, Inc.*, IPR2018-01130 (“the ’1130 IPR”); and
- ’307 Patent: *Lectrosonics, Inc. v. Zaxcom, Inc.*, IPR2018-00972 (“the ’972 IPR”)

(collectively, “the Lectrosonics IPRs”).

55. I am aware that, in the Lectrosonics IPRs, the PTAB issued Final Written Decisions (“FWDs”) in which the Board made certain findings regarding

the presence of claim elements in Strub, Woo, Nagai, and Gleissner, and regarding the obviousness of combining those references. I have reviewed those FWDs.

56. For example, in the '972 IPR, the PTAB found Claims 12-14 of the '307 Patent anticipated by Strub. Ex. 1014 at 25-26. I understand that, since anticipation requires all elements of a claim to be present in the anticipatory reference, the Board's finding of anticipation means that it must have found all elements of Claims 12-14 of the '307 Patent present in Strub. Those elements include the following:

- locally receiving local audio generated by at least one performer during an audio event;
- locally recording the local audio as local audio data in at least one memory of at least one local audio device wearable by a creator of said local audio;
- locally receiving or generating master time data including at least one of the groups consisting of hour data, minute data, second data, and combinations thereof;
- at least one of a group consisting of...adding a local audio device identifier to at least a portion of said memory,...and adding said performer identifier to at least a portion of said local audio data;

- wirelessly transmitting the locally generated audio to a remote recorder;
and
- remotely recording the locally generated audio by the remote recorder
as remotely recorded audio data.

See Ex. 1015 Claims 12-14; Ex. 1016 at 48 (relying on Strub for “local audio device identifier” and “performer identifier” limitations); *see also* Ex. 1014 at 21 (finding that Strub discloses “a local audio device that records local audio and transmits the local audio to other remote devices” and “that the same local audio is stored at both the wearable local audio device as local audio data and the remote receiver/recorder as remotely recorded audio data”), 22 (“We...agree with Petitioner that Strub’s device is ‘wearable.’”).

57. Further in the ’972 IPR, the PTAB found Claim 1 of the ’307 Patent obvious over Strub combined with Nagai or Gleissner. Ex. 1014 at 18, 19, 25. In making that determination, the PTAB necessarily found that Strub, Nagai and/or Gleissner teach “at least one audio input port for receiving said locally generated audio from an audio input device,” and that it would have been obvious to combine Strub with Nagai or Gleissner. *Id.* 16-19.

58. In the ’1129 and ’1130 IPRs, the Board made similar findings regarding (1) the presence of the above-referenced limitations in Strub, Nagai, and Gleissner, and (2) the obviousness of combining those three references. See, e.g., Ex. 1017 at

25 (finding Strub's device wearable), 35 (finding '902 Claims 7, 8, and 11 obvious over Strub in combination with Nagai or Gleissner, and Woo), 40 (finding that Strub teaches a local audio device that records local audio and transmits the same local audio to a remote device), 41 (finding '902 Claims 12, 14, and 15 anticipated by Strub); Ex. 1018 at 22 (finding Strub's device wearable), 32 (finding numerous '902 Claims obvious over Strub in combination with Nagai or Gleissner, and Woo). The Board also found that Strub discloses "at least one control unit electrically coupled to said local audio device receiver, said audio input device, said memory, and said local timecode generator for creating stamped local audio data and storing said stamped local audio data in said memory," that Woo discloses a "master timecode generator for generating a plurality of master timecodes" and "jam synchroniz[ing]" a local clock with a master time clock "just as disclosed by the [related '902 and '814] patent[s]," and that a POSA would have been motivated to use Woo's synchronization techniques in Strub's system. Ex. 1017 at 25-31; Ex. 1018 at 22-28.

59. I have been informed that Zaxcom appealed the Board's decisions in all three of the Lectrosonics IPRs, and that each case, the Court of Appeals for the Federal Circuit affirmed the decision in its entirety.

60. However, although I am aware of the above findings by the PTAB regarding the presence of the above-referenced claim elements in Strub, Woo, Nagai,

and Gleissner and regarding the obviousness of combining those references, I am not relying on any findings of the Board in formulating the opinions in this Declaration. To the contrary, I have conducted my own independent analysis and independently formulated my own opinions of what elements are present in Strub, Woo, Nagai, and Gleissner and whether a POSA would have been motivated to combine those references.

2. PTAB’s Findings Regarding Zaxcom’s Purported Objective Indicia of Nonobviousness

61. In the Lectrosonics IPRs, Zaxcom submitted evidence purporting to show objective indicia of nonobviousness, including: testimony alleging a long-felt need for repairing dropouts; testimony alleging failure of others to implement dropout repair; alleged industry praise in the form of witness testimony, an Emmy award, and a Technical Achievement Award from the Academy of Motion Picture Arts and Sciences (the “Academy”); and expert testimony attempting to connect the objective-indicia evidence to the challenged claims. See Ex. 1019 at 52-59; Ex. 1020 at 54-66; 1021 at 34-59. But the PTAB found that all of Zaxcom’s purported objective indicia related to replacing remotely recorded audio data with local audio data—a/k/a “dropout repair”—and had no nexus with claims lacking that feature. See Ex. 1014 at 23-25; Ex. 1017 at 31-35; Ex. 1018 at 28-31. In the above-captioned IPRs, none of the Challenged Claims include dropout repair or replacing remotely

recorded audio data with local audio data. Thus, they also have no nexus with Zaxcom's purported objective indicia of nonobviousness to the extent that those objective indicia relate to replacing remotely recorded audio data with local audio data.

62. However, although I am aware of the above findings by the PTAB regarding the lack of nexus between Zaxcom's objective indicia evidence and claims lacking the remote-data-replacement feature, I am not relying on those findings of the Board in formulating the opinions in this Declaration. Instead, I have independently reviewed and analyzed the evidence of objective indicia that Zaxcom submitted in the Lectrosonics IPRs and formulated my own opinion that there is no nexus between that evidence and the Challenged Claims.

IX. CLAIM CONSTRUCTION

63. I have applied the plain meaning of the terms and phrases in the claims in my analysis, as a POSA would have understood those terms and phrases at the relevant time (around 2005). However, it is my opinion that the prior art relied on in the grounds set forth below discloses the subject matter of the challenged claims under any reasonable construction, including their plain meaning.

X. THE PRIOR ART

64. In this section, I provide an overview of the five prior art references relied upon in the obviousness combinations detailed herein.

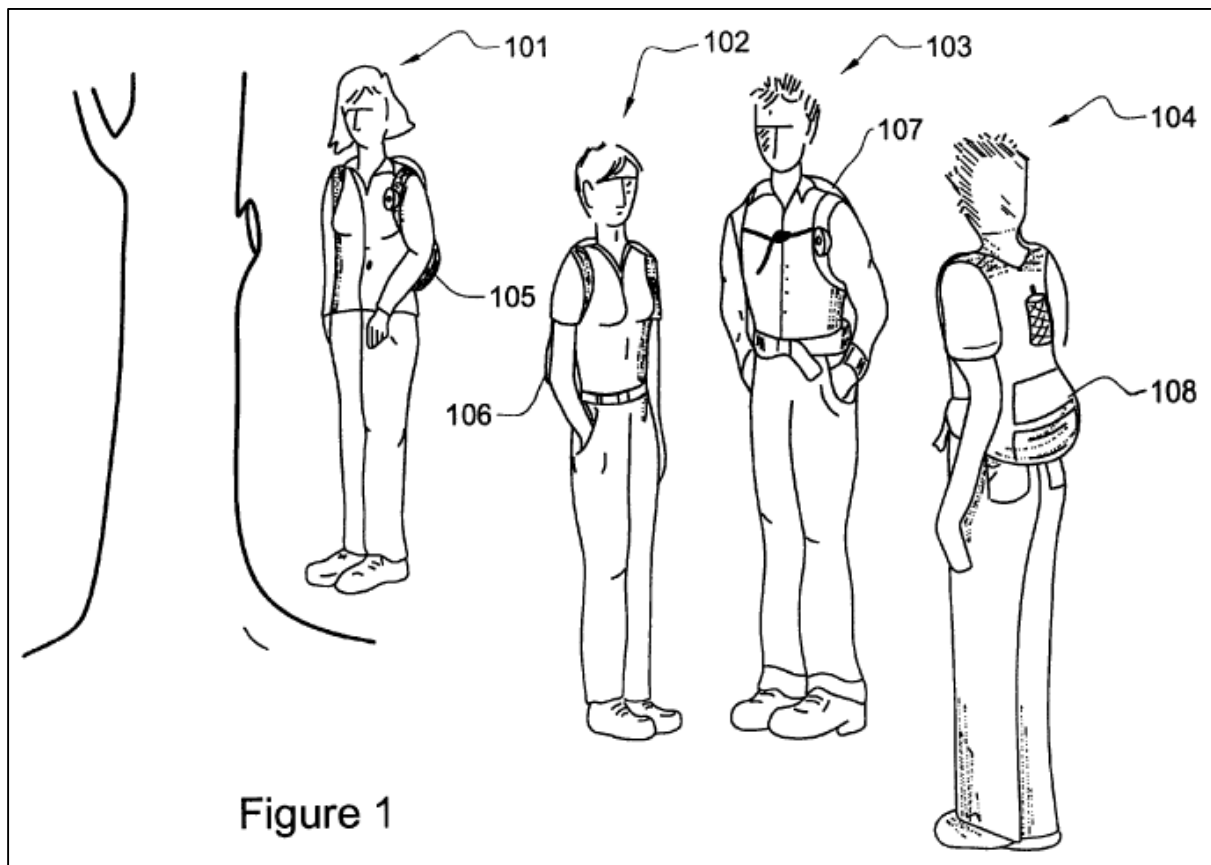
A. Strub

65. I understand that U.S Patent No. 6,825,875 to Strub et al (“Strub”), entitled “Hybrid Recording Unit Including Portable Video Recorder and Auxillary [sic] Device,” was filed on April 21, 2000 and issued on November 30, 2004 and is prior art under at least pre-AIA 35 U.S.C. §§ 102(a) and (e).

66. Strub discloses a system comprising a plurality of wearable, audio/video recording units, each storing locally generated audio and video and wirelessly transmitting that same audio and video to one or more of the other wearable devices. *See, e.g.,* Ex. 1003, 4:28-30 (“a small, lightweight, wearable recording unit”), 8:7-19, 8:50-53 (recording units “adapted to obtain audio data representing an aural record of the event....[S]uch visual and/or audio data is sometimes referred to as ‘recording data.’”), 12:13–21, 12:31–43 (“The transmitter 309 transmits signals (‘recording data signals’) representing recording data acquired by the recording unit 300, so that such recording data can be used by other recording units...”), 14:59-15:11 (wearable), 21:65-22:7 (audio data acquisition), 35:54–65, 37:11–40, Figs. 1, 4, 6, 8A-9B. Further, “each recording unit...stores[s] data representing the recording(s) obtained by another recording unit[.]....”). *Id.* 37:11–40. Thus, from the perspective of a person wearing one of Strub’s recording units, that unit is a local audio device and the recording units worn by other people are remote devices that receive audio data from the local device and create their own

recordings of that audio data. Strub's system also includes mechanisms for embedding timecode data into the audio recordings, facilitating precise synchronization with other media. It also discloses remote adjustments of the local recording parameters.

67. Examples of Strub's audio/video recording units 105, 106, 107, 108 are depicted in Fig. 1:



See also *id.* 8:7-14, 67:30-53, Figs. 4, 6, 8A-9B.

68. Strub discloses examples of master timecode generators—*e.g.*, a “master” recording unit” that “transmit[s] a synchronization pulse...to each of the

other recording units,” *id.* 38:29-39, a GPS satellite “used as a clock to generate time-stamps,” *id.* 62:26-63:49, and a SMPTE timecode source, *id.* 75:25-57; *see also id.* 63:50-60.

69. A POSA would consider Strub’s master recording unit and GPS receivers to be master timecode generators. For example, a POSA would have considered Strub’s synchronization pulses to be master timecodes, because the recording units receiving the synchronization pulses interpret them as representing time information and use them to synchronize audio samples. Furthermore, since the master recording unit sends the synchronization pulses to the other recording units, the master recording unit is a master timecode generator from the perspective of the other recording units.

70. Each of the GPS receivers in Strub’s recording units is a master timecode generator from the perspective of the other components in the recording units. A POSA would understand that the GPS receiver demodulates the satellite signal to extract the timecodes and passes the timecodes on to the other components such as system controller 301 and data storage device 305.

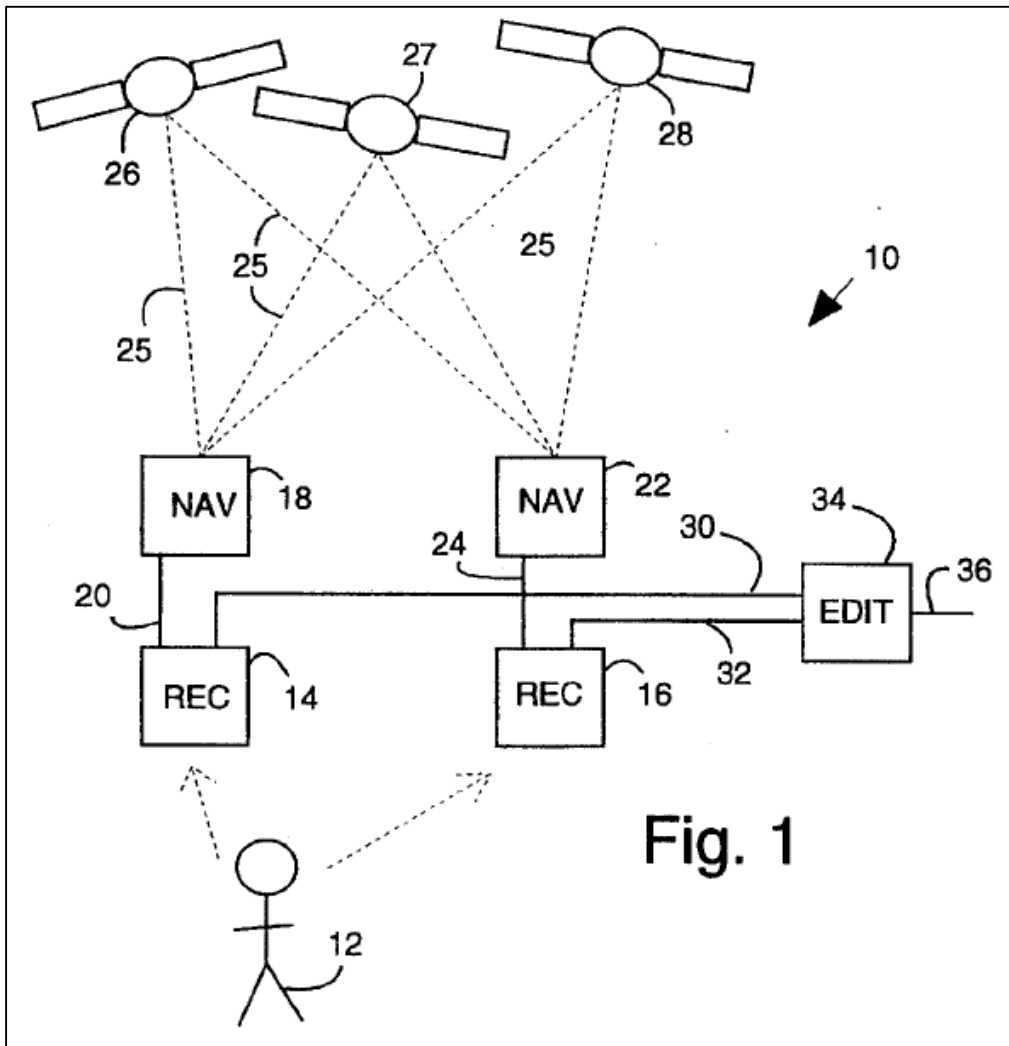
71. Strub was not considered in the prosecution of the ’444 Patent.

B. Woo

72. I understand that US Patent No. 5,479,351 to Woo et al (“Woo”), entitled “Time-Keeping System and Method for Synchronizing Independent

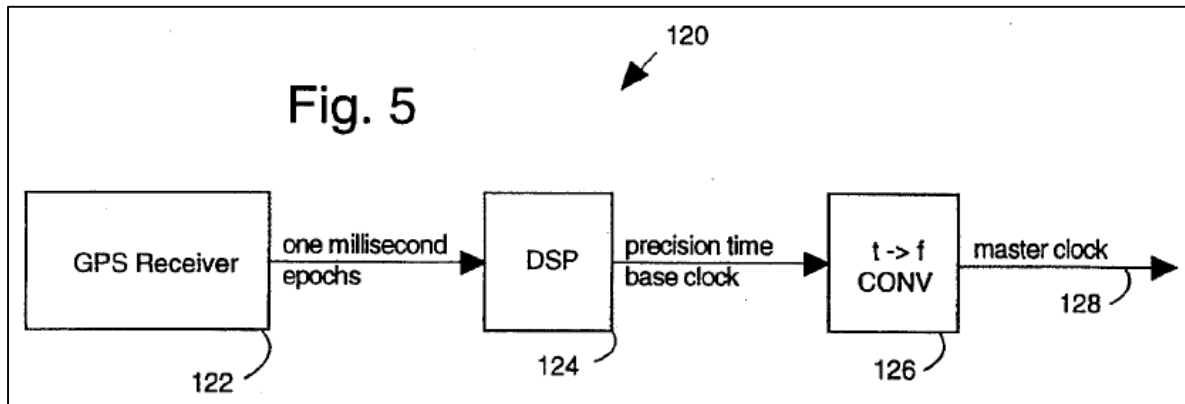
Recordings of a Live Performance in Post-Recording Editing,” was filed on December 23, 1994 and issued on December 26, 1995, and is prior art under at least pre-AIA 35 U.S.C. §§ 102(a), (b), and (e).

73. Woo discloses a system in which one or more local audio devices—recorders 14 and 16—record locally generated audio and transmit the same locally generated audio to a remote device—editing station 34—which creates its own recording of the audio. *See* Ex. 1004, 5:1-5 (“The system 10 is used to record the live performance of a performer 12, e.g., a singer or actor. A recorder 14 captures the performance from its vantage point while another recorder 16 independently captures the same performance from its own vantage point.”), 5:37-49 (“The connections 30 and 32 represent the communication of the respective recordings by wire, radio link and/or tape or film delivery to the editing station 34, e.g., a telecine suite or an audio layback [sic:playback] suite.”), 8:32-44, 9:40-43, 9:56-63, Figs. 1, 4. Fig. 1 depicts Woo’s system on block-diagram form, including recorders 14 and 16 and editing station 34:



74. Woo provides examples in which the local storage of the audio and the transmission of the audio to the remote editing station 34 are done substantially simultaneously. *Id.* 8:51-54 (“In step 114, the combining and generating may be done in real-time with the performance such that the third recording is delayed from the performance by an insubstantial amount of time.”), 10:7-10 (“the combining and generating are done in real-time with said common event such that said third recording is delayed from said common event by an insubstantial amount of time.”).

75. Each of Woo's local audio devices includes a local timecode generator that is jam-synchronized to a master timecode generator using GPS-based master timecodes. *Id.* Abstract ("A GPS receiver comprises a data output port for communicating time code information....Such time code information is input to independent sound, film and video recorders...."), 3:37-67 (describing soft and hard jam-syncing of a local timecode generator to a master timecode generator), 7:26-50, (using GPS-based time code generator as a master clock), 8:60-9:4 ("synchronizing film and video equipment"), Figs. 1, 3, 5, 6. A POSA would consider the satellites and the GPS receivers 18 and 22 to be master timecode generators. For example, each of the GPS receivers is a master timecode generator from the perspective of the other components in Woo's system. A POSA would understand that the GPS receiver 18 or 22 demodulates the satellite signal to extract the timecodes and passes the timecodes on to the other components such as recorder 14 or 16. Fig. 5 provides an exemplary depiction of how Woo's system uses GPS signals to provide master timecodes—master clock output 128—for synchronizing the local timecode generator in each local audio device:



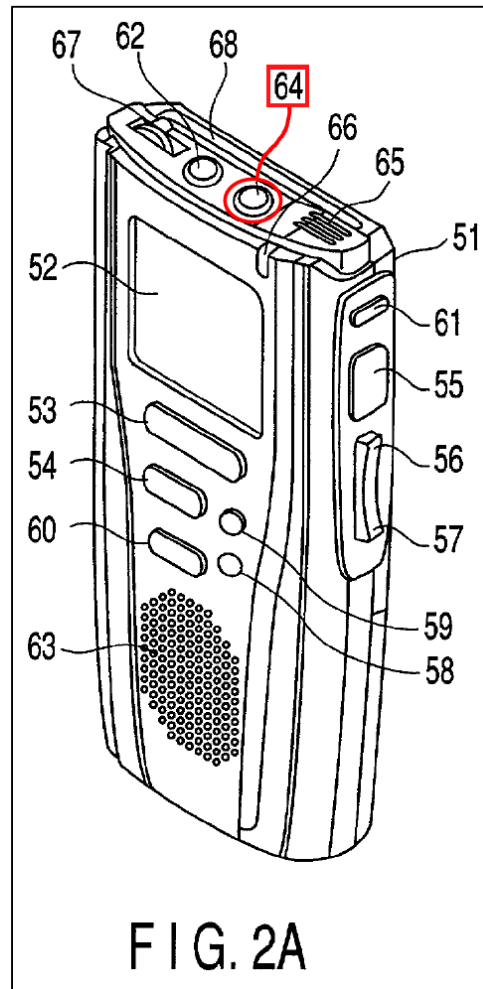
76. The local timecode generator generates SMPTE timecodes which are used to time-stamp—e.g., date and time tag—the local audio data. *Id.* Abstract (“[SMPTE-formatted] time code information is input to independent sound, film and video recorders...to create tracks on each recording for re-synchronizing the pictures and sounds in post-performance editing”), 1:60-2:9, 2:39-48, 3:3-24, 4:3-32 (“generating coordinated time codes at independent sites proximate to respective recorders.”), 4:62-64 (describing “a time-keeping system for synchronizing sound and picture recordings from a plurality of independent recording devices”), 5:37-45 (“The recorders 14 and 16 each transmit their respective recordings over a pair of connections 30 and 32 to an editing station 34...Each recording delivered to the editing station 34 has been date and time tagged, using date and time information received by the recorders 14 and 16 over connections 20 and 24.”).

77. Woo was not considered in the prosecution of the '444 Patent.

C. Nagai

78. I understand that US Patent Publication No. 2002/0159179 to Nagai et al (“Nagai”), entitled “Data Recording and Reproducing Apparatus and Data Reproducing Apparatus,” was filed on March 14, 2002 and published on October 31, 2002, and is prior art under at least pre-AIA 35 U.S.C. §§ 102(a), (b), and (e).

79. Nagai describes a voice recording and reproducing apparatus with a memory card 117 for storing voice data. Ex. 1005, Abstract, [0105]-[0106], [0115], Figs. 1, 4. Nagai’s voice recorder has an audio input port—“mike jack” (i.e., microphone jack) 2 or 64—configured to couple to an audio input device—e.g., an external microphone—to receive locally generated voice signals. *Id.* [0100], [0109]-[0110], [0139], Fig. 1, 2A. An example of Nagai’s audio input port—“mike” (i.e., microphone) jack 64—is illustrated in Fig. 2A (annotated below):



80. Nagai's voice recorder also has a gain adjustment circuit—volume-control wheel 67 and accompanying circuitry 25—which controls the "reproduction level" of sound coming from the headphone or speaker, and also sets the "attenuation value" for recording:

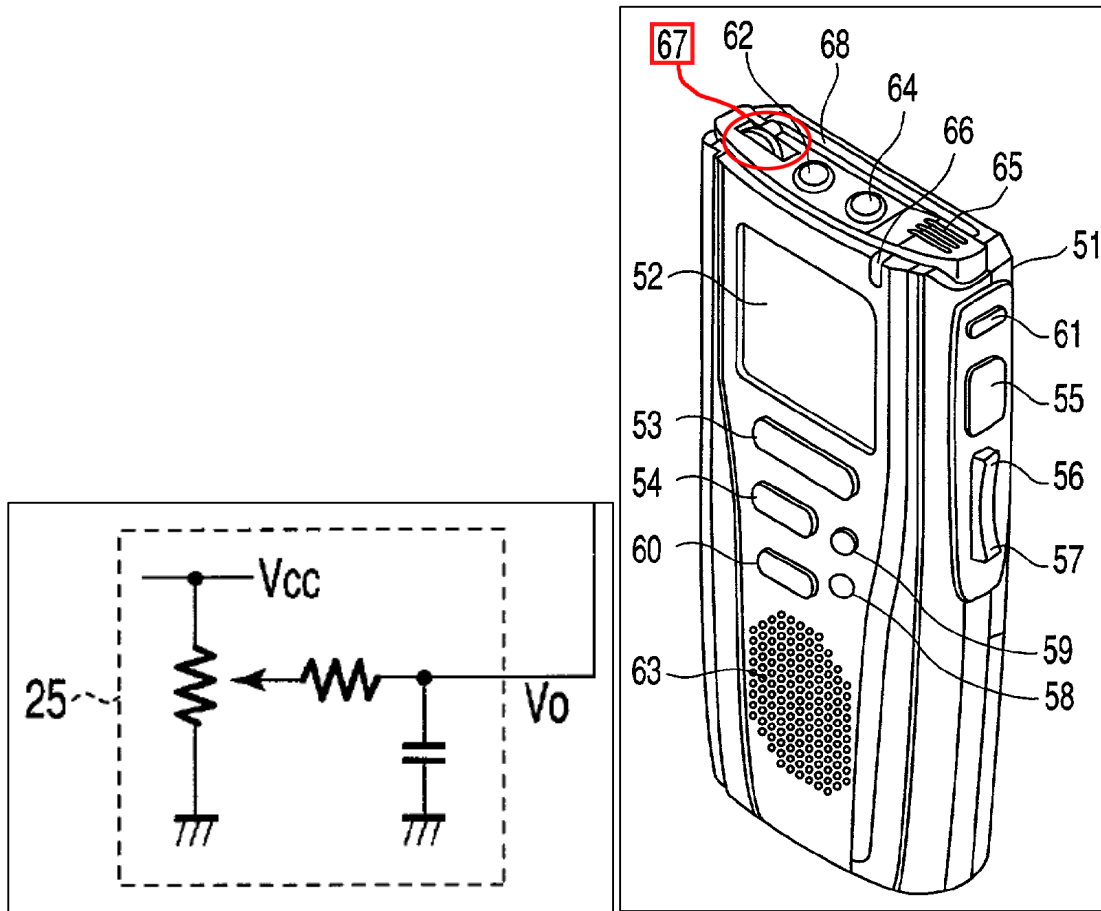


Fig. 1 (excerpted)

Fig. 2A (annotated)

See also *id.* [0033]-[0036] (“reproduction level control means”), [0141]-[0143], [0261]-[0274] (using wheel 67 and control circuit 25 to set “attenuation value”), [0278]-[0279], [0285], [0321] (reproduction level “used in both the recorder and player modes”), Claims 11-15, Figs. 3, 21.

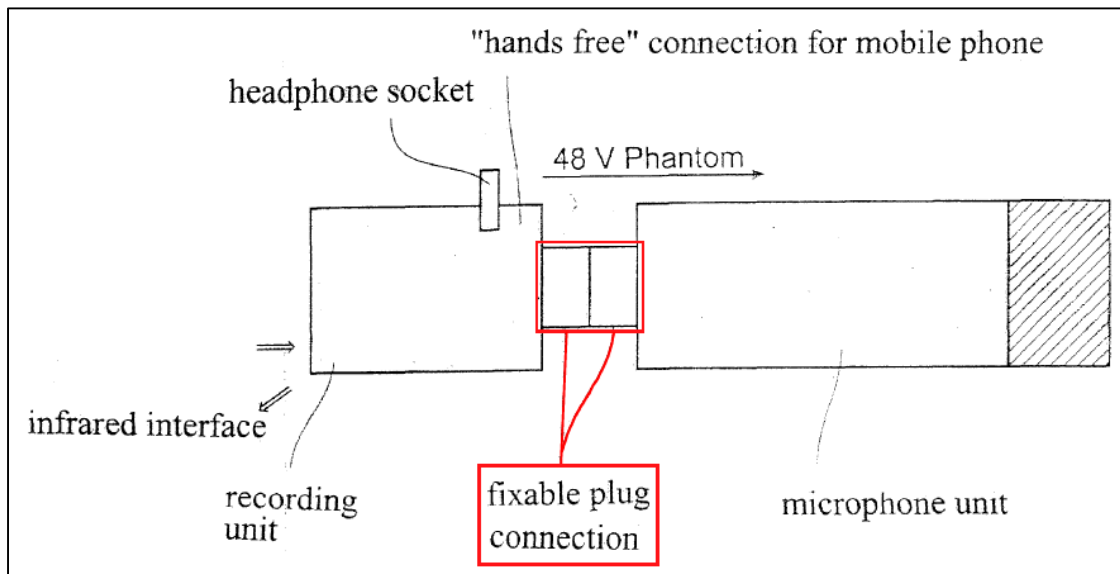
81. Nagai was not considered in the prosecution of the ’444 Patent.

D. Gleissner

82. I understand that US Patent Publication No. 2004/0028241 to Gleissner (“Gleissner”), entitled “Audio Data Recorder,” was filed on July 25, 2003 and

published on February 12, 2004, and is prior art under at least pre-AIA 35 U.S.C. §§ 102(a), (b), and (e).

83. Gleissner discloses a portable audio data recorder which stores locally generated audio in a data memory. Ex. 1006, Abstract, [0025], [0031]. Gleissner's audio data recorder has an audio input port—an XLR plug connector—configured to couple to an audio input device—a microphone—to receive locally generated audio. *Id.* [0013] (“A XLR plug connection is preferably formed between the recording unit and the microphone unit. This has the advantage that the recording unit can be coupled together with practically any desired microphones....”), [0024], [0032]. Gleissner's audio input port—the XLR plug connector—is depicted in Fig. 1:



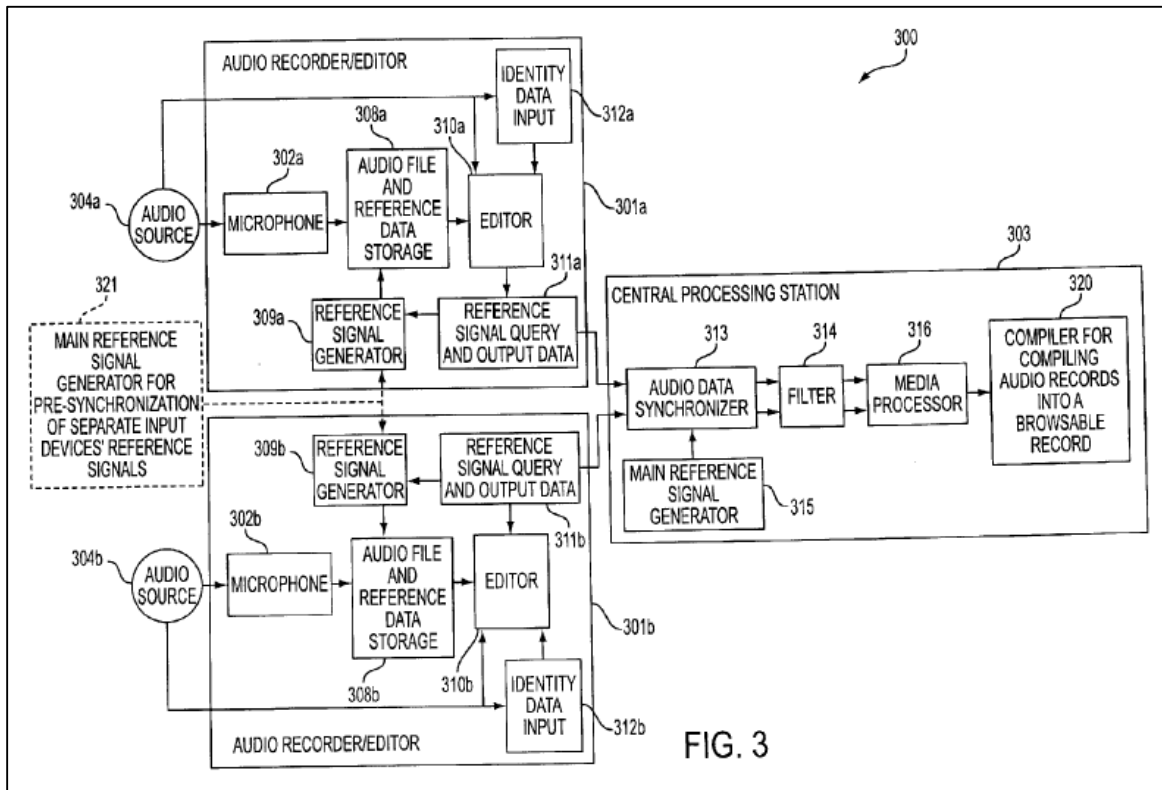
Id. Fig. 1 (annotated).

84. Gleissner was not considered in the prosecution of the '444 Patent.

E. Samadani

85. Samadani discloses one or more local audio devices—e.g., audio recorders/editors 301a/301b—for storing locally generated audio and transmitting that audio to a remote device—e.g., central procession station 303—which comprises a receiver and a recorder. See Ex. 1007, Abstract (“A method and system...for capturing media during a recording session using a separate input device for each of plural audio sources. An exemplary method includes producing audio data with the separate input device,...and storing an audio record for each identified portion of audio data.”), [0035]-[0036] (“The media recorder/editors 301a and 301b are connected to a central processing station 303 [which] processes the audio data from a media recorder/editor 301....The respective connections of the media recorder/editors 301a and 301b to central processing station 303 can be a...wireless connection....”), Fig. 3; see also *id.* [0045] (“audio/visual recorders 501a and 501b can be respectively connected via a wire or wirelessly to the processing stations.”), [0046], Figs. 5, 6.

86. An embodiment of Samadani’s system is depicted in Fig. 3:



87. Samadani's local audio device has a wireless transmitter—e.g., reference signal query and output data component 311a or 311b—which wirelessly transmits the locally generated audio to the remote receiver/recorder. *Id.* [0036] (“The respective connections of the media recorder/editors 301a and 301b to central processing station 303 can be a...wireless connection....”), Fig. 3. Processing station 303 includes a remote recorder—e.g., compiler 320—which stores the audio data. *Id.* [0038]; *see also* [0028] (compiler 120 in central processing station/editor 106), [0053] (compiler 520 in central processing station 505), Figs. 1, 5.

88. Samadani's local audio device—e.g., audio recorder/editor 301a or 301b—stores the local audio data in memory—e.g., audio file and reference data

storage 308a, 308b. Samadani [0035] (“A media recorder/editor 301 records an audio signal from a microphone 302 along with a reference data from one or more reference signal generators 309 into audio file and reference data storage 308.”), [0037], [0040], Figs. 3, 4.

89. Samadani’s local device—e.g., audio/visual recorder 501a or 501b—wirelessly receives master timecodes—e.g., reference signals containing time information—from a master timecode generator—e.g., reference signal generator 509, which can be a GPS-based timing source. *Id.* [0047] (“Each audio/visual recorder 501a, 501b, as shown in the exemplary embodiment of FIG. 5, can include reference signal receiver 525a, 525b, respectively that receives a main reference signal from a main reference signal generator 509....[T]he main reference signal generator 509 can provide an external time base (e.g., absolute time associated with a GPS signal)”), [0048], Fig. 5; *see also id.* [0038]-[0039], Fig. 3 (main reference signal generator 321). Samadani teaches the use of master timecodes—e.g., the reference signals from reference signal generator 321—to synchronize a local timecode generator—e.g., reference signal generators 309a/309b. *Id.* [0039] (“[T]he reference signal generators 309a and 309b in the media recorder/editors 301a and 301b within the exemplary embodiment of FIG. 3 can be synchronized prior to the recording session with a main reference signal generator for pre-synchronization of separate input device reference signals 321.”), [0040], [0042], [0047], FIGs. 3-5.

90. Samadani's stored copy of the local audio data includes time stamps. Id. [0037] ("The reference signal generator 309 is a timer-based generator in that a time stamp is generated as the reference data."), [0040] ("[R]eference signal generator 309a...generates a reference signal that is stored as reference data in the audio file and reference data storage 308a within the audio recorder/editor 301a"), [0048].

91. Samadani was not considered in the prosecution of the '207 Patent or in the Lectrosonics IPRs.

XI. SPECIFIC GROUNDS FOR INVALIDITY

A. Ground 1: Claims 1-7, 9, 10, 13-15, 17-20, 22, 23, and 27 are Rendered Obvious Under § 103 By the Combination of Strub and Woo

1. A POSA Would have Been Motivated to Combine Strub and Woo

92. The teachings of Strub and Woo provide substantial motivation to combine them. For example, the systems described in Strub and Woo are the same type of apparatus used for the same purpose. Each discloses a system for receiving and recording local audio in a local device, wirelessly transmitting the same audio to a remote device, and recording the audio in the remote device. *See, e.g.*, Ex. 1003, 8:50-53, 12:13-21, 12:31-39, 21:65-22:7, 35:54-65, 37:11-40, Figs. 1, 4, 6, 8A-9B; Ex. 1004, 5:3-5, 5:37-49, Fig. 1. In addition, each of the local audio devices of Strub

and Woo wirelessly receives master timecodes from a master timecode generator and uses the timing information from the master timecodes to stamp the local audio. *See, e.g.,* Ex. 1003, 13:50-58, 63:50-60, 79:54-80:9; Ex. 1004, Abstract, 1:60-2:9, 2:39-48, 3:3-24, 3:37-67, 4:3-32, 4:62-64, 5:37-45, 7:26-50, 8:32-44, 8:60-9:4, 9:40-43, 9:56-63, Figs. 3-6.

93. Indeed, Woo itself provides express motivations to use its synchronization methods in a wireless, multi-recorder system such as Strub's. For example, Woo's master clock (1) provides accurate synchronization across recorders recording a performance, (2) can generate coordinated timecodes at independent sites proximate to recorders, (3) is simple to connect to the recorders, and (4) provides timecode output in a format that is compatible with a standard (SMPTE) used by commercially available equipment. *Id.* 4:3-44; *see also* Ex. 1017 at 29. In addition, modifying Strub's recording unit to include a conventional SMPTE timecode input port for receiving conventional SMPTE-formatted master timecodes from Woo's master clock would involve nothing more than combining familiar elements according to known methods to improve Strub's system and yield predictable results.

94. The '444 Patent sought to solve the problem of matching the timing between multiple recordings produced by one or more wireless devices. *See* Ex. 1001, 1:40-2:5. It purports to have solved that problem by generating master

timecodes with a master timecode generator, providing those timecodes to a local recording device, and using the timing information in those timecodes to time-stamp the locally recorded audio data. *Id.* 3:11-14, 3:66-4:22, 4:48-5:6, 5:65-6:4, 10:49-11:1, 11:26-32, 14:52-60, 15:32-36, 16:44-47, 17:9-22, Figs. 3A, 4A, 4B, 5, 6. Strub and Woo recognized and solved that same problem in the same way. *See* Ex. 1003, 13:50-58 (local audio device includes “clock that is used to time-stamp the recording data obtained by the recording unit.”), 62:26-63:49 (receiving “current time that can be used as a clock to generate time-stamps” from a GPS or satellite service), 63:50-60, 75:25-57 (“SMPTE time code input...to enable synchronization with an external device”), 79:54-80:9; Ex. 1004, Abstract (“A GPS receiver comprises a data output port for communicating time code information....Such time code information is input to independent sound, film and video recorders....”), 1:60-2:9, 2:39-48, 3:3-24, 3:37-67 (synchronizing local timecode generator to a master timecode generator), 4:13-19 (“GPS navigation receiver with a data output port for communicating time codes in SMPTE format...to form a time-keeping base for the time code output.”), 5:5-10 (satellite receivers “provide[] highly-accurate date and time information to the recorder 14”), 5:21-29, 5:37-45 (recordings are “date and time tagged, using date and time information received by the recorders 14 and 16 over connections 20 and 24.”), 7:26-50, (using GPS-based time code generator as a

master clock), 8:60-9:4 (“synchronizing film and video equipment”), 9:33-39, 9:45-55, 10:15-11:1, Figs. 1, 3-6.

95. In addition, every element of Claims 1-7, 9, 10, 13-15, 17-20, 22, 23, and 27 appears in Strub and/or Woo. *See infra* § XI.A.2. Those elements comprise standard, off-the-shelf audio-recording components that would be familiar to any POSA. There is nothing unpredictable about the claimed use of those components in a wireless audio-recording system. Furthermore, the technology and operation of such components were well-understood in the relevant time period such that the combination of Strub and Woo would have had a high likelihood of success.

96. Thus, since Strub and Woo teach the same kind of device used for the same purpose, since Strub and Woo identified the same problem identified in the ’444 Patent and solved it in the same way, since the combination of elements in the Challenged Claims is nothing more than “the predictable use of prior art elements according to their established functions,” and since the combination of Strub and Woo would have had a high likelihood of success, a POSA would have been motivated to combine Strub and Woo.

2. **The Combination of Strub and Woo Meets All Elements of The Challenged Claims 1-7, 9, 10, 13-15, 17-20, 22, 23, and 27**

97. As discussed below, the Preambles and every element of Claims 1-7, 9, 10, 13-15, 17-20, 22, 23, and 27 of the ’444 Patent are taught by Strub and/or Woo.

To the extent Patent Owner alleges that any of Strub or Woo fails to teach any claim element, that element is provided by the other references. Further, to the extent the teachings of any of Strub and/or Woo are substantively different for any given claim element, it would have been at least obvious to try the other references' implementation of that element, given the overall similarity in their purpose, design and operation.

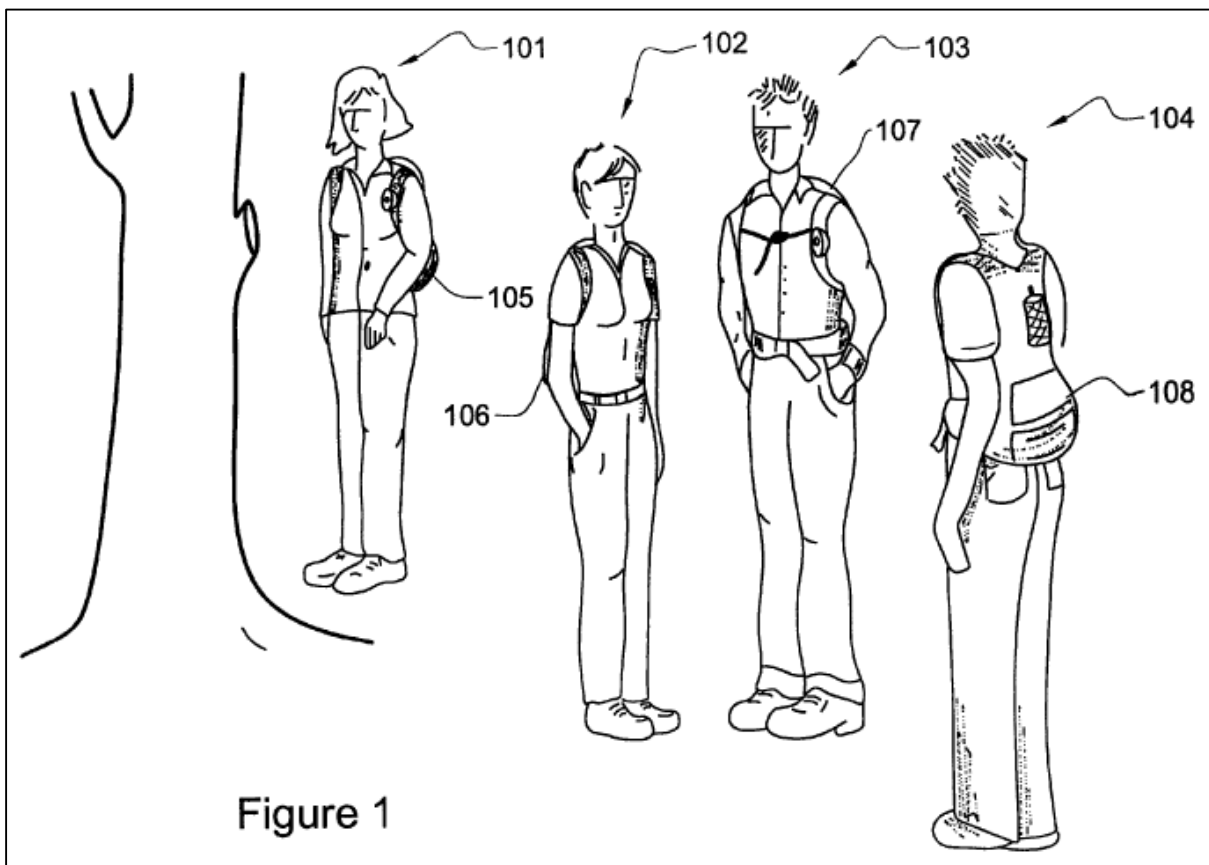
a. **Claim 1**

98. Challenged Claim 1 has mostly the same limitations as Claim 1 of the '814 Patent, which the PTAB found unpatentable in the Lectrosonics '1130 IPR, except that Challenged Claim 1 also recites: (1) substantially simultaneously transmitting audio data to a remote device, and (2) timestamps referencing local data to at least one of master timecodes (as opposed to '814 Claim 1's local timecodes). Ex. 1001, Claim 1; Ex. 1028, Claim 1, IPR Certificate at 1:6-7. I note, however, that transmitting audio data to a remote device and receiving master time data are present in Claims 12 and 13 of the related '307 Patent, which were found unpatentable in the Lectrosonics '972 IPR. Ex. 1015, Claims 12, 13, IPR Certificate at 1:5.

(1) **1[Pre]: “A system for locally recording locally generated audio as time-referenced local audio data and for substantially simultaneously transmitting audio data to a remote device, the system comprising:”**

99. Regardless of whether the preamble of Claim 1 is limiting, Strub teaches it. In the Lectrosonics IPRs, the Board found that Strub discloses “a local audio device that records local audio and transmits the local audio to other remote devices” and “creating stamped local audio data and storing said stamped local audio data in said memory.” *See supra* § VIII.C.

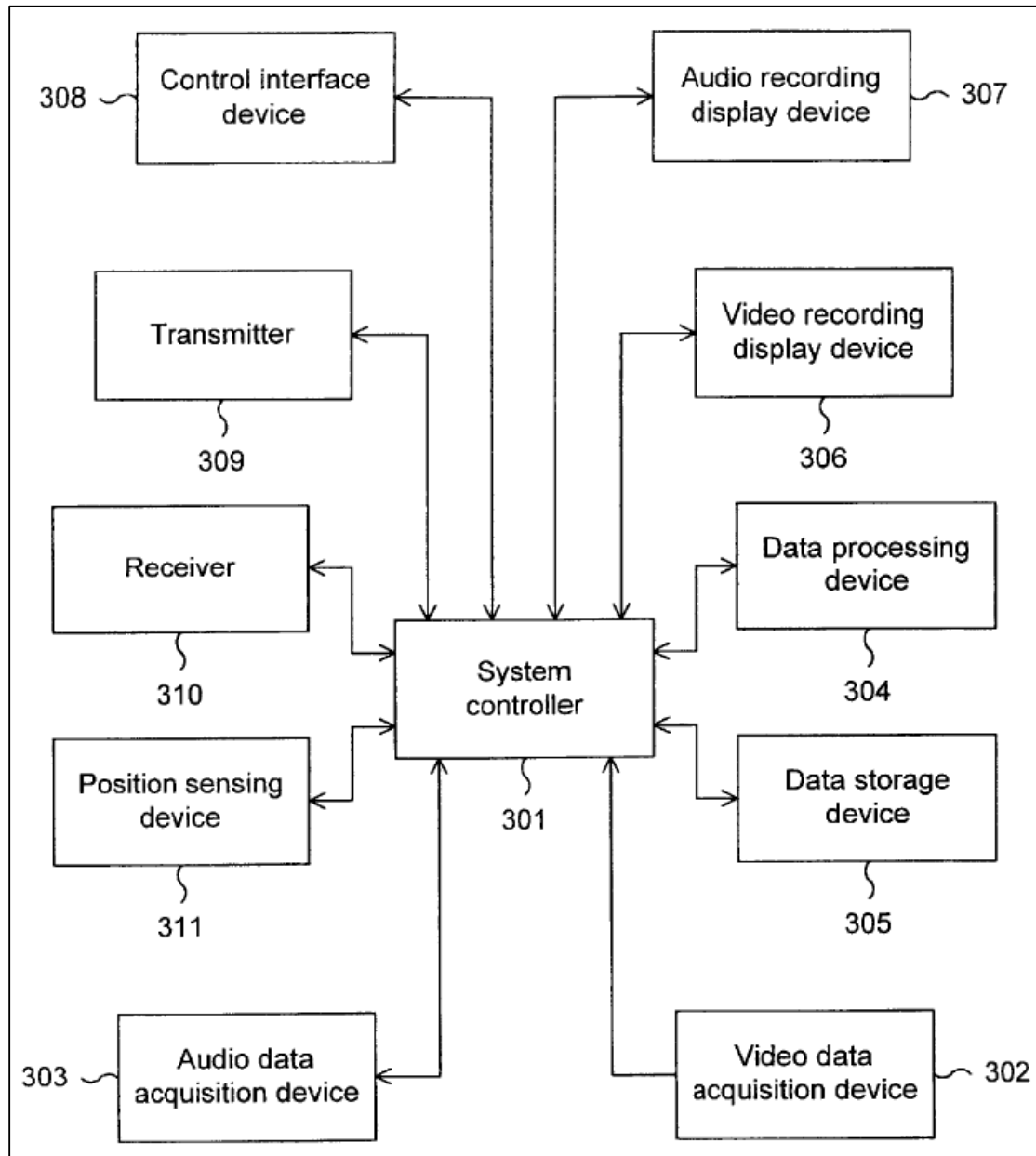
100. Specifically, Strub’s audio devices—recording units 105-108, 200, and 300—are worn by a plurality of users:



Ex. 1003, Fig. 1.

101. Each recording unit stores locally generated audio and transmits the audio to a remote device—e.g., a different one of recording units 105-108, 200, and 300—which also records it. *See* Ex. 1003, 8:10-29, 8:50-53, 11:32-50, 12:13-21, 12:31-43 (“[T]ransmitter 309 transmits signals...representing recording data acquired by the recording unit 300 [to] other recording units.”), 25:35-49, 35:54-65, 37:18-40, 38:1-4, Figs. 1-3; *see generally id.* 35:53-38:39.

The internal components of Strub’s local and remote audio devices are depicted in Fig. 3:



102. Furthermore, the system controller 301 in Strub's local audio device "can include a clock that is used to time-stamp the recording data obtained by the recording unit. (The time-stamps can be used, for example, to display the time at which a displayed recording was obtained, to locate particular stored recording data,

or to enable post-event synchronization of the display of recordings obtained by different recording units.)” *Id.* 13:50-58, 63:56-60 (“an internal clock ... used to accurately time-stamp data”). The time-stamping is performed using timecodes. *Id.* 6:65-7:24 (establishing “temporal correspondence” with stored “visual and aural” data by storing a “time code on the videotape”); 29:42-62 (digital disk recorder records both audio and visual data and also “record[s] other types of data (e.g.,...time codes)” with the recorded data.); 77:24-28 (identifying “Hi-8 with RC time code and mini-DV” as exemplary portable video recorders that “write a time code to the linear data storage medium...indicating the time at which corresponding recording data was obtained.”); 78:7-40 (storing timecodes on videotape); 84:20-25.¹ A POSA would understand that the application of time stamps or timecodes to the local audio data serves to time-reference the local audio data.

103. The transmission is sent to Strub’s remote device at the same time that the recording is “being obtained” by the local device—i.e., the storage and transmission occur substantially simultaneously. *Id.* 1:26-35 (“The invention...relates to recording an event in which multiple persons participate..., ...more particularly, to recording of the event by multiple participants (i.e., from multiple points of view), often simultaneously.”), 4:55-58 (“[A] recording unit

¹ Emphasis added throughout unless otherwise indicated.

according to the invention can be adapted to enable recordings to be shared between or among recording units **during the event.**”); 10:25-49 (“[A] recording unit according to the invention can be adapted to enable recordings to be shared between or among recording units **during the event** so that recorders can observe **recordings that** have been, or **are being, obtained by other recording units.**”), 35:61-36:2 (“[A] recording unit [can] display and/or store, **during the event**, a recording being obtained by another recording unit.”), 38:8 (“Recording data can be transmitted as acquired.”), 38:20-24 (“Compression...enable[s] enable more channels of recording data to be transmitted, i.e., more recording units can simultaneously transmit data”), 44:48-45:8 (“display device...capable of **simultaneously** displaying multiple visual recordings at one time...to enable[] a [user] to be cognizant of the content of the visual recordings **being obtained by more than one recording unit,**”); 79:54-80:9 (“recordings of the same event that were simultaneously obtained by different recording units”); 85:18-23.

104. The preamble is also taught by Woo. Woo’s system includes at least one local audio device—e.g., an arrangement comprising recorder 14 and GPS receiver 18, or recorder 16 and GPS receiver 22—which records locally generated audio and transmits that audio to a remote recorder—editing station 34—which also records it, as depicted in Figs. 1 and 3:

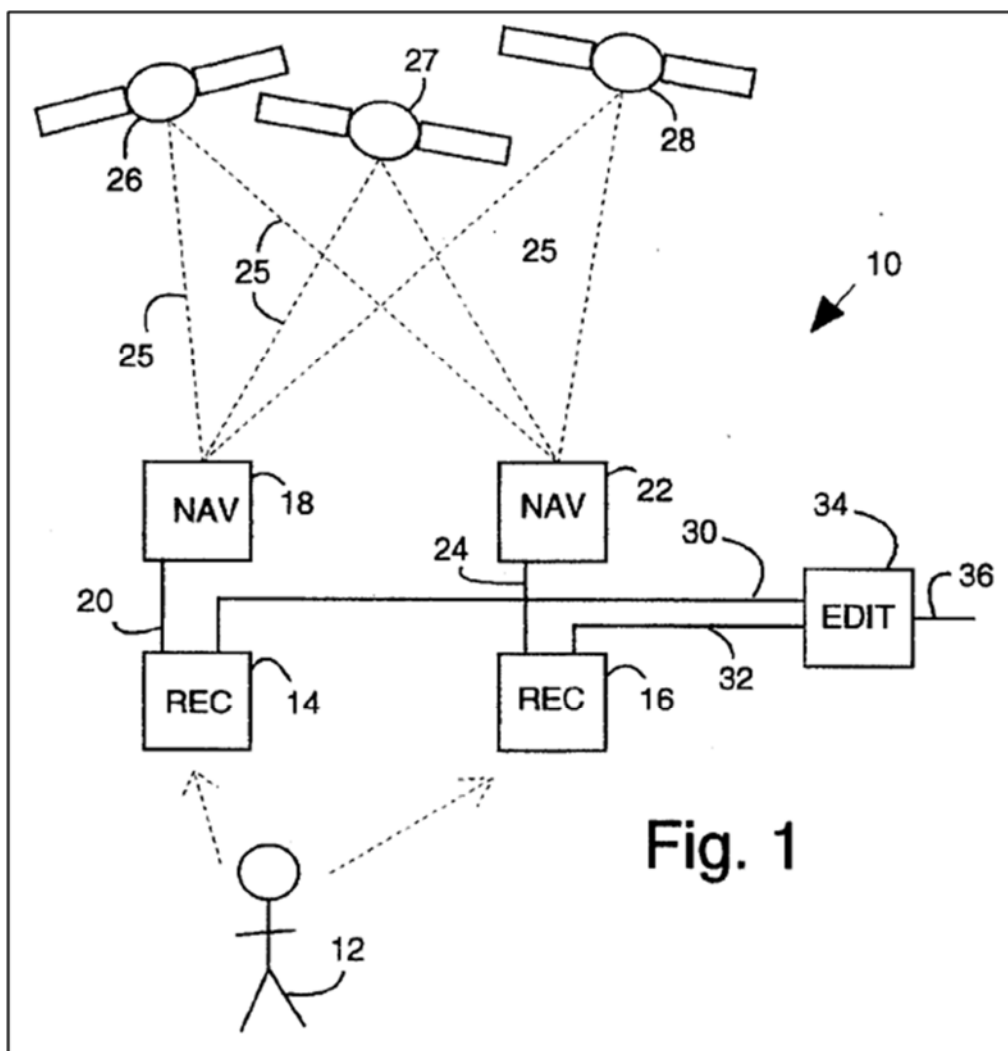
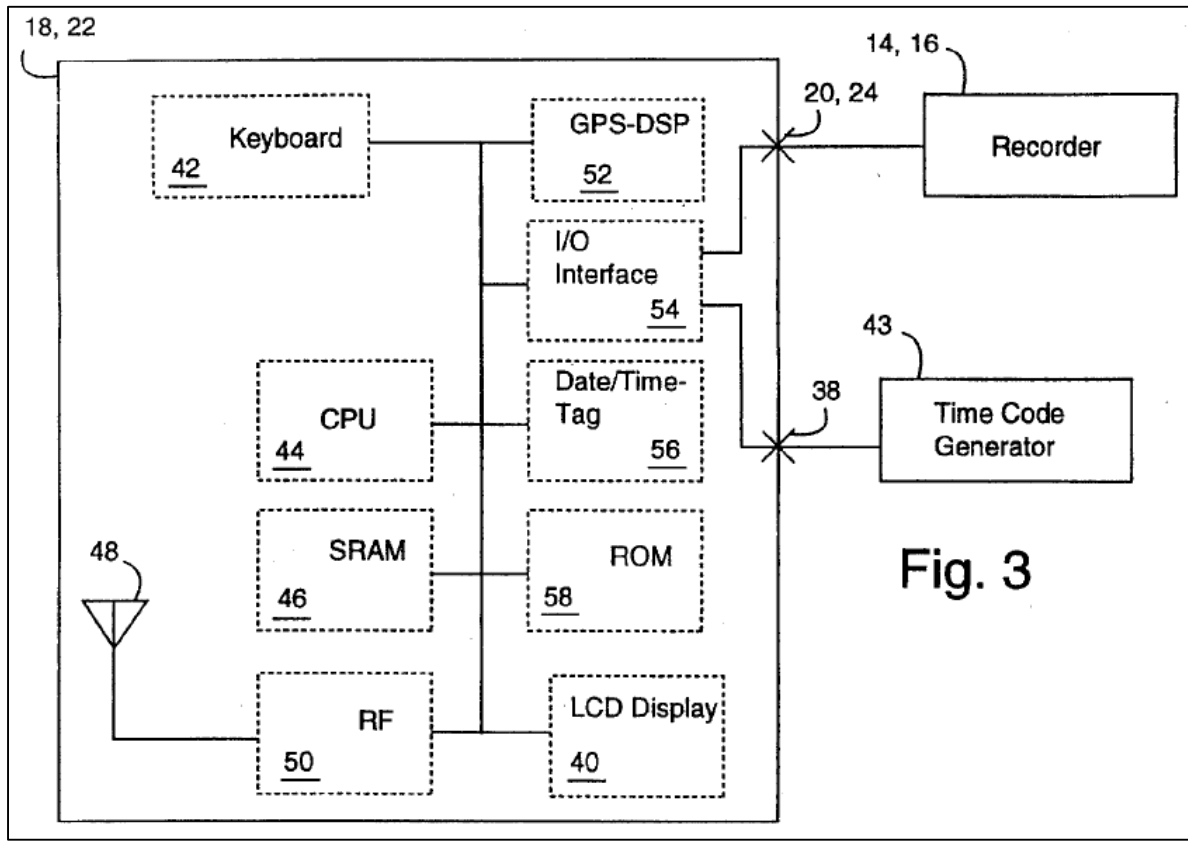


Fig. 1



105. See also Ex. 1004, 5:3-5 (recorders 14 and 16 “capture[] [a] performance”), 5:37-49 (recordings communicated to editing station 34), 8:32-44, 9:40-43, 9:56-63, Figs. 1, 3, 4.

106. Woo’s local audio device includes “a date and time tag unit 56 and a read only memory (ROM) 58.” *Id.* 7:59-60, Fig. 3. “The ROM 58...includes an application program for generating SMPTE time codes....” *Id.* 8:21-22. In addition, Woo’s local audio device can employ “commercially-available time code generator 43” to generate time codes. *Id.* 7:28-29, Fig. 3. Based on the timecodes, the date and time tag unit 56 provides time stamps—e.g., “date and/or time tag[s]”—which

are used to time-reference the local audio data, and the resulting stamped local audio data is stored as a recording in a memory in the recorder 14 or 16. *Id.* 8:11-21 (“The date/time-tag unit 56 associates a date and/or time tag with each...position determination stored in SRAM 46. Time code information is generated for connections 20, 24 and 38 by combining a one-pulse-per-second output from the GPS-DSP 52 with the conventional date and time information available from deciphering the navigation satellite transmissions.”), 8:25-44 (“A step 104 derives a first date and time code information with the first navigation satellite receiver. A step 106 tags a first recording generated by the first performance recording device with the date and time code information....A step 110 extracts a second date and time code information with the second navigation satellite receiver. A step 112 tags a second recording generated by the second performance recording device with the date and time code information.”), Figs. 3, 4; *see also id.* 1:60-2:1 (time codes stored with recorded content), 5:37-45 (“The recorders 14 and 16 each transmit their respective recordings over a pair of connections 30 and 32 to an editing station 34...Each recording delivered to the editing station 34 has been date and time tagged, using date and time information received by the recorders 14 and 16 over connections 20 and 24.”).

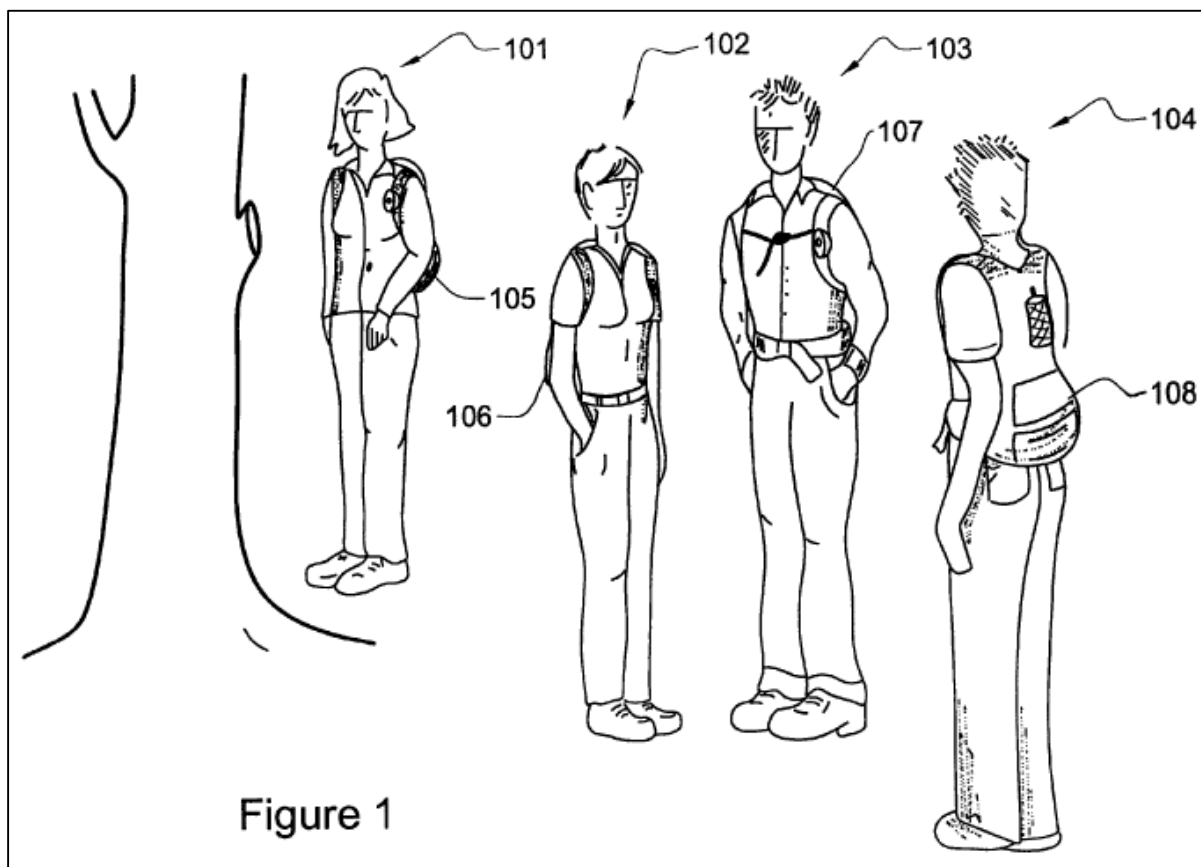
107. Woo teaches that the transmission of the audio data to the remote device can be done in real time—i.e., at the same time that the audio is being locally

stored. *Id.* 8:51-54 (“In step 114, ***the combining and generating may be done in real-time*** with the performance such that the third recording is delayed from the performance by an insubstantial amount of time.”), 10:7-10 (“***the combining and generating are done in real-time*** with said common event such that said third recording is delayed from said common event by an insubstantial amount of time.”).

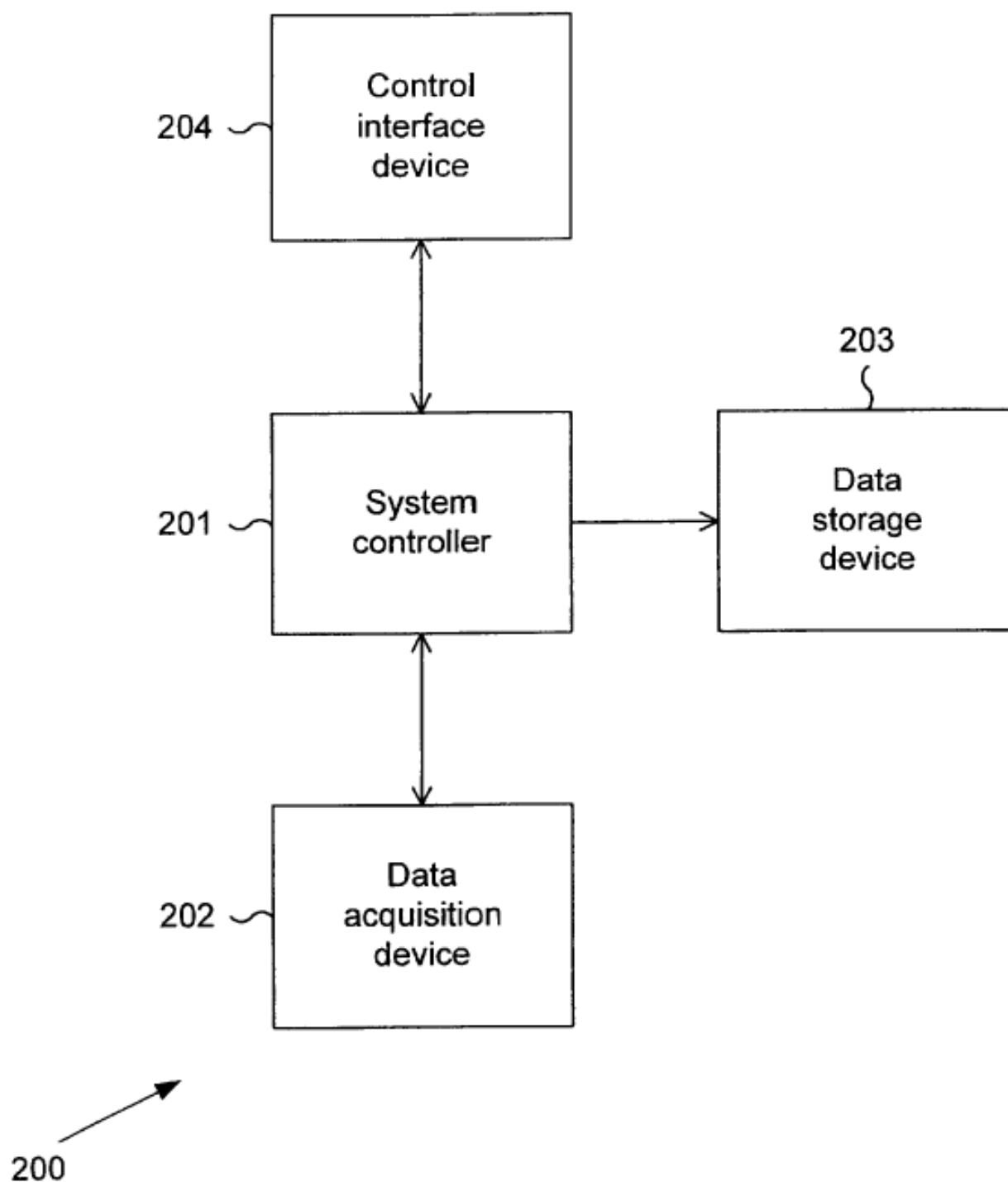
(2) **1[A]: “a remote receiver, the remote receiver configured to create at least one master timecode and to receive audio data; ”**

108. In the Lectrosonics IPRs, the Board found that: (1) Strub teaches (a) “a local audio device that...transmits...audio to other remote devices”—i.e., there is necessarily a remote receiver that receives audio data from local audio devices—and (b) generating—i.e., creating—master time data; (2) Woo discloses a “master timecode generator for generating a plurality of master timecodes,” “just as disclosed by the [related ’902] patent”; and (3) a POSA would have been motivated to use Woo’s synchronization techniques in Strub’s system. *Supra* § VIII.C.

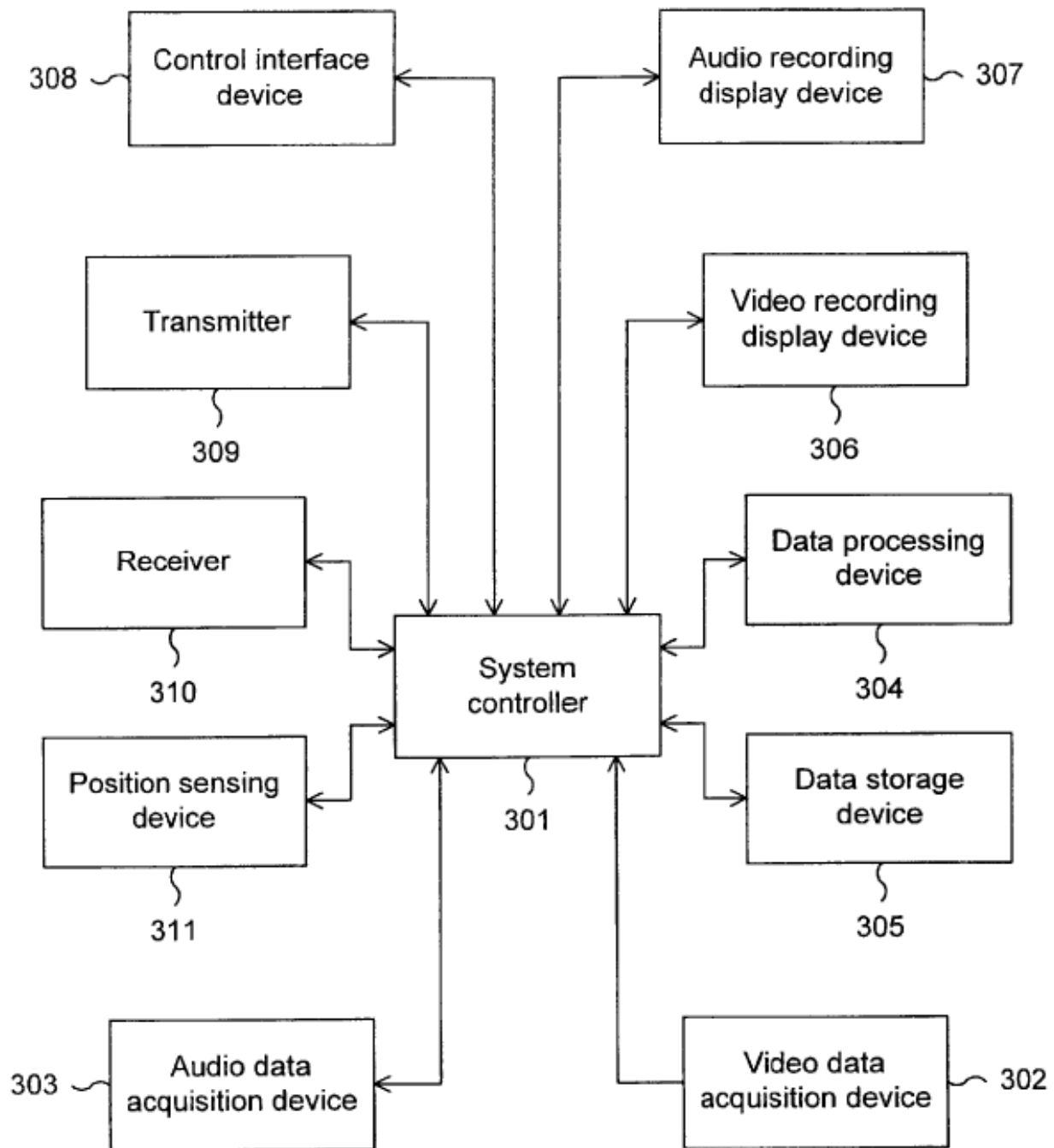
109. More specifically, Strub discloses recording units 105-108 which are worn by a plurality of users as depicted in Fig. 1:



110. Figures 2 and 3 of Strub illustrate internal components of recording units 200 and 300, respectively, which are examples of the recording units 105-108 illustrated in Figure 1:



Id. Fig. 3.



Id. Fig. 3.

111. Each of Strub's recording units 105-108 transmits locally generated audio data to one or more of the other recording units, which receives the audio data.

See Ex. 1003, 8:10-29, 8:50-53, 12:31-43 (“[T]ransmitter 309 transmits signals...representing recording data acquired by the recording unit 300, so that such recording data can be used by other recording units....The receiver 310 receives recording data signals representing recording data acquired by one or more other recording units....”), 25:35-49, 35:54-65 (“[R]ecording unit can include a receiver that enables receipt of [recording data] broadcast from other recording units”; “enabling [the] recording unit to...store, during the event, a recording being obtained”), 35:65-36:9, 37:18-40 (“[R]ecording data from multiple recording units can be recorded simultaneously”), Figs. 1 (recording units 105-108), 2 (recording unit 200), 3 (recording unit 300 including audio data acquisition device 303, transmitter 309, receiver 310, position sensing device 311, data storage device 305, system controller 301, and data processing device 304); see *generally id.* 35:53-38:39 (“Communication Between Recording Units”). From the perspective of the recording units **transmitting** the locally generated audio data, the recording unit **receiving** the audio data is the remote receiver.

112. In addition, Strub teaches using one of the recording units as a “‘master’ recording unit” which sends a synchronization pulse to the other recording units—i.e., the local audio devices—to allow them to synchronize their recordings. *Id.* 38:29-39 (“[I]t may be desirable to coordinate the recordings obtained by recording units so that [they] are temporally synchronized.... This can be done by **transmitting**

a synchronization pulse from a ‘master’ recording unit to each of the other recording units....”). A POSA would have understood that the purpose of a master timecode in the audio context is to provide time information for synchronizing audio samples. Thus, a POSA would have considered Strub’s synchronization pulses to be master timecodes, because they are interpreted/understood by the local audio devices as representing time information, and because they are used to synchronize audio samples. Furthermore, a POSA would have considered it obvious for Strub’s remote receiver—the one receiving audio—to be the one to generate the master timecodes/synchronization pulses. More particularly, Strub teaches embodiments in which the remote receiver receives audio data from multiple other recording units—*i.e.*, local audio devices. *Id.* 12:39-41 (“The receiver 310 receives...recording data acquired by one *or more other recording units*...”), 35:57-61, 37:32-36 (“[A] recording unit...may be implemented so that recording data from **multiple recording units** can be recorded simultaneously....”). Strub further teaches using timecodes to synchronize recordings between the recording units. *See, e.g., id.*, 7:11-24, 75:47-51, 78:7-40. Since Strub’s remote receiver is the unit receiving audio from multiple sources, a POSA would have recognized the desirability and practicality of having the remote receiver generate master timecodes for all the units so that all the received audio is synchronized to its own clock or time reference. At a minimum, it would have been obvious to try having the remote receiver, as opposed to one of the other

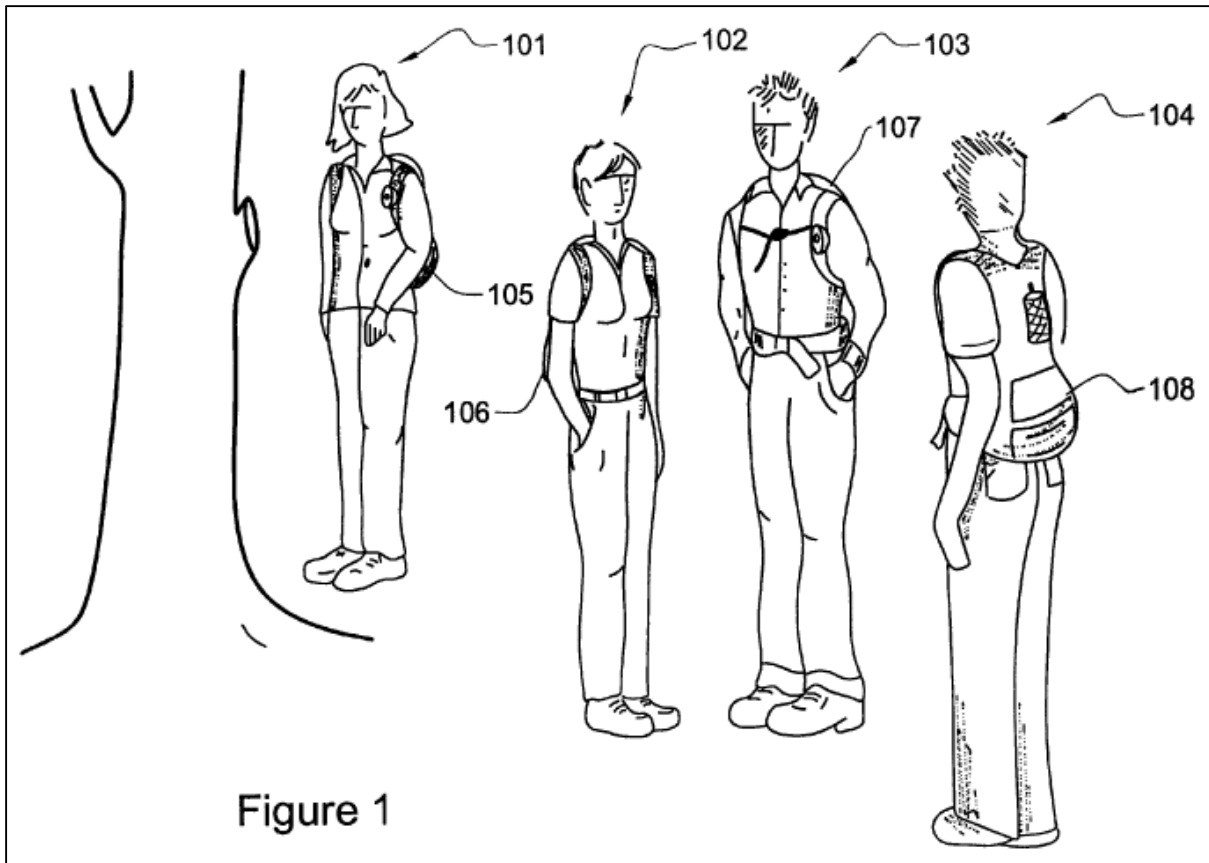
three recording units, as the generator of master timecodes, because there is only a limited number of choices. *See id.*, Fig. 1. In addition, since the generation and transmission of master timecodes was well-known and well-understood by POSAs in the relevant time period, using the remote receiver as the master timecode generator would have had a high likelihood of success.

113. Alternatively, the remote recording unit (“remote receiver”) can also create master timecodes with a “position sensing device” comprising a “GPS receiver” that uses “current time” from GPS satellites. *Id.* FIG 3, 12:4-10, 62:53-55, 63:41-60. The remote recording unit can also be a camcorder having an “SMPTE time code input.” *Id.* Abstract, 5:23-29, 75:7-57. To reduce cost and complexity a POSA would have been motivated to include the GPS receiver and/or SMPTE receiver/input in just one of the recording units (i.e., the remote receiver) and have that recording unit create and send the master timecodes to the other recording units.

(3) **1[B]: “a local audio device capable of communicating with the remote receiver and configured to receive locally generated audio”**

114. This limitation is taught by Strub. In the Lectrosonics IPRs, the Board found that Strub teaches “a local audio device that records local audio and transmits the local audio to other remote devices,” the local audio device including an “at least one audio input port for receiving said locally generated audio from an audio input device.” *See supra* § VIII.C.

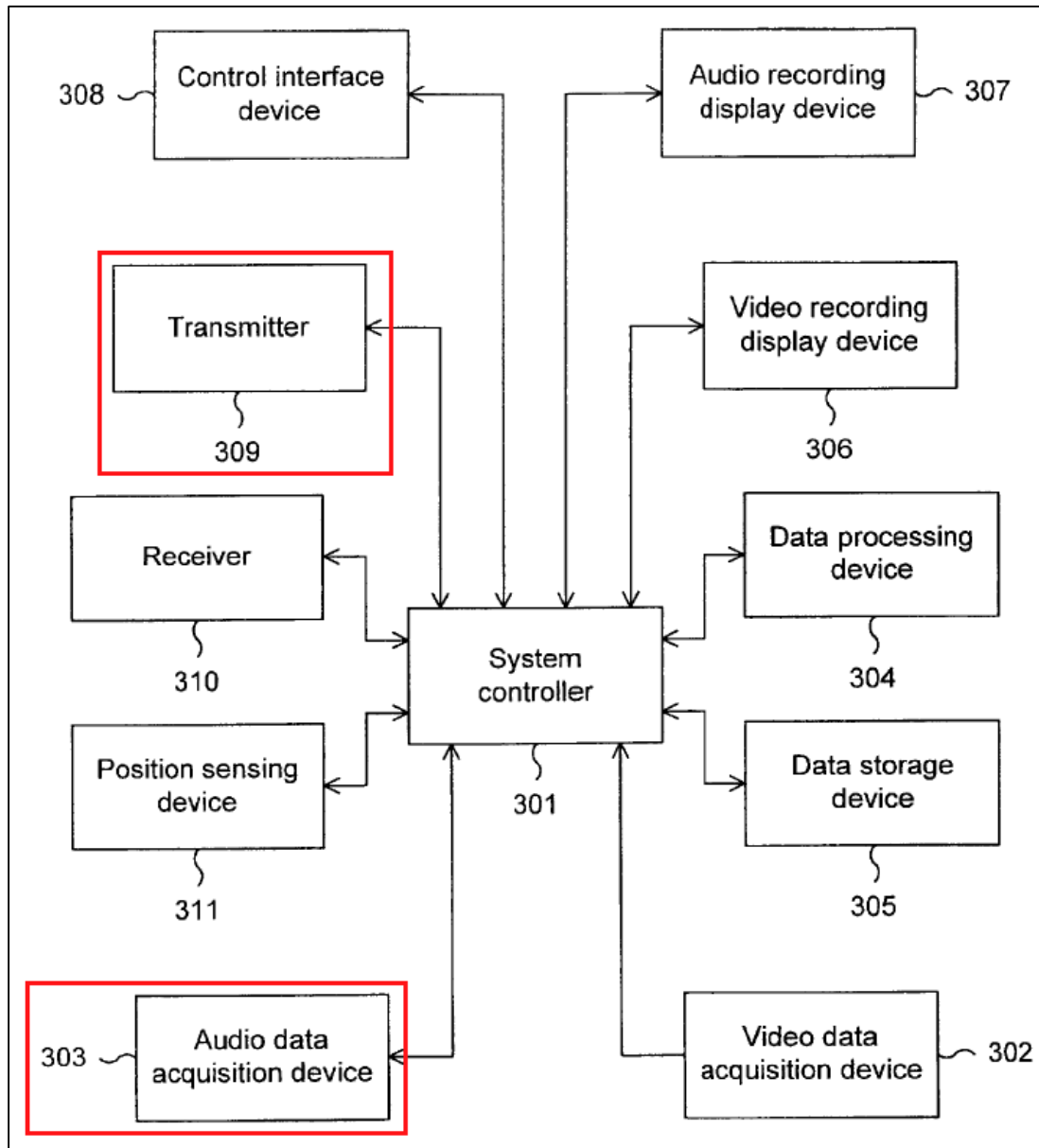
115. Specifically, Strub discloses at least one local audio device—e.g., one of recording units 105-108 (also illustrated as recording units 200 and 300, with internal components shown, in Figs. 2 and 3, respectively), which are worn by a plurality of users as depicted in Fig. 1:



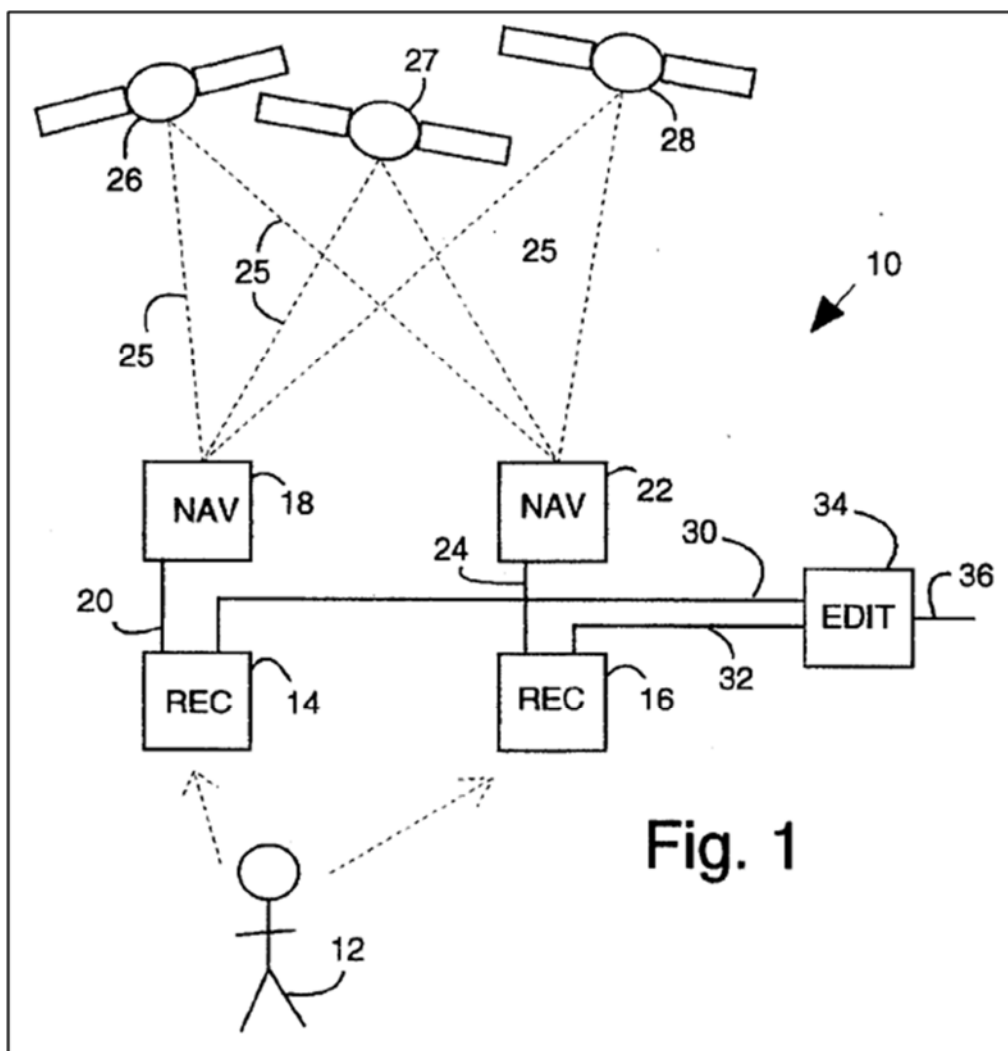
116. Each of Strub's recording units receives locally generated audio through a microphone and communicates the locally generated audio to a remote receiver—e.g., a different one of recording units 105-108, 200, and 300. *See Ex. 1003, 8:10-29, 8:50-53, 11:32-50, 12:13-21, 12:31-43* (“[T]ransmitter 309 transmits signals...representing recording data acquired by the recording unit 300, so that such

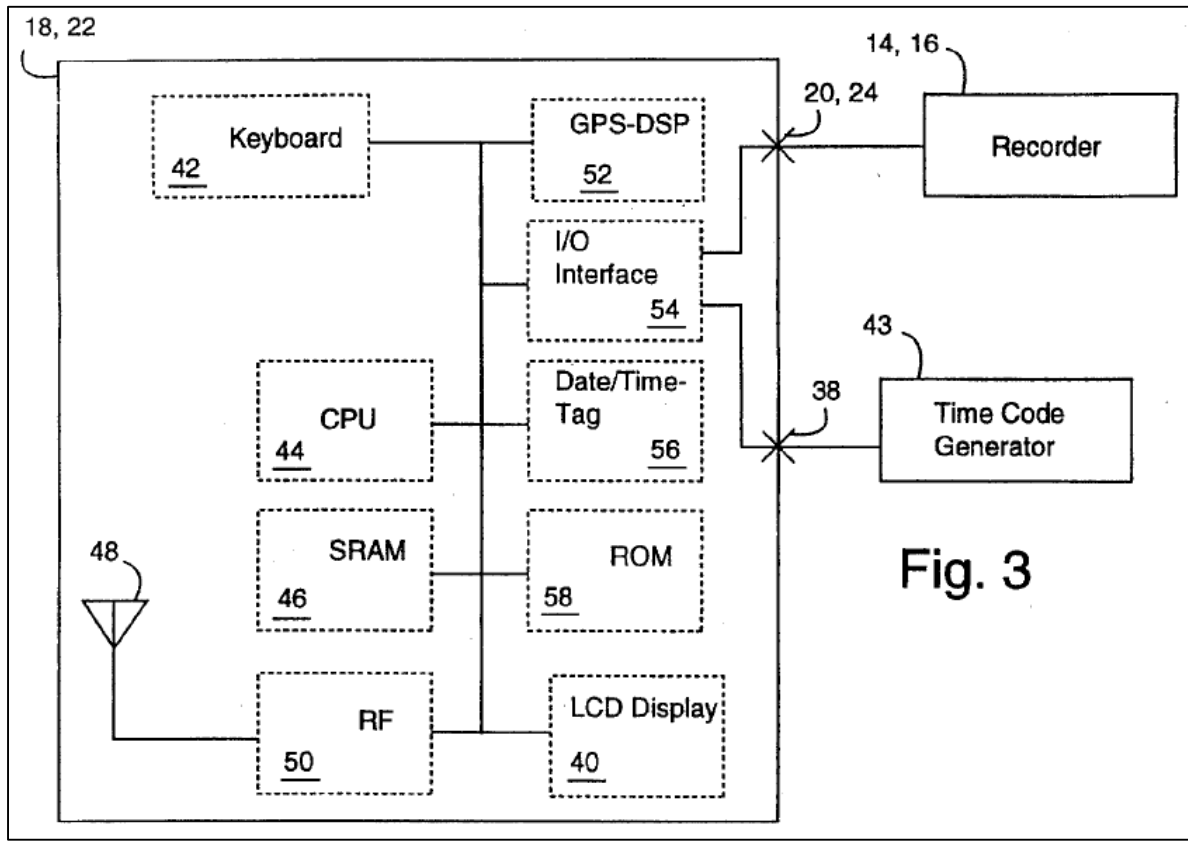
recording data can be used by other recording units.”), 21:65-22:2 (“[A]ny suitable audio data acquisition device (e.g., microphone) can be used in a recording unit according to the invention.”); 22:64-23:31 (examples of microphones that can be used as the audio data acquisition device), 25:25-49, 35:54–65, 37:18–40, 38:1–4, 60:3-5 (“The audio data acquisition device itself can be a conventional microphone.”), Figs. 1 (recording units 105-108), 2 (recording unit 200), 3 (recording unit 300 including audio data acquisition device 303, transmitter 309, receiver 310, position sensing device 311, data storage device 305, system controller 301, and data processing device 304); *see generally id.* 35:53-38:39 (“Communication Between Recording Units”).

117. The internal components of Strub’s local audio device, including the audio data acquisition device 303 (e.g., a microphone) for receiving the locally generated audio and the transmitter 309 for communicating with the remote receiver, are depicted in Fig. 3:



118. This limitation is also taught by Woo. Woo's system includes at least one local audio device—e.g., an arrangement comprising recorder 14 and GPS receiver 18, or recorder 16 and GPS receiver 22—which receives locally generated audio and communicates the audio to the remote receiver and recorder—editing station 34, as depicted in Figs. 1 and 3:



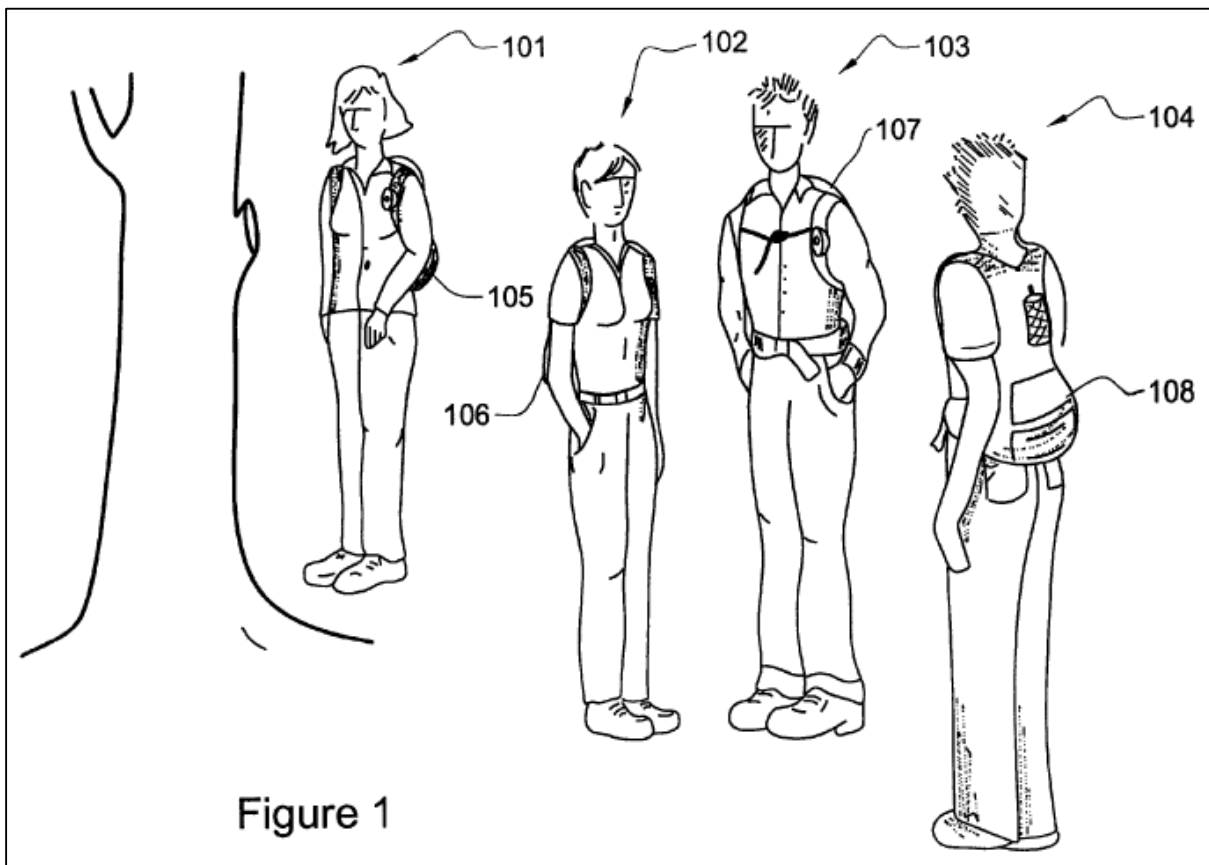


119. See also Ex. 1004, 5:3-5 (“A recorder 14 captures [a] performance from its vantage point while another recorder 16 independently captures the same performance from its own vantage point.”), 5:37-49 (“The connections 30 and 32 represent the communication of the respective recordings by wire, radio link and/or tape or film delivery to the editing station 34, e.g., a telecine suite or an audio layback [sic:playback] suite.”), 8:32-44, 9:40-43, 9:56-63, Figs. 1, 3, 4. Communication between the local audio devices and the remote receiver/recorder 34 are illustrated in Fig. 1. See *supra*.

(4) **1[C]: “the at least one local audio device wearable by a creator of the locally generated audio,”**

120. In the Lectrosonics IPRs, the Board found that Strub’s local audio device is “wearable by a creator of said locally generated audio.” *See supra* § VIII.C.

121. For example, Strub expressly states that each of its local audio devices—recording units 105-108, 200, and 300—is wearable by a creator of the locally generated audio—one of participants 101-104—and illustrates the devices’ wearability throughout the drawings, including Fig. 1:

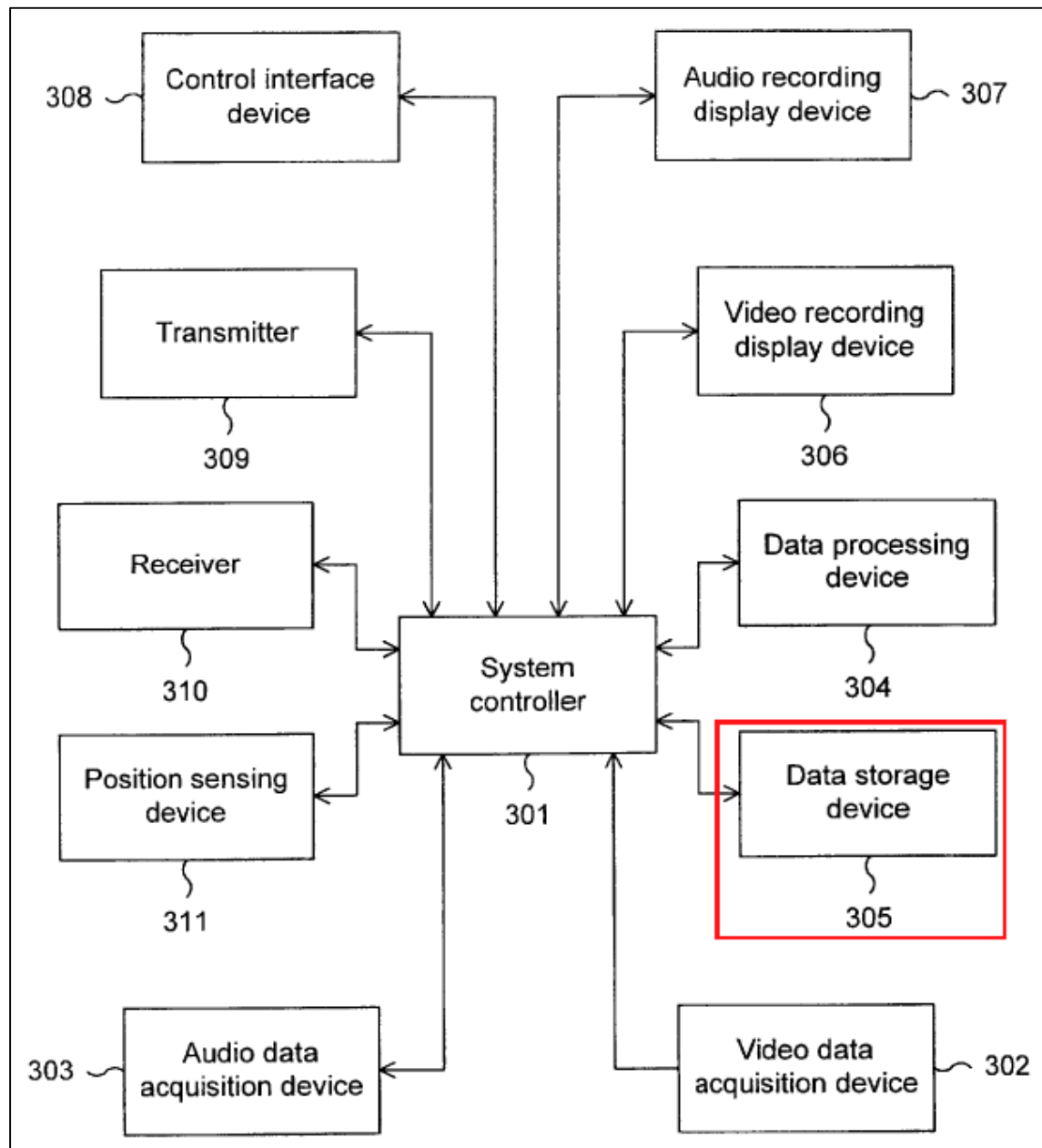


122. Ex. 1003, 4:21-31 (“a small, lightweight, wearable recording unit”), 8:7-12 (“In FIG. 1, four people are participating in, or observing, an event....Each of the participants (designated by the numerals 101, 102, 103 and 104) are equipped with a recording unit (designated by the numerals 105, 106, 107 and 108).”), 14:59-15:11 (“for the recorder to wear”), 16:66-17:24 (“wearable apparatus”), 38:65-39:11, 66:33-51 (“make the recording unit more comfortable to wear”), 67:54-68:10 (“emphasis on the wearability”), 72:9-19 (“recorder 850 is wearing the recording unit 800”); see also Figs. 4, 6, 8A-9B.

(5) **1[D]: “the at least one local audio device including: at least one local memory;”**

123. In the Lectrosonics IPRs, the Board found that Strub teaches that the local audio device has a memory. *Supra* § VIII.C.

124. Specifically, Strub’s local audio device includes at least one local memory—e.g., data storage device 305:



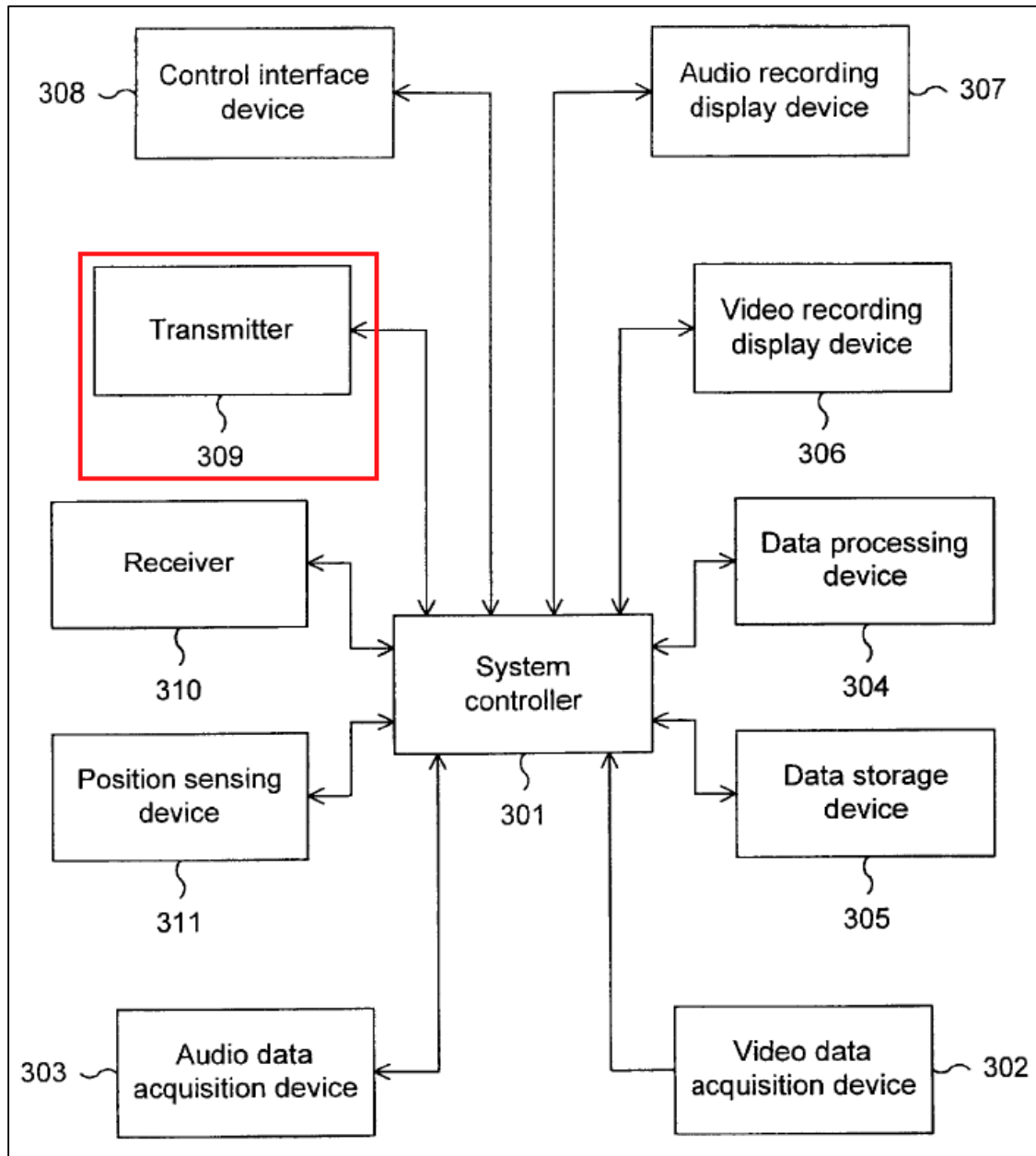
Ex. 1003, Fig. 3 (annotated), 12:13-21.

125. Memory 305 may include a hard disk, removable media (e.g., recordable DVD), or solid state or flash memory. *Id.*, 27:36-51, 33:20-35:50, 76:6-34, 94:15-20, Fig. 3.

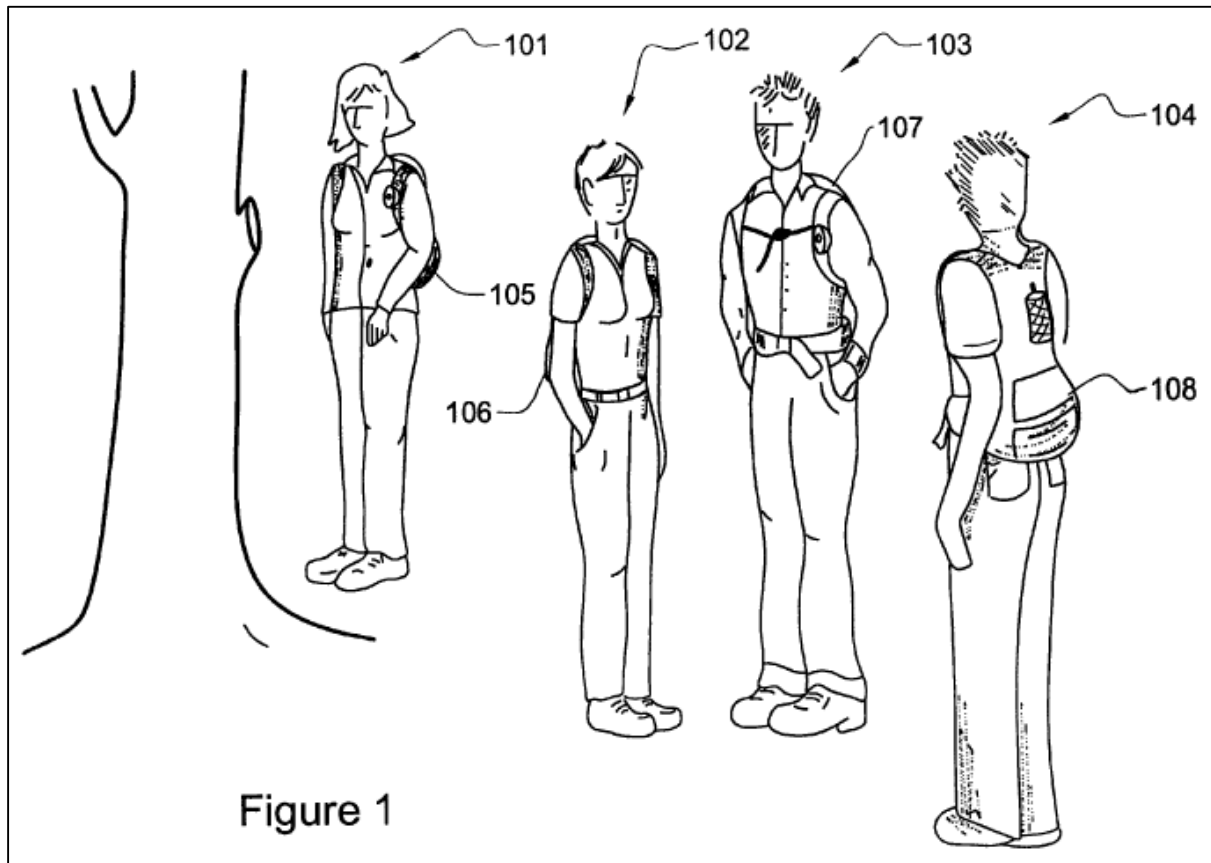
(6) **1[E]: “at least one local transmitter;”**

126. In the Lectrosonics IPRs, the Board found that Strub teaches that the local audio device wirelessly transmits the locally generated audio to a remote recorder. *Supra* § VIII.C.

127. In particular, Strub’s recording unit includes a local transmitter 309 for wirelessly transmitting audio to the other mobile and physically separated recording units:



Ex. 1003, Fig. 3 (annotated).



128. See also *id.* 12:31-46, 35:51-36:29 (“transmitter that enables signals representing the recording data ... to be broadcast from the recording unit”).

129. Woo’s local audio device—e.g., an arrangement comprising recorder 14 and GPS receiver 18, or recorder 16 and GPS receiver 22—transmits locally generated audio (in one example, wirelessly) to the remote recorder—editing station 34:

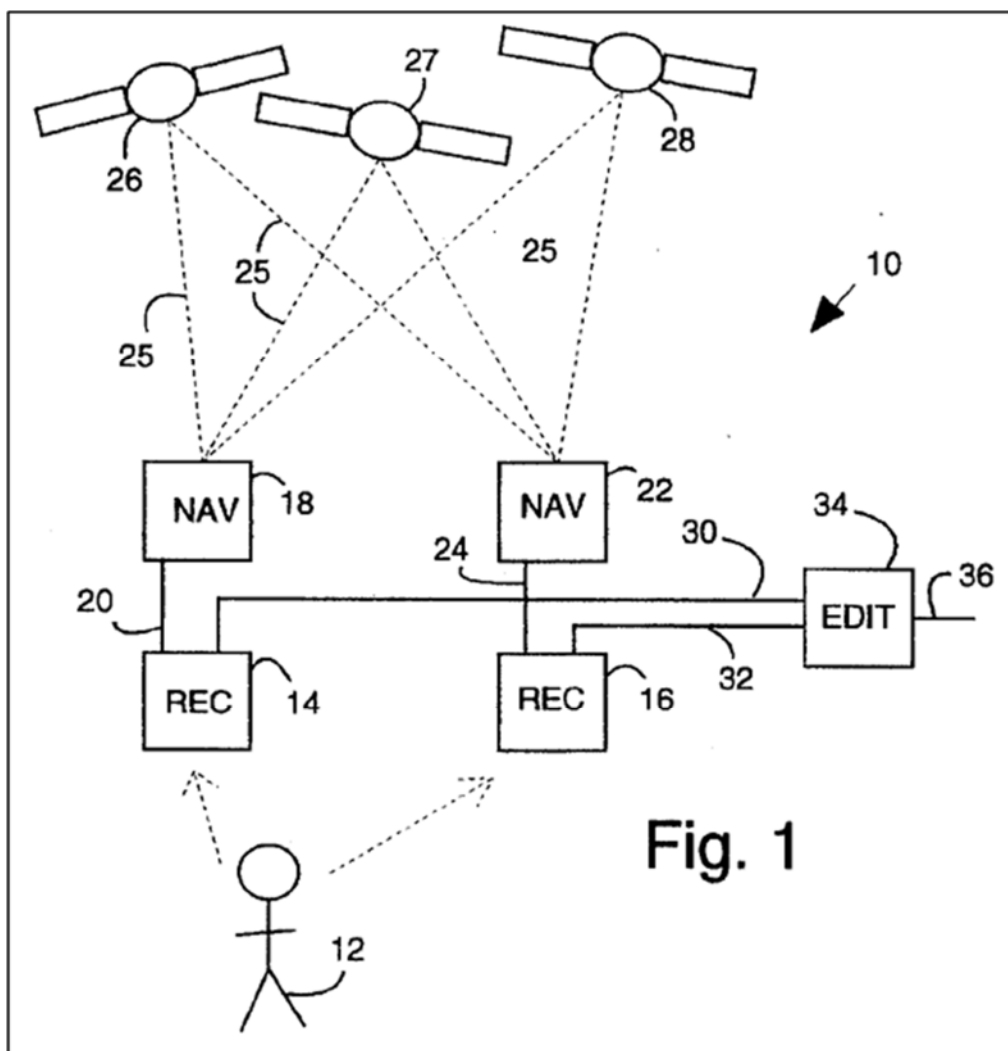


Fig. 1

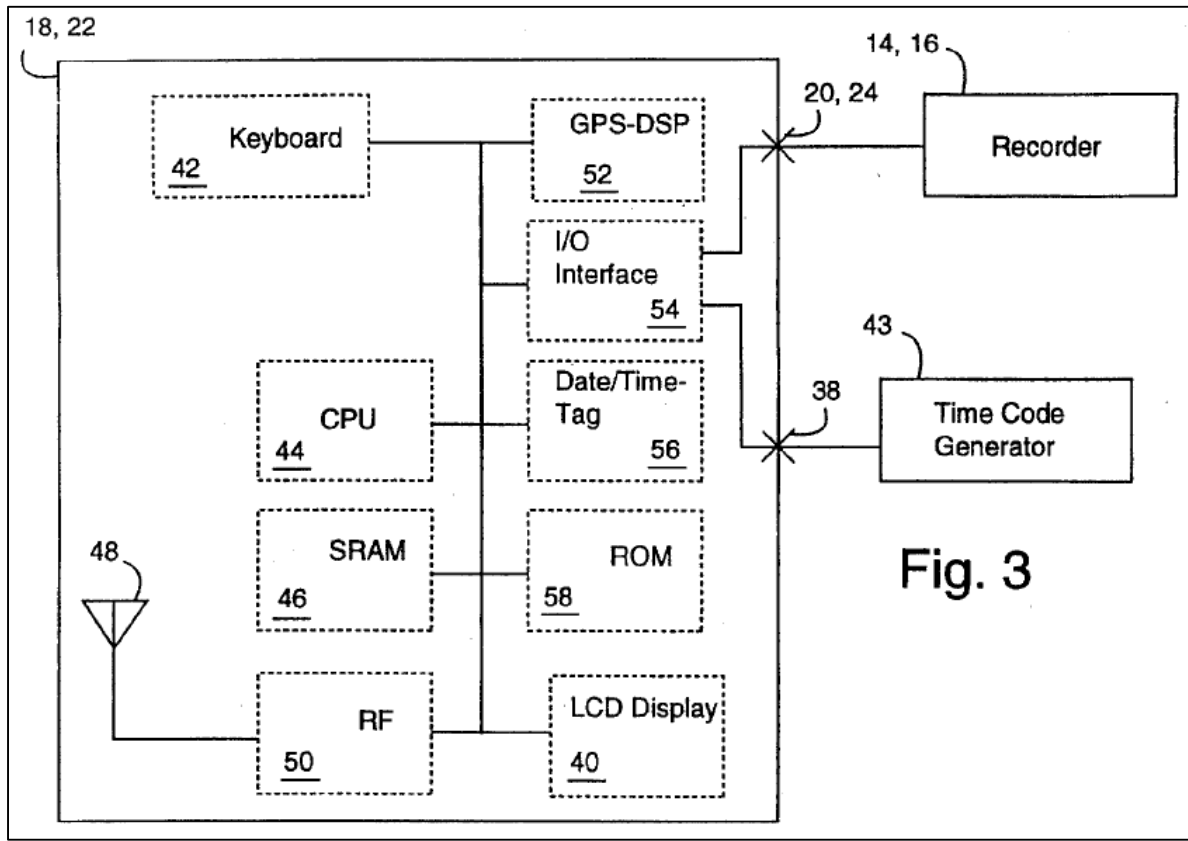


Fig. 3

130. Ex. 1004, Figs. 1, 3; *id.* 5:37-49 (“The connections 30 and 32 represent the communication of the respective recordings by wire, **radio link** and/or tape or film delivery to the editing station 34, e.g., a telecine suite or an audio layback [sic:playback] suite.”), 8:32-44, 9:40-43, 9:56-63, Fig. 4 (emphasis added). A POSA would have understood that Woo’s “radio link” necessarily would have required at least one local transmitter in the recorder 14 or 16.

(7) **1[F]: “at least one local receiver; and”**

131. In the Lectrosonics IPRs, the Board found that Strub discloses a “local audio device receiver.” *Supra* § VIII.C.

132. In particular, the position sensing device 311 in Strub's local audio device comprises a local receiver which receives GPS time information from a GPS satellite. Ex. 1003, 62:26-63:49 ("position sensing device" can be a "GPS receiver [which] receive[s] a signal representing the current time that can be used as a clock to generate time-stamps"), Fig. 3. In addition, each of Strub's local audio devices includes local receiver 310, which receives audio data from the other recording units and synchronization pulses from the master recording unit. *Id.* 12:4-10, 12:39-43 ("The receiver 310 receives recording data signals representing recording data acquired by one or more other recording units...."), 35:57-62 ("[E]ach recording unit can include a receiver that enables receipt of signals broadcast from other recording units that represent the recording data (and, if desired, other related data) obtained by those recording units. The transmitters and receivers enable recording data to be communicated between recording units...."), Fig. 3; *see generally id.* 35:53-38:39 ("Communication Between Recording Units"). Strub also describes "transmitting a synchronization pulse from a 'master' recording unit to each of the other recording units." *Id.* 38:29-39. In view of Strub's description of using the transmitters and receivers of the respective recording units to allow them to communicate with each other, *id.*, 35:53-38:39, a POSA would understand that each recording unit other than the master recording unit receives the synchronization pulse through its receiver 310.

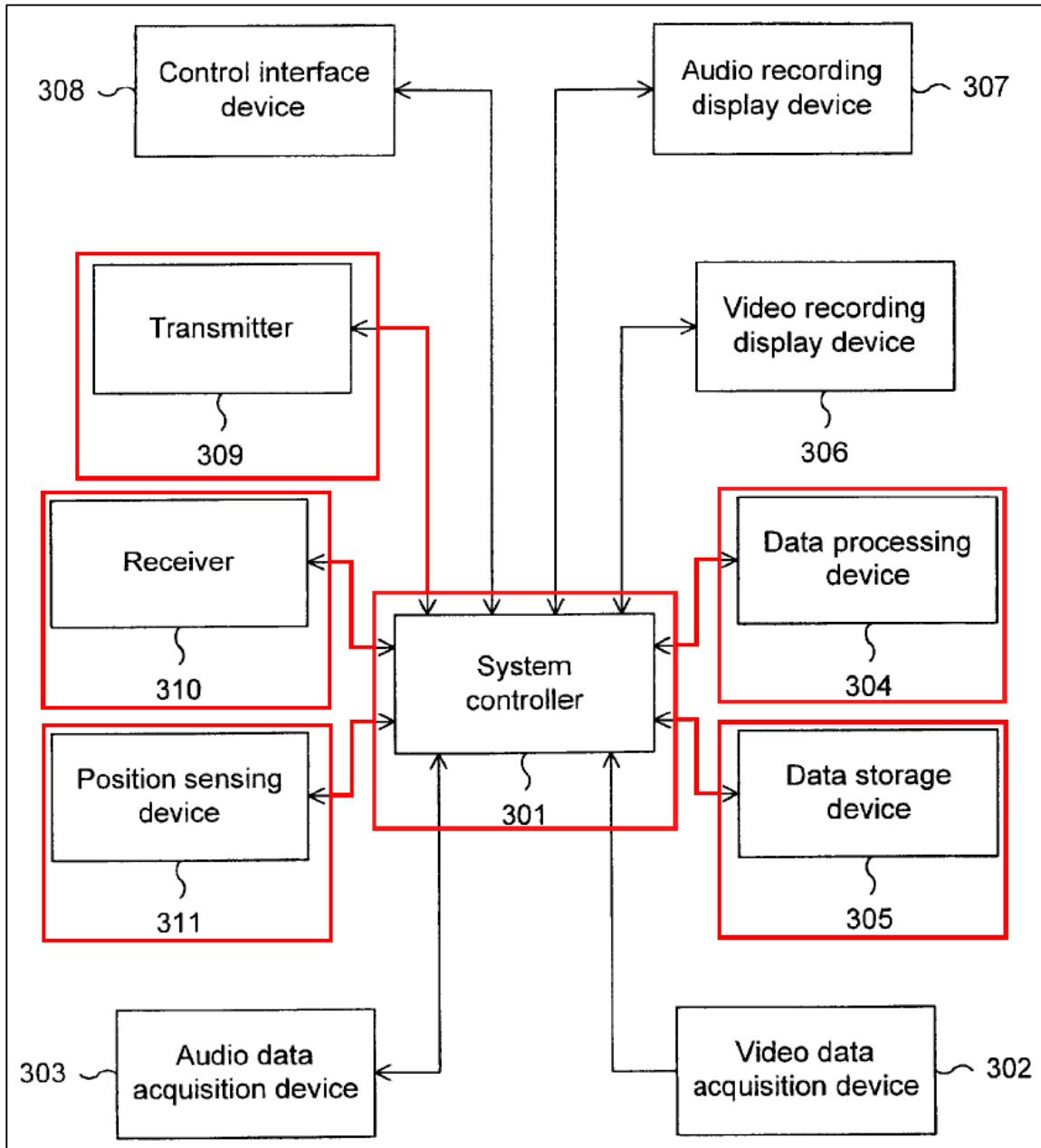
133. Woo’s local audio device also has a GPS receiver which wirelessly—i.e., via microwave radio transmissions 25—receives time information from one or more of GPS satellites 26-28. Ex. 1004, Abstract, 4:13-19 (“GPS navigation receiver...for communicating time codes in SMPTE format”), 4:45-48, 5:5-10 (“[S]atellite receiver[s] 18 [and 22] provide[]...date and time information to...recorder[s] 14 [and 16]”), 5:21-29 (“[N]avigation satellite receivers 18 and 22 receive...microwave radio transmissions 25 from a constellation of orbiting satellites, [which] provide...time clock information...”), 5:54-67, 7:18-25, 7:26-47, 7:49-8:59, 8:60-9:19, 9:33-39, 9:45-55, 10:15-64, Figs. 2-4, 5 (“GPS Receiver” 122), 6 (“GPS Receiver” 142).

(8) **1[G]: “at least one local processing unit, the at least one local processing unit operatively coupled to the at least one local memory, and, optionally, the at least one local transmitter and, optionally, the at least one local receiver”**

134. In the Lectrosonics IPRs, the Board found that Strub teaches “at least one control unit electrically coupled to said local audio device receiver, said audio input device, said memory, and said local timecode generator.” *Supra* § VIII.C.

135. Specifically, Strub’s local audio device—any of recording units 105-108—includes a local processing unit—e.g., system controller 301 and/or data processing device 304—which is operatively coupled to the local memory (data

storage device 305), the local transmitter 309, and the local receivers (receiver 310 and GPS-based position sensing device 311):



136. Ex. 1003, Fig. 3 (annotated); *id.* 12:4-13, 13:36-14:13 (describing operation of “system controller”).

(9) **1[H]: “wherein the at least one local memory stores instructions that, when executed by the at least one local processing unit, configures the local audio device to: receive the at least one master timecode from the remote receiver via the at least one local receiver; ”**

137. Strub’s local memory—data storage device 305—stores instructions—e.g., one or more computer programs. *Id.* 14:4-13 (“computer programs [for the system controller]...are stored on a data storage device of the recording unit....”). A POSA would understand that the instructions are executed by, and control, the at least one local processing unit—e.g., system controller 301 and/or data processing device 304. In addition, the system controller “controls the operation of other components of the recording unit and mediates interaction among those components to effect performance of the functions of the recording unit.” *Id.* 13:37-41. Thus, a POSA would understand that the instructions, when executed by the at least one local processing unit, configure Strub’s local audio device to perform the functions disclosed in Strub, including receiving the synchronization pulses—which are master timecodes, *see supra* Element 1[A]—from the remote receiver—a different recording unit, e.g., the master recording unit. Ex. 1003, 38:29-39 (synchronizing recordings “by transmitting a synchronization pulse from a ‘master’ recording unit to each of the other recording units....”). More specifically, since the system controller 301 is the only component connected to the receiver 310, *id.* Fig. 3, and since Strub states that the system controller “controls the operation of other

components of the recording unit,” *id.* 13:37-41, a POSA would understand that the system controller 301 configures receiver 310 to receive the master timecodes for recording device 300.

138. For example, Strub’s “system controller can include a clock.” *Id.* 13:52-53. A POSA would understand that, in order to synchronize the clock, the system controller in the local audio device would receive the master timecodes—e.g., synchronization pulses—from the remote receiver via the local receiver 310.

(10) **1[I]: “create time-referenced local audio data from the locally generated audio and the at least one master timecode; ”**

139. In the Lectrosonics IPRs, the Board found that Strub teaches “creating stamped local audio data.” *Supra* § VIII.C.

140. For example, Strub’s local audio device receives at least one synchronization pulse—i.e., master timecode—from the remote receiver. *See supra* 1[A]. Strub’s synchronization pulse would synchronize the local clock in the local audio device. Strub’s local audio device then would use its synchronized local clock to “time-stamp”—i.e., time-reference—the local audio data, creating time-referenced local audio data. Ex. 1003, 13:52-58 (“[T]he system controller can include a clock that is used to time-stamp the recording data obtained by the recording unit....The time-stamps can be used, for example, to display the time at which a displayed recording was obtained”). Since the time stamps—i.e., time

references—are created using a local clock which was synchronized from the master timecode, the time-referenced local audio data has been created from the locally generated audio and the at least one master timecode.

141. In addition, Strub discloses creating time-referenced local audio data by adding GPS time stamps, which are also master timecodes, to the locally generated audio. *Id.* 63:12-49 (recording unit using “GPS time signal” to “generate time-stamps for the recording data”); see also *id.* 6:65-7:24 (storing timing information on videotape); 29:42-62, 77:24-28 (writing timing information to audio/video storage medium); 78:7-40; 84:20-25;

142. Woo also teaches creating time-referenced local audio data from the locally generated audio and at least one master timecode. For example, Woo’s local audio device includes “a date and time tag unit 56.” Ex. 1004, 7:59, Fig. 3. Date and time tag unit 56 provides time stamps, which comprise master timecodes and are used to stamp at least a portion of the local audio data. *Id.* 8:11-21, 8:25-44, Figs. 3, 4; see also *id.* 1:60-2:1, 5:37-45. The time stamps—i.e., timecodes—can be based on GPS signals from GPS receivers 18 and/or 22, or can be provided by “commercially-available time code generator 43.” *Id.* 4:13-19 (SMPTE timecodes based on GPS timing signals), 4:45-48 (GPS), 5:5-13, 7:26-29, 7:29-35 (timecodes provided by “commercially-available time code generator 43”), 7:49-53 (“Such a time code generator preferably also can be used as a master clock.”), 8:25-36

(tagging first recording with date and time code information from satellite receiver),
9:33-39, 10:44-60, Figs. 2-4.

(11) **1[J]: “store the time-referenced local audio data in the at least one local memory; and ”**

143. In the Lectrosonics IPRs, the Board found that Strub teaches storing the locally generated audio as audio data in the memory of the local audio device. *Supra* § VIII.C.

144. In particular, the system controller 301 in Strub’s local audio device stores the audio as time-referenced local audio data in the local memory—i.e., data storage device 305—by storing the local audio data together with the corresponding time-stamps. Ex. 1003, 12:10-21 (“[A]udio data acquisition device 303 acquire[s]...audio recording data...representing the content of the event being recorded....[T]he acquired recording data can be stored directly in the data storage device 305, or can first be processed (e.g., compressed) in the data processing device 304....”), 6:65-7:24 (establishing “temporal correspondence” with stored “visual and aural” data by storing a “time code on the videotape”), 29:42-62 (digital disk recorder records both audio and visual data and also “record[s] other types of data (e.g.,...time codes)” with the recorded data.), 77:24-28 (identifying “Hi-8 with RC time code and mini-DV” as exemplary portable video recorders that “write a time code to the linear data storage medium...indicating the time at which corresponding

recording data was obtained.”), 78:7-40 (storing timecodes on videotape), 13:50-58 (“time-stamp the recording data”), 63:41-60, Fig. 3.

145. Woo’s system stores the locally generated audio in the local memory as “time-tagged”—i.e., time-referenced—local audio data. Ex. 1004, 4:62-64 (“sound and picture recordings” stored in “a plurality of independent recording devices”), 5:1-5 (recorders 14 and 16 “capture” performance), 5:37-45 (“recordings” stored within recorders 14 and 16); *supra* 1[Pre] (audio data is time-tagged by Woo’s date/time-tag unit 56).

(12) **1[K]: “wherein the audio data is transmitted to the remote receiver substantially simultaneously with the receiving of the local audio data by the local audio device, the creating of the time-referenced local audio data, or the storing of the time-referenced local audio data in the at least one local memory.”**

146. Strub’s local audio device—e.g., recording unit 300—receives the local audio data, creates the time-referenced local audio data, stores the time-referenced local audio data in the local memory—data storage device 305—and transmits the locally generated audio to a remote device—one or more of the other recording units, e.g., 105-108. See *supra* 1[Pre], Elements 1[A], 1[B], 1[E], 1[I], 1[J]. The transmission is sent to the remote device at the same time that the recording is “being obtained” by the local device—i.e., the reception of the local audio data, creation of the time-referenced local audio data, storage of the time-referenced local audio data in the local memory, and transmission of the locally generated audio to the remote

device occur substantially simultaneously with the local device's receiving the audio "during the event." *See supra* 1[Pre]; Ex. 1003, 35:61-65.

147. To the extent Zaxcom contends that Strub does not disclose Element 1[K], that element is taught by Woo. Woo's local audio device—e.g., an arrangement comprising recorder 14 and GPS receiver 18, or recorder 16 and GPS receiver 22—receives the local audio data, creates the time-referenced local audio data, stores the time-referenced local audio data in the local memory—data storage device 305—and transmits the locally generated audio to the remote receiver—editing station 34. *See supra* 1[Pre], Elements 1[A], 1[B], 1[E], 1[I], 1[J]. Woo teaches that the transmission can be done in real time—i.e., at the same time as the receiving of the local audio data, creation of the time-referenced local audio data, and storage of the time-referenced local audio data in the local memory. *See supra* 1[Pre]; *see also* Ex. 1004, 8:51-54 (combining/generating in "***real-time***" with performance), 10:7-10.

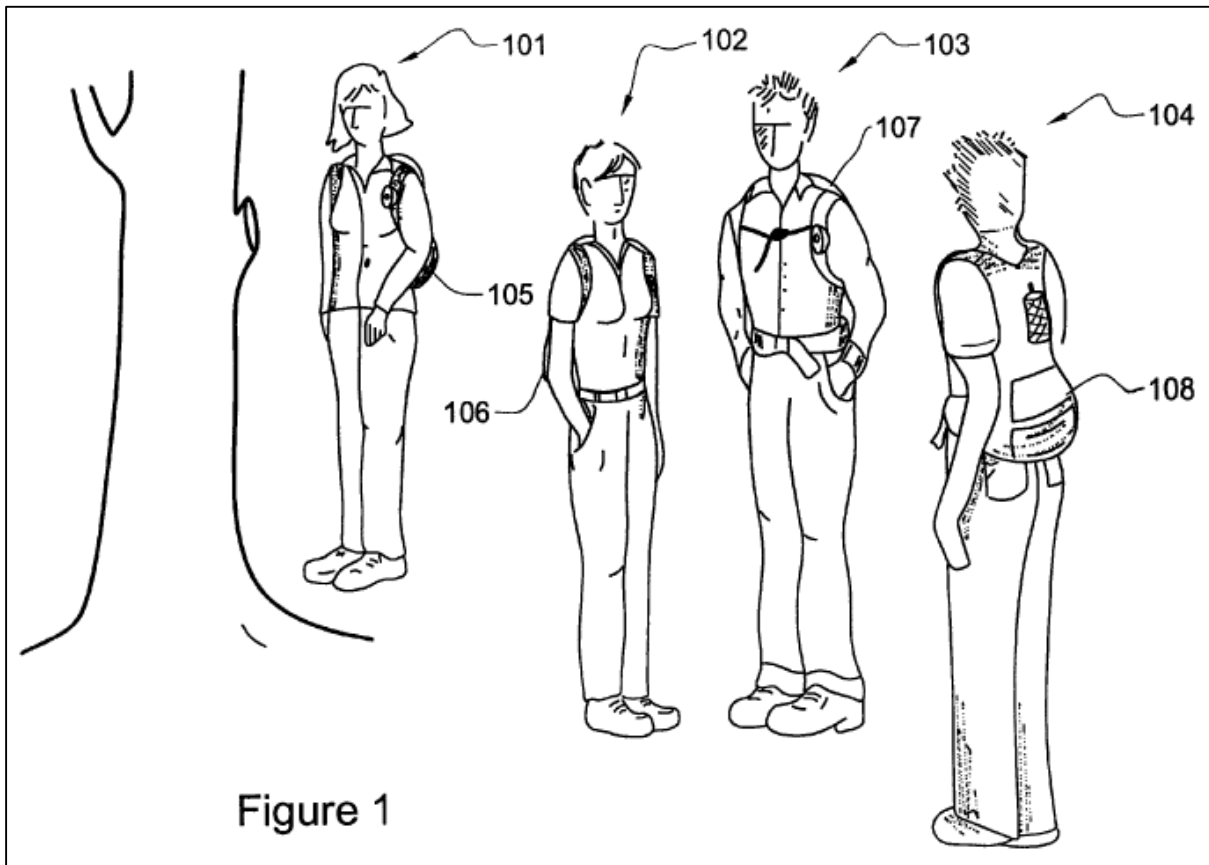
b. **Claim 2: "A system according to claim 1, wherein the local audio device is in the form of a body pack"**

148. Strub's local audio device can be a body pack—e.g., a backpack or other package worn on the recorder's body. Ex. 1003, 11:11-17 ("[T]he recording unit [is] mounted on (e.g., attached on, or worn by)...the recorder"), 16:49-65 (device worn as backpack), 22:3-7, 66:52-56, 70:52-67, 71:53-66 (device attached

to user's body with waist strap), 73:24-50 (harness, backpack), Figs. 1, 4, 6, 8A-9B (depicting body packs).

c. **Claim 3: “A system according to claim 1, wherein the local audio device is in the form of a body pack typically worn by news announcers and performers.”**

149. This element is disclosed by Strub, which teaches a body pack. *Supra*, claim 2. Additionally, to the extent Claim 3 is definite, Strub teaches that the recording unit (local audio device) is in a form typically worn by a “performer,” *i.e.*, a “participant” in an event. *See id.* 8:7-29 (recording units are for “people ... participating in ... an event”), 11:1-9 (“... the recorder’s participation in the event ...”), Abstract, 1:24-34. For instance, the person wearing Strub’s recording unit can record the event while also singing “Happy Birthday” as a participant. *Id.* 52:19-24. *See also id.* 67:59-68:2 (“recording while engaging in an athletic activity...”), 2:55-65, 47:33-39.



150. To the extent Claim 3 is definite, Strub's recording unit also can be in a form typically suitable for news announcers. For instance, Strub teaches that it should be "wearable," "small," "lightweight," "inconspicuous," "unobtrusive," "operate[s] easily," facilitates "low-attention recording," and does "not physically interfere (e.g., obstruct vision or movement) with the recorder's participation in the event." *Id.* 4:20-31, 9:4-33, 11:1-24, 23:58-67, 34:12-15. These are physical characteristics that make the form of Strub's wearable body pack typically suitable for news announcers; therefore, a POSA would understand that Strub either teaches this element or renders it obvious.

- d. **Claim 4: “A system according to claim 1, wherein the at least one master timecode includes hour data, minute data, second data, SMPTE timecode, or combinations thereof.”**

151. In the Lectrosonics IPRs, the Board found that Strub teaches master time data including hour, minute, and/or second data. *Supra* § VIII.C.

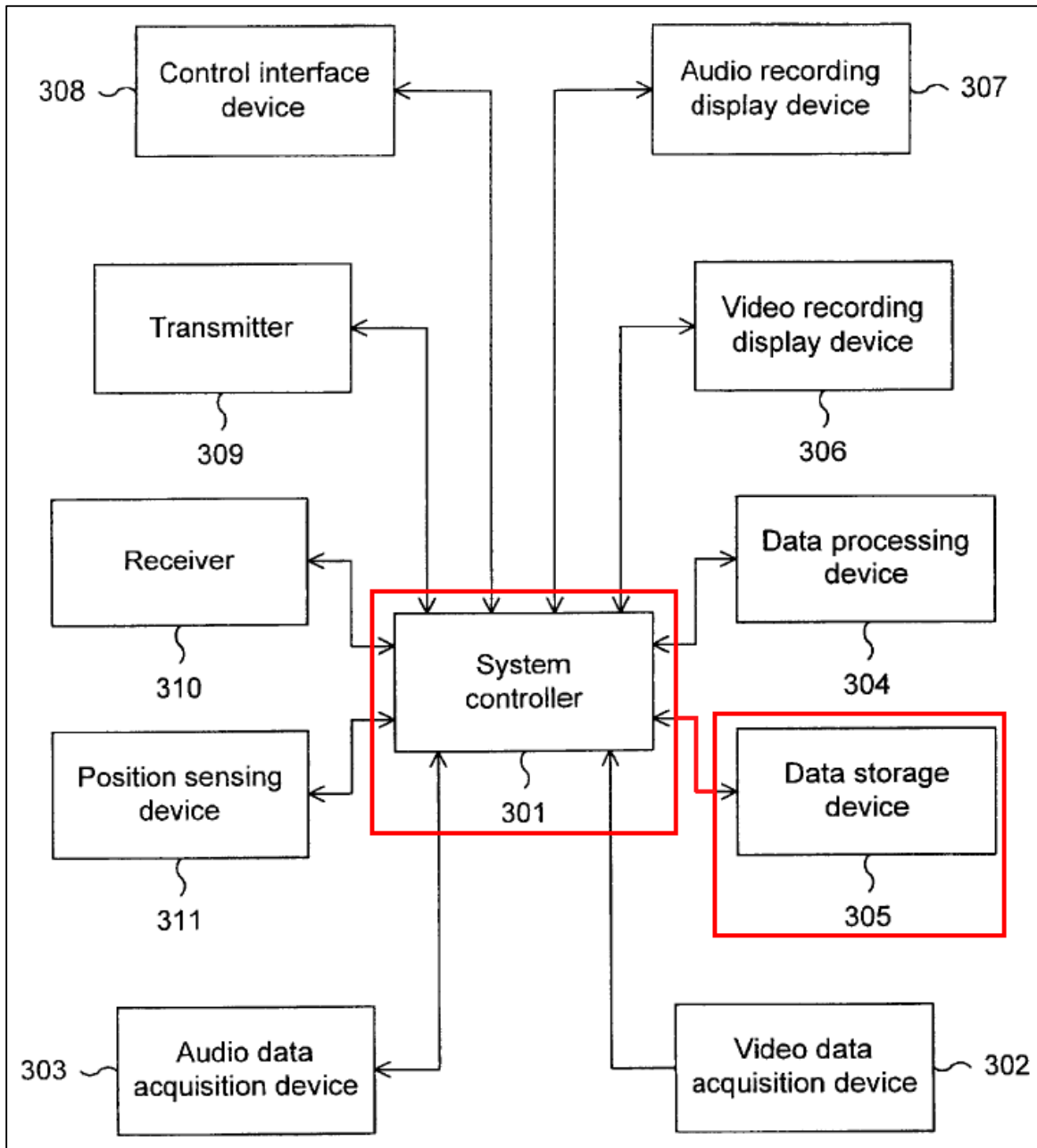
152. In addition, Strub teaches master timecodes from a SMPTE timecode source. Ex. 1003, 75:47-51. A POSA would know that SMPTE timecodes contain hour data, minute data, and second data. *See* Ex. 1037 at 30-35; Ex. 1039 at 2, 3, 6, 13; *see also* Ex. 1004, 3:20-22 (“Twenty-six [bits of a SMPTE timecode] are used to store time information.”). Strub also teaches the use of GPS time signals as master timecodes. *See supra* Elements 1[A], 1[H], 1[I]. Strub explains that the “GPS time signals” “represent[] the current time.” Ex. 1003, 63:41-49. A POSA would have known that GPS time signals include GPS time, which is based on (1) the number of weeks elapsed since the GPS zero point—midnight UTC on January 6, 1980, and (2) the number of seconds since the beginning of the current week, also referred to as “time of week” or “TOW.” *See* Ex. 1040 at 1:47-60 (“GPS time is stated in terms of a time of week (TOW) and a week number. TOW ranges from 0 to 604800, corresponding to the number of seconds in a week.”). Thus, a POSA would have known that the GPS time signals referenced in Strub would include the TOW, which

would comprise second data in the form of the number of seconds since the beginning of the week. *Id.*

153. Woo's timecode generator 43 and CPU 44 running the timecode-generation program stored in ROM 58 both generate SMPTE timecodes which include hour data, minute data, and second data. *See supra* Element 1[Pre]; Ex. 1004, 1:21-40 (time code clock provides data "in hours, minutes, seconds and frames"), 2:3-9, 2:42 (time codes include "time bits"), 3:20-22 ("Twenty-six [bits of a SMPTE timecode] are used to store time information.").

- e. **Claim 5: "A system according to claim 1, wherein the remote receiver is configured to communicate with a recording device."**

154. Strub's remote receiver—e.g., the master recording unit 300, *see supra* Element 1[A]—is configured to communicate with a recording device, including its own internal recording device—data storage device 305—through its system controller 301, as illustrated in Figure 3:



See Ex. 1003, 12:10-21 (“[T]he system controller 301 controls the operation of, and mediates interaction among, the other components of the recording unit 300,” including data storage device 305); see also *id.* 6:14-15 (recording unit has “non-volatile data storage device on which recording data is stored”), 6:16-53, 7:14

(recording device can comprise videotape), 11:37-53 (recording unit 200 stores audio/video in data storage device 203), 13:36-14:7, 27:36-28:14 (recording device can comprise “wide variety of...storage devices,” including hard disk or non-volatile data storage), 29:19-23 (recording device can be a non-volatile storage device), 33:20-56, Fig. 2 (illustrating system controller 201 configured to communicate with data storage device 203).

155. Alternatively, a POSA would have considered it obvious to take Strub’s recording unit (data storage device 305) out of the the remote receiver (local recording unit 300), provide it with its own enclosure, and have the remote receiver communicate with it using an external interface. For instance, Strub teaches that the recording unit 300 can be used with “existing camcorders” connected via “an external communication port.” *Id.* 5:23-48, 48:45-47, 70:6-57. More generally, Strub teaches connecting “additional devices” to a recording unit via wires and ports or wirelessly. *Id.* 66:7-25, 67:30-44, 70:40-43. Furthermore, taking Strub’s recording unit out of the remote receiver, putting it in its own enclosure, and having the remote receiver communicate with it using an external interface would involve merely a simple rearrangement of parts and thus would have had a high likelihood of success.

156. Woo’s remote receiver—editing station 34—can be a “telecine suite or an audio layback [sic:playback] suite.” Ex. 1004, 5:36-42. A POSA would

understand that an “audio playback suite”—a well-known term in the recording industry—comprises post-processing and recording equipment used by editing and post-processing personnel, and that the respective devices in the suite communicate with each other. Furthermore, a POSA would have considered it a routine design choice whether to include the recording device within Woo’s editing station 34 or as an external recording device with which the remote receiver separately communicates, with each having a high likelihood of success.

f. **Claim 6: “A system according to claim 5, wherein the recording device is a multi-track recorder, a personal computer, a cellular phone, or a camera.”**

157. Strub’s recording device is a camera—e.g., a camcorder, video cassette recorder, or portable dockable videotape recorder. *See supra* Claim 5; Ex. 1003, 5:23-48, 48:45-47, 66:7-25, 67:30-44, 70:6-57, 70:40-43, 75:25-57.

g. **Claim 7: “A system according to claim 1, wherein the remote receiver is a master timecode generator.”**

158. Claim 7 does not narrow Claim 1, which already requires the remote receiver to create at least one master timecode. In any event, Claim 7 is disclosed by each of Strub and Woo for the reasons set out *supra* Element 1[A].

- h. **Claim 9: “A system according to claim 1, wherein the time-referenced local audio data is configured to facilitate synchronization of the time-referenced local audio data and the remotely recorded audio data.”**

159. Strub’s time-stamped—i.e., time-referenced—local audio data, *supra* Element 1[I], is configured to facilitate synchronization of the time-referenced local audio data and the remotely recorded audio data. For example, the system controller 301 in Strub’s local audio device “time-stamp[s] the recording data obtained by the recording unit. (The time-stamps can be used...to enable post-event synchronization of the display of recordings obtained by different recording units.)” Ex. 1003, 13:50-58; *see also id.* 79:54-80:9 (“temporally synchronize multiple recordings of the same event that were simultaneously obtained by different recording units”), 84:5-25 (“[T]he...time codes that can be obtained by a recording unit according to the invention can be used to identify the position of each recording unit at any particular time, thus facilitating such processing by enabling the delays between recording units to be calculated.”), 38:29-39. A POSA would understand that Strub’s references to synchronizing the “recordings obtained by different recording units” include both the local recordings created by the respective recording units and the remote recordings received by recording units acting as remote receivers.

160. Woo’s time-stamped—i.e., time-referenced—local audio data, *supra* Element 1[I], is configured to facilitate synchronization of the time-referenced local

audio data captured by the local audio devices and the remotely recorded audio data stored at the editing station 34. For example, Woo's "time code information is input to independent sound, film and video recorders...to create tracks on each recording for re-synchronizing the pictures and sounds in post-performance editing." Ex. 1004, Abstract; *see also id.* 1:60-2:9 ("A time code is generally used for locating or referencing a specific point within a reel of film or tape. This is most useful in the editing process...."), 2:39-48, 4:3-32 ("generating coordinated time codes at independent sites proximate to respective recorders."), 4:62-64 (describing "a time-keeping system for synchronizing sound and picture recordings from a plurality of independent recording devices"). In addition, Woo teaches using software and timecode information to synchronize and "blend" two different recordings from different microphones to generate a third, composite recording which is a combination of the first two. *Id.* 8:44-52 ("[S]tep 114 combines the first and second recordings, according to a synchronization between the first and second date and time code information. A step 116 generates a third recording from the date and time synchronized portions..."), 9:65-5, 11:12-16 ("editing means...for combining said first and second recording mediums according to said recorded formatted digital time codes to create a time-synchronized composite recording."), 12:11-14. Woo provides alternative examples in which the combining is done either in post-processing or in real time. *See id.* 8:51-54, 10:7-10, 10:12-14. Moreover, Woo

teaches synchronizing clocks of recording units so that recordings can later be combined by aligning time stamps. *See id.* 3:38-67.

i. **Claim 10: “A system according to claim 1 further comprising: a remote control unit.”**

161. Strub’s system further comprises a remote control unit—a “control interface device” or “control interface unit 702”—which can be “implemented to enable wireless communication...between the control interface device...and the remainder of the recording unit[s].” Ex. 1003, 47:41-48, 68:11-18, Fig. 7. “[T]he control interface device enables the recorder to control operation of the recording unit. [It] includes...mechanisms (e.g., pushbutton, switch) for enabling the recorder to start and stop operation of the recording unit.” *Id.*, 47:49-53; *see also id.* 45:52-46:5, 47:50-63, 48:4-17, 49:4-14, 49:22-31, 49:46-55, 57:25-32. Strub teaches that the control interface device is remote and separate from the recording unit. *Id.* 47:25-32, 46:18-24, 46:54-56, 47:2-9. For example, a “transmitting recording unit” can send signals to one or more “receiving recording unit[s]” to cause the receiving recording units to “emi[t] an audible tone, display...a visual cue (e.g., lighting of an LED indicator) and/or produc[e] a haptic sensation...” *Id.* 40:45-60.

j. **Claim 13.**

162. Challenged Claim 1 has mostly the same limitations as Claim 37 of the ’814 Patent, which was found unpatentable in the Lectrosonics ’1130 IPR and

subsequently canceled, except that Challenged Claim 13 refers to substantially simultaneously transmitting audio data to a remote device; and canceled Claim 37 of the '814 Patent has an audio input port and a local timecode generator. *See* Ex. 1001, Claim 13; Ex. 1028, Claim 37, IPR Certificate at 1:6-7. Transmitting the audio data to a remote device is present in Claim 13 of the '307 Patent, which was found unpatentable in the Lectrosonics '972 IPR and subsequently canceled. Ex. 1015, Claims 12, 13, IPR Certificate at 1:5.

(1) **13[Pre]: “A system for locally recording locally generated audio as time-referenced local audio data and for substantially simultaneously transmitting audio data to a remote device, the system comprising: ”**

163. Regardless of whether the preamble of Claim 1 is limiting, it is taught by Strub and Woo. *See supra* 1[Pre].

(2) **13[A]: “a remote receiver, the remote receiver configured to create at least one master timecode and to receive audio data; ”**

164. This element is taught by Strub and/or Woo. *See supra* 1[A].

(3) **13[B]: “a local audio device capable of communicating with the remote receiver and configured to receive locally generated audio; ”**

165. This element is taught by Strub and Woo. *See supra* 1[B].

(4) **13[C]: “the at least one local audio device wearable by a creator of the locally generated audio, ”**

166. This element is taught by Strub. *See supra* 1[C].

(5) **13[D]: “the at least one local audio device including: at least one local memory; ”**

167. This element is taught by Strub. *See supra* 1[D].

(6) **13[E]: “at least one local transmitter; ”**

168. This element is taught by Strub and Woo. *See supra* 1[E].

(7) **13[F]: “at least one local receiver; and ”**

169. This element is taught by Strub and Woo. *See supra* 1[F].

(8) **13[G]: “at least one local processing unit, the at least one local processing unit operatively coupled to the at least one local memory, and, optionally, the at least one local transmitter and, optionally, the at least one local receiver, ”**

170. This element is taught by Strub. *See supra* 1[G].

(9) **13[H]: “wherein the at least one local memory stores instructions that, when executed by the at least one local processing unit, configures the local audio device to: receive the at least one master timecode from the remote receiver via the at least one local receiver; ”**

171. This element is taught by Strub. *See supra* 1[H].

(10) **13[I]: “synchronize a local timecode with the at least one master timecode; ”**

172. In the Lectrosonics IPRs, the Board found that Woo discloses synchronizing a local clock with a master time clock “just as disclosed by the [related ’902 and ’814] patent[s],” and that a POSA would have been motivated to use Woo’s synchronization techniques in Strub’s system. *Supra* § VIII.C.

173. Strub discloses that master timecodes comprising a “synchronization pulse” are used to synchronize other “devices.” Ex. 1003, 38:29-39. A POSA would understand that synchronizing “devices” entails synchronizing the devices’ clocks, and thus that the master timecode is used to synchronize the other recorders’ local clocks so that the local timecodes generated by those clocks are synchronized with the master timecode. At minimum this would have been an obvious way to accomplish such synchronization and, since clock synchronization and timecode generation were well-understood, would have had a high likelihood of success. Alternatively, Strub discloses using GPS time as master timecodes. *Supra*, element 1[A].

174. In addition, Strub’s local audio device (a recording unit) includes a local timecode generator—an internal clock—that generates a local timecode—e.g., a signal indicating the time—used to timestamp the recording data. Ex. 1003, 13:52-56 (“[T]he system controller can include a clock that is used to time-stamp the recording data obtained by the recording unit. (The time-stamps can be used, for example, to display the time at which a displayed recording was obtained....)”), 63:56-60 (“[A] recording unit according to the invention...includes an internal clock ... that ... can ... be used to accurately time-stamp data”), 79:54-80:9 (“[R]ecording unit ... typically includes a clock that is used to time-stamp recording data as the recording data is acquired”), Fig. 3. Strub discloses synchronizing the local

timecode generator—the internal clock—with master timecodes from, e.g., GPS satellite or SMPTE timecode source. Ex. 1003, 63:50-60 (“[T]he 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.”); 79:63-80:7 (“[The] recording unit...includes a clock that is used to time-stamp recording data as the recording data is acquired. However, adequate synchronization requires that each recording unit “include a GPS receiver” and not be “shielded from a GPS transmitter system for an extended period of time....”), 75:25-57 (“SMPTE time code input ... to enable synchronization with an external device”), Fig. 3 (position sensing device 311). Since the local timecode generator generates the local timecodes, synchronizing the local timecode **generator** with the master timecodes has the effect of synchronizing the local **timecodes** with the master timecodes.

175. Furthermore, a POSA would have considered it a routine and obvious design choice whether to use Strub’s GPS or SMPTE master timecodes or Strub’s synchronization pulses—which also comprise master timecodes, *see supra* 1[A]—to synchronize the local timecode generator and thus the local timecodes. *See e.g.,*

Ex. 1003, 75:25-57 (“SMPTE time code input ... to enable synchronization with an external device”). Since timecode-generator synchronization was well understood, any of those choices would have had a high likelihood of success.

176. To the extent Zaxcom contends that Strub does not disclose Element 13[I], this element is taught by Woo. Specifically, Woo discloses receiving a master timecode from a master timecode generator—e.g., one or more of GPS satellites 26-28—and synchronizing the local timecode generator 43 to the satellite(s) using the master timecode. Ex. 1004, 3:37-45 (describing the synchronization process), 4:13-19 (“[A]n embodiment of the present invention comprises a GPS navigation receiver with a data output port for communicating time codes in SMPTE format. The conventional date and time sentence output of the GPS navigation receiver is combined with a highly-accurate one pulse-per-second ($\pm$ one microsecond) to form a time-keeping base for the time code output.”), 4:45-48, 5:5-10 (“A navigation satellite receiver 18 provides highly-accurate date and time information to the recorder 14 over a connection 20. Similarly, another navigation satellite receiver 22 provides highly-accurate date and time information to the recorder 16 over a connection 24.”), 5:21-29 (“Both navigation satellite receivers 18 and 22 receive a plurality of microwave radio transmissions 25 from a constellation of orbiting satellites, which are represented by a set of three satellites 26-28....Each satellite 26-28 has an atomic clock synchronized system-wide to provide highly accurate time

clock information, e.g., the time-of-day and the calendar date.”), 5:54-67, 7:18-25, 7:26-47 (“commercially-available time code generator 43...will jam [(i.e., jam synchronize)] to both the output connection 38 and normal SMPTE/EBU time code”), 7:49-8:59, 8:60-9:4 (“synchronizing film and video equipment”), 9:5-19, 9:33-39, 9:45-55, 10:15-64, Figs. 2-4.

(11) **13[J]: “create time-referenced local audio data from the at least one local timecode; ”**

177. In the Lectrosonics IPRs, the Board found that Strub teaches a “local timecode generator for creating stamped local audio data and storing said stamped local audio data in said memory.” *Supra* § VIII.C.

178. In particular, the system controller 301 in Strub’s local audio device creates time-referenced local audio data by time-stamping the locally generated audio with local timecodes generated by a local clock. Ex. 1003, 13:50-58 (“[T]he system controller can include a clock that is used to time-stamp the recording data obtained by the recording unit. (The time-stamps can be used, for example, to display the time at which a displayed recording was obtained, to locate particular stored recording data, or to enable post-event synchronization of the display of recordings obtained by different recording units.)”), 63:56-60 (“an internal clock ... used to accurately time-stamp data”), 6:65-7:24 (establishing “temporal correspondence” with stored “visual and aural” data by storing a “**time code** on the videotape”); 29:42-

62 (digital disk recorder records both audio and visual data and also “record[s] other types of data (e.g.,...***time codes***)” with the recorded data.); 77:24-28 (identifying “Hi-8 with RC time code and mini-DV” as exemplary portable video recorders that “***write a time code to the linear data storage medium...*** indicating the time at which corresponding recording data was obtained.”); 78:7-40 (storing timecodes on videotape); 84:20-25.

(12) **13[K]: “store the time-referenced local audio data in the at least one local memory; and ”**

179. This element is taught by Strub and Woo. *See supra* 1[J].

(13) **13[L]: “wherein the audio data is transmitted to the remote receiver substantially simultaneously with the receiving of the local audio data by the local audio device, the creating of the time-referenced local audio data, or the storing of the time-referenced local audio data in the at least one local memory.”**

180. This element is taught by Strub and Woo. *See supra* 1[K].

k. **Claim 14: “A system according to claim 13, wherein the local audio device is in the form of a body pack.”**

181. This element is taught by Strub. *See supra* Claim 2.

l. **Claim 15: “A system according to claim 13, wherein the local audio device is in the form of a body pack typically worn by news announcers and performers.”**

182. This element is taught by Strub. *See supra* Claim 3.

- m. **Claim 17: “A system according to claim 13, wherein the at least one master timecode and the at least one local timecode include hour data, minute data, second data, SMPTE timecode, or combinations thereof.”**

183. This element is taught by Strub and Woo. *See supra* Claim 4.

- n. **Claim 18: “A system according to claim 13, wherein the remote receiver is configured to communicate with a recording device.”**

184. This element is taught by Strub and Woo. *See supra* Claim 5.

- o. **Claim 19: “A system according to claim 18, wherein the recording device is a multi-track recorder, a personal computer, a cellular phone, or a camera.”**

185. This element is taught by Strub. *See supra* Claim 6.

- p. **Claim 20: “A system according to claim 13, wherein the remote receiver is a master timecode generator.”**

186. This element is taught by Strub and Woo. *See supra* Claim 7.

- q. **Claim 22: “A system according to claim 13, wherein the time-referenced local audio data is configured to facilitate synchronization of the time-referenced local audio data and the remotely recorded audio data.”**

187. This element is taught by Strub and Woo. *See supra* Claim 9.

- r. **Claim 23: “A system according to claim 13 further comprising: a remote control unit.”**

188. This element is taught by Strub. *See supra* Claim 10.

- s. **Claim 27: “A system according to claim 13, wherein the synchronize a local timecode with the at least one master timecode is done by synchronizing a local timecode generator to the master timecode, or synchronizing a local timecode to the master timecode.”**

189. Each of Strub and Woo teaches both synchronizing a local timecode generator to the master timecode and synchronizing a local timecode to the master timecode. *See supra* 13[I].

B. Ground 2: Claims 12 and 26 are Rendered Obvious Under § 103 By the Combination of Strub, Woo, Nagai, and Gleissner

1. **A POSA Would have Been Motivated to Combine Strub, Woo, Nagai, and Gleissner**

190. A POSA would have been motivated to combine Strub and Woo. *See supra* § XI.A.1. In addition, A POSA would have been motivated to combine Nagai and/or Gleissner with Strub and Woo. For example, in the Lectrosonics IPRs, the PTAB found that a POSA would have motivated to combine Strub, Woo, Nagai, and Gleissner, and that the combination(s) would have been obvious. *See supra* VIII.C.

191. Moreover, the teachings of Strub, Woo, Nagai, and Gleissner provide substantial motivation to combine them. For example, Nagai and Gleissner teach audio recording systems having an audio input—a “mike jack” or XLR plug connector—configured to couple to an audio input device for receiving locally generated audio. Ex. 1005, [0100], [0109]-[0110], [0139], Fig. 1, 2A; Ex. 1006, [0013], [0024], [0032], Fig. 1. Audio plugs and jacks such as those in Nagai have

existed for over 130 years and have not changed substantially since the 19th century. See, e.g., Ex. 1023 ; Ex. 1024. XLR connectors such as those referenced in Gleissner were so common as of the priority date of the '444 Patent that they had been standardized. Ex. 1025 at 1 (standard date March 2004), *passim* (copyright year 2004). A POSA would have considered it obvious to use those well-known standard connectors in Strub's local audio device because of their popularity, especially since Strub recommends specific brands of commercially available microphone—e.g., a Sanken CSS-5—which were configured to be plugged into an input. Ex. 1003, 25:35-49. The Sanken CSS-5, for example, plugged into a standard XLR jack as described in Gleissner. Ex. 1026 at 6, 14 (CSS-5 uses XLR-5 “IN/OUT” connection), *passim* (other XLR-connected microphones); Ex. 1027, at 7 (CSS-5 uses XLR-5 “IN/OUT” connection), *passim* (other XLR-connected microphones).

192. Furthermore, every element of Challenged Claims 12 and 26 appears in Strub, Woo, Nagai, and/or Gleissner. See *infra* § XI.B.2. Those elements are standard method steps using well-known, off-the-shelf audio-recording and radio components that would be familiar to any POSA. There is nothing unpredictable about the claimed use of those components in a wireless audio-recording system. *Id.* Furthermore, the technology and operation of such components was well-understood in the relevant time period such that the combination of Strub, Woo, Nagai, and Gleissner would have had a high likelihood of success.

193. Thus, since the microphone jacks and plugs of Nagai and Gleissner were old elements performing the same function they had always been known to perform, since audio inputs have been known for over a century, since the combination of elements in the Challenged Claims is merely “the predictable use of prior art elements according to their established functions,” and since the combination of Strub, Woo, Nagai, and Gleissner would have had a high likelihood of success, a POSA would have been motivated to combine Strub, Woo, Nagai, and Gleissner.

2. **The Combination of Strub, Woo, Nagai, and Gleissner Meets All Elements of Challenged Claims 12 and 26**

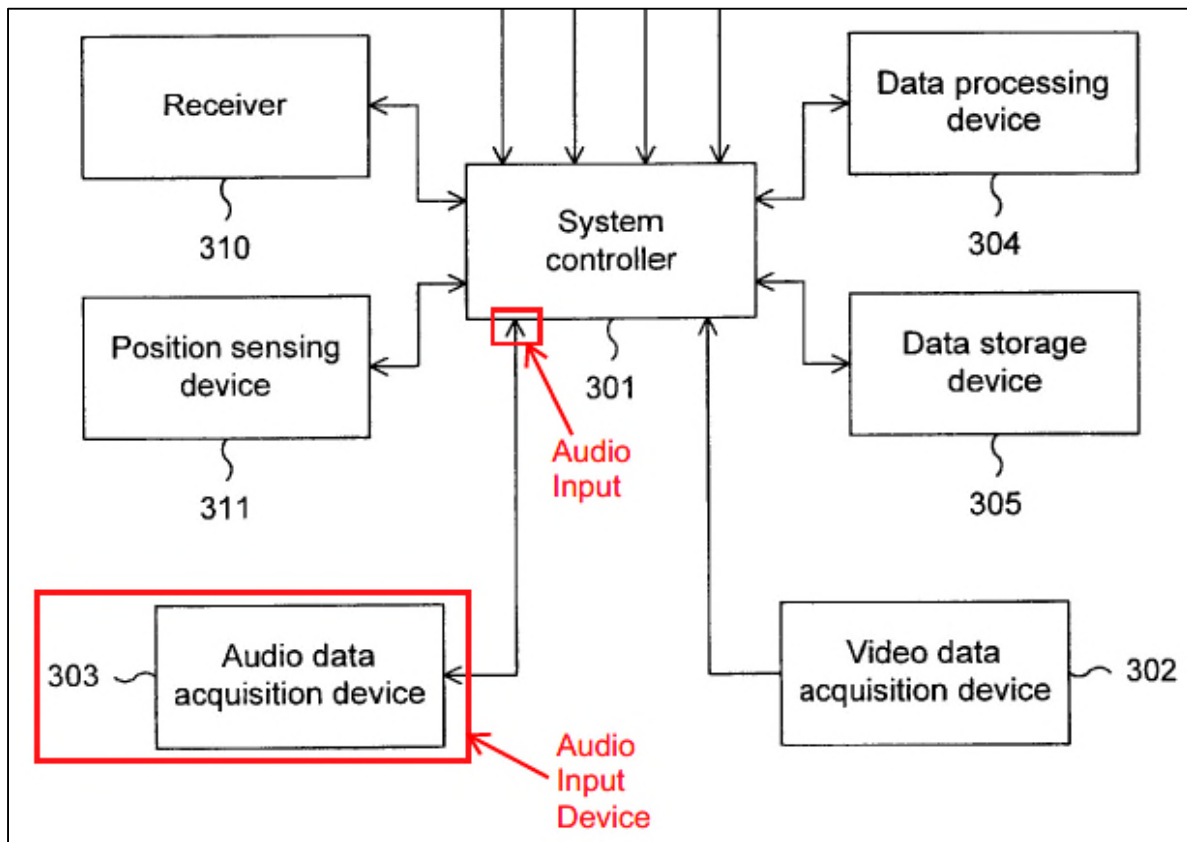
a. **Claims 12 and 26: “A system according to claim [1/13], the local audio device further comprising: at least one audio input configured to receive the local audio data.”**

194. In the Lectrosonics IPRs, the Board found that each of Strub, Nagai, and Gleissner teaches an “audio input port for receiving said locally generated audio from an audio input device,” and that it would have been obvious to combine Strub with Nagai or Gleissner. *Supra* § VIII.C.

195. For example, Strub’s audio data acquisition device 303 is an audio input device, specifically a microphone. Ex. 1003, 21:65-22:2 (“[A]ny suitable audio data acquisition device (e.g., microphone) can be used in [the] recording unit....”); 22:64-23:31 (exemplary microphones used as audio input device), 25:25-49, 60:3-5

(“conventional microphone.”). Among the exemplary microphone types disclosed in Strub are digital microphones. *Id.* 21:65-22:2. A POSA would understand that a digital microphone outputs audio data.

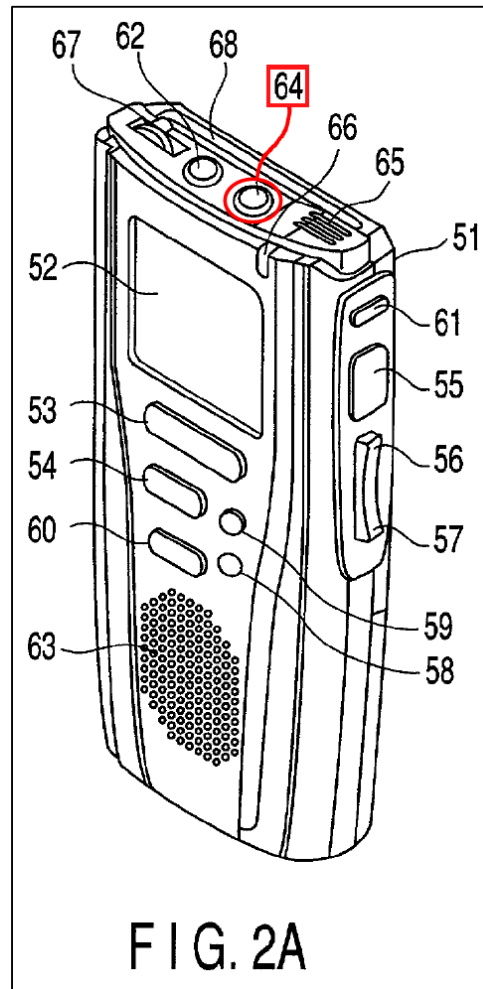
196. The system controller 301 in Strub’s local audio recording unit 300 has a local audio input—the controller’s connection to audio input device 303 (e.g., a microphone)—configured to receive the local audio data from the audio input device 303:



197. *Id.*, Fig. 3 (excerpted, annotated), 21:65-25:49, 68:63-69:67 (receiving audio from “lavalier microphone”); *see also id.* 64:50-65:3 (wired or wireless

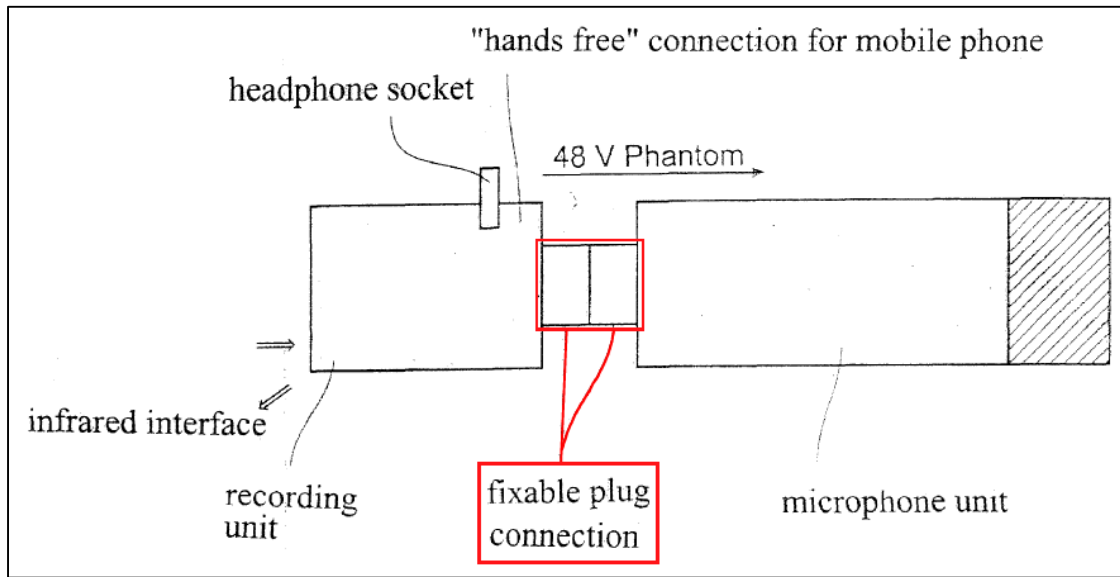
connections known in the art, which would include a standard microphone jack). Furthermore, Strub states: “It can be advantageous to mount the audio...data acquisition device[s] so that [it is] detachably attached.” *Id.* 69:23-26. A POSA would interpret Strub’s statement about detachability as meaning that the microphone is not soldered/hard-wired but connected through an audio input such as a microphone jack/plug.

198. To the extent Zaxcom contends that Strub does not disclose the additional elements of Claims 12 and 26, those elements are taught by Nagai and Gleissner. Nagai’s audio recorder has an audio input—“mike [sic] jack” 2 or 64—for coupling to an audio input device—an external microphone, or “mike [sic]”—to receive the local audio data:



199. Ex. 1005, Fig. 2A (annotated); *id.* [0100], [0109], and [0139], Fig. 1.

200. Gleissner's audio recorder has a conventional audio input—an XLR plug connector—to couple to an audio input device—a microphone—to receive the local audio data:



201. Ex. 1006, Fig. 1 (annotated); *id.* [0013] (“[T]he recording unit can be coupled together with [a] microphone[] [using] an XLR connector....”), [0024], [0032]. Gleissner provides explicit motivation for using a standard microphone connector: “This has the advantage that the recording unit can be coupled together with practically any desired microphones, because an XLR connector is generally formed as the preferred embodiment in the case of microphones.” *Id.* [0013].

202. Woo refers to using a recorder 14 to “record the live performance of a performer 12, e.g., a singer or actor.” Ex. 1004, 5:1-5. Recorder 14 necessarily would have had an audio input to couple to a microphone in order to receive the sound from the performer.

203. Furthermore, a POSA would have been motivated to include Nagai’s microphone jack or Gleissner’s microphone plug connection in Strub’s and/or

Woo's local audio device because there were many alternative types and brands of microphones that were commercially available as of the priority date of the '444 Patent, and the operator would choose one according to the particular application. Examples are provided in Strub: analog, digital, directional, omni-directional, lavalier, spatial-distribution-detection, lavalier stereo omni-directional (e.g., Lectret 5200), stereo directional (e.g., Sanken CSS-5), and microphone arrays for beam forming. Ex. 1003, 21:65-22:2, 22:65-23:31, 24:61-64, 25:35-49, 29:35-37, 31:37-45, 32:17-26, 68:63-69:18, 84:52-62. A POSA would have understood the advantages of using Nagai's or Gleissner's standard microphone jacks and plugs to allow different kinds of microphones to be easily swapped in and out of Strub's and Woo's audio recording systems according to the application and thus would have considered the combination obvious.

C. Ground 3: Claims 16 and 24 are Rendered Obvious Under § 103 By the Combination of Strub, Woo, and Samadani

1. A POSA Would have Been Motivated to Combine Strub, Woo, and Samadani

204. A POSA would have been motivated to combine Strub and Woo. *See supra* § XI.A.1. In addition, A POSA would have been motivated to combine Samadani with Strub and/or Woo. The teachings of Strub, Woo, and Samadani provide substantial motivation to combine them. For example, the systems described in Strub, Woo, and Samadani are the same type of apparatus used for the

same purpose. Each discloses a system for receiving and recording local audio in a local device, transmitting the same audio to a remote device, and recording the audio in the remote device. *See, e.g., supra* § XI.A.1 (discussing Strub and Woo); Ex. 1007, Abstract, [0028], [0035], [0037], [0038], [0042], [0044], [0048], [0053], Figs. 3-7. In addition, each of the local audio devices of Strub, Woo, and Samadani wirelessly receives master timecodes from a master timecode generator and uses the timing information from the master timecodes to stamp the local audio. *See, e.g., supra* § XI.A.1 (discussing Strub and Woo); Ex. 1007, [0038]-[0040], [0042], [0047], [0048], Figs. 3 (items 321, 309a/309b), 4 (item 446), 5 (items 509, 525a/525b), Claims 10, 15, 19, 32, 35.

205. Indeed, Woo itself provides express motivations to use its synchronization methods in wireless recording systems such as Samadani's. For example, Woo's master clock (1) provides accurate synchronization across recorders, (2) can generate coordinated timecodes at independent sites proximate to recorders, (3) is simple to connect to the recorders, and (4) provides timecode output in a format that is compatible with a standard (SMPTE) used by commercially available equipment. *See supra* § XI.A.1. In addition, modifying Samadani's recording unit to include a conventional SMPTE timecode input port for receiving conventional SMPTE-formatted master timecodes from Woo's master clock would

involve nothing more than combining familiar elements according to known methods to improve Samadani's system and yield predictable results.

206. Moreover, the '444 Patent sought to solve the problem of matching the timing between multiple recordings produced by one or more wireless devices and did so by generating master timecodes with a master timecode generator, providing those timecodes to a local recording device, and using the timing information in those timecodes to time-stamp the locally recorded audio data. *Supra* § XI.A.1. Strub, Woo, and Samadani recognized and solved that same problem in the same way. *See supra* § XI.A.1 (discussing Strub and Woo); Ex. 1007, [0038]-[0040], [0042], [0047], [0048], Figs. 3 (items 321, 309a/309b), 4 (item 446), 5 (items 509, 525a/525b), Claims 10, 15, 19, 32, 35.

207. Furthermore, every element of Challenged Claims 16 and 24 appears in Strub, Woo, and/or Samadani. *See infra* § XI.C.2. Those elements are standard method steps using well-known, off-the-shelf audio-recording and radio components that would be familiar to any POSA. There is nothing unpredictable about the claimed use of those components in a wireless audio-recording system. *Id.* Furthermore, the technology and operation of such components was well-understood in the relevant time period such that the combination of Strub, Woo, and Samadani would have had a high likelihood of success.

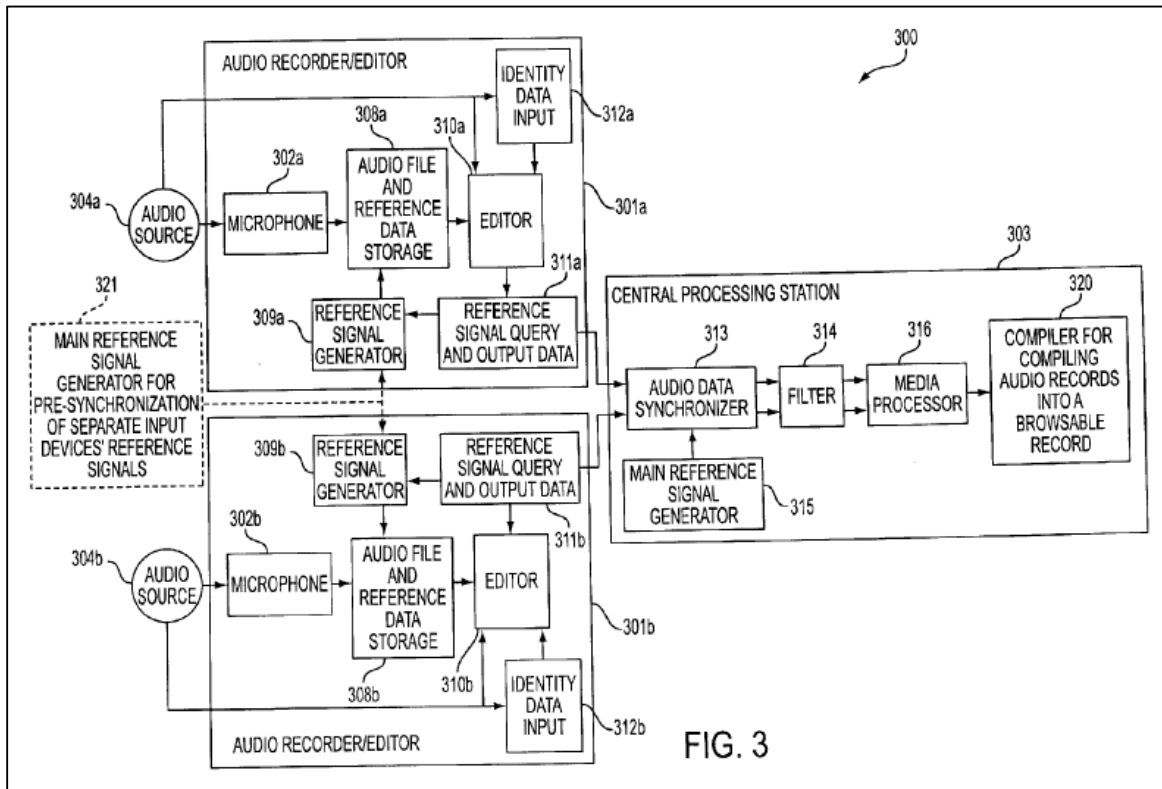
208. Thus, since Strub, Woo, and Samadani teach the same kind of device used for the same purpose, since each of them identified the same problem identified in the '444 Patent and solved it in the same way, since the combination of elements in the Challenged Claims is nothing more than “the predictable use of prior art elements according to their established functions,” and since the combination of Strub, Woo, and Samadani would have had a high likelihood of success, a POSA would have been motivated to combine Strub, Woo, and Samadani.

2. **The Combination of Strub, Woo, and Samadani Meets All Elements of Challenged Claims 16 and 24**

a. **Claims 16 and 24: “A system according to claim [15/23], wherein the remote control unit is a personal computer.”**

209. Samadani teaches one or more local audio devices—e.g., audio recorders/editors 301a/301b—which transmit locally generated audio to a remote receiver—e.g., a central procession station 303. See Ex. 1007, [0035]-[0036] (“The media recorder/editors 301a and 301b are connected to a central processing station 303 [which] processes the audio data from a media recorder/editor 301....The respective connections of the media recorder/editors 301a and 301b to central processing station 303 can be a...wireless connection....”), Fig. 3; see also *id.* [0045] (“audio/visual recorders 501a and 501b can be respectively connected via a wire or wirelessly to the processing stations.”), [0046], Figs. 5, 6.

210. An embodiment of Samadani's system is depicted in Fig. 3:



211. Samadani's local audio devices—e.g., audio recorders/editors 301a/301b—and remote receiver—e.g., central processing station 303—can be personal computers. *Id.* [0035] (“The media recorder/editors 301a and 301b are connected to a central processing station 303, which can be a personal computer”), [0044] (“An audio/visual recorder can be a personal computer...”); *see also id.* [0015] (“[C]entral-processing-station/editor 106...can be a personal computer...”), [0022], [0046] (“[C]entral processing station 505...can be a personal computer...”). Samadani's central processing station has a graphical user interface (“GUI”) with

various buttons and other graphical elements to allow the user to control the central processing station. *Id.* [0056]-[0057], [0059]-[0072].

212. A POSA would have been motivated to use Samadani's personal computer, including its GUI, as Strub's remote control unit in order to benefit from (1) the convenience and flexibility of a GUI for configuring and controlling Strub's recording units, and (2) the cost savings in engineering and components associated with using standard hardware and software such as a personal computer with a GUI. Furthermore, a POSA would have known that there was a high likelihood of success in using Samadani's personal computer as Strub's remote control unit.

213. In addition, each of Strub's recording units can comprise a remote control unit. *See supra* Claim 10. Strub further teaches that a cell phone can be used as a recording unit. Ex. 1003, 40:12-31. Thus, the cell phone described in Strub comprises a remote control unit. A POSA would consider it a routine design choice whether to use a cell phone or a personal computer as Strub's remote control unit and thus would consider it obvious to use a personal computer for that purpose.

XII. SECONDARY CONSIDERATIONS

214. I am not aware of any secondary considerations of non-obviousness for the Challenged Claims of the '444 patent. For example, for the reasons provided *supra* ¶ VIII.C., it is my opinion that the evidence of objective indicia that Zaxcom submitted in the Lectrosonics IPRs has no nexus to the Challenged Claims.

However, if Patent Owner raises any new evidence of secondary considerations or objective indicia (or re-submits any of the same evidence that it submitted in the Lectrosonics IPRs) in its briefing or expert's declaration, I reserve the right to respond to those considerations.

XIII. CONCLUSION

215. For the foregoing reasons, it is my opinion that Claims 1-7, 9, 10, 12-20, 22-24, 26, and 27 of the '444 Patent would have been obvious to a POSA at the time of the alleged invention.

Executed on February 7, 2025, in Los Angeles, California.

A handwritten signature in dark ink, appearing to read "Ch. Kyriakakis", written over a horizontal line.

Dr. Chris Kyriakakis